DOES OIL PRICE AND PRODUCTION INFLUENCE ECONOMIC GROWTH? EVIDENCE FROM NIGERIA

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ABSTRACT
The study examined the effect of oil price and oil production on economic growth in Nigeria over the period 1989-2020. Applying the Augmented Dickey Fuller test, the study found mixed order of integration among the variables, thereby warranting the application of the Autoregressive Distributed Lag (ARDL) model. The results of the ARDL bounds test indicated the presence of cointegration among the variables. The estimates of the ARDL model revealed that there is a positive influence of oil price on economic growth both in the long run and short run. As oil price increases, real GDP increases both in the short-run and in the long-run. Regarding the effects of oil production, the result showed a negative effect on real GDP in the short run, while the long-run effect is statistically insignificant. The study recommends amongst others that, the NNPC should explore more efficient means of oil production to avert the current negative short-run effect on Nigeria's real GDP.

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1. INTRODUCTION

Crude oil has been a major source of energy since its discovery in the 1800's. It has contributed significantly to the growth and development of both oil exporting and importing nations. The production and pricing of crude oil is determined both by the market forces and by the Organization of the Petroleum Exporting Countries (OPEC) which is an intergovernmental organization of 13 oil-exporting developing nations that coordinates and unifies the petroleum policies of its Member Countries (Usman et al. 2021, Iorember et al 2022). The oil pricing system in the world had undergone several reforms with organization of petroleum exporting countries (OPEC) emerging victorious over the Seven Oil Sisters namely: Anglo-Iranian oil company now BP, Royal Dutch shell, now shell, standard oil company of California, now chevron, gulf oil, Texaco, standard oil company of new jersey now ExxonMobil and standard oil company of new York. Nigeria is part of the OPEC basket as it is one of the oil exporting countries in the world. According to the British Petroleum (BP) Statistics, Nigeria is the 11th oil producing country. The production quota is largely determined by the OPEC in line with the production capacity of a member country. Nigeria is blessed with a favourable tropical climate condition which lies in the watershed of the River Niger. The River Niger is linked to Atlantic Ocean and the Niger Delta. Therefore, the five main basins which are the Benue Trough, Chad, Niger Delta, Benin and Anambra Basins are located around the rivers (Uwakonye et al., 2006).

The Nigerian oil industry is categorized into three sub-sectors (The Up-stream, Mid-stream, and the Down-stream sectors). The upstream is the most important sub-sector because it deals with the exploration of oil and gas, which serves as the starting point of the oil and gas processing. The main oil exploration companies in Nigeria are Chevron, Shell BP and Total. The sector produces over 90% of the oil exportation. The key players in this sector are the International Oil Company's (IOC) and the Nigerian National Petroleum Corporation (NNPC). The crude oil production per day has risen since the beginning of production in 1981 with 1,433 thousand barrels per day with an increased share of GDP from 1.6% in the 1960's to 40% (Kola-olusanya & Mekuleyi, 2018). The rise which led to higher level of production was due to the success rate of oil companies in search of new oil fields for exploration.

The main products of crude oil that are in demand for most countries, including Nigeria, are diesel, jet fuel, petrol, kerosene, natural gas, and bitumen(Hu et al., 2017). The usage of crude oil products is for the high amount of energy they give off and the high-octane value they possess (Demirbas et al., 2015). They have a universal usage for both domestic and commercial purposes. The oil products are used in industries to facilitate the production of goods and services and used domestically for cooking and heating. In most developing countries and third-world countries, the usage of petroleum products has a high percentage (Arinze, 2011). It provides a medium for foreign exchange for the country.

Without an ounce of doubt, oil has generated a lot of revenue for the government right from its discovery in 1965, but its effect on the growth of Nigeria economy remains sketchy. However, the monolithic nature of the Nigerian economy, over dependence on the crude oil and the lack of control over the global price of crude oil in the international market has really led the country on a spiral of economic challenges that impedes the economic growth and other relevant sectors. The current situation has put the economy in a devastating and vulnerable position. The economy is exposed to all oil shocks that would happen in the oil market. In 2004, the negative shock of the oil price led to the Obasanjo's administration to introduce an *Excess Crude Account* to cushion the effect of short-falls of the crude oil price on planned budgets (Ogboru et al., 2017). The most recent shock has to do with the Covid-19 Pandemic that affected the crude oil pricing.

