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Correlations between the Petroleum Industry and the Per Capita Income in Nigeria: Cointegration and Error Correction Model Approach

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ABSTRACT

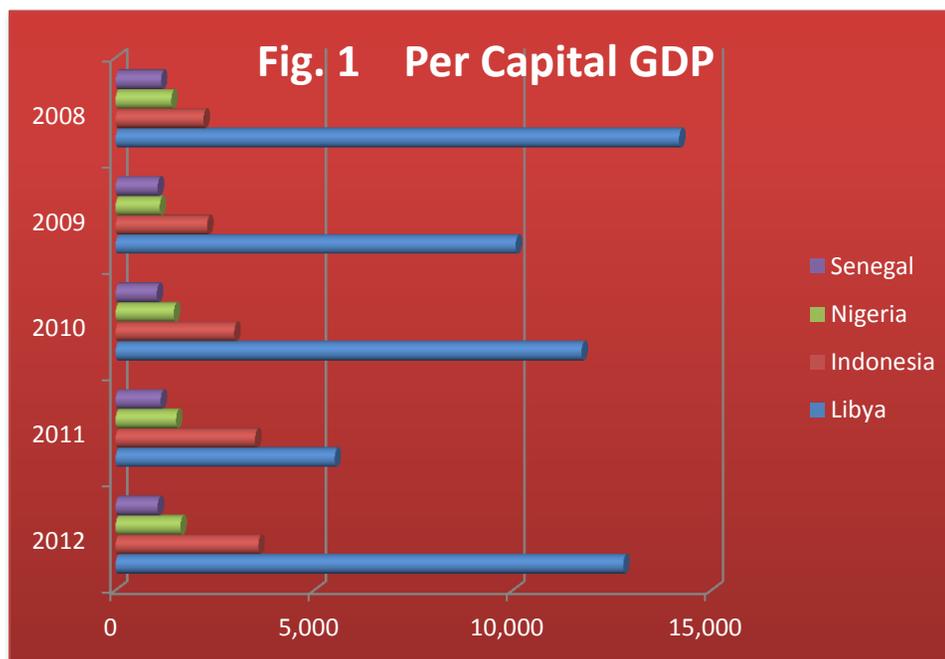
In the literature, there has been an acquiescence that the greater the dependence on oil and mineral resources, the worse the growth performance of an economy. With time series data of Oil Revenue (proxy for petroleum industry), Non-oil Revenue, Investment and GDP per capital from 1970-2012, the paper explores the correlations between the petroleum industry and real per capita income in Nigeria. Using cointegration and error correction approach, the study finds that oil revenue has a positive and significant impact on per capital real income in the long-run. As well, the study shows that non-oil revenue and investment has insignificant impact on per capital real income, validating the fact that the entire economy is dominated by oil.

Contrary to a report by the Ernst & Young (2013) which indicated that Nigeria's per capita Gross Domestic Product is expected to cross the \$2,000 threshold by 2017, Nigeria may not harness its petroleum revenues to lift its teeming population out of the vicious circle of poverty because only a small percentage of the population is employed in the petroleum industry. Therefore, Nigeria needs to develop other sectors of the economy. Some of the suggested means are: economic diversification, technology management, transparency, investments in education, domestic private ownerships, public involvement and strong institutions among others.

1. Introduction

A recent United Nations report shows that in quality of life, Nigeria rates below all other major oil nations, from Libya to Indonesia. Its annual per capita income of \$1,400 is only close to that of Senegal, which exports mainly fish and nuts. In 1960, agricultural products such as palm oil and cacao beans account for almost all Nigeria's exports. In 2000s, they barely register as trade items so much so that Nigeria has downgraded from being self-sufficient in food to importing more than it produces. The oil boom of the 1970s led Nigeria to neglect its strong agricultural and light manufacturing bases in favor of an anemic dependence on crude oil. By 2000, oil and gas exports accounted for more than 98% of export earnings and about 83% of federal government revenue. New oil wealth has led to the concurrent decline of other economic sectors, and a lurch toward a static economic model.

