INTERNATIONAL JOURNAL OF RESEARCH AND INNOVATION IN SOCIAL SCIENCE (IJRISS)
ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue XII December 2023

Petroleum Industry and The Development of The Nigerian Economy: Is There Resource Curse?

Clement Korgbeelo[1], Leelee N. Deekor[2]

Department of Economics, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt.

DOI: https://dx.doi.org/10.47772/IJRISS.2023.7012012

Received: 31 October 2023; Accepted: 07 November 2023; Published: 29 December 2023

ABSTRACT

Despite the fact that Nigeria is endowed with enormous petroleum resources, the performance of the economy, in terms of core development indices, has not been satisfactory. Besides, there is no consensus in the findings of empirical analysis on the impact of the petroleum industry on the Nigerian economy. This study therefore examined the impact of the petroleum industry on economic development in Nigeria. Specifically, the study investigated the impact of oil revenue, crude oil price, crude oil output, gross fixed capital formation, and exchange rate on economic development (proxied by the human development index) in Nigeria. Annual time series data for the period 1990 to 2022 were used for the study. A variety of analytical techniques including Augmented Dickey-Fuller (ADF) unit root test, Johansen cointegration test, error correction model and Granger causality test were used to analyze the data. The Johansen cointegration test established long-run relationships among the variables of the study. The estimated regression result revealed that oil revenue, crude oil price and exchange rate have significant negative impact on economic development in Nigeria. On the other hand, crude oil output has insignificant positive impact on economic development while gross fixed capital formation has significant positive impact on economic development in Nigeria. The study therefore concludes that the phenomenon of resource curse exists with regard to the petroleum industry in Nigeria. Among other things, it is recommended that there is the urgent need to diversify the economy away from its current dangerous dependence on petroleum resources.

Keywords: Petroleum, Economic, Development, Resource, Curse

INTRODUCTION

During colonial rule and up to the first decade after independence, agriculture was the mainstay of the Nigerian economy. The agricultural sector then contributed about 95% of the country's total foreign exchange earnings. The sector also generated over 60 per-cent of the country's employment capacity, and approximately 56% of gross domestic product (Akpan, 2012; Sertoglu et al, 2017). However, with the discovery of petroleum in 1956, and the subsequent oil boom of the 1970s, the attention of the government was shifted away from the agricultural sector since the revenue and expenditure needs of the government were met with the proceeds from crude oil exports. Hence, the once vibrant agricultural sector was neglected as a result of the crude oil syndrome (Anyanwu et al, 1997).

The oil boom which Nigeria experienced in the 1970s helped the country to recover rapidly from the civil war and at the same time gave enormous support to the government programme of rapid industrialisation. Consequently, many industrial enterprises were set up and the economy recorded a high growth rate of about 8% per year which made Nigeria, by 1980, the largest economy in Africa (Yakub, 2008). However, the growth was not sustained as the new oil wealth was not able to significantly reduce the widespread poverty and the collapse of basic infrastructure and social services in the country. Hence, when in 1981 the price of crude oil fell due to the oil glut, and corruption and mismanagement still prevailed at all levels, the economy became severely depressed (Yakub, 2008; Adeniyi, 2009).

Nigeria is the largest crude oil producer in Africa, and the fifth largest oil exporter in the world. The country produces about 2.4 million barrels of crude oil per day, and it holds the 10th largest proven oil reserves in the world, with the second largest reserves in Africa after Libya (Organization of Petroleum Exporting Countries, 2015). But according to the United Nations' Human Development Index (HDI) reports, Nigeria is among some of the poorest nations in the world. Thus, Nigeria is depicted as a good example of the resource curse phenomenon- a paradox of suffering in the midst of plenty (Elwerfelli & Benhin, 2018).

The foregoing discussion shows that, due to its oil dependent nature, the performance of the Nigerian economy has not been satisfactory. In this context, successive governments have introduced several policies and programmes. These policies and programmes were meant to fast-track economic growth and development by altering the structure of production and consumption pattern, diversify the country's economic base, generate employment and above all, create a globally competitive and stable economy (Anyanwu et al, 1997; Eneh, 2011; Amani & Hassan, 2021; Effiong, 2022). However, due to several impediments including political instability, corruption, and lack of faithful implementation, the various policies and programmes were not able to deliver the developmental objectives for which they were introduced (Wilson, 2002; Effoduh, 2015; Effiong, 2022). Today, the country is facing severe developmental challenges, and it is generally being asserted that there is an urgent need to reduce the dependence and perceived vulnerability of the economy to the oil industry. This study therefore is an attempt to re-examine the impact of the petroleum industry on the development of the Nigerian economy.

LITERATURE REVIEW AND CONCEPTUAL CLARIFICATIONS

2.1 Conceptual Clarifications

2.1.1 Petroleum Industry

The petroleum industry refers to the sector of the economy that is concerned with exploration, production, distribution, and exportation of crude oil and its related products. For the purpose of this study, the impact of the oil industry on the economy is captured in terms of oil revenue, crude oil output, and crude oil prices.

2.1.2 Economic Development

Akpakpan (1999) defines economic development as "a process of improvement in the various aspects of the economy and the society it supports." Similarly, Todaro & Smith (2011) defines economic development as "a process involving major changes in the social structure, popular attitudes and national institutions as well as the acceleration of economic growth, reduction of inequality, and the eradication of poverty."

Economic development is a multifaceted concept which is measured in terms of several indicators. However, for the purpose of this study, economic development is measured in terms of the human development index. The Human Development Index (HDI) is a composite statistical measure developed and compiled by the United Nations since 1990 to assess various countries' achievements in the levels of social and economic development. It is composed of four main areas of interest namely; mean years of schooling, expected years of schooling, life expectancy at birth, and gross national income per capita.

