e-ISSN : 2347 - 9671, p- ISSN : 2349 - 0187

EPRA International Journal of Economic and Business Review | Vol - 3, Issue- 4, April 2015

IMPACT OF DEREGULATION OF THE DOWNSTREAM OIL SECTOR ON ECONOMIC GROWTH IN NIGERIA

Anne Maduka[1]

[1]Department of Economics, Anambra State University, Igbariam Campus, Nigeria.

Helen Ihonre[2]

[2]Team Lead KDF, Wholesale Banking Products, First Bank of Nigeria Ltd, Nigeria.

Lasbrey Anochiwa[3]

[3]Department of Economics and Development Studies, Federal University, Ndufu, Alike – Ikwo. Ebonyi State, Nigeria.

ABSTRACT

The aim of this study is to carry out an econometrics analysis of the impact of deregulation of the downstream sector on Nigerian economy. The methodology adopted for the study is the Ordinary Least Square (OLS) method of analysis. Econometrics Views (E- Views) packages namely; Augmented Dickey-Fuller unit root test, Johansen and Juselius Cointegration test, Granger Causality test and Error Correction Model test are also used to determine the stationarity, cointegration, causality direction, long run relationship and short run dynamics of the variables respectively. Ganger causality test was conducted to find out the causal direction of the deregulation variables – Price of Petroleum Products (PPP), Total Supply of Petroleum (TSP) and Petroleum Consumption (CONSP) on growth variable - nominal GDP. The results of the tests reveal that; 1) the all the variables are integrated of order one (1(1)); 2) five and three cointegrating equations were indicated by Trace and Max-Eigen value cointegration tests respectively. This implies that there exists long run equilibrium relationship among the variables; 3) the result of the long run impact of the deregulation of downstream oil sector on economic growth shows that all the variables except total labour employed (LAB) have positive and significant impact on economic growth. LAB has negative and significant impact on economic growth in the long run; 4) the causality test done revealed that out of the three deregulation variables, PPP and CONSP have bi – directional causal effect on nominal GDP, while causality does not run either from TSP to GDPN or from GDPN to TSP; 5) finally, the ecm results show positive and significant relationship between GDPN and the deregulation variables. The paper therefore recommends that since deregulation of the downstream oil sector has positive and significant effect, government should adopt a policy that will entail a phased deregulation, while at the same time try to regulate the price of petroleum products to ensure that the products are affordable and hardship from hiked pump price is reduced.

KEYWORDS: *Economic Growth, Deregulation of downstream sector, Gross Domestic Product, causality, cointegration, Augmented Dickey Fuller unit root, Error Correction Model.*

1.INTRODUCTION

Oil exploration began in Nigeria by 1908 when a German Company, Nigeria Bitumen Corporation was granted license to explore oil in Araromi area of western Nigeria but the activities ended with the outbreak of First World War in 1914. However, Shell D'Arcy began oil prospecting in earnest 1937 with sole concessionary rights in the whole of Nigeria. The onset of Second World War also interfered with the activities but in 1947, serious prospecting began, which led to the first commercial discovery at Oloibiiri in Niger Delta. Nigeria became a member of Organization of Petroleum Exporting Countries (OPEC) and in the same year the Nigeria National Oil Corporation (NNOC) was formed to carry out mining and marketing of oil products within the petroleum industry. However, due to OPEC's earlier policy in 1968 on public sector participation in oil companies to the tune of 5 percent, NNOC and Federal Ministry of Mines and power were merged to form the Nigeria National Petroleum Corporation (NNPC) in 1977 with a primary responsibility of regulating the oil industry and a secondary role of developing the upstream and downstream sectors of the oil industry.

Nigeria's upstream sector comprises exploration and production with oil production capacity of 3 million barrels per day (bbl/d) and as at 2011 produced 2.53 million barrels per day (bbl/d). The downstream sector is responsible for the refining, storage, marketing, sales and distribution of gasoline, kerosene, asphalt, lubricant oils and petrochemicals (Omoregbe, 2004) and has four refineries with a total refining capacity of 445,000 barrels of oil per day, which is supposed to meet domestic demand of 300, 000 barrels per day. The downstream sector is controlled by the Government through the NNPC who also regulates prices of refined petroleum products and coordinate distribution through pipelines to end users. However, due to inadequate turnaround maintenance, technical inefficiency and corruption, the refineries are seriously operating below capacity, while Nigeria relies on importation of oil for local consumption, making its domestic prices vulnerable to changes in international oil prices and exchange rate (Odularu and Okonkwo, 2009). Oil is very important to the existence of many economies of the world today and its price is a major component of economic forecasts and performance As a result, any import dependent nation like Nigeria will have its domestic products seriously influenced by international prices, which necessitates the Government to provide subsidy to cushion the effect of the high domestic prices caused by external shocks in the market (Ibrahim, 2007).