The revenues generated from the crude oil production have contributed to the economy and well-being of the country. However, the exploration of oil has resulted in some ecological problems. The major problem to the environment is the oil spillage. This problem is visible at the oil fields and oil producing areas. The Niger Delta region serves as a perfect example.

Despite the huge endowment and exploitation of the crude oil, it is still debatable whether it is a curse or a blessing to the country. Since the discovery and exploitation of the crude oil in Nigeria, other important economic sectors such as mining, agriculture, life-stock farming, have been neglected. Supporters of diversification have been relentless on trying to shift the focus from crude oil to diverse resources that can help develop and improve the Nigerian economy(Abdulsalam, 2021). Most of the proponents of diversification are trying to prevent a crowding out effect of the neglected sectors. This may result in an economic suicide because any shock in the oil market would reduce the revenue of the economy and in turn retard economic growth. The world today is focused on different way of generating revenue. Nigeria was once known as an Agricultural country that dealt in the exportation of Agricultural goods like cocoa, cotton, ginger, palm kernels, cassava, (Abdulsalam, 2021). The country can still regain its past glory only if it uses the natural resources and the fertile lands within its borders instead on focusing on the black gold.

Furthermore, oil pricing and production has always been a pertinent issue in the economy of Nigeria. Despite the abundance of mineral and human resources, Nigeria still faces challenges that continue to hamper large scale economic development. Right from time, Nigeria has been highly dependent on crude oil for her revenue, thus the annual budget is pegged to an expected

or estimated level of oil price and production. This has resulted in the economy being placed on a critical situation which exposes it to the vagaries of change in the crude oil price and production. The Excess Crude Account was brought into existence to reduce the effect of changes in oil price and production on the economy. This plan however could not be sustained because of disagreement between states and the federal government, with one party insisting on saving, while the other demands for sharing of the excess.

A research survey of a similar works shows that there are three main strands of hypotheses, depending on the country of survey, the necessary methods of analysis and the range of period of the research. One school of thought argued that the changes experienced in the crude oil price and production have a positive impact on the growth of the economy(Ogboru et al., 2017). Others are of the opinion that the effect on the growth of the economy is negative. The third school of thought saw no connection between the two. Therefore, this current study applied the Nigerian data over the period of 1989 to 2020 to examine the long-run and short-run effects of crude oil pricing and production on economic growth in Nigeria.

The rest of the paper is organised as follows, section 2 deals with the literature review which embraces conceptual, theoretical and empirical reviews; chapter three focuses on the methodology; chapter four presents the results and discussions and chapter five concludes the work and presents the recommendations.

2. LITERATURE REVIEW

2.1 Conceptual Review

Crude Oil Price

In the global market, crude oil price is a measure used in the spot price of different barrels of oil quote. The various oil barrels include; Brent Blend, West Texas Intermediate (WTI), New York Mercantile Exchange (NYMEX) and the OPEC basket price (Ogboru et al., 2017). The Nigerian crude oil falls under the OPEC Price Basket. It serves as the mean value of prices gotten from Nigeria and other countries like Indonesia, Dubai, Saudi Arabia, Algeria, Mexico, and Venezuela (Ogbu, 2019).

Crude Oil Production

According to OECD (2021) crude oil production can be defined as the quantities of oil that is extracted from the ground after the removal of inert (impurities). The oil production is focused on the exploration and processing of the crude oil. After the discovery of oil in Niger Delta around 1956, Nigeria started oil exploration. Shell-BP was a sole concessionaire when it discovered the crude oil in Nigeria. In 1958, Nigeria became part of the oil producing countries with 5,100 bpd initial production (Akinyetun, 2017). The exploration and production of the crude oil soar higher every year due to the operations of the streams like the Upstream, Mid-stream and downstream sector.

The upstream consist of about 80% of the oil producing wells in the country (Uwakonye et al., 2006). Nigeria's oil-production backbone is centred on the upstream sector. The mid-stream sector is a highly capital-intensive sector which consists of the oil and gas transportation, processing, and transmission.