2.2 Theoretical Literature Review

This study is generally based on the resources curse theory. The term "resource curse", also known as "the paradox of plenty", refers to the inability of many resource-rich countries to benefit fully from their natural resource wealth, and for the governments of such countries to adequately attend to the welfare needs of their citizens compared to their non-resource-rich counterparts. The central theme of the resource curse theory is that minerals and fuel abundance in less developed countries tend to generate undesireable developmental outcomes such as poor macroeconomic performance, dwindling economic growth, high levels of corruption, ineffective governance and greater political violence (Brunnschweiler, 2008).

There are basically two variants of the theory of resource curse. These are the Dutch Disease theory and Rentier-State theory. The term "Dutch Disease" was coined by the Economist Magazine in 1977 when it analyzed a crisis that took place in the Netherlands after a large deposit of natural gas was discovered in the North Sea in 1959. The new found wealth made the value of the Dutch guilder to appreciate sharply, making Dutch exports of all non-oil products less competitive in the international market. Unemployment increased from 1.1 percent to 5.1 percent, while capital investment declined (Bresser-Pereira, 2008).

Dutch disease is an economic term for the negative consequences that can emanate from an increase in the value of a country's currency. It is mainly associated with the new discovery or exploitation of a valuable natural resource and the unexpected consequences that such a discovery can have on the overall economy of a country (Abdlaziz et al, 2018). It is a shorthand form of describing the paradox which takes place when the discovery and exploitation of a natural resource (for e.g., petroleum) harm a nations' economy. Dutch disease reduces the price competitiveness of a country's non-oil exports and increases imports in the long-run. Dutch disease can contribute to unemployment as manufacturing jobs move to lower-cost countries while non-resource-based industries suffer due to the increased wealth generated by resource-based industries. The idea of the simple Dutch disease model is that a permanent increase in the inflow of external funds results in a change in relative prices in favour of non-traded goods (services and construction) and against non-oil traded goods (manufacturing and agriculture) leading to the crowding out of non-oil tradeables by oil-tradeables. That is, an increase in the exchange rate leads to a fall in the competitiveness, and hence, production and employment of the traded-goods sector (Di John, 2009). The Dutch disease model therefore predicts that de-industrislization is an inevitable structural change that takes place as a result of resource boom (Neary & Van-Wijnberger, 1986).

The rentier-state models go beyond the economic models of the resource curse, such as Dutch disease models, by attempting to endogenize policy-formulation and institutional formation. Particularly, the rentier-state models attempt to explain why policy-makers in natural resource-rich countries create and maintain growth-restricting policies (Mahdavy, 1970; Karl, 1997; Auty, 2007). These models are part of a growing trend of reviving the "staples thesis"- the notion that natural factor endowments or technology shape the relations of production, or institutional evolution of a society (Engerman & Sokoloff, 1997).

In the rentier-state models, mineral abundance is assumed to generate growth-restricting state intervention and extraordinarily large-scale rent-seeking, where these rent-seeking contests are assumed to be largely detrimental in terms of the developmental outcomes they generate. Within the framework of the rentier-state theory, several propositions are developed. In the first place, the existence of a higher level of mineral rents increases rent-seeking and corruption relative to economies with lower mineral abundance. Secondly, increased rent-seeking and corruption generate lower growth rates. This is partly due to the fact that with corrupt transactions, the need to keep bribes secret lowers the security of property rights, which in turn, reduces investments in projects with long gestation period. Thirdly, mineral rents provide a sufficient fiscal base for the state which reduces the need to tax citizens. Consequently, there will be reduction in political bargaining between the state and interest groups, which makes governance more arbitrary, paternalistic and even predatory. Finally, lack of incentives to tax internally weakens the administration reach of the government, which ends up in lower levels of state authority, capacity and legitimacy to intervene in the economy (Di John, 2010). Therefore, the basic idea behind the rentier-state theory is that oil economies are prone to a higher level of rent-seeking and corruption than non-oil economies, and that mineral economies generate both higher rent-seeking costs and less developmental outcomes (Khan & Jomo, 2020).

2.3 Empirical Literature Review

Ebimobowei (2022) analyzed the relationship between oil revenue and economic growth in Nigeria for the period 1990 to 2019 and found that crude oil and gas exports have significant negative impact on real GDP; petroleum profit tax and oil royalties have significant positive impact on real GDP; while domestic crude oil sales and oil licencing fees have insignificant negative impact on real GDP. Oyalabu & Oyalabu (2023) established insignificant positive relationship between crude oil price and GDP in Nigeria for the period 1985 to 2019. Similarly, Sule-Iko & Nwoye (2023) found that oil prices have insignificant positive impact on GDP in Nigeria. Osamor et al (2023) established insignificant positive impact of petroleum profit tax revenue on real gross domestic product in Nigeria. Adamu & Usman (2022) from their study found that oil prices have positive impact on Nigeria's real GDP while oil production has negative impact on real GDP. Ishiro (2022) showed that crude oil production has significant negative impact on Nigeria's GDP growth rate. Ologunde et al (2020) carried out a panel data analysis on the impact of crude oil revenue on human development in a panel of selected oil-producing African countries. The findings showed that crude oil revenue has significant negative impact on human development index. Onoja & Ibrahim (2021) established insignificant positive impact of petroleum profit tax revenue on GDP in Nigeria. In a related study, Amade et al (2021) found that oil revenue has significant negative impact on GDP in Nigeria.

Yuzbashkandi & Sadi (2020) examined the impact of crude oil production on economic growth in a sample of 11 Organization of Petroleum Exporting Countries (OPEC) including Nigeria. The findings showed that petroleum production has significant positive impact on GDP. Akinleye et al (2021) showed that petroleum profit tax revenue has insignificant negative impact on real GDP in Nigeria while Udeh (2021) found that oil revenue has significant positive impact on GDP in Nigeria. Patrick (2020) studied the impact of oil revenue generated from contractual agreements on economic growth in Nigeria for the period 2000 to 2019. The study revealed that revenues from joint venture and service contracts have significant negative impact on GDP, while revenue from production sharing contracts has significant positive impact on GDP. Olojede & Micheal (2020) found significant negative impact of oil revenue on GDP in Nigeria. Similarly, Ogbeifun et al (2019) showed that oil revenue has significant negative impact on GDP in Nigeria while Igberaese (2013) also established significant negative impact of oil dependency on GDP growth in Nigeria.