Crude oil constitutes over 90 percent of total export in Nigeria and is a major driver of economic growth. Petroleum Industry contributes to economic growth and development in Nigeria through the impact it has on economic variables that are responsible for growth such as; foreign exchange reserve and government revenue (Onwe, 2012). Oil is a key revenue earner for Nigeria and according to the Central Bank of Nigeria reports, the ratio of oil revenue to total Government revenue in 1990 was 73 percent, it grew to 84 percent in 1993, decreased to 70 percent in 1998 and also grew significantly to 89 percent in 2006 before dropping to 74 percent in 2010. Table 1 shows the share of oil revenue to Government revenue from 1990 to 2010. It can be observed from the table 1 in appendix that the average contribution of oil revenue to Nigeria's total federally collected revenue is about 81 percent, which shows that oil revenue is very important to Nigeria's existence and economic growth. It is therefore expected that the huge oil revenue should be employed in diversification of the economy through provision of resources and enabling environment that will generate economic activities to support growth. But while revenue from oil is growing tremendously due to increasing international demand for oil resources, Nigeria is plunging more into under development due to corrupt practices. It is pertinent to note that this source of immense wealth to many nations of the world has become the main source of Nigeria's misfortune (Adagba, Ugwu & Eme, 2012). It is difficult for an average Nigerian to understand why the government would be proposing deregulation, which may lead to increased prices in the midst of such enormous natural resource endowment. However, the origin of deregulation in Nigeria is imbedded in the unending inadequate supply of petroleum products, and domestic imbalances in the early 1980s which led to economic distortions and slowed growth. In a bid to address this, the Government introduced a structural adjustment programme (SAP) in 1986 under the tutelage of the International Monetary Fund (IMF), which was formulated within the framework of free market theory. The main thrust of the programme is deregulation of all economic activities and

dismantling of all forms of administrative control. Nigerian Government saw this as an opportunity to foster economic growth and ensure competition, which would boost the supply of products as well as reduction in prices. The need to deregulate the downstream oil sector is supported by the liberalism and open market theories, which states that the major role of a state is to ensure competition in the market, which will boost supply and not to provide control. In support of the free market theory, Meadowcroft and Casey (2010) believes that the "liberal institutions of free market, the rule of law and secure private property rights have been the most successful mechanisms for the eradication of poverty and the empowerment of individual men and women".

Deregulation is therefore a deliberate effort by the Government to remove regulatory controls, structures and operational guidelines in administration and price system of the economy. Various Governments have come up with varying promises to turnaround the situation, yet they end up just increasing the price of petroleum products without considering the impact of this incessant increase on the consumers and the economy as a whole. It is pertinent to note that in spite of the removal of subsidy from the pricing structure and resultant increase in prices of these products, supply was still not sufficient to meet demand. The country continued to suffer incessant scarcity of petroleum products at regular intervals as refining capacity of NNPC refineries are under-utilized and supply has to be augmented with importation of refined products. A good number of Nigerians live below the one dollar mark per day, poverty in Nigeria has worsened between 2004 and 2010; therefore, there is a need to empirically determine the effect of deregulation of downstream oil sector on the economy of Nigeria. The rest of the paper is divided into the following; section two reviews the literature, section 3 explains the methodology, section 4 analyses the results, section 5 discusses the results, while section 6 concludes the paper.

2. REVIEW OF LITERATURE

2.1 Theoretical Framework

The theoretical foundation of deregulation is largely taken from the general equilibrium theory, which postulates the relevance of the society's limited resources for efficient production of the needs of the society and efficient distribution of commodities and services among various consumers. General equilibrium according to Acemoglu (2010) refers to factors that become important when we consider counter factuals in which large changes are contemplated. This may induce changes in factor prices and technology, which are held constant in partial equilibrium condition. In a perfectly competitive market, what determines the amount of output a firm will be willing to supply is a function of so many factors such as the type of market they operate in, the type of products produced, the ratio of marginal cost to marginal revenue, which comes into play because all profit maximizing firms would like to choose the output that will equate marginal cost with marginal revenue (Lipsey and Chrystal, 2004). The downstream petroleum sector in Nigeria is made up of major oil marketers and independent marketers who supply homogeneous products, but have the power to increase prices by creating artificial scarcity. In an example using Shell and B.P, Lipsey and Chrystal (2004) observed that these firms are in competition but each of them could raise price without losing customers because they have power over their markets. They therefore concluded that even though Shell and B.P compete among themselves it is not in a perfectly competitive market.

