Crude Oil Production and Nigerian Economic Growth: A Test of Dutch Disease and the Paradox of Plenty: 1981-2014

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Abstract

This study examined Nigeria Crude oil Production and its impact the economic growth from 1981-2014. The objective was to investigate the impact of Nigeria crude oil production on economic growth, test the DUTCH DISEASE AND THE CLASSICAL PARADOX OF PLENTY in Nigeria. Time series data were collected from Central Bank of Nigeria (CBN) Statistical and World Energy Report was modeled as the function Oil Revenue (OILR), Oil Export (OILEX), Crude oil Reserves (COR), Quantity of Crude Oil Produced (QOP), Domestic Consumption (DC) and Crude Oil Price (OILP). The Ordinary Least Square Method of Cointegration, Granger Causality test, Augmented Dickey Fuller Unit Root Test and Vector Error Correction Model were used to determine the long and short –run relationship that exist among the variables. Findings from the regression result revealed that Oil Revenue, Oil Export have positive but insignificant impact on Nigeria economic growth. Domestic consumption has positive and significant impact while Crude Oil reserves, Quantity of Crude Oil Produced and Oil Price have negative and insignificant impact on economic growth. The result of the Unit Root proved stationarity of the variables at first difference. The cointegration test proved long-run relationships that exist between the dependent and the independent variables while the Granger Causality test proved bi-directional causal relationship running from the independent to the dependent and the dependent to the independent. The study concludes that oil revenue and oil export have no significant effect on the growth of Nigeria economy, this proved presence of the DUTCH DISEASE AND THE CLASSICAL PARADOX OF PLENTY in Nigeria. It recommends that the oil revenue should properly be accounted for and invested to enhance economic growth.

KEYWORDS: Crude Oil, Economic Growth, Dutch Disease, Paradox of Plenty, Nigeria economy, Oil Export.

1. INTRODUCTION

Nigeria is recognized as oil producing country, a member of Organization of Petroleum Exporting Countries (OPEC), the tenth largest producer of crude oil in the world and African highest exporter of crude oil. Nigerian crude oil ranges from the bonny light, forcados, Quaibo and Brass River which are regarded as sweet crude in the international oil market. The country's crude oil reserve is estimated at 35 billion barrel with national gas reserve of 180 trillion cubic feet, a production capacity of 2.5 million barrel per day and annual production of 900,000,000 barrel (Ushie *et al*. 2012). The discovery of oil in commercial quantity, increase in demand and the oil boom gave Nigeria comparative and absolute cost advantage that led to the neglect of other sectors of the economy and position Nigeria as a monocultural economy of oil.

In the last three decades Nigeria fiscal year budget has been the function of price and the quantity of crude oil produced. Crude oil account for over 96% of export and 80% of total revenue, Nigerian total oil revenue was ₦34.2 trillion from 2000-2009. An average of ₦3.42 trillion compared with non-oil revenue of ₦732.2 billion within the same period (Ogbonna and Appah, 2012). Apart from foreign earning, Nigeria generate significant revenue from petroleum profit tax, licensing and domestic consumption of crude oil. The extent to which the trillions of naira generated from oil revenue have impacted on the growth and development of Nigerian economy remain a matter of fact to Nigerians and the international communities. In the period of the oil boom, Nigeria was known to be the most African indebted nation, in October 2013 Nigerian debt amount to N8.32 trillion. The question is "does Nigeria really need external borrowing if the trillion of naira generated from the oil revenue is properly accounted for"?

Again, Nigeria is rated among the poorest countries and ranked 157th out of 187 countries by United Nation Development Index in 2011. The World Bank estimate that over 70% of Nigerians are living in an object poverty of less than $2 a day. The deplorable state of infrastructure in the country triggered another question "what is the trillions of naira generated from crude oil used for? The country is known to be the highest importer of generator as a result of ill power supply. A country with over 1 trillion cubic feet gas reserves, 95% of the oil wealth is controlled by less then 0.01% of the population (Odularu and Okonwo, 2009). The country's economy is seen to be suffering from the so-called **Dutch disease**, **Resource Curse** and held the classical example of the **paradox of plenty**. From the above, this paper wants to examine the effect of crude oil production on the growth of Nigerian economy. The paper is divided with five sections. The introductory section is followed by section 2 which contain the theoretical, conceptual and empirical review. Sections three *is* the research methodology while the results and discussion is presented in section 4, section 5 contains conclusions and recommendations.

2. LITERATURE REVIEW

Overview of Crude Oil Productions in Nigeria

The Nigerian petroleum industry covers the exploration and production of crude oil as well as petroleum refinery, marketing and servicing any (Anyanwu *at el*.1997). On shore, oil exploration account for about 65% of total production and it is found mainly in the swampy areas of the Niger Delta while the remaining 35% represent offshore production and involves in the deep waters of the continental shelf (Oladepo and Fabayo, 2012). Crude oil production in Nigeria is

by Joint Venture (JV) companies which accounts for about 95% of Nigerian crude oil production with government interest of 55%. Exxon Mobil, Chevron Texco, ENI/Agip and Total finaElf operate the other joint venture which Nigeria government has 60% stake. Specific policy objectives with respects to petroleum and mining can be summed up as follows: Active government participation, diversification, mineral products, the organization and regulation of mineral resources, conservation of the country's mineral resources, research into efficient extraction methods, wider application and use of mineral manpower development and accelerated transfer of technology and achievement of internal self- sufficiency in the supply and effective distribution of petroleum products, exports of petro-industry products commerlization of gas and the control of the environmental problem of oil production, this include water, land and air population a problem that has threaten the existence of the oil producing communities.

Advantages and Disadvantages of Crude Oil Production

If America sneezes, the whole world catches cold is a phrase to qualify the importance of oil production on Nigerian economy. This can be seen in three days strike in the petroleum industry labour union. Dominants theories of economic growth have suggested that significant relationship exist between national income and economic growth. That is when income is invested in an economy, it result to economic growth (Ogbonna and Appah, 2012). Harrod (1939) and Domar (1946) models states economic growth as a positive function of savings. Nigeria generates significant proportion of her revenue from crude oil production. Oil revenue comprises proceeds from sales of crude oil, profit tax, licensing and sales of refined petroleum products. Oil revenue dominates the source of Nigeria revenue accounting for over 90% of total foreign earnings and over 80% total collected revenue. When compared with non-oil, it shows that Nigeria cannot survive without the oil sector. In 2000 to 2009 Nigeria generated an average of 82% of total revenue from oil, in 2011 and 2012 oil revenue account for 80% and 75% of the total collected revenue. The trillion of Naira generated from the oil revenue serve the country the opportunity to import raw materials, intermediate and capital goods which is used by the non-oil sector of the economy (Akinlo, 2012). As a major export that account for over 90% foreign earnings, it boost the external reserve that leverage Nigerian against domestic and international shocks.

