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Impact of Petroleum Revenue and the Economy of Nigeria

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Abstract: This study investigates the impact of petroleum revenue and the economy of Nigeria for the period 1970-2009. To achieve this objective, primary and secondary data were used. The primary data was generated from a well structured questionnaires administered to 150 oil and gas and non oil and gas workers in Rivers and Bayelsa states, respectively. The secondary data was culled from the Central Bank of Nigeria Statistical Bulletin 1970-2009. The data collected were analysed using Pearson product correlation coefficient, Ordinary Least Square Regression and descriptive statistics. The results of the analysis suggests that petroleum revenue affects the gross domestic product and per capital income of Nigeria positively. However, the relationship between petroleum revenue and inflation rate was negative. Therefore, the research conclude that the revenue generated from petroleum exploration in Nigeria contributes to the gross domestic product and per capita income, hence proper management and utilization to achieve long run growth and development of the country. Useful recommendations were provided to improve the revenue generation effort and usage of the oil wealth in Nigeria.

Key words: Petroleum, revenue, economy, GDP, inflation, per capita income, Nigeria

INTRODUCTION

The petroleum industry constitutes a major source of income and occupies a strategic position in the economic development of Nigeria. For the past decades, the industry has been playing vital and dominant role to the economic growth of Nigeria, both in foreign exchange earning and domestic income generation (Azaiki, 2007). Petroleum is the main source of energy and shapes the political, socio-cultural, technological and economic destiny of the country. It is a source of power in international politics. From 1970-2009, the petroleum industry generated 82% income for federal government while 18% came from non-oil revenue. According to Egbogah (2006), Nigeria is the largest oil producer in Africa, 6th in organization of Petroleum Exporting Countries (OPEC), 5th largest supplier to USA and 11th in the world. The proven oil reserves of Nigeria improved from 0.184 (1958) to 36 billion barrels (present) and 4 billion barrels of condensate.

Proven gas reserves are 2.260 billion cubic feet (in 1958) to 187 trillion cubic feet (present). One of the sources of petroleum income is the Petroleum Profit Tax (PPT). Accounting for income from oil and gas producing activities according to Gallun and Stevenson, differ in many respects from financial accounting. The purpose of tax accounting is to gather information for the efficient preparation of income tax returns according to rules established by the Federal Board of Inland Revenue Code and Regulation (now Federal Inland Revenue Services). Besides the petroleum profit tax, Nigeria needs to meet its export commitment or quota approved by the Organization of Petroleum Exporting Countries (OPEC), scheduled dates of each supply agreement and resolve all necessary regulatory issues between government agencies and oil companies as operators of oil fields.

It is therefore note worthy that oil and gas industries are very critical and without the income accruing from them, Nigerian government may not be able to carry out certain public expenditure and survive as a nation. Such expenditure relate to socio-cultural, economic, military, environmental, legal and political activities. Empirical investigation of the effects of income on the Nigerian economy is extremely very crucial for the nation. The problems of petroleum income fluctuation, its conflicting financial reporting from different agencies of government, its uncertainties and risks associated with the exploration, drilling, development and production are so great and critical that their study cannot be ignored (Ogbonna, 2011). The widespread issues that affect petroleum

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operations in Nigeria invariably affect the process of petroleum operations in Nigeria invariably affect the process of petroleum income generation and its effects on the Nigerian economy. The global perception of Nigeria is that of a richly blessed oil producing nation but with a growing poverty index. The problem of low economic performance of Nigeria cannot be attributed solely to instability of earnings from the oil sector but as a result of failure by successive government to utilize productively the financial windfall from the export of crude oil from the mid-1970's to develop other sectors of the economy. In effect, the oil boom of the 1970's led to the neglect of non oil revenues, expansion of public sector and deterioration in financial discipline and accountability. In turn, excess oil-dependence exposed Nigeria to oil price volatility which threw the country's public finance into disarray (Yakub, 2008). As a mono-product economy, Nigeria derives significant percentage of her national income from oil and gas industries. The activities of these industries are crucial and hold the key to the economic development and survival of Nigeria as a nation. Therefore, this study examines the relationship and effects of petroleum revenue on the Nigerian economy.

Theoretical and empirical literature

Gross domestic product and per capita income: Schiller used GDP and per capita income to assess the growth rate of selected countries from 1990-2000. The relationship between GDP growth and population growth is very different in rich and poor countries. The populations in rich countries according to him are growing very slowly and gains in per capita GDP are easily achieved. In the poorest countries, population is still increasing rapidly, making it difficult to raise standard of living. A topical example is how per capita incomes are declining in many poor countries such as Nigeria, Kenya, Venezuela and Haiti.

