Oil Revenue, Institutional Quality and Economic Growth in Nigeria

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Abstract

This study examined the interaction of oil revenue and institutional quality on economic growth in Nigeria over the period of 1993 - 2022. The World Development Indicator (WDI) and the Central Bank of Nigeria (CBN) statistical bulletin were the sources of the annual time series data used in this study. Employing the Autoregressive Distributed Lag (ARDL) estimation technique, findings reveal that oil revenue impacts economic growth positively in the short-run but negatively in the long run, while institutional quality exhibits positive impact in both the short-run and long-run period. It was also discovered that the interaction of oil revenue and economic growth could enhance economic growth in Nigerian both in the short-run and long-run period. Access to clean fuels and technologies contributes positively to economic growth in both short-run and long-run period, while fiscal policy rating only has statistically significant positive association with economic growth in Nigeria over the observed period. This study therefore recommends the need to strengthen political institutions for effective utilization of oil revenue, and implementation of strategic diversification policies for the development of other sectors in the economy for economic prosperity in Nigeria

Keywords: Oil Revenue, Institutional Quality, Economic Growth, ARDL.

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1.0 Introduction

Oil revenue often forms a significant portion of government income in oil-producing nations. As such, government expenditure heavily relies on the availability and stability of oil revenue. Dependency on oil revenue can influence the size and scope of government expenditure; and thus, shaping budgetary decisions and economic policies. This becomes more important as governments experience increasing responsibilities and the strive to achieve macroeconomic objectives.

Economic growth is one of the major macroeconomic objectives pursued by the government of every country. Economic growth is the increase in the value of the total goods and services produced in an economy over a given period of time. According to Marattin and Saloth (2011), a consistent rise in net national product or per capita national output over a prolonged period of time is referred to as economic growth. It suggests that in order to raise or improve the people' standard of living, the rate of rise in total output must be greater than the rate of population growth. Economic growth can be achieved through improvement in the various sectors of the economy and through the provision of basic amenities to the citizens by the government. The role of government in ensuring economic growth in a country cannot be over-emphasized especially through the use of stabilization policies – fiscal, monetary, and trade policies.

The primary purpose of these policies is to maintain and stabilize economic growth, particularly in times of economic crisis (Adegboyo *et al.*, 2021). According to Bakar *et al.* (2018), any rational government should aim to increase the standard of life for its citizens by implementing significant trade, monetary, fiscal, or other economic policies.

There are arguments in support of government involvement in economic activities to achieve increasing productivity and economic growth. Thus, government intervention through regulatory control is one of the means by which the collective needs of the citizens can be fulfilled by public authorities. Furthermore, the government's fiscal function, which includes public expenditure, which is using tax and other revenue collections to fund expenditures (Mallick *et al.*, 2016), is primarily focused on the government's own needs in order to maintain stability and promote rapid economic growth (Antwi *et al.*, 2013).

Scholars consistently highlight the significant impact of oil revenue on government expenditure, emphasizing the dependency of many oil-producing countries, including Nigeria, on oil revenues. The literature underscores the role of institutional quality as a crucial factor influencing government spending patterns. High-quality institutions are essential for effectively managing oil revenue and channeling it

towards productive investments that promote sustainable economic growth. Strong institutions can mitigate the negative effects of resource abundance by promoting transparency, accountability, and efficient resource allocation. Conversely, oil revenue can influence institutional quality, as governments may become less accountable and more prone to authoritarianism in resource-rich environments. Rent-seeking behaviour and corruption can weaken institutions over time, further hindering economic growth prospects.

Research suggests that the management of oil revenue plays a pivotal role in shaping fiscal policy and macroeconomic stability. Governments in oil-dependent economies often face challenges in managing windfall revenues effectively. Failure to implement prudent fiscal policies can result in pro-cyclical expenditure patterns, exacerbating economic instability during periods of oil price volatility. While institutional quality which includes the laws, quality of government regulation, individuals right and absent of violence, has been perceived as a panacea to sustainable development (Rodrik, 2004).

Nigeria heavily relies on oil revenue as a primary source of income, being one of the largest oil producers in Africa, petroleum exports constitute a significant portion of the country's revenue, accounting for a substantial percentage of its GDP. However, Nigeria's economy faces challenges due to the volatile nature of oil prices in the global market. Fluctuations in oil prices directly impact government revenue, leading to budgetary constraints and economic instability. Over-reliance on oil revenue makes the economy vulnerable to external shocks and price fluctuations, which can affect the level of economic growth of the country.

