



## RESOURCE ENDOWMENT AND EXPORT DIVERSIFICATION: IMPLICATIONS FOR GROWTH IN NIGERIA

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### **Abstract:**

*This paper examined the relationship between resource endowment and export diversification and its implication for economic growth in Nigeria based on data from 1981 to 2015. The result of the Granger causality test suggests that unidirectional causality runs from oil production to economic growth, while export diversification does not granger cause economic growth. From the error correction result, it was established that export diversification positively impacts growth from the last two periods, while in the current period, it has negative effect on growth. This means that the key issue with Nigerian economy might not be structural but institutional. That is, even if the economy is diversified, the expected result may still be a ruse without appropriate economic institutional reform. The study concludes that specialisation is preferred to diversification for Nigeria in the current circumstance. Hence, the key issue to sustain growth in Nigeria is not in the number of productive sectors but in their efficiency.*

**Key words:** *Resource endowment, Export Diversification, Specialisation, Growth, Nigeria*

### **1. Introduction**

Among economists, the issue of natural resource endowment has led to conflicting results. Before the 1980's, economic scholars are of the opinion that the existence of natural resources is needed for the development of a nation. According to Rostow (1990), the presence of abundant natural resource is a necessary pre-condition for take-off into the manufacturing growth stage as observed in the examples

of countries like Canada and Australia. On the other hand, since the 1980's, economists have been sceptical on the notion that resource abundance stimulates positive effect in the economy. This has led to series of discussion on the Resource Curse and Dutch Disease Syndrome (Sachs and Warner, 1995; Sala-i-Martin, 1997; Doppelhofer *et al*, 2000).

Several studies have shown that many countries that have plentiful natural resource, particularly oil-rich countries, have been ensnared by their resources (Shao and Yang, 2014; Murshed and Serino, 2011; Eregba and Mesagan, 2016). For instance, it was observed that oil-dependent African economies have failed to transform their large oil earnings into funding productive sectors that have positive linkages with their various economies, thereby turning the resource blessing into a curse (Eregba and Mesagan, 2016). Similarly, studies have shown that countries with abundant resources have the tendency to be highly import-dependent, thereby leading to domestic output and export instability (Malik and Temple, 2009; Acemoglu and Zilibotti, 1997; Di Giovanni and Levchenko, 2006). Moreover, nations focusing on the export of few commodities are prone to volatility in their foreign exchange earnings, which makes it difficult to finance their import bills. On the other hand, with a more diversified export basket, the prices of the products in the world market will move in such a way as to balance one another, thereby causing export earnings to be stable (Aditya and Acharyya 2015; Acemoglu and Zilibotti, 1997). Export diversification also helps in employment creation, resource allocation and in the creation of quality institutions, which speeds up development (Albassam 2015).

Nigeria is endowed with so many natural resources, ranging from crude oil to coal, limestone, bitumen and agricultural resources, but has it impacted favourably on the growth of the economy? The performance of Nigeria's export has been monotonous, as crude oil consistently dominates the export basket. As a result, the complete dominance of crude oil in the country's export has made it vulnerable to the global oil market and hindered it from availing itself of the prospects that abounds in other sectors (Walkenhorst and Cattaneo, 2006). This therefore calls for the need to diversify the export base of the country in order to increase the varieties of goods in its export basket and enhance its growth process.

In modern times, diversification of exports in resource-rich countries is now getting the attention of researchers and policy makers, and that is what has necessitated a research of this nature. Several studies have been carried out on the nexus between resource endowment and economic growth (Sachs and Warner, 1995; Isham *et al*, 2005; Gaitan and Roe, 2011; Murshed and Serino, 2011; Regolo, 2013; Shao and Yang, 2014; Andersen *et al*, 2014; Alexeev and Chernyavskiy, 2015; Eregba and Mesagan, 2016) with the aim of recommending policies that reduce over-dependence on resource endowments. These studies mostly looked at the effect of resource endowment on economic growth, and also the impact of export diversification on several variables such as trade costs, institutions and on the political economy. However, this paper deviates from existing studies and seeks to extend the frontiers of knowledge by looking at a causality analysis which determines the causation among

resource endowment, export diversification and economic growth. Also, it seeks to determine the effect of resource endowment on Nigeria's real GDP and to also assess the impact of export diversification on the Nigerian economy. To this end, the study seeks to address these questions: what effect does export diversification have on Nigeria's economic growth? Does resource endowment have significant impact on economic growth in Nigeria? And finally, what is the causal link between export diversification, resource endowment and real GDP in Nigeria?

