The Black Gold Curse: Examining the Link Between Nigeria's Oil Sector and Inequality

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Abstract- ***The abundance of oil reserves and revenues in Nigeria, while providing significant economic benefits, has also resulted in a noticeable income inequality among its population, with over 50% living below the poverty line. This study aims to investigate the complex relationship between oil sector performance and inequality in Nigeria between 1980 and 2025. Phillips–Perron unit root and KPSS tests revealed that all variables were stationary at first difference. The study then conducted further analysis using Autoregressive Distributed Lag (ARDL) bounds tests. The findings revealed that while increased oil revenue reduces income inequality among Nigerians, increased oil sector output does not. Furthermore, the government's spending patterns exacerbate the income inequality, necessitating more targeted and strategic spending to reduce the disparity in incomes. This study concludes with the following recommendations: Proper management and reinvestment of oil revenues into productive sectors like agriculture and manufacturing can create employment opportunities, reduce poverty, and subsequently reduce inequality. Tackling systemic corruption is crucial to fully harness the economic benefits of oil revenues, while investing in other mineral resources can help reduce the dependence on oil, promote economic diversification, and contribute to income equality. In addition, increasing transparency and accountability in the oil sector, as well as encouraging participation of stakeholders in decision-making, can contribute to a more equitable distribution of oil wealth among the Nigerian population***

Keywords: Auto-Regressive Distributed Lag (ARDL), Income Inequality, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test, Oil Sector Performance and Resource Curse

I. BACKGROUND TO THE STUDY

The oil sector, which plays a crucial role in Nigeria's economy, is marred by corruption, environmental degradation, and conflicts, leading to persistent poverty and inequality. The phenomenon of Dutch Disease, the unequal distribution of oil wealth through corruption, and the environmental impact of the oil sector have hindered the growth of other sectors of the economy, perpetuating inequality and poverty (Ekpo, 2025). In Nigeria, wealth and income inequality is rampant, with a high Gini coefficient of 0.35 and a poverty ratio of 40.1% in 2023, increasing to 55.1 in 2025. The disproportionate concentration of wealth in the hands of the wealthy 20% of the population, who earn 42% of the national income, exacerbates the existing inequalities in the country. On the other hand, the poorest 20% of the population barely scrape by with only 7% of the national income. Moreover, the multidimensional nature of poverty afflicting millions of people, including children, presents a grim picture of the prevailing inequalities in Nigeria. These stark economic disparities contribute to a myriad of social and economic problems, including violence, corruption, and political instability (NBS,2025).

Despite the potential for oil wealth to promote development and reduce poverty and inequality, many of Nigeria's citizens have yet to reap the benefits of the country's resource wealth, with poverty and inequality remaining widespread. The relationship between the oil sector and inequality is further complicated by the politics of resource control, with various stakeholders demanding a larger share of the oil revenue. This has led to conflicts between different regions and ethnic groups, further undermining the potential for inclusive growth and development. The phenomenon of resource curse, where countries rich in natural resources experience worse economic outcomes than those with fewer resources, is often cited to explain Nigeria's underperformance. The lack of transparency and accountability in the management of oil revenues has also contributed to the persistence of inequality and poverty in the country (Aslaksen,2010; Adelowokan, et al,2015; Chijioke, et al,2023).

To address the curse of black gold, some authors such as Ekpo and Udoh, (2025); Ekpo, (2022); Lawal *et al*, (2022); Edmond *et al* (2020), Parcero (2016) and Orebiyi (2018) have suggested diversifying the economy away from oil and investing more in sectors such as agriculture, manufacturing, and services, which have the potential to create more jobs and improve income distribution. Other measures include improving transparency and accountability in the management of oil revenues, strengthening institutions and governance, promoting anti-corruption efforts, and implementing policies to support the poorest and most vulnerable communities. However, these measures face significant challenges in Nigeria, including vested interests, weak institutions, and political instability. The legacy of the black gold curse is evident in the widespread poverty and inequality in Nigeria, particularly in the Niger Delta region, despite the country's abundant oil wealth. This phenomenon is not unique to Nigeria, as other oil-rich countries, such as Venezuela and Angola, have also struggled to translate their resource wealth into inclusive development and poverty reduction. The challenge for Nigeria and other resource-rich countries is to address the structural and institutional factors that contribute to the curse of black gold and implement policies that promote inclusive growth and reduce inequality.

Against the backdrop of Nigeria's persistent inequality and its status as a major oil producer, this study seeks to unravel the link between the performance of the oil sector and inequality in the country. The study aims to answer the critical question of whether the oil sector has effectively reduced inequality in Nigeria. Employing the ARDL bounds test, the study will shed light on the impact of the oil sector on inequality and offer policy recommendations that can harness the sector's potential to mitigate inequality in Nigeria, thus adding to the existing body of knowledge on this crucial issue.

II. REVIEW OF RELATED LITERATURE

2.1 Conceptual Framework

2.1.1 Oil Output and Revenue

Oil revenue constitutes a significant proportion of Nigeria's government revenues, dictating fiscal policy decisions and budgetary allocations. This reliance on oil revenue is akin to a natural resource rent, which carries inherent risks as countries dependent on rents essentially borrow from their future resources for present gains. This study therefore seeks to comprehend the intricate dynamics between oil sector performance and inequality as well as poverty alleviation in Nigeria, with a particular focus on oil rent as a crucial variable for gauging the impact of oil on the economy. A comprehensive analysis of the role of oil revenue in fostering poverty alleviation hence mitigate income inequality necessitates a multidimensional approach that accounts for various aspects of poverty. These dimensions encompass income poverty, which assesses individuals' earnings relative to a set minimum threshold; human poverty, which measures deprivation in education, health, and other basic human necessities; social poverty, which considers the ability of individuals to participate in society and access social services; and capability poverty, which evaluates access to economic opportunities and the ability to make choices (Imanojemu and Akinlosotu 2018; Ekpo and Udoh, 2025)

2.1.2 Poverty

Poverty, an all-encompassing concept, encompasses the absence of fundamental human needs and is therefore a pressing challenge in development discourse. Various measurement techniques, such as Deninger's database, the Gini coefficient, annual per capita income, and the proportion of the population living under the one to two-dollar per day range, are employed to gauge poverty. However, due to limited data availability in some regions, including Nigeria, the Private Per Capita Consumption index (PPC) has emerged as a proxy measure of poverty (Ekpo and Udoh, 2025).

Notwithstanding its abundant oil wealth, Nigeria has been labeled a paradox by the World Bank, as poverty levels have not significantly improved despite decades of resource extraction. This has aroused concern over the relationship between oil sector performance and poverty alleviation in Nigeria, as the evident wealth has not translated into tangible improvements in socio-economic indicators (Bell and Wolford, 2015; Ekpo and Udoh, 2025).

