IOSR Journal of Economics and Finance (IOSR-JEF)
e-ISSN: 2321-5933, p-ISSN: 2321-5925.Volume 7, Issue 4. Ver. IV (Jul. - Aug. 2016), PP 10-21
www.iosrjournals.org

Analysis of the Impact of Oil Revenue on the Nigerian Economy

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Abstract: *Oil revenue is indeed an important component of economic growth of the recipient nations. Therefore, most of the oil-rich nations invest the revenue from the oil sector into the non-oil sectors for strategic reasons. However, over the past five decades there has been a blur in the practicality to fulfilling this purpose in the context of Nigerian economy. So far, there is high inconsistency on the utulisation of such oil revenue in Nigeria. Using a multivariate regression analysis, this study aims at critically analysing the impact of oil revenue on the Nigerian economy. Findings indicate a high insignificance in establishing the flow of oil revenue into the key economic sectors in Nigeria.*

Keywords: *Oil Revenue, Rent-seeking, Dutch Disease, Nigeria*

I. Introduction

Nigeria is one of the countries blessed with huge oil resources. It is the most populous country in Africa with over 250 ethnic groups spread across six geo-political zones, with an estimated population of 170.1 million people (CIA Fact Book, 2012). It is placed as the number 10th country in the world in terms of oil reserves estimated at 37.2 billion barrels and ranked 8th in the Organization of Petroleum Exporting Countries (OPEC) based on its crude oil reserves and production (OPEC 2012, CIA Fact Book, 2012). The country produces a daily average of about 2.45 million barrels of oil per day (mb/d), accounting for around 95% of foreign exchange earnings and about 80% of fiscal revenues (CIA Fact Book 2012, Paki and Ebienfa 2011).

Reliance on one commodity as a source of revenue to a country has its consequence leading to political, social, and economic crises and inter-state conflicts across nations with Nigeria as an example. Prior to the discovery of oil in the 1960s and its sudden boom, Nigeria relied on agriculture as the key source of revenue, which accounts for about more than 50 percent of the country's Gross Domestic Product (GDP). However, between 2007 and 2011 the country earned a total of $196 billion from oil exports (Business day, 2011). However, despite the flow of oil revenue, Nigeria records low economic growth and slow economic development (Abubakar, 2011).

The high stake rent seeking that has permeated the Nigerian political economy has been facilitated by two important factors, according to the empirical literature: systematic decline into a regime of lawlessness and political extreme rule during the military era. Therefore, it is important to determine the extent to which these and other factors have influenced the oil revenue allocation with the return of the democratically elected government in Nigeria; thus the following objectives:

To identify the extent and distribution of oil revenue in Nigeria during the recent democratic era (1999-2010).
To assess the impact of the oil revenue on economic growth of the country.

II. Literature Review

2.1 The Concept of Natural Resource Rents

Natural resource rents and their impacts on economic growth and development have attracted considerable attention in economics literature during the past four decades. Since then, the plethora of empirical studies conducted on this subject has helped to enrich the literature on natural resource economics. In line with international economics and the traditional meaning by Adam smith, rent is defined as an additional amount obtained after taking account for the estimated costs along with usual returns. In order words, rent can be defined as an interconnecting value, which relates the price of goods sold with its production cost as well as the value of normal return over the sold goods. In general, rent is calculated as a difference between afore-mentioned two interrelating attributes (Bardhan 2007).

Natural resource rents in many natural resource abundant countries have created problems that such natural resources have frequently been cited as a "curse" rather than blessing to refer to the detrimental effect of such resources on economic growth and development. The concept of the resource curse postulates that "poor countries with large endowments of natural resources, especially oil, often do not achieve sustainable economic growth because the size and volatility of oil revenues encourage corruption, mismanagement, and authoritarian

governments that fail to invest for the future or provide for the well-being of the majority of their populations" (Hammond, 2011). This means that these problems are not the effects of the resource rents per se, but of the political or civil environments in which the natural resources are exploited. Lane (2005) has revealed that the stability in the growth rate of production per capita in a financial system with natural resources is relative to the rate of technical development tuned for the purpose of 'population growth drag' because of the diminishing returns along with 'natural resource reduction drag' which is caused due to declining points of exhaustible natural supplies.

2.2 Rent Seeking

Rent-seeking is an effort made to acquire financial rent by controlling the societal or political surroundings where all the economic happenings are taking place, instead of adopting the idea of generating new capital, for instance, expenditure of capital on political propagandas for the cause of being able to get a share in the distribution of wealth which is rolling all over the financial and has made its roots firm within the system. The term rent seeking has different connotations but it is often used to refer to a situation when economic agents through the political arena are seeking benefits. Rent is generally used to refer to the difference between the cost of production of a commodity and its price. In cases, when the price of a commodity far outweighed its cost, players use political measures to take the rent, thereby creating a bias toward unproductive activities (Hammond, 2011). Oil as a commodity possesses several characteristics, which encourage rent seeking as bonus proceeds boost unnecessary expense, even for appropriate devotions, without keeping for economic expansion to counterbalance the ensuing exhaustion of reserves. In other words, owners of natural resources have tenacious motivations to use the rents for immediate utilization and temporary gain rather than financing them for lasting development. Numerous modern researches on rent seeking have concentrated their ideas on attempts to detain different monopoly opportunities branching through the administrative regulation system of free competition. On the other hand, the word itself draws from the far more matured acts of appropriating a segment of production by getting the bragging rights or the command of land.