## **2. Literature review**

### ***2.1 Theoretical Review***

#### **2.1.1 Trade Theory and Natural Resource Distribution**

The different natural resource endowments that nations possess coupled with the non-uniformity of its geographical location enables a proper interpretation of trade across borders. Based on earlier theories of trade, there is a great emphasis on the fact that diverse resource endowments enable specialization by nations which in turn enables them to export those goods wherein they possess comparative advantage. Hence, according to Heckscher-Ohlin, nations export those goods in which they use its relative abundant resources intensively and import those goods in which they use its relative scarce resources intensively (WTO, 2010). Therefore, a source of comparative advantage that directs the flow of trade can be from endowments of natural resources. According to Learner (1984), the presence of relative abundant oil led to the exportation of oil and the presence of relative abundant coal and minerals also led to its exportation.

#### **2.1.2 Comparative Advantage**

According to David Ricardo's theory of comparative advantage, a good is produced for trade only when its relative productivity or relative advantage is high. Relative costs or productivity before trade determines the relative prices before trade. These relative prices in turn determine the different sets of terms of trade, while the real term of trade is determined by the demand/taste pattern, and this influences each trading partner's benefits from trade (Gupta, 2009). Factors that influence comparative advantage such as factor endowments, tastes/demand patterns, presence of high human skills, policies of government, managerial practices can cause a nation's comparative advantage in a product to vary over time. For instance, the presence of natural resource endowment can confer comparative advantage to a nation's product even when the nation does not possess higher technological competencies. In addition, the possession of specialized human skill in the production of a product can also confer comparative advantage to the nation's product (Gupta, 2009).

### **2.1.3 Competitive Advantage**

Porter (1985) interpreted competitive advantage as having to do with lower costs and or differentiation of products. Others such as Prahalad and Hamel (1990), defined it as a combination of skills and resources by the development of high quality proficiencies. Hunt and Morgan (1995), also defined it as a set of fundamental resources, and they physical, financial, legal, organizational, infrastructural, human and intellectual resources. Porter (1990) posited that if a nation has competitive advantage as compared with world class global competitors, using measures such as the possession of significant exports to a larger number of nations, the presence of large number of foreign based investments, then it is said to have competitive advantage in its industry. He also explained that competitive advantage is not bequeathed, rather, it is created. It is not as a result of the natural resource endowment of a nation or its collection of labour resources, but rather, it is dependent on the innovative ability of an industry. Competitive advantage can be gained by competing against world class global competitors, as a result of aggressive pressure from domestic customers with a high demand, local based suppliers, and the presence of forceful local competitors.

### **2.2 Empirical Review**

Several studies have beamed searchlight on resource endowment, export diversification and economic growth. However, on the basis of this study, previous studies will be reviewed in two components. The first focuses on factor endowment and economic growth (Gaitan and Roe, 2011; Isham et al, 2005; Alexeev and Chernyavskiy, 2015; Shao and Yang, 2014; Andersen et al, 2014; Murshed and Serino, 2011; Sachs and Warner, 1995, 2001; Eregha and Mesagan, 2016). Out of the studies reviewed in component A, only Andersen et al, (2014), showed that there was a positive effect on growth as a result of the abundant resource, while the rest of the studies reviewed indicated the opposite. For instance, Gaitan and Roe (2011) in their study of International trade, exhaustible-resource abundance and economic growth. They developed an infinite horizon, two-country model, in which countries are alike, however, one is gifted with abundant exhaustible resource and the other is not. The study showed that that there is an inelastic demand for the exhaustible resource which in turn increased the revenue from trade, and this encouraged them to invest relatively less than the country deficit in the resource. Isham et al (2005) discussed how nations depending on point source natural resources and plantations are prone to high social and economic divisions and weak institutional capacity, thereby hindering their ability to respond to shocks when necessary. It was also observed that across a range of governance indicators, point source and plantation exporting nations perform badly. Alexeev and Chernyavskiy (2015) confirmed that non-hydrocarbons had a little positive effect on growth, while hydrocarbon showed none or a slightly negative impact on growth. This is caused by the removal of oil and gas rents from the regions by the government through taxation.