2.1.3 Poverty Indicators

Poverty indicators, encompassing a range of variables such as unemployment, income inequality, mortality rates, corruption levels, educational access,

and healthcare standards, provide a comprehensive understanding of the multifaceted nature of poverty. Despite Nigeria's abundant oil wealth, the country still grapples with widespread poverty, raising questions about its development path. Development theories have evolved over time, from a focus on economic growth to a more holistic approach that accounts for socio-economic aspects. The Human Development Index, developed by the World Bank, encapsulates life expectancy, education, and income, providing a comprehensive view of a society's well-being. In the context of Nigeria's oil revenue, socio-economic development serves as a crucial lens for understanding the impact of oil wealth on various indicators, such as poverty, inequality, and human development. The Millennium Development Goals and Sustainable Development Goals, initiated by the United Nations, further underscore the interconnectedness of these factors in promoting living standards (Arezki, 2009; International Monetary Fund, 2011).

2.1.4 Inequality as a Poverty Indicator

Income inequality refers to the uneven distribution of income within a population, which can have negative social and economic effects. Nigeria is grappling with a widening income gap between urban and rural areas, due to the dominance of the oil sector and the lack of investment in human capital development in rural areas. This disparity has led to increased poverty rates and incidents of violence, corruption, and social unrest, with rural dwellers dependent on agriculture facing the brunt of the inequality. The gap in income levels, which emerged after the economic growth period from 1965 to 1975, has exacerbated poverty in the country, contributing to a range of socio-economic problems. In essence, the increasing income inequality is entrenching poverty in Nigeria and impeding the country's progress.

2.2 Theoretical Literature

2.2.1 Oil Revenue and Income Inequality: Marginal Productivity Theory

The marginal productivity theory suggests that participants in the production process are remunerated based on their marginal productivity, a principle that proponents argue ensures fair distribution of wealth. However, empirical evidence suggests that inequality persists, as extreme levels of inequality can result from various factors, including discrimination, exploitation, and monopoly power. Nigeria serves as a case study, with its excessive inequality and disproportionate distribution of wealth due to factors such as expropriation of resources by urban elites and the inequitable distribution of oil wealth from the Niger Delta region to the rest of the country.

The prolonged rule of the military and subsequent civilian governments in Nigeria have resulted in the emergence of a class of elites engaged in primitive accumulation through corruption, rent-seeking, and theft of public funds. These elites prioritize their own wealth accumulation over the development of the country, stashing their ill-gotten gains in foreign banks and neglecting the well-being of ordinary Nigerians. The Nigerian economy continues to suffer from severe poverty, high rates of unemployment, inadequate infrastructure, high infant mortality rates, maternal deaths, social vices, and insecurity, reflecting the damaging impact of these elite groups on the country's development.

2.2.2 Resource Curse Theory

The term "resource curse" was coined by Richard Auty, an economist and researcher at the University of Oxford, in his 1993 article titled "Natural Resources: The Double-edged Sword." He observed that many resource-rich countries have failed to achieve economic growth and development despite their abundant natural resource wealth. Auty's idea built on earlier work by Dutch economist E. F. Schumacher, who, in his 1973 book "Small is Beautiful," argued that resource-rich countries often experience economic underdevelopment due to mismanagement and misallocation of resources (Orebiyi, 2018).

Auty's theory posits that the presence of natural resources, particularly non-renewable resources like oil, gas, and minerals, can create adverse effects on a country's economy and society. These adverse effects can manifest in several ways:

- Economic Volatility: Resource-rich countries may experience volatile economic growth, as resource prices fluctuate in global markets. This volatility can disrupt investment and create uncertainty for businesses.
- Corruption: Resource wealth can create incentives for corruption and rent-seeking behavior, as politicians and elites capture resource revenues for personal gain.

2.2.3 Dutch Disease

The concept of Dutch Disease was first introduced by the economists W. Max Corden and J. Peter Neary in the 1980s, during a study of the economic impact of the natural gas boom in the Netherlands in the 1960s and 1970s. The term "Dutch Disease" refers to the negative impact of a natural resource boom on a country's other industries. The phenomenon was named after the Dutch experience of declining manufacturing exports after the discovery of natural gas fields in the North Sea in the 1960s. The Dutch Disease occurs when a sudden increase in natural resource exports leads to a rise in the value of the domestic currency. This currency appreciation makes exports from other sectors less competitive, leading to a decline in production and employment in those sectors. For instance, an increase in oil exports can lead to an appreciation of the domestic currency, making the country's manufactured goods more expensive in international markets. As a result, manufacturers may experience reduced demand for their products and lose market share (Ekpo and Udoh, 2025).

The Dutch Disease can also lead to other economic and social problems, such as:

- Increased Inequality: The influx of natural resource revenues can lead to increased inequality in income and wealth distribution, as a small number of individuals or groups capture a large share of the revenues.
- Decreased Innovation: A reliance on natural resource exports can reduce the incentives for innovation and diversification, as firms may be less inclined to invest in research and development when profits are easily generated from resource extraction.

2.2.4 Natural Resource Revenues and Redistributive Politics (Jeffrey D. Sachs 2005)

Natural resource revenues and redistributive politics is a theory that posits that revenues from natural resources, such as oil, can lead to an unequal distribution of wealth and power. This is because natural resource revenues are often concentrated in the hands of a few individuals or groups, such as government elites, state-owned enterprises, or large multinational corporations. This concentration of wealth can create incentives for those in power to maintain control over natural resource revenues, rather than redistributing them to the broader population.

2.2.5 The Endogenous Growth Theory

The endogenous growth theory, proposed by economists such as Arrow and Romer, offers a compelling explanation for economic growth. Unlike the neoclassical growth theory, which relies on exogenous factors such as population growth and technological progress to explain growth, the endogenous growth theory emphasizes the role of factors that are internally generated by the economy. The endogenous growth theory posits that innovation, human capital formation, and productivity enhancements can drive economic growth. This implies that countries can achieve sustained economic growth by investing in research and development, education, and institutions that foster innovation. This theory has important implications for policymaking. Moreover, the endogenous growth theory suggests that government policy can play a crucial role in shaping economic growth. For instance, governments can invest in education, support R&D activities, and implement policies that facilitate technological adoption and innovation. This approach contrasts with the traditional neoclassical growth theory, which places greater emphasis on market-driven economic growth (Ekpo *et al,*2022; Ekpo *et al,*2023; Ekpo, 2024; Ekpo and Udobia 2025; Ekpo *et al,*2025).