Notwithstanding, Uremadu *et al.* (2020) reported that, Nigeria's oil and gas industry is estimated to have contributed 95% of foreign exchange earnings and roughly 65% of government budgetary income in 2019. In a similar vein, Nweze and Edame (2016) contended that in 2016 oil and gas contributed roughly 90% of foreign exchange earnings, 80% of government revenue, and supported Nigeria's GDP growth rate.

More importantly, the influx of oil revenue can lead to currency appreciation, making non-oil exports less competitive and hindering the development of other sectors. Moreover, the resource curse phenomenon highlights the potential negative consequences of excessive reliance on oil revenues, such as corruption, rent-seeking behaviour, and economic distortions. Institutional quality, including governance structures, rule of law, property rights protection, and regulatory frameworks, could play a crucial role in shaping how oil revenue is managed and utilized within a country. Weak institutions can exacerbate the negative effects of oil revenue, leading to rent-seeking

behaviour, corruption, and mismanagement of resources. This can undermine economic growth and development efforts.

Over the years, there has been an increase in revenue generated by the Nigerian government from the oil sector, yet, the country is still far behind in actualizing substantive economic growth. Since oil revenue constitutes a significant portion of the Nigerian government's income, and highly vulnerable to fluctuations in oil prices, investigating the relationship between oil revenue and economic growth helps assess the resilience of the economy to external shocks and the effectiveness of policies aimed at mitigating these fluctuations. In addition, the goal of this study is to offer new perspectives on resource allocation and policy-maker's tactics for encouraging structural change and diversification away from oil dependency.

Nigeria's economy continues to grow more slowly than anticipated, with weak economic diversification, depressing social welfare statistics, severe environmental effects, high rates of poverty and inequality, widespread corruption, frequent conflicts, and remarkably sub-par administration. The purpose of the study is to assess how Nigeria's economic growth was impacted between 1993 and 2022 by oil revenue and the caliber of its institutions. The other sections of the study are arranged as follows: section 2 gives the literature review; section 3 presents the methodology; section 4 presents the results and discussion; and section 5 concludes and makes policy suggestions.

2.0 Literature Review

2.1 Theoretical Review

Several economic theories help explain the relationship among oil revenue, institutional quality and economic growth – resource course theory, Dutch disease theory, export-led growth theory, revenue volatility hypothesis, institutional theory, etc. This study is anchored on the resource dependency theory and institutional theory (1835-1917).

Richard Auty first proposed the idea of the "resource curse" in 1993. The paradox that resource-rich countries tend to expand more slowly than resource-poor ones is known as the "resource curse theory." It was also acknowledged that many resource-rich states were disappointed by the absurdity of abundance and that their governments were unable to adequately address the requirements of the general public welfare. Although the discovery of natural resources should lead to better development results, resource-rich nations typically have greater rates of conflict and authoritarianism, as well as lower rates of economic growth and stability, when compared to their non-resource-rich neighbours. Ross (2015) examines the resource curse theory by analysing the impact of oil and mineral wealth on economic development and governance in various countries.

He discusses how resource abundance, including oil revenue, can lead to adverse economic outcomes such as slower growth, increased corruption, and political instability.

On the other hand, the institutional theory emphasizes the importance of institutions in shaping the impact of both oil and non-oil revenues on economic growth. Strong institutions, including transparent governance structures, effective regulatory frameworks, and rule of law, are crucial for ensuring that revenues are managed efficiently, corruption is minimized, and resources are allocated effectively to promote sustainable economic growth. Researchers like Rafiu (2021), Besley and Persson (2011) among others, have explored the institutional theory while investigating the role of institutions in shaping economic development outcomes across countries.

In summary, these theories provide insights into the complex relationship between oil revenue, institutional quality and economic growth, highlighting the importance of diversification, prudent fiscal management, institutional quality, and macroeconomic stability in achieving sustainable development outcomes.

2.2 Empirical Review

A few studies have examined the connection between economic growth and institutional quality related to oil revenue. Important insights into the intricate link between resource richness, institutional quality, and growth outcomes can be gained from empirical literature on the effects of oil revenue and institutional quality on economic growth.

Many studies have found mixed evidence regarding the impact of oil revenue on economic growth (Samuel & Adedigba, 2019). While some research suggests that oil-rich countries experience slower economic growth due to the resource curse phenomenon (Ross, 2015), others have found that oil revenue can have positive effects on growth under certain conditions, such as good governance and institutional quality (Boschini *et al.*, 2013, Al-Rasasi *et al.*, 2019). The empirical evidence also indicates that the volatility of oil revenue plays a crucial role in shaping its impact on economic growth. Countries with higher oil revenue volatility tend to experience more significant fluctuations in economic growth, highlighting the importance of stabilizing mechanisms and prudent fiscal management.

