



Crude Oil Revenue and Real Sector Performance in Nigeria

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Abstract: This study investigates the impact of crude oil revenue on real sector performance (RSP) in Nigeria, employing an ex post facto research design and relying on secondary data from the Central Bank of Nigeria Statistical Bulletin and World Bank Development Indicators. The analysis utilizes the Autoregressive Distributed Lag (ARDL) model to assess the long-run relationship between crude oil revenue (OREV) and key real sector indicators, including oil export (OXP), oil import (OIP), and exchange rate (EXR). Findings from the ARDL long-run regression reveal that crude oil revenue has a significant positive effect on real sector performance, indicating that increases in oil revenue enhance real sector growth. Oil export (OXP) also positively impacts real sector performance, highlighting that revenue generated from exports of crude oil supports sectoral productivity. The effect of oil import (OIP) is likewise positive, signifying that oil imports contribute to real sector development, likely through the provision of essential resources and technology for industrial activities. Conversely, the exchange rate (EXR) effect is positive but statistically insignificant, suggesting a limited role in driving long-term real sector growth. The study's results underscore the importance of effectively managing crude oil revenue and oil-related trade to enhance the real sector's performance in Nigeria. The findings recommend policy strategies for encouraging oil revenue and promoting exchange rate stability to foster sustainable economic growth in Nigeria's real sector.

Keywords: Real Sector Performance, Oil Revenue, Oil Price, Oil Export and Re-Export, Exchange Rate.

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INTRODUCTION

The Nigerian economy has long been tangled with crude oil, which serves as a dominant source of revenue, foreign exchange, and public income. Since the discovery of crude oil in Oloibiri in 1956, crude oil has transformed Nigeria's economic landscape, becoming a central driver of government revenue and an essential element in the country's economic policies (Akinlo, 2021). Crude oil revenue represents the largest share of Nigeria's total government revenue, often accounting for over 70% of the national budget (National Bureau of Statistics, 2023). Despite its substantial contributions, Nigeria's

reliance on crude oil has raised critical issues, especially regarding its effects on the real sector. The real sector directly drives productive activities, job creation, and sustainable economic growth (Okonkwo & Obikeze, 2022). The real sector encompasses agriculture, manufacturing, mining, and construction industries, all of which are crucial for economic diversification and long-term growth. However, persistent fluctuations in oil prices, governance challenges, and issues with oil revenue management have had complex and often adverse impacts on the real sector's performance.

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The correlation between crude oil revenue and Nigeria's real sector performance has been a subject of considerable debate and analysis. Theoretically, resource-rich countries, including Nigeria, are positioned to use revenue from natural resources to finance development across critical economic sectors (Ross, 2018). Ideally, the revenue generated from crude oil exports should be used to build infrastructure, stimulate private investment, and drive growth within the real sector. However, Nigeria's over-reliance on oil revenue has contributed to what scholars term the "resource curse," wherein the abundance of natural resources can paradoxically hinder sustainable economic growth (Auty, 2020).

Over the past decade, global crude oil price volatility has highlighted the vulnerability of Nigeria's economy to external shocks. With global shifts towards cleaner energy sources and increasing concerns over environmental sustainability, the oil market has experienced significant fluctuations. These fluctuations directly affect Nigeria's economy, leading to budgetary constraints, currency devaluation, and inflation (Adeola & Bankole, 2022). In response to such issues, the Nigerian government has emphasized economic diversification strategies under various policy frameworks, such as the Economic Recovery and Growth Plan (ERGP) launched in 2017 and the National Development Plan (NDP) 2021–2025. These frameworks aim to boost real sector development, reduce oil dependency, and promote the sustainable use of crude oil revenue (Federal Ministry of Budget and National Planning, 2022).

The Nigerian real sector remains underdeveloped compared to its potential. The manufacturing sector, for example, has consistently contributed less than 10% to the Gross Domestic Product (GDP), reflecting limited industrialization and heavy reliance on imported goods (World Bank, 2023). Furthermore, the agricultural sector, although a major employer, is plagued by low productivity, inadequate infrastructure, and limited access to financing. This raises questions about the effectiveness of oil revenue in supporting the real sector's development (Ikechukwu & Onyekachi, 2023). Given that crude oil resources are finite and global energy policies are increasingly pivoting towards sustainability, Nigeria's economic stability requires that oil revenues are effectively channelled into sectors with long-term growth potential, such as agriculture, manufacturing, and construction.

Despite decades of oil revenue, Nigeria's real sector remains weak, characterized by low productivity, structural inefficiencies, and limited contributions to economic growth. The problem lies

in the paradox of wealth from oil that has not translated into a robust and diversified economy. Crude oil revenue, though substantial, has not effectively fostered the growth of the real sector. Research by Ogbonna and Eze (2022) indicates that rather than enhancing productivity, oil revenue has led to neglect of the real sector, creating a cycle of dependency and underinvestment. This dependency creates vulnerability to oil price shocks, impacting revenue and constraining government spending on essential sectors.

