An Empirical Investigation of Oil Revenue and Economic Growth in Nigeria

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doi: 10.19044/esj.2016.v12n25p271 URL:http://dx.doi.org/10.19044/esj.2016.v12n25p271

Abstract

This empirical study examined oil revenue and economic growth in Nigeria between 1981 to 2014. Secondary data on gross domestic product (GDP), used as a proxy for economic growth; oil revenue (OREV), and government expenditure (GEXP) which represented the explanatory variables were sourced mainly from CBN publications. In the course of empirical investigation, various advanced econometric techniques like Augmented Dickey Fuller Unit Root Test, Johansen Cointegration Test and Error Correction Mechanism (ECM) were employed and the result reveals among others: That all the variables ware all stationary at first difference, meaning that the variables were not integrated of the same order justifying co-integration and error correction mechanism test. The cointegration result indicated that there is long run relationship among the variables with three cointegrating equation(s). The result of the error correction mechanism (ECM) test indicates that all the variables except lag of government expenditure exerted significant impact on economic growth in Nigeria. However, all the variables exhibited their expected sign in the shortrun but exhibited negative relationship with economic growth in the longrun except for government expenditure, which has positive relationship with economic growth both in the longrun and shortrun. The study concluded that Government should use the revenue generated from petroleum to invest in other domestic sectors such as Agriculture and manufacturing sector in order to expand the revenue source of the economy and further increase the revenue base of the economy.

Keywords: Oil Revenue, Government expenditure, Economic growth.
JEL Classification: F43, H53, O13, O47, Q28, Q34

Introduction

Background to the Study

Prior to the discovery of oil in Nigeria, agricultural sector was the main stay of Nigeria economy, contributing about 95% to her foreign exchange earnings, generating over 60% of her employment capacity and approximately 56% to her gross domestic earnings (World Bank, 2013). The major exportable crops were cocoa, palm products, cotton, ground nut, timber and rubber, with these products contributing most of Nigeria's export, Agriculture was the leading growth sector of the Nigerian economy while oil export was very poor. Infact, available literature on the Nigerian economy has it that Nigeria was primarily an agrarian economy, whose revenue generation was based on agriculture; statistics from the federal Bureau of statistic indicates that between 1958 and 1969, the contribution of petroleum (GDP) at current factor was just 0.007 percent. While agriculture formed the mainstay of the country's economy accounting for higher percentage of Gross Domestic Product (GDP).

Meanwhile, with the discovery of oil at Oloibiri area of Bayelsa State in 1956 by Shell BP, oil has remained a major source of energy and income in Nigeria. Although Nigeria's oil industry was founded at the beginning of the century, it was not until the end of the Nigeria civil war (1967-1970) that the oil industry began to play a prominent role in the economic life of the country.

Oil being the mainstay of the Nigerian economy plays a vital role in shaping the economic and political destiny of the country. The petroleum industry has been seen as the engine that drives the economic wheel of Nigerian economy. Its contribution can be viewed from the angle of employment generation, foreign exchange earnings, government revenue and gross domestic product.

After the discovery of oil in commercial quantity, petroleum industry in Nigeria became the largest industry. Oil provided approximately 90 percent of foreign exchange earnings and about 80 percent of Federal revenue and contributes to the growth rate of Gross domestic product (GDP) of the Nigerian economy.

The oil boom of the 1970s led to Nigeria's neglect of its strong agricultural and light manufacturing bases in favour of an unhealthy dependence on crude oil. In 2002 oil and gas exports accounted for more than 98% of export earnings and about 83% of federal government revenue. In 2011, fuel exports were 89 per cent of all merchandise exports. New oil wealth, the concurrent decline of other economic sectors, and a lurch toward a statist economic model fueled massive migration to the cities and led to increasingly widespread poverty, especially in rural areas. A collapse of basic infrastructure and social services since the early 1980s accompanied this trend. By 2002 Nigerian's per capita income had plunged to about one – quarter of

its mid – 1970s high, below the level at independence. Along with the endemic malaise of Nigeria's non – oil sectors, the economy continues to witness massive growth of "informal sector" economic activities (Igberaese, 2013).

Nigeria being one of OPEC member countries and the second largest producer of oil in Africa was said to have high consumption of petroleum products. The high demand for petroleum products could be as a result of rising incomes (Akinlo, 2012). However, lower prices (influenced by a subsidy), a teeming population (of which Nigeria happens to be the most populous country in Africa), and various other factors that could affect demand.

From the statistics provided by the world fact book (2005; Akinlo, 2012), Nigeria is said to have an oil production of about 2.451 million bbI/day, while she consumes about 310,000 bbI/day(2005 EST.). As at 2006, the level of consumption increased to 312,000 bbI/day with production level of 2.352 million bbI/day (2006 EST.). Nigeria, as at 2007 ranked 38th position in the world with respect to oil consumption. From these facts, it is quite obvious that Nigeria, despite the decrease in oil production in 2006, still has an increase oil consumption rate.

With Nigeria's rapid growth currently becoming stagnant at around 7 per cent and oil prices which continue to be volatile, there is much discussion on the topic of what can be done to ensure continuous growth regardless of the global market. This volatility has come from international shocks caused by financial crises, strikes, wars and decreased oil production. It is because of this volatility in oil prices and Nigeria's dependence on oil that many economists raise concern about the future of the economy. As alternative fuels become more popular and oil importing countries continue to discover oil deposits, there is a need for the Nigerian economy to look to other, more manageable sources of foreign exchange and government revenue to spur economic growth (Igberaese, 2013).

