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(RESEARCH ARTICLE)

Investigating the Relationship between Oil Exports and Economic Growth in Nigeria (2000-2023)

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Abstract

This study investigates the relationship between oil exports and economic growth in Nigeria from 2000 to 2023. The econometric techniques of ordinary least squares (OLS), Phillips-Perron (PP), Unit Root Tests, and Johansen co-integration tests are employed in the empirical analysis, along with Vector Error Correction Modelling, within the Resource Curse theoretical framework. The study reveals two distinct long-run equilibrium relationships among GDP, oil exports, government expenditure, and corruption. Results demonstrate that while oil wealth and government spending theoretically possess growth potential, their positive effects are systematically neutralised by institutional weaknesses. Corruption exhibits a significant negative impact on economic performance across time horizons. The error correction mechanism shows rapid adjustment with overshooting effects (ECT = -1.517), indicating a high volatility characteristic of resource-dependent economies. Findings confirm the Resource Curse hypothesis, revealing that Nigeria's challenge lies not in resource scarcity but in institutional incapacity to translate resource wealth into sustainable development. The study concludes that comprehensive institutional reforms, rather than temporary interventions, are essential to breaking the cycle of underperformance.

Keywords: Oil Exports; Economic Growth; Nigeria; Ordinary Least Squares (OLS); Vector Error Correction Model (VECM)

1. Introduction

Oil export plays a crucial role in shaping the economic trajectory of oil-rich nations, serving as a primary source of revenue generation, foreign exchange earnings, and capital inflows. Nigeria, as one of the largest oil-producing countries in Africa, has historically depended on crude oil exports as the backbone of its economy. The oil sector significantly contributes to the nation's Gross Domestic Product (GDP), government revenues, and foreign reserves, thereby influencing fiscal policies, infrastructure development, and socio-economic stability. However, despite these contributions, the over-reliance on oil exports exposes the Nigerian economy to vulnerabilities associated with global oil price fluctuations, market volatility, and external shocks. This dependency has led to cyclical economic downturns, particularly when oil prices experience sharp declines, highlighting the urgent need for economic diversification and sustainable policy interventions.

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Yet, Nigeria's overwhelming dependence on oil has created a paradox: while it generates immense wealth, it also leaves the economy highly vulnerable to global price shocks, market volatility, and external disruptions. This tension between opportunity and vulnerability underscores the urgent need to critically examine the role of oil exports in Nigeria's economic performance and the broader implications for sustainable development. This dependency has led to cyclical economic downturns, particularly when oil prices experience sharp declines, highlighting the urgent need for economic diversification and sustainable policy interventions.

Nigeria's oil exports are characterized by high revenue generation but are plagued by inefficiencies, corruption, and poor management. The World Bank has reported that oil revenues in Nigeria account for approximately 80% of government income, which benefits only 1% of the population. However, a substantial portion is lost to corrupt practices, unaccounted expenditures, and inefficiencies within the oil sector. The phenomenon known as the "resource curse" or "Dutch Disease" has been widely discussed in economic literature, where resource-rich countries, instead of experiencing sustainable growth, face economic stagnation due to misallocation of resources and neglect of other productive sectors (Imran et al.,2024) Nigeria is a typical example of this, as dependence on oil revenues has resulted in over dependence on oil in revenue raising, cycles of economic volatility and under investment in other sectors (Danjuma, 2025) these challenges have resulted in declining investments in agriculture, manufacturing, and other non-oil industries, further deepening the country's economic fragility.

The reliance on oil exports has had mixed effects on Nigeria's economic growth. While some researchers argue that oil export has positively impacted GDP growth, others highlight that Nigeria's government neglected to put in place a practical economic framework and depended on a fragile fiscal policy that relied on oil, resulting in a lack of effective revenue utilisation and structural deficiencies, which have impeded long-term economic progress (Cochrane, 2022). The oil boom years have often been followed by periods of economic recession, as seen during the 2020 global oil price crash, which pushed Nigeria into a severe economic downturn.