According to the Central Bank of Nigeria (2009), GDP is the money value of goods and services produced in an economy during a period of time irrespective of the nationality of the people who produced the goods and services. It is usually calculated without making any allowance for capital consumption. Also, GDP by expenditure based is total final expenditure at purchases' prices less the FOB value of imports of goods and services. Buhari (1993) clearly states that the GDP or Gross Domestic Product is the total volume of production that has taken place in the economy irrespective of the nationality of the people who produced the goods and services. According to him, it is the total production that has taken in Nigeria by Nigerians themselves and foreigners in Nigeria. The GDP does not include incomes and property earnings of Nigerians abroad. In the same vein, it does not exclude the income of foreigners and foreign property earnings in Nigeria. Writing on achieving a High Level of Economic Growth, Nzotta (2004) posits that monetary policy seeks to address the problem of inadequate economic growth and also realizing a satisfactory growth rate.

That is the problem of economic growth is usually addressed by the instrument of monetary policy. Economic growth implies a change in amount of real output or income in an economy over time. An economy grows because it obtains increased goods and services, obtains increased resources or uses the resources more efficiently.

Nigeria's real 5 years average GDP per capita (US$), 1962-2001, grew 0.32% yearly. Nigeria's annual GDP (US$ PPP) growth per capita 1973-1998 was -0.63% so that Nigeria's 1998 real average income after 25 years of military rule was 85% of that in 1983 (Maddison, 2001). This 1973-98 economic collapse is a sharp contrast to the 2.9% yearly growth of another repressive oil-exporting country, Indonesia during the same period (Nafziger and Auvinen, 2003). GNP per capita (PPP) in Nigeria ranked 117th among 130 countries and 2006 Human Development Index ranked 159th among 177 (Nafziger and Auvinen, 2003). Except for 1967-70, Nigeria experienced steady growth from 1960 to the late 1970's. Indeed, yearly GDP per capita growth, 1969-1977 was 2.2%. However in the late 1970's, naira real appreciation reduced post war agricultural and manufacturing growth. According to the World Bank Report, the following shows Nigeria's GDP from 1970-2007 (Table 1).

Petroleum income and inflation: Black describes inflation as a persistent tendency for price and money wages to increase. It is measured by the proportional changes over time in some appropriate price index, commonly a consumer price index or a GDP deflator. Jhingan (2005)

Table 1: GDP per capita in Nigeria (USD)

Years	GDP per capita (US$)	Years	GDP per capita (US$)
1970	344.27	1994	330.60
1971	382.61	1995	328.94
1972	384.66	1996	333.42
1973	394.22	1997	333.15
1974	425.95	1998	330.60
1975	329.21	1999	325.93
1976	415.45	2000	331.56
1977	427.67	2001	333.69
1978	391.10	2002	330.76
1979	404.99	2003	357.36
1980	409.18	2004	388.09
1981	344.51	2005	416.81
1982	332.98	2006	440.99
1983	305.50	2007	470.53

World Bank (2007) and Economist Intelligence Unit (2008)

says that inflation is a highly controversial term which has undergone modification, since it was first defined by the neo-classical economists. They meant a galloping rise in prices as a result of the excessive increase in the quantity of money. They regarded inflation as a destroying disease born out of lack of monetary control whose results undermined the rules of business, creating havoc in markets and financial ruin of even the prudent. However, Keynes in his general theory did not see it in with the neo-classical economists. He therefore, allayed all such fears. He did not believe according to Jhingan (2005) like the neo-classicalists that there was always full employment in the economy which resulted in hyper inflation with increase in the quality of money. Inflation has never been welcome as a positive phenomenon in any economy. US President Gerald Ford declared when it approached double digit as a public enemy number and President Ronald Reagan also called it the cruelest tax (Mankiv, 2000). Therefore, effort should be made to avoid it at all cost unless when it becomes economically necessary to stimulate the economy.

Review of Nigerian economy: The Nigerian economy has the potentialities of becoming one of the twenty leading economies of the world before the year 2020 if her abundant crude oil wealth, human and natural resources would be properly managed, corruption mitigated, the key national institutions such as power, energy, road, transportation, political, financial, socio-economic, legal, investment environment systems, etc., developed. Accountability of petroleum income, its profitable investment and the diversification of the economy are very crucial for economic development (Ogbonna, 2011). Unfortunately according to Odularu, crude oil discovery has had certain impacts on the Nigerian economy both positively and negatively. On the negative side, it has caused environmental degradation which leads to deprivation of means of livelihood and other economic and social factors.

