THE IMPACT OF OIL RESOURCE ABUNDANCE ON BUILDING AND CONSTRUCTION INVESTMENT IN NIGERIA

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Abstract. This study empirically evaluated the impact of Oil Resource Abundance (ORA) on the building and construction sector investment (BCI) in Nigeria. Two Stage Least Squares (2-SLS) and the Three Stage Least Squares (3-SLS) methods of estimation were adopted in estimating the empirical model. The results revealed that ORA has a positive but insignificant effect on BCI. The degree of responsiveness of BCI to a 1% change in ORA is 0.15%. MANI positively and significantly affected BCI. The magnitude of the sensitivity of BCI to 1% change in MANI is 1.09%. REXR has positive but insignificant effect on BCI. The results further showed that the price level significantly determine the size of BCI. 1% change in the price level causes investment in the building and construction sector to drop by about 3.6%. RGDP significantly and positively affects BCI. A 1% increase in RGDP results into 3.51% increase in BCI. Finally, a 1% rise in RIR reduces BCI by about 2.3 %.

Key Words: Oil, Resource Abundance, Building, Construction, Investment

1.1: Introduction

In developed and developing countries, the relationship between resource[1] abundance and economic growth has been the subject of a growing literature. In the early 1950s, some development economists have suggested that natural resource abundance would help the backward states to rise above their capital shortfalls and provide revenues for their governments to offer public goods and lift citizens out of the despair of poverty. Notably, since the 1990s, a growing number of studies have established a link between resource abundance and a number of socio-economic problems. Natural resource abundance has been associated with slow growth (Sachs and Warner, [12]), increased inequality and poverty for a large majority of a country's population (Ross, 2005) [11].

The Nigerian economy was driven by the non-oil sector, especially agriculture in the 1960s, before the advent of the oil boom of the 1970s. However, the scenario changed with oil sector dominating the economic landscape. The oil boom of the 1970s and 80s, followed by the excessive appreciation of the exchange rate reduced agricultural competitiveness and encouraged rent-seeking behaviour in the economy. The Nigerian economy has over the years witnessed prolonged economic stagnation, rising poverty levels and infrastructural decay. The United Nation Human Development Indicators (UNHDI) for Nigeria were low compared with those of other developing countries like Indonesia and Malaysia, that were at the same level of development as Nigeria in the early 1960s. In the last four decades, crude oil has been a major source of revenue, energy and foreign exchange in Nigeria. As the mainstay of the economy, it plays a vital role in determining the economic and political bearing of the country. Nigeria can be classified as a country that depends on primary product exports (especially oil products). Since independence in 1960, Nigeria has experienced regional, ethnic and religious tensions, magnified by the significant inequalities in economic, educational and environmental development. These in part could be attributed to the discovery of oil in the country which impinges on and is in turn affected by economic and social components.

One of the indicators of growth in any given economy is the construction industry and the number of buildings. Ever since post 1980, the building and construction industry has consistently witnessed slow growth, but the operators in the industry claim that it has high growth potential if only some factors that drive growth are suitably addressed. Some blame the slow growth of the industry on lack of capacity for expansion; others trace the problem to neglect arising from over concentration on crude oil revenue. A third school say the industry is not growing as a result of foreign firms' dominance and the government's failure to meet its financial requirements to contractors.

Given that building and construction is very essential, there is the compelling need to interrogate the impact of Oil Resource Abundance (ORA) on Building and Construction Investment (BCI). Considering the fact that there are other sectors in the economy, the excess revenue made from the oil sector could be invested in them to diversify and also increase the total GDP of the economy. The remainder of this paper is structured as follows. Section 2 presents the profile of building and construction in Nigeria while section 3 captures a review of alternative definitions and measurement of resource abundance. Section 4 briefly describes the theoretical framework and Methodology adopted. Section 5 presents and discusses the empirical results while section 6 concludes the study.

[1] In this study, the resource interest is only on Crude oil. Crude oil is simply a mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. NNPC (2009) clearly reveals that Nigeria is oil resource abundant.

2. The profile of Building and Construction in Nigeria

The building and construction sector accounted for 4.45% of the real GDP in 1960, and by 1970, the composition rose to 5.24%. It increased further to 9.69% in 1980 before shrinking to 1.69% in 1985. Ever since then, the sector has remained a laggard. For instance, the sector only composed of 1.63% of the RGDP in 1990. In 1995, it slightly increased to 1.86%. As at 2000, the composition stood at 1.96% and decreased to 1.52% in 2005. In 2010, the building and construction sector accounted for 1.93% of the total RGDP (Figure 1).