Oil- exporting countries of the developing world depend heavily on oil revenue for foreign exchange earnings and for the government budget in most cases reaching 90 percent or above. The petroleum industry covers the exploration and production of crude oil as well as petroleum refining, marketing and servicing.

Statement to the Problem

Since the discovery of oil, petroleum industry has played significant role towards the development of Nigerian economy, the impacts are both positive and negative. Various scholars have advocated for the development of other sectors owing to their belief in the negative falconets of the oil industry. While others argued that the sector should be promoted and developed for its benefits.

Nigeria is estimated to has 37.2 billion barrels of oil reserves in 2011 and produces an average of 2.13 million barrels per day (Igberaese, 2013). The hydrocarbon sector also accounts for 82 per cent of the federal government's revenue (World Bank, 2013). This suggests that Nigeria is heavily dependent on the oil sector for the majority of government spending, infrastructure and most economic development activities. With the increasing volatility of oil prices, the discovery of oil in other parts of the world and the instability of the global economy, oil imports from Nigeria to major economies such as the United States has steadily decreased. The U.S once imported 9-11% of its crude oil from Nigeria but in the first half of 2012, the share of imported oil from Nigeria to the U.S has dropped to 5% (Igberaese, 2013).

Over dependence on oil revenue tends to distort and discourage sourcing of funds from other source by the government, for example, as a result of huge oil revenue flows; countries tend to de-emphasize income taxes as a source of government revenue. Besides, low tax ratios and high consumption expenditures (typically on imported goods) reinforce inflationary tendencies with regard to expenditure; government pay less or no attention to infrastructural development, encouragement of private sector investment, mechanizing the agricultural and manufacturing sector of the economy because of reliance on petroleum revenue.

However, it is noted that large proceeds obtain form the domestic sales and exports of petroleum products, acts like a multipliers to other sector of the economy through government expenditure; this has generated the needs to properly investigate the relationship between oil revenue and Nigeria economic growth. This study aims at achieving the following objectives:

1. Examine the long-run relationship between oil revenue and economic growth in Nigeria; and
2. Determine the extent which oil revenue impacted on the economic growth in Nigeria.

Review of related literature

Theoretical Literature

Classical theory of economic growth: The traditional classical and neoclassical growth models developed by Solow (1956) and Mincer (1958) in the late 1950's, showed that the output of an economy grows in response to larger inputs of capital and labour (all physical inputs). Non-economic variables such as human capital or human health variables have no function in these models.

This theory revealed how capitals including technology leads to increase in productivity and efficiency of workers and expand production of goods and services. In economic lexicon, this simply means that the technological progress is "exogenous" to the system. In summary the

conventional "neoclassical" growth theory as modelled by Solow (1956) holds the view that economic growth is a result of the accumulation of physical capital and an expansion of the labour more productive.

Resource endowment theory of growth: The major advocates of this theory was Adam Smith "absolute cost advantage", David Ricardo " Comparative cost advantage" among others, they argues that countries should specialize to produce and export according to their comparative advantage. The theory of comparative advantage suggests a country gains the greatest economic benefit relative to other countries by producing at lower overall cost, commodities which a country has in abundance or can be easily produced. Other countries will therefore benefit form trade only if they accept the cost advantage of the trading country and focus on producing a commodity in which they have an advantage (Igbesere, 2013). It is this theory that guides resource endowment economist's belief in free trade, specialization and the international division of labour. This was their reasoning behind why some countries produce agricultural and mineral commodities while others produce industrial goods (O'Toole, 2007; Igbeasere, 2013).

The doctrine of comparative advantage according to the Heckscher-Ohlin (HO) theory states that countries produce and export the commodities which require the use of its abundant productive factors intensely (Feenstra, 2004). This model is based on the assumption of two countries, two goods and two factors and assumes that both countries have identical technologies, identical tastes, free trade in goods and different factor endowments (Feenstra, 2004). This theory was based on the proposition that countries (developed nations: Japan, Germany, United Kingdom, etc.) with an abundance of capital would export capital intensive goods and import labour intensive goods, while countries (most third world countries: African and part of Asian countries) with an abundance of labour would export labour intensive goods and import capital intensive goods (Igbeasere, 2013).

A number of empirical work has evolved to test the HO theory including Leontief (1953), he studied the U.S economy in order to prove the doctrine of comparative advantage. He utilized U.S. economy data on input-output accounts and U.S trade data from 1947 to evaluate the Heckscher-Ohlin-Samuelson (HOS) model (Igbeasere, 2013). He first measures the labour and capital used directly and indirectly in each exporting industry in order to determine the amount of labour and capital required in the production of one million dollars of U.S exports and imports (Feenstra, 2004). Leontief finds that each person employed works with $13,700 worth of capital in producing the exports and each person employed works with $18,200 worth of capital in producing the imports. Although the U.S was capital abundant in 1947, Leontief's findings appear to contradict the HO theory and his study

would come to be known as the Leontief Paradox (Feenstra 2004; Igbeasere, 2013).