The multiplier effect of the oil production is an advantage to other sectors of the economy. It provides bi- products and intermediate input to other industries. The intermediate inputs such as crude oil gas and liquid feeds stocks as well as oil and gas into the refining, petrochemical, electricity and energy intensive industries (Al-Moneef, 2006). This is an advantage to the growth and development of the industries which was the government policy objectives for establishing the petro chemical companies. The oil sector enhance Nigeria market contribution, the effect enlarge the demand of goods and services by the oil sector provided by local source. Significant proportion of the labor market is absorbed by the activities oil exploration any other activities. Apart from the market effect of the oil sector, the sector attracts large proportion of foreign direct investment which is one of determinants of increase capacity utilization and labor productivity (Ayanwale, 2007).

However, the global perception of Nigerian is that of a really blessed oil producing nation. Like the advantages, the disadvantages cannot be overlooked. The Nigerian crude oil is produced in an area known as the Niger Delta Region covering nine states out of the 36 states of the

federation. The coastal area consist of fresh water, Swamp, mangrove, beach ridges, sandbars, lagoon marshes and tidal chemicals (Ayubas ,2012).Oil Spill has been the major environmental challenges facing the people of the region. Oil spill have the capacity of affecting negatively the terrestrial and marine source. Some past oil spill have caused the relocation of some communities, lost of forest and agricultural land, destruction of fishing grounds and reduction of fish population which is the major source of income for the Niger Delta people. The heat generated from gas flaring kills vegetation around flaring areas, destroys mangrove swamp and salt marshes, suppressed the growth and flowing of some plants, induces soil degradation and diminishes agricultural productivities (Adeyemo, 2002). In 2004 NLNG gas pipeline transvasing through Kala-Akama okirika mangrove forest leaked, set ablaze and bunt for three days.

The saying by Sammulsion that the calculus of the American politics can not be diverse from the calculus of American dollars is a typical example of the power politics in the Nigerian oil sector. The politics in the sector range from the   agitation for resource control by the oil producing states and the communities as witness fort the drama between the states and the federal government on the April 5th supreme court verdict that national resource derived from the onshore /offshore the derivable from the respective territory and in useful therefore each of the state is entitled to not less than 13% allocation. The agitation led to the execution of the Ken Saro Wiwa in 1997 and the restiveness in the region.

The policies, institutions and policy reforms in the sector is more of political than economic reality. The gulf oil company Act was established and repealed by the Petroleum Technology Development Fund (PTDF) Act No25 of 1973 with the development of indigenous manpower and domiciliation of oil and gas technology in the Nigerian petroleum industry (Hadiza, 2013). The Babangida administration introduced the Oil Mineral Producing Area Development Commission and later renamed Niger Delta Development Commission (NNDC) in 2000 by Obasanjo administration with the objective of developing the oil rich region. Obasanjo administration does not have minister of petroleum, but reserve it to him, a position that is reserved for indigenes of the oil producing states. In 2007 late **Umaru Musa Ya'Adua** created the ministry of Niger Delta with the oversight function of developing the region. In 2004 Obasanjo introduced the Excess crude account with the objective of saving Nigerian oil revenue above the budget bench mark.

An examination of these policies and institution reveals that it is purely for political interest rather than economic development and a channel for stealing the trillions of naira from the oil revenue. The management board of NDDC is not elected by the people but appointed by the president with political interest. In 2006 vice president Atiku accursed Obasanjo of being the only beneficiary of the PTDF, the excess crude fund has been a bone of contention between the presidency and the 36 states governors. Significant proportion of the oil revenue is laundered by the politicians through capital fight.

Another disadvantage of the crude oil production is the macro economic imbalance caused by the oil boom in Nigeria. Nigeria neglects the strong agricultural and light manufacturing bases in favor of an unhealthy dependence on crude oil (Odularu, 2008). The country was known as a leading exporter of primary agricultural products such as cocoa, groundnut; cotton and palm produce (Okoh, 2004). Today Nigeria is importing these primary agricultural products for consumption and industrial use. The monetizations of the oil revenue expand government

spending ability. Significant proportion of the trillions is sport unproductively while part of it goes outside the country's boarder. The consequences of this is the deficit in Nigerian current account, depreciating Naira exchange value, challenges in liquidity management, hyper inflation and high interest rate that crowd out domestic investments.

THE ROLE OF NNPC IN THE NIGERIAN OIL SECTOR

NNPC was established on April 1, 1977 as a merger of the Nigerian National oil corporation (NNPC) and the federal ministry of mines and steal. By laws NNPC was established to manage the joint ventures between Nigeria and the foreign multinational corporations, decree N0.3 of 1977 empowered NNPC the following functions.

(1)   produce crude oil, refined treat and process

(2)   market crude oil and petroleum products

(3)   Provides and operates pipelines, tankership sand other facilities for conveyance of crude oil, national gas and other.

(4)   Construct, equip and maintain tank farms and other facilities for the handling and treatment of petroleum products.

(5)   Cary out research in connection with petroleum, its departments and promoting activities for the for utilization of such research.

(6)   Explore and exploit her oil resources directly alone or through contract by association with other foreign companies or through service contracted with the companies.

In evaluation, the creation of NNPC has not yet resulted in Nigeria wrestling control of its petroleum resources. The sector an enclave economy remains highly capital –intensive and dominated by the foreign Oligopolistic capital with high import content any (Anyanwu *et al.* 1997) for instance Nigeria is a major exporter of crude oil with four government refineries but import refined products. This is an ironical situation that has been blamed on the political interest, NNPC officials and the less than 1% Nigerians that control the oil wealth.

The operation of NNPC is characterized with fraud. In 2006, NNPC and one of its subsidiaries disagreed over N926billion NNPC withdrew from the excess crude account without the approval of the finance minister. In 2011, a foreign report conducted by KPMA found that between 2007 and 2009, NNPC over deducted funds in subsidy claims to the tune of N28.5 billion which cannot be accounted for, in November 2013 the Beine Declaration allege NNPC siphoning N6.8billion in crude oil revenue. In December 2013 CBN governor reported that and $49.8billion oil revenue has not been remitted by NNPC. The officials who sabotage the refineries to promote fuel importation benefit in two main ways from fuel supply and sales first, funds for maintaining the refineries go into private pockets, guaranteeing low capacity utilization or complete breakdown. Secondly heavily inflated supply term contracts and import license are awarded cronies for the importation of refined products from abroad (Nwokeji, 2010).