The downstream sector focuses on the distribution of the refined oil products to its final consumers. The civil unrest that lingers in the economy revolves around it. The downstream sector has four main refineries with different capacity. The four refineries can produce a total of 445,000 barrels per day (Mgbame & Mboto, 2015). Some of the products that are obtained in the refineries include Liquefied Petroleum Gas (LPG), Automotive Gas Oil (AMO), Dual Purpose Kerosene (DPK), Fuel Oil, etc. The Port Harcourt Refinery is the first refinery in Nigeria with the capacity range of 35,000 – 60,000 bpd in 1965. The second refinery is the Warri refinery with the capacity range of 100,000 – 125,000 bpd in 1986. In 1980, the Kaduna

refinery was commissioned with the capacity range of 100,000 – 110,000 bpd. The last refinery was built in Port Harcourt in 1989 with a capacity of 150,000 bpd.

98% of the oil and gas are being exported and it accounts for 83% governments revenue in 2000. The Nigerian reserves is estimated around 35 billion barrels. It consist of natural gas reveres which is over 100 trillion (Odularu, 2008). The oil production and exploration in Nigeria is achieved via Join Venture (JP) Companies. The Joint Venture accounts for 95% of the Nigeria's Production. The Joint Ventures are Shell BP, Chevron Texaco, Exxon Mobil, Total Elf, etc. The largest of the Joint Venture is Shell BP with about 55% Nigeria Government interest through the Nigerian National Petroleum Corporation (Odularu, 2008). The revenue gotten from the Nigerian government is obtained through percentage interest for each venture.

Economic Growth

Economic growth is defined as an increase in the amount of goods and services that are produced per head of the population over a certain period. In an economic theory, the concept of economic growth Is focused on the annual increase of the total material produced in the country (Acemoglu, 2016). The growth in an economy refers to the continuous increase in output per capital of a country over a long period of time. The growing speed of a country's output over a period is referred to as the growth rate. The economic growth of a country is the measure determinant of the domestic demand and the wellbeing of the people (Iorember, 2020b). The growth rate per capita is used as a benchmark to measure the economic growth (Ivic, 2015). The GDP per capita is an important variable in macroeconomic and it's a good tool that shows the condition of the county in a Marco level. In Nigeria, the growth of GDP is determined not just by oil revenue but by also the non-oil exports (Gbaka et al 2021) and by the strength of the country's financial institutions (Dabwor et al 2020).

According to Todaro and Smith (1977), economic growth is defined as a steady process in which the productive capacity of the economy is increased overtime to bring about rising levels of national income. To them economic growth can only occurs when improvement in the growth of the economic improves the condition of lives of the people. Thus, economic growth is a steady process of increasing the productive capacity of the economy and hence of increasing national income, which means if the country's capacity is increasing on a steady basis, more of its resource will be employed.

2.2 Theoretical Review

Mainstream Theory of Economic Growth

The mainstream theory of economic growth sees production as the most important determinant for economic growth. Production which is the transformation of matter in some ways requires the use of energy. The theory sees land, capital, and labour as a primary factor of production, which exist at the beginning of a production period but not directly used in production (can be degraded or added to), while energy resources like oil, fuels and embers are regarded as intermediate inputs. All these are created during the production period and can be used during the production. Thus, determining the marginal product of oil as an energy resource that is useful in determining economic growth. Also, the theory captures one part of its capacity to do work and flexibility of us. Also, considering other attributes such as capital type, material or labour that is used in conjunction with the production. This theory also estimates the ideal price to be paid for crude oil which is proportional to its marginal product.

Dutch Disease Theory of Economic Growth

The Dutch Disease Theory was postulated in 1977 by The Economist to describe the decline of the manufacturing sector in the Netherlands after the discovery of the large Groningen natural gas field in 1959.the theory became popular in the 1980s after the development of the

classic economic model describing it by the economists W. Max Corden and J. Peter Neary in 1982. The model consists of the non-tradable sector, which includes services, and two tradable sectors: which are the booming and the lagging tradable sectors. The booming sector is usually the natural resource sector whereas the lagging sector is usually the manufacturing or agricultural sectors which declined because of lack of competitiveness created by the sudden natural resource discovery. The Dutch disease is the apparent causal relationship between the increase in the economic development of a specific sector such as natural resources and a decline in other sectors manufacturing, trading, and agriculture. The presumed mechanism is that as revenues increase in the developing sector, then occurs a decline in other sectors due to lack of economic interest in such sectors. As economic growth occurs, due to sudden discovery of a natural resources such as oil and natural gas, the currency of that nation becomes stronger relative to currencies of other nations. This resorts in the nation's other exports becoming more expensive for other countries to buy, and imports becoming cheaper, making the manufacturing sectors of that country less profitable, thus less desirable economically.