The endogenous growth theory has been extensively studied, and empirical evidence has lent support to its tenets. However, critics argue that it overlooks the potential role of external factors such as international trade and globalization in shaping economic growth.

2.3 Empirical Literature

While a sizable body of literature has examined the relationship between resource abundance and per capita income, the focus here is on how income is distributed. Studies on resource rents have suggested that equitable distribution of revenues can reduce income inequality by improving education, health, and institutional quality. However, the effects of resource abundance and volatility on income inequality are nuanced, with varying outcomes depending on factors such as ethnic divisions. For instance, in ethnically diverse societies, natural resources tend to exacerbate income inequality, while in homogeneous societies, they tend to mitigate it.

Leamer *et al.* (1999), argued that resource abundance leads to higher income inequality through lower human capital accumulation and a relocation of physical capital from manufacturing. Gylfason and

Zoega's 2003 study demonstrated that economic growth and inequality are affected by natural resources when the distribution of capital is not evenly spread between resource-based and non-resource sectors. This finding was echoed by Buccellato and Mickiewicz's 2009 work, which suggested that natural resources primarily benefit the few.

With a particular focus on the role of ethnic divisions, Fum and Hodler (2010) conducted a study that investigated the relationship between natural resources and income inequality. The findings of the study revealed that in ethnically divided societies, natural resources tend to exacerbate income inequality. However, in ethnically homogenous societies, natural resources tend to have the opposite effect, reducing income inequality. The empirical evidence provided in the study supports these conclusions, highlighting the complex interplay between natural resources, ethnic divisions, and income distribution

Similarly, Carmignani's 2013 study showed that there is a positive link between natural resources and income inequality. The results from these studies are supported by several other pieces of evidence that demonstrate the detrimental effect of natural resources on economic growth and inequality. For instance, Bárcena and Sánchez-Ancochea (2012) argued that natural resources may drive up income inequality by increasing income differences between capital-intensive extractive industries and the rest of the economy. Moreover, Akhanjee et al. (2014) indicated that natural resources may exacerbate income inequality by reducing incentives for elites to undertake redistributive measures, as resources provide a way for elites to maintain their power and wealth. Despite Stijns (2006) and Ross (2008) failing to find any direct relationship between natural resources and income inequality, both scholars believe that the absence of transparency from governments in resource-rich countries can distort the data on income inequality, potentially leading to biased results. This issue highlights the need for greater transparency in the reporting of income inequality data in resource-rich countries, as it can influence the accuracy of economic analysis and policy decisions.

Utilizing the Standardized World Income Inequality Database in the United States, Parcero and Papyrakis (2016) conducted an empirical study on the relationship between oil and income inequality. The study's innovative approach examined whether oil-rich nations tend to under-report income inequality data and the potential implications of this under-reporting. They utilized Heckman selection models to verify this tendency and correct for any possible biases. The findings indicated that oil was generally associated with reduced income inequality, with the exception of countries with extremely high oil wealth.

In a separate study, Steinberg (2017) investigated the relationship between resource abundance and migration selectivity. By combining Dutch Disease- and Roy-Borjas-model-based approaches, the study examined the impact of resource shocks, particularly oil booms, on migrant selectivity across 116 source and 23 destination countries from 1910 to 2009. The findings revealed that resource shocks strengthened the phenomenon of brain drain, whereby skilled workers emigrate from their home countries to seek better opportunities elsewhere

In the United States of America, Kim and Lin (2018), investigated the impact of natural resource abundance, in particular oil, on income disparities. They employed common correlated effects and pooled mean group methodology for estimation to account for the cross-country heterogeneity and cross-section dependence in the oil-inequality relationship. In a sample of industrialized and emerging countries, they established that oil abundance as well as oil dependence reduce income inequality. The inequality-reducing outcome is likely to operate from better education accomplishments and healthier status due to oil booms.

Kim et al. (2020) conducted a study using dynamic panel co-integration techniques to examine the relationship between oil, volatility, and income inequality, taking into account the cross-country heterogeneity, cross-section dependence, and feedback effects. The findings suggest that while oil abundance leads to increased human capital investment, improved institutional quality, and reduced income inequality, oil volatility has the opposite effect. This is in line with the resource curse literature, which posits that volatility, rather than abundance, is the key driver of the paradox of plenty.

While some studies support the notion that resource abundance can lead to increased income inequality

through lower human capital accumulation and unequal distribution of capital between resource and non-resource sectors, other studies suggest a positive correlation between natural resources and income inequality, potentially due to the lack of transparency in resource-rich countries and under-reported data on income inequality. These diverging findings highlight the complex nature of the relationship between resource abundance and inequality and the need for further research and data to develop a comprehensive understanding

III.METHODOLOGY

3.1 Research Design

This study utilizes a combined approach of descriptive and ex-post facto research designs to provide a comprehensive analysis of the long-term relationship between oil sector performance and inequality over a 45-year period from 1980 to 2025. The extended timeframe allows for a thorough investigation of the trends and patterns, providing a more holistic understanding of the interplay between the oil sector and inequality in Nigeria. By examining the data over an extended period, the study aims to offer insights into the relationship between the two variables and their potential impact on the country's socio-economic development (Ekpo *et al,*2023; Ekpo *et al,*2025).

3.2 Model Specification

To analyze the impact of oil sector performance on inequality in Nigeria, this study adopts the endogenous growth theory, originally developed by Arrow (1962) and Romer (1986) in Ekpo and Udoh, (2025). This theory suggests that long-term economic growth is achievable due to internally generated forces within the economic system, namely, capital accumulation and technological advancement. This framework provides a theoretical foundation for examining the relationship between oil sector performance and inequality in Nigeria

In a simplified form of the model, Ekpo and Udoh (2025) showed Equation 3.1 that:

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

The endogenous growth theory presumes that economic growth (Y) is a function of technological advancement (A) and capital stock (K), with capital stock comprising of human capital (h) and physical capital (p). In this study, gross fixed capital formation, which serves as an effective proxy for physical capital, will be used to evaluate the relationship between oil sector performance and inequality in Nigeria. This approach builds upon the existing literature, as demonstrated by Ekpo and Udoh (2025), to provide a comprehensive understanding of the topic. Thus, Equation 3.1 becomes Equation 3.2:

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

To provide a more comprehensive representation of Equation 3.1, the modern version of this equation can be rewritten as Equation 3.3 as:

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

Equation 3.3 illustrates that economic growth is dependent on various forms of capital, including financial capital (f), coupled with the level of technology that the economy can generate. In this context, financial capital refers to investments that finance business activities and spur growth. By incorporating financial capital into the model, the equation presents a more complete representation of the endogenous growth theory and its implications for economic development