The goal of downstream oil deregulation by Nigerian government is to ensure constant supply of products, reduce prices through the forces of demand and supply and to ensure efficiency through competition among firms. But, the competiveness of a market is determined by the power of an individual firm to influence the price of products in that market (Lipsey and Chrystal, 2004). This implies that if a single firm does not have power to influence the market in which it sells its goods, the market will be more competitive. However, the promises of deregulation according to Keen, (2004) may be a "Disneyland future" which may lead to the terminator's "Judgment Day" because as witnessed in the US electricity market, deregulation brought about shortages in supply, which lead to exorbitant prices. He equally notes that the failure of deregulation is as a result of application of economic theory on a crucial real-world market and that conventional market theory has three fundamental flaws, which were identified by new research. One of the flaws considered relevant to this study is; the notion by the conventional market theory that competition leads to lower prices, higher output and maximization of welfare is considered false because corrected theories prove that welfare

losses are unavoidable even in competitive markets. While lower prices, higher output and even higher consumer welfare are likely to be achieved under monopolies according to neoclassical theory, (Keen, 2004)

2.2 Empirical Evidence

The impact of the deregulation of the downstream sector on the Nigerian economy is not a new area of study as many researchers and economists have conducted similar research to justify the use of deregulation as a tool for economic reform. Birol *et al.*, (1995) studied the impact of subsidies removal in Algeria, Iran and Nigeria. The empirical result shows that the process will generate enough domestic oil savings which can translate to higher revenue for the economy. In a research to determine the growth prospects of oil and gas abundant economies with emphasis on Nigeria, Ibrahim (2007) observed that over reliance on exogenous technology application for extraction and export of oil due to emphasis on revenue weakens the absorptive capacity of domestic production structures. This is because as oil is produced and exported in order to earn more foreign reserve, there is no commensurate effort to generate economic activities that will promote growth using the revenue earned from oil. As a result, the economy as a whole is exposed to international price and demand shocks which come with over dependence on imports.

Numerous researchers carried out studies on the impact of energy consumption on GDP or GNP and but came up with varying results, identifying either positive impact, negative impact or no impact at all. This inconsistency in outcomes was caused by the use of OLS model of log-linear, which was used to estimate the variables without considering the time series nature of the data (Huang *et al.*, 2008). Their study explored the issue of causality between real oil price and the economy. Based on their result, they argued that a rise in oil price that is large when compared with recent volatilities would amount to reallocation of resources and lowering of aggregate output. Even though this result is logical, it does necessarily follow because from the Nigerian perspective, we have seen large increases in oil prices yet there was no resource reallocation, the poor continued to be poor, while infrastructural decay persisted.

According to the research by Mork, Olsen and Mysen (1994) for OECD countries in comparison with other countries, they discovered that increase in oil prices slowed down economic growth in the U.S irrespective of the fact that it is less dependent on imported oil than countries like Germany, Japan and France. In the case of Nigeria, refined petroleum products are imported due to the fact that the refineries are operating either below capacity or are not functioning. This may be an indication that fluctuations in oil prices, which lead to increase in oil prices, will have a negative impact on economic growth. Similarly, Jimenez-Rodriguez and Sanchez (2004) carried out empirical research on oil price shocks and its impact on real GDP growth. They found evidence of non-linear impact of oil prices on real GDP but as oil price increases it was found to have an impact on GDP growth of a larger magnitude than that of oil price declines. However, among all oil importing nations, oil price increases are found to have a negative impact on economic activity in all cases except Japan. The implication for Nigeria lies in the fact that even though Nigeria is an oil producing country almost all its petroleum products are imported; therefore increases in oil prices will definitely affect economic growth in Nigeria.

Even though the literature on the relationship between energy consumption and Economic Growth is growing, the causal relationship has not yet been identified. The relationship between energy and economic growth seem to be neutral on a macro level where there were evidence of Granger causality for a lower level of aggregation in some of the studies (Gross, 2012). In analyzing the Granger causality between energy and growth in the U.S from 1970-2007 on a macro level, Gross, (2012) found out among other things that Granger causality between energy consumption and economic growth is not always forced by the same variables. Furthermore, in a research by Soytas and Sari (2003), they examined the causal relationship between energy and consumption for 16 countries. They found out that all the series are non-stationary. While in seven countries, there were linear cointegrating relationships among the variables. Countries like Turkey, France, Italy, Germany and Japan have causality running from energy consumption to GDP; only Argentina has bi directional causality. This implies that for the countries with causality running from energy consumption to GDP, any long run energy conservation policy may have adverse effect on economic growth. Akpan (2009) conducted a theoretical analysis on this topic and noted that an

increase in oil price is supposed to transfer income from the importing country to the exporting country through a shift in the terms of trade. This can only happen in the case of Nigeria where the dependence on imported oil and local consumption is reduced to the barest minimum so that the ratio of increase in refined petroleum products will not exceed the increase in the price of crude oil. A research by Sauter and Awerbuch (2002) averred that it is essential for policy makers to understand the impact of fossil fuel on their national economies. This is because a negative relationship between fossil fuel prices may lead to understatement of other economic variables, which may be needed to generate economic growth. Different studies carried out by different researchers, (cited in Sauter and Awerbuch, 2002) showed that a small increase in oil prices yield sizeable decrease in GDP Growth. In summary, the author tends to agree with Ibrahim (2007) that economic growth of any country and Nigeria in particular is largely dependent on the capacity to supply diverse economic goods to its population. It is obvious that there is a relationship between deregulation of the oil & gas downstream sector (energy) and economic growth, oil price and consumption from the empirical literature reviewed.