2.3 Empirical Studies

Mgbane (2015) investigates the oil pricing factor and the impact of oil and gas fluctuation in Nigeria from 2000-2012. The study used time series data extracted from the World Bank statistical bulletin. The result revealed that oil price has a direct relationship with gross domestic product (GDP) because as oil price rises, the GDP also rises. Although there is no significant effect on the Nigeria economy, because the level of unemployment is still very high. The study recommends the diversification of the economy in other to curtail it negative consequence on the economy.

Gbatu, Wangz, and Wesseh (2017) analysed the asymmetric effect of oil price shocks and exchange rate fluctuations on real GDP for panel of ECOWAS countries from 1980-2015. The study employs the fixed effect model. The sample was grouped into three, namely the ECOWAS countries, the net oil exporting countries and lastly the net oil importing countries. The result showed a linear and asymmetric impact of oil price on the GDP for all the ECOWAS and net oil exporting countries. However, exchange rate volatility negatively impacts on the sample for ECOWAS and net oil importing countries.

Muhammad (2017) investigated the impact of oil prices on the real economic activity. The study adopted the nonlinear autoregressive distribution lag model (NADL) which enables them in testing the short run and long run asymmetric. The result shows that the effect of oil price changes on economic growth such as the rise on oil price has a negative influence in the long run. But the output growth those not response to the reduction in oil prices but rises in oil price.

In Nigeria, Kabir et al (2019), examines the impact of crude oil price and exchange rate on economic growth from 1982-2018, using the autoregressive distribution lag (ARDL)model. The result revealed that crude oil price and exchange rate could affect the economy both in the short run and long run. The study recommends that government should diversify the sector of investment, agriculture, and industrialization to reduce the reliance on crude oil and income fluctuation as a result of crude oil price.

Similarly, Dadson et al (2018) examined the nexus between oil price change and economic growth. Data were sourced from World Development Indictor (WDI) and International Financial Statistics. The study adopted the descriptive statistics and unit root test to analyse the data. The result revealed a unidirectional causality between oil prices and economic growth. The study also recommends that policy should be put in place in other to influence economic growth of oil prices.

In addition, Alley et al (2014) examines the impact of crude oil price shock on the Nigerian economy. The study adopted the general methods of moment (GMM). Using the annual time series data from 1981-2012, the result shows that oil price volatility insignificantly retards economic growth, while oil price significantly improves it.

Furthermore, the oil pricing and economic growth chain in Nigeria was equally structured by Saibu (2011). He performed the unit root and integration test for the time series of component characteristics and the result showed that energy usage is revenue elastic and the domestic expenditure and energy use have a substantial negative correlation. The world oil supply adjustment has changed Nigeria's overall domestic energy use and economic development. The study recommends that electricity consumption has essential impacts on macroeconomic performance in Nigeria. And that energy conservation policy should be taken as energy saving policy and energy management strategy.

In addition, Sunday (2019) examined the relationship between oil price volatility and infrastructural growth in Nigeria, using annual time series data from1981-2015. The study adopted the Johannsen cointegration approach and error correction mechanism. The result revealed that volatility in oil price and inflation is negative and statistically significant, and interest rate also negative but statistically insignificant, on infrastructural growth.

Consequently, Ebenezer (2016) investigated the relationship of oil consumption, oil price volatility and economic growth. Annual time series data from 1980-2013, sourced from World Bank Development Indicator (WDI) were used. The study adopted the Johansen Cointegration Test and vector error correction mechanism. The variables proved to be stationary at first difference. The result revealed a positive relation between crude oil consumption and economic growth, also the study recommends that government, policy maker as well as researchers to adopt policies that could enhance an efficient consumption of crude oil most especially in the productive sector (i.e., manufacturing and transportation sector) of the economy in other to stimulate economy growth.

