

Has Oil Revenue Enhanced Non-Oil Export in Nigeria? A Co-integration Approach

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Abstract

This study examines effect oil revenue on non-oil export in Nigeria for the period 1970 to 2011. Utilizing a Johansen co-integration approach, the study observes the existence of a long run co-integration among the variables while the long run co-integration estimate shows that oil revenue has a significant negative impact on non-oil export in Nigeria. The study concludes that oil revenue has not enhanced non-oil export in Nigeria. Thus, the study recommends the need for the current and successive governments to judiciously channel the oil revenue to the development of the non-oil sector of the economy (especially manufacturing and agricultural sectors) so as to promote the export potential of the non-oil sector.

Keywords: oil revenue, non-oil export, co-integration, Nigeria.

1. Introduction

Since the mid-1970s oil revenue has accounted for a very significant proportion (from 77.5% in 1975 to 88.6% in 2011) of total revenue of the Nigerian government. Consequent to the phenomenal increase in oil revenue over the years with its associated wealth, various economic projects, programs, expenditures and even the national and state budgets have been closely tied to oil revenue (Edame & Efeiom, 2013). Also, the enormous oil wealth is expected to empower the government in the provision of basic infrastructural facilities, building of industrial estates and even increase in the ability of the government to grant tax incentives and other manufacturing/industrial incentives; which are essential to spurring the performance of the non-oil sector.

Expectedly, it is assumed that the phenomenal increase in oil revenue would translate into meaningful growth of the non-oil sector as was experienced in some East Asian economies such as Malaysia, Indonesia and even Dubai among others (Sanusi, 2003). Paradoxically, the unimpressive and progressively-steady decline of non-oil export amongst rising oil revenue has been a course of concern for researchers and non researchers are like. More disturbing is even the absence of empirical indigenous literature on the link between oil revenue and non-oil export in Nigeria. Previous empirical studies have focused majorly on the impact of non-oil export on economic growth (see Raheem & Busari, 2013 Onodugo, Ikpe & Anowor, 2013; Ozurumba & Chigbu, 2013; Olurankinse & Fatukasi, 2012; Akeem, 2008). The few studies on oil revenue (Edame & Efeiom 2013; Kareem, Osisanya, Raheem & Bashir, 2012; Uwem, 2012; Rewane, 2007) also paid no attention to the relationship between oil revenue and non-oil export in Nigeria. The absence of indigenous studies on the link between oil revenue and non-oil export informed the need of this research.

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Further, the non-oil sector has huge potentials for foreign exchange earnings and can bring about huge employment generation and poverty reduction through extensive backward linkages it offers (Ozurumba & Chigbu, 2013). Given the immense potentials of the non-oil sector and the need to fill the gap among indigenous literature, this study examines the impact of oil revenue on non-oil export in Nigeria for the period 1970 to 2011.

2. Literature Review

As noted above, studies exist on non-oil export separately and also on oil revenue separately. Ozurumba and Chigbu (2013) examined the effect of non-oil export credits on economic growth in Nigeria for the period 1984 to 2009. The study utilized a multiple linear regression technique to examine the effect of non-oil export credits on economic growth and Granger causality tests to determine the direction of causation between the variables. The study observed that banks credits for agriculture and forestry, mining and construction, and nominal effective exchange rates have negative impact on non-oil gross domestic product in Nigeria while banks credits for merchandise export, import and domestic trade, public utilities and services impacted positively on non-oil gross domestic product. The causality estimate revealed uni-directional causality from GDP to public utilities and services, and agriculture and forestry. The study recommended the need for a sustainable programme towards the diversification of the economy by developing the non-oil sector, which will in turn enhance the revenue accruing to the country.