Table 1:   Ratio Analysis of Nigeria Oil to Non Oil Sector

Year	% oil import to TMPT	%nonoil import TO TMPT	%oil export TO TEX	%Non oil export TO TEX	%OILR/ TR
1981	0.933	99.067	96.890	3.110	64.409
1982	2.094	97.906	97.524	2.476	68.329
1983	1.927	98.073	95.984	4.016	68.982
1984	3.934	96.066	97.278	2.722	73.511
1985	0.733	99.267	95.759	4.241	72.558
1986	15.273	84.727	93.811	6.189	64.365
1987	17.748	82.252	92.912	7.088	74.980
1988	17.734	82.266	91.160	8.840	71.848
1989	15.138	84.862	94.904	5.096	72.638
1990	13.284	86.716	97.034	2.966	73.282
1991	8.685	91.315	96.151	3.849	81.860
1992	13.665	86.335	97.944	2.056	86.154
1993	24.836	75.164	97.718	2.282	84.090
1994	26.015	73.985	97.404	2.596	79.337
1995	20.636	79.364	97.571	2.429	70.556
1996	28.825	71.175	98.219	1.781	78.071
1997	19.735	80.265	97.651	2.349	71.517
1998	21.000	79.000	95.469	4.531	69.953
1999	24.540	75.460	98.361	1.639	76.320
2000	22.418	77.582	98.724	1.276	83.502
2001	17.458	82.542	98.501	1.499	76.517
2002	23.912	76.088	94.569	5.431	71.072
2003	19.177	80.823	96.931	3.069	80.551
2004	16.009	83.991	97.538	2.462	89.000
2005	28.466	71.534	98.538	1.462	85.848
2006	22.862	77.138	98.176	1.824	88.642
2007	19.638	80.362	97.602	2.398	77.921
2008	23.520	76.480	94.938	5.062	83.017
2009	19.500	80.500	94.180	5.820	65.887
2010	21.523	78.477	94.081	5.919	73.882
2011	27.679	72.321	94.005	5.995	64.409
2012	31.375	68.625	94.192	5.808	68.329
2013	25.736	74.264	92.595	7.405	68.982
2014	21.018	78.982	92.643	7.357	73.511

Source: Authors Computation.

From the table above, Nigerian non oil export to total export is less than 10% within the period of this study while Nigeria oil export to total export fluctuate within 90%. Oil revenue to total revenue swings between 64.4% to 89.0%. Oil import to total import fluctuates within 31.3% to

0.9% while non oil import fluctuates between 68.6% and 99.0%. This proved Nigeria as a monoculture economy of oil.

Empirical Review

Ogbonna and Appah (2012) studied the effects of petroleum income on the Nigerian economy for the period 2000-2009 using the gross domestic product (GDP), per capita income (PCI) and inflation as explained variables and oil revenue, petroleum profit tax/royalties (PPT/R) and licensing fees (LF) as the explanatory variables. The simple regression with the aid of SPSS was employed to evaluate the relationship that exists among the variables. The study found that oil revenue has a positive and significant relationship with GDP and PCI, but positive and insignificant relationship with INF PPT/R has a positive and significant relationship with GDP and PCI but negative and insignificant relationship with GDP, PCI but negative and insignificant relationship with inflation. LF has positive but insignificant relationship with GDP, PCI and INF. The time covered in this study is too short having examined empirically the effect the dependent and the independent variables in the study.

Tibrin *et al.* (2012) examined the impact of petroleum profit tax on economic development of Nigeria from 2000-2010 using ordinary least square (OLS). The study found that petroleum profit tax and total oil revenue is positively and significantly related to the growth of Nigerian gross domestic product. The time covered in this study is too short to have empirically the effect of the independent variables on the dependent variable and petroleum profit tax is a component of total oil revenue. Odularu (2008) examined crude oil and the Nigerian economic performance using the ordinary least square regression method, the study revealed that crude oil consumption and export have contributed positively to Nigerian economy. Akinlo (2012) studied the important of oil to the Nigerian economy in a multivanate VAR model over the period 1960-2009. The finding showed that five sub-sectors are comtegrated and that the oil can cause other non oil sector to grow. Oil had adverse effect on the manufacturing sector. Granger causality tests towards be directional causality between oil and manufacturing, oil and building and construction, manufacturing and building and construction, manufacturing and trade and service, and agriculture and building and constitution. It also found a unidirectional causality from manufacturing to agriculture and trade and service to oil but no causality was found between agriculture and oil, between trade and service and between building and construction.

Oladepo and fabayo (2011) examined global recession, oil sector and economic growth in Nigeria. Empirical analysis of the study using ordinary least square revealed that there is negative and significant relationship between domestic consumption and export of oil to the growth of Nigerian economy and negative effect of the global recession on the oil sector. This study did not report the effect of oil price on GDP as modeled is the study. Ibrahim (2007) found a weak relationship between the oil industry and other sectors in Nigeria. He blames this on the low level of technological development in the country. The finding is limited growth of the downstream sector. As a result, the avenues through which downstream oil sector could have forward and backward linkages with other sectors are thus limited. Bernanke (1983) found in a partial equilibrium model that oil price shocks would tend to reduce value added, because firms will defer irreversible investment decisions as they endeavour to find out whether the increase in oil price is transitory or lasting. Chang and Wong (2003) investigated the effects of oil price fluctuations on the Singaporean economy and found an insignificant negative relationship between oil price shocks and Singapore's gross domestic output, inflation and unemployment rate. Farzanegan and

Markwardt (2009) on the Iranian economy found a strong positive relationship between oil price changes and industrial output growth. Olomola (2006), Akpan (2009) and Oriakhi and Osaze (2013) have all proved a positive relationship between oil price increases and growth of output in Nigeria. Jumah and Pastuszyn (2007) investigated the relationship between oil price shocks and monetary policy in Ghana for the period 1965 to 2004. The study did not identify a direct significant relationship between output and crude oil price changes, but found that the international price of crude directly affected the price level which tends to negatively affect real output. The results also proved that monetary policy is initially stilled in response to an increase in the price of oil in order to lessen any growth effects but at the cost of higher inflation.