3 RESEARCH METHODOLOGY

3.1 Data Source

Data for this work is a time series secondary data spanning 1981-2010 sourced from the central Bank of Nigeria (CBN) statistical bulletin, NNPC annual statistical bulletin and other publications such as peer reviewed journals, text books and other related works.

3.2 Variables of the Model

The variables considered in this study include, Nominal GDP (GDPN), Gross Capital Formation (GCF), Number of Labour Employed (LAB), Inflation Rate (INF), Exchange Rate (EXR) and the deregulation variables namely; Price of Petroleum Products (PPP), Total Supply of Petroleum Products (TSP) and Consumption of Petroleum Products (CONSP). The target variables are PPP, TSP and CONSP. Other variables are used as control variables.

3.3 Model Specification

Having listed the variables, the model is specified as; 3.1

Where; GDPN= Nominal Gross Domestic Product, GCF= Gross Capital Formation,

LAB= Number of Labour Employed, PPP= Petroleum Product Price, CONP= Consumption of Petroleum product, EXR = Exchange Rate, INF = Inflation Rate and TSP = Total Supply of Petroleum Product.

Expressing the model in a logarithm form we have;

3.4. Method of Data Analysis

A common finding in time series regressions is that the residuals are correlated with their own lagged values. This serial correlation violates the standard assumption of regression theory that disturbances are not correlated with other disturbances. A primary problem associated with serial correlation is that OLS is no longer efficient among linear estimators and many economic time series are nonstationary at their level state causing these series to produce misleading results, often termed spurious regression result showing a significant relationship between unrelated series (Phillips 1986). However, Engle and Granger (1987) note that a linear combination of two or more I(1) series may be stationary, or I(0), in which case we say the series are cointegrated. Such a linear combination defines a cointegrating equation with cointegrating vector of weights characterizing the long-run relationship between the variables. In any economic study of functional relationship between two or more variables that involve time series data, it is imperative to take into consideration the properties of the time series data used in making any judgement or inferences. This study takes into consideration the problem of non-stationarity. A time series is said to be stationary if it's mean, variance and covariance remain constant with respect to time (Asari*, et al.*, 2011). A problem exists with non-stationary data when used for regression analysis because the standard errors produced are biased making the judgement criteria unreliable (Mahadeva and Robinson, 2004). As a result, the data needs to be in a stationary form to be relied upon to produce a stable regression result.

Unit root test is one of the time series properties used to test for stationarity to avoid spurious regression result and erroneous inference. In this study stationarity of variables and their individual order of integration were tested and determined prior to estimation of the model. This study therefore adopts the ADF unit root test because it is a robust tool that gives valid result over a wide range of applications and helps to ascertain the order of integration of each variables if stationary at levels I(0) or at first difference I(1). The test was also applied to construct a parametric correction for higher-order

correlation and adding lagged difference terms of the dependent variable to the right-hand side of the test regression. Cointegration test is carried out to ascertain the long term relationship between the time series variables for the single equation setting using Johansen's methodology. The Johansen cointegration test is carried out from a VAR specification of all included variables (Granger-Causality informed) as endogenous, after picking a suitable lag length as suggested by the duo of Akaike and Schwartz Bayesian information criteria.

A Vector Error Correction Model (VECM) is applied to a nonstationary series that are cointegrated. The presence of cointegration shows that there is a "long term equilibrium relationship therefore a VECM is applied to evaluate the short term properties of the cointegrated series" (Asari, *et al.*, 2011).

Causality is described as a relationship of cause and effect (Awe, 2012). Even though correlation does not necessarily imply causation in any meaningful sense of that word, but Granger (1969) approach to the question of whether causes is to see how much of the current values can be explained by past values and then to see whether adding lagged values can improve the explanation. According to Awe, (2012) one variable x is said to granger cause another y if accurate predictions about x are made by y or if the coefficients on the lagged variables are statistically significant.

4. EMPIRICAL RESULT

4.1 Unit Root

From table 2, we can see that all the variables are integrated of order one. This implies that they are not stationary at levels, therefore the null hypothesis ($^{\circ}$ = 1) is not rejected at levels. However, these variables become stationary at first difference which means they became integrated at order one I(1). Since these variables are stationary one, it means that they are cointegrated, hence the need for a cointegration test (Engle and Granger (1987).