In Nigeria, where oil revenue accounts for approximately 80% of government revenue (according to official sources), oil revenue becomes a critical component of the country's financial capital. As such, it is expected that oil sector performance can fuel the growth of not only the overall economy but also the various sectors within it. Therefore, the study posits that improved oil sector performance, if managed efficiently, can contribute to the alleviation of poverty in Nigeria, potentially resulting in a significant redistribution of income (Olayungbo and Adediran, 2017; Onakoya and Agunbiade, 2020), Rewriting Equation 3.1 gives Equation 3.4 as follows:

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

The study posits that there is a relationship between inequality (δ) and the overall economy (Y), and this relationship is influenced by the performance of the oil sector (OSep). Specifically, changes in oil sector output (Oilp) and oil sector revenue (Or) affect inequality (ine), which, in turn, affect the overall economy. There is a strong rationale for this causal link, as inequality has far-reaching impacts on the economic and social dynamics within a country. It is argued that every aspect of the economy, including the oil sector, has a ripple effect on the overall economy (Y). Therefore, changes in the oil sector performance (OSep), which affect poverty indicator (inequality) (δ), will have corresponding effects on the general economy (Y) at any given time (t). This

establishes a direct causal link between oil sector performance and overall economic development. Taking into account the role of government expenditure and institutional quality in economic growth, we can extend Equation 3.1 to encompass these factors as follows:

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

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:

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

Expanding Equation 3.6 and disintegrating Y_δ gives Equation 3.7

$$\text{LogIneq}_t = \alpha_{0t} + \alpha_1 Log\text{gfc}_t + \alpha_2 \text{LogOr}_t + \alpha_3 Log\text{Oilp}_t + \alpha_4 \text{Loggdp}_t + \alpha_5 Log\text{insq}_t + \alpha_6 Log\text{ge}_t + \varepsilon_t \qquad \text{Equation 3.7}$$

where, $Ineq_t$ is Inequality; 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 inequality in Nigeria.

3.3 Estimation Technique:

To investigate the relationship between oil sector performance and inequality in Nigeria, this study uses the Autoregressive Distributed Lag (ARDL) bounds test approach proposed by Pesaran et al. (2001). This approach, in contrast to other conventional co-integration procedures, offers several advantages: compatibility with a mix of stationary (I(0)) and non-stationary (I(1)) variables, simplicity in implementation and interpretation, superior statistical properties with small sample sizes, and endogenous treatment of all variables. Additionally, the ARDL framework allows for different lag lengths for various variables, enhancing flexibility (Ekpo *et al* 2022; Ekpo *et al* 2023 and Ekpo et al,2024). The basic form of an ARDL (p, q_1, q_2….q_m) model is specified as shown by Equation 3.8 as thus:

$$\pi_t = \sum_{i=1}^{\rho} \delta_\kappa \pi_{it-\rho} + \sum_{i=0}^{q} \beta_\kappa x_{it} + \mu_t \qquad \text{Equation 3.8}$$

The ARDL framework in Equation 3.7 models the relationship between the explained variable (πt) and explanatory variables; (x_t) through a set of lagged terms (p, q), white noise (μt), and a set of estimated parameters ($\delta\kappa$, $\beta\kappa$). This framework allows for flexible lag lengths (q) of various variables (up to m), and the lagged explanatory variables can be either endogenous or exogenous. The ARDL model captures long-term relationships and dynamic adjustment processes, enabling a comprehensive understanding of the complex relationship between oil sector performance and inequality in Nigeria. An expansion of the above model to a standard bound testing procedure becomes Equation 3.9:

$$\Delta\pi_t = \delta_o + \sum_{i=1}^{\rho} \delta_\kappa \Delta\pi_{it-\rho} + \sum_{i=0}^{q} \beta_\kappa \Delta x_{it-q} + \psi_1 \pi_{it-1} + \psi_{2i} x_{it-1} + \mu_t \qquad \text{Equation 3.9}$$

The ARDL model is specified with the inclusion of various lagged variables, denoted by the parameters, ψs, using the difference operator Δ. The model is constructed with variables representing oil sector performance (OSep) and inequality (inq). The specific formulation of the model is defined as:

$$\begin{aligned}\Delta\text{ineq}_t = {} & \delta_o + \sum_{i=1}^{\rho} \delta_1 \Delta\text{ineq}_{it-\rho} + \sum_{i=0}^{q} \beta_0 \Delta\text{gfc}_{it-q} \\ & + \sum_{i=0}^{q} \beta_1 \Delta\text{Or}_{it-q} \\ & + \sum_{i=0}^{q} \beta_2 \Delta\text{Oilp}_{it-q} + \sum_{i=0}^{q} \beta_3 \Delta\text{gdp}_{it-q} \\ & + \sum_{i=0}^{q} \beta_4 \Delta\text{inq}_{it-q} \\ & + \sum_{i=0}^{q} \beta_5 \Delta\text{ge}_{it-q} + \psi_1 \text{ineq}_{it-1} + \psi_2 gfc_{it-1}\text{gfc} \\ & + \psi_3 \text{Or}_{it-1} \\ & + \psi_4 \text{Oilp}_{it-1} + \psi_5 \text{gdp}_{it-1} + \psi_6 \text{inq}_{it-1} + \psi_7 \text{ge}_{it-1} \\ & + \mu_t \qquad \text{Equation 3.10}\end{aligned}$$

3.6 Diagnostic Test

Pre-Estimation Test:

Stationarity Test:

To ensure the validity of the times series data used in the study, a stationarity test is conducted to avoid drawing erroneous conclusions from non-stationary data. The PP test proposed by Perron (1997) is selected for its ability to accommodate structural breaks in the data, which can affect the stability of the time series. The PP test, described in Equation 3.11, outperforms traditional methods, such as the Augmented Dickey Fuller test, in handling data with structural shifts, yielding more reliable estimates as:

$$\theta_{\alpha}^{*} = \theta_{\alpha}\left[\frac{\gamma_{\circ}}{\omega_{\circ}}\right]^{\frac{1}{2}} - \frac{T(\omega^{\circ} - \gamma^{\circ})[se(\varphi)]}{2\omega_{\circ}^{\frac{1}{2}}s} \quad \text{Equation 3.11}$$

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. $\omega°$ and $\gamma°$ are the residual spectrum at zero frequency and consistent estimate of the error variance respectively.