Moreso, studies examining the impact of non-oil revenue on economic growth have highlighted its positive association with growth. Non-oil revenue, including taxes and non-resource exports, can contribute to economic diversification, increase fiscal stability, and promote sustainable growth (Apergis & Payne, 2010). Empirical research has shown that countries with diversified revenue sources tend to exhibit higher levels

of economic resilience and growth compared to those heavily reliant on oil revenue alone (Raifu, 2021).

Whereas, institutional quality can play a critical role in shaping the impact of both oil and non-oil revenue on economic growth. Studies have found that countries with stronger institutions, including good governance, rule of law, and regulatory quality, are better able to harness the benefits of resource wealth and mitigate the adverse effects of the resource curse (Besley & Persson, 2011). Moreover, empirical evidence suggests that institutional quality can moderate the relationship between revenue sources and growth outcomes. Countries with better institutional quality tend to experience more positive growth effects from both oil and non-oil revenue, highlighting the importance of institutional reforms in promoting sustainable development (Rodrik et al., 2004).

In a recent study, Raifu (2023) looked at how oil revenue affected Nigeria's economic growth distribution across several quantiles from 1981 to 2018. He employed ordinary least square (OLS) as the study estimator. The outcome demonstrates that oil revenue significantly and favourably influences economic growth. The regression's outcome, however, suggests that the beneficial impact of oil revenue on economic growth differs between quantiles.

Once more, Appah (2022) looked into the connections between Nigeria's economic growth and oil revenue between 1990 and 2019. The study found a strong correlation between Nigeria's economic growth and oil revenue, and it suggested that the government use the oil fund wisely and effectively for strategic development initiatives to lower the country's poverty rate and spur economic expansion.

In the same vein, Raifu (2021) used the ARDL estimate technique to examine the relationship between oil revenue and economic growth in Nigeria from 1984 to 2018. The results show that oil revenue is essential to economic growth in both the short and long terms, regardless of the factors chosen to measure economic growth. This illustrates how effective oil revenue is at fostering economic expansion. They advise the government to enhance the nation's institutional framework. The moderating effect of institutional characteristics in the relationship between oil revenue and economic growth in Nigeria has to be examined further.

Similarly, Amade *et al.* (2021) examined the impact of oil revenue on economic growth in Nigeria over the period of 1981 to 2019. The findings shows that oil revenue impacted positively and significantly on economic growth in Nigeria. The paper recommended strongly that government should diversify the economy from oil dependent economy to agriculture and manufacturing driven economy, this will provide

alternative source of revenue to the government for adequate funding of annual national budget. This study neglects the role of institutional variables on economic growth.

A study by Akinleye *et al.* (2021) examined Nigeria's economic growth and oil earnings from 1981 to 2018. Utilizing the ARDL model, their findings demonstrated a direct correlation between Nigeria's economic growth in the preceding year and oil revenue; additionally, an inverse relationship was found between the country's economic growth in the short and long terms and the petroleum profit tax, inflation rate, and exchange rate. This suggests that the lag value of economic growth influences it in addition to other macroeconomic factors. Because of this, it is necessary to include other developmental factors while elucidating the connection between revenue and economic growth in Nigeria.

Conversely, the relationship between Nigeria's economic growth and oil revenue has been the subject of conflicting research. For instance, Omodero (2021) looked at the topic of social development, which has garnered attention on a global scale, particularly in nations with abundant resources but little thought given to social well-being. The OLS method was used in the study, which covered the years 2003 to 2019. It was discovered that Nigeria's social development is not much impacted by crude oil earnings.

On the other hand, Ilori and Akinwunmi (2020) examined the impact of both oil and non-oil revenue on Nigeria's economic growth between 1989 and 2018. Their findings demonstrate how real gross domestic products in Nigeria are adversely impacted by oil and non-oil earnings. Nonetheless, the real gross domestic products of Nigeria are positively impacted by the exchange rate. The study comes to the conclusion that a number of factors, including the ongoing drop in crude oil prices globally, opposition from insurgents in Nigeria's oil-producing region, extravagant spending by the Nigerian government, and the global COVID-19 health pandemic, are hindering Nigeria's economic development.