New Institutional Economist: This group developed as a reaction to the resource endowment economist, they argued that the resource endowment economists' assumptions of perfect information, no transaction costs, perfect competition and unbounded rationality are not always valid. These groups instead of accepting the postulation of resource endowment economist assume individuals do not have perfect information and due to their limited mental capacity create formal and informal institutions to reduce the risk of uncertainty and transaction costs. Individuals develop systems of organization to motivate agents. Therefore, the performance of the economy is dependent on the formal and informal institutions (Menard and Shirly, 2008; Igbeasere, 2013). According to NIE, transaction costs are dependent on the institutional setting; therefore, the political institutions are influential in rules, laws and contracts (Menard et al. 2008). However, both NIE and resource endowment economist accept the assumptions of competition and scarcity (Menard et al, 2008; Igbeasere, 2013).

NIE attempts to answer the question surrounding the inability of countries to foster sustainable growth and looks to the role of institutions for the answer. NIE ultimately believes that the quality of institutions will fundementedly determine the countries which experience good economic growth and the countries which do and not (Frankel 2010; Igbeasere, 2013). According to NIE, countries with high transaction costs have less trade, specialization, investment and productivity (Shirley, 2008). As Sachs and Warner (1995) points out, per capita income of resource poor countries grew three times faster between 1960 and 1990 than resource abundant countries.

Empirical Literature

The role of oil revenue to the development and well-being of many oil producing countries most especially Nigeria has remained one of the focal concern of macroeconomists and researchers for decades. A number of literatures abound on the said role of oil revenue to the economic life of the oil producing countries at large. However, there is conflicting results on the nature of the relationship between the two concepts, with some indicating reverse causality and others resulting in insignificant parameters, leading to the need for more indepth research on the subject.

Odularu (2008) examined the relationship between the crude oil sector and the Nigerian economic performance. Using the Ordinary Least Square regression method, the study revealed that crude oil consumption and export contributed to the improvement of the Nigerian economy. The study recommends that government should implement policies that would encourage the private sector to participate actively in the crude oil sector.

On the other hand, Ibeh (2013) investigated the impact of the oil industry on the economic growth performance of Nigeria. Using ordinary least square (OLS) regression technique, she regressed Gross Domestic Product (GDP), against oil Revenue (OREV) and time appeared as repressor's. A two-tailed test of 5% significant levels were conducted indicating that the two explanatory variables did not have any significant impact on growth performance of the Nigerian economy within the same period. The researcher therefore recommends that government should formulate appropriate policy mix that would motivate the firm in the oil sector to enhance improved performance and contribution of the sector. Her findings contradict the findings of Odularu (2008), who find a positive relationship between oil sector and Nigeria economic performance.

Akinlo (2012) assessed the importance of oil in the development of the Nigerian economy in a multivariate VAR model over the period 1960-2009. He model oil sector against other four sectors i.e. manufacturing, agriculture, trade & service and building & construction. Empirical evidence shows that the five subsectors are cointegrated and that the oil can cause other non-oil sectors to grow. However, oil had adverse effect on the manufacturing sector. Granger causality test finds bidirectional causality between oil and manufacturing, oil and building & construction, manufacturing and building & construction, manufacturing and trade & services, and agriculture and building & construction. It also confirms unidirectional causality from manufacturing to agriculture and trade & services to oil. No causality was found between agriculture and oil, likewise between trade & services and building & construction. The paper recommends appropriate regulatory and pricing reforms in the oil sector to integrate it into the economy and reverse the negative impact of oil on the manufacturing sub sector.

The findings of Ibeh and Akinlo revealed that petroleum industry have not rely contributed significantly to Nigeria economy this owned to the fact that Nigeria government have not used her revenue generated from the sector efficiently. The industry has faced enormous challenges such as lack of infrastructures, lack of proper turn around maintenance in the oil and gas industries, high rate of corruption, militant insurgences, the recent Boko haram, bunkering, and all sorts of criminal activities.

Nwezeaku (2010) point that, the economy has been bedeviled by perennial underdevelopment, poverty, increasing debt burden due to multiple problems such as poor energy supply and power outages, systematic collapsing of industries and infrastructures, lack of proper turn around maintenance in the oil and gas industries, high are of corruption, militant insurgences, criminal activities etc. The is really faced with poor human developmental and economic indices as evidenced by high rate of perennial and persistent inflation, low per capital income, poor income distribution,

GDP and sustained impoverishment, mismanagement of abundant natural, human and material resources, insatiability greed and loss for excessive wealth. Corruption practices at all levels and political banditry have been the bane of the Nigeria economy.

Shihab (2001) have linked abundant natural resources to show economic collapse, civil conflict and socio-economic collapse. They further state that, all natural resources, oil has been found to have the highest risk of civil conflict because of the large rents it offers. Therefore Nigeria needs to be careful about the way it manages her petroleum to avoid socio-economic collapse.

Ibaba (2005) posits that the Nigeria economy has been facing developmental crisis such as high level of poverty, declining economic growth, collapse of local economics and social infrastructure. There have been corruption, financial indiscipline, lack of proper accountability of oil revenue, co-existence of abundant foreign reserves have become the order of the day (Shihab, 2001; Ibeh, 2013).