Thomas (2008) and Nwezeaku (2010) posit that the economy has been bedeviled by perennial under-development, poverty, increasing debt burden due to multiple problems such as poor energy supply and power outages, systematic collapsing of industries and infrastructures, lack of proper turn around maintenance in the oil and gas industries, high rate of corruption, militant insurgences, criminal activities, etc. The economy is really faced with poor human developmental and economic indices as evidenced by high rate of perennial and persistent inflation, low per capita income, poor income distribution, GDP and sustained impoverishment. Mismanagement of abundant natural, human and material resources, insatiable greed and loss for excessive wealth, corruption practices at all levels and political banditry have been the bane of the Nigerian economy.

Collier *et al*. (2003) and Yakub (2008) have linked abundant natural resources to slow economic growth, civil conflict and socio-economic collapse. They further state that all natural resources, oil has been found to have the highest risk of civil conflict because of the large rents it offers. Therefore, Nigeria needs to be careful about the way it manages her petroleum revenue to avoid socio-economic collapse. Ibaba (2005) posits that the Nigerian economy has been facing developmental crisis such as high level of poverty, declining economic growth, collapse of local economies and social infrastructure. There have been corruption, financial indiscipline, lack of proper accountability of oil revenue, co-existence of abundant oil wealth with extreme poverty; depleting foreign reserves have become the order of the day (Yakub, 2008). Also, Bawa and Mohammed posit that Nigeria with all oil wealth has performed poorly with GNP, per capita income today not higher than at independence in 1960.

MATERIALS AND METHODS

The study used survey research design. Primary and secondary were used for the study. The secondary data was culled from the Central Bank of Nigeria Statistical Bulletin for the period 1970-2009. The primary data for the study were generated through the administration of questionnaire on 150 respondents and 90 to accountants, financial managers/controllers, management staff, chief executive who are knowledgeable to provide relevant answers to the questionnaire in the oil and gas industry in Rivers and Bayelsa state. The questionnaire has three sections. The 1st section is related to demographic (name of organization, position, number of years worked, classification of your industry, the 2nd section comprises research issues and the 3rd section examines qualitative data. Using a 5-points scale of 1-5 (5-strongly agree, 4-agree, 3-neutral, 2-disagree and 1-strongly disagree). The Cronbach's alpha test of 0.814 shows a reliable measurement of the instrument on the effect of petroleum income on the Nigerian economy. The results obtained from the ratings were analysed using descriptive statistics, Pearson Product Moment Correlation Coefficient and Ordinary Least Square Regression. The Excel software helped us to transform the data into a format suitable for analysis after which the Statistical Package for Social Sciences (SPSS) was utilized for the purpose of data analysis. The ordinary least square was guided by the following linear model:

$$GDP = \alpha + \beta 1PR + \varepsilon \quad (1)$$

$$PCI = \alpha + \beta 2PR + \varepsilon \quad (2)$$

$$INF = \alpha + \beta\ PR + \varepsilon \quad (3)$$

Where:

GDP = Gross Domestic Product
PCI = Per Capita Income
INF = Inflation rate
α = Constant
β = Regression coefficient
ε = Stochastic term

RESULTS AND DISCUSSION

H_{O1}: There is no significant relationship between oil revenue and gross domestic product in Nigeria

The result in Table 2 shows that r = 0.839. This implies that a strong correlation exists between petroleum revenue and GDP. This positive sign of the correlation coefficient implies that increase in petroleum revenue increased GDP with the period under review. The coefficient of determination (R^2) value of 0.705 shows that 70.5% in GDP is explained by petroleum revenue which is the dependent variable. The F-value of 90.630 and a corresponding significant value of 0.000 show a significant model utility. The t-cal which is 9.520 and a corresponding t-value of 0.000 shows that petroleum revenue significantly affects GDP (that is if the significant t<0.05 significant level, the researchers reject null hypothesis and conclude significant relationship). Therefore, the researchers fail to accept the null hypothesis which states that there is no significant relationship between oil revenue and GDP in Nigeria. The Partial Correlations Procedure computes partial correlation coefficients that describe the linear relationship between two variables while controlling for the effects of one or more additional variables. The partial correlation, Table 3 shows both the 0-order correlation 0-order correlation between oil revenue on gross domestic product is indeed both fairly high (r = 0.839) and statistically significant (p = 0.000; <0.05). That is the correlation between oil revenue on gross domestic product is how the two variables are connected to each other. The partial correlation controlling for government policy is higher (r = 0.858) and statistically significant (p = 0.000; <0.05). One interpretation of this finding is that the observed increase in the correlation coefficient between oil revenue and gross domestic product when government policies are controlled is that the government policies induced the relationship between oil revenue and gross domestic product. That is why the correlation coefficient increased from 0.839-0.858 when government policy is controlled. Since the difference between (0.839-0.858 = -0.019) is negatively >0.01 (i.e., at 1% significance level), the moderating variable is significant.