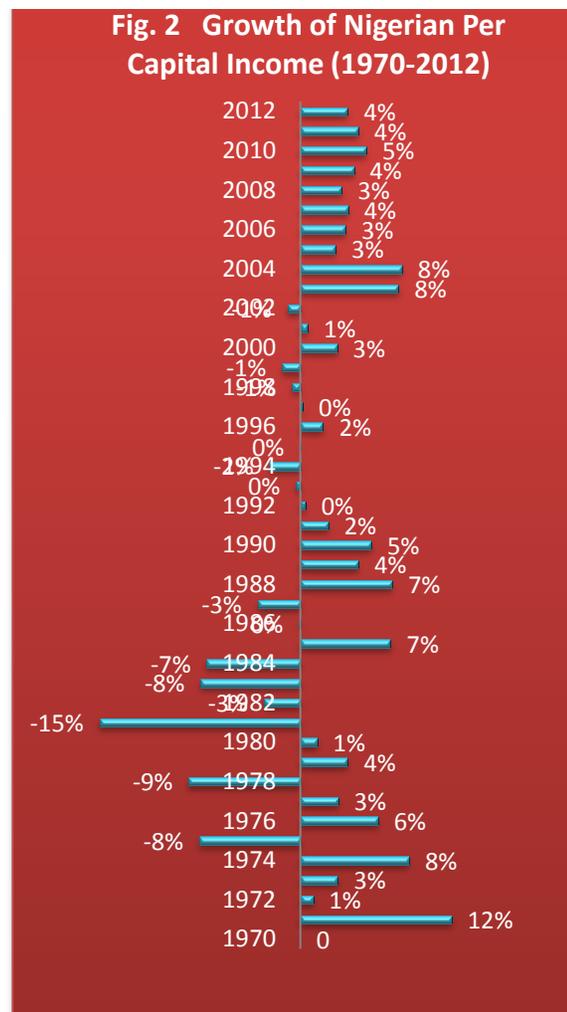
In spite of abundance of natural resources, the expansion of the petroleum industry has been thwarted by its obsolete infrastructure and the "frustratingly slow" movement of goods through the major ports, according to the U.S. Office of Trade in 2002. The economy is struggling to leverage the country's vast wealth in fossil fuels in order to displace the poverty that affects about 45% of its population who lives on less than US\$2 per day. Reportedly, 80% of Nigeria's energy revenues flow to the government, 16% covers operational costs, and the remaining 4% go to investors. However, the World Bank has estimated that as a result of corruption 80% of petroleum revenues benefit only 1% of the population.



Current GDP per capita of Nigeria expanded 132% in the Sixties reaching a peak growth of 283% in the Seventies. But this proved unsustainable and it consequently shrank by 66% in the Eighties. In the Nineties, diversification initiatives finally took effect and decadal growth was restored to 10%. Due to inflation, per capita GDP, in 2012, remains lower than in 1960 when Nigeria declared independence. Nigeria is ranked 30th (40th in 2005, 52nd in 2000), in the world in terms of GDP (PPP) as of 2012, and 3rd largest within Africa (behind South Africa and Egypt). The Gross Domestic Product per capita in Nigeria was last recorded at 1052.34 US dollars in 2012. This is equivalent to 8 percent of the world's average. From 1960 until 2012, Nigeria GDP per capita averaged 686.2 USD reaching a record low of 431.0 USD in 1968 and an all-time high of 1052.3 USD in 2012.

The issue is the overdependence on the capital-intensive oil sector, which provides less than 25% of GDP, despite providing 95% of foreign exchange earnings and about 65% of government revenues. Nigeria produces only about 2.7% of the world's oil supply (Saudi Arabia: 12.9%, Russia: 12.7%, USA: 8.6%). According to the CBN (2013), crude oil production, including condensates and natural gas liquids, is estimated at an average of 1.88 million barrels per day. With 35 billion barrels of proven oil reserves and another 5 billion in development, petroleum is the lifeblood of Nigerian economy. It has an estimated 159 trillion cubic feet of proven natural gas reserves, making the country one of the top ten natural gas endowments in the world. The types of crude oil exported by Nigeria are Bonny light oil, Forcados crude oil, Qua Ibo crude oil and Brass River crude oil.