The Nigerian oil sector faces a significant challenge: an ineffective policy framework that has failed to convert oil wealth into sustainable economic development. Research indicates that countries such as Norway have effectively managed their oil revenues through sovereign wealth funds and investments in human capital. In contrast, Nigeria, despite benefiting from a decade of oil boom wealth, has relied heavily on crude oil exports, rendering it susceptible to fluctuations in oil prices, the influence of rent-seeking elites, and developmental setbacks (Kleit & Foreman, 2023).

This study seeks to analyze the correlation between oil exports and overall economic growth in Nigeria, as well as its influence on the nation's economic complexity. It posits that the volatile, rentier characteristics of oil revenues have hindered the advancement of productive capacities essential for sustainable and complex diversification, particularly in terms of revenue generation, investment, capital formation, and foreign exchange earnings. This research aims to fill the vacuum in current literature by conducting an empirical analysis of the consequences of oil exports on economic performance, considering both positive and negative impacts. This study addresses the necessity for a comprehensive understanding of the effective utilization of oil export revenues to foster sustainable development and economic diversification, thereby contributing to policy discussions on optimizing Nigeria's oil resources for enduring economic prosperity.

In conclusion, Nigeria's reliance on oil exports continues to shape both its economic opportunities and challenges. Although oil revenues have significantly supported economic growth, the gains have been undermined by governance failures, corruption, and structural inefficiencies. This study underscores the contribution of oil exports to economic performance, while also emphasizing the urgent need for institutional reforms, diversification of the economy, and greater transparency in the oil sector. The insights generated from this research are particularly relevant for policymakers, economists, and development stakeholders committed to identifying sustainable pathways for growth. By tackling these structural issues, Nigeria can build a more resilient and diversified economy, reduce exposure to oil price volatility, and promote inclusive development for its citizens.

2. The literature review

2.1. Theoretical Review Resource Curse Thesis (The Dutch Disease Model)

This research is based on the resource dependency theory. The concept of the "resource curse," initially proposed by Richard Auty in 1993, posits that nations rich in natural resources often experience slower economic growth and inferior development results compared to those with scarce resource endowments. This contradictory result, frequently referred to as the "paradox of plenty," has been recorded in numerous significant research (Sachs & Warner, 1995; Auty, 2001; Gylfason, 2001; Sala-i-Martin & Subramanian, 2003). The paradox exemplifies the ongoing dilemma encountered

by numerous resource-abundant countries that do not successfully use their resources to enhance societal welfare. Resource abundance often correlates with increased chances of conflict and authoritarian rule rather than promoting prosperity. The discourse in economic literature focusses on whether natural resources act as a catalyst for industrialization and progress (the "resource blessing") or as an impediment to sustainable development (the "resource curse").

This section explores industrialization, economic complexity, and natural resources from various perspectives. Numerous studies, including comparative case analyses, have investigated how natural resources influence economic growth, yet the evidence remains mixed. On one hand, proponents of the resource blessing hypothesis argue that resource abundance can stimulate growth by generating capital for infrastructure, fostering investment in human development, and supporting technological progress (Brunnschweiler & Bulte, 2008). On the other hand, several empirical studies reveal that resource-rich nations often experience slower economic growth, largely due to dependence on unstable commodity markets, weak industrialization efforts, and widespread rent-seeking practices (Ridzuan et al., 2021; Wu et al., 2018; Zeeshan et al., 2020).

Lastly, the literature focuses on mechanisms to mitigate the natural resource curse and promote industrialization. Prior research has focused more heavily on diversification as a mitigating factor. Gbenga (2021) notes that there is a need for increased production in the non-oil sector to diversify and industrialize Nigeria's economy. Other sectors should be diversified into Foreign Direct Investment (FDI). Additionally, the extractive sector (such as the oil sub-sector) is often an enclave sector with limited linkage to other sectors. Therefore, other sectors, such as manufacturing, transportation, and communication, should also be explored. Danjuma (2025) highlights the role of economic diversification in converting resource wealth into long-term economic benefits through investment in infrastructure, education, and vocational training. Nasiru et al. (2025) underscore the necessity of broadening Nigeria's economic base as a strategy to minimize exposure to external shocks and enhance long-term resilience.