From the empirical literature on the relationship between crude oil production and economic growth in Nigeria, it is observed that almost all the studies concentrated on the impact of crude oil production on economic growth measured in terms of either GDP or real GDP. To fill this gap, this study examined the impact of crude oil production on economic development in Nigeria. Economic development is measured in terms of human development index. It is also observed from the empirical literature that there is no consensus in the findings of previous studies on the topic in Nigeria. For instance, Udeh (2021), Amade et al (2021), Onoja & Ibrahim (2021), Ebimobowei (2022), Osamor et al (2023), etc. found that oil revenue has positive impact on GDP. On the other hand, Igberaese (2013), Ogbeifun et al (2019) , Olojede & Micheal (2020), Patrick (2020), Akinleye et al (2021), Ishiro (2022), etc established that oil revenue has negative impact on GDP in Nigeria. This study will therefore contribute to the literature by investigating the impact of the crude oil production on economic development in Nigeria.

METHODOLOGY

3.1 Description of Variables

Dependent Variable

The dependent variable for this study is economic development. It is measured in terms of the human development index which is defined as a composite statistical measure used to assess the achievement of various countries in their levels of social and economic development.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue XII December 2023

Explanatory Variables

1. **Oil Revenue**

This refers to the share of total federally collected revenue that comes from crude oil and gas exports and sales in Nigeria. It is composed of crude oil and gas exports, revenue from petroleum profit tax and royalties, domestic crude oil and gas sales, etc.

2. Oil Price

This refers to the average annual price of a barrel of crude oil in the international oil market.

3. Crude oil output

This refers to the total quantity of crude oil produced in Nigeria in a year

4. Gross Fixed Capital Formation

Fixed capital refers to the value of capital assets available for production purposes at a given point in time. Gross fixed capital formation consists of residents' investments, less disposals, in fixed asset during a given period. It also includes certain additions to the value of non-produced assets realized by producers or institutional units.

5. Exchange Rate

This refers to the average amount of naira exchanged for one US dollar in a year. It is simply the average rate at which one US dollar is exchanged for the naira in a year.

Gross fixed capital formation and exchange rate were used as control variables.

3.2 Model Specification

The model used for this study is specified based on the Dutch Disease and Rentier-State models of the resources curse theory, and the analytical model used by Adamu & Usman (2023) which is expressed as follows:

RGDP= f (OP, COP, EXR, LAB, CAP) 1

where RGDP= Real Gross Domestic Product

OP= Oil Price

COP= Crude Oil Production

EXR= Exchange Rate

LAB= Labour Force Participation Rate

CAP= Gross Fixed Capital Formation

F= Functional Notation

The adopted model was slightly modified to allow for the inclusion of the variables of the present study. Hence, the mathematical form of our model is specified as follows:

HDI= f (OILREV, OILP, COUPT, GFCF, EXR)…..2

where HDI=Human Development Index (a proxy for economic development)

OILREV= Oil Revenue

OILP= Crude Oil Price Per Barrel

COUPT= Crude Oil Output

GFCF= Gross Fixed Capital Formation

EXR= Exchange Rate

F= Functionality Notation

HDI is the dependent variable while OILREV, OILP, COUPT, GFCF and EXR are the explanatory variables.

The ordinary least squares (OLS) multiple regression equation based on the functional relation above is expressed as follows:

$HDI= \beta_0+\beta_1 OILREV+\beta_2 OILP+\beta_3 COUPT+\beta_4 GFCF+\beta_5 EXR+U$ …………3

where $\boldsymbol{\beta_0}$ is the regression constant, β_1-β_5 are parameter estimates, and U is the stochastic variable. All other terms and variables are as earlier defined

Equation 3 is transformed into logarithmic form as shown below.

$HDI= \beta_0 +\beta_1 LOILREV + \beta_2 LOILP+\beta_3 LCOUPT+\beta_4 LGFCF+\beta_5 LEXR+U$ ………4

where L is the natural logarithm of the variables where applicable. All other variables are as earlier defined.

3.2.1 Apriori Theoretical Expectations

Based on apriori theoretical reasoning, we expect the following signs of the parameter estimates:

$\beta_1 > 0, \beta_2 >0, \beta_3 >0, \beta_4 >0, \beta_5 < 0$

The above signs of the parameter estimates imply that a positive relationship is expected between the dependent variable (HDI) and each of OILREV, OILP, COUPT and GFCF while a negative relationship is expected between HDI and EXR.

3.3 Nature and Sources of Data

This study made use of annual time-series data for the period 1990 to 2022. The data were collected from secondary sources including the Central Bank of Nigeria annual statistical bulletin for 2022; the Central Bank of Nigeria annual reports and statements of account (various years) and the World Bank Development Indicators (various years).

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue XII December 2023

3.4 Techniques of Data Estimation

The classical least squares technique rests on the implicit assumption that the time-series data are stationary. However, in real life, most macroeconomic time-series are non-stationary. It is therefore necessary to account for the time-series properties of the variables before actual estimation (Gujarati & Porter, 2009). To this end, the analytical procedure for this study was started with stationarity test which was conducted using the Augmented Dickey-Fuller (ADF) unit root test. In its general form, the ADF unit root test is conducted using the following regressions:

$$\Delta Y_t = a_0 + a_1 Y_{t-1} + \sum_{i=1}^{n} a \Delta Y_i + \epsilon_t \quad \ldots 5$$

$$\Delta Y_t = a_0 + a_1 Y_{t-1} + \sum_{n=1}^{n} a_1 \Delta Y_i + \delta_t + \epsilon_t \quad \ldots 6$$

Where Y_t is a time-series, t is is a linear time trend, Δ is the first difference operator, a_0 is a constant, n is the optimum number of lags in the dependent variable, and ϵ_t is the random error term.

The ADF unit root test rejects the null hypothesis of unit root (i.e. series is not stationary) in favour of the alternative hypothesis of no unit root (i.e., series is stationary).