Furthermore, the allocation of oil revenue has historically been plagued by inefficiency, corruption, and a lack of accountability. For example, government expenditures on infrastructure have been limited and sporadic, often failing to address the real sector's needs (Transparency International, 2022). Misallocation of oil revenue has undermined industrialization efforts and left Nigeria heavily reliant on imported goods, resulting in a trade imbalance that weakens the national currency and fuels inflation. Moreover, studies by Ihenacho and Awolabi (2023) reveal that the lack of adequate funding for agricultural and manufacturing sectors has hindered the development of value chains and limited job creation, especially in rural areas.

The issues surrounding crude oil revenue allocation are compounded by the absence of robust policies to direct funds toward productive sectors. Policies often lack continuity, as successive administrations modify or discard existing frameworks, which impedes long-term planning and sustainable growth in the real sector. According to Akanji and Afolabi (2023), frequent policy shifts have created uncertainty, discouraging local and foreign investors from committing to long-term projects in critical sectors like manufacturing and agriculture.

Global trends also highlight the urgency of addressing this issue. The global shift towards renewable energy and environmental sustainability poses a threat to oil-dependent economies, as the demand for oil may decline in the coming decades. Nigeria's failure to proactively channel oil revenues into non-oil sectors not only exacerbates economic vulnerability but also increases the risk of economic stagnation as the world transitions away from fossil fuels (International Energy Agency, 2023).

It is against this, the study seeks to investigate the impact of crude oil revenue on Nigeria's real sector performance. Using real gross domestic product as a proxy for real sector performance. It will examine whether the revenue generated from oil exports is effectively utilized to stimulate the real sector's productivity, growth, and competitiveness. Furthermore, the study will assess

the role of government policies and regulatory frameworks in managing oil revenue to support the real sector. By identifying the constraints and potential pathways for enhancing the real sector's performance, this research aim to achieve some objectives.

- i. To analyze the effect of government oil revenue on real gross domestic product in Nigeria over the study period.
- ii. To examine the impact of oil export earnings on real gross domestic product in Nigeria over the study period.
- iii. To assess how fluctuations in oil price per barrel influence infrastructure real gross domestic product in Nigeria over the study period.
- iv. To investigate the impact of exchange rate on real gross domestic product in Nigeria over the study period.

LITERATURE REVIEW

This section synthesizes previous studies, theories, and findings to highlight trends, gaps, and debates in the study area. In a literature review, researchers gather relevant scholarly articles, books, reports, and other sources to provide context and background for their study.

Conceptual Framework Concept of Oil Revenue

Crude oil revenue refers to the income generated from the extraction, production, and export of crude oil. For oil-rich countries like Nigeria, this revenue represents a major part of national income, accounting for a substantial portion of government revenue, foreign exchange earnings, and national GDP (Central Bank of Nigeria, 2023). Crude oil revenue comprises various financial streams, including royalties, profit taxes, rents, and fees imposed on foreign and local companies involved in oil extraction and sale. According to the National Bureau of Statistics (2023), oil revenue continues to form over 70% of Nigeria's government income, underscoring the country's heavy reliance on the oil sector.

In theoretical terms, crude oil revenue serves as a crucial asset in financing national development by contributing to infrastructure development, public services, and economic diversification strategies (Ross, 2018). However, as scholars highlight, the relationship between crude oil revenue and economic development is often complex and problematic for many oil-dependent nations (Auty, 2020). In Nigeria, fluctuations in global oil prices create instability, as periods of high revenue often led to increased government spending, while revenue drops during oil price slumps lead to budget shortfalls, affecting the stability of public finance and

national development projects (Ogbonna & Eze, 2022). This volatility complicates economic planning, often resulting in what is known as the "resource curse," wherein abundant natural resources impede rather than support sustainable economic growth (Sachs & Warner, 2022).

Real Sector Performance

The real sector refers to the part of the economy that produces tangible goods and services, comprising agriculture, manufacturing, construction, and mining activities. This sector is essential for sustainable economic growth, as it fosters productivity, job creation, and income generation, driving both supply and demand within the economy. For Nigeria, the real sector has significant potential, given the country's vast natural resources and population, which can support diverse economic activities beyond oil (World Bank, 2023). Real sector performance is generally evaluated based on productivity, output growth, employment levels, and sectoral contributions to GDP (Akanji & Afolabi, 2023).

In Nigeria's case, real sector growth has historically been hampered by low investments, inadequate infrastructure, and limited access to financing. Agriculture, although a primary employer, faces structural challenges, including outdated technology and limited government support. The manufacturing sector, similarly, is underdeveloped, with industrial activities limited to a small number of sub-sectors that often depend on imported raw materials. This dependence undermines the sector's growth potential and increases production costs, affecting competitiveness (Ikechukwu & Onyekachi, 2023).

The Relationship between Crude Oil Revenue to Real Sector Performance in Nigeria

In an ideal economic model, crude oil revenue would serve as a financial base for developing Nigeria's real sector, facilitating investments in infrastructure, technology, and human capital. Such investments could help diversify the economy, lessen dependency on oil, and create a resilient economic structure capable of withstanding external shocks (Adeola & Bankole, 2022). However, in Nigeria, the allocation and utilization of oil revenue have often failed to address the needs of the real sector adequately.