To complement the stationarity analysis, the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test is utilized, which assumes stationarity as the null hypothesis and determines stationarity based on the residuals from a regression on the original data. This test, employed by Ekong and Ekong (2022) and Ekpo and Udoh (2025), involves regressing the residuals on the independent variables of the original regression. The test statistic is calculated using Equation 3.12, and the null hypothesis of stationarity is accepted if the absolute value of the calculated statistic is below the critical value and is given by Equation 3.12 as:

$$\text{KPSS} = \frac{1}{T^{2}} \cdot \frac{\sum_{t=1}^{T} S_{t}^{2}}{\varpi_{\infty}^{2}} \quad \text{Equation 3.12}$$

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

Table 3.1: Explanation of variables and *Apriori* expectation

S/N	Variables	Description	Sources	Apriori Expectation
1.	Oil Revenue	Oil revenue, which consists of income generated from the sale of crude oil and other related products, is an important component of the Nigerian economy. As Hirschman (2015) and Imandojemu and Akinlosotu (2018) have noted, this revenue stream provides a significant portion of the country's income, particularly in the oil-dominated economy of Nigeria. According to CIA (2008), oil revenue currently accounts for approximately 80% of government revenue, representing a vital source of income that influences government budgetary processes and planning.	CBN statistical bulletin	$\alpha_2 < 0$
2.	Gross fixed capital formation	Gross fixed capital formation (GFCF) refers to a country's net investment in fixed assets, such as infrastructure, machinery, and buildings, in a given year. This investment contributes to economic growth and development, serving as an important indicator of a nation's financial health. The GFCF covers a wide range of capital expenditures, including land improvements, equipment purchases, and construction projects, such as roads, hospitals, and private residences. In this study, GFCF will be incorporated as an independent variable in the model, providing a valuable perspective on the relationship between oil sector performance and inequality (Ekpo *et al,*2023).	CBN statistical bulletin	$\alpha_1 < 0$
3	Government Expenditure	Government expenditure (GE) represents the total amount of money spent by the government on various public services, projects, and programs. In Nigeria, it is the sum of recurrent and capital expenditures, which includes salaries, infrastructure development, and public welfare initiatives. Numerous studies have demonstrated the significant role of government spending in stimulating economic growth, which, in turn, can contribute to poverty reduction. In this study, GE will be considered as an independent variable in	CBN statistical bulletin	$\alpha_6 < 0$

		the model, providing insight into the relationship between government expenditure and inequality in Nigeria.		
4.	Gross Domestic Product	Gross Domestic Product (GDP) represents the monetary value of all final goods and services produced within a country's borders during a specific period, usually a year. It is calculated by adding up total consumption, investment, government spending, and net exports. GDP is widely regarded as a key indicator of economic growth and has been used extensively in economic research. In this study, GDP will serve as an independent variable in the model, offering a valuable perspective on the relationship between variables	CBN statistical bulletin	$\alpha_4 < 0$
5.	Income Inequality	Income inequality, defined as the extent to which a country's wealth is distributed among its citizens, can be measured by various methods. In this study, we will focus on income inequality, which refers to the evenness of income distribution within a population. The most commonly used metric for measuring income inequality is the Gini index, which captures the extent to which income or consumption expenditure varies among individuals or households in an economy. The Gini index provides a quantitative measure of income inequality and will be used in this study as a dependent variable.	Computed	Gini < 0
6.	Oil sector output	The contribution of the oil sector to Gross Domestic Product (GDP) is an important indicator of the sector's performance and its impact on the overall economy. In the third quarter of 2022, 5.40% in 2023, 5.51% in 2024 and 3.97% projection for 2025 the oil sector contributed 6.33% to Nigeria's GDP, highlighting its importance to the country's economic development. The contribution of the oil sector to GDP will be incorporated as an independent variable in the model, providing valuable insight into the relationship between oil sector performance and income inequality.	World Development Indicators	$\alpha_3 < 0$
7.	Institutional quality	Institutions are instrumental in organizing groups, promoting cooperation, reducing uncertainty, and fostering economic development. The quality of institutions directly influences economic performance by maximizing resource utilization, encouraging factor accumulation, and stimulating innovation. In this study, we will use the index of corruption, a proxy for institutional quality, to measure the effectiveness of institutions in Nigeria. As the impact of institutions on economic performance is highly dependent on the quality of these institutions, a deeper understanding of institutional quality is critical in assessing the relationship between oil sector performance and income inequality. Institutional quality will be incorporated as an independent variable in the model.	Computed	$\alpha_5 < 0$

Source: Researchers' field work (2025).

IV. OIL SECTOR AND POVERTY IN NIGERIA

4.1 An Appraisal of Oil Sector Performance and Inequality in Nigeria

The oil sector in Nigeria generates substantial revenue for the government, contributing significantly to GDP, foreign exchange earnings, and foreign reserves. However, despite the vast amounts of money generated from oil over the years, Nigeria continues to grapple with widespread poverty and inequality. The country's overreliance on oil and structural constraints have hindered economic development, leading to a situation where the benefits of oil revenue have not been equitably distributed. The relationship between oil sector performance and inequality in Nigeria from 1980 to 2024 is shown in Figure 4.1.

4.1.1 The Trend of Nigeria's Oil Performance and Income Inequality

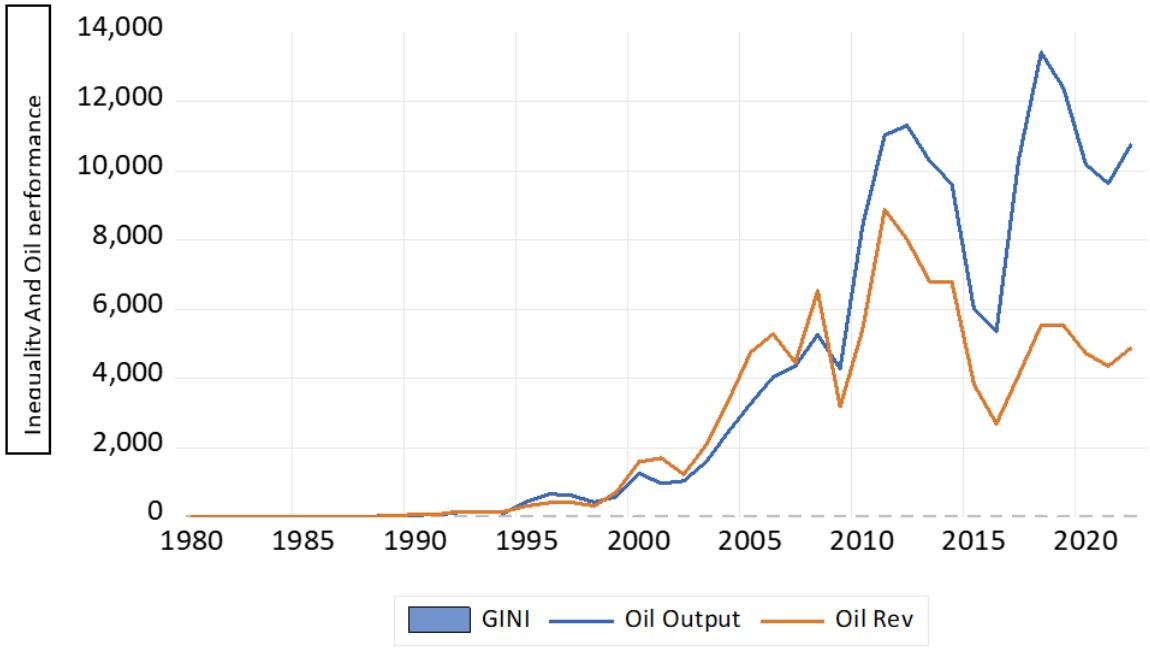

Figure 4.1: Nigeria's Inequality and oil revenue (1985 – 2024).
Source: World Development Indicators (2025).