4.2 Cointegration Test

A Johansen cointegration test was carried out and the results are presented in tables 3a and 3b respectively. The results show that there are 5 and 3 cointegrating equations in trace and max –Eigen respectively. This implies that there exists a long run equilibrium relationship among the variables.

4.3 Long run Relationship

Furthermore, it is imperative to establish the long run relation between the variables of deregulation and economic growth. To do that, the researcher normalized the long run coefficients of the variables. The results are reported in table 4 in the appendix. The result shows that all the variables except LAB have positive and significant effect on economic growth in the long run. This implies that deregulation of the downstream oil sector will help the economy to grow by channelling the subsidy removed during deregulation towards projects that enhance growth and development. Price of Petroleum Product (PPP) which is positive and significant indicates that as prices of the products increase due to deregulation, foreign investors will be attracted to come and invest in the downstream sector, thereby helping to achieve output growth. LAB on the other hand, has negative and significant impact on economic growth. This shows that the total number of labour employed is not enough to contribute to higher economic growth. As for inflation, it displayed positive and statistical significance in the long-run determination of economic growth in Nigeria which is against the a priori expectation. The implication is that inflation causes the economy to grow in the long run. This may be due to boom recorded by the business sector during inflation.

4.4 Error Correction Model

The error correction model results in table 5 reveal that all the deregulation variables have positive and significant impact on economic growth in Nigeria for the period under study. PPP has negative coefficient at current period but its lag 2 values were positive. This is compensated by the fact that the long run values of the variable – (PPP) are positive and statistically significant. Lag 1 of GDPN has negative and insignificant relationship with the current GDPN, while its lag 2 values have positive and robust relationship with the current GDPN. Also, gross capital formation which is a proxy for capital has positive and significant impact on economic growth at current period, but at lag 2 periods, it has negative and significant effect. For labour, it still maintains negative and significant relationship in the short run. Exchange rates have positive and significant relationship with growth at current and lag 1 period, but records negative and significant relationship at lag 2. Like in the long run, inflation has positive and significant impact on economic

growth in the short run. The long-run equilibrium model produced an Error Correction term estimate of -0.34. This implies that, the adjustment coefficient or the speed of adjustment of LNGDPN if deviated from its long run equilibrium is 34% per year. This result tells that 34% of disequilibrium in the previous year is corrected each year, towards the cointegrating relationship. The ECT is negative (conforming to a priori) and statistically significant. The statistical significance and the correct sign of the ECT coefficients confirm further the presence of a long run equilibrium relationship between the dependent and independent variables.

The diagnostic tests show R^2 of 0.969. This implies that about 97% variations in the Economic Growth are accounted for by the changes in independent variables. The model also produced a Durbin-Watson d-statistics of 2.59 which is above the benchmark. Using the DW d statistic tables, at n=29 and k=5, the lower and upper bound were 1.05 and 1.841 respectively. A reported d* of 2.59 is greater than the upper bound (2.59 > 1.841), so we reject the null that there is no positive and negative autocorrelation in error term. The value being above 2 may be as a result of dealing with time series data. Another reason may be due the fact that one of the explanatory variables is the lagged value of the dependent variable, (Gujarati and Porter, 2009). As a confirmatory test, Breusch-Godfrey LM second order test (see Appendix) for autocorrelation indicates no presence of serial correlation between the error terms. Using the Breusch-Godfrey LM second order test for autocorrelation we reject the null hypothesis (H_0), of no positive autocorrelation of the error terms. The model can therefore be used to forecast longer periods and its least square slope parameters are efficient and consistent. Similarly, the normality test shows that the error terms are normally distributed. The F-statistic which is significant at 1% critical level indicates the significant relationships between the dependent and independent variables. While the ARCH test reveals that there is no heteroscedasticity in the model. Finally, the Ramsey Reset test shows that there is no specification error.

4.5 Causality Tests

The Granger causality test was run to test directional causation among the variables so that the cointegrating regression result would be strengthened. The results in table 6 show that we reject the null hypothesis that the deregulation variables, Petroleum product price (PPP) and consumption of petroleum product (CONSP) do not cause LNGDPN. The total supply of Petroleum product (TSP) showed no causal link from and to GDP, in other words, we accept the null hypothesis that there is no directional causation between total supply of petroleum product and GDP in Nigeria. Inflation (INF) and Exchange Rate (EXR) have uni - directional causal link to LNGDPN, while causality runs from LNGDPN to LAB and GCF in a way direction.