Massive reserves of natural resource fees may well generate the prospects for rent-seeking activities on a wider perspective as per the producers' point of view, therefore switching the resources away from the economic happenings that can have a more dynamic outcome (Auty 2001; and Temple 2008). For instance Tornell and Lane (2006) gives us an idea that regarding terms-of-trade bonuses and upshots in the natural resources may prompt political interference, or diversions, between influential groups of interest – diversions that can result in current account scarcity, inconsistent economic rearrangement, as well as decrease in the developmental aspects. In acute situations, civil wars break out– such as the one in Africa known as the diamond wars – which not only distract the causes of production from fruitful employment in the social context but also tear down public organizations and the stipulations by law. Woolcock (2008) illustrate with an observed notion as in what ways natural resources raises the prospect of civil war. One more extreme situation engages overseas managements taking charge with critical effects and the associated defense expenses.

2.2.1 Empirical evidence on rent-seeking in Nigeria

The literature on rent seeking in Nigeria is copious. Broadly speaking, the literature suggests that the development challenges in the country are closely related to the management of revenues from the petroleum sector (Eifert et al. 2003; Sala-i-Martin 2003). For instance, Eifert and Sala (2003) have described the political environment as one in which individual politicians rely on non-democratic mechanisms to sustain their power and private agendas have been important drivers for political decisions. Prevailing patron-client politics may explain why welfare-enhancing political solutions have been eschewed if vested interests would be threatened.

Similarly, Sala-i-Martin *et al.* (2003), who extensively analysed the resource curse hypothesis in Nigeria, found that the country's poor development record is caused more by political economy difficulties than by macroeconomic factors. The incentive problems include endemic corruption and patronage, which have worsened as executive control has become less dependent on democratic support. The federal government's responsibility for collection and redistribution of public revenues has strengthened its political relation to the states and local governments.

In this context, the comparison between Nigeria and Angola by Heller (2007) provides some useful insights. Heller's (2007) results showed systemic inefficiencies in both petroleum revenue generation and expenditure, as uncoordinated self-interested actors lead corrupt transactions and block attempts at consolidated reform. This points to important risks in Nigeria's petroleum governance with particular relevance to the revenue-generating aspect. As political power increasingly became dependent on allocations of petroleum revenues and decisions in petroleum regulation, the social contract between politicians and the electorate became less critical for political control. As a consequence, the electorate's perception of political accountability faded.

According to Heller (2007) these outcomes confirm the rentier state postulation, which suggests that in a resource-rich and resource-dependent country, revenue control could become the core source of political power—a challenge Nigeria has in common with several other petroleum-rich developing countries (Ross 2001). Political power bolstered by petroleum revenues at the federal level has had ramifications beyond the three tiers of governance. Considering important non-political aspects, the causality in the development challenges sometimes seems unclear. The alternative explanations behind weak development tend to point toward the political setup.

In his analysis, Ross (2001) argued that the institutional framework for petroleum governance has not been made strong enough to prevent conflict of interest. In particular, it has been difficult to ensure transparency and control4 over production figures and revenues. Every institution along the extractive industries value chain that potentially could prevent fraud is weak. Although these weaknesses allow for manipulation, it is clear that the necessary underlying conditions for what generally is perceived as best practice in petroleum governance are not in place. The responsibility is political.

Gillies et al. (2009) said that these representatives allegedly condone or are involved in organized petroleum theft (bunkering) with opportunities to gain substantially. The entrenched interests of the long periods of military rule, combined with the military‘s inability to curb bunkering, demonstrate the military‘s continued influence on the government. Nevertheless, it is unlikely that military influence on the government alone would explain the comprehensive and systematic weaknesses in sector governance. None of these theories rejects the assumption of political incentive problems—those developed through petroleum-financed patronage—as the main explanation behind the country‘s challenges in petroleum sector governance.

2.3 Dutch Disease

Natural resource in great quantities can become a reason leading towards to the Dutch disease, in some pretexts. A natural resource increase and the surge associated in the export of raw-material can augment the actual exchange rate of the currency, therefore probably cutting down manufacturing and services sales made to other countries (Krugman 2001). Persistent booms and frequent halts have a propensity to raise actual exchange rate instability (Gylfason et al., 2009), hence reducing investment in the trading region along with the exports and imports of manufactured goods and services.

As stated earlier, the Dutch disease originally comprised the adverse effects on Dutch manufacturing of natural gas discoveries, which led to real exchange rate appreciation of its currency and consequently led to a contraction of production and exports of its tradable (i.e. manufacturing) sector (Corden and Neary, 1982). The manufacturing sector is a more dynamic sector than natural gas due to its learning-by-doing effects and other encouraging externalities, so its contraction (because of natural resource boom) could exert a drag on long-run economic growth (Sala-i-Martin *et al.*, 2003). After all, oil and gas are exhaustible resources that will diminish in the long run thereby exposing the vulnerabilities of the economies heavily dependent on such resources.