Nigeria's real sector performance remains suboptimal despite the government's substantial earnings from crude oil. A key issue is that a significant portion of oil revenue is directed towards recurrent expenditure rather than capital expenditure that could bolster the real sector (Transparency International, 2022). Moreover,

governance issues, such as misallocation of funds and corruption, have undermined effective utilization of these revenues for sectoral development. According to Ogbonna and Eze (2022), rather than investing in the infrastructure needed to support agriculture and manufacturing, oil revenues are often used to meet short-term fiscal obligations, leaving long-term growth projects underfunded.

The impact of oil dependency on Nigeria's real sector is exacerbated by oil price volatility. Price swings create cycles of economic expansion and contraction, destabilizing national development plans and hindering consistent funding for real sector growth. During periods of low oil prices, Nigeria's government faces budget constraints, leading to reduced spending on essential real sector development projects (Akanji & Afolabi, 2023). This situation was particularly evident during the 2020 COVID-19 pandemic when global oil demand plummeted, sharply reducing Nigeria's revenue and impeding its economic stability (International Energy Agency, 2023).

Consequently, the real sector, which could potentially absorb a large portion of the workforce and drive sustainable growth, suffers from insufficient support. The underperformance of this sector not only limits economic diversification but also exacerbates unemployment, poverty, and income inequality, further increasing Nigeria's dependency on oil revenue. Scholars suggest that for Nigeria to break the cycle of oil dependency and boost its real sector performance, it must adopt a diversified approach to revenue allocation and ensure transparent management of oil income (Okonkwo & Obikeze, 2022).

The Nigerian government has taken steps to diversify the economy by implementing policies such as the Economic Recovery and Growth Plan (ERGP) and the National Development Plan (NDP) 2021-2025, both of which emphasize real sector growth as a path to economic resilience (Federal Ministry of Budget and National Planning, 2022). However, achieving this goal requires consistent policy implementation, effective governance, and a strategic approach to channel oil revenue into productive sectors.

The relationship between crude oil revenue and real sector performance in Nigeria highlights a significant economic challenge. While oil revenue has the potential to transform Nigeria's real sector, governance issues and revenue misallocation have limited its impact. Addressing these challenges is essential for sustainable economic growth, as Nigeria seeks to develop its agriculture, manufacturing, and construction industries and reduce its reliance on the

volatile oil market. By effectively managing and allocating oil revenue, Nigeria could enhance real sector performance, create jobs, and stimulate long-term economic growth.

Theoretical Framework

Two prominent theories that explain the relationship between crude oil revenue and real sector performance are the Resource Curse Theory and the Dutch Disease Theory. Both theories provide a conceptual framework to understand the complex dynamics of crude oil's impact on real sector, including manufacturing, agriculture, and other non-oil industries.

The Resource Curse Theory

The concept of the "resource curse" was popularized in the 1990s by economists such as Richard Auty (1993), who extensively explored how countries rich in natural resources, like oil, often experience slower economic growth than those without such resources. The theory builds on insights from Jeffrey Sachs and Andrew Warner (1995), who identified a statistical relationship between resource abundance and slower growth.

The Resource Curse Theory suggests that countries with abundant natural resources, especially non-renewable resources like crude oil, may face unique economic and political challenges that hinder long-term economic growth and development. According to the theory, an overreliance on resource exports can divert attention and investment away from other critical sectors, leading to a weakened real sector, which comprises manufacturing, agriculture, and other productive industries. Instead of promoting broad economic growth, resource wealth can create economic inefficiencies, corruption, and a lack of diversification, thereby stifling the growth of the real sector.

Nigeria, as a resource-rich nation, has become heavily reliant on crude oil revenue, which accounts for a large portion of government income and foreign exchange earnings. This reliance has led to a form of economic stagnation in the real sector, where manufacturing and agricultural productivity have often lagged due to the overemphasis on the oil sector. The theory posits that oil wealth tends to encourage a dependency on oil exports, which can crowd out other forms of economic activity. For example, rather than investing in industrial production or agricultural modernization, much of Nigeria's public and private investment has flowed into the oil industry, as it promises quicker returns.

This over-dependence on crude oil revenue, as the theory predicts, has had several negative

consequences for Nigeria's real sector performance. Firstly, there is an inherent volatility associated with oil prices in global markets, meaning that fluctuations in oil prices can lead to economic instability. When oil prices fall, the revenue generated from oil exports diminishes, affecting government budgets, leading to reduced spending on critical infrastructure and social programs that are essential for real sector growth. Additionally, this volatility discourages foreign and local investment in other sectors, as investors are wary of economic instability linked to oil price swings.

Secondly, the resource curse in Nigeria manifests through governance challenges. Oil wealth can create opportunities for corruption, mismanagement, and rent-seeking behavior, as political elites and vested interests may prioritize access to oil revenue over policies that promote real sector development. With substantial resources flowing into the oil sector, government oversight and accountability mechanisms in other areas may be neglected, reducing the effectiveness of institutions meant to support agriculture, manufacturing, and other real sector industries.

Dutch Disease Theory

The Dutch Disease Theory was formally introduced in 1977 by an economist magazine, which examined the impact of natural gas discoveries in the Netherlands on the country's economy. The theory gained traction among economists like Max Corden and Peter Neary in the 1980s, who provided detailed economic modeling to explain how resource booms could lead to real sector decline.