Moreover, Shao and Yang (2014) researched into natural resource dependence, human capital accumulation and growth using both conceptual and mathematical model. The study observed that the rate of return on investment in education and government's behaviour played important role in forming and promoting economic virtuous circle at both micro and macro levels. It also observed that price of the resource goods, elasticity of intertemporal substitution and rise in discount rate have negative impact on economic virtuous circle. Andersen et al (2014) employed temporal variation from China's accession to the world trade organisation (WTO) and spatial variation from the differences in resource endowments to compare changes in economic growth in the post accession period with that of the pre-accession period. The study found that about 10% of the post accession growth in resource rich countries was due to China's demand for raw materials which was induced by China's accession to WTO. For cross-country studies, Murshed and Serino (2011) employed a dynamic panel analysis and found that nations that concentrate on natural resource export have their growth hindered because they did not diversify their economies and export structure. Sachs and Warner (1995) found that there was an indirect relationship between natural resource abundance and economic growth even after controlling for a large number of variables which were germane for cross-country growth. In a recent study conducted on resource abundant African economies by Eregha and Mesagan (2016), it was confirmed that institutions had insignificant effect on per capita GDP growth and that large crude oil export earnings have not been properly used to develop sectors that can help to grow and develop oil-rich African countries, thereby turning the resource blessing into curse.

Component B focuses on studies on export diversification, which include Regolo (2013), Cirera et al (2015), Omgba (2014), Makhoul et al (2015), Klinger and Lederman (2011) and Aditya and Acharyya (2015). For instance, Regolo (2013) focussed on export diversification among 102 trade partners between 1995 and 2007. The study showed that similarities between trade partners in physical capital, land and human capital endowments are associated with more diversified bilateral exports. The study also confirmed that exports are more diversified when bilateral trade costs are relatively low. Cirera et al (2015) explained export diversification, as regards a firm's innovative decisions using Brazil as a case study. It was observed that the heterogeneity observed in firm's export diversification cannot be explained by access to resources, but by the innovative efforts and the strategic positioning of firms in the domestic market. Omgba (2014) examined the institutional foundations of export diversification patterns in oil-producing countries. In the study, the difference in years between when an oil producing country started oil production and when the country gained independence was measured. The study opined that the larger the difference, the more the oil producing country participates in export diversification. Makhoul et al (2015) in a panel study of 116 nations over 35 years showed that trade openness is linked to both specialization and diversification. Among the developing countries in their sample, it was observed that autocratic openness is linked with specialization, while democratic openness is associated with export diversification. Klinger and

Lederman (2011) in their findings suggested that export discovery is being reduced within countries and industries by the risk of entry by imitators. Nevertheless, the effect of market failure is curbed by spillovers from one industry to the other thereby boosting export discoveries. Aditya and Acharyya (2015) showed that under bilateral tariff reduction, exports of a higher number of differentiated varieties may be realized only for the nation in whose favour, the national wage moves. Balavac and Pugh (2016) examined the role of trade openness, export diversification and institutions as potential predictors of output volatility in 25 transition economies between 1996 and 2010. It was observed that the effects of output volatility may not be soothed by diversification for transition nations that are at middle or greater levels of diversification, but may have the soothing effect at lower levels of diversification. Moreover, better political institution was observed to have stabilized output in the transition economies.

From the empirical studies reviewed, it is clear that majority of the preceding studies looked at the effect of resource endowment on economic growth, and also the impact of export diversification on several variables such as trade costs, institutions and on the political economy. However, this paper deviates from existing studies and seeks to extend the frontiers of knowledge by looking at a causality analysis which determines the causation among resource endowment, export diversification and economic growth, and also to assess the impact of export diversification on the Nigerian economy.

### **3. Research methodology**

#### **3.1 The Empirical Model**

The econometric model approach employed by Balavac and Pugh (2016) is adopted to analyze the effect of resource endowment, export diversification on economic growth in Nigeria between 1981 and 2015. The adopted empirical model specifies that the log of Real GDP in the Nigerian economy was used to capture economic growth and that it is explained by some performance variables expressed as:

$$LRGDP_t = f(LOIL, HHI, LGEXPE, LPOP, LGCF) \quad (1)$$

Thus, econometrically stated as thus:

$$LRGDP_t = \alpha_0 + \alpha_1 LOIL_t + \alpha_2 HHI + \alpha_3 LGEXPE_t + \alpha_4 LPOP_t + LGCF + u \quad (2)$$