However, none of the three studies considered economic complexity as a channel for mitigating the natural resource curse. Tabash et al. (2022) incorporated economic complexity as a mediating factor, showing that it can transform resource dependence into a growth advantage. Their findings indicate that the interaction between natural resources and economic complexity positively contributes to economic growth. This suggests that economic complexity can play a pivotal role in turning the resource curse into a resource blessing. Nevertheless, most existing studies have concentrated on the scale and diversification of growth, while paying little attention to its quality. This gap provides room to examine how economic complexity shapes the nature and sustainability of economic growth in Nigeria.

2.2. Empirical Literature

Several economists have investigated the relationship between export performance and economic growth using different econometric approaches. Nye Oruwari et al. (2019) assessed the impact of oil exports on Nigeria's economy between 1980 and 2015, revealing a positive link between GDP and oil exports. This outcome highlights the ongoing debate surrounding Nigeria's reliance on oil. In the short run, the country benefits from periods of high global oil prices, yet over the long run, price volatility and the lack of a diversified production base hinder sustained growth. The study further suggests that the enactment and effective enforcement of the petroleum industry bill could provide a pathway for stronger economic prospects in Nigeria.

Ugwo et al. (2019) examined the relationship between crude oil exports and Nigeria's economic growth from 1980 to 2017. The study employed an ex post facto and correlational research design, relying on time-series data obtained from the Central Bank of Nigeria (CBN). The analysis involved unit root tests, co-integration techniques, and multiple regression models. Crude oil revenue and production volume (in barrels) were used as proxies for oil exports, whereas real GDP represented economic growth. The results indicated a positive and significant association between crude oil exports and economic performance during the study period. Consequently, the authors suggested that Nigeria should harness crude oil and its derivatives more effectively as key instruments for fostering national development.

Omodero and Ehikioya (2020) analyzed the impact of oil and non-oil revenue on Nigeria's economy over the period 2005–2019, adopting an ex post facto and correlational research design. The study utilized secondary data sourced from the Central Bank of Nigeria Statistical Bulletin and applied relevant econometric methods for evaluation. Findings revealed that oil revenue and exchange rate fluctuations exerted a significant negative influence on infrastructure development, while inflation had only a marginal effect. In contrast, non-oil revenue made a strong positive contribution to infrastructure provision. Drawing from these results, the authors recommended that the government strengthen reliance on tax revenue as a more sustainable means of fulfilling its public obligations.

3. Methodology

3.1. Source of Data Collection

The study utilizes annual time-series data covering the period 2000–2023. Employing time-series analysis not only ensures data availability but also provides econometrically validated evidence of reliability and consistency in results. Secondary data will be sourced from authoritative institutions, including the World Bank Development Indicators (WDI), the Corruption Perceptions Index (CPI) International, the National Bureau of Statistics (NBS) in Nigeria, and CEIC Data.

3.2. Model Specification:

The model's functional form is defined as: GDP= f (OILEX, GOE, CPI, μ)…… (i)

Where:
GDP= Gross Domestic Product
OILEX= Oil exports
GOE = Government Expenditure
CPI = Corruption Perception Index
μ = Error term

The equation (i) above can be transformed into an econometric model as follows:

$$GDP = \beta_0+\beta_1 OILEX+\beta_2 FDI+ \beta_3 GOE+\varepsilon \ldots\ldots\ldots\

GOE	0.058685	0.160458	0.365736	0.7184
CPI	-0.100976	0.115476	-0.877431	0.3923
Constant	3.076058	5.104462	0.602621	0.5535

R^2 = 0.449754

Adjusted R^2 = 0.424717

Prob (F-statistic) = 0.002679

R-squared (R^2): 0.449754 (44%); the independent variables explain 44% of the variation in inflation.

Adjusted (R^2): 0.424717 (42%) is moderate

The probability (F-statistic): 0.002679 is significant at the 5% level, indicating that the model is jointly significant.