Sala-i-Martin *et al.* (2003) have, however, argued that although “waste” and “Dutch disease” pervade any macroeconomic account of Nigeria’s post-independence development experience, the Dutch disease provides an inadequate explanation for Nigeria’s growth performance. They, however, strongly argued that the waste explanation “appears to be overwhelming, with oil a key factor causing a whole series of pathologies that have led to the waste” (p.12). Expatiating further on the ‘waste’ hypothesis, Sala-i-Martin *et al.* (2003) pointed to the rapid deterioration and decline in ability operation in Nigeria’s manufacturing sector, a substantial portion of which is government-owned. They observed that "capacity utilization, which averaged about 77 percent in 1975, started declining very quickly, to about 50 percent in 1983, and since the mid-1980s, capacity utilization has never exceeded 40 percent, and has languished at around 35 percent. In other words, two-thirds of the investment in manufacturing by the government is consistently wasted." (p.13).

2.4 Natural Resource Rents and Economic Growth

The world perceives natural resources as the most primitive yet significant source of economic as well as financial affluence for the countries. However, history evidenced that it is not necessarily true that the country, which is affluent in its natural resources, is likely to acquire maximum economic prosperity and progress out of it. To affirm this point, take the most successful and richest countries of world for instance; the prominent names in the list of world’s richest countries are Hong Kong, Japan, Singapore and Switzerland and in actual fact, all these countries do not posses sovereign ownership of their natural resources and do not also use them for their national wealth (Mauro 2005). On the other hand, countries like United States and the United Kingdom are among the most developed nations of the world as they are rich in all of their industrial sectors, but when it comes to natural resources, these countries do not involve the natural resource they have for generating economic benefits for the entire nation and thus, natural resources play a very minor role in their national income. Empirical studies on the subject matter suggest that the inclinations towards natural resources in developing countries are comparatively more ubiquitous (Backus 2002). This fact reflects the economic status of

these countries to be underdeveloped as those countries which are developing their economic sectors for being modestly recognized frequently takes account for agriculture and other natural-resource-based economic activities to boost their economic growth. On the other, this world is full of such countries that are tremendously affluent as far as their natural resources are concerned but still did not come up with apparent gestures of a sustained economic growth (Levine and Renelt, 2002).

Economic growth is influenced by many factors, although the neoclassical growth model emphasises the role of investment as a key determinant of growth. The other factors include legal, political, socio cultural and the geographical factors as in the case of the Solow model. Eifert (2003) and Sala et al. (2003) also identified a number of other factors as important determinants of economic growth, including labour force, tangible capital, technological know-how and natural resources.

The role of natural resources in the economic growth process is, however, subject to controversy, as a number of empirical studies have yielded evidence of the adverse impact of natural resource rents on growth. For instance, Hausman and Rigobon (2002) have stated that: "The concern that natural resource wealth may somehow be immiserating is a recurring theme in both policy discussions and in empirical analysis. The practical uniformity seems to be in the data but understanding its causes has been a much harder task." Sala-i-Martin *et al.* (2003) have argued that this practical consistency originates from the original work of Sachs and Warner (1995), who showed that "the curse of natural resource-ownership is substantial, manifested in such countries growing slower, on average, by about 1 percent per year during the period 1970–1989. (P.5)" Different alternatives of this result have also been emphasized by Leite and Weidmann (1999) and Bravo-Ortega and De Gregorio (2001).

III. Research Design

The methodological framework for analyzing the impact of oil rent on economic growth and development in Nigeria will be based on regression analysis. Two types of a regression equation will be used for this purpose. The first type of model will be based on the regression of equation of GDP per capita on oil revenues, controlling for other development indicators such as health, education, agriculture, transport and communications infrastructure. Here, the estimated coefficient of the oil revenue is expected to capture the direct impact of oil rent on economic development. The stylized form of the regression equation is as follows:

$$GDPPC_t = \alpha_0 + \beta_1 Ln\_OIL_t + \beta_2 Ln\_EDUC_t + \beta_3 Ln\_HEALTH_t + \beta_4 Ln\_TRANS_t + \beta_5 Ln\_AGRIC_t + \beta_6 Ln\_LABOUR_t + \beta_7 Ln\_INVEST_t + \varepsilon_t \quad (1)$$

Where:
Ln = Natural logarithm
GDPPC = Gross domestic product (GDP) per capita in constant local currency price
OIL = Oil revenue as a percentage of GDP
EDUC = Education expenditure as a percentage of GDP
HEALTH = Health expenditure as a percentage of GDP
TRANS = Transport and communications expenditure as a percentage of GDP
AGRIC = Agriculture expenditure as a percentage of GDP
LABOUR = Labour force (million persons)
INVEST = Gross fixed capital formation as a percentage of GDP
t = Time period from 1980-2010
ε_t = Random error term
α_0 = Constant term
β_1, β_2, β_3, β_4, β_5, β_6, β_7, = Coefficients for Oil, Education, Health, Transport, Agriculture, Labour force and Investment capital respectively.