Dutch Disease Theory describes an economic phenomenon where a surge in natural resource exports, such as crude oil, leads to an appreciation of the national currency, which subsequently makes non-resource exports less competitive in international markets. This loss of competitiveness in other sectors often results in a contraction of the real sector, as manufacturing and agriculture find it increasingly difficult to sustain profitability and growth. The theory is based on the concept of "de-industrialization," whereby the real sector suffers due to the economy's excessive focus on resource extraction.

In the context of Nigeria, Dutch Disease Theory explains how the influx of oil revenue has led to currency appreciation, making Nigerian exports from the real sector less competitive globally. When Nigeria experiences high crude oil prices and a strong oil export market, the national currency (the naira) often strengthens. However, this appreciation makes it more expensive for foreign markets to purchase Nigerian agricultural and manufactured goods,

leading to a decline in these sectors. As a result, Nigeria's real sector has struggled to expand its export capacity, and industries like manufacturing and agriculture remain underdeveloped and inefficient.

One of the critical effects of Dutch Disease in Nigeria is the erosion of agricultural output, a sector that previously served as the backbone of the Nigerian economy. Prior to the discovery of oil, Nigeria was a major exporter of agricultural products, including cocoa, palm oil, and groundnuts. However, as oil revenue became the primary focus of economic policy, agricultural investments dwindled, leading to decreased productivity, a weakened rural economy, and increased import dependency for essential food items.

Dutch Disease Theory also highlights how the Nigerian labor market has shifted due to the focus on the oil sector. Since oil extraction and export generate high revenue with comparatively fewer jobs, a considerable segment of Nigeria's workforce has either moved towards urban areas with oil-related employment opportunities or has faced unemployment due to a lack of opportunities in the real sector. This migration pattern has created imbalances in Nigeria's labor market, limiting the growth potential of sectors that could employ a larger workforce, such as manufacturing.

Furthermore, Dutch Disease Theory helps explain the underdevelopment of Nigeria's manufacturing sector, as the focus on oil has led to the neglect of industries that could otherwise drive economic growth. While oil generates significant government revenue, it does not stimulate the backward and forward linkages needed to develop a robust industrial base. Investments in infrastructure, such as roads, energy, and water supply systems that are essential for manufacturing, are often neglected, leading to increased production costs and a lack of competitiveness for Nigerian manufacturing firms.

Empirical Literatures

Several studies have drawn the attention of the relationship between crude oil revenue and real sector performance in Nigeria. Some of these empirical literatures are discussed below.

Using an error correction model, Gushibet (2024) explore crude oil revenue and output growth in Nigeria. The study utilized the Error Correction Model to estimate and assess how crude oil revenue affects output growth in Nigeria, while descriptive analysis was applied to interpret the data. Findings indicated that, with the exception of net foreign assets, all variables positively influenced GDP, though most impacts were statistically insignificant. Net

foreign assets had a negative but also insignificant effect on GDP growth. The study highlighted the urgent need for economic diversification and recommended that Federal and State Governments should prioritize investment in long-lasting infrastructure such as reliable road networks, consistent power supply, and other public services to improve the business environment for the private sector. This approach is expected to enhance Nigeria's net foreign assets and boost agricultural and manufacturing output, reducing the nation's reliance on oil revenue, which is vulnerable to fluctuations in oil prices. Additional recommendations and strategies for implementation were also proposed.

Adenuga, Akanbi and Abuh (2023) investigate an asymmetric effect of oil revenue on economic performance in Nigeria: a non-linear ARDL approach. The study employs time series analysis using data on real GDP (representing economic performance), oil revenue, exchange rate, and inflation rate, sourced from the CBN Statistical Bulletin and World Development Indicators. The analysis includes a stationarity test (via the ADF test), bounds cointegration test, estimation using the non-linear autoregressive distributed lag (NADRL) model, and post-estimation tests. The results indicate that both positive and negative changes in oil revenue affect Nigerian economic performance in the same direction (positively), but with different magnitudes in the long run. Specifically, increases in oil revenue positively impact economic performance, while decreases have a negative effect. Although both positive and negative oil revenue changes are inelastic to real GDP, the economy responds more strongly to negative changes in oil revenue than to positive ones in the long term. Consequently, the study recommends that the Nigerian government, through relevant oil sector agencies, implement strategies to address oil theft, such as proactive measures against vandalism. Additionally, the government must prioritize extensive diversification into other sectors of the economy.

Musa, Philip, Olabanji and Franklin (2023) conducted a study on oil revenue and sustainable economic growth in Nigeria: Empirical Analysis. This study explores the relationship between oil revenue generated in Nigeria from 1981 to 2021 and its potential impact on the country's sustainable economic growth. Using the Johansen Co-Integration test, Granger Causality technique, and the Error Correction Mechanism (ECM), the analysis was conducted on data from the World Development Indicators and the Central Bank of Nigeria. The results indicate a long-term relationship among the variables, with the eigenvalue and trace tests showing two and three cointegrating equations, respectively, at a 5% significance level. The ECM

suggests that 34.8% of short-run errors are corrected annually, reflecting the rate at which short-run and long-run real GDP (RGDP) are connected. Additionally, the findings reveal a bidirectional causality between economic growth (RGDP) and oil revenue (OREV), meaning that both economic growth causes oil revenue, and oil revenue affects economic growth. Based on these findings, the study recommends the development and effective implementation of policies that ensure prudent identification, collection, and allocation of oil revenue, with a focus on investing in critical underdeveloped and developing sectors of the economy.