The works of Nwezeaku (2010), Shihab (2001) and Ibaba (2005) provided evidence to contradict the facts that abundance of natural resources do not really spur economic growth but rather leads to several ethnic crisis and civil unrest. At the same vein Sachs and Warner (1997) provide empirical evidence to explain the slow growth in Sub Saharan Africa from 1965-1990. They hypothesize that factors such as geography, economic policy, demography and initial conditions all explain the growth in Africa in recent decades (Sachs and Warner, 1997). Therefore they run regressions using a variety of variables as determinants of growth and estimate a variety of factors which were shown to influence growth in Africa. Natural resource endowments were found to correlate with slower growth as the work from Sachs and Warner (1995) also showed. The regression showed that as natural resource exports increased GDP by .1, growth was projected to decrease by .33 percentage points annually (Sachs and Warner, 1997).

Methodology

Model Specification

Following the research work of Akinlo (2012) in assessing the importance of oil in the development of the Nigerian economy in a multivariate VAR model over the period 1960-2009. The adapted form of the model is expressed in a multiple regression and modified with the incorporation of exogenous factors considered includes: oil revenue (OREV), government expenditure (GEXP). Government expenditure was incorporated in the model because revenue from oil export constitutes 82 percent of government revenue which form their expenditure (World Bank, 2013).

The dynamic form of the modified adapted multiple regression model (1) is considered by incorporating first autoregressive i.e [AR(1)= ΔGDP_{t-1}] as one of the explanatory variables. Therefore the functional form of the model is expressed below;

$GDP_t = F(GDP_{t-1}, OREV_t, GEXP_t)$……1

The mathematical and econometric form of the model is as given below;

$\Delta GDP_t = \delta_0 + \delta_1 \Delta GDP_{t-1} + \delta_2 \Delta OREV_t + \delta_3 \Delta GEXP_t + U_t$……..……2

Where;

δ_0 = constant term/parameter intercept

δ_1, δ_2, and δ_3, = coefficients of the parameters estimates.

U_t = Error Term.

δ_1, δ_2, and δ_3, > 0

Evaluation procedure

The properties of the time series were examined using the Augmented Dickey-Fuller (ADF) unit root tests to determine their long-run convergence and stationary levels, also was error correction mechanism was used to estimate the short run speed of adjustment from this equilibrium.

Data Source

The time series data on real gross domestic product, trade openness, foreign direct investment, external debt, and exchange rate were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin various issues and the World bank publications.

Result and discussion

Unit Root Test Results

To properly examine the trend relationship and the nature of stationarity in this study, the researcher adopted the Augmented Dicks-Fuller test (ADF) at trend only in order to eliminate the possibility of obtaining spurious result. Thus, below is the tabular representation of the empirical results.

Table1: Augmented Dickey Fuller Unit Root Test Trend and Intercept

Variables	Level	1st difference	2ND Difference	Critical value (5%)	Order of integration	Remark
D(GDP)	-2.128327	-5.279981	-	-3.557759	I(1)	Stationary
D(OREV)	-1.622279	-6.416124	-	-3.568379	I(1)	Stationary

D(GEXP)	-1.017561	-8.414963	-	-3.574244	I(1)	Stationary

Source: Researchers Computation December, 2016 (See Appendix)

From table 1 above none of the variables ware stationary at level since their critical value is less than 5% level of significance, but after differencing the variables by one all became stationary. This means that all the variables were stationary at first difference since their critical value is greater than 5% level of significance i.e. (-5.279981, -6.416124, and -8.414963> -3.568379)

Hence, since all the variables are not stationary at level and are not integrated at level, co-integration analysis is justified. We there proceed to conduct the long run relationship of the variables and their short term speed of adjustment to equilibrium.

Cointegration Test

The result of the test is summarized below:

TABLE 2

Series: GDP OREV GEXP

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.867230	101.9105	29.79707	0.0000
At most 1 *	0.551708	37.29816	15.49471	0.0000
At most 2 *	0.304592	11.62422	3.841466	0.0007

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

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

Source: Researchers Computation December, 2016 (See Appendix)

This test is used to test for the long run relationship between the variables under consideration; it was carried out using the augmented eagle – Granger test on the residuals under the following hypothesis:

$H_{0:}$ $\delta = 0$ (Not- cointegrated)

H_1: $\delta \neq 0$ (cointegrated)

Decision Rule: Reject H_0 if T*. Adf (trace Statistic) > T-Adf (Critical Value), Accept if otherwise.

From table 2 above it can be seen that the trace statistic (t*) is greater than the T-adf i.e. the critical value at 5% or since the Eigen value are greater than 5% level of significance, we reject H_o and conclude that the variable are cointegrated. Put differently, there is a sustainable long-run relationship (i.e. steady-state path) between gross domestic product (GDP), Oil revenue (OREV), and Government expenditure (GEXP). The normalized co-

integrating coefficients for one co-integrating equation given by the long-run relationship is

GDP = 3734.527 + 1.718481OREV - 16.69059GEXP

Where GDP is the dependent variable, 1.718481 is the coefficient of Oil revenue (OREV), and -16.69059 is the coefficient of government expenditure (GEXP).