As stated earlier, the coefficient β_1 captures the direct effect of oil rent on GDP per capita. But oil rent could also affect economic development of Nigeria indirectly through its impact on the other controlled independent variables. Such indirect effects could be measured by including "interaction terms" between oil rent and each of other independent variables (education, health, agriculture, transport, labour force and investment). For example, the interaction term between oil rent and education can be obtained by multiplying the oil rent by expenditure on education. A similar procedure can be used to calculate the interaction terms between oil rent and other variables. However, including six or more additional variables (interaction terms) will affect the degrees of freedom of the regression equation thereby rendering such an exercise meaningless. For this reason, we shall only confine our analysis here to measuring the direct effect of oil rent on per capita GDP by estimating the regression equation 1 above.

In order to capture the impact of oil rent on education, health, agriculture, and transport and communications infrastructure in Nigeria, we shall specify and estimate the following four additional regressions:

$$EDUC = \alpha + \beta_1 Ln\_OIL + \beta_2 Ln\_INVEST + \beta_3 Ln\_LABOUR + \beta_4 Ln\_GDPPC + \varepsilon_1 \quad (2a)$$

$$HLTH = \alpha + \beta_1 Ln\_OIL + \beta_2 Ln\_INVEST + \beta_3 Ln\_LABOUR + \beta_4 Ln\_GDPPC + \varepsilon_2 \quad (2b)$$

$$AGRIC = \alpha + \beta_1 Ln\_OIL + \beta_2 Ln\_INVEST + \beta_3 Ln\_LABOUR + \beta_4 Ln\_GDPPC + \varepsilon_3 \quad (2c)$$

$$TRANS = \alpha + \beta_1 Ln\_OIL + \beta_2 Ln\_INVEST + \beta_3 Ln\_LABOUR + \beta_4 Ln\_GDPPC + \varepsilon_4 \quad (2d)$$

In equations 2a to 2d above, all variables are as defined in equation 1. The aim of these four equations is to capture the direct effect of oil rent on education, health, agriculture, and transport and communications respectively.

IV. Analysis And Results

Results obtained from the statistical analysis of the impact of oil on Nigeria's economic development, measured by GDP per capita are discussed, followed by the analysis of the results from the regression of each of the national income accounting components on oil revenues

4.1 Analysis of Results: Impact of Oil Revenues on GDP Per Capita

As stated earlier, the first set of regression equations involves measuring the impact of oil revenue on economic development in Nigeria, using GDP per capita as the dependent (criterion) variable. In addition to oil revenue, other controlled variables such as expenditures on education, health, agriculture and transport have been used as independent (predictor) variables. The various results derived from this type of regression model are discussed below.

4.1.1 Results of the Standard OLS Regressions

In an attempt to test the research hypothesis of the impact of oil rent on economic development, we first employed the standard method of ordinary least squares (OLS) regression of real GDP per capita on oil revenues and a host of other independent variables covering the period 1980-2010. The regression equation was estimated using the E-Views statistical software, and the results from this equation are presented in Table 4.1.

Table 4.1: Estimated Regression Equation of GDP Per Capita

Independent Variable	Estimated Coefficient	Standard Error	t- Statistic	Probability Value
Constant	8.5267 (8.4208)	1.0125	8.4208	0.0000
LN_OIL	0.0471 (0.6146)	0.0766	0.6146	0.5448
LN_LABOUR	0.4785 (3.2051)	0.1493	3.2051	0.0039
LN_INVEST	0.1043 (0.5719)	0.1823	0.5719	0.5729
LN_HEALTH	0.2554 (3.0719)	0.0831	3.0719	0.0054
LN_EDUC	-0.2152 (-2.6750)	0.0804	-2.6750	0.0135
LN_AGRIC	-0.1122 (-2.5202)	0.0445	-2.5202	0.0191
LN_TRANS	0.0001 (0.0031)	0.0371	0.0031	0.9975
Time Period	1980-2010			
Adjusted R2	0.5853			
F-statistic	7.05; Prob>F=0.0002			
LN = Natural logarithm; OIL = Oil revenue as a percentage of GDP; LABOUR = Workforce; INVST = total investment; while HLTH, EDUC, AGRIC, and TRAN are percentage respective shares of Health, Education, AGRIC, and Transport & Communication in GDP.				

In interpreting the results from our estimated regression equation contained in Table 4.1 we shall evaluate the significance of the estimated coefficients from both 'economic' and 'statistical' perspectives. With regard to the independent variables, our main focus is on the estimated coefficient of Oil revenue which is at the heart of the research hypothesis concerning the link between oil rent and economic development. As the results in Table 4.1 shows, the estimated coefficient of Oil revenue is 0.0471. This means that, ceteris paribus, a one-percentage increase in oil revenue would increase GDP per capita by only 0.0471 percent. Thus, in terms of economic importance, oil revenue is positively related to economic development in Nigeria in line with *a priori* expectations although the magnitude of the relationship at 0.0471 appears to be low. But is the estimated

coefficient of the oil revenue significant in the statistical sense? Here, we need to look at the "probability value" (margin of error in rejecting a null hypothesis) of the estimated coefficient of the oil revenue, which is 0.5448. Based on the high margin of error, we can say that the estimated coefficient of oil revenue is not statistically significant. This means that the relationship between oil rent and GDP per capita in Nigeria is not significant since the probability value ("margin of error") of rejecting the null hypothesis of "no relationship" is much higher than the allowable upper limit of 10%.