Where; RGDP = Real Gross domestic product); OIL= Oil production,  
HHI= Herfindahl Hirschman Index export concentration index from UNCTAD (2012).  
The HHI is calculated as

$$Hj = \frac{\sqrt{\sum_{i=1}^n \left( \frac{x_i}{X} \right)^2} - \sqrt{\frac{1}{n}}}{1 - \sqrt{\frac{1}{n}}} \quad (3)$$

Where  $Hj$  is country Index,  $x_i$  is the value of export of goods,  $X = \sum_{i=1}^n x_i$ , while  $n$  signifies the number of groups of goods, based on the SITC (Standard International Trade Classification) revision 3. According to Lederman and Maloney (2009), most diversification studies use the HHI export concentration Index. From the equation above, the HHI is normalise, having a range of value of 0 which indicates lowest export concentration (export diversification) and 1, which indicates highest export concentration. GEXPE= Government Expenditure on Education which is a proxy for human capital, POP= Population which is a proxy for labour, GCF=Gross capital formation which is a proxy for investment,  $\alpha_0$  = intercept or constant; and  $u$  = error term. This is basically referred to the sign and size of the parameters of economic relationship. It is purely determined by the principle of economic theory. The data for this study would be obtained from secondary sources, such as the Central Bank of Nigeria (CBN) Statistical Bulletin (2015) and World Development Indicators of the World Bank (WDI, 2016).

### **3.2 Estimation techniques**

The time series properties of the variables were examined using the Augmented Dickey-Fuller unit root test in order to determine the long-run convergence of each series to its true mean. The test involves the estimation of equations with drift and trends as proposed by Dickey and Fuller (1981). The test equations are expressed as:

$$\Delta Z_t = \eta_0 + \eta_1 Z_{t-1} + \sum_{i=1}^n \pi_i \Delta Z_{t-i} + v_t \quad (4)$$

$$\Delta Z_t = \eta_0 + \eta_1 Z_{t-1} + \eta_1 t + \sum_{i=1}^n \pi_i \Delta Z_{t-i} + v_t \quad (5)$$

$$H_0 : \quad \eta_1 = 0$$

$$H_1 : \quad \eta_1 < 0$$

The time series variable is represented by  $Z_t$  and  $v_t$  as time and residual respectively. Equations (3) and (4) are the test model with intercept only, and linear trend respectively. The specified multiple regression model (2) is estimated through the use of Error Correction as well as Granger Causality Analysis.

#### 4. Empirical result

**Table 1: ADF Unit Root Test Result**

Variable	Intercept	Order of Integration
GEXPE	--5.848672*(8)[-2.954021]	1
HHI	-5.608970*(8)[-2.957110]	1
OIL	-6.433906*(8)[-2.957110]	1
POP	-3.696485*(8)[-2.957110]	1
GCF	-4.727261*(8)[-2.957110]	1
RGDP	-4.359114*(8)[-2.954021]	1

*Note: \* significant at 5%; Mackinnon critical values and are shown in parenthesis. The lagged numbers shown in brackets are selected using the minimum Schwarz Information criteria.*

The above unit root test shows that government expenditure on education (GEXPE), Herfindahl Hirschman Index (HHI), Oil production (OIL), Gross Capital Formation (GCF), Population (POP) and Real Gross Domestic Product (RGDP) are stationary at first difference. This is an indication that in the regression model, the series incorporated, have no unit root in their first difference, which implies that they revert to their mean and converges towards their long run equilibrium. Since the variables are stationary at first difference, Error correction Model (ECM) will then be carried out.

**Table 2: Test for cointegration**

Variable	Intercept	Order of Integration
Resid01	-4.196812*(8)[-2.954021]	I(0)

*Note: \* significant at 5%; Mackinnon critical values and are shown in parenthesis. The lagged numbers shown in brackets are selected using the minimum Schwarz Information criteria.*

Table 2 shows the result of the unit root test that was conducted on the error term of the OLS regression. The result shows that the error term is stationary at level; this is an indication that there is cointegration among the variables. This implies that there exists a long run relationship among the variables.