Tweneboah and Adam (2008) used vector error correction model to explore the dynamic long run and short run relationship between world crude oil price and monetary policy in Ghana for the period 1970:1 to 2006:4. The results of the study proved that there is a long run relationship between oil price, domestic price level, GDP, exchange rate and interest rate in Ghana in which oil price positively impact the price level while negatively impacting output. It also proved that an unexpected oil price shock is followed by an increase in inflation rate and a decline in output in Ghana. Idowu (2005) investigated extensively on the existing relationship between oil exports and economic growth in Nigeria using Johansen's multivariate Co-integration technique. His test analysis, found that there is a stationary relationship between oil exports and economic growth and feedback causality between Oil export and GDP. Akanni (2007) used the PC-Give 10 (ordinary least square regression) to determine if oil exporting countries grows as their earnings on oil rents increases. The test analyses using OLS, the result proved positive and significant, that means there is a positive relationship between Oil rents and economic growth. Mohammed and Amirahi (2010) investigated using Error correction model of ARDL to check if factors like world oil demand and supply, oil price and production capacities enhances export growth in Iran. The result found that there is an inverse relationship between consumption of oil products and revenues from oil export. Abdu Hadi, et al (2009) investigated using Cobb-Douglas production function to know if the income generated from Iran's Oil export has an impact on their economy. Findings reveal that Iran's economy adjusts quickly to shocks and there level of technology is progressing. Therefore oil exports in Iran contributed to their real income through real capital accumulation. Afolabi (2011) examined the effect of crude oil export on Nigeria economy using the Ordinary least square method (OLS) as econometric technique to test its significance. He proved that some of the explanatory variables (labour, domestic consumption, crude oil export and total production) are statistically significant while capital is statistically not significant. Oriakhi and Osaze (2013) investigated the impact of oil price volatility on the growth of the Nigerian economy within the period 1970 to 2010. He found out of the six variables examined, oil price volatility impacted directly on real government expenditure, real exchange rate and real import, while impacting on real GDP, real money supply and inflation through other variables, notably real government expenditure. By implication, oil price changes determine government expenditure level, which in turn determine the growth of the economy thereby reflecting the dominant role of government in Nigeria.

Ito (2012) studied the impact of oil prices on the macroeconomic variables in Russia using the VAR model. The study covered fifteen years, from 1994:Q1 to 2009:Q3, yielding 63 observations. The paper found that a 1% increase (decrease) in oil prices contributes to the depreciation (appreciation) of the exchange rate by 0.17% in the long run, whereas it leads to a 0.46% GDP growth (decline). Also found that in the short run (8 quarters) rising oil prices not

only causes GDP growth and the exchange rate depreciation, but also a marginal increase in inflation rate. Masih et al. (2010) investigated the impact of oil price volatility on stock price fluctuations. They expanded the standard error correction model by examining the dynamics of out of sample causality through the variance decomposition and impulse response function techniques. Findings proved the dominance of oil price volatility on real stock returns. The study emphasized that oil price volatility can have profound effect on the time horizon of investment and firms need to adjust their risk management procedures accordingly. Alia, Mukhtar, Tijanib, and Auwal (2015) studied the relationship between the exchange rates and crude oil prices for the period of 1960 to 2013 based on Engle-Granger. They found that the variables are cointegrated; meaning that there exist long-run relationship.

Adebisi (2012) stated that Dutch Disease occurs when a country discovers a substantial natural resource deposit and begins a large-scale exportation of it. As a result, the country's currency appreciates, thereby reducing the competitiveness of the country's traditional export sector. Therefore, this tradable goods sector should contract, leading to structural changes in the economy. The investigated if Dutch Disease was present in Nigeria in the light of the rejection of the Dutch Disease thesis in other studies. The study examined the impact of expanding oil revenues on non-oil sectors of the Nigerian economy, using the agricultural sector as the non-tradable sector. It produced some empirical evidence for the contraction of Nigerian agriculture in the past five decades or more and it demonstrated that the variation in the direction of the Nigerian economy in general was in part a direct consequence of the raising oil revenue which pushed up the exchange rate and made agricultural product uncompetitive for export. Diagnosing Dutch Disease found that the contraction of the agricultural sector in Nigeria was a result of the sudden windfall from oil. Ojebiyi and Wilson (2011) examined the relationship that exists between exchange rate of Nigerian naira and Unites States dollar and oil price on the basis of monthly data from 1999-2009. The used the fundamental variables which were assumed to be the monthly spot crude oil price, monthly exchange rate of Nigeria naira and monthly exchange rate of United States dollar. The result employed the ordinary least square using regression analysis and also the correlation model which proved that there was a weak/negative relationship between exchange rate and oil price as there are other factors that bring about changes in oil price other than the exchange rate.

3.   RESEARCH METHODS
This study was motivated to examine the impact of Nigeria crude oil production on economic growth by testing the presence the so-called DUTCH DESEASE SYNDRONE. Data was sourced from the publications Central Bank of Nigeria (CBN) and the world energy report.

MODEL SPECIFICATION
The model specified below is based theories and empirical studies.

GDP =   f(OILR,OILEX,COR,QCOP,DC,OILP)………………… (1)

Transforming equation I to econometrics form we have:

$GDP = \beta + \beta_1 OILR + \beta_2 OLIEX + \beta_3 COR + \beta_4 QCOB + \beta_5 DC + \beta_6 OILP + \mu$…………..…2

Where:

GDP	=	Nigeria Gross Domestic Product
OILR	=	Oil Revenue
OILEX	=	Oil Export
COR	=	Crude Oil Reserves
QCOB	=	Quantity of Crude Oil Produced

DC   =   Domestic Consumption
OILP   =   Oil price in dollar multiply by official Naira exchange rate for the year.
µ   = Error Term

STATIONARITY TEST

To determine the stationarity, the study apply the Augmented Dickey Fuller Unit Root Test with automated length selection using the Akaike Information Criterion (AK) to ascertain if the mean and the autocorrelation of the series do not depend on time (Campbell and Perron, 1991). The ADF test brings into play the (agreed dependent variable as explanatory variables to approximate for autocorrelation (Omiete and Onyemachi, 2015). The ADF test stastistics is mathematically stated as:

$$\Delta y_t = c + \beta_t + \alpha y_{t-1} + \sum_{t-i}^{k} \gamma_j \Delta y_{t-j} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.5$$

$$\Delta y_t = c + \alpha y_{t-1} + \sum_{t-i}^{k} \gamma_j \Delta y_{t-j} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.6$$

Equation 5 is determined to test for the null hypotheses of non stationarity of unit root against trend stationaerity alternative in Y_t where y refers to the examined time series. Equation 6 is determined to tests the null hypotheses of a unit root against a mean stationarity alternative.

Johansen Cointegration Test

The cointegration test determined whether a long run equilibrium relationship exist among the variables. It is generally accepted that to establish a cointegration, the likelihood ratio must be greater than the Mackinnon critical values. The model can be stated as

$$\Delta X_t = \mu + \Psi_1 \Delta X_{t-1} + \Psi_2 \Delta X_{t2} + \ldots + \Psi_{p-1} \Delta X_t - p + 1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots.7$$

Where μ is a constant term.

ΔX_t Represents the first cointegrating differences

Vector Error Correction Model

Empirically analyze the data with the Vector Error Correction (VEC) Model. Vector Error Correction (VEC) model is a restricted VAR which is designed for use with nonstationary series that are known to be cointegrated. The VEC has cointegration relations built into the specification so that it restricts the long-run behavior of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics. The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.
Our VEC model is:
$\Delta y1, t = \alpha1 (y2, t-1 - \beta y1, t-1) + \varepsilon1, t\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.8$
$\Delta y2, t = \alpha2 (y2, t-1 - \beta y1, t-1) + \varepsilon2, t\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.9$
The right-hand side variable is the error correction term; and is zero in the long run. But a deviation of y1 and y2from equilibrium makes the error correction term to be nonzero and each will have to adjust to equilibrium. The coefficient α1 measures the speed of adjustment of the i-th endogenous variable towards the equilibrium (Omiete and Onyemachi, 2015).