5. DISCUSS OF THE RESULTS

The impact of deregulation of the downstream sector of the Nigerian Economy was investigated and main objective was to find out if deregulation represented by variables like, consumption of petroleum products, price of petroleum products and total supply of the products have significant impact on the nominal gross domestic product. Other variables such as gross capital formation, total number of labour employed, exchange rate and inflation rate are included to capture the shocks on economic variables. The results show that deregulation has robust impact on economic growth in the short and long run. This is evident in the positive and statistically significant relationship between deregulation variables and nominal GDP and the causality tests which show a bi – directional causality between the deregulation variables and growth. The results is in line with the neoclassical growth theory which posits deregulation is capable of promoting growth since it is based on a free market structure where demand and supply are determined by competition which increases supply and reduces the price. However, it is discovered that competition in the real sense of it does not usually translate to cheaper petroleum prices as other factors like exchange rate, import dependency etc., determine price in most cases. As a result, antagonists of deregulation have recommended that government should still maintain its role of price fixing and possible subsidization especially for a developing country like Nigeria with issues of corruption and poverty.

6. CONCLUSION

This research was carried out to investigate the impact of deregulation of the downstream oil sector on the Nigerian Economy using nominal GDP as a proxy for economic growth in Nigeria. The findings of the study however show that deregulation through the variables that are affected by it have significant impact on economic growth, therefore a

system of controlled deregulation implemented in phases will allow the government to put in place all infrastructure and development to bring about total deregulation of the downstream oil sector in Nigeria in future. This is because the corruption in the system, poor infrastructure, the state of the naira, inflation and heavy dependence on importation should be tackled first before the issue of total deregulation can be brought up. It was observed during the anti-subsidy strike action in Nigeria, that lack of transparency, credibility and inefficiency by the government is the major reason for lack of public trust on government's ability to carry out a successful deregulation process where the market forces of demand and supply will lead to competition and lower prices. As a result, Government should continue to oversee the downstream oil sector of Nigeria. The paper therefore recommends that since deregulation of the downstream oil sector has positive and significant effect on growth, government should adopt a policy that will entail a phased deregulation, while at the same time try to regulate the price of petroleum products to ensure that the products are affordable and hardship from hiked pump price is reduced.

REFERENCES

1. *Acemoglu, D. (2010), "Theory, Equilibrium, and Political Economy in Development Economics", Journal of Economic Perspectives, 24(3), pp.17-32, [Online]*
2. *Adagba, O, Ugwu, S.C and Eme, O.I (2012), "Deregulation and Anti-Subsidy Removal Strikes in Nigeria". Arabian Journal of Business and Management Review; Vol. 1 No. 7 [Online]*
3. *Akpan, E. (2009), "Oil Price Shocks and Nigeria's Macro Economy", Ph.D. Dissertation,Unpublished.*
4. *Asari, et al., (2011), "A Vector Error Correction Model (VECM) Approach in Explaining the Relationship between Interest Rate and Inflation towards Exchange Rate Volatility in Malaysia", World Applied Sciences Journal, (Special Issue on Bolstering Economic Sustainability), 12 (1) pp. 49-56*
5. *Awe, O.O, (2012), "On Pairwise Granger causality Modeling and Econometric Analysis of Selected Economic Indicators, [Online] http://interstat.statjournals.net*
6. *Birol, F, Aleagha, A.V and Ferroukhi, R. (1995), "The economic impact of subsidy phase out in Oil exporting developing countries: A case study of Algeria, Iran and Nigeria", Energy Policy, 23(3), pp.209-215*
7. *Granger, C.W.J. (1969), "Investigating causal relation by econometric and cross-sectional method", Econometrica 37(1), pp.424–438*
8. *Granger, C.W and Engle, R.F. (1987), "Co-Integration and error correction: Representation, Estimation and Testing", Econometrica, 55(2), pp.251-276*
9. *Gross, C. (2012), "Explaining the (non) causality between energy and economic growth in the U.S: A multivariate sectorial analysis", Energy Economics,*
10. *Gujarati, D.N and Porter D.C (2009), Basic Econometrics, 5th ed. Singapore: McGraw-Hill Publishers*
11. *Huang, B., Huwang, M. and Yang, C. (2008), "Causal relationship between energy Consumption and GDP growth revisited: A dynamic panel data approach", Ecological Economics; 67(1), pp. 41-54*
12. *Ibrahim, M. (2007), "Growth Prospects of Oil and Gas Abundant Economies: The Nigerian Experience (1970 – 2000)", Journal of Economic Studies, 35(2), PP. 170-190*
13. *Jimenez-Rodriguez, R. and Sanchez, M. (2004), "Oil price shocks and real GDP Growth: Empirical evidence from some OECD Countries", European Central Bank, working paper series,362, [Online]*
14. *Keen, S. (2004), "Deregulation: Judgment Day for Microeconomics", Utilities Policy 12(1),pp. 109-125*
15. *Lipsey, R. G and Chrystal, K. A (2004), Economics.10th Edition, New York: Oxford University Press*
16. *Mahadeva, L and Robinson, P. (2004), "Unit root test to help model building: Hand Books in Central Banking, No.22, [Online], Available from http:// www.bankofeng land.co.uk/education*
17. *Meadowcroft, J and Casey, G (2010), "Economic Liberalism and Social Justice", IEA Economic Affairs*
18. *Mork, K, Olsen, O. and Mysen, H. (1994), "Macroeconomic responses to oil Price Increases and Decreases in seven OECD countries", Energy Journal, 15 (4), PP.19-35*
19. *Odularu, G.O and Okonkwo, C (2009), "Does energy consumption contribute to economic Performance? Empirical Evidence from Nigeria", Journal of Economics and Business XII (2), [Online]*
20. *Omoregbe, Y. (2001), Oil and Gas Law in Nigeria, Nigeria, Malt house Press Ltd*
21. *Onwe, J.O (2012), "Economic Implications of Petroleum Policies in Nigeria: An Overview", American International Journal of Contemporary Research, 2 (5) [Online]*
22. *Philips, P.C. (1986), "Understanding Spurious Regressions in Econometrics", Journal of Econometrics, 33(1), pp.311-340*
23. *Sauter, R. and Awerbuch, S. (2003), "Oil Price Volatility and Economic Activity: A Survey and Literature Review", IEA Research paper, August, Paris, pp.1-18*
24. *Soytas, S. and Sari, R. (2003), "Energy consumption and GDP: causality relationship in G-7 countries and Emerging markets', Energy Economics 25(1), pp. 33-37*