An examination of the data reveals a worrying trend. While Nigeria's oil sector revenue experienced an overall upward trend from 1980 to 2025, with occasional fluctuations, inequality, as measured by the Gini coefficient, also increased during the same period.

In 1980, oil sector revenue stood at 14.5 billion USD, and the Gini coefficient was 0.27, indicating relatively lower inequality. However, by 2025, oil sector revenue had risen significantly to 25.8 billion USD, yet inequality had also risen to 0.41, indicating a widening gap between the rich and poor. Interestingly, the trends in oil sector revenue and inequality do not show a direct or linear relationship. For example, in the late 1990s and early 2000s, when oil sector revenue decreased due to lower oil prices, inequality remained relatively stable or even decreased slightly.

The data suggest that while oil sector revenue may contribute to a country's overall economic growth, other factors such as government policies, corruption, and distribution of wealth also play a significant role in determining income inequality. A comprehensive analysis of these factors is necessary to understand the complex relationship between oil sector performance and inequality in Nigeria.

The data from 1981 to 2000 shows that while oil sector revenue fluctuated significantly, inequality remained relatively stable. The year 1980 recorded 18.6 billion USD in oil sector revenue and a Gini coefficient of 0.29. The subsequent years saw significant variations in oil revenue, with the lowest recorded in 1998 at 3.7 billion USD. Despite these fluctuations, inequality remained relatively stable, with a slight increase to 0.31 in 1986 and a decrease to 0.28 in 1997.

From 2001 to 2025, there was a significant increase in both oil sector revenue and inequality.

During the period from 2001 to 2025, there was a surge in oil sector revenue, reaching its highest point of 32.5 billion USD in 2025, which was more than twice the revenue recorded in 2000. However, inequality also increased significantly during this period, with the Gini coefficient rising from 0.30 in 2000 to 0.41 in 2025. This upward trend in both oil sector revenue and inequality indicates a widening gap between the rich and the poor in Nigeria, despite the overall growth in oil revenue.

V. DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

5.1 Data Presentation

5.1.1 Descriptive Properties

Table 5.1 provides the descriptive properties of the variables. The majority of the variables were measured on average, with real Gross Domestic Product (36138.4) and Oil Sector Output (3527.0) exhibiting the highest values. A few variables displayed negative skewness, including Gross Fixed Capital Formation and Corruption Perception Index (proxy for institutional quality). In contrast, other variables exhibited positive skewness, with Gross Domestic Product (GDP) recording the highest positive skewness value of 1.3177.

The Gini coefficient, which measures income inequality, having a mean of 42.67, median of 41.35, and standard deviation of 35, indicates that the distribution of income is significantly unequal, with a large spread of values. A Gini value of 0.42 represents substantial inequality, suggesting a wide disparity between the income levels of the rich and the poor in Nigeria.

For oil revenue, the mean of 2437, median of 1411, and standard deviation of 2889 indicate that the values are not evenly distributed. The wide standard deviation for oil revenue suggests that there are large fluctuations in the amount of revenue generated from oil, with some years experiencing significantly higher or lower revenue than others. When compared with the inequality data, the high standard deviation of oil revenue indicates that oil sector performance may not be a reliable factor in reducing inequality, as its fluctuations may not directly translate into improved economic conditions for the poor. To gain a comprehensive understanding of the relationship between oil sector performance and inequality, further analysis will be necessary to determine if other factors, such as government policies and corruption, also contribute to the observed income inequality.

Table 5.1: Descriptive properties of the variables

Variables	Gini	Gfcf	Oil Rev	Oil Output	gdp	Insq	ge
Mean	42.6767	21.1115	2437.385	3572.024	36138.36	13.1521	2133.421
Median	41.3500	21.9620	1411.264	1004.394	7515.812	16.0000	982.8450
Maximum	55.0000	33.0400	8878.970	1342.87	173527.7	28.0000	9145.157
Minimum	35.1000	9.8970	7.2530	4.2800	139.2701	0.0000	9.6400
Std. Dev.	5.8099	5.3446	2689.885	4395.278	49588.84	11.4522	2552.465
Skewness	0.5197	-0.1678	0.7037	0.9189	1.3177	-0.0817	1.0629
Kurtosis	2.1514	2.7598	2.2059	2.3065	3.5394	1.2865	3.0851
Jarque-Bera	3.1505	0.2980	4.5701	6.7537	12.6641	5.1849	7.9203
Probability	0.2069	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).

Table 5.2 presents the correlation properties of the variables. The table reveals that all variables have a positive correlation, with Gross Domestic Product (GDP) and Government Expenditure (GE) having the highest correlation coefficient of 0.98, and Inequality Proxy (Gini coefficient) and Institutional Quality Proxy (Corruption Perception Index) exhibiting the weakest correlation (0.01)

Table 5.2: Correlation of the variables

Variables	Gini	Gfcf	Or Rev	Oil Output	gdp	Inqs	ge
Gini	1						
Gfcf	0.0747	1					
Oil Rev	0.1407	0.2658	1				
Oil Output	0.2635	0.2303	0.8959	1			
gdp	0.2984	0.0282	0.7036	0.9034	1		
Inqs	0.0071	0.0951	0.8559	0.8291	0.7638	1	
ge	0.2465	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		
Gini	-4.0952*	0.0026			0.1727*	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).

According to the KPSS test, most of the variables under investigation were found to be stationary at levels, indicating that they are not significantly different from a stationary process. However, Institutional Quality was found to be stationary at first difference, suggesting that the variable exhibits a unit root process and needs to be differenced to become stationary. This result validates the appropriateness of using the Autoregressive Distributed Lag (ARDL) model in our analysis, as the model can accommodate variables that are stationary at level and those that are stationary at first difference (Ekpo *et al,*2022).