In the case of the other independent variables in the regression equation, with the exception of Agriculture and Education, all of them have positive coefficients, implying that a percentage increase in each of the independent variables will increase GDP per capita in Nigeria by the corresponding coefficients in percentage terms. However, only the estimated coefficients of Labour and Health are statistically significant while the coefficients of Investment and Transport are not statistically significant. As Table 4.1 shows, the estimated coefficient of labour force is 0.4785 and statistically significant at the 1% level (i.e. probability value of 0.0039). This means that a one-percentage increase in the workforce would increase GDP per capita by 0.48%, holding other independent variables constant. Similarly, Health appears to have a positive effect on GDP per capita in Nigeria, with an estimated coefficient of 0.2554, which is also statistically significant at the 1% level (probability value of 0.0054).

In the case of agriculture and education, the results suggest that they both tend to have negative impacts on real GDP per capita in Nigeria. Unfortunately, the negative coefficients of both Agriculture and Education are statistically significant at the 5% level. These results are perverse but not surprising as, with the discovery of oil, Nigerian policy makers have virtually turned blind eyes to agricultural development with devastating consequences for the sector. Similarly, Nigeria's education system, which used to be one of the best in Sub-Saharan Africa, was neglected in recent years leading to a rapid deterioration in the quality and standards of education in the country.

Overall, the regression equation has produced mixed results, which can be attributed to a number of reasons. First, the lack of statistical significance of the coefficients of the oil revenue, for instance, may be a reflection of the widely reported distortion that is associated with rent-seeking and economic mismanagement of oil rents in Nigeria. Second, regression equation can also produce unreliable results if the model suffers from econometric problems such as autocorrelation (associated largely with time series data), heteroscedasticity (associated with cross section regression), multicollinearity, unit root, misspecification, and simultaneity bias. For instance, the low Durbin-Watson statistic suggests that the regression equation in Table 4.1 suffers from autocorrelation problem. The rest of the econometric problems would, however, require further investigations or tests to warrant detection, which would then require remedial measures to deal with the problems.

In spite of these potential problems, however, the overall model is good as demonstrated by the relatively high R-squared (0.682) and a high F-statistic of 7.05. The fact that the F-statistic is statistically significant shows that although some of the independent variables have insignificant coefficients, all the independent variables jointly (collectively) exert considerable influence on economic development in Nigeria. The R-squared also suggests that 68.2 percent of the variation in GDP per capita in Nigeria is explained by the independent variables in the model.

4.1.1.1 Further Investigation of Autocorrelation Problems

Autocorrelation (serial correlation) is a common problem that is associated with a time series model such as the one in the present study. The presence of autocorrelation will not affect the unbiasedness property of the OLS coefficients but it will increase the standard errors of estimated coefficients thereby making the coefficients insignificant and rendering inappropriate for forecasting or inferential analysis. However, autocorrelation is a matter of degree but first-order autocorrelation, AR(1) is the most common form of autocorrelation in annual time series data although higher-order serial correlation can also be detected in such data.

Table 4.2 shows the results of the regression equation that includes AR(1) term. The fact that the coefficient of the AR(1) is statistically significant confirms the presence of first order autocorrelation. The inclusion of the AR (1) term in the regression equation has raised the Durbin-Watson statistic to 1.61 and has also improved the adjusted R-squared to 0.8858. However, the correction for serial correlation has rendered all the variables insignificant as adjudged by their high probability values. Nonetheless, the joint significance of the model has improved as confirmed by the F-statistic.

Table 4.2: Estimated Regression Equation for GDP Per Capita with AR(1)

Independent Variable	Estimated Coefficient	Standard Error	t- Statistic	Probability Value
Constant	0.166657 (0.016942)	9.837139	0.016942	0.9866
LN_OIL	0.000119 (0.002133)	0.055651	0.002133	0.9983

LN_LABOUR	2.630997 (1.185602)	2.219123	1.185602	0.2490
LN_INVEST	0.063462 (0.629514)	0.100812	0.629514	0.5358
LN_HEALTH	0.044256 (1.136407)	0.038944	1.136407	0.2686
LN_EDUC	-0.029564 (-0.721237)	0.023803	-0.721237	0.4787
LN_AGRIC	-0.011623 (-0.488295)	0.023803	-0.488295	0.6304
LN_TRANS	-0.018231 (-0.90937)	0.020048	-0.90937	0.3735
AR(1)	0.940285 (18.80799)	0.049994	18.80799	0.0000
Time Period	1980-2010			
Adjusted R^2	0.885826			
F-statistic	29.12487; Prob>F=0.0000			

The regression equation was therefore subjected to further tests of higher-order autocorrelation by including a second-order autocorrelation, AR(2) term. However, the estimated coefficient of the AR(2) is not statistically significant, as shown in Table 4.3, suggesting that the model does not suffer from higher-serial correlation problems. Even so, the results of the estimated coefficients of all the independent variables are not statistically significant. As a result, we subjected the data to further tests for unit root problems as discussed below.