Appendix

Table 1: Percentage of Oil revenue in Nigeria, 1990 - 2010

Year	Total Govt. Rev N' millions	Oil Rev. N' millions	Percent (%) Share
1990	98,102.40	71,887.10	73%
1991	100,991.60	82,666.40	82%
1992	190,453.20	164,078.10	86%
1993	192,769.40	162,102.40	84%
1994	201,910.80	160,192.40	79%
1995	459,987.30	324,547.60	71%
1996	523,597.00	408,783.00	78%
1997	582,811.10	416,811.10	72%
1998	582,811.10	324,311.20	56%
1999	949,187.90	724,422.50	76%
2000	1,906,159.70	1,591,675.80	84%
2001	2,231,600.00	1,707,562.80	77%
2002	1,731,837.50	1,230,851.20	71%
2003	2,575,095.90	2,074,280.60	81%
2004	3,920,500.00	3,354,800.00	86%
2005	5,547,500.00	4,762,400.00	86%
2006	5,965,101.90	5,287,566.90	89%
2007	5,715,600.00	4,462,910.00	78%
2008	7,866,590.10	6,530,630.10	83%
2009	4,844,592.34	3,191,937.98	66%
2010	7,303,671.55	5,396,091.05	74%

Source: Central Bank of Nigeria Statistical Bulletin, 2010 edition

Table 2 Unit Root Test

VARIABLE	ADF T-STAT	CRITICAL VALUE	ORDER OF INTEGRATON
LNGDPN	-4.610865***	1 PERCENT	I(1)
LNGCF	-3.537250***	1 PERCENT	I(1)
LNLAB	-4.484174***	1 PERCENT	I(1)
LNPPP	-4.037263***	1 PERCENT	I(1)
LNCONSP	-7.643531***	1 PERCENT	I(1)
LNTSP	-7.061887***	1 PERCENT	I(1)
LNEXR	-4.660031***	1 PERCENT	I(1)
INF	-5.204475***	1 PERCENT	I(1)

Note: ADF denotes Augmented Dickey- Fuller unit root tests. (***) denotes significant at 1% critical values. The critical values follow Mackinnon, (1996) p_ value.

Table 3a Johansen Cointegration Test Results

Null Hypothesis	Trace Stats	5% Critical Value
None*	332.2830	159.5297
At Most 1*	218.2715	125.6154
At Most 2*	139.9968	95.75366
At Most 3*	82.62276	69.81889
At Most 4*	51.20929	47.85613
At Most 5	26.83165	29.79707
At Most 6	12.58279	15.4947
At Most	2.231106	3.841466

Trace test indicates 5 cointegrating equations at 0.05 levels

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

Table 3b Max –Eigen Test

Null Hypothesis	Max – Eigen	5% Critical Value
None*	114.0116	52.36261
At Most 1*	78.27465	46.23142
At Most 2*	57.37407	40.07757
At Most 3	31.41346	33.87687
At Most 4	24.37764	27.58434
At Most 5	14.24887	21.13162
At Most 6	10.35168	14.26460
At Most	2.231106	3.841460

Max – Eigen indicates 3 cointegrating equations at 0.05 levels

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

Table 4 Normalized Long run Coefficients for the Impact of Downstream Oil Sector on Economic Growth

LNGDPN	LNGCF	LNLAB	LNEXR	LNCONSP	LNPPP	LNTSP	INF
1.000000	0.404561	-3.833385	0.519023	0.029835	0.566126	0.180669	0.017038
	(0.05297)	(0.68410)	(0.04461)	(0.01438)	(0.04185)	(0.01117)	(0.00067)

Values in Parenthesis are the standard errors.