In summary, research on the impact of oil revenue and institutional quality on economic growth in Nigeria has been extensive due to the country's heavy reliance on oil exports and its diverse economic structure. These studies contribute to our understanding of the complex relationship between oil revenue, non-oil revenue, and economic growth in Nigeria, highlighting the challenges and opportunities associated with resource dependence and the importance of diversification and institutional reforms for sustainable development. The present study will set a new pace by examining the role of the interaction of institutional quality composite index on the oil revenue – economic growth relationship.

3.0 Methodology

3.1 Theoretical framework

The resource curse and institutional theory provide valuable frameworks for understanding the impact of oil revenue on economic growth in any country, particularly in Nigeria. The resource curse and institutional theory provide complementary perspectives on the impact of oil revenue on economic growth. The resource curse theory highlights the potential negative consequences of oil wealth, such as rent-seeking behaviour and Dutch Disease, while the institutional theory emphasizes the importance of governance, institutions, and policy frameworks in moderating these effects and harnessing oil revenue for sustainable development. In the context of Nigeria and other oil-producing countries, addressing institutional weaknesses and promoting good governance are essential for maximizing the positive impact of oil revenue on economic growth.

3.2 Model Specification

To specify a model that incorporates both the resource curse and institutional theory in examining the impact of oil revenue and non-oil revenue on economic growth, we can construct a regression model that includes relevant variables representing key concepts from each theory. The dependent variable is economic growth, while the independent variables are oil revenue and institutional quality. Other control variables that can influence the relationship, but not investigated by previous researchers are included in this study, which includes fiscal policy rate and access to clean fuels and technologies for cooking.

By specifying a model that incorporates both the resource curse and institutional theory, we are able to empirically analyse the joint impact of oil revenue and institutional quality on economic growth, providing insights into the complex relationship between natural resource wealth, governance, and economic development.

Following the work of previous researchers (Boschini et al., 2013, Appah, 2022), the model can be specified thus:

$$EG = F\ (OR,\ IQ,\ FPR,\ AE) \tag{1}$$

Where EG is economic growth, OR is oil revenue, IQ is institutional quality, FPR is fiscal policy rating and AE is access to clean fuel for cooking. The econometrics model can be presented as follows:

$$EG_t = \alpha_0 + \alpha_1 OR_t + \alpha_2 IQ_t + \alpha_3 FPR_t + \alpha_4 AE_t + \varepsilon_t \tag{2}$$

α_0 is constant; α_1, α_2, α_3 and α_4 are the coefficients of long run elasticities associated with the explanatory variables; ε is the error term; t is the period spanning 30 years (1993 – 2022). It is expected that the elasticities of the explanatory variables are to be positively related to economic growth in Nigeria. Therefore, the signs expected in the coefficient of the co-integration are as follows; α_1, α_2, α_3, $\alpha_4 > 0$. However, inefficiencies in the utilization of the explanatory variables including weak institutional quality will result in negative elasticities, that is, α_1, α_2, α_3, $\alpha_4 < 0$.

The study further estimates the impact of the interaction between institutional quality and oil revenue on economic growth. This interaction will reveal if effective institutions in the management of oil revenue could translate to economic growth in the country. The model to investigate this interaction is specified thus:

$$EG_t = \alpha_0 + \alpha_1 OR_t + \alpha_2 IQ_t + \alpha_3 FPR_t + \alpha_4 AE_t + \alpha_5 OR*IQ_t + \varepsilon_t \quad (3)$$

Annual time series data covering the period of 1993 – 2022 is sourced from the Central Bank of Nigeria (CBN) annual statistical bulletin and World Bank, World Development indicators (WDI) website. From the model specified, EG represents economic growth which is proxied by gross domestic product per capita (current $) (Nyeadi, 2023) to reflect real growth in the economy, also as dependent variable of the model. OR is oil revenue which is the total revenue generated from oil income. IQ is institutional quality which represents the quality of political institution in the economy, measured using four dimensions of political stability and absence of violence/terrorism, regulatory quality, rule of law, and control of corruption. A composite index of these dimensions was estimated using principal component analysis. FPR denotes fiscal policy rating which evaluates the influence of fiscal policy on growth as well as the short- and medium-term sustainability of the policy (taking into consideration the sustainability of the public debt, monetary and exchange rate policy, and policy). AE, or access to clean cooking fuels and technologies, is defined as the percentage of the population that cooks primarily with clean fuels and technologies. This variable is included in the model to find out if the usage of clean energy in cooking could impact economic growth (Nyeadi, 2023) in Nigeria. Perhaps, improvement in energy access can enhance economic growth (Suroop & Raghoo, 2018).