The positive sign of oil revenue indicate a direct relationship between both variables. This implies that revenue generated from oil sales has potential significant impact on Nigeria economic growth through government expenditure in the long run. Although, there was an inverse relationship between OREV and GDP in the short run. This might be as a result of the fact that the policy maker has so relied on oil revenue to the detriment of other promising sector especially the agriculture sector, which if not corrected may have serious effect on the economic growth of Nigeria in the long run.

Error Correction Mechanism

The existence of a long-run co-integrating equilibrium provides for short-term fluctuations. In order to strengthen out or absolve these fluctuations, an attempt was made to apply the Vector Error Correction Mechanism (ECM). As noted, the VECM is meant to tie the short-run dynamics of the co-integrating equations to their long-run static dispositions. Table 3 below shows the error correction mechanism result.

Table 3: Vector Error Correction Mechanism Result

Sample (adjusted): 1983 2012

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Remarks
C	1532.814	707.623	2.16615	0.0338	Reject
D(GDP(-1))	0.585738	0.12777	4.58415	0.0000	Reject
D(OREV(-1))	-3.131149	0.43105	-7.26396	0.0000	Reject
D(GEXP(-1))	-5.324755	3.73886	-1.42417	0.1589	Accept
ECM(-1)	-0.519923	0.13632	-3.81406	0.0003	Reject

Source: Researchers Computation December, 2016 (See Appendix)

$R^2 = 0.8946$, $F^* = 27.89$

From the result the coefficient of error correction term is -0.5199. This showed that 51.99% of the errors in the short run are corrected each year. Thus, the coefficient captures the speed for adjustment at which the short-run of GDP ties with its long-run. The result is significant since the coefficient of multiple (0.8946) determination is greater than zero and the error correction variable (ECM), is negative which shows that there is a feedback from the previous year's disequilibrium.

A mere observation of the individual parameters reveals that all the variables ware significant since their p-value is greater than 5% level of

significance, except government expenditure which was not significant given the 5% level of significance and its P-value. The a priori expectation of the oil revenue is expected to be positive, which mean that the higher the level of revenue generated from oil the higher the economic growth. The regression result showed that the coefficient is negative, even though it has a positive relationship with economic growth in the long-run as revealed by the VECM result. This variable is expected to have positive relationship with economic growth both in the short run and in the long-run. The positive relationship between the two variables signifies that revenue generated from oil has form the major source of revenue of Nigeria government since its discovery in commercial quantity at Oloibiri area of Bayelsa state.

Since its discovery, the sector has contributed to over 80% of government revenue in Nigeria; the flux of revenue from the sector has led to the neglect of other sectors especially the agricultural sector, which is why the short term result reveals a negative relationship between oil revenue and economic growth at large. The Oil mining and export on the other hand is positively related to economic growth. The discovery oil in large quantity has increase the flow of FDI in the country, either through purchase or the establishment of new production facilities (i.e. green field" investment), the flow of FDI contribute to capital formation and to export earnings, contribution to technological change and growth of the economy.

The result revealed that the government expenditure has negative with economic growth in both the short and long run. The sign of government expenditure is expected to be positive for economic growth to take place. This has to do mainly with the state and expenditure pattern of government. The expenditure of government through accelerator principle is supposed to spur every other sector of the economy. As postulated by Keynes, if an economy is experiencing recession government can through her expenditure boost the economy; by increasing her expenditure thereby raising the aggregate demand of the economy depending on the multiplier. In Nigeria oil revenue constitute 80% of government revenue which they intern expend to drive the economy, if government spend in without adhering to certain guiding principles such as principle of sanction, principle of economy among others it can lead to negative relationship between government spending and economic growth in both short and long-run.

Summary, conclussion and recomendation

The paper investigated the relationship between oil revenue and economic growth in Nigeria between 1981 and 2014. Error Correction Mechanism was used to estimate the regression result. Cointegration test and Unit root test was also conducted to determine the stationarity and long-run relationship between the variables. The results showed that oil revenue has

positive relationship in the long-run but has a negative relationship with economic growth in the short-run. The implication is that revenue generated from oil is yet to be used effectively and efficiently in Nigeria. Embezzlement of funds and reckless spending of revenue generated from oil has remains one of the major problem of Nigeria economy. Nigeria needs to improve on her trade with the rest of the world, the revenue generated from oil should be used judiciously to develop other sector of the economy most especially the agricultural sector and the manufacturing sector at large.

Also sound macroeconomic policies are needed to reinforce the growth exercise for a better result in the country. The positive sign is an indicator that Nigeria at large is benefitting from oil revenue; this could be a product of the oil export in Nigeria which makes Nigeria to enjoy a favourable balance of payment. This outcome is expected, oil export encourage or leads to favourable balance of payment which boost the currency and image of the country in the international scene. This is needed to attract foreign direct investment which is essential for all developing countries and Nigeria is no exception. Sequel to the finding of this research work, it has been established that with the present situation and policies adopted to stabilize the economy in Nigeria, the country stands a good chance of benefiting from oil revenue. Government should use the revenue generated from petroleum to invest in other domestic sector such as Agriculture and manufacturing sector in order to expand the revenue source of the economy and also increase the revenue. The Nigerian government should invest oil revenue more on the economic sectors that has significant and direct bearing on the economy in order to improve the value of gross domestic product. Government should give training on quality systems, technology development and directly acquire foreign technology for use by local firms. Government should focus not only on petroleum revenue generation but should also re-direct its attention to proper management of the revenue and effective control of necessary expenditure.