The outcome of the ADF unit root test provided the basis for the Johansen cointegration test which was used to test for the presence of long-run relationships among the variables. Johansen (1988) and Johansen & Juselius (1990) developed the test based on the Vector Autoregressive (VAR) model expressed as shown below:

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + - - - + A_p Y_{t-p} + \beta X_t + \varepsilon_t \quad \ldots 7$$

where Y_t is a K-vector of non-stationary endogenous variables that are generally integrated of order one (I(1); X_t is a d-vector of exogenous deterministic variable; A_1, A_2, A_P and β are matrices of coefficients that will be estimated; while ε_t is a vector of innovation that may be contemporaneously correlated with their own lagged values and the variables on the right hand side. Considering that many economic time-series are non-stationary, the VAR model is re-stated as follows:

$$\blacktriangle y_t = \pi y_{t-1} + \sum_{i=I}^{p-1} r_i \blacktriangle y_{t-1} + \beta X_t + \varepsilon t \quad \ldots 8$$

where $\pi = \sum_{i=I}^{p} A_{i-1}$ and $r = \sum_{j=i+1}^{p} A_j$

Two statistical tests were developed by Johansen (1988) and Johansen & Juselius (1990) to determine the number of cointegrating vectors. These are as shown below:

$$\lambda_{trace}(r) = - T \sum_{i=r+1} \log(1 - \lambda_t) \quad \ldots 9$$

$$\lambda_{max}(r/r\text{-}1) = - T\log(1 - \lambda r{+}1) \quad \ldots 10$$

where T is the sample and λ's are the estimated eigen values from the matrix. The trace statistic tests the null hypothesis (H_o) of r cointegrating equations against the alternative hypothesis (H_1) of n cointegrating equations. On the other hand, the max eigen statistic tests the Ho of r cointegrating equations against the H_1 of r + 1 cointegrating equations. The error correction model (ECM) was used to estimate the short-run (dynamic) behaviour of the time-series. In specific terms, the ECM was employed to measure the speed of adjustment of any disequilibrium in the short-run to long-run trend. Hence, equation 4 can be stated in ECM format as shown below:

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue XII December 2023

$$\blacktriangle HDI_t = a_0 + \sum_{i=1}^{n} a_{1t} \blacktriangle HDI_{t-1} + \sum_{i=1}^{n} a_{2t} \blacktriangle logOILREV_{t-1} + \sum_{i=1}^{n} a_{3t} \blacktriangle logOILP_{t-1} + \sum_{i=1}^{n} a_{4t} \blacktriangle logCOUPT_{t-1} + \sum_{i=1}^{n} a_{5t} \blacktriangle logGFCF_{t-1} + \sum_{i=1}^{n} a_{6t} \blacktriangle logEXR_{t-1} + \lambda_{ECM_{t-1}} + \varepsilon_t \quad \ldots 11$$

where a_0 is the drift parameter, $\blacktriangle$ is the first difference operator, the terms with the summation sign (i.e., a_{1t} - a_{6t}) are the short-run coefficients, n is the ECM lag, length, log is the natural logarithm, λ is the coefficient of the error correction term, and ε_t is the white noise error term. All other variables are as earlier interpreted.

The Granger causality test was used to check if there is any causality among the variables and to determine the direction of such causality. The Granger causality test, in its general form, involves the estimation of the following pair of reopressions:

$$X_t = \sum_{i=1}^{n} a_i Y_{t-i} + \sum_{i=1}^{n} \beta_j X_{t-j} + U_{1t} \quad \ldots 12$$

$$Y_t = \sum_{i=1}^{n} \lambda_i Y_{t-i} = \sum_{i=1}^{n} \pi_j X_{t-j} + U_{2t} \quad \ldots 13$$

where it is assumed that the disturbance terms U_{it} and U_{2t} are uncorrelated.

PRESENTATION OF RESULTS AND DISCUSSION

4.1 Presentation of Results

The results of the data analysis are presented in this section.

4.1.1 Descriptive Statistics

The descriptive statistics results are presented in table 1

Table 1: Descriptive Statistics Results

Variable	HDI	LOILREV	LOILP	LCOUPT	LGFCF	LEXR
Mean	0.274567	2608.997	43.93976	3849.202	8745.654	120.0043
Median	0.247200	1649.620	32.41500	1154.335	8316.085	115.2550
Maximum	0.543500	8898.970	114.2100	13423.46	15789.67	506.7600
Minimum	0.199000	7.250000	12.62000	4.280000	5668.870	0.610000
Std. Dev	0.071093	2718.556	29.91834	4529.898	2051.155	126.5314
Skewness	0.465919	0.621002	1.107196	0.805332	1.113508	1.152863
Kurtosis	1.662242	2.083543	3.176556	2.064431	4.764654	3.799479
Jargue-Bera	4.651359	4.169322	8.635728	6.071673	14.12880	10.42219
Probability	0.097717	0.124349	0.013328	0.048034	0.000855	0.005456
Sum	11.53180	109577.9	1845.470	161666.5	367317.5	5040.180
Sum Sq. Dev.	0.207224	3.03E+08	36699.38	8.41E+08	1.72E+08	655418.4
Observations	33	33	33	33	33	33

Source: Authors' Computation from E-view

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue XII December 2023

The descriptive statistics results in table 1 show that the mean values of the variables are 0.27567, 2608.997, 43.93976, 389.202, 8745.654, and 120.0043 for HDI, OILREV, OILP, COUPT, GFCF, and EXR respectively. The standard deviation statistic shows that HDI with a value of 0.071093 is the most stable variable while COUPT with a value of 4529.898 is the most fluctuating variable. The skewness statistic indicated that all the variables are positively skewed. The Kurtosis statistic shows that HDI, OILREV, and COUPT are platykurtic (i.e., their values are less than 3) which implies that they have thinner tails relative to normal distribution. On the other hand, OILP, GFCF, and EXR are leptokurtic (i.e., their values are greater than 3). This implies that they have wider or flatter tails relative to normal distribution.