Table 1: *Variables description, sources and expected signs*

Variable Name	Notation	Estimations	Data Source	Expected Sign
Economic Growth	EG	GDP per capita (current US$)	WDI	
Oil Revenue	OREV	Total revenue generated from oil income (₦)	CBN	+
Institutional Quality	IQ	i.Political Stability and Absence of Violence/Terrorism ii.Regulatory Quality iii.Rule of Law iv.Control of Corruption	WDI	+

Fiscal Policy Rate	FPR	CPIA fiscal policy rating (1=low to 6=high)	WDI	+
Access to Clean Energy	AE	Access to clean fuels and technologies for cooking (% of population)	WDI	+

CBN; Central Bank of Nigeria, WDI; World development indicators.
Source: Authors' compilation, 2024**.**

The ARDL estimation technique is employed in our analysis. The ARDL method contains the lagged values of the dependent variable, the current and lagged values of regressors as explanatory variables. The condition for the use of ARDL model is by ensuring none of the variable is stationary at second difference. That is, it can be used when the variables in the model are integrated at I(0) and I(1) or when all are integrated at I(1). The stationary test is conducted using the Augmented Dickey-Fuller (ADF) test. The ARDL technique is efficient in providing unbiased long-run estimates (Tadesse & Abafia, 2019).

The generalized ARDL (a, b) model is specified as:

$$y_t = \gamma_{0i} + \sum_{i=1}^{a} \delta_i\, y_{t-1} + \sum_{i=0}^{b} \beta_i\, x_{t-i} + \varepsilon_{it} \qquad (4)$$

where y_t is a vector and the variables in X_t are the regressors which are allowed to be purely I(0) and I(1) or co-integrated; β and δ are coefficients; γ is the intercept which is constant; i is the numbers of variable in the model = 1,...., k; a and b are the optimal lag orders of the dependent variable and independent variables respectively; ε_{it} is the vector of the error terms. The simple explanation of the model is that the dependent variable is a function of its lagged values, the current and lagged values of other exogenous variables in the model. On this bases, the study constructed a model of ARDL co-integration as follows:

$$\Delta EG_t = \gamma_0 + \beta_1 EG_{t-1} + \beta_2 OR_{t-1} + \beta_3 IQ_{t-1} + B_4 FPR_{t-1} + \beta_5 AE_{t-1} +$$
$$\sum_{i=1}^{a} \delta_1 \Delta EG_{t-i} + \sum_{i=1}^{b} \delta_2 \Delta OR_{t-i} + \sum_{i=1}^{c} \delta_3 \Delta IQ_{t-i} + \sum_{i=1}^{d} \delta_4 \Delta FD_{t-i} +$$
$$\sum_{i=1}^{e} \delta_5 \Delta AE_{t-i} + \varepsilon_t \qquad (5)$$

From equation (5), Δ represents the first difference operator; *a, b, c, d* and *e* are the lag length with their respective variables; and ε_t is the error term, assumed to be have no serial correlation. Moreover, β₁, β₂, β₃, β₄ and β₅ indicates the coefficients of long-run elasticities associated with the variables while δ₁, δ₂, δ₃, δ₄ and δ₅ represents the coefficients of short-run elasticities associated with the variables.

With the discovery of long-run co-integrating relationship among the variables, the study estimates the error correction model (ECM) models. The short-run ECM can therefore be specified as follows:

$$\Delta EG_t = \gamma_0 + \Sigma_{i=1}^{a} \delta_1 \Delta EG_{t-i} + \Sigma_{i=1}^{b} \delta_2 \Delta OR_{t-i} + \Sigma_{i=1}^{c} \delta_3 \Delta IQ_{t-i} +$$
$$\Sigma_{i=1}^{d} \delta_4 \Delta FPR_{t-i} + \Sigma_{i=1}^{e} \delta_5 \Delta AE_{t-i} + \gamma ECM_{t-1} + \mu_t \quad (6)$$

where, ECM_{t-i} is the error correction term which captures the degree of adjustment from the short run to the long-run when there exists any disequilibrium in the model. In addition, the value of the ECM is expected to be negative, less than one and statistically significant.

4.1 Results and Discussion

The summary of variables used in this study are presented in table 2 below, which show the mean, maximum, minimum, standard deviation and number of observations respectively. The variables of economic growth and oil revenue are in absolute values while the remaining variables are in percentages (AE), index (IQ) and ratings (FPR). Economic growth and oil revenue are thereby converted into logarithm form in order to have an unbiased result.