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APPENDIX I
DATA FOR REGRESSION

YEARS	GDP (₦ 'Billions)	OREV (₦ 'Billions)	GEXP (₦ 'Billions)
1981	94.3300 \	8.560000	11.41000
1982	101.0100	7.810000	9.640000
1983	110.0600	7.250000	11.92000
1984	116.2700	8.270000	9.930000
1985	134.5900	10.92000	13.04000
1986	134.6000	8.110000	16.22000
1987	193.1300	19.03000	22.02000
1988	263.2900	19.83000	27.75000
1989	382.2600	39.13000	41.03000
1990	472.6500	71.89000	60.27000
1991	545.6700	82.67000	66.58000
1992	875.3400	164.0800	92.80000
1993	1089.680	162.1000	191.2300
1994	1399.700	160.1900	160.8900
1995	2907.360	324.5500	248.7700
1996	4032.300	408.7800	337.2200
1997	4189.250	416.8100	428.2200
1998	3989.450	324.3100	487.1100
1999	4679.210	724.4200	947.6900
2000	6713.570	1591.680	701.0600
2001	6895.200	1707.560	1018.030
2002	7795.760	1230.850	1018.160
2003	9913.520	2074.280	1225.970
2004	11411.07	3354.800	1426.200
2005	14610.88	4762.400	1822.100
2006	18564.59	5287.570	1938.000
2007	20657.32	4462.910	2450.900
2008	24296.33	6530.630	3240.820
2009	24794.24	3191.940	3452.990
2010	54612.26	5396.090	4194.580
2011	62980.40	8878.970	4712.060
2012	71713.94	8025.970	4605.390
2013	80092.56	6809.230	5185.320
2014	89043.62	6793.720	4578.060

SOURCE: CENTRAL BANK OF NIGERIA (CBN) STATISTICAL BULLETINE, 2014

APPENDIX II
REGRESSION RESULT
UNIT ROOT RESULT (@ LEVEL)

Null Hypothesis: LOG(GDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.128327	0.5118
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GDP))
Method: Least Squares
Date: 12/26/15 Time: 18:23
Sample (adjusted): 1982 2014
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDP(-1))	-0.258735	0.121568	-2.128327	0.0416
C	1.248124	0.494267	2.525201	0.0171
@TREND(1981)	0.058333	0.027534	2.118598	0.0425

R-squared	0.131237	Mean dependent var	0.207578
Adjusted R-squared	0.073320	S.D. dependent var	0.186637
S.E. of regression	0.179665	Akaike info criterion	-0.508939
Sum squared resid	0.968384	Schwarz criterion	-0.372892
Log likelihood	11.39749	Hannan-Quinn criter.	-0.463163
F-statistic	2.265938	Durbin-Watson stat	1.719175
Prob(F-statistic)	0.121204		

Null Hypothesis: LOG(OREV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.622279	0.7622
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(OREV))
Method: Least Squares
Date: 12/26/15 Time: 18:25
Sample (adjusted): 1982 2014
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(OREV(-1))	-0.226375	0.139541	-1.622279	0.1152
C	0.631576	0.253499	2.491429	0.0185
@TREND(1981)	0.052232	0.035829	1.457815	0.1553

R-squared	0.093877	Mean dependent var	0.202323
Adjusted R-squared	0.033469	S.D. dependent var	0.386252
S.E. of regression	0.379734	Akaike info criterion	0.987816
Sum squared resid	4.325933	Schwarz criterion	1.123862
Log likelihood	-13.29896	Hannan-Quinn criter.	1.033591
F-statistic	1.554039	Durbin-Watson stat	1.975874
Prob(F-statistic)	0.227934		

Null Hypothesis: LOG(GEXP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.017561	0.9277
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GEXP))
Method: Least Squares
Date: 12/26/15 Time: 18:27
Sample (adjusted): 1982 2014
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GEXP(-1))	-0.124467	0.122319	-1.017561	0.3170
C	0.474498	0.245689	1.931300	0.0629
@TREND(1981)	0.024094	0.027275	0.883362	0.3841

R-squared	0.053139	Mean dependent var	0.181653
Adjusted R-squared	-0.009985	S.D. dependent var	0.225645
S.E. of regression	0.226769	Akaike info criterion	-0.043263
Sum squared resid	1.542724	Schwarz criterion	0.092783
Log likelihood	3.713838	Hannan-Quinn criter.	0.002512
F-statistic	0.841813	Durbin-Watson stat	2.362512
Prob(F-statistic)	0.440855		

UNIT ROOT RESULT (@ FIRST DIFFERENCE)

Null Hypothesis: D(LOG(GDP)) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.279981	0.0008
Test critical values:	1% level	-4.273277	
	5% level	GH	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GDP),2)
Method: Least Squares
Date: 12/26/15 Time: 18:24
Sample (adjusted): 1983 2014
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(GDP(-1)))	-0.976220	0.184891	-5.279981	0.0000
C	0.219079	0.082074	2.669278	0.0123
@TREND(1981)	-0.000695	0.003719	-0.186868	0.8531