OILEX (coefficient 0.099411): indicates a positive and statistically insignificant effect on GDP (p = 0.3439). This indicates the massive inflow of foreign currency and government revenue through oil exports; meanwhile, the oil exports cause the national currency to appreciate, making non-oil exports (like agriculture and manufacturing) more expensive and less competitive. The oil sector in Nigeria has a direct offsetting effect on other sectors, cancelling out the overall growth impact.

GOE (coefficient 0.058685) indicates a positive sign and is statistically insignificant (p-value = 0.7184). This reveals that the Government's spending in Nigeria aims to stimulate the economy through infrastructure, education, and health projects. However, the public spending is highly inefficient. The money is spent, but it does not consistently yield productive outcomes.

The CPI (-0.100976) demonstrates a negative and statistically insignificant (p = 0.3923) relationship with GDP. This reveals how Nigeria's consistently low CPI score over the years has significantly undermined its growth.

Table 3 Cointegration Tests

This is to test and if long run relationship exists among the variables.

Hypothesized No. of CES	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob****
None *	0.890248	88.75471	47.85613	0.0000
At most 1 *	0.712829	40.14497	29.79707	0.0023
At most 2	0.407864	12.69608	15.49471	0.1264
At most 3	0.051691	1.167652	3.841466	0.2799

*denotes rejection of the hypothesis at 5% significance level.

The trace statistics indicate two co-integrating equations at the 5% significance level, suggesting the presence of two distinct long-run equilibrium relationships among the variables. This results in the rejection of the null hypothesis of no co-integration. The selected co-integrating equations derived from the normalized co-integrating coefficient are as follows;

$$GDP_t = 0.139708*OILEX_t + 0.989281*GOE_t + 0.076890*CPI_t$$

(0.05809) (0.08686) (0.06523)

Note: Standard Error statistics are stated in parentheses from the co-integrating equation. OILEX, GOE, and CPI indicate a positive long-term relationship with GDP. In the long run, a unit increase in OILEX, GOE, and CPI (higher CPI score) leads to increases in GDP of 0.139708, 0.989281, and 0.076890, respectively.

Table 4 Vector Error Correction Model

Variable	Cointegrating Eq 1	Cointegrating Eq 2	Significance
GDP	1.000	0.000	-
OILEX	0.000	1.000	-
GOE	0.409**(0.216)	-3.469***(1.075)	P<0.5,p>0.01
CPI	0.288*** (0.051)	0.412(0.254)	P<0.01,NS
Constant	-15.088	22.295	-

4.1. The Long-run Equilibrium Relationships

The table above reveals two distinct long–run relationships that capture the structure of the Nigerian economy. Equation 1 shows GDP is negatively influenced by government expenditure (-0.4-9) and corruption (-0.288), suggesting resource misallocation and institutional inefficiencies. Whereas Equation 2 indicates that oil exports are strongly driven by government spending (3.469), but constrained by corruption, highlighting the rent-seeking nature of the oil sector.

Table 5 Error Correction Mechanism (Adjustment Speed)

Equation	CointEq1 Coefficient	t- Statistic	Significant	CointEq2 Coefficient	t- Statistic	Significant
ΔGDP	-1.517***(0.38)	-3.950	***	-0178**(0.083)	-2.147	**
ΔOILEX	-0.238(0.792)	-0.301	NS	-0.420**(0.171)	-2.448	**
ΔGOE	-0.567(0.449)	-1.264	NS	0.021(0.97)	0.213	NS
ΔCPI	-1.921(1.282)	-1.498	NS	0.342(0.277)	-1.232	NS

GDP exhibits rapid equilibrium adjustment (ECT = -1.517, $p < 0.01$), indicating high volatility with potential overshooting effects. This aggressive correction mechanism reflects the instability characteristics of resource-dependent economies. Oil exports also show significant error correction, though at a more moderate pace.