Table 2: *Summary Statistics*

Variable	lnEG	lnOR	IQ	FPR	AE
Mean	7.333204	7.711796	2.00E-08	3.916667	4.081667
Maximum	8.071204	9.091441	2.686219	4.500000	16.80000
Minimum	6.202797	5.076376	-1.254388	3.000000	0.600000
Std. Dev.	0.559203	1.207360	1.000002	0.542716	5.103421
Observations	0.152054	0.086951	0.066907	0.291706	0.004488

Source: Authors' computation using E-views 12, 2024

Table 3: *Correlation matrix*

	lnEG	lnOR	IQ	FPR	AE
lnEG	1				
lnOR	0.605702	1			
IQ	-0.496353	-0.621300	1		
FPR	-0.141776	-0.254167	0.277935	1	
AE	0.452650	0.403718	-0.369926	-0.618400	1

Source: Authors' computation using E-views 12, 2024

The correlation matrix in table 3 shows the correlation among the variables, with possible values from -1 to +1. The correlation among the variables was estimated to be sure there exist no high correlation among the variables, and prevent multicollinearity. As indicated in the result, no variable is up to 70% correlation with other variables in the model.

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Table 4: *Stationary test result*

Level				First Difference			
Variable	**ADF Stat**	**5% C.V**	**Prob.**	**ADF Stat**	**5% C.V**	**Prob.**	**Rank**
lnEG	-2.078423	-2.967767	0.2542	-4.699564	-2.971853	0.0008	I(1)
lnOR	-2.306877	-3.679322	0.1766	-4.895025	-2.971853	0.0005	I(1)
IQ	-1.987627	-2.967767	0.2903	-4.906349	-2.976263	0.0005	I(1)
FPR	-1.888741	-2.967767	0.3327	-4.539138	-2.971853	0.0012	I(1)
AE	-5.454672	-2.981038	0.0001	-	-	-	I(0)

Source: Authors' computation using E-views 12, 2024

Table 4 shows the ADF stationary test. The result revealed that access to clean energy was found to be stationary at level, while economic growth, oil revenue, fiscal policy rating and institutional quality were all stationary at first difference. The assertion is bolstered by the likelihood that the coefficients pertaining to economic growth, oil revenue, institutional quality, and fiscal policy rate are less than <0.05 at the first difference, and less than <0.05 at the level of access to clean energy. The Autoregressive Distribution lag (ARDL) is a suitable tool for estimating the co-integrating relationship between variables in the model because of the mix order of integration.

Table 5: *ARDL co-integration test*

Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	5.306033	10%	2.45	3.52
K	4	5%	2.86	4.01
		1%	3.74	5.06

Source: Authors' computation E-view 12, 2024

There is a long-term co-integrating relationship between the dependent variable and the explanatory variables in the model, as shown by the result in Table 5. This is due to the fact that at all critical values, the F-statistic of 5.306033 is more than the upper bound. In light of this, the autoregressive distribution lag (ARDL) estimation technique was used to estimate the long-run relationship, and the error correction model (ECM) was estimated to compute the short-run relationship. The outcomes are shown in Table 6 below.

Table 6: *Estimated long and short run coefficients*

	Long-run analysis			Short-run analysis		
Variable	**Coefficient**	**t-Statistic**	**Prob.**	**Coefficient**	**t-Statistic**	**Prob.**
lnOR	-0.383825	-2.665839	0.0169	0.112963	1.117733	0.0230

IQ	0.259810	3.365634	0.0039	0.127902	1.927383	0.0719
FPR	-0.061630	-0.621693	0.5429	0.486514	6.210949	0.0000
AE	0.291311	0.551561	0.0354	0.172661	4.096429	0.0008
ECM(-1)	-	-	-	-0.720840	-5.758707	0.0000

Source: Authors' computation using E-view 12, 2024

Table 6 depicts the coefficients of the long-run estimate among the variables. The result indicates that in the long run, oil revenue has a negative and statistically significant impact on economic growth, while institutional quality and access to clean energy reported positive and significant association with economic growth. Whereas, fiscal policy rating reported negative but insignificant association with economic growth. The result reveal that, all things being equal, a one percent increase in oil revenue is associated to approximately 0.3838 decrease in economic growth in Nigeria, and vice versa. This can be as a result of over-reliance on the oil sector at the expense of other sectors in the economy. On the other hand, a one percent improvement in institutional quality and access to energy is associated with approximately 0.2598 and 0.2913 economic progress. This result supports the notation that a strengthened quality of institution, comprising of the existence of rule of law, improved regulatory quality and accountability in government is instrumental to economic growth in Nigeria. The findings also support the assertion that access to clean fuels and technologies could enhance economic growth in Nigeria. Whereas, fiscal policy rating presented no significant linkage with economic progress in Nigeria in the long-run period. This is in line with findings of previous studies (Amade et al., 2021, Akinyele et al., 2021).