Table 4.3: Estimated Equation of GDP Per Capita with AR(1) and AR(2)

Independent Variable	Estimated Coefficient	Standard Error	t- Statistic	Probability Value
Constant	4.791922 (1.319189)	3.632476	1.319189	0.2028
LN_OIL	0.017283 (0.342467)	0.050467	0.342467	0.7358
LN_LABOUR	1.509154 (1.681406)	0.897555	1.681406	0.4146
LN_INVEST	0.075176 (0.834140)	0.090125	0.834140	0.4146
LN_HEALTH	0.018784 (0.576001)	0.032611	0.576001	0.5714
LN_EDUC	-0.005848 (-0.167325)	0.034953	-0.167325	0.8689
LN_AGRIC	-0.004050 (-0.167325)	0.019501	-0.167325	0.8377
LN_TRANS	-0.019140 (-1.027043)	0.018636	-1.027043	0.3173
AR(1)	1.125204 (5.773868)	0.194879	5.773868	0.0000
AR(2)	-0.244625 (-1223383)	0.199958	-1.223383	0.2361
Time Period	1980-2101			
Adjusted R^2	0.915804			
F-statistic	34.83966; Prob>F=0.0000			

4.2 Unit Root Test

One of the problems that is common with most time series data is that of unit root problem as the order in which the data is integrated with one another is determined by unit root. Thus, the presence of a unit root problem in the time series data suggests that the data is not stationary, which means that the data will continue to diverge away from its long-run path. Under such circumstances, an application of the OLS estimation technique will yield spurious regression that will render the estimated coefficients meaningless and ineffective (Brooks, 2002).

Thus, if the data is not stationary at levels, it should be subjected to further stationarity tests at first-difference and higher order differences if necessary until the unit root problem is resolved. Given that the data used for the analysis is time series, it is important that we conduct unit root tests to determine whether or not the data is stationary at levels.

There are a number of methods for testing unit root tests but the most common ones are the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) techniques. Testing for unit root via both approaches involves comparing the test statistic with the corresponding critical values that are at 1%, 5% and 10% respectively. The absolute values of the ADF and PP must be greater than the critical values to reject the null hypothesis of unit

root. If the absolute values of the ADF and the PP statistics are, however, smaller than their corresponding critical values the the data can be said to suffer from a unit root problem and must be differenced and subjected to additional unit root tests.

We performed the ADF and PP tests on all the variables in our model and the results are shown in Tables 4.4 and 4.5 respectively. As can be seen from the tables, all the variables are stationary at levels except per capita income. This suggests that, with the exception of GDP per capita, all the variables do not have unit root problems at levels. In contrast, the per capita income is not stationary at levels, so its first difference form was subjected to a further unit root test before becoming significant. The implication of this test is that since at least one of the variables has a unit root problem at levels but not at first difference, it is desirable to perform the regression analysis in first-difference of all variables.

Table 4.4: Results of the Augmented Dickey-Fuller Unit Root Test

Variables	Levels	First difference
LN_	-0.63	-3.51**
LN_OIL	-3.45***	-6.32*
LN_AGRIC	-3.86**	-7.50*
LN_EDUC	-4.70*	-5.19*
LN_HEALTH	-5.88*	-5.39*
LN_INVEST	-4.40*	-5.16*
LN_LABOUR	-3.49***	-7.09
LN_TRANS	3.63**	-7.50*
*, **, *** significant at 1%, 5%, 10% respectively. *Test includes an intercept and a trend*		

Table 4.5: Results of the Phillips-Perron Unit Root Test

Variables	Levels	First difference
LN_	-0.54	-9.05*
LN_OIL	-3.53***	-8.17*
LN_AGRIC	-3.86**	-20.86*
LN_EDUC	-5.37*	-15.42*
LN_HEALTH	-5.94*	-22.09*
LN_INVEST	-3.89**	-9.05*
LN_LABOUR	-3.47***	-7.93*
LN_TRANS	-3.69**	-7.66*
*, **, *** significant at 1%, 5%, 10% respectively. *Test includes an intercept and a trend*		

We re-estimated the regression equation using first difference of all variables and the results are presented in Table 4.6. The results are, however, show that all the estimated coefficients are individually and jointly insignificant as demonstrated by the probability values and the F-statistic. In addition, with the exception of investment and health variables, all the independent variables including oil revenues have negative coefficients, lending support to findings from previous studies about natural resource curse in Nigeria, as will be discussed in the next section.