R-squared	0.491511	Mean dependent var	0.001173
Adjusted R-squared	0.456443	S.D. dependent var	0.263302
S.E. of regression	0.194123	Akaike info criterion	-0.351589
Sum squared resid	1.092829	Schwarz criterion	-0.214176
Log likelihood	8.625426	Hannan-Quinn criter.	-0.306041
F-statistic	14.01588	Durbin-Watson stat	2.008506
Prob(F-statistic)	0.000055		

Null Hypothesis: D(LOG(OREV)) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.416124	0.0000
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(OREV),2)
Method: Least Squares
Date: 12/26/15 Time: 18:26
Sample (adjusted): 1983 2014
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(OREV(-1)))	-1.158607	0.180577	-6.416124	0.0000
C	0.378844	0.156434	2.421741	0.0219
@TREND(1981)	-0.007670	0.007520	-1.019984	0.3162

R-squared	0.587652	Mean dependent var	0.002794
Adjusted R-squared	0.559215	S.D. dependent var	0.588834
S.E. of regression	0.390937	Akaike info criterion	1.048519
Sum squared resid	4.432121	Schwarz criterion	1.185932
Log likelihood	-13.77631	Hannan-Quinn criter.	1.094068
F-statistic	20.66450	Durbin-Watson stat	2.101900
Prob(F-statistic)	0.000003		

Null Hypothesis: D(LOG(GEXP)) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.414963	0.0000
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GEXP),2)
Method: Least Squares
Date: 12/26/15 Time: 18:28
Sample (adjusted): 1983 2014
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(GEXP(-1)))	-1.381155	0.164131	-8.414963	0.0000
C	0.378680	0.085022	4.453897	0.0001
@TREND(1981)	-0.006468	0.003890	-1.662710	0.1071

R-squared	0.712471	Mean dependent var	0.001375
Adjusted R-squared	0.692641	S.D. dependent var	0.365439
S.E. of regression	0.202599	Akaike info criterion	-0.266114
Sum squared resid	1.190346	Schwarz criterion	-0.128702
Log likelihood	7.257831	Hannan-Quinn criter.	-0.220566
F-statistic	35.92964	Durbin-Watson stat	1.928080
Prob(F-statistic)	0.000000		

COINTEGRATION RESULT

Date: 12/26/15 Time: 18:29
Sample (adjusted): 1983 2014
Included observations: 32 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP OREV GEXP
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.867230	101.9105	29.79707	0.0000
At most 1 *	0.551708	37.29816	15.49471	0.0000
At most 2 *	0.304592	11.62422	3.841466	0.0007

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**

None *	0.867230	64.61234	21.13162	0.0000
At most 1 *	0.551708	25.67394	14.26460	0.0005
At most 2 *	0.304592	11.62422	3.841466	0.0007

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

GDP	OREV	GEXP
-0.000152	6.36E-06	0.002729
-6.51E-05	0.001213	-0.002014
0.000108	0.001399	-0.003611

Unrestricted Adjustment Coefficients (alpha):

D(GDP)	2986.456	-1480.459	-750.7420
D(OREV)	-41.23235	253.8571	-492.6699
D(GEXP)	186.2364	125.4527	-4.094033

1 Cointegrating Equation(s): Log likelihood -764.9062

Normalized cointegrating coefficients (standard error in parentheses)

GDP	OREV	GEXP
1.000000	-0.041849	-17.95796
	(0.89952)	(1.77837)

Adjustment coefficients (standard error in parentheses)

D(GDP)	-0.453812
	(0.07841)
D(OREV)	0.006266
	(0.02796)
D(GEXP)	-0.028300
	(0.00538)

2 Cointegrating Equation(s): Log likelihood -752.0692

Normalized cointegrating coefficients (standard error in parentheses)

GDP	OREV	GEXP
1.000000	0.000000	-18.06803
		(0.51579)
0.000000	1.000000	-2.630143
		(0.15143)

Adjustment coefficients (standard error in parentheses)

D(GDP)	-0.357503	-1.776471
	(0.07111)	(0.52173)

D(OREV)	-0.010249	0.307609
	(0.02932)	(0.21512)
D(GEXP)	-0.036461	0.153330
	(0.00429)	(0.03145)

VECTOR ERROR CORRECTION

Vector Error Correction Estimates
Date: 12/26/15 Time: 18:32
Sample (adjusted): 1984 2014
Included observations: 31 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
GDP(-1)	1.000000
OREV(-1)	1.718481
	(0.93153)
	[1.84479]
GEXP(-1)	-16.69059
	(1.99773)
	[-8.35477]
C	3734.527

Error Correction:	D(GDP)	D(OREV)	D(GEXP)
CointEq1	-0.519923	-0.223663	-0.031344
	(0.13632)	(0.05130)	(0.01203)
	[-3.81406]	[-4.35969]	[-2.60457]
D(GDP(-1))	0.585738	0.232940	0.039860
	(0.12777)	(0.04809)	(0.01128)
	[4.58415]	[4.84409]	[3.53376]
D(GDP(-2))	0.548105	0.133205	-0.016382
	(0.14849)	(0.05588)	(0.01311)
	[3.69112]	[2.38356]	[-1.24968]
D(OREV(-1))	-3.131149	-0.183655	0.019490
	(0.43105)	(0.16223)	(0.03805)
	[-7.26396]	[-1.13210]	[0.51217]
D(OREV(-2))	0.417070	-0.061232	0.139950
	(0.62768)	(0.23623)	(0.05541)
	[0.66446]	[-0.25921]	[2.52565]
D(GEXP(-1))	-5.324755	-5.189984	-0.619377