The short-run result is presented alongside the long-run result in Table 6 above. From the result all variables except institutional quality, exhibits a significant and positive association with economic growth in Nigeria. The result revealed that while one percent increase in oil revenue amount to 0.1130 increase in economic growth, a one percent increase in fiscal policy rating and access to clean energy reported 0.4865 and 0.1727 increase in economic growth, respectively in the short run. Perhaps, fiscal policy rating only has a short-run impact on economic growth but insufficient to trigger economic growth in the long-run in Nigeria, while the economic benefits of oil revenue is only enjoyed in the short-run but retards economic growth in the long run.

In order to estimate the impact of the interaction between institutional quality and oil revenue on economic growth, the second model was estimated and result of the co-integrating relationship is presented in table 7 below.

Table 7: *ARDL co-integration test*

Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	4.113676	10%	2.06	3
K	5	5%	2.47	3.29
		1%	3.15	4.13

Source: Authors' computation E-view 12, 2024

The outcome presented in Table 7 suggests that there is a long-term equilibrium link between the model's variables. This is because the F-statistic of 4.113676, is higher than the upper bound at both 10% and 5% critical values. With this outcome, the long-run relationship was estimated using the autoregressive distribution lag (ARDL) estimation technique. The results are as presented in Table 8 below.

Table 8: *Estimated long and short run coefficients*

Variable	Long-run analysis			Short-run analysis		
	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
lnOR	-0.443089	-0.944081	0.3637	0.014864	0.252423	0.0408
IQ	0.260290	2.761875	0.0172	0.367251	8.422623	0.0000
FPR	-0.448360	-1.166439	0.2661	0.156352	2.930309	0.0126
AE	0.006684	0.240981	0.0481	0.100679	4.198444	0.0012
lnOR*IQ	0.515956	4.473899	0.0008	0.118137	4.556699	0.0007
ECM(-1)	-	-	-	-0.865141	-6.572184	0.0000

Source: Authors' computation using E-view 12, 2024

The result from the long-run and short-run analysis reflects that the interaction of oil revenue and institutional quality has positive and statistically significant short-run and long-run relationship with economic growth in Nigeria, with larger impact in the long-run (0.515956) than in the short-run period (0.118137). However, the association of the explanatory variables vary in direction and coefficient. While oil revenue still reports positive impact on economic growth in the short-run, the relationship is now insignificant in the long-run. Moreso, institutional quality now reported positive and significant association with economic growth in both short-run and long-run period. Whereas, access to clean energy still report positive and significant association in both long and short-run period, while fiscal policy rating also maintains the initial report of only short-run positive association with economic growth. This implies that oil revenue only has a direct beneficial impact on economic growth in the short run, beyond which only its interaction with institutional quality can translate to economic progress in Nigeria in the long-run.

4.2   Reliability and Stability Test Results

We estimated both the short- and long-term relationships between the independent factors and the dependent variable before performing diagnostic tests to ensure the

stability and dependability of our findings. By performing tests for serial correlation, normalcy, and heteroskedasticity, the model's dependability was evaluated. Table 9 displays the results of the diagnostic test, which indicates that the model passes all three diagnostic checks with a p-value greater than 0.05. The cumulative sum of squared recursive residuals and cumulative total of recursive residuals, which are shown in Figures 1 and 2, were used to test the model's stability. The statistics fall inside the crucial boundaries at the 5% level of significance, as shown in Figs. 1 and 2, which demonstrates that the model is stable and consistent
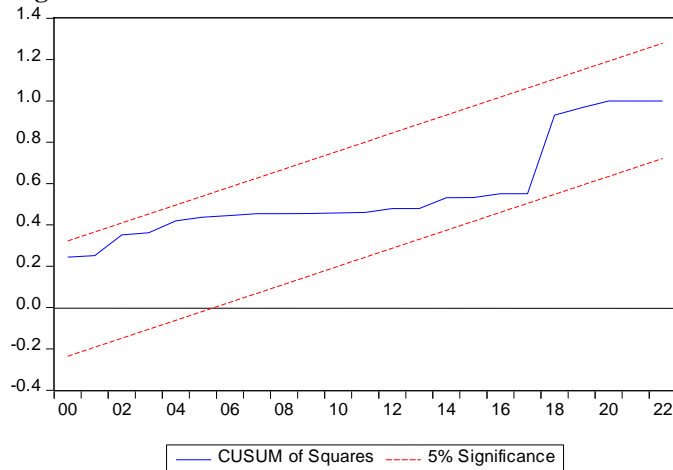
Table 9: *Diagnostic test results*