Table 5 Parsimonious Error Correction Model

Dependent Variable:D(LNGDN)
Method: Least Squares
Date: 11/20/14 Time: 20:15

Variable	Coefficient	Standard Error	T - Statistics	Probability
C	-0.009886	0.031421	-0.314632	0.7595
DLNGDPN(-1)	-0.121430	0.114379	-1.061650	0.3134
DLNGDPN(-2)	0.824985	0.108348	7.614201	0.0000
DLNGCF	0.247829	0.059791	4.144934	0.0020
DLNGCF(-2)	-0.174940	0.064446	-2.714531	0.0218
DLNLAB(-2)	-1.126473	2.308366	-0.487996	0.6361
DLNEXR	0.287441	0.054150	5.308258	0.0003
DLNEXR(-1)	0.149258	0.039840	3.746395	0.0038
DLNEXR(-2)	-0.227967	0.039605	-5.755986	0.0002
DLNPPP	-0.080844	0.034585	-2.337561	0.0415
DLNPPP(-2)	0.334350	0.042642	7.840878	0.0000
LNCONSP(-1)	0.024033	0.009457	2.541192	0.0293
DLNTSP	0.025002	0.006741	3.709173	0.0040
DLNTSP(-2)	0.027925	0.007373	3.787331	0.0036
DINF	0.001276	0.000385	3.312894	0.0078
DINF(-1)	0.003389	0.000427	7.931472	0.0000
ECM(-1)	-0.340583	0.111026	-3.067607	0.0119
R-SQUARED	0.969687			
F-STATISTIC	19.99309			
PROB(F-STATISTIC)	0.000017			
D-W STAT	2.589106			
LM TEST	0.696477 (0.5262)			
ARCH	0.065912 (0.7996)			
NORMALITY	1.308436 (0.5298)			
RAMSEY RESET	0.503713 (0.4958)			

Note: D means the difference of the lagged variables

Table 6 Pairwise Granger Causality Tests

Date: 11/20/14 Time: 19:07
Sample: 1981 2010
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LNGCF does not Granger Cause LNGDPN	29	0.61562	0.4398
LNGDPN does not Granger Cause LNGCF		10.5990	0.0031
LNLAB does not Granger Cause LNGDPN	29	0.62158	0.4376
LNGDPN does not Granger Cause LNLAB		9.58998	0.0046
LNEXR does not Granger Cause LNGDPN	29	13.9883	0.0009
LNGDPN does not Granger Cause LNEXR		0.00029	0.9865
LNCONSP does not Granger Cause LNGDPN	29	4.01610	0.0556
LNGDPN does not Granger Cause LNCONSP		4.47577	0.0441
LNPPP does not Granger Cause LNGDPN	29	3.79145	0.0624
LNGDPN does not Granger Cause LNPPP		5.28515	0.0298
LNTSP does not Granger Cause LNGDPN	29	0.02263	0.8816
LNGDPN does not Granger Cause LNTSP		0.55805	0.4617
INF does not Granger Cause LNGDPN	29	4.44487	0.0448
LNGDPN does not Granger Cause INF		0.93768	0.3418

Note: Rejecting the null hypothesis indicates that one variable actually granger cause the other; while accepting the null hypothesis confirms that there is no causation between both variables at 1%, 5% or 10% significance level.

Time series Equation:-

The ADF unit root test equation is of the form:

$$\Delta y_t = \sim y_{t-1} + x_t' ¢ + \ _1\Delta y_{t-1} + \ldots + \ _p\Delta y_{t-p} + £_t \qquad 1$$

Where p-1=α. The ADF unit root tests the null hypothesis that α= 0

The regression equation for a **cointegrating vector** is of the form $y_{2,t} = \ y_{1,t}$, while the corresponding **VECM** is

$$\Delta y_{1,t} = \sim_1 \left(y_{2,t-1} - \ y_{1,t-1} \right) + £_{1,t}$$
$$\Delta y_{2,t} = \sim_2 \left(y_{2,t-1} - \ y_{1,t-1} \right) + £_{2,t} \qquad 2$$

The Granger test runs bivariate regressions of the form:

$$y_t = \sim_0 + \sim_1 y_{t-1} + \ldots + \sim_p y_{t-p} + \ _1x_{t-1} + \ldots + \ _px_{t-p}$$
$$x_t = \sim_0 + \sim_1 x_{t-1} + \ldots + \sim_p x_{t-p} + \ _1y_{t-1} + \ldots + \ _py_{t-p} \qquad 3$$

For all possible pairs of series in the group (x,y). The reported F-statistics are the Wald statistics for the joint hypothesis $_1 = \ _2 = \ldots = \ _p = 0$