Granger Causality Test

Granger (1969) approach to the question of whether two variables X causes Y is to see how much of the current Y can be explained by past values of Y and then to see whether adding lagged values of X can improve the explanation. Vesela (2010) noted that the Granger test assumes that all information for predicting chosen variables is included in the very past values of the variables. Y is said to be Granger-caused by X if X helps in the prediction of Y, or equivalently if the coefficients on the lagged X's are statistically significant If it found that "X Granger causes Y", this does not mean that Y is the effect or the result of X. ranger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term.

$$Y_t = \alpha_o + \sum_{i=1}^{n} \alpha_1^y Y_{t-1} \sum_{i=1}^{n} X_{a1} X\mu \quad \text{...10}$$

and

$$X_t = \beta_o + \sum_{i=1}^{n} \beta_1^y Y_{t-1} \sum_{i=1}^{n} X_{\beta1} XY_t \quad \text{..................................11}$$

In case we do not find any evidence for Cointegration among the variables, the specification of the Granger causality will be a Vector Autoregression (VAR) in the first difference form. However, if will find evidence of Cointegration, there is the need to augment the Granger-type causality test model with a one period lagged error term. This is a crucial step because as noted by Engel and Granger (1987).

4.   RESULTS AND DISCUSSION

The objective of this study is to investigate the impact of Nigerian crude oil production on the growth of Nigeria economy. The following tables proved the short-run and long-run relationship that exist between the dependent and the independent variables as formulated in the regression model. The table below has detail of the annual time series data of the variables used in this study.

Table 2: Annual time series Data of the Variables

YEAR	GDP (NB)	OILR(NB)	COR(MB)	OILEX(NB)	QOP(MB)	DC(MB)	OILP (N)
1981	94.33	8.56	16.7	10.7	2,059	103,857.00	22.30
1982	101.01	7.81	16.5	8.0	1,440	56,196.00	26.06
1983	110.06	7.25	16.8	7.2	1,290	68,980.00	26.08
1984	116.27	8.27	16.5	8.8	1,236	58,930.00	23.98
1985	134.59	10.92	16.6	11.2	1,388	56,907.00	96.51
1986	134.60	8.11	16.1	8.4	1,499	60,508.00	118.36
1987	193.13	19.03	16.0	28.2	1,467	49,345.00	79.87
1988	263.29	19.83	16.0	28.4	1,353	92,755.00	141.90
1989	382.26	39.13	16.0	55.0	1,496	93,805.00	139.15
1990	472.65	71.89	17.1	106.6	1,715	103,427.00	254.88
1991	545.67	82.67	20.0	116.9	1,870	112,310.00	178.23
1992	875.34	164.08	21.0	201.4	1,960	104,012.00	356.82
1993	1,089.68	162.10	21.0	213.8	2,020	107,040.00	306.86

1994	1,399.70	160.19	21.0	200.7	2,024	127,786.00	347.45
1995	2,907.36	324.55	21.8	927.6	1,991	118,146.00	1,455.11
1996	4,032.30	408.78	21.8	1,286.2	1,998	98,500.00	1,911.00
1997	4,189.25	416.81	21.8	1,212.5	2145	91,500.00	1,445.02
1998	3,989.45	324.31	22.5	717.8	2,316	86,370.00	1,659.24
1999	4,679.21	724.42	29.0	1,169.5	2,167	88,620.00	2,352.82
2000	6,713.57	1,591.68	29.0	1,920.9	2,066	112,410.00	2,548.22
2001	6,895.20	1,707.56	31.5	1,839.9	2,159	109,800.00	2,077.62
2002	7,795.76	1,230.85	34.3	1,649.4	2,268	142,220.00	3,605.70
2003	9,913.52	2,074.28	35.3	2,993.1	2,087	164,250.00	4,004.81
2004	1,141.07	3,920.50	35.9	4,489.5	2,233	164,250.00	5,248.47
2005	14,610.88	4,762.40	36.2	7,140.6	2,430	73,105.00	7,411.55
2006	18,564.59	5,287.57	37.2	7,191.1	2,502	172,118.00	7,992.50
207	20,657.32	4,462.91	37.2	8,110.5	2,392	214,689.00	11,511.73
2008	24,296.33	6,530.60	37.2	9,861.8	2,265	190,415.00	5,068.60
2009	24,794.24	3,191.94	37.2	8,105.5	2,113	256,028.00	11,201.25
2010	54,612.26	5,396.09	37.2	11,300.5	2,211	211,005.00	13,829.67
2011	62,980.40	8,878.97	37.2	14,323.2	2,523	304,628.00	16,864.91
2012	71,173.94	8,025.97	37.2	14,260.0	2,460	286,426.00	17,084.10
2013	80,092.56	6,809.23	37.8	14,131.8	2,417	349,483.00	17,227.30
2014	89,043.62	8,561.34	39.1	12,007.0	2,502	398,672.00	9,739.82

SOURCE: 1.CBN STATISTICAL BULLETIN VARIOUS ISSUES. 2. WORLD ENERGY REPORT.

Keynote:

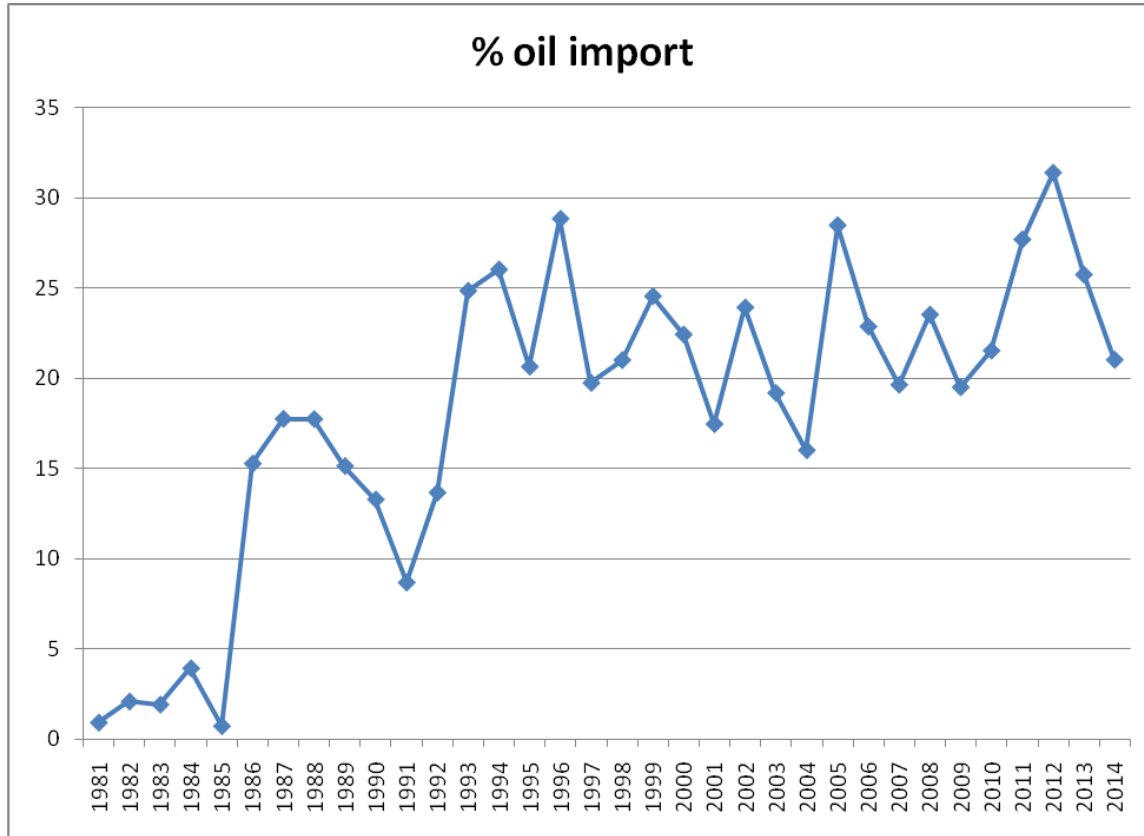|		
GDP	=	Nigeria Gross Domestic Product
OILR	=	Oil Revenue
OILEX	=	Oil Export
COR	=	Crude Oil Reserves
QCOB	=	Quantity of Crude Oil Produced
DC	=	Domestic Consumption
OILP	=	Oil price in dollar multiply by official Naira exchange

Figure 4.1 above shows the fluctuation of oil import to total import of the economy within the period covered in this study. The trend shows high fluctuation of the variable.
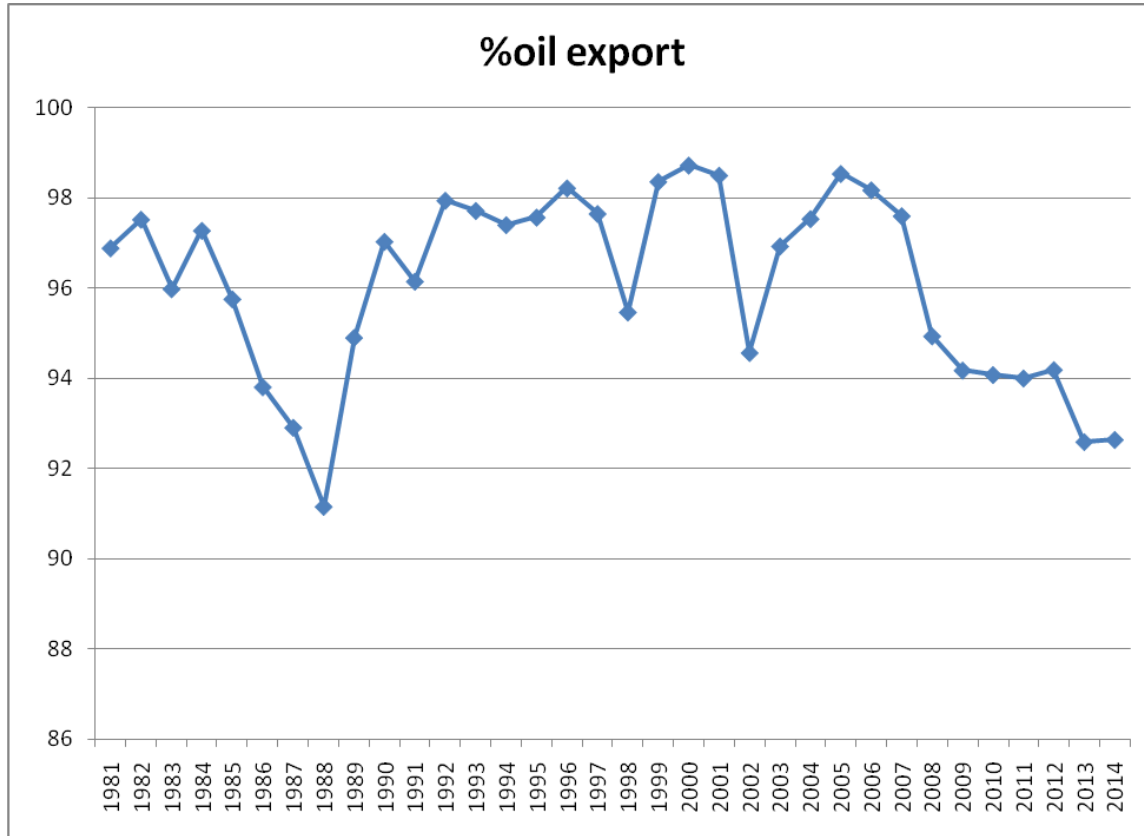
Figure 4.2 above shows fluctuation of oil export to total export of the economy. The shows oil export fluctuating within 90% of total export.
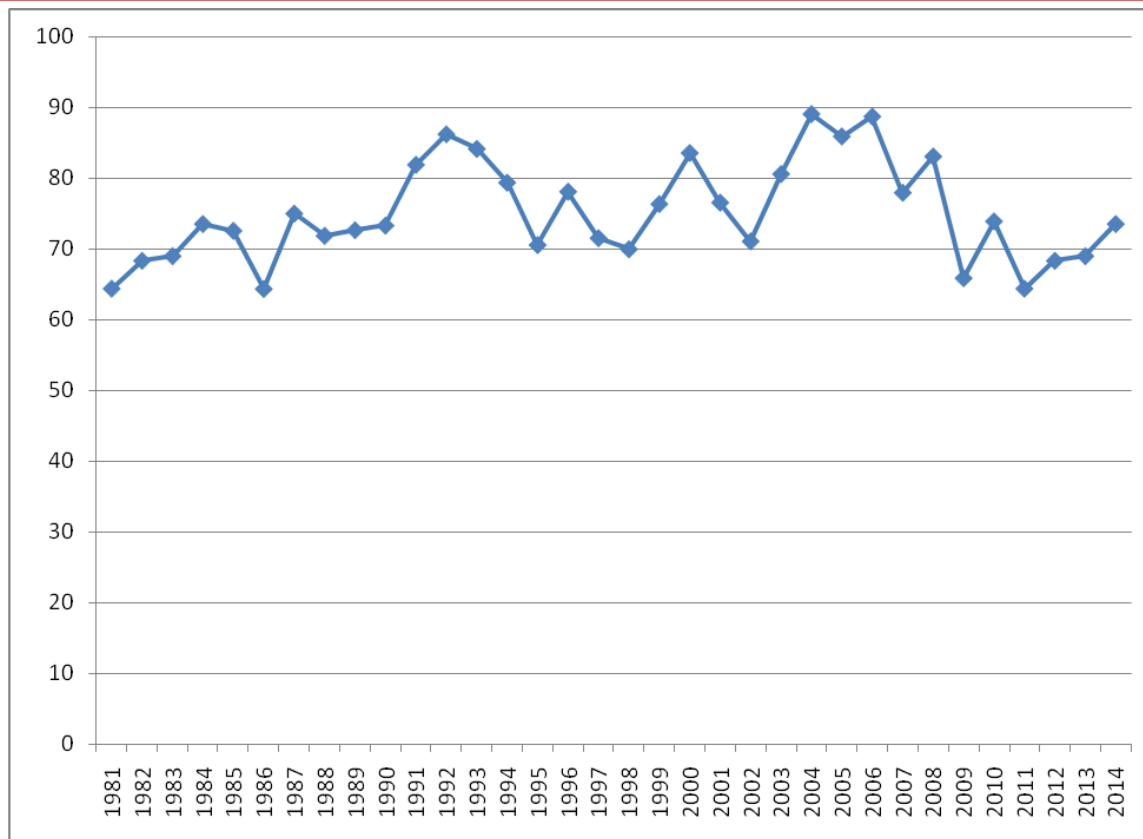
Figure 4.3 shows the fluctuation of Nigeria oil revenue to total revenue between 60% to 90% within the period of this study.