	Model 1	Model 2
Normality	0.122713 (0.94019)	0.782416 (0.676240)
Serial correlation	0.295322 (0.7929)	2.666528 (0.1180)
Heteroscedasticity	0.667457 (0.7573)	1.841147 (0.1460)

P-values in parenthesis
Source: Authors' computation using E-view 12, 2024
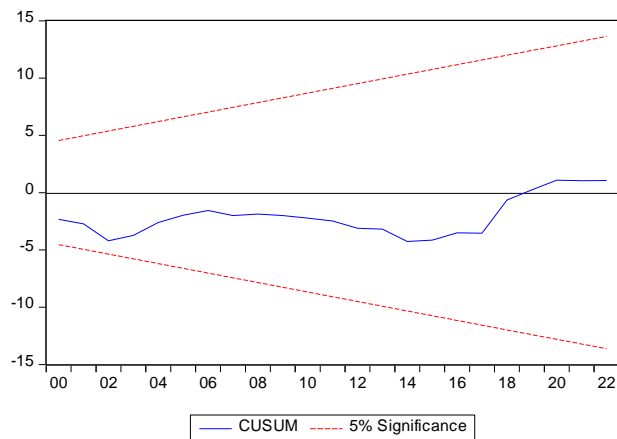
Fig 1: Plot of cumulative sum of recursive residuals

Fig 2: *Plot of cumulative sum of squares of the recursive residuals*

5.1 Conclusions and Policy Recommendations

The relationship between oil revenue, institutional quality, and economic growth is context-specific and varies across countries. Some resource-rich countries with strong institutions have effectively managed their oil wealth to achieve sustained growth, while others have struggled due to institutional weaknesses. This study conducted an assessment on the impact of oil revenue and institutional quality on economic growth in Nigeria over the period of 1993 – 2022. The ARDL estimation technique was employed after data satisfied a mixed stationary level at levels and first differencing.

Findings from the study revealed that oil revenue has a direct positive impact on economic growth in the short-run but negative impact in the long-run. It was also discovered that the interaction between oil revenue and institutional quality is instrumental to both short-run and long-run economic development in Nigeria. Moreso, institutional quality and access to clean fuels and technologies for cooking reported both short-run and long-run association with economic growth in Nigeria. Whereas, fiscal policy rating has only a short run positive impact on economic growth with insignificant long-run impact.

In conclusion, the relationship between oil revenue, institutional quality, and economic growth is multifaceted and contingent on a range of factors. Strong institutions are essential for effectively managing oil wealth and promoting sustainable economic development in Nigeria. However, achieving this requires concerted efforts to address governance challenges, promote transparency, and diversify the economy away from oil dependence.

There is a need for the government to implement policies that promote economic diversification away from oil dependency. This includes investing in sectors such as agriculture, manufacturing, and services to create employment opportunities, increase productivity, and reduce reliance on oil revenue. The government should also provide incentives, tax breaks, and infrastructure support for non-oil sectors to encourage their growth and development.

We also call for the need to prioritise governance reforms aimed at improving institutional quality, transparency, and accountability. Strengthen anti-corruption measures, streamline bureaucratic processes, and promote the rule of law to enhance investor confidence and foster a conducive business environment. Whereas, the enactment of fiscal responsibility laws and frameworks to ensure prudent management of oil revenue, and. implementing transparent budgeting processes, sovereign wealth funds, and fiscal rules could safeguard oil wealth for future generations. Also, investment in capacity building initiatives for public officials, judiciary, and law

enforcement agencies could enhance their effectiveness in enforcing regulations and combating corruption.

In addition, expanding access to modern energy services, particularly in rural and under-served areas, through the deployment of renewable energy technologies, mini-grids, and off-grid solutions, could enhance productivity and economic growth in the country. And noting that investment in renewable energy sources, clean technologies, and green infrastructure would promote environmental sustainability and resilience to climate change.

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