The review of the empirical literature revealed that Nigeria is a country that is endowed with various resources which includes crude oil. Oil, being the main source of revenue of the Nigerian economy, plays a dynamic role in influencing the economy and political structure. However, various research in this direction, largely investigated the impact or shock on oil prices and how it effects economic growth without considering the dynamic nature of such effect. The effect of such strategies needs to be determined and examine from time to time especially for developing country like ours (Nigeria). Secondly the review above shows the relationship and effect of how oil prices and shocks on economic growth has influence Nigerian economy, this is still far from controversy since there is no uniformity among the studies, also there is a dearth of literature on effect of oil pricing and production on economic growth in developing countries. This study will add to existing literature in this area of study. Herein lays the essence of this study, by employing the autoregressive distribution lag model (ARDL), to assess the effect of oil pricing and production on the Nigerian economy.

3. METHODOLOGY AND DATA

The study relied on secondary type of data extracted from the Central Bank of Nigeria Statistical Bulletin, the World Development Indicators and the OPEC websites. The data covers the period from 1989 to 2020 based on availability.

Model Specification

To achieve the objectives of the study, the following model is specified and estimated using a robust econometric technique. The functional form of the model is given as;

$$RGDP = f(OP, COP, EXC, LAB, CAP) \quad (1)$$

Where:

RGDP = Real gross domestic product (GDP at constant basic prices)

OP = Oil price at the international market

COP = Crude oil production

EXR = Exchange rate

LAB = Labour Force Participation rate

CAP = Gross fixed capital formation

The stochastic or econometric form of the model is given as;

$$ln\text{RGDP} = \beta_0 + \beta_1 ln\text{OP}_t + \beta_2 ln\text{COP}_t + \beta_4 ln\text{EXR}_t + \beta_4 lnLAB_t + \beta_5 lnCAP_t + \mu_t \quad (2)$$

3.4 Description of Variables in the Model

Real GDP: real gross domestic product can be defined as a measure of economic output which account for the effect of inflation or deflation. (Kimberly 2018). In the study it served as a proxy for Nigerian economy and as well the dependent variable.

Oil price: According to petropedia, oil price can be defined as the spot price per one barrel of crude benchmark. The price of crude oil can be determined by the forces of demand and supply.in this research it serves as the independent variables.

Crude oil production: this refers to the quantities of oil that is extracted from the ground after it has undergone the removal of inert matter or impurities. In this research it also serves as the independent variables.

Exchange Rate: The exchange rate is defined as the price of one currency in term of another currency. In this study, it is the rate at which the naira exchanges the US dollar. It serves as an independent variable.

Gross fixed capital formation: also referred to as "investment," is defined as the acquisition of generated assets (including second-hand acquisitions), including the development of such assets by producers for their own use, minus disposals. In this research it serves as a control variable.

The Labour Force will be capturing the labour force participation rate within the time frame. In this research it serves as a control variable.

Method of data analysis

The study applied the Autoregressive Distributed Lag (ARDL) model given its superiority and flexibility over and above other techniques of estimations, especially when the order of integration of the variables is mixed. Following the specification of Pesaran et al (2001), and as applied by Iorember et al (2020a); Usman et al (2020), the ARDL formulation of the model for this study is given as;

$$\Delta lnRGDP_t = \beta_0 + \beta_1 lnRGDP_{t-i} + \beta_2 lnOP_{t-i} + \beta_3 lnCOP_{t-i} + \beta_4 lnEXR_{t-i} + \beta_5 lnLAB_{t-i} + \beta_6 lnCAP_{t-i} + \sum_{i=0}^{p} \beta_7 \Delta lnRGDP_{t-i} + \sum_{i=0}^{p} \beta_8 \Delta lnOP_{t-i} + \sum_{i=0}^{p} \beta_9 \Delta lnCOP_{t-i} + \sum_{i=0}^{p} \beta_{10} \Delta lnEXR_{t-i} + \sum_{i=0}^{p} \beta_{11} \Delta lnLAB_{t-i} + \sum_{i=0}^{p} \beta_{12} \Delta lnCAP_{t-i} + ECM + \mu_t$$

Where Δ is the difference operator, and other variables remain as defined. ECM is the error correction term which indicates the speed of adjustment to the long-run. It is expected to be negative and statistically significant for there to be convergence.