**Table 3: Granger Causality Result**

Null Hypothesis:	F-Statistic (Obs =32)	Prob.
HHI does not Granger Cause LRGDP	3.75657	0.0235
LRGDP does not Granger Cause HHI	1.61878	0.2102
LOIL does not Granger Cause LRGDP	3.42867	0.0324
LRGDP does not Granger Cause LOIL	1.13902	0.3523
LOIL does not Granger Cause HHI	0.33332	0.8013
HHI does not Granger Cause LOIL	0.30353	0.8225

From the result of the Granger causality above, it is observed that HHI does granger cause LRGDP, which implies that export diversification does not granger



cause LRGDP. Also from the result above, it is observed that there is a unidirectional causality between OIL and economic growth. This implies that oil causes economic growth.

**Table 4: Error Correction Model Result**

Dependent variable D(LRGDP)				
Variable	Coefficient	Std. Error	t-stat	Probability
C	-1.014327	0.579666	-1.749846	0.1056
D(LRGDP(-2))	0.272974	0.192332	1.419289	0.1813
D(LRGDP(-3))	0.479145	0.125886	3.806194	0.0025
D(HHI(-2))	-0.706445	0.158894	-4.446016	0.0008
D(HHI)	0.289719	0.126702	2.286627	0.0412
D(HHI(-3))	-0.561753	0.191204	-2.937976	0.0124
D(LGEXPE)	-0.116078	0.032787	-3.540373	0.0041
D(LGEXPE(-1))	-0.145715	0.037679	-3.867262	0.0022
D(LGEXPE(-2))	-0.110783	0.032307	-3.429123	0.0050
D(LOIL)	-0.323754	0.219691	-1.473683	0.1663
D(LOIL(-1))	0.669167	0.214841	3.114706	0.0089
D(LOIL(-2))	-0.159888	0.170528	-0.937607	0.3669
D(LGCF(-2))	-0.050157	0.039731	-1.262436	0.2308
D(LGCF(-3))	0.070073	0.052229	1.341652	0.2045
D(LPOPNI)	19.24861	6.211493	3.098871	0.0092
D(LPOPNI(-1))	-163.7521	103.6762	-1.579457	0.1402
D(LPOPNI(-2))	237.6872	149.4190	1.590743	0.1377
D(LPOPNI(-3))	-49.31655	64.89848	-0.759903	0.4620
ECM(-1)	-0.510387	0.165335	-3.086995	0.0094

Adj. R2 = 0.725713, F-Stat=5.409697, Prob.(F-stat) = 0.002392;

Log Likelihood= 74.13591; Durbin Watson=2.30

Source: Author's computation 2017

From the result above, it can be seen that the value of the error correction term (ECM(-1)) is negative and significant. It shows that the speed of adjustment to the long run equilibrium is 51.03%. Also, it is observed from the ECM result that the coefficient of HHI positively and significantly impacts LRGDP, which by implication means that export diversification has a negative impact on economic growth. Although, export diversification from two previous periods indicates a positive and a significant impact on LRGDP. This could be as a result of the fact that though export diversification has many advantages on a nation's economy, it might yield no positive result if the nation's economic institutions are weak and fragile. Also, it can be seen that the coefficient of LOIL negatively impacts economic growth, albeit insignificant. This could be as a result

of the dwindling price of oil in the global market. In addition, it can be observed that Population has a positive and significant effect on economic growth.

## **5. Conclusion and policy recommendation**

This study sets out to examine resource endowment, export diversification and economic growth in Nigeria. The study determined the causation among resource endowment, export diversification and economic growth. It also determined the effect of resource endowment on export diversification in Nigeria. The data for the study was from 1981 to 2015. The variables used in this study included real gross domestic product, population, oil production, HHI, government expenditure on education and gross capital formation. It was observed that all the variables employed are stationary at a degree of one (1) and long run relationship exists among the variables. The causality test shows that export diversification does not granger cause economic growth and that unidirectional causality runs from oil production to the real GDP. From the ECM result conducted, it was observed that export diversification in the current period has a negative impact on economic growth, although, in the last two previous periods, export diversification had a positive impact on economic growth. This implies that the key issue with the Nigerian economy is not structural but institutional. Therefore, even if the economy is diversified, the expected result may still be a ruse without appropriate economic institutional reform. It thus implies that specialisation is preferable to diversification in Nigeria in the current circumstance. Also, the key issue in Nigeria's development is not in the number of productive sectors but in the efficiency of those sectors coupled with a strong institution. Therefore, the study recommends that the government should establish strong and reliable economic institutions that will help in promoting export diversification which is necessary for the sustenance of the economy and important in steering the economy out of its current recession.

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