Table 3: OLS REGRESSION RESULTS
Dependent Variable: GDP

Variable	Coefficient	Std. Error	T-Statistics	Prob.
β_0	18594.86	13810.45	1.346434	0.1898
OILR	1.375723	2.807994	0.489931	0.6283
OILEX	3.128224	2.47330	1.264782	0.2172
COR	-1660.173	602.6085	-2.754978	0.0106
QOP	-1.925930	6.514779	-0.295625	0.7699
DC	0.149097	0.032250	4.626811	0.0001
OILP	-0.160308	1.155977	0.138678	0.8908
R_2	0.834749	-	-	-
Adj. R_2	0.717182	-	-	-
F-Statistics	53.20897	-	-	-
Prob.	0.000000	-	-	-
D. Watson	1.587293	-	-	-

Source: **Author's computation from E-view 7.0**

From the table above the co-efficient of determination which measures the extent to which the independent variables in the model can explain changes on the dependent variable shows that 83.4% and 71.7% variation in Nigerian Gross Domestic Products can be explained by the independent variables in the model, while the remaining 16.6% and 20.3% can be traced to exogenous variables. The F-statistics of 53.20897 and the probability of 0.000000 proved the significant of the overall regression model. The Durbin Watson statistics of 1.587293 is greater than 1.00 but less than 2.00 proved the presence of serial autocorrelation between the variables in the time series.

However coefficient of the regression variables proved that oil revenue, oil export and domestic consumption have positive effect on the growth of Nigerian economy. This finding confirms the a-piriori expectation of the result. The insignificant effect of oil revenue and oil export proved the existence of the **DUTCH DISEASE**, the positive effect of the variables confirm the empirical findings of Khadiyat and Aflobi (2011), Oriahi and Osaze (2013), Akanni (2007) and Akinlo (2012). The result further proved that crude oil reserve, quantity of crude oil produced and oil price have negative effect on the growth of Nigerian Economy. This finding is contrary to the expectation of the result. The negative effect can be traced to politics of the international oil market, fraudulent activities that characterize the Nigeria oil industry and shocks in oil price.

Table 4: ADF STATIONARITY TEST AT LEVEL

Variable	ADF Value	Mackinnon Value 1%	5%	10%	Prob.	Order of Integration
GDP	-0.197037	-4.323979	-3.580623	-3.225334	0.9898	1(0)
OILR	-1.372949	-3.661661	-2.910411	-2.619160	0.9984	1(0)
OILEX	-0.295814	-3.646342	-2.954021	-2.617434	0.0012	1(0)
COR	-0.022474	-3.646342	-2.954021	-2.615817	0.9998	1(0)
QOP	-0.983588	-3.6613661	-2.960411	-2.619160	0.7466	1(0)
DC	-1.991561	-3.653730	-2.957110	-2.617134	0.9998	1(0)
OILP	-1.819767	-4.323979	-3.5806223	-3.225334	0.9456	1(0)

Source: Author's computation from E-view 7.0

Table 5:ADF STATIONARITY TEST AT LEVEL

Variable	ADF Value	Mackinnon Value 1%	5%	10%	Prob.	Order of Integration
GDP	-10.19317	-4.323979	-3.580623	-3.225334	0.0000	1(1)
OILR	-1.372949	-3.661661	-2.910411	-2.619160	0.9984	1(1)
OILEX	-0.295814	-3.646342	-2.954021	-2.617434	0.0012	1(1)
COR	-0.022474	-3.646342	-2.954021	-2.615817	0.9998	1(1)
QOP	-0.983588	-3.6613661	-2.960411	-2.619160	0.7466	1(1)
DC	-1.991561	-3.653730	-2.957110	-2.617134	0.9998	1(1)
OILP	-1.819767	-4.323979	-3.5806223	-3.225334	0.9456	1(1)

Source: Author's computation from E-view 7.0

The Augmented Dickey Fuller Root Test presented in the table 4.2 and 4.3 above reveal that are variables are non-stationary at level as the respective values of ADF is less than the Mackinnon critical values at 1%, 5% and 10%, this is supported by the probability values of variables which are greater than 0.05 critical value. However, all the variables are stationary at first difference and are all co integrated in the order of 1 (1), this is proved as the respective values of ADF are greater than the Mackinnon critical values and the probability values are less than 0.05. This enables the study for further econometrics analysis.

Table 6: Correlation Matrix Results

Variable	GDP	OILR	OILEX	COR	QOP	DC	OILP
GDP	1.000000						
OILR	0.366725	1.000000					
OILEX	0.495108	0.235681	1.000000				
COR	0.315291	165.5770	43.11450	1.000000			
QOP	0.289408	1.800493	4.119211	8.926823	1.000000		
DC	-0.492316	0.314936	7.893450	10.118340	1.817345	1.000000	
OILP	0.404928	0.82617	0.643189	0.1145166	0.490310	0.259100	1.000000

Source: **Author's computation from E-view 7.0**

The correlation coefficient of the pair variables proved weak positive correlation between the dependent and the independent variables except DC with negative sign. The percentage proved 36.6%OILR, 49.5%OILEX, 31.5%COR, 28.9%, QOP – 49.2%DC and 40.4% OILP. This signifies that the pair with negative sign shows that the variables are inversely related with one another. The pairs that are positive show that a rise in one implies that the other variables in the pair will also rise.