Furthermore, the ARDL Bounds technique was used to investigate the existence or otherwise of cointegration among the variables. Specifically, the null hypothesis of the ARDL bound test is that, there is no cointegration, while the alternative hypotheses state that, there exit a

cointegration. Rejecting the null hypothesis implies the existence of cointegration in the model (Iorember et al 2021).

4. RESULTS AND DISCUSSIONS

Summary Statistic and Correlation

The estimation of the result to investigate the effect of oil price and oil production on real GDP commences with the summary or descriptive statistics and unit root analysis as presented in Table 1 and 2 respectively.

Table 1 Descriptive Statistics

	LNRGDP	LNCOP	LNOP	LNEXR	LNLAB	LNCAP
Mean	6.162916	7.750507	3.649467	4.543381	4.071497	3.302525
Median	5.850298	7.677503	3.690561	4.852	4.09301	3.322287
Std. Dev.	2.120062	0.555893	0.685469	1.038732	0.045965	0.412483
Skewness	4.954417	4.860523	0.105626	-1.18434	-1.10951	-0.05653
Kurtosis	27.06506	26.52214	1.605843	3.472397	2.534601	1.728228
Jarque-Bera	903.0829	863.7195	2.651068	7.778429	6.854248	2.173583
Probability	0.0000	0.0000	0.265661	0.020461	0.03248	0.337297
Observations	32	32	32	32	32	32

Sources: Authors' Computation, 2021 Using EViews 10

In table 1 all the values are in their natural logarithmic form. LNCOP has the highest mean value followed by LNRGDP, while LNCAP has the lowest mean value. All the variables exhibit low standard deviations indicative of the absence of volatility among the series. This is expected given that all the variables are in the log forms. Three of the variables (LNRGDP, LNCOP and LNOP) have positive skewness, while the other three (LNEXR, LNLAB and LNCAP) exhibit negative kweness. The findings of the Jaque Bera statistics indicate that the variables are not normally distributed. This however does not cause a problem since the method of analysis used in the study in indifferent to the assumption of normality.

Unit Root (Stationarity) Test

The unit root results presented in table 2 is the augmented dickey fuller test. The ADF test was chosen because it is widely used, and its output are robust. The results show that all the variables except Real GDP and oil production are stationary at level.

Table 2 Augmented Dickey-Fuller (ADF) Unit Root Test

Variables	Level t-statistics	p-value	Ist difference t-statistics	p-values	Order of integration
LNRGDP	-4.014519	0.0037	-10.72888	0.0000	1(0)
LNCOP	-5.840389	0.0000	-3.737134	0.0092	1(0)
LNOP	-1.352079	0.5924	-4.525108	0.0012	1(1)
LNEXR	-2.559725	0.1120	-5.945805	0.0000	1(1)
LNLAB	3.369994	1.0000	-3.173332	0.0317	1(1)
LNCAP	-1.630525	0.4555	-3.730998	0.0086	1(1)

Note: Unit root test was based on Augmented Dickey-Fuller (ADF) technique following Schwarz Info Criterion (SIC) which was automatically selected
Source: Authors' computation 2021 Using EViews 10

Bound Test for Cointegration

Prior to estimating the long run and short run relationship among the variables, it is relevant check whether there is long run relationship among the variables of the model. Applying the bounds testing procedure to cointegration and using the criteria established by Pesaran et al (2001), which suggest that the F-statistics must be greater than the upper critical bound for

cointegration to exist. Given that our F-statistics falls above the upper bound at 1% level of significant as presented in Table 3, we reject the null hypothesis of no cointegration and conclude that there exits cointegration/long-run relationship among the study variables.

Table 3: Cointegration Bound Tests Result

F-statistic	**7.70522**			
Significant level		10%	5%	1%
F-Bounds Test	Lower bound	3.47	4.01	5.17
	Upper bound	4.45	5.07	6.36

Note: the number in parenthesis represents t-statistics, *** signifies 1% level of significant, F-statistics is determined with restricted constant and no trend
Source: Authors' computation 2021 Using Eview 10

The Short-run and Long -run Estimates

The short run and long run results are posted in Table 4 and Table 5 respectively. The results show that oil price has a positive influence on economic growth in the short-run in Nigeria. The short-run coefficient for the oil price is 0.192888 and statistically significant at 5%. This indicates that as oil price increases by one per cent, real GDP will increase by 19.29 per cent, all things being equal. The results highlights that as oil price increases by one per cent, real GDP will increase by 19.29 per cent, all things being equal. This finding is consistent with the study of Mgbane (2015), who established a positive and statistically significant relationship between oil price and economic growth.