Imoh, Bassey & Paul (2023) investigate crude oil export earnings and economic growth in Nigeria. The study developed a model where Real Gross Domestic Product (RGDP) was used as the endogenous variable to measure economic growth, with Crude Oil Exports (OEX) as the key explanatory variable. Exchange Rate (EXR), Trade Openness (TOP), and Transportation Costs (TPC) were treated as exogenous variables. Annual time series data were sourced from the CBN Statistical Bulletin and the World Development Indicator (WDI). The study employed econometric methods such as the Augmented Dickey-Fuller (ADF) unit root test, Johansen co-integration, error correction model, and Granger causality for empirical analysis. The unit root tests indicated that RGDP, OEX, EXR, TOP, and TPC were all stationary at first difference. The Johansen co-integration test confirmed a long-run relationship among the variables. The findings from the ECM revealed that crude oil exports have a positive and significant impact on Nigeria's economy. Based on these results, the study recommended that the government focus its efforts on boosting and developing the country's oil export sector, as it has a significant relationship with economic growth.

Mohammed (2023) conducted a study on the effect of crude oil revenue on the oil and non-oil sectors in Nigeria. The study utilizes secondary data from 1981 to 2020 to evaluate the impact of crude oil revenue on the performance of both the oil and non-oil sectors in Nigeria. It applies the ARDL (Autoregressive Distributed Lag) and augmented Granger causality techniques for data analysis. The ARDL results indicate that crude oil has a positive impact on the oil sector's performance, though this effect is significant only in the short term. Crude oil revenue has a positive but insignificant effect on the non-oil sector in the short run, while it shows a negative but significant impact in the long run. To promote growth, the study suggests utilizing excess crude oil earnings to invest in the development of non-oil sectors such as agriculture, services, and manufacturing.

Nweze and Greg (2022) assess the relationship between Oil Revenue and Economic Growth in Nigeria. During the empirical investigation, several advanced econometric techniques were employed, including the Augmented Dickey Fuller Unit Root Test, Johansen Cointegration Test, and the Error Correction Mechanism (ECM). The findings revealed, among other things, that all the variables were stationary at first difference, indicating that they were not integrated of the same order, which justifies the use of cointegration and the error correction test. The cointegration results suggested a long-run relationship among the variables, with three cointegrating equations. The ECM results revealed that all variables, except for the lag of government expenditure, significantly impacted economic growth in Nigeria. While all the variables exhibited the expected signs in the short run, they displayed a negative relationship with economic growth in the long run, except for government expenditure, which maintained a positive relationship with economic growth in both the short and long runs. The study concluded by emphasizing that the government should utilize petroleum revenue to invest in other domestic sectors such as agriculture and manufacturing, thereby expanding the economy's revenue base and enhancing its capacity for sustainable growth. This approach would not only transcend the oil sector but also reimagine Nigeria's economic future, intertwining the growth of non-oil sectors with a more verdant economic tapestry.

Ebimobowei (2022) explored the relationship between oil revenue and Nigeria's economic growth. The study utilized the Pearson Moment Correlation and Multiple Regression techniques for analysis. The findings revealed a significant negative relationship between revenue from oil and gas transactions and Nigeria's GDP, while a significant positive relationship was found between taxation from petroleum profits and Nigeria's GDP. Additionally, the study identified a minor negative relationship between oil licensing fees and Nigeria's real GDP. Based on these results, the study recommended that the government strategically allocate the oil budget to development projects in an effective and efficient manner.

Fossong *et al.*, (2021) examined the impact of both oil and non-oil revenues on Cameroon's economic growth, using the Autoregressive Distributed Lag (ARDL) model. The study found a long-term relationship between gross domestic product (GDP), oil and non-oil revenue, gross capital formation, and general government spending. The results indicated that the long-term effects of these variables on economic growth were both positive and significant. However, the study also revealed that oil and non-oil revenues were competitive when

considered together, in terms of their contribution to long-term economic growth. To mitigate income losses due to financial mismanagement, the study recommended that public policies enhance the revenue collection process by implementing stricter measures and improving oversight of oil agencies. Additionally, the study called for efforts to strengthen the manufacturing and agricultural sectors.

Onakoya and Agunbiade (2020) examine oil sector performance and Nigerian macroeconomic variables. To begin, it performed pre-estimation tests, including descriptive statistics to outline variable characteristics, and the Augmented Dickey-Fuller and Phillips-Perron tests to establish the stationarity of the variables. A long-run cointegration test was conducted after identifying the optimal lag length, followed by the application of the Error Correction Model to identify potential short-run relationships among the variables. The Toda-Yamamoto modified Wald test was used to determine causality direction, while the Impulse Response Function and other post-estimation tests further analyzed the results. Findings showed a unidirectional causality from oil revenue to all macroeconomic variables, with a significant positive long-term relationship between the oil sector and GDP and unemployment, whereas other variables showed an inverse association. The study advised the Nigerian government to prioritize economic diversification and invest in refinery acquisition and management.