The petroleum industry has emerged from the scourge of militancy in the Niger-Delta



when production was at a low of 1.6 million barrels per day in 2009 to current levels of about 2.4 million barrels per day mainly attributable to the government's amnesty program. This current production comes from Joint Ventures with International Oil Companies which accounts for about 64% of production and Production Sharing Contracts (PSCs) which accounts for about 36% of production. The industry has also undergone some asset transfer transactions largely from Shell, Total and ENI, alongside the emergence of new largely indigenous led independent companies. In 2011, the Nigerian gas produced for sale has increased to a historic high level of 4.3 billion cubic feet per day out of which 1.1 billion cubic feet per day is sold domestically. Nigeria has three refineries with nameplate capacity of 445,000 barrels per day, 5,120 km of product and crude pipelines, 21 storage depots and one import terminal at Atlas Cove, all of which have suffered from vandalism and poor maintenance over the years because of the lack of a commercially viable framework for cost recovery.

The political intrigues in Nigeria have cracked critical sectors of the economy, such as the oil and gas industry. Through various forms of subsidies, the huge cost of a non-commercial midstream and downstream oil sector has been borne by the government. These subsidies are no longer sustainable. Oil dependency, and the allure it generated of great wealth through government contracts, spawned other economic distortions. The industry is presently longing for workable framework that would put off the challenges to growth, production and security threats that has nearly crippled the industry in the past years. Poor corporate relations with indigenous communities, vandalism of oil infrastructure, severe ecological damage, and personal security problems continue to plague Nigeria's oil sector. Most of Nigeria's oil fields are located in the swamps of the Niger Delta where environmental pollution and damage arise from oil companies' development projects. The high unemployment and poverty levels in the region have exacerbated a long-running conflict between the indigenous community and the oil companies. According to a 2002 World Bank report, further sources of conflict stem from the multinational petroleum corporations' decisions to contract foreign workers instead of members of the local population.

Several strategies are open to an economy in its attempt to attain sustainable economic development, depending on its historical background and resource endowment. One such strategy is the resource-led strategy. Nigeria is very rich in crude oil and has reaped

billions of petrodollars. Sadly, Nigeria has not seen anything like the same sort of economic success that helped Canada, the United States and Australia industrialize in the early 20th Century. That is because in these advanced economies, oil production never rose to such a level as to dominate the entire economy. On the other hand, in Nigeria, oil is the major industry.

Estimating the impact of the petroleum industry on real per capita income is pertinent, considering a report by the Ernst & Young (2013) which indicated that Nigeria's per capita Gross Domestic Product is expected to cross the \$2,000 threshold by 2017. The entire economy is dominated by oil. It is imperative to determine if Nigeria can actually harness its petroleum revenues to lift its teeming population out of the vicious circle of poverty.

The rest of the paper is organized as follows: Section 2 summarizes the theoretical and empirical literature. Section 3 discusses estimation techniques. Section 4 analyses the empirical results using VAR modeling. Section 5 concludes with a discussion of policy implications.

2. Theoretical and Empirical Literature

A large literature suggests that there is a 'resource curse'. The literature offers six candidate explanations for the resource curse effect: Dutch disease, governance, conflict, excessive borrowing, inequality and volatility. This supports the argument of Terry (2000) which stated that oil-dependent countries suffer from what economists call the "resource curse". According to Ross (1999), available evidence shows that countries with abundant resource wealth do not perform better than their resource poor counterparts the greater; the dependence on oil and mineral resources, the worse the growth performance.

The so-called "Dutch disease" has thwarted the hopes of many poor, primary commodity exporters and spawned an extensive academic literature intent on explaining this seemingly paradoxical outcome. The Dutch disease is a theory that explains the

relationship between an increase in revenues from natural resources and the damaging effect on an economy. Also referred to as resource curse or paradox of plenty, it is a term used by economists to mean that resource-rich countries tend to perform poorly when compared with economies that are not well-endowed with natural resources. The claimed mechanism will make a given nation's currency stronger compared to that of other nations resulting in the nations other exports becoming more expensive for other countries to buy making the manufacturing sector particularly less competitive.