In the long run, the coefficient is positive (0.303421) and statistically significant at one per cent. This implies that as oil price increases by one per cent, the real GDP increases by 30.34 per cent in the long run, all things being equal. This implies that oil price plays a major and significant role in the growth of the Nigerian economy. This is not a surprise given that the Nigerian economy has been solely dependent on the oil export for its development. Therefore, a rise in oil price would positively increase the income level and lead to growth of the economy. This finding is consistent with the finding of Dadson et al (2018) and Nwanna and Eyedayi (2016) which suggested that a periodic increase in the oil prices will affect the economy positively in the long run.

A look at the oil production indicated that there is a negative influence on economic development in short-term in Nigeria. With the reported coefficient of -3.57762 which is statically significant at one per cent. This demonstrates that there is negative effect of oil production on Nigerian economy. It shows that as oil production rise by one per cent, the real GDP drops by 357.76 per cent, all things being equal. This result is in lag one and consistent in lag two. The outcome in level is also negative but not statistically significant.

Table 4 ARDL Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRGDP(-1)	0.364288	0.449454	2.810512	0.0295
D(LNCOP)	-0.00608	0.062637	-0.09714	0.9238
D(LNCOP(-1))	-3.57762	0.095403	-37.5002	0.0000
D(LNCOP(-2))	-3.55022	0.075726	-46.8821	0.0000
LNOP	0.192888	0.255437	2.75513	0.0411
LNEXR	-0.23311	0.15147	-1.53901	0.1433
D(LNLAB)	-6.53246	3.286307	-1.98778	0.0642
D(LNLAB(-1))	9.657599	4.064279	2.376214	0.0303
D(LNLAB(-2))	8.239164	3.306208	2.492028	0.0241

ECM(-1)	-0.63571	0.022952	-27.6977	0.0000

Case 2: Restricted Constant and No Trend
Source: Authors' computation 2021 Using EViews 10

However, in the long run, the effect of oil production is positive and statistically significant at ten per cent. The coefficient is 5.547842 which has probability lower than 10%. The effect of oil production is a long-run phenomenon. The result demonstrates as oil production increases by one per cent, the real GDP will rise by 554.78 per cent, all things being equal. Dependency on crude oil production has long-run effect on Nigerian economic development. The effect of oil production is a long-run phenomenon. The result demonstrates there is a possible long-run effect which is not surprising because of the high dependency on oil production for revenue generation in the country. These results are consistent with Berument, Ceylan and Dogan (2020) examined how oil price shocks and production as affect the output growth in some net-exporting and net-importing countries in the Middle Eastern and North African (MENA) region.

The results also established the long-run effect of oil price on economic development in Nigeria. The result is statistically significant at one per cent. This implies as oil price increases by one per cent, the real GPD increase by 30.34 per cent in the long run, all things being equal. This implies that oil price major and significant role to play in development of the Nigerian real GDP. This is not a surprise given that the Nigerian economy has been solely dependent on the oil export for its development. Therefore, a fall in oil price would greatly affect the revenue generation of Nigeria. The coefficient of lag one of real GDP is positive and statistically significant at one per cent level. There is an indication that the present year's real GDP could be influenced by the previous year's real GDP. The effect is reportedly in the short run. Other variables include the exchange rate, labour participation rate and gross capital formation. The short-run coefficient for the exchange rate is negative and not statistically significant while its long-run effect is negative and statistically significant at 10 per cent. This implies that as exchange rate increases by one per cent, real GDP decreases by 36.67 per cent in the long run, all things being equal.