4.1.2 Unit Root Test Result

The Augmented Dickey-fuller (ADF) unit root test result is presented in table 2.

Table 2: ADF Unit Root Test Result

Variable	ADF Test Statistic (At Levels)	Critical Values		ADF Test Statistic (At Ist Diif.)	Critical Values		Order of Integration
		1%	5%		1%	5%	
HDI	-0.826039	-3.600987	-2.935001	-4.333583*	-3.605593	-2.936942	I(1)
LOILREV	-1.521074	-3.600987	-2.935001	-6.553606*	-3.605593	-2.936942	I(1)
LOILP	-1.439831	-3.600987	-2.935001	-5.871353*	-3.605593	-2.936942	I(1)
LCOUPT	0.020533	-3.610453	-2.938987	-6.423710*	-3.610453	-2.938987	I(1)
LGFCF	-1.777352	-3.610453	-2.938987	-5.195895*	-3.610453	-2.938987	I(1)
LEXR	-1.939708	-3.600987	-2.935001	-3.993918*	-3.605593	-2.936942	I(1)

Source: Authors' Computation from E-view

Note: * denotes rejection of the null hypothesis at the 1 percent level of significance.

From the ADF unit root test result in table 2, none of the variables are stationary at levels. However, they are all stationary at first difference (i.e., 1 (1)) at the 1 percent significance level.

4.1.3 Cointegration Test Result

The result of the Johansen cointegration test is shown in table 3. The standard test statistics used in evaluating the result are the trace and max-eigen statistics.

Table 3: Johansen Cointegration Result

Hypothesized No. of CE(s)	Eigen value	Trace Statistics	0.05 Critical Value	Prob. **
None *	0.871712	200.3933	95.75366	0.0000
At Most 1*	0.608289	118.2540	69.81889	0.0000
At Most 2*	0.559770	80.76483	47.85613	0.0000

At Most 3*	0.425736	47.94654	29.79707	0.0002
At Most 4*	0.299858	25.75989	15.49471	0.0010
At Most 5	0.249883	11.50102	13.84147	0.0617
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob. ****
None *	0.871712	82.13921	40.07757	0.0000
At Most 1*	0.608289	37.48921	33.87687	0.0177
At Most 2*	0.559770	32.81830	27.58434	0.0097
At Most 3*	0.425736	22.18665	21.13162	0.0354
At Most 4	0.299858	14.25887	14.26460	0.0501
At Most 5	0.249883	11.50102	13.84147	0.0617

Source: Authors' Computation from E-view

Trace test indicates 5 cointegrating equations at the 0.05 level.

Max-eigen value test indicates 4 cointegrating equations at the 0.05 level.

* denotes rejection of the null hypothesis at the 0.05 percent level

** Mackinnon-Haug-Michelis (1999) p-values

From the Johansen cointegration test result in table 3, the trace statistic indicates 5 cointegrating equations while the max-eigen statistic indicates 4 cointegrating equations. The implication of the result is that there are long-run (equilibrium) relationships among the variables of the study.

4.1.4 Estimated Long-Run Result

The estimated long-run regression result was obtained from the normalized cointegrating coefficients. Table 4 shows the long-run coefficients with their standard errors and t-statistics.

Table 4: Long-Run Coefficients

HDI	LOILREV	LOILP	LCOUPT	LGFCF	LEXR
1.000000	-7.33E-05	-0.006532	4.09E-06	6.11E.06	-0.001241
S.E.	-5.40E-05	-0.00037	-2.10E-06	-2.40E-06	-7.80E-05
t-Statistics	(-13.57407)	(-17.65405)	-0.194762	-2.545833	(-15.91026)

Source: Authors' Computation from E-view

Note: The figures in the first and second parenthesis are the standard errors (S.E.) and the t-statistics respectively.

The estimated long-run result indicated that oil revenue, oil price, and exchange rate have significant negative impact on human development index while crude oil output and gross fixed capital formation have insignificant and significant positive impact respectively on human development index.

4.1.5 Estimated Short-Run Regression Result

The parsimonious error correction model (ECM) (short-run) regression result is presented in table 5.

Table 5: Error Correction Model (ECM) Result

Dependent Variable: HDI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.117313	0.022432	5.229791	0.0001
LOILREV	-8.46E-06	3.10E-06	-2.728557	0.0149
LOILREV(-1)	-1.13E-05	3.89E-06	-2.907199	0.0103
LOILREV(-2)	-1.91E-05	4.06E-06	-4.711703	0.0002
LOILP	-0.00147	0.000322	-4.567838	0.0003
LOILP(-1)	0.001508	0.000359	4.198481	0.0007
LOILP(-2)	0.001376	0.000283	4.871858	0.0002
LCOUPT	-2.51E-06	1.95E-06	-1285222	0.217
LCOUPT(-1)	-4.08E-06	2.55E-06	-1.598477	0.1295
LCOUPT(-3)	5.63E-06	2.99E-06	1.882396	0.0781
LGFCF	8.75E-06	1.80E-06	4.857182	0.0002
LGFCF(-2)	-2.54E-06	1.82E-06	-1.392234	0.1829
LGFCF(-3)	-7.75E-06	1.32E-06	-5.87013	0.0001
LEXR	-0.000101	8.60E-05	-1.179013	0.2556
LEXR(-2)	-0.00054	0.000121	-4.45E+00	0.0004
ECM(-1)	-0.026805	0.0030125	-8.897925	0
R-squared	0.89694	Mean dependent var	0.279653	
Adjusted R-squared	0.842925	S.D. dependent var	0.072479	
S.E. of regression	0.006097	Akaike info criterion	7.060302	
Sum squared resid	0.000595	Schwarz criteria	6.121225	
Log likelihood	156.3167	Hannan-Quinn criter	6.731983	
F-statistic	248.2638	Durbun-Watson stat	2.141189	
Prob (F-statistic)	0			

Source: Authors' Computation from E-view

From the error correction model result in table 5, the error correction term displayed a correct negative coefficient and it is statistically significant at the 0.05 level of significance. The coefficient of the error correction term is -0.026805. This implies that about 2.6 percent of any disequilibrium in the short-run is reconciled to long-run trend within a year in the current period.