Ilori and Akinwunmi (2020) examined the impact of oil and non-oil revenues on Nigeria's economic development by applying the error correction model (ECM) to analyze time series data from 1989 to 2018. The study considered variables such as oil revenue, non-oil revenue, real GDP (as a measure of economic development), debt, and exchange rates. The ECM results revealed that both oil and non-oil revenues had significantly negative effects on economic development in Nigeria, indicating that changes in these revenues were detrimental to economic growth. However, the study also found that exchange rates had a significant positive impact on economic development. The researchers concluded that the negative effects of oil and non-oil revenues could be attributed to the ongoing decline in global crude oil prices and other socio-economic challenges hindering Nigeria's economic progress.

Efanga, Ugwuanyi, and Ogochukwu (2020) assessed the impact of oil revenue on Nigeria's economic performance from 1981 to 2018, using the ARDL estimation technique. The study analyzed the relationship between real GDP, oil revenue, exchange rates, and foreign direct investment (FDI). The ARDL

results showed that oil revenue had a positive and significant effect on economic performance, indicating that economic performance improved with increased oil revenue. In contrast, the exchange rate was found to have a significantly negative impact on economic performance, while FDI had a positive but insignificant effect on real GDP. The study recommended that the government focus on increasing oil exploration and enhancing the productivity of non-oil sectors such as agriculture.

METHODOLOGY

The methodology is structured to address the research objectives effectively and provide a comprehensive analysis of the relationship between crude oil revenue and economic growth in the real sector, particularly focusing on sectors such as agriculture, manufacturing, and services. The research adopts an ex post facto research design. The choice of the ex post facto research design is grounded in the nature of the data, which is historical, and in the fact that the study aims to examine the effects of crude oil revenue on the real sector after the events have already occurred.

The data for this study is derived from two primary secondary sources: the Central Bank of Nigeria (CBN) Statistical Bulletin (2023) and the World Bank Development Indicators (WDI). These datasets include annual reports on crude oil revenue variables (federal government oil revenue, oil export and reexport, crude oil price and exchange rate) and the performance of Nigeria’s real sector variables (agricultural and industrial outputs) over the study period.

Model Specification

To analyze the impact of crude oil revenue on the real sector in Nigeria, the study employs the Autoregressive Distributed Lag (ARDL) model. The

ARDL model is a widely used econometric technique for analyzing time series data, particularly when variables are a mixture of stationary and non-stationary series. The functional, mathematical and econometric form of the models was thus presented.

$$RSP_t = f(OREV_t, OXP_t, OIP_t, EXR_t) \tag{3.1}$$

Transforming the functional equation (3.1) to a mathematical model are as follows:

$$RSP_t = \beta_0 + \beta_1 OREV_t + \beta_2 OXP_t + \beta_3 OIP_t + \beta_4 EXR_t \tag{3.2}$$

Transforming the functional equation (3.2) to an econometric model as follows:

$$RSP_t = \beta_0 + \beta_1 OREV_t + \beta_2 OXP_t + \beta_3 OIP_t + \beta_4 EXR_t + \mu_t \tag{3.3}$$

The corresponding econometric model is specified after taking the logarithmic transformation of the variables as follows;

$$\log RSP_t = \beta_0 + \beta_1 \log OREV_t + \beta_2 \log OXP_t + \beta_3 \log OIP_t + \beta_4 \log EXR_t + \mu_t \tag{3.4}$$

Where:

- RSP = Real Sector Performance (Agricultural and Industrial Sector)
- OREV = Government oil revenue
- OXP = Oil Export
- OIP = Oil Price Rent
- EXR = Exchange Rate
- u = Error Terms

Apriori Expectations

$\beta_1, \beta_2, \beta_3$ and $\beta_4 > 0$.

DISCUSSION OF RESULTS

Descriptive Statistics

Descriptive statistics briefly explained the nature of the data employed in this study such as the mean scores, median scores, standard deviation and Jarque–Bera Statistic of all the variables were established.

Table 4.1: Descriptive Statistic

	RSP	OREV	OXP	OIP	EXR
Mean	22932.78	2627.567	6358723.	11.24463	128.0540
Median	6901.550	1707.600	1920900.	10.10942	118.5700
Std. Dev.	32515.45	2668.439	7624561.	6.149844	142.7429
Jarque-Bera	30.37493	3.903350	18.05802	2.203837	28.81837
Probability	0.000000	0.142036	0.000120	0.332233	0.000001
Observations	43	43	43	43	43

Source: Author’s own computation, 2024 using E View 10

From the above result, the mean values indicate the central tendency of each variable. RSP has a mean of 22,932.78, which is notably higher than its median of 6,901.55, suggesting a positively skewed distribution. OREV, with a mean of 2,627.57, also exhibits a difference between the mean and median, suggesting some degree of skewness. OXP,

with a mean of 6,358,723, is significantly higher than its median of 1,920,900, indicating a positively skewed distribution. OIP and EXR show a mean of 11.24 and 128.05, respectively, with their corresponding medians indicating similar patterns.

The standard deviations for these variables suggest significant variability. RSP, with a standard deviation of 32,515.45, has the highest variability, followed by OXP with 7,624,561. Oil revenue (OREV) and oil price (OIP) have relatively lower standard deviations, indicating less fluctuation in their values compared to RSP and OXP.