	(3.73886)	(1.40711)	(0.33007)
	[-1.42417]	[-3.68840]	[-1.87653]
D(GEXP(-2))	0.178249	-4.921231	-0.014240
	(3.69487)	(1.39055)	(0.32618)
	[0.04824]	[-3.53905]	[-0.04366]
C	1532.814	962.0293	147.3366
	(707.623)	(266.312)	(62.4687)
	[2.16615]	[3.61242]	[2.35857]
R-squared	0.894600	0.626872	0.669268
Adj. R-squared	0.862521	0.513311	0.568610
Sum sq. resids	1.04E+08	14785572	813546.3
S.E. equation	2130.426	801.7799	188.0733
F-statistic	27.88797	5.520138	6.648960
Log likelihood	-276.9469	-246.6523	-201.7022
Akaike AIC	18.38367	16.42918	13.52918
Schwarz SC	18.75373	16.79924	13.89924
Mean dependent	2868.825	218.9184	147.2948
S.D. dependent	5745.779	1149.289	286.3469

Determinant resid covariance (dof adj.)	5.90E+16
Determinant resid covariance	2.41E+16
Log likelihood	-716.6430
Akaike information criterion	47.97697
Schwarz criterion	49.22592

System: UNTITLED
Estimation Method: Least Squares
Date: 12/26/15 Time: 18:33
Sample: 1984 2014
Included observations: 31
Total system (balanced) observations 93

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.519923	0.136317	-3.814062	0.0003
C(2)	0.585738	0.127774	4.584153	0.0000
C(3)	0.548105	0.148493	3.691119	0.0004
C(4)	-3.131149	0.431053	-7.263961	0.0000
C(5)	0.417070	0.627682	0.664461	0.5086
C(6)	-5.324755	3.738857	-1.424167	0.1589
C(7)	0.178249	3.694866	0.048242	0.9617
C(8)	1532.814	707.6226	2.166146	0.0338
C(9)	-0.223663	0.051303	-4.359689	0.0000
C(10)	0.232940	0.048088	4.844086	0.0000
C(11)	0.133205	0.055885	2.383557	0.0199
C(12)	-0.183655	0.162225	-1.132096	0.2615

C(13)	-0.061232	0.236226	-0.259208	0.7962
C(14)	-5.189984	1.407108	-3.688404	0.0004
C(15)	-4.921231	1.390552	-3.539047	0.0007
C(16)	962.0293	266.3118	3.612417	0.0006
C(17)	-0.031344	0.012034	-2.604571	0.0113
C(18)	0.039860	0.011280	3.533760	0.0007
C(19)	-0.016382	0.013109	-1.249680	0.2156
C(20)	0.019490	0.038053	0.512168	0.6102
C(21)	0.139950	0.055412	2.525646	0.0138
C(22)	-0.619377	0.330065	-1.876530	0.0648
C(23)	-0.014240	0.326182	-0.043657	0.9653
C(24)	147.3366	62.46870	2.358566	0.0212
Determinant residual covariance		2.41E+16		

Equation: D(GDP) = C(1)*(GDP(-1) + 1.71848109687*OREV(-1) - 16.6905923487*GEXP(-1) + 3734.52650095) + C(2)*D(GDP(-1)) + C(3)*D(GDP(-2)) + C(4)*D(OREV(-1)) + C(5)*D(OREV(-2)) + C(6) *D(GEXP(-1)) + C(7)*D(GEXP(-2)) + C(8)

Observations: 31

R-squared	0.894600	Mean dependent var	2868.824
Adjusted R-squared	0.862521	S.D. dependent var	5745.779
S.E. of regression	2130.426	Sum squared resid	1.04E+08
Durbin-Watson stat	1.455202		

Equation: D(OREV) = C(9)*(GDP(-1) + 1.71848109687*OREV(-1) - 16.6905923487*GEXP(-1) + 3734.52650095) + C(10)*D(GDP(-1)) + C(11)*D(GDP(-2)) + C(12)*D(OREV(-1)) + C(13)*D(OREV(-2)) + C(14) *D(GEXP(-1)) + C(15)*D(GEXP(-2)) + C(16)

Observations: 31

R-squared	0.626872	Mean dependent var	218.9184
Adjusted R-squared	0.513311	S.D. dependent var	1149.289
S.E. of regression	801.7798	Sum squared resid	14785572
Durbin-Watson stat	2.265256		

Equation: D(GEXP) = C(17)*(GDP(-1) + 1.71848109687*OREV(-1) - 16.6905923487*GEXP(-1) + 3734.52650095) + C(18)*D(GDP(-1)) + C(19)*D(GDP(-2)) + C(20)*D(OREV(-1)) + C(21)*D(OREV(-2)) + C(22) *D(GEXP(-1)) + C(23)*D(GEXP(-2)) + C(24)

Observations: 31

R-squared	0.669268	Mean dependent var	147.2948
Adjusted R-squared	0.568610	S.D. dependent var	286.3469
S.E. of regression	188.0733	Sum squared resid	813546.4
Durbin-Watson stat	2.059213		