Table 5: Long Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCOP	5.547842	3.979654	2.394051	0.0824
LNOP	0.303421	0.353105	2.059295	0.0029
LNEXR	-0.3667	0.206169	-1.77862	0.0943
LNLAB	-7.64951	5.444678	-1.40495	0.1792
LNCAP	0.417599	1.232405	0.338849	0.7391
C	-6.24834	32.2073	-0.194	0.8486

Case 2: Restricted Constant and No Trend
Source: Authors' computation 2021 Using EViews 10

Diagnostic and Stability Tests

The study conducted diagnostic tests to ascertain the robustness of the estimates and the results are presented in table 6. Applying the Jarque-Bera test for normality test, Breusch-Godfrey test for serial correlation, and the Breusch-Pagan-Godfrey test for heteroskedastic, the results showed that the model is free from serial correlation, heteroskedasticity, and the residuals are normally distributed. More so, applying the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUM of Square)

tests as shown on Figures 1 and 2, the results confirms that the coefficients are stable over time and are robust for policy decisions.

Table 6 Diagnostic Test

Normality Test	1.455036 (0.483107)
Serial Correlation	1.798240 (0.2044)
Heteroscedasticity Test	0.477231 (0.9126)

Note: Values in parentheses are probabilities, Jarque Bera Normality Test was utilised, Serial correlation is with Breusch-Godfrey serial correlation Lagrange Statistics, Heteroscedasticity test is with Breusch-Pagan-Godfrey test.
Source: Authors' computation 2021 Using EViews 10

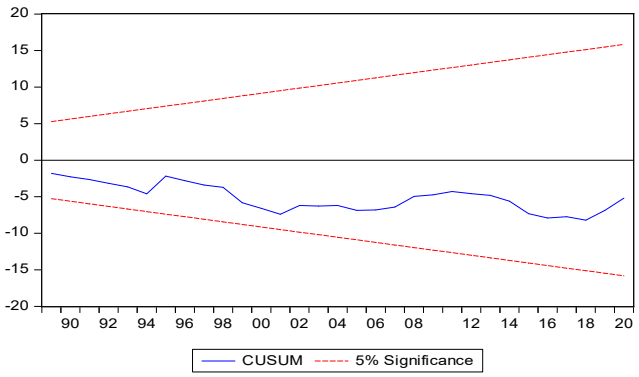

Figure 1: CUSUM Graph.

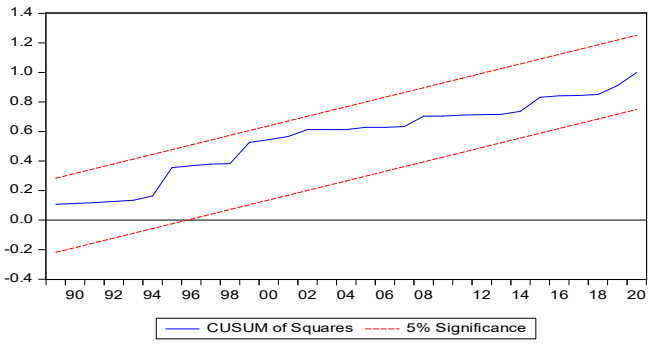

Figure 2: CUSUM of Square Graph

5. CONCLUSION AND POLICY RECOMMENDATIONS

The crude oil is the major source of foreign exchange earnings and dominant source of revenue for Nigerian government, in which its high dependence serves as the basis upon which revenue distribution, budgeting, and capital allocations are determined in the country. Thus, the upward or downward production of crude oil may have an attendant multiplier effect on economic growth in Nigeria.

Assessing the effect of oil price shows that there is a positive influence on economic development in short-term in Nigeria. It highlights that as oil price increases, real GDP also increase. Also, there is an established long-run effect of oil price on economic development in Nigeria. This suggests that oil price is a major and significant determinant of economic growth in Nigeria. This is not a surprise given that the Nigerian economy has been solely dependent on the oil export for its development. Therefore, a fall in oil price would greatly affect the

revenue generation of Nigeria. Therefore, based on the result, increase in oil productivity is encouraged.

Based on the research findings, the study recommends that NNPC should explore more efficient means of oil production to avert the current negative short-run effect on Nigeria's real GDP. The negative effect implies that the production means is not currently efficient and required a better means of production to reduce waste and increase profitability in the organisation. Also, improving on the long-term effect is crucial and therefore, the current status quo should be improved on. While production is expected to increase, improved productivity is very important to reduce waste.

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