Table 4.6: Estimated Regression Equation of GDP Per Capita Based on First Differences

Independent Variable	Estimated Coefficient	Standard Error	t- Statistic	Probability Value
Constant	0.024615 (0.394477)	0.062399	0.394477	0.6970
D(LN_OIL)	-0.014578 (-0.256845)	0.056759	-0.256845	0.7997
D(LN_LABOUR)	-0.389211 (-0.151339)	2.412375	-0.161339	0.8733
D(LN_INVST)	0.015263 (0.144645)	0.105520	0.144645	0.8863
D(LN_HLTH)	0.057522 (1.424907)	0.040369	1.424907	0.1682
D(LN_EDUC)	-0.044129 (-1.046405)	0.042172	-1.046405	0.3067
D(LN_AGRIC)	-0.007310 (-0.290451)	0.025167	-0.290451	0.7742
D(LN_TRANS)	-0.015914 (-0.760433)	0.020927	-0.760433	0.4551
Time Period	1980-2010			
Adjusted R2	-0.119776			
F-statistic	0.556863; Prob>F=0.782251			

V. Impact Of Oil Revenue On Nigeria's Key Socio-Economic Sectors

The analysis in the preceding section was intended to capture the direct impact of oil rents on overall economic development in Nigeria, proxied by real GDP per capita. This aggregate analysis, however, masks considerable variation in the impact of oil on the various sectors of the economy. To evaluate the sector-specific impacts of oil rents, we performed four additional regression equations corresponding to the following four sectors: Education, Health, Agriculture and Transport. Results from these four regression equations are presented in Table 4.7.

Table 4.7: Regression Equations for Education, Health, Agriculture and Transport

Independent Variables	Education	Health	Agriculture	Transport
Constant	2.75 (0.4182)	-13.13* (2.163)	5.07* (0.91)	-8.41 (1.17)
Ln_OIL	0.35 (0.08)	-0.01 (0.03)	0.56 (1.86)	-0.09 (0.21)
Ln_INVEST	1.70 (1.03)	1.32** (2.05)	1.70** (2.87)	2.06** (2.71)
Ln_LABOUR	2.67** (2.21)	1.18** (2.00)	2.67* (4.95)	1.29*** (1.85)
Ln_GDPPC	-2.25*** (1.40)	0.34 (0.46)	-2.25** (3.77)	-0.42 (0.54)
Time period	1980-2010	1980-2010	1980-2010	1980-2010
Adjusted R^2	0.1240	0.337	0.651	0.3076
F-Statistics	2.061***	4.812**	14.993*	4.332**
*, **, *** significant at 1%, 5%, 10% respectively. Note: Figures in brackets are absolute values of T-statistic				

The results from Table 4.7 show that oil has a negative impact on education, health and transport sectors but the coefficient of oil in all three equations is not statistically significant. On the other hand, contrary to the reality on the ground, oil appears to have a positive effect the agriculture sector. In almost all equations, however, the estimated coefficients of labour and investment are positive and statistically significant at various levels. This suggests that labour and investment play a significant role in all different sectors of the Nigerian economy. However, the results may also run counter to the reality on the ground as the productivity of most Nigerian workers is low and the quality of investment capital is rather poor.

VI. Discussion Of Findings

We shall now discuss the results obtained from our econometric analysis in the context of the theoretical literature and findings from past empirical studies. Theoretically, when managed efficiently and effectively, oil rents are expected to promote economic growth and developments of nations. But under the natural resource curse literature, however, oil revenues tend to encourage corruption and rent-seeking activities, which in turn undermines economic development.

The results from our analysis broadly tend to lend support to the natural resource curse literature, as the estimated coefficient of oil in all equations is either negative or positive but not statistically significant. This is not surprising as most oil exporting countries that have earned huge oil rents also tend to have high socio-economic problems, including high poverty rates, poor health services, high rates of child mortality and poor educational system amongst others (Karl, 2007). Nigeria is therefore not an exception as, despite oil wealth, it is one of Africa's most impoverished nations. Clearly, the huge oil revenues Nigeria has amassed over the years have not been used for the greater good of the country as other recent studies have unearthed (Eric, 2008, Isham et al., 2005, Sala-i-Martin *et al.*, 2003).

As stated in earlier, Nigeria provides a classic example of a country that suffers from the resource curse, and the results from the regression of GDP per capita on oil (with or without first-differencing) tend to lend support to this argument. These results concur with findings from several past studies, such as Auty (1990, 2001); Sachs and Warner (1997); and Tornell and Lane (2006). These past studies have advanced the argument that excessive oil rent-seeking prevents the oil from having a positively statistical effect on economic growth and development. In the case of Nigeria, revenues earned from oil exports over the decades have been mismanaged due to corruption, rent seeking, economic wastages, inefficiency and lack of transparency in the affairs of the government. In terms of corruption, Nigeria has been consistently rated as one the most corrupt nations in the world in the last decade by the Transparency International, a Berlin-based anti-corruption agency. In the 2011 Corruption Perception Index table, Nigeria was rated as 143rd in the league table out of 183 countries (Transparency International, 2011). This means that only 40 countries in the world surpass Nigeria in terms of the nature and extent of corruption, and many of these countries are poor developing countries anyway.

The sad state of economic affairs in Nigeria is unfortunate as during the past two and half decades the country has earned over $300 billion (34 trillion naira) most of which were earned in the last ten years of democratic era (Daily Times, 2012; Economic Confidential, 2010), yet the country has one of the highest poverty rates in the world with high child mortality rates, poor educational system, poor health services and infrastructures. According to the UNDP (2011), Nigeria's human development index (HDI) for 2011, at 0.459, is one of the lowest in the world, ranking Nigeria at 156 out of 187 countries.