Osuntogun, Edordu, Oramah (1998) were of the view that the oil boom rather than contributing positively to economic growth has afflicted the Nigerian economy with the so-called "Dutch disease". Ross (2004) supported the presence of "Dutch disease" in Nigeria in terms of the distributive consequences of oil revenues. According to him, the most important Dutch disease effects can be linked to the crowding-out of agricultural and manufacturing exports. Any crowding-out of labor-intensive sectors can have adverse distributional consequences. A booming agricultural or manufacturing sector provides many economic opportunities to low-skill workers. Whereas a booming petroleum sector offers them few opportunities, except through government transfers or rent-seeking. When a booming petroleum sector crowds out agriculture or manufacturing exports, the opportunities for the poor could drop sharply.

Gelb (1988) documents six cases of Dutch Disease: Algeria, Ecuador, Indonesia, Nigeria, Trinidad and Tobago, and Venezuela. One of his case studies bares how Nigeria suffered from an extreme instance of the "Disease" in the 1980s. Spikes in oil prices in 1973-74 and 1979-80 led to a large oil windfall for the government, but this windfall and its concomitant spending amplifies inflation, an exchange rate hike and, subsequently, a 90% decline in the non-mining sector.

Akinwale (2012) investigates the existence of resource curse in Nigeria and examines various challenges that caused it. He adopts purposive sampling technique, distributing questionnaires across the key sectors of the economy. He shows that weak institution, poor level of technology and Dutch Disease have direct and significant impact on the resource curse in Nigeria while volatility of crude oil price does not have a significant impact on resource curse in Nigeria. He concludes that most of the solutions suggested in combating resource curse would not be realistic if high level of corruption, poor level of science and technology policy implementation and

infrastructural development, volatilities of price in the oil market, Dutch disease through overreliance on oil revenue, insufficient investment in education, weakly institutionalised states and lack of transparency continue to dominate the Nigerian system.

Karl (2005) find that, more than any other group of countries, oil-dependent countries show perverse linkages between economic performance, poverty, bad governance, injustice, and conflict. This is not due to the resource per se, but to the structures and incentives that oil dependence creates. Weinthal and Luoung (2006) stated that the more intense a country's reliance on mineral exports, the more slowly its economy grows. They find that GDP per capita in mineral-rich countries increased by 1.7% while that of mineral-poor countries increased by 2.5-3.5% between 1960 to 1990.

Yang and Lam (2007) examines the relationship between oil prices and economic activities for 17 oil-rich developing countries based on cointegration analysis. Their results indicate that in the majority of cases, oil revenue increases are followed by increases in both GDP per capita and investment. The economic development of the majority of sample countries, regardless of institutional quality, does not appear to be negatively affected by an oil boom, leaving the relation of oil revenues with the other macroeconomic variables such as the economic growth debatable. So, the issues that whether oil resources are a curse or a blessing for economic growth in oil exporting countries warrant more attention both theoretically and empirically.

Ogwumike and Ogunleye (2008) employs the vector error correction technique in examining the long-run impact of the oil wealth accruing to Nigeria on its economic development. They used indicators such as growth, private consumption, infrastructure (electricity), agriculture and manufacturing output growth rates. The empirical results suggest a significant positive long-run impact of per capita oil revenue on per capita household consumption and electricity generation while a negative relationship is established for GDP, agriculture and manufacturing. Even for those with a negative relationship at current period, there exist positive relationships at subsequent lags. Consequently, they opined that, oil revenue, if properly managed and invested, could be effectively used to induce oil-led development for Nigeria especially if corruption and poverty of transparency, accountability and fairness are uninvolved.