Table 4 shows the descriptive statistics of oil revenue on gross domestic product, per capital income and inflation rate. Table 4 shows the relationship between oil revenue and GDP in terms of sum, mean and standard deviation as 421, 4.68 and 0.668; oil revenue and per capita income sum mean and standard deviation as 397, 4.41 and 0.833 and oil revenue and inflation rate sum, mean and standard deviation as 355, 3.94 and 1.053.

H_{O2}: There is no significant relationship between oil revenue and per capita income in Nigeria

Table 2: Regression output of effects of petroleum revenue on GDP

Statistics	Estimates
R	0.8390
R^2	0.7050
AR^2	0.6970
F	90.6300
Sig. F	0.0000
α	163385.9000
β	0.0990
t-cal	9.5200
t-tab	1.6849
Sig. t	0.0000

SPSS Version 15 output; GDP = 163385.9+0.099 PR (9.520)

Table 3: Partial correlation analysis showing oil revenue and GDP controlling for government policies

Control variables	Oil revenue	GDP	Government policies
None oil revenue			
Correlation	1.000	0.839	0.223
Significance (2-tailed)	-	0.000	0.166
df	0	38	38
GDP			
Correlation	0.839	1.000	0.015
Significance	0.000	-	0.926
df	38	0	38
	0.223	0.015	1.000
	0.166	0.926	-
	38	38	0
Govt. plocies oil revenue			
Correlation	1.000	0.858	-
Significant	-	0.000	-
df	0	37	-
GDP			
Correlation	0.859	1.000	
Significant	0.000	-	
df	37	0	

Cells contain zero-order (Pearson) correlations; SPSS Version 15.0

Table 4: Descriptive statistics of oil revenue on GDP on per capita income and inflation rate

Responses	N	Sum	Mean	SD
Oil revenue and GDP	90	421	4.68	0.668
Oil revenue and per capital income	90	397	4.41	0.833
Oil revenue and inflation rate	90	355	3.94	1.053
Valid N	90	-	-	-

SPSS Version 15.0 output

Table 5: Summary of regression result on effect of oil revenue on per capita income

Statistics	Estimates
R	0.908
R^2	0.824
AR^2	0.819
F	117.562
Sig. f	0.000
α	-402188
β	10.086
t-cal	13.325
t-tab	1.6849
Sig. t	0.000

SPSS version 15 output

The result in Table 5 shows that r = 0.908 which implies that a strong correlation exists between oil revenue and per capita income. The positive sign of the correlation coefficient implies that oil revenue increased per capita income within the study period. The coefficient of determination R^2 value of 0.824 shows that 82.4% variation in per capita income is explained by oil revenue. The F-value of 117.562 and a corresponding significant value of 0.000 show a significant model utility. The t-cal which is 13.325 and the corresponding value of 0.000 shows that oil revenue significantly affects per capita income. Therefore, the researchers fail to accept the null hypothesis which states that there is no significant relationship between oil revenue and per capita income.

The 0-order correlation between oil revenue on per capita income is both fairly high (r = 0.908) and statistically significant (p = 0.000; <0.05). That is the correlation between oil revenue and per capita income is how the two variables are connected or related to each other. The partial correlation controlling for government policy is higher (r = 0.908) and statistically significant (p = 0.000 ; <0.05). one interpretation of the finding is that the observed non-increase in the correlation coefficient between oil revenue and per capita income when government polices are controlled is that government policies do not induce the relationship between oil revenue and per capita income. That is why, there was zero correlation coefficient when government policy is controlled. Oil revenue and per capita income are poorly positively correlated. With the control variable, r = 0.223 under oil revenue and r = 0.144 under per capita income, respectively (Table 6).