The recent national protest about the removal of oil subsidy in Nigeria has highlighted the widespread nature of corruption and rent seeking activities in the oil sector. The government always acts in cohort with politicians and other self-serving Nigerians and foreigner to engage in such rent seeking activities. Similarly, lack of political will to implement the annual budgets, coupled with lopsided allocations between recurrent expenditure and capital expenditure/projects has resulted in wastages of scarce resources meant for sustainable development. Policy makers have consistently not been fully implementing the country's approved budgets. For instance, in 2012 the Nigerian Senate accused the government of implementing only 21.5% of the 2012 budget in July, more than six months into the year. In the same budget, the Government, as in previous years, allocated a whopping 74% (about 3.34 trillion naira) to recurrent expenditure, while only 1.32 trillion naira (24% of the budget) was earmarked for capital projects. Even so, the bulk of these budgetary allocations actually go to their intended targets. These and other related issues cannot be picked up by a regression equation, and it is therefore not surprising that the results from our statistical analysis may not necessarily reflect the reality of what obtains.

VII. Conclusions

This paper examines the national accounts of Nigeria with the view to determine where the oil revenue is channeled to during the period of the study. The aim is to critically examine the Nigeria's oil rent and its impact on the country's national development during the recent democratic transition period (1999-2010).

As is widely known, Nigeria is endowed with substantial amounts of crude oil which puts the country as the world's sixth largest exporter of oil. And, during the last three decades, Nigeria has earned over $300 billion from oil exports but with little to show on ground in terms of economic development, as the country is ranked as one of the poorest in the world in terms of key economic development indicators, such as per capita income, human development index, health and education statistics, and physical infrastructure facilities. Agriculture, which was once the mainstay of the economy in terms of its contribution to national income, government revenue and foreign exchange earnings, has been neglected following the discovery of oil and, as a result, the country has suffered from the consequences of the so-called Dutch disease syndrome. This sad state of affairs has generated intense debate in the natural resource literature as to the beneficial effects of oil in Nigeria, with many analysts suggesting that oil is a curse rather than a blessing for the country. The key questions are why is oil a curse for Nigeria? Why did the accumulated oil rents go? What are the impacts of oil rent on overall economic development and individual sectors of the Nigerian economy?

The results show that oil has no significant impact on both overall economic development and all individual sectors with the exception of agricultural sector, as the estimated coefficient of oil in all equations is either negative or positive but not statistically significantly different from zero. The results are contrary to expectations but not surprising as most oil exporting countries that have earned huge oil rents also tend to be bedeviled with massive socio-economic problems including high incidence of poverty, poor social (health and education) services, and dilapidated physical infrastructure. Nigeria is therefore not an exception as the development challenges facing the country tend to surpass those of comparable oil-abundant countries. The outcomes of the statistical analysis therefore seem to lend credence to the theoretical literature of a natural resource curse.

Thus Nigeria provides a classic example of a country that is rich and yet so poor because despite the oil wealth over 70 percent of the population languish in abject poverty living below the poverty line of $2 per day. Nigeria's educational system, once described as the best in Sub-Saharan Africa, is now in serious trouble as the quality has deteriorated beyond belief. Similarly, hospitals have been reduced to mere consulting clinics and death traps devoid of equipment, facilities, drugs, and highly qualified personnel as the best medical experts have fled the country. Despite billions of dollars purposed to have been budgeted for overhauling the notorious power sector, Nigeria currently suffers from constant power outages with electricity being rationed on a daily basis, which creates havoc to household and industrial equipment as well as costing households and business substantial amounts of money in terms of private generators and expensive fuel to power these generators. In addition, Nigeria's transport system, especially road and air transportation, has become death traps as demonstrated by the widespread cases of road and air transport accidents and fatalities. All this sad state of affairs exists in a country that is blessed with abundance of natural and human resources, and during the last ten years the government has garnered more revenues from oil than during the previous forty years due to substantial increases in both oil prices and production. So, what accounts for such a puzzling situation?

A number of factors and reasons have been advanced in this study, as in previous studies, for the lack of effective and efficient utilisation of oil rent in Nigeria. Simply put, revenues earned from oil exports over the decades have been mismanaged due to corruption, rent-seeking, wastage, inefficiency and poor governance as demonstrated by lack of accountability and transparency in the affairs of the government. As a result, the bulk of the oil wealth has leaked out of the formal system instead of being channeled to productive activities that could create jobs, boost income, improve living standards, eradicate poverty, and promote overall economic growth and development. So long as these phenomena continue to exist in Nigeria, the country's oil wealth will continue to be squandered by the few individuals (politicians, policy makers, oil marketers and their international collaborators) to the detriment of the majority of the population. Surely, the status quo is not sustainable and efforts must be made to introduce and implement genuine reforms to allow oil to play a key beneficial role in the economic development process of Nigeria. Whether or not the ugly status quo can be 'changed' for better by the current administration of Muhammadu Buhari is very difficult to conclude.

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