Almost all available literature deems that countries fortunate enough to have petroleum can center their development on this resource. They point out the possible benefits from increased government revenues, the transfer of technology, the improvement of infrastructure, heightened economic growth and job creation. Yet the experience of Nigeria to date illustrates little of these benefits. To the contrary, the corollaries of oil-led development in Nigeria tend to be negative, including slower than expected growth, barriers to economic diversification, poor social welfare performance, high levels of poverty, inequality and unemployment, poor governance high corruption, a culture of rent-seeking, often devastating economic, health and environmental degradation (Karl, 2005)

3. Model Specification and Estimation Techniques

3.1 Model Specification

Taking inference from the empirical findings and theories, which has been derived from the theoretical exposition of the Dutch disease and then making oil revenue central to the equation, the model to estimate the threshold of the impact of the petroleum industry on the per capital income has been considered in the following form:

$$GDPC = f(\text{OilRev}, \text{NonRev}, \text{Inv})$$

Where; GDPC = real per capital income. OilRev = Oil Revenue. NonRev = Non-oil Revenue, Inv = Investment.

$$GDPC = k \cdot \text{OilRev}^{\beta_1} \cdot \text{NonRev}^{\beta_2} \cdot \text{Inv}^{\beta_3}$$

Rewriting the model above in a log-linearised form, we obtain:

$$\ln GDPC_t = \beta_0 + \beta_1 \ln \text{OilRev} + \beta_2 \ln \text{NonRev} + \beta_3 \ln \text{Inv} + \Theta$$

Where; β_1 , β_2 and β_3 represent the slope coefficients. β_0 is the intercept. ϵ is the stochastic term or the residual error term which will capture any variations in the model that cannot be attributed to The a priori expectations are $\beta_1 > 0$, $\beta_2 > 0$ and $\beta_3 > 0$. The a priori expectation of the model implies the result expected to be obtained when the regression is carried out. Basically, the a priori signs indicate that all the coefficients β_1 , β_2 and β_3 should be positively related to the dependent variable; hence a positive relationship is expected to exist between the dependent variable and all the explanatory variables.

3.2 Estimation Techniques

3.2.1 Stationarity Test

Standard inference procedures do not apply to regressions, which contain an integrated (non-stationary) dependent variable or integrated regressors. Therefore, it is important to investigate the stationarity of time series data before estimation in order to avoid the problem of obtaining spurious regression results. Most tests of the Dickey-Fuller (DF) type have low power. Because of this Maddala and Kim (1998) argue that ADF (augmented Dickey-Fuller) and PP (Phillips and Perron) tests should be discarded. KPSS (Kwiatkowski, Phillips, Schmidt and Shin 1992) test, which is considered relatively more powerful, is therefore employed to test the stationarity of the time series.

In KPSS, the series is expressed as the sum of deterministic trend, random walk, and stationary error. The test is the Lagrange multiplier test of the hypothesis that the random walk has zero variance. By testing both the unit root hypothesis and the stationarity hypothesis, one can distinguish between series which are stationary, series that have a unit root, and series for which the data are not sufficiently informative to be certain whether they are stationary or integrated.

3.2.2 Cointegration Test

If the time series variables are non-stationary, but cointegrated, at any point in time the two variables may drift apart, but there will always be a tendency for them to retain a reasonable proximity to each other. There may be more than one cointegrating relationship among cointegrated variables. Johansen test provides estimates of all such cointegrating equations and provides a test statistic for the number of cointegrating equations

There are two types of Johansen test, either with trace or with eigenvalue, and the inferences might be a little bit different. It is possible to produce long-run coefficients and error correction models with this approach. This test permits more than one cointegrating relationship. It is commonly acknowledged that the statistical properties of the Johansen procedure are generally better and the cointegration test is of higher power compared to the EG one. However, it is important to point out that they are grounded within different econometric methodologies and thus cannot be directly compared. The main difference with the Engle-Granger approach is that it is possible to have more than a single cointegrating relationship. The test itself produces a number of statistics which can be used to determine the number of cointegrating vectors present. Another difference with the Engle-Granger test is that there are two separate tests for the number of cointegrating relationships and they do not always agree to the number present.

3.3.3 Error correction model

Where the variables are found to be cointegrated, one can go ahead to specify the error correction model. An error correction model is a multiple time series model that directly estimates the speed at which a dependent variable returns to equilibrium after a change in an independent variable. ECM is appropriate for estimating both short term and long term effects of one time series on another. ECM, as a dynamic system, has the characteristics that the deviation of the current state from its long-run relationship will be fed into its short-run dynamics.