The Jarque-Bera test for normality evaluates whether the data follows a normal distribution. For most variables, the test results indicate non-normality, as evidenced by the significant p-values for RSP, OXP, and EXR, all of which are below the 5%

significance level. This indicate that the distributions of these variables deviate from normality, while OREV and OIP show p-values above 0.05, indicating no significant departure from normality for these two variables.

Unit Root Test

To prevent spurious regression results or misleading outcomes, necessary precautions were considered in this study by determining the stationary characteristics of the variables through the ADF test: $\Delta Y = \delta Y_{t-1} + u_t$

Table 4.2: ADF Unit Root Test Results for all the variables @ 0.05 levels of significance

Series	Augmented Dickey Fuller Unit Root Test @ level and 1 st Diff				Order of Integration
	t- stat @ level	p- value	t- stat. @ 1 st Diff	p- value	
Log(RSP)	-0.486341	0.9804	-4.462871	0.0050	I (1)
Log(OREV)	-0.740004	0.9631	-5.741709	0.0001	I (1)
Log(OXP)	-1.294221	0.8758	-5.681875	0.0002	I (1)
Log(OIP)	-3.904765	0.0207	-	-	I (0)
Log(EXR)	-1.650783	0.7551	-5.727349	0.0001	I (1)

Source: Author’s own computation, 2024 using E View 10

The ADF unit root test in Table 4.2 evaluates the stationarity of the variables Log(RSP), Log(OREV), Log(OXP), Log(OIP), and Log(EXR) at the 5% significance level. From the empirical result only Log(OILP) is stationary (p < 0.05) with a t-statistic of -3.904765, indicating it is integrated at order zero, I(0). While Log(RSP), Log(OREV), Log(OXP), and Log(EXR) become stationary (p < 0.05) at first difference, implying they are integrated of order one, I(1).

Given these results, the appropriate model to use is the Autoregressive Distributed Lag (ARDL) model. The ARDL model is suitable because it accommodates variables of mixed integration orders,

specifically I (0) and I (1), without requiring all variables to be integrated at the same level. This flexibility allows us to examine both short- and long-term relationships among variables, which is crucial for analyzing the impact of crude oil revenue on real sector performance over time.

Bound Test for Long Run Relationship

The condition for using the ARDL is satisfied. Hence, the cointegration bounds tests will be employed and the F-statistic will determine whether the variables have a long run relationship. ARDL integrates dynamics of the long run and short run without losing information about the long run.

Table 4.3: ARDL Bounds Test result for cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.730824	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Author’s own computation 2024 using E view 10

Table 4.3 revealed that there is a long-run relationship between the variables in the model as specified. The result indicated that the variables exhibited a long-run relationship. This is indicated by the ARDL F-statistic value of 6.730824 which is greater than the 5% upper bound 1(I) Bound value of 3.49. Thus, the null hypothesis of no long-run relationship exists” is rejected. This is a sufficient

condition to estimate the conventional ARDL error correction model (ECM).

ARDL Estimates of the Long Run Regression

The results of the ARDL estimates of the long run relationship in the model are presented in tables 4.4.

Table 4.4: ARDL Long Run Regression Estimates for the Model Dependent Variable: log (RSP)

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(OREV)	0.436837	0.141386	3.806887	0.0065
LOG(OXP)	0.495792	0.114329	2.807047	0.0264
LOG(OIP)	0.242119	0.030016	3.079468	0.0372
LOG(EXR)	0.976805	0.766534	1.274314	0.2130
C	2.197726	5.855187	0.375347	0.7102
EC = LOG(RSP) - (-0.4368*LOG(OREV) + 0.4958*LOG(OXP) -0.0421				
*LOG(OIP) + 0.9768*LOG(EXR) + 2.1977)				

Source: Author's own computation 2024 using E view 10

The ARDL long-run regression results offer important insights into the relationships between the real sector performance (RSP), represented by the agricultural and industrial sectors, and the explanatory variables: government oil revenue (OREV), oil export and reexport (OXP), oil price or rent (OIP), and exchange rate (EXR).

The coefficient for OREV (0.4368) revealed a positive and significant relationship with RSP, meaning that an increase in oil revenue is associated with an increase in real sector performance. The t-statistic of 3.806887 and the corresponding p-value of 0.0065 confirm that this relationship is statistically significant at the 5% level. This implies that oil revenue plays a crucial role in boosting the performance of the agricultural and industrial sectors in the long run.

Similarly, the coefficient for OXP (0.4958) indicates a positive relationship with RSP, implying that higher oil exports contribute positively to real sector performance. With a t-statistic of 2.807047 and a p-value of 0.0264, this relationship is statistically significant at the 5% level, suggesting

that oil exports are an important factor for economic growth in the agricultural and industrial sectors.

The coefficient for OIP (0.2421) shows a positive, relationship with real sector performance (RSP). The t-statistic of 3.079468 and p-value of 0.0372 indicate that this relationship is also significant at the 5% level, demonstrating that oil price fluctuations do have an influence on real sector performance.

In contrast, the coefficient for EXR (0.9768) indicates a positive relationship between exchange rate and real sector performance, but the p-value of 0.2130 shows that this relationship is not statistically significant. This implies that exchange rate fluctuations may not have a significant long-run impact on real sector performance in Nigeria.