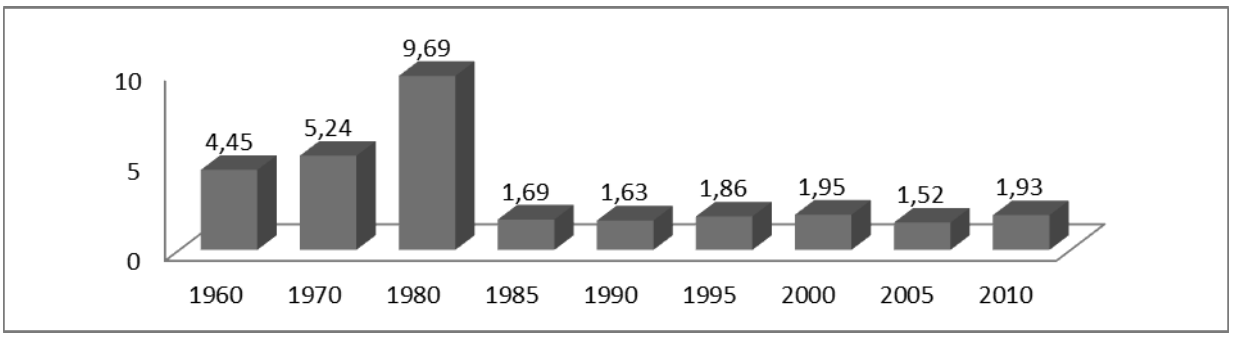

Figure 1: Building and Construction Sector Percentage Composition of Real GDP
Source: *Author's initiative with data obtained from CBN (2011).*

3. Review of alternative definitions and measurements of resource abundance

An essential issue in the resource curse literature relates to the measurement of natural resources. In fact, much of the debate on the existence of the resource curse revolves around this measurement issue. Existing literature has shown that empirical findings on the resource curse are extremely sensitive to the choice of resource measures. Since specialisation in minerals and fuels is often associated with greater economic distortions [1,2], it is appropriate to focus more directly on measures of these resources. In this regard, more direct and conceptually appealing indicators of resource abundance have been compiled and published by the World Bank (1997, 2005). These are based on the net present value of the stream of rents. Total national wealth is divided into three main components: produced assets, human resources and natural capital. The measure of natural capital is based on agricultural land, pasture lands, forests, protected areas, metals and minerals, as well as coal, oil and natural gas. Estimates for the value of subsoil assets (metals, minerals, coal, oil and natural gas) are derived by taking present values of the total rents over the projected life of the resource deposit.

Sachs and Warner (1995) used the share of primary commodity exports in GDP (or in total exports) to proxy for natural resource abundance. According to Stijns (2005) there are three main concerns raised by this measure of resource abundance. First, a resource-rich country may export few natural resources at the same time that its manufacturing sector exports embody intensively its natural resources. Second, as Wright (2001) argues, "if countries fail to build upon their resource base productively, then measures of 'resource dependence' (such as the share of resources in exports) may serve primarily as proxies for development failure, for any number of reasons that may have little to do with the character of the resources themselves". Third, the role played by resource abundance for economic growth depends critically, and in a somewhat complicated way, on the type of growth model adopted. Stijns (2005) therefore asserts that three options offer themselves to the researcher for measuring natural resource abundance, namely natural resource exports, production and reserves. He further argues that there is a high degree of correlation between production and reserves data for oil, coal, gas, and minerals.

Herb (2005) proposes a more theoretically appealing measure of ORA that captures the impact of oil on government revenue: the ratio of revenues from petroleum and minerals to total government revenue. However, Haber and Menaldo [6] opine that existing indicators may not satisfactorily capture the "fiscal impact of oil" on an economy. For example, the ratio of fuel exports to GDP, one of the more commonly used measures in the literature, does not properly encapsulate the effect of oil on government revenues.

Two measures based on production data for minerals have received attention in the literature, these are the share of mineral production in GNP and the share of mining in GDP. Brunnschweiler and Bulte (2008) observe that mineral indicators are marred by lack of consistent quality of data on mineral production, absence of weights to value different minerals and possible endogeneity concerns (raised by the influence of technology and economic development on mineral production). According to them, amongst the different types of natural resources, oil stands out for its distinct effects on political economy.

Markus (2010) argues that the commonly used nominal measure of natural resource dependence - the share of exports of primary products in GNP - understates in growth regressions the negative link between natural resource dependence and per capita GDP growth [8]. He shows that using the purchasing power parity (PPP) adjusted measure yields an economically much larger negative relationship between per capita GDP growth and natural resource dependence than what has been suggested by the nominal measure. On Nigeria and Colombia, Perry *et al* (2011) used "net exports per capita" and "oil price" as measures of oil resource abundance [11].

From the foregoing and to get as close as possible to the concept of 'abundance,' the Herb (2005) measure of ORA (The ratio of revenues from oil to total government revenues) was adopted in the empirical analysis of this study [7]. The reasons for this are two-fold: the measure aptly captures the Nigerian situation where a great chunk of the government fiscal actions is derived from the activities in the oil sector; and it enables us capture the "fiscal impact of oil" on the Nigerian economy.