H_{o3}: There is no significant relationship between oil revenue and inflation in Nigeria

The result in Table 7 shows r = 0.33 which implies that a weak relationship exists between oil revenue and inflation. The positive sign of the correlation coefficients

Table 6: Partial correlation analysis showing oil revenue and per capita income controlling government policy

Control variables	Oil revenue	Per capital income	Government policies
None oil revenue			
Correlation	1.000	0.908	0.223
Sig.	-	0.000	0.166
df	0.000	38.000	38.000
Per capita income			
Correlation	0.908	1.000	0.144
Sig.	0.000	-	0.375
df	0.000	0.000	38.000
Govt. policies			
Correlation	0.223	0.144	1.000
Sig.	0.166	0.375	-
df	38.000	38.000	0.000
Govt. policy oil revenue			
Correlation	1.000	0.908	-
Sig.	-	0.000	-
df	0.000	38.000	-
Per capita income			
Correlation	0.908	1.000	-
Sig.	0.000	-	-
df	37.000	0.000	-

Table 7: Summary of regression result on the effect of oil revenue on inflation

Statistics	Estimates
R	0.33
R^2	0.018
AR^2	-0.008
F	0.689
Sig f.	0.0412
α	39.290
β	-0.0000066
t-cal	-0.830
t-tab	1.6849
Sig. t	0.412

SPSS Version 15 outputs

shows that increase in oil revenue increased inflation rate within the period under review. The coefficient of determination value of 0.018 shows that 1.8% variations in inflation rate is explained by oil revenue. The F-value of 0.689 and a corresponding significant value of 0.000 show a poor model utility. The t-cal of -0.830 and a corresponding significant t-value of 0.412 shows that oil revenue does not significantly affect inflation.

The researchers therefore, accept the null hypothesis which states that there is no significant relationship between oil revenue and inflation.

The zero-order correlation between oil revenue inflation is indeed both fairly high (r = -0.133). They are therefore statistically significant (p = 0.000; <0.05). The partial correlation controlling for government policy is high (r = -0.146) and statistically significant (p = 0.000; <0.05). One interpretation of this finding is that the observed negative increase in r value from -0.133 to -0.146 in the correlation coefficient between oil revenue and inflation rate when government policies are controlled is that the government policesdo significantly induce the relationship between oil revenue and inflation rate even

Table 8: Partial correlation analysis showing oil revenue on inflation rate

Control variables	Oil revenue	Inflation rate	Govt. inflation
None oil revenue			
Correlation	1.000	-0.133	0.233
Sig.	-	0.412	0.166
df	0.000	38.000	38.000
Inflation rate			
Correlation	-0.133	1.000	0.037
Sig.	0.412	-	0.819
df	38.000	0.000	38.000
Govt. policy			
Correlation	0.22	0.037	1.000
Sig.	0.166	0.819	-
df	38.000	38.000	0.000
Govt policy oil revenue			
Correlation	1.000	-0.146	-
Sig.	-	0.377	-
df	0.000	37.000	-
Inflation rate			
Correlation	-0.146	1.000	-
Sig.	0.377	-	-
df	37.000	0.000	-

SPSS version 15.0

though they have negative or inverse relationship. That is why the correlation coefficient increased from -0.133 to -0.146 when government policy is controlled. With the control variable (i.e., government polcies), r = -0.133 under oil revenue and r = -0.146 under inflation rate, respectively (Table 8).

CONCLUSION

The study examines the impact of petroleum revenue on the economy of Nigeria. The regression and correlation results shows that significant relationship of r = 0.839 between oil revenue and GDP which means that increase in oil revenue increased GDP within the period under review. Also, a significant relationship between oil revenue and per capita income and a weak relationship between oil revenue and inflation rate; the foregoing findings are underscored by Wikepedia which states that the petroleum-based economy of Nigeria, long hobbled by political instability, corruption and poor macroeconomic management is undergoing substantial economic reform following the restoration of democratic rule in 1999. The economy has overdependence on the capital intensive oil sector which provides <25% of GDP, despite providing 95% of foreign exchange earnings and about 65% of government revenues. Bawa and Mohammed (2007) assert that Nigeria with all its oil wealth has performed poorly with GNP per capita today not higher than at independence I, 1960. In view of the findings which is based on the results of the hypotheses tested, the study conclude that oil revenue benefits few highly placed individuals to the exclusion of the majority in Nigeria as r-values show insignificant relationship that petroleum revenue is not fairly distributed to the people who are supposed to get it; that oil revenue is no t invested in the economy to the extent that it would make significant or material difference in inflation rate, GDP and per capita income.

RECOMMENDATIONS

On the basis of the conclusion drawn, the following recommendations were provided:

- It is imperative for government to start with fair and most equitable reallocation of oil blocks on the basis that will ensure even distribution and balanced economic development
- Government should focus not only on petroleum revenue generation but should also re-direct its attention to proper management of the revenue and effective control of necessary expenditure
- Government should avoid budget deficit and ensure that balanced budgeting is the norm in the country
- The Nigerian government should invest oil revenue more on the economic sector that has significant and direct bearing on the economy in order to improve the value of GDP, per capita income and reduce inflation
- The government should use petroleum revenue to diversify the economy in the critical economic sectors such as agriculture and manufacturing sectors that would impact the per capita income positively

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