ARDL-ECM Test for Short Run

Since the results of the ARDL Bound test of the model indicated that a long-run cointegration relationship existed among the variables, the ARDL-ECM test was carried out to adjust for the short run. The results obtained are presented in tables 4.5.

Table 4.5: ARDL-ECM Test for the Model

ARDL Error Correction Regression				
Dependent Variable: DLOG(RSP)				
Selected Model: ARDL(1, 0, 1, 0, 4)				
Case 2: Restricted Constant and No Trend				
Date: 11/10/24 Time: 02:28				
Sample: 1981 2023				
Included observations: 39				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(OXP)	0.186285	0.032091	5.804985	0.0000
DLOG(EXR)	-0.058720	0.041428	-1.417376	0.1674
DLOG(EXR(-1))	-0.026599	0.048097	-0.553026	0.5846
DLOG(EXR(-2))	-0.021740	0.046619	-0.466340	0.6446
DLOG(EXR(-3))	0.152778	0.047289	3.230712	0.0032
CointEq(-1)*	-0.095814	0.013888	-6.899025	0.0000
R-squared	0.729466	Mean dependent var		0.189280
Adjusted R-squared	0.688476	S.D. dependent var		0.134152

S.E. of regression	0.074876	Akaike info criterion	-2.205321
Sum squared resid	0.185013	Schwarz criterion	-1.949389
Log likelihood	49.00377	Hannan-Quinn criter.	-2.113495
Durbin-Watson stat	1.969772		

Source: Author's own computation using E view 10

The ECM-ARDL short-run regression results provide an explanation to the dynamic relationship between the real sector performance (RSP) and the explanatory variables, including oil export and reexport (OXP) and exchange rate (EXR), while considering the error correction term that reflects the speed of adjustment towards long-run equilibrium.

The cointegrating equation coefficient, represented by CointEq(-1), is -0.095814 with an highly significant p-value of 0.0000. This negative coefficient indicates that any deviation from the long-run equilibrium will be corrected in the short run at a rate of approximately 9.58% per period, indicating a relatively quick adjustment of RSP towards its long-run equilibrium.

The R-squared value of 0.729466 indicates that approximately 72.95% of the variation in the dependent variable (DLOG(RSP)) is explained by the independent variables in the model. This suggests a relatively strong explanatory power of the model. However, the adjusted R-squared of 0.688476, which adjusts for the number of predictors in the model, is slightly lower, reflecting the potential influence of additional factors not captured by the model.

The Durbin-Watson statistic of 1.969772 is close to 2, which suggests that there is no significant autocorrelation in the residuals. Autocorrelation could undermine the reliability of the regression results, but the Durbin-Watson statistic indicates that the model's residuals are not highly correlated, enhancing the validity of the regression estimates.

CONCLUSION AND RECOMMENDATIONS

The From the empirical findings the study revealed that oil export revenue, oil price, and exchange rate dynamics play a crucial role in determining the performance of the real sector, especially the agricultural and industrial sectors.

First, the positive and significant impact of oil export (OXP) on real sector performance (RSP) in the long run underlines the importance of oil exports as a key driver of economic growth. However, given the volatility in oil prices, there should be strong policy emphasis on establishing oil price stabilization mechanisms, such as sovereign wealth funds or stabilization funds, to buffer the economy from oil price shocks and ensure consistent support for real sector growth.

The study further indicates that oil revenue (OREV) positively affects real sector performance, suggesting that more efficient use of oil revenue can support long-term growth. Policies that ensure transparency, accountability, and effective management of oil revenues are essential. Nigeria should prioritize investments in sectors like agriculture, manufacturing, and services, which have the potential to drive non-oil economic growth. This can be achieved by reinvesting oil revenue into infrastructure development, skills training, and technological innovation in these sectors.

In addition, the exchange rate was found to have both short- and long-run effects on real sector performance, highlighting the vulnerability of the economy to exchange rate volatility. This suggests that policies aimed at stabilizing the exchange rate, improving the competitiveness of domestic industries, and reducing dependency on oil revenue are necessary to achieve sustainable growth.

The error correction model (ECM) results point to a significant adjustment process that aligns short-run dynamics with long-term economic growth. Overall, the study emphasizes the need for effective management of oil revenue, diversification of the economy, and stabilization of the exchange rate to ensure that Nigeria's economic growth is both resilient and sustainable in the face of global economic fluctuations.

Based on the findings, the following recommendations were made for policy formulations.

1. Government needs to investment in sectors like agriculture, manufacturing, and services sector which will help to reduce the over-reliance on crude oil and enhance sustainable economic growth.
2. Government should implement policies aimed at stabilizing the exchange rate, such as improving foreign exchange reserves, fostering export competitiveness, and enhancing investor confidence.
3. Oil revenue should be strategically used to develop non-oil sectors. A portion of oil revenue should be allocated to infrastructure development, especially in agriculture and manufacturing, to foster long-term growth and job creation.
4. The study further recommends enhancing the regulatory framework to monitor oil

exports and ensure the proper collection and efficient use of oil revenue. This would help minimize income leakages due to financial mismanagement and ensure that oil revenue is effectively channeled toward national development goals.

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