5.2 Findings

Table 5.4 presents the results of both double log and exponential specifications, revealing that both specifications yielded an equivalent number of statistically significant estimates. However, in terms of goodness-of-fit measures, such as the R^2, the exponential specification was found to be more suitable for modeling the relationship between oil sector performance and inequality in Nigeria. Therefore, the exponential specification was relied upon for further analysis. and considered the exponential function more suitable for the relationship was rely on more.

Table 5.4: Model selection test

Dependent variable: Inequality

Models/Variables	Linear	Semi-log	Double-log	Exponential
GFCF	-0.0169	-0.0234	-0.0178	-0.9678
Oil Rev	-0.0012*	-2.3505**	-0.0638**	-3.0598**
Oil Output	6.0605	-1.7806	0.0818	3.6037
gdp	-0.0127	-3.7206	-0.3220*	-14.5083*
Insq	0.3851**	0.0084**	-0.0015	-0.0503
ge	0.0023	4.9105	0.3185*	14.5697*
C	42.2910*	3.7341*	4.5494*	79.5422*

R^2	0.26	0.25	0.44	0.50
DW	1.59	1.60	1.86	1.80

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

Figure 5.1 depicts the model selection criteria, showcasing the evaluation of over 8192 models under similar conditions. After thorough analysis, the ARDL model with the optimal lag structure of (1, 0, 2, 3, 2, 3, 1) was chosen as the most suitable model for this study. The selection was based on the Akaike Information Selection Criteria, which compares the fitness of different models to choose the most suitable one.

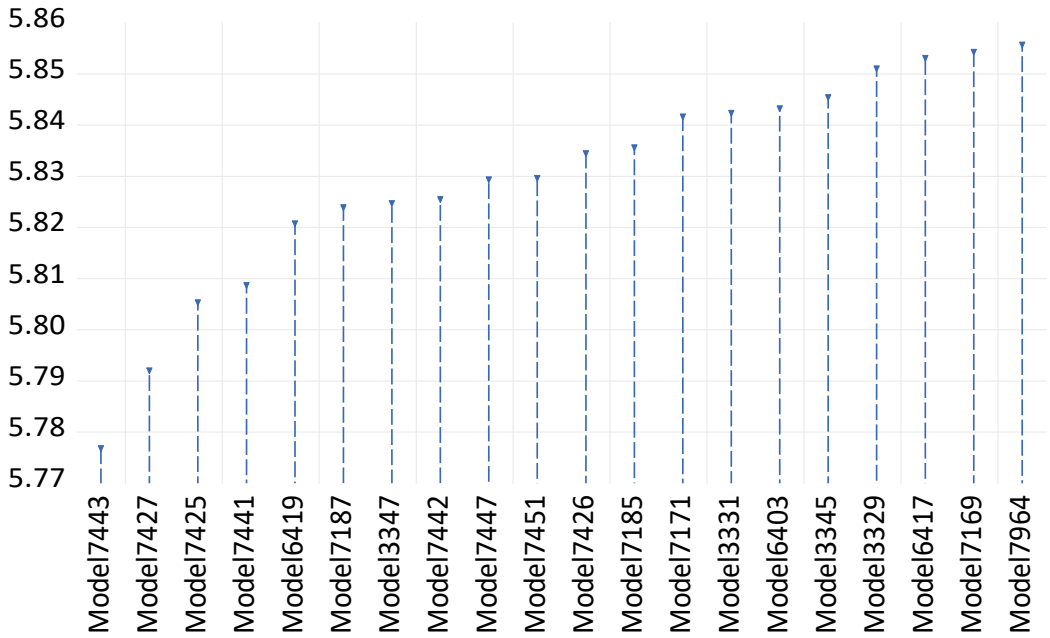

Figure 5.1: Model selection.
Source: Researchers' extracts from e-views 12 (2025).

Table 5.5 presents the results of the cointegration test for the relationship between oil sector performance and income inequality. Based on the F-statistic of 7.9505, which is greater than the upper bound values at the 1%, 5%, and 10% significance levels, the null hypothesis of no relationship between the variables is rejected. This implies that there is a long-term relationship between the variables, indicating that changes in the oil sector performance will affect income inequality in Nigeria over the long term. This finding provides further evidence to support the analysis of the impact of oil sector performance on inequality in Nigeria.

Table 5.5: F-bound test

Test Statistic	Value	Signif.	I(0)	I(1)
Actual Sample Size	40		Finite Sample: n=40	
F-statistic	7.950510	10%	2.218	3.314
k	6	5%	2.618	3.863
		1%	3.505	5.121

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

In the long run, our study indicates that oil sector revenue plays a significant role in reducing income inequality in Nigeria, while oil sector output does not. A 1% increase in oil sector revenue is found to reduce inequality by 8%, highlighting the potential of oil sector revenue to support income redistribution through government expenditures such as salary payments, overhead costs, and cash transfers to the poor.

Despite the positive effect of oil sector revenue on inequality, the results suggest that oil sector output may have a negative impact, increasing inequality by approximately 19% per 1% increase. This may be caused by factors such as oil theft, raw output exports, and institutional inefficiencies. On the other hand, a 1% increase in Real Gross Domestic Product (RGDP) appears to have a significant positive effect on inequality reduction, resulting in a 19% decrease.

In contrast to oil revenue and output, other variables were found to be associated with a worsening inequality in the long run. Specifically, a 1% increase in capital stock was found to exacerbate inequality by approximately 4%, though with less statistical significance. Moreover, government expenditure was also found to increase inequality by about 3% over time, underscoring the critical role of targeted spending in reducing income inequality.

Overall, the study reveals that while oil sector revenue can serve as a key tool for reducing income inequality, factors such as corruption, inefficient institutions, and income distribution patterns also play significant roles in shaping income inequality in Nigeria. This highlights the need for comprehensive and targeted policy interventions to ensure that the benefits of oil sector performance are effectively distributed and utilized to improve the lives of all Nigerians.

Table 5.6: Long run relationship

Dependent Variable: Inequality

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Log(gfcf)	3.552219	2.233163	1.590667	0.1274
Log (Oil Rev)	-8.035368	2.227809	-3.606848	0.0018
Log (Oil Output)	18.65450	5.126404	3.638905	0.0016
Log(gdp)	-19.19761	3.394409	-5.655655	0.0000
Insq	0.782732	0.392995	1.991712	0.0602
Log(ge)	2.677743	4.518732	0.592587	0.5601
C	103.7722	13.22835	7.844684	0.0000

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

In the short-run, the findings suggest that oil sector revenue contributes significantly to reducing income inequality by 8% at the 5% significance level. The positive impact of oil sector output, however, is delayed due to institutional quality constraints, which improve over time, thereby facilitating the reduction of income inequality after three years. National income also contributes significantly to reducing inequality in the short term, with a 1% increase leading to a 25% decrease in inequality.