4.1.6 Granger Causality Test Result

The result of the Pairwise Granger causality test is reported in table 6.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue XII December 2023

Table 6: Granger Causality Test Result

Lags: 2

Null Hypothesis	Obs	F-Statistic	Prob
LOILREV does not Granger Cause HDI	30	0.77117	0.4702
HDI does not Granger Cause LOILREV		3.8746	0.0302
LOILP does not Granger Cause HDI	30	0.88537	0.4216
HDI does not Granger Cause LOILP		1.30658	0.2836
LCOUPT does not Granger Cause HDI	30	0.99878	0.3786
HDI does not Granger Cause LCOUPT		7.88482	0.0015
LGFCF does not Granger Cause HDI	30	0.46221	0.6337
HDI does not Granger Cause LGFCF		8.47894	0.001
LEXR does not Granger Cause HDI	30	6.07548	0.0054
HDI does not Granger Cause LEXR		0.43557	0.6504

Source: Authors' Computation from E-view

The Granger causality test result in table 6 shows unidirectional causalities from human development index to oil revenue; from human development index to crude oil output; from human development to gross fixed capital formation; and from exchange rate to human development index.

4.1.7 Post-Estimation Tests

It is important to test and verify the assumptions on which the classical linear regression model (CLRM) is based. The results of these post-estimation tests and their respective decisions are presented in table 7 and figures 1 and 2.

Table 7: Post-Estimation Test Results

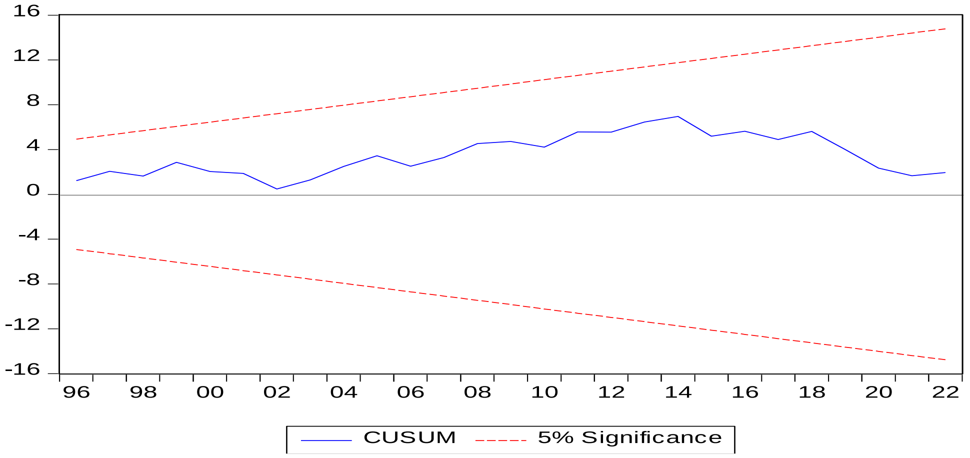
Tests	Value	Prob.	Decision
Linearity (Ramsey Reset Test) t-statistic F-statistic	1.229814 1.512441	0.2324 0.2324	Accept. (Model Correctly Specified)
Breusch-Godfrey Serial Correlation LM Test F-statistic	1.079507	0.9239	Accept. (No Serial Correlation)
Heteroscedasticity Test (Breusch-Pagan-Godfrey) F-statistic	1.311298	0.2747	Accept. (Residuals have Constant Variance)

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue XII December 2023

Normality (Jarque-Bera) Test F-statistic	0.334097	0.853454	Accept. (Data Normally Distributed)

Source: Authors' Computation from E-view

Figure 1: Cumulative Sum (CUSUM) Stability Test



Source: Extracted from E-view

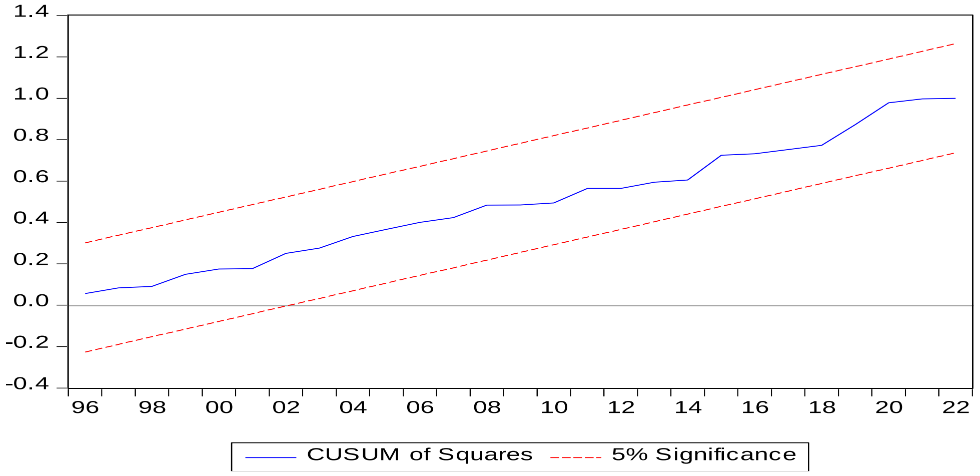


Figure 2: Cumulative Sum of Square (CUSUMSQ) Stability Test

Source: Extracted from E-view

For the CUSUM and CUSUMSQ stability tests, if their plots lie within the 5 percent critical bounds, it is suggestive that the estimated model is stable.

4.2 Discussion of Findings

The results of the data analysis are discussed in detail in this section

Estimated Long-run Result

The estimated long-run regression result showed that oil revenue, crude oil price and exchange rate have

The estimated long-run regression result showed that oil revenue, crude oil price and exchange rate have significant negative relationship with human development index. On the hand, crude oil output has insignificant positive impact on human development index while gross fixed capital formation has significant positive impact on human development index. In terms of magnitude, every one percent increase in oil revenue is associated with 7.33E-07 decrease in HDI. Similarly, one percent increase in oil price and exchange rate will lead to about 6.532E-04 and 1.241E-5 decrease respectively in HDI. On the other hand, a one percent increase in crude oil output will lead to 4.09E-8 increase in HDI while a one percent increase in gross fixed capital formation will bring about 6.11E-8 increase in HDI.