Table 7: Johansen Cointegration Test (Trace)

Hypothesized	Eigen value	Trace statistics	Critical value	Prob.	Remark	Decision
$r \leq 0$	0.997644	424.9703	189.5297	0.0000	Significant	Reject H_0
$r \leq 1$	0.933943	231.3394	125.6154	0.0000	Significant	Reject H_0
$r \leq 2$	0.813322	144 .3877	95.75366	0.0000	Significant	Reject H_0
$r \leq 3$	0.773631	90.67982	69.81889	0.0005	Significant	Reject H_0
$r \leq 4$	0.414630	43.14104	47.85613	0.1292	Not Significant	Accept H_0
$r \leq 5$	0.308827	26.00471	29.79707	0.1286	Not Significant	Accept H_0
$r \leq 6$	0.224232	14.18502	15.49471	0.0780	Not Significant	Accept H_0
$r \leq 7$	0.172528	6.061172	3.841466	0.0138	Significant	Reject H_0

Source: **Author's computation from E-view 7.0**

The co integration test in the above table shows at least four cointegrating equations. This signifies the presence of long-run relationship among the variables.

Table 8: Normalized Cointegration Equations

Variables	Coefficient	STD Error	Relationship (Type)	Remark
GDP	1.000000	-	-	-
OILR	3.66725	0.25965	Positive	Expected
OILEX	7.378943	0.15917	Positive	Expected
COR	-364.5770	41.7065	Negative	Not Expected
QOP	5.035514	0.29200	Positive	Expected
DL	-0.054226	0.00358	Negative	Not Expected
OILP	-11.80901	0.10601	Negative	Not Expected

Source: **Author's computation from E-view 7.0**

The normalized co integration revealed the nature of long-run relationship that exists between the dependent and the independent variables. From the above, COR, DC and OILP have negative long-run relation. This means that increase in the variables will lead to decrease in GDP in the

long-run, this is contrary to the expectation. OILR, OILEX and QOP have positive long-run relationship which implies long-run increased.

Table 9: Analysis of Diagnostic Test Result

Test Statistics	T.M Version	Prob. Value	F-statistics	Prob. Value
J.B Normality Test	0.480330	0.786495	-	-
First Order Serial Correlation	3.655036	0.1608	1.445394	0.2554
White Heteroskedasiticity	39.46894	0.0045	17.18432	0.0000
Ramsey Test	27.98681	0.0000	31.94110	0.0000
Wald Test	8.964629	0.0113	4.482315	0.0213

Source: **Author's computation from E-view 7.0**

From the table, the probability value of 0.786498 is greater than 0.05, this means the residual is not normally distributed, we reject the alternate and accept the null hypotheses. The L.M value of 3.655036 and the probability value of 0.1608 proved the reject alternate hypotheses. The result of the While Heteroskedasiticity, test show the rejection of null hypothesis as the probability value are less than 005. The Ramsey test also shows significance and the rejection of null hypothesis

Table 10: Vector Error correlation Test

Variables	Adjusted perimeters	STD Error	T. statistic	Speed of Adj. %
GDP	1.000000	-	-	-
OILR	-6.998502	0.86682	-8.07378	86.7
OILEX	16.03696	0.75570	21.2213	75.6
COR	535.6468	68.7683	7.78916	68.8
QOP	4.280928	0.74648	5.73479	74.7
DC	-0.061964	0.00688	-9.00321	6.9
OILP	-12.87619	0.46745	-27.5456	46.8

Source: **Author's computation from E-view 7.0**

The objective of Vector Error Correction Model is to examine the speed to which the variables can be adjusted to equilibrium if there is any shock in the system. From the table above the variable with the highest speed of adjustment is oil revenue while the variable with the lowest speed of adjustment is domestic consumption.

TABLE 11: Granger Causality Test

Null Hypothesis		Obs.	Lag	F- statistic	Prob.	Decision
OILR	GDP	32	2	5.01923	0.0140	Reject H0
GDP	OILR	32	2	4.36169	0.0228	Reject H0
OILEX	GDP	32	2	7.18867	0.0431	Reject H0
GDP	OILEX	32	2	3.13924	0.0595	Reject H0
COR	GDP	32	2	1.41788	0.2597	Accept H0
GDP	COR	32	2	0.04588	0.9550	Accept H0
QOP	GDP	32	2	0.11537	0.8915	Accept H0
GDP	QOP	32	2	1.40207	0.2634	Accept H0

DC ⟶ GDP	32	2	2.87365	0.0735	Accept H0
GDP ⟶ DC	32	2	14.5479	0.2634	Reject H0
OILP ⟶ GDP	32	2	9.84827	0.0006	Reject H0
GDP ⟶ OILP	32	2	3.13.67	0.0599	Reject H0

Source: **Author's computation from E-view 7.0**

From the grander causality test result, oil revenue and Gross Domestic Product are causally related bi- directionary, oil export and Gross Domestic Product are casualty relation bi – directionary, crude oil reserve, quality of crude oil produce have no counsel relationship, oil price and Gross Domestic Product are bi- directionary related while domestic consumption and Gross Domestic Product have uni- directional relationship.

5. Conclusion and Recommendations

The objective of this study is to investigate the impact of Nigeria crude oil production on the growth of the economy. Published data were sourced from Central Bank of Nigeria Statistical Bulletin and world energy report. It is observed from the regression result oil export, oil revenue have positive impact on the growth of Nigeria economy but has not significantly result in the growth of the economy despite the trillions of naira generated from the oil on domestic consumption and export. To recall that Nigeria is the African largest exporter of crude oil a country that earns average of 3.4 trillion naira from crude oil. This proved the presence the **DUTCH DISEASE SYNDROME AND THE CLASSICAL THEORY OF THE PARADOX OF PLENTY IN NIGERIA**. This finding confirm the depleting level of infrastructure and high rate of poverty as the less than 1% that have access to the oil revenue continue to enrich themselves and launder the money abroad. The study concludes that crude oil production though significantly accounts for variation in the growth of Nigerian economy, the variables are statistically not significant due to fraud and misappropriation that is known in the sector. We recommend that:

1. Articulation policies should be formulated to manage the explanation and export of the crude oil to enhance Nigeria economy growth.
2. Oil Revenue should properly be accounted for and invested in the economy to enhance the growth of the economy.
3. Nigeria Economy should be deepened to enhance domestic consumption of crude oil.
4. There is need to deregulate the sector and formulate policies that will encourage private sector participation in the production and marketing of crude oil.
5. Domestic and international policies should be well managed to leverage Nigerian economy the negative effect of oil price shocks.

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