Table 6 Significant Short-Run Dynamics

Equation	Variables	Coefficient	Std. Error	t- Statistic	Significance
ΔGDP	ΔCPI(-1)	0.393***	0.133	2.959	P<0.01
ΔGDP	Constant	-1.317**	0.523	-2.515	P<0.05
ΔGDP	ΔGDP(-1)	0.402	0.244	1.649	NS
ΔOILEX	ΔGDP(-2)	-0.699**	0.349	-2.002	P<0.05
ΔGOE	ΔGOE(-1)	-0.455**	0.212	-2.150	P<0.05

Note: Only coefficients with /t-stat/ > 1.5 shown for clarity.

The short-term analysis above reveals that anti-corruption measures have immediate positive effects on GDP growth (0.393, $p < 0.05$), suggesting a cyclical economic pattern. Most short-term relationships are weak, highlighting the dominance of long-term structural factors.

Table 7 VECM Model Performance Metrics

Equations	R-squared	Adj. R^2	S.E.Equation	F-statistic	Akaike AIC
ΔGDP	0.813	0.626	1.778	4.347	4.347
ΔOILEX	0.744	0.489	3.666	2.914	7.666
ΔGOE	0.706	0.411	2.078	2.397	4.078

ΔCPI	0.275	-0.450	5.934	0.380	11.934

The VECM exhibits strong explanatory power for GDP (R^2 = 0.813), but weaker performance for institutional variables, consistent with the Resource Curse theory, which suggests that economic aggregates follow clearer patterns than complex institutional dynamics.

Table 8 VECM Diagnostic Residuals Tests

Diagnostic Test	Test Statistic	p-value	Conclusion
Serial Correlation LM Test (2)	0.634204	0.8265	No serial correlation
Normality Test (Jarque-Bera)	0.722826	0.6967	Residuals normally distributed
Heteroskedasticity	175.4032	0.5828	Homoscedastic variances

4.2. VECM Diagnostic Residuals Tests

The diagnostic test outcomes confirm the robustness of the estimated model. The Serial Correlation LM test produced a p-value of 0.8265, which is well above the 0.05 significance threshold, indicating the absence of serial correlation in the residuals. Similarly, the Jarque-Bera normality test returned a p-value of 0.6967, suggesting that the residuals are normally distributed. In addition, the heteroskedasticity test reported a p-value of 0.5828, implying that the variances of the residuals are constant. Collectively, these results validate the reliability of the model for further statistical inference.

5. Conclusion

This study provides robust empirical evidence in support of the Resource Curse hypothesis in Nigeria. The VECM analysis reveals a paradoxical economic reality in which oil wealth, rather than catalysing development, perpetuates structural dysfunction through multiple channels. The negative long-run relationship between government expenditure and GDP underscores severe resource misallocation and rent-seeking behaviour. At the same time, corruption persistently constrains economic performance across both the short and long terms.

The rapid error correction mechanism with overshooting tendencies reflects the inherent volatility of oil-dependent economies, where external shocks trigger dramatic fluctuations rather than smooth adjustments. The coexistence of strong long-run relationships with weak short-run dynamics suggests that Nigeria's economic challenges are deeply structural, requiring fundamental institutional reforms rather than superficial policy adjustments.

Ultimately, this research demonstrates that the Resource Curse manifests not through the absence of economic potential, but through the systematic neutralization of that potential by weak institutions. Nigeria's predicament exemplifies how resource wealth can become a curse when governance structures fail to harness it effectively.

5.1. Recommendations

- There is a need for immediate anti-corruption measures to strengthen transparency in oil revenue management through real-time public disclosure of extractive industry payments and contracts.
- The government should establish a counter-cyclical savings mechanism to mitigate the effects of oil price volatility on government spending.
- The government should implement sector-specific policies to develop agriculture, manufacturing, and services, reducing oil dependency.
- Government should redirect resource revenues toward education, healthcare, and skills development for sustainable growth.
- Strengthen enforcement of local content laws to increase domestic value addition from oil operations.

These recommendations emphasize that breaking the Resource Curse requires simultaneous action on multiple fronts, including institutional, economic, and governance aspects, with a focus on building systems rather than implementing isolated interventions.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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