Estimated short-run Result

The estimated short-run (ECM) regression result indicated that the current value of oil revenue and its lagged values in periods 1 and 2 have significant negative impact on HDI in the current period. Oil price in the current period has significant negative impact on HDI while its lagged values in periods 1 and 2 have significant positive impact on HDI in the current period. Crude oil output in the current period and its value lagged by one period have insignificant negative impact on HDI in the current period. However, crude oil output lagged by 3 periods has insignificant positive impact on HDI. Gross fixed capital formation in the current period has significant positive impact on HDI while its lagged values in periods 2 and 3 have insignificant and significant negative impact on HDI in the current period respectively. Exchange rate in the current period has insignificant negative impact on HDI while its lagged value in period 2 has significant negative impact on HDI in the current period.

The estimated coefficient of multiple determination (R-squared) is 0.896940. This implies that the explanatory variables jointly account for about 89% of the total variations in HDI. The adjusted R-squared is 0.842925. This means that if additional explanatory variables are introduced to the model, they will jointly explain about 84 percent of the total variations in the HDI. The F-statistic is 258.2638 with probability value of 0.000000. This means that the overall regression model is statistically significant at the 0.05 level of significance. The Durbin-Watson statistic is 2.141189 which implies that the estimated regression model is not affected by problem of autocorrelation. The Granger causality test indicated unidirectional causalities from HDI to oil revenue; from HDI to crude oil output; from HDI to gross fixed capital formation; and from exchange rate to HDI.

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based the findings of the study, the following conclusions are drawn.

1. Oil revenue significantly reduces the level of economic development in Nigeria.
2. Crude oil prices strongly reduce the level of economic development in Nigeria.
3. Crude oil output makes insignificant contribution to improvement in Nigeria’s economic development.
4. Gross fixed capital formation strongly improves economic development in Nigeria.
5. Exchange rate significantly deteriorates the level of economic development in Nigeria.
6. There is existence of resource curse with regard to the petroleum industry in Nigeria.

5.2 Recommendations

Based on the conclusions drawn from the study, the following policy measures are recommended.

1. To reduce the adverse effect of petroleum industry on the development of the Nigerian economy,

there is the urgent need to diversify the economy away from its present dangerous dependence on crude oil through improvement in agriculture and manufacturing.

2. There is the need to improve the contribution of oil revenue to the growth and development of the Nigerian economy. To this end, the government should ensure that oil revenue is invested in productive enterprises that will contribute significantly to the growth of the economy. There is also the need to use oil revenue to improve the productive capacity of the economy through the provision of basic economic and social infrastructure.
3. To ensure steady inflow of oil revenue, the oil production capacity of the economy should be improved upon. To achieve this, government should guard against oil theft and illegal bunkering in the oil-producing regions. Oil facilities should also be protected against vandalism.
4. To ameliorate the adverse effects of oil exploration and exploitation activities on the welfare of the citizens, the government should subsidize petroleum products consumption and agricultural inputs in the country.
5. To reduce the negative effect of exchange rate on the economy, there is the need for policy measures that will stimulate exports and reduce importation. The Central Bank of Nigeria should also adopt a managed floating exchange rate policy. This will allow the CBN to intervene when the exchange rate is high.

REFERENCES

1. Abdlaziz, R.A., Naseem, N.A.M., Slesman, L. (2018). Dutch disease effect on oil price on agriculture sector: Evidence from panel cointegration of oil exporting countries. *International Journal of Energy Economics and Policy*, 8(5), 241-250.
2. Adamu, A., & Usaman, H.H. (2022). Does oil price and production influence economic growth? Evidence from Nigeria. *Journal of Economics and Allied Research*, 7(2), 146-159.
3. Adeniyi, O. (2019). *Oil price shocks and macroeconomic performance in Nigeria*. University of Ibadan Press.
4. Ahuja, H.L. (2013). *Modern economics* (17th ed.). S. Chand Publishing Ltd.
5. Akinleye, G.T., Olowokere, J.K., & Fajuyagbe, S.B. (2021). The impact of oil on economic growth of Nigeria (1981-2018). *Acta Universitatis Danubius Economica*, 17 (3), 317-327.
6. Akpakpam, E.B. (1999). *The economy: Towards a new type of economics*. Belpot Publishers.
7. Akpan, N.S. (2012). From agriculture to petroleum oil production: What has changed about Nigeria’s rural development? *International Journal of Developing Societies*, 1(3), 97-100
8. Amade, A.M., Alabo, F.O., & Udi, J. (2021). Oil revenue and economic growth in Nigeria: An empirical analysis. *Journal of Economics and Allied Research*, 6 (1), 248-263.
9. Amani, A.A., & Hassan, A.A. (2021). An assessment of the response of agriculture to government policies and programmes in Nigeria. (1981-2019). *FUDMA Journal of Agriculture and Agricultural Technology*, 7 (2), 175-181. https://doi.org/10.33003/jaat.2021.0702.064
10. Anyanwu, J.C., Oyefusi, A., Oaikhenan, H., & Dimowo, F.A. (1997). *The structure of the Nigerian economy (1960-1997).* Joanee Educational Publishers
11. Auty, R. (2007). *Patterns of rent-extraction and development in developing countries: Implications for governance, economic policy and performance.* In Mavrotas, G., & Shorrocks, A. (eds.). Advancing Development: Core themes in global economics. Palgrave.
12. Bresser-Pereira, L.C. (2008). The Dutch disease and its neutralization: A Ricardian approach. *Revista de Economia Politica,* 28 (1), 47-71. https://doi.org/10.1590/S0101-31572008000100003.
13. Brunnschweiler, C. (2008). Cursing the blessings? Natural resource abundance, institutions and economic growth. *World Development*, 36 (3), 1728-1742
14. Di John, J. (2009). *From windfall to curse? Oil and industrialization in Venezuela, 1920 to the present* . Penn State University Press.
15. Di John, J. (2010). The resource curse: Theory and evidence. *ARI Discussion Paper No. 172/2010.*