Therefore, the form of the error correction model would be:

$$D(\ln \text{GDPC})_t = \beta_0 + \beta_1 D(\ln \text{OilRev})_t + \beta_2 D(\ln \text{NonRev})_t + \beta_3 D(\ln \text{Inv})_t + \beta_4 D(\ln \text{OilRev}(-1))_{t-1} \\ + \beta_5 D(\ln \text{NonRev})_{t-1} + \beta_6 D(\ln \text{Inv})_{t-1} + e\text{ECM}_{t-1} + \Theta$$

Where:

D indicates the first difference of variables.

ECM stands for the error correction term (the residual series created from the cointegrating equation); and

t is a time subscript.

4. Empirical Estimation and Results

4.1 Unit Root Tests

Prior to estimating the equation of the model, we investigate the unit root properties of the variables involved, using KPSS. The KPSS Lagrange Multiplier tests the null of stationarity ($H_0: \rho < 1$) against the alternative of a unit root ($H_1: \rho = 1$). The critical values for the LM test statistic are based on the asymptotic results given in KPSS.

Table 1: KPSS Test Results

Variable	KPSS at level	KPSS at First Difference	Order of Integration	Test Equation specification
GDPC	0.328429*	-	I(0)	Intercept
OILREV	0.814871	0.272817*	I(1)	Intercept
NONREV	0.810639	0.125147*	I(1)	Intercept
INV	0.654058	0.139461*	I(1)	Intercept
Asymptotic critical values	1% 0.739000 2% 0.463000 3% 0.347000			

*Notes: An * indicates rejection of the null hypothesis of non-stationarity at the 5 percent level of significance. Barlett-Kernel is used as the spectral estimation method. The bandwidth is selected using Newey-West method.*

KPSS test indicates that GDPC is stationary at level while the independent variables included in the model are not stationary at levels but at first difference. Hence, higher order of integration is needless. The above unit root results suggests the inappropriateness of the application of the multiple linear regression model estimated with the ordinary least square method of estimation and this is due to the fact that some of the variables – independent variables – are stationary at first difference, thus, suggesting the possibility of spurious regressions in multiple linear regression model.

4.2 Cointegration Test

Cointegration analysis allows non-stationary data to be used so that spurious results are avoided. It also provides applied econometricians an effective formal framework for testing and estimating long-run models from actual time-series data.

Table 2 Johansen test for Cointegration

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.678054	93.25258	69.81889	0.0002
At most 1	0.424321	46.78438	47.85613	0.0628
At most 2	0.271586	24.14394	29.79707	0.1944
At most 3	0.210899	11.15165	15.49471	0.2024
At most 4	0.034521	1.440364	3.841466	0.2301
Trace test indicates 1 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		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.678054	46.46820	33.87687	0.0010
At most 1	0.424321	22.64044	27.58434	0.1894
At most 2	0.271586	12.99229	21.13162	0.4529
At most 3	0.210899	9.711289	14.26460	0.2316
At most 4	0.034521	1.440364	3.841466	0.2301

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level	
* denotes rejection of the hypothesis at the 0.05 level	
**MacKinnon-Haug-Michelis (1999) p-values	

Table 2 reveals the presence of 1 cointegrating vectors from the maximal eigenvalue statistic and the trace test statistic at the 5% level and 1 cointegrating equation at the 1% level. The maximal eigenvalue statistic forms the basis of the formulation of a one-vector model. The existence of Cointegration is indicative of a long run relationship between real output and the independent variables and is consistent with the literature.

4.3 Estimation of the Error Correction Model

According to the Granger Representation theorem, when variables are cointegrated, there must also be an error correction model (ECM) that describes the short-run dynamics or adjustments of the cointegrated variables towards their equilibrium values. ECM consists of one-period lagged cointegrating equation and the lagged first differences of the endogenous variables.