4. Theoretical framework and methodology

4.1: Theoretical framework

This study adopts the Dutch disease framework developed by Corden and Neary (1982) [4]. The basis for this choice is three-fold. First, the framework is capable of illuminating many historical episodes where there have been sectoral boom, with adverse or favourable effects on other sectors. Second, it provides a systematic analysis of some aspects of structural changes in a small open economy. Lastly, the framework is suitable in countries where the proceeds from resource abundance accrue directly to the government.

4.2: Methodology

4.2.1: Formulation of the model

In line with the above theoretical framework, the model includes measure of investment in building and construction as the dependent variable and presents explanatory variables that attempt to capture the impact of ORA in the sectors. The variation in the investment of the sector is hypothesized to be a function of ORA plus the control variables. This is algebraically expressed as:

$$BCI = f(ORA, REXR, P, RGDP, RIR) \quad (1)$$

Presenting equation (1) in its estimable version, we have;

$$BCI_t = \theta_0 + \theta_1 ORA_t + \theta_2 BCI_{t-1} + \theta_3 REXR_t + \theta_4 P_t + \theta_5 RGDP_t + \\ + \theta_6 RIR_t + \theta_7 \mathrm{MANI}_t + \varepsilon_t \quad (2)$$

$$\theta_1, \theta_2, \theta_5, \theta_7 > 0 and \theta_3, \theta_4, \theta_6 < 0$$

Where:

BCI = Investment in the Building and Construction sector
ORA = Oil resource abundance
RGDP = Real gross domestic product
RIR = Real interest rate
REXR = Real exchange rate
P = Price level
MANI = Manufacturing sector investment

In the IS-LM model, interest rates are considered the unique determinants of investment. In fact, interest rates play three distinct functions; they influence the discounted value of net benefits over time, they determine the cost of loans from banks and the required rate of return for the owners and financing institutions, and they set the economic climate for financial and real markets. The Keynesian theory of investment states that interest rate has unambiguous negative influence on investment. Fluctuations in output exert a strong influence on investment behaviour [5]. The price level has been included in the sectoral investment model to capture the effect of price on investment. A higher price level is interpreted as a signal to macroeconomic distortions.

4.3: Estimation method for the macroeconomic model

The model of this study was estimated using the Two Stage Least Squares (2-SLS) and the Three Stage Least Squares (3-SLS) methods of estimation. The overriding consideration in making this choice is to obtain consistent estimates and address endogeneity bias problem and it is often felt that the 2-SLS and 3-SLS estimators are appropriate. Annual aggregate data that spans 1970 to 2012 were used in the estimation of the model.

5. Empirical Results

Table 2 shows the estimated results of the building and construction investment (BCI) function. The results reveal that ORA has a positive but insignificant effect on BCI. The positive sign suggests that expansion in oil resource could spur growth in the economy via the BCI channel. Specifically, the degree of responsiveness of BCI to a 1% change in ORA is 0.15%.

MANI positively and significantly affected BCI. The magnitude of the sensitivity of BCI to 1% change in MANI is 1.09. This shows the interconnectedness of the sectors of the economy. In addition, it was noticed that the REXR has positive but insignificant effect on BCI. The results further showed that the price level significantly determine the size of BCI. This is in line with *a priori* expectation and further implies that investment in the building and construction sector decreases in the face of rising cost of investment items. Specifically, 1% change in the price level causes investment in the building and construction sector to drop by about 3.6%. The Table also revealed that the RGDP significantly and positively affects BCI. A 1% increase in RGDP results into 3.51% increase in BCI. Finally, the impact of the RIR concurs with *a priori* expectation. Its negative sign implies a contraction of the investment base of the sector in the face of rising RIR. Specifically, A 1% rise in RIR reduces BCI by about 2.3%.

Table 2

The building and construction investment function result

Variables	2-SLS		3-SLS	
	Coefficient	t-statistic	Coefficient	t-statistic
C	-0.0860	-0.0631	-0.5422	-0.4738
ORA	0.3459	0.3170	0.1501	0.1695
BCI(-1)	-0.0497	-0.8225	-0.1026	-2.1300
MANI	0.0239	3.9153	0.0895	3.8046
REXR	0.0009	1.1500	0.0510	1.4747
P	-0.0363	-2.4398	-0.0341	-2.4936
RGDP	0.0284	1.9786	0.0351	1.9813
RIR	-0.0213	-2.1729	-0.0234	-2.5852
Adj R^2	0.75		0.74	

6. Conclusion and Policy Recommendations

This study examined the effects of ORA on BCI. Annual aggregate data that spans 1970 to 2010 were used in

the estimation of the model. The model was estimated using the 2SLS and the 3SLS methods. A number of interesting and important results emerged. The result of the estimated function disclosed that ORA had a positive and statistically insignificant effect on BCI. Based on the findings, we recommend that Nigeria should learn from the experience of Botswana where diamond exports, instead of hurting the country's exports, boosted the other sectors of the economy.

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