16. Ebimobowei, A. (2022). Oil revenue and economic growth of Nigeria: 1990-2019. *African Journal of Economics and Sustainable Development,* 5 (1), 17-46. https://doi.org/10.52589/AJESD.JWZXIFNW
17. Effiong, U.E. (2022). Industrial policies and industrial sector performance in Nigeria. *Asian Journal of Economics, Finance and Management,* 4(1), 268-289.
18. Effoduh, J.O. (2015). *The economic development of Nigeria from 1914 to 2014.* Retrieved from www.casale.org/economic.development.
19. Elwerfelli, A., & Benhin, J. (2018). Oil a blessing or curse: A comparative assessment of Nigeria, Norway and the United Arab Emirates. *Theoretical Economic Letters*, 8 (5), 1136-1160. https://doi.org/10.4236/tel.2018.85076.
20. Eneh, C.O. (2011). Failed development vision, political leadership and Nigeria's underdevelopment: A critique. *Asian Journal of Rural Development*, 1(1), 63-69.
21. Engerman, S., & Sokoloff, K. (1997). *Factor endowments, institutions and differential paths to growth among new world economies: A view among economic historians in the United States.* In Haber, S. (ed.). How Latin America fell behind: Essays on the economic histories of Brazil and Mexico, 1800-1914. Standford University Press.
22. Gujarati, D.N., & Porter, D.C. (2009). *Basic econometrics* (5th ed.). McGrow Hill Inc.
23. Igberaese, T. (2013). *The effect of oil dependency on Nigeria's economic growth:* A Master of Art Thesis presented to the Institute of Social Studies, the Hague, The Netherlands.
24. Ishioro, B.O. (2022). Oil production -gdp nexus: Empirical insights from the Nigerian economy. *International Journal of Applied Research in Social Sciences,* 4(11), 1-14. Hhttps://doi.org/10/51594/ijarss.v44iii.480.
25. Karl, T. (1997). *The paradox of plenty: Oil booms and petro states*. University of California Press.
26. Khan, M., & Jomo, K.S. (2000). *Rents, rent seeking and economic development.* Cambridge University Press.
27. Mahdavy, H. (1970). *The patterns and problems of economic development in rentier states.* In Cook, M. (ed.). Studies in the economic history of the Middle East. Oxford University Press.
28. Neary, P., & Van-Wijnbergen, S. (1986). *Natural resources and the macroeconomy*. Management Institute of Technology (MIT) Press.
29. Ogbefun, I.E., Ajetunmobi, T.P., Moronkeji, T.A., & Adindu, G.C. (2019). Revenue generation and economic growth of Nigeria. *International Journal of Current Research,* 11(7), 5786-5792. https://doi.org/10.24941/ijcr.35972.07.2019.
30. Ologunde, I.A., Kapingura, F.M., & Sibanda, K. (2020). Sustainable development and crude oil revenue: A case study of selected crude oil producing African countries. *International Journal of Environmental Research and Public Health,* 17 (18), 1-15. https://doi.org/10.3390/ijerphi7186799.
31. Olojede, A.A., & Micheal, N.F. (2020). Oil revenue and Nigerian economic growth from 1981-2018: A resource curse? *International Journal of Management Studies and Social Science Research,* 2(4), 291-296.
32. Onoja, E.E., & Ibrahim, A.S. (2021). Tax revenue and Nigeria economic growth. *European Journal of Economics and Business Studies*, 7 (2), 102-124.
33. Organization of Petroleum Exporting Countries (OPEC) (2015). *Annual Statistical Bulletin*. Retrieved from https://www.opec.org/opec_web/states.file.
34. Osamor, I.F., Omoregbe, G., Ajasa-Adeoye, F.Z., & Olumuyiwa-Loko, J.M. (2023). Tax revenue and economic growth: Empirical evidence from Nigeria. *Journal of Economics and Behavioural Studies,* 15(1), 15-26.
35. Oyalabu, O.E., & Oyalabu, G.I. (2023). Effect of crude oil price on economic growth in Nigeria (1985-2019). *Sapientia Global Journal of Arts, Humanities and Development Studies,* 6(1), 147-158.
36. Patrick, D.B.S. (2020). Oil revenue and economic development: Evidence from contractual arrangements in Nigeria. *Kebbi Journal of Accounting Research*, 1(1), 167-173.
37. Sertoglu, K., Ugural, S., & Bekun, F.V. (2017). The contribution of agricultural sector on economic growth of Nigeria. *International Journal of Economics and Financial Issues*, 7(1), 547-552

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue XII December 2023

38. Sule-Iko, S.S.S., & Nwoye, M.I. (2023). Effect of international crude oil prices on Nigeria's gross domestic product from (1985-2020). *Journal of Human Resources and Sustainability Studies,* 11, 118-137. https://doi.org/10.236/jhrss.2023.111008.
39. Todaro, M.P., & Smith, S.C. (2011). *Economic development* (11th ed.). Pearson.
40. Udeh, H.E. (2021). Effect of oil and non-oil revenue on economic growth of Nigeria. *International Journal of Management Studies, Business and Entrepreneurship Research,* 6 (1), 12-31.
41. Wilson, G. (2002). *Development economics: A concise text.* Pearl Publishers.
42. Yakub, M.U. (2008). The impact of oil on Nigeria's economy: The boom and the burst cycles. *CBN Bullion*, 32(2), 41-50.
43. Yubashkandi, S.S., & Sadi, M.A. (2020). Petroleum production impacts on the economic growth of the opec countries: Panel ardl approach. *Springer Nature Applied Sciences,* 2, 1-10. https://doi.org/10.1007/S42462-020-2490-0.