Table 3 Results of Error Correction Model

Dependent Variable: D(GDPC)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008103	0.004700	1.723896	0.0941
D(OILREV)	0.076063	0.019238	3.953816	0.0004
D(NONREV)	0.038221	0.023121	1.653069	0.1078
D(INV)	0.065489	0.033807	1.937128	0.0613
D(OILREV(-1))	0.010669	0.019198	0.555739	0.5821
D(NONREV(-1))	-0.018544	0.023312	-0.795485	0.4320
D(INV(-1))	-0.002010	0.032179	-0.062449	0.9506

ECM(-1)	-0.025301	0.009672	-2.615930	0.0133
R-squared	0.793530	Mean dependent var		0.004114
Adjusted R-squared	0.264884	S.D. dependent var		0.022176
S.E. of regression	0.019014	Akaike info criterion		-4.914117
Sum squared resid	0.011930	Schwarz criterion		-4.579762
Log likelihood	108.7394	Hannan-Quinn criter.		-4.792363
F-statistic	3.059030	Durbin-Watson stat		2.084111
Prob(F-statistic)	0.013525			

From Table 3, Oil Revenue has a positive and significant relationship with GDP per capital in compliance with the apriori expectation. Its coefficient is statistically different from zero at 5 percent level. Non-oil Revenue has a positive non-significant relationship with GDP per capital. Also, investment has a positive non-significant relationship with GDP per capital. These findings are validated by the Wald Tests presented in the Appendix.

At 2.084111, the Durbin Watson statistics does not suggest evidence of serious auto–correlation. This value is between 1.8 and 2.2. This implies the absence of autocorrelation. Therefore we reject the null hypothesis of the presence of autocorrelation among the disturbance terms in the model and accept the alternative hypothesis that there is no autocorrelation between the error terms.

The fitness of the model is confirmed by the F-statistic which is significant at 1 percent. With this, we reject the null hypothesis that all the explanatory variables introduced in the model are not jointly significant in explaining the variations in gross domestic product and conclude that they are simultaneously significant. The error correction variable (ECM), which is -0.025301, was highly significant validating the error correction model specification. This shows that a feedback of -2.53 from the previous year’s disequilibrium from the long-run elasticity of the identified variables can determined per capital real income. The strong significance of the ECM connotes the existence of a long-run equilibrium relationship between per capital real income and the factors affecting it.

5. Summary, Conclusion and Recommendations

In the literature, there has been an acquiescence that countries with abundant resource wealth do not perform better than their resource poor counterparts; the greater the dependence on oil and mineral resources, the worse the growth performance. With time series data of Oil Revenue (proxy for petroleum industry), Non-oil Revenue, Investment and GDP per capital from 1970-2012, the paper explores the correlations between the petroleum industry and real per capita income in Nigeria. Using cointegration and error correction approach, the study finds that oil revenue has a positive and significant impact on per capital real income in the long-run. As well, the study shows that non-oil revenue and investment has insignificant impact on per capital real income, validating the fact that the entire economy is dominated by oil.

Contrary to a report by the Ernst & Young (2013) which indicated that Nigeria's per capita Gross Domestic Product is expected to cross the \$2,000 threshold by 2017, Nigeria may not harness its petroleum revenues to lift its teeming population out of the vicious circle of poverty because only a small percentage of the population is employed in the petroleum industry. Therefore, Nigeria needs to develop other sectors of the economy. Some of the suggested means are: economic diversification, technology management, transparency, investments in education, domestic private ownerships, public involvement and strong institutions among others. Further, demands for revenue transparency by oil companies and the government, revenue management schemes, stabilization funds to mitigate price shocks, reforms of taxation and civil service, and the democratization and deconcentration of the industry are worth considering.

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APPENDIX

Wald Test for Non-Oil Revenue

Test Statistic	Value	df	Probability
F-statistic	1.410023	(2, 33)	0.2585
Chi-square	2.820047	2	0.2441
Null Hypothesis: $C(3)=C(6)=0$			
Null Hypothesis Summary:			
Normalized Restriction (= 0)	Value	Std. Err.	
C(3)	-0.038221	0.023121	
C(6)	-0.018544	0.023312	
Restrictions are linear in coefficients.			

Wald Test for Non-Oil Revenue

Test Statistic	Value	df	Probability
t-statistic	2.505295	33	0.0173
F-statistic	6.276505	(1, 33)	0.0173
Chi-square	6.276505	1	0.0122

Null Hypothesis: $C(2)=C(5)$

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
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$C(2) - C(5)$	0.065394	0.026102
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Restrictions are linear in coefficients.