The pattern of government expenditure, however, was found to exacerbate income inequality significantly, highlighting the need for more targeted spending to address income disparities. Error correction estimates were correctly signed and statistically significant. A short run error correction mechanism coefficient of -1.37 implies that the system will self-correct any imbalances at a rate of approximately 73% per period until equilibrium is achieved. This means that the long-term disequilibrium values will move toward equilibrium at a rate of 1.37 units per period, given that other variables remain constant.

The R^2 value of 0.73 indicates that 73% of income inequality variations over the study period can be explained by fluctuations in oil sector activities, lending credence to the central role of the oil sector in shaping income distribution in Nigeria.

The model's DW statistic of approximately 2.0 suggests that the data exhibits no autocorrelation bias, enhancing the robustness and validity of the results.

Overall, our results confirm that oil sector performance, particularly revenue generation, plays a pivotal role in reducing income inequality in the Nigerian economy, both in the short and long term. However, the efficacy of other performance indicators, such as output, may be constrained by institutional quality and government expenditure patterns. Effective policy interventions to enhance institutional quality and promote targeted spending are therefore crucial for sustaining and enhancing the impact of oil sector performance on income inequality.

Table 5.7: Short run results

Dependent Variable: Δ Inequality

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Δlog Oil Rev	-8.649671	3.430311	-2.521541	0.0203
Δlog Oil Rev(-1)	12.04715	3.747650	3.214587	0.0043
Δlog Oil Output	10.67725	3.812006	2.800952	0.0110
Δlog Oil Output (-1)	-24.76808	4.778340	-5.183408	0.0000
Δlog Oil Output(-2)	-13.17843	2.151542	-6.125110	0.0000
Δlog gdp	-25.08333	9.370617	-2.676807	0.0145
Δlog gdp(-1)	45.19596	9.857192	4.585074	0.0002
ΔInsq	1.667946	0.299233	5.574074	0.0000
ΔInsq(-1)	-0.562735	0.235427	-2.390276	0.0268
ΔInsq(-2)	-0.518475	0.224415	-2.310340	0.0317
Δlog ge	17.57207	3.617571	4.857423	0.0001
ECM(-1)	-1.367051	0.147528	-9.266364	0.0000
R-squared	0.813586	Adjusted R-squared		0.737640
F-statistic	278.1522	Durbin-Watson stat		1.994250
Prob(F-statistic)	0.000000			

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

The stability of our estimates was confirmed using the CUSUM and CUSUM of squares tests. Figure 5.1 shows that the estimates were stable, as they remained within the 5% significance level of the acceptable bandwidth for stability. This stability affirms that our estimates are reliable, valid, and reflective of the desired population, bolstering confidence in the findings of our analysis.

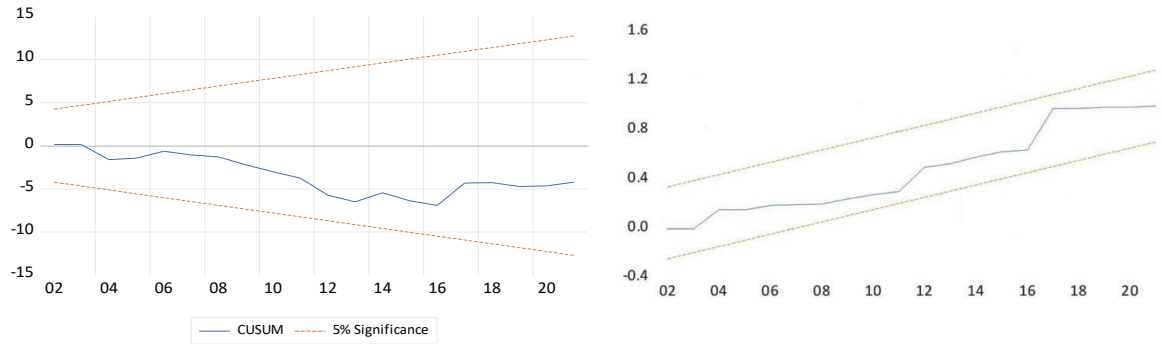

Figure 5.1: Model stability test.

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

5.3 Discussion of Findings

The study sought to investigate the intricate link between oil sector performance and inequality in Nigeria. The findings revealed a range of impacts of oil sector performance on income inequality at different points in time. Oil revenue was found to have a mitigating effect on income inequality, reducing it by 8%, indicating the sector's potential role in reducing economic disparity. However, a 1% rise in oil sector output was found to increase income inequality by almost 19%, highlighting the need for focused policies such as modular refining investments to address this disparity. Additionally, the analysis revealed that government expenditure also contributes to widening income inequality by approximately 3%

VI. SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

6.1 Summary

The study provides a comprehensive analysis of the intricate relationship between oil sector performance and inequality in Nigeria over a 45-year period. The major findings of the study are summarized as follows:

- Oil revenue has reduced income disparity among Nigerians during the study period, which is statistically significant.
- Oil sector output did not reduce income inequality among Nigerians, which is statistically significant.
- Government spending has contributed to widening income inequality, emphasizing the need for more targeted spending to reduce the disparity in incomes.

These findings provide a basis for formulating effective policy recommendations to address the issue of inequality in Nigeria.

6.2 Conclusion

This study critically investigates the intricate dynamics between oil sector performance and inequality in Nigeria over the period spanning from 1980 to 2025.

The findings support the notion that the oil sector, particularly through its revenue generation, is an important determinant of income inequality in Nigeria. While some indicators of oil sector performance have an immediate effect on inequality, others may be affected by institutional quality and government expenditure patterns. Therefore, policy interventions that focus on improving institutional quality and promoting targeted spending could enhance the ability of the oil sector to address income inequality in the Nigerian economy. In conclusion, the research demonstrated that the distribution of government spending exacerbated income inequality, emphasizing the necessity for more focused and strategic spending to mitigate the discrepancy in incomes.

6.3 Policy Implications

Drawing from the findings of this study, the following recommendations can help reduce income inequality in Nigeria:

i. Proper management and reinvestment of oil revenues in productive sectors, such as agriculture and manufacturing, can create employment and help reduce inequality.

ii. Tackling systemic corruption is crucial to fully benefit from oil revenues. A possible solution is to distribute oil revenues directly to land owners (states), promoting true federalism and reducing the incentive for corruption.

iii. Investment in other mineral resources can reduce the dependence on oil and promote economic diversification, contributing to income equality.

iv. The analysis indicated that the government's spending habits further widened the income gap, demonstrating the importance of focusing government funds on reducing income disparities

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