Riman, Akpan, Offiong and Ojong (2013) examined the nexus among oil revenue shock, non-oil export and industrial output in Nigeria for the period 1970 to 2010. The study employed Vector Autoregressive (VAR) model and co-integration technique to examine the long run relationship, while the Vector Error Correction Model (VECM) was used to analyze the short-run behavior of the variables. The Johansen co-integration estimate showed that a long run behavior exist among oil revenue shock, non-oil export, policy/regime shift and industrial output in Nigeria. The VECM estimate showed that the speed at which industrial output converges towards long-run equilibrium after experiencing shock from oil revenue was very slow. The long run estimate showed that oil revenue shock and policy/regime shift had negative impact on industrial output and non-oil export. The impulse response function and variance decomposition analysis suggested that the major drivers of industrial development in Nigeria are non-oil export, regime shift and oil revenue. The study recommended the diversification of the economy from crude oil export and ensuring a stable government that will endure long enough to sustain industrial and other economic policies.

Ningi (2013) examined the effect of banks financing on non-oil exports in Nigeria. The study employed questionnaires which were distributed to 120 non-oil exporting firms. Tools used for data analysis and hypotheses testing included: mean and standard deviation, and multiple regression. The multiple regression estimate indicated that non-oil exports financing by banks significantly accounts for slightly 16% of variance in non-oil exports performance, similarly the beta coefficient revealed that firm' perception of banks attitude to risk of financing non-oil exports had the highest beta value followed by cost of bank finance. Also the study observed that exchange rate fluctuation and access to credit facility had insignificant relationships with non-oil exports performance in Nigeria.

Raheem and Busari (2013) examined the impact of non-oil export on economic growth in Nigeria for the period 1970 to 2010. The study employed Simultaneous Equation Model (SEM) and a single equation model. The growth equation in the SEM showed that non-oil export and agricultural performance negatively impacted on economic growth, while the single equation model showed that the industrial sector performance and population growth are good determinant of economic growth. The study recommended the need for increase in government participation and patronage as well as creating investment friendly environment for investors in the sector.

Onodugo et al. (2013) examined the impact of non-oil export on economic growth in Nigeria for the period 1981 to 2012. Employing Endogenous Growth Model (EGM), the study observed a very weak and infinitesimal impact of non-oil export on economic growth in Nigeria. Edame and Efeiom (2013) descriptively analyze the trends of oil revenue and oil export as it relates to other potential economic variables required for the transformation of the Nigerian economy. The study concluded that the Nigerian economy has not reaped the benefits of oil resource due to high level of mismanagement of her resources. Thus, the study recommended the maximization the huge revenue derived from oil export by channelling oil revenue towards the development of other critical sectors of the economy e.g. the agricultural and manufacturing sectors.

Olurankinse and Fatukasi (2012) examined the impact of non-oil export on economic growth in Nigerian. The study employed an ordinary least square (OLS) technique and observed that non-oil export has positive impact on the economic growth. The study recommended the need to increase production in both agricultural and manufacturing sectors to ensure product availability for both local and export purposes. The study also recommended an urgent completion of the export processing zones to promote the establishment of export oriented firms that will produce solely for export market. Enoma and Isedu (2011) examined the impact of financial sector reforms on non- oil export in Nigeria from 1986 to 2009. The study found a positive relationship between financial sector reforms and non oil export in Nigeria. The study recommended that financial sector reforms should be improved upon and sustained by the monetary in order to fully optimise the gains.

From the above, it is crystal clear that previous indigenous studies have paid little or no attention to the relationship between oil revenue and non-oil export, thereby providing further justification for this study.

3. Research Methodology

3.1 Model Specification

To examine the impact of oil revenue and non-oil export, this study adopts a simple modified model developed by Enoma and Isedu (2100). This model is specified as:

$$NOE_t = \alpha_0 + \alpha_1 IRT_t + \alpha_2 EXT_t + \alpha_3 CPS_t + \alpha_4 OIR_t + \varepsilon_t \dots\dots\dots (1)$$

3.2 Measurement and Sources of Variables

Non-oil export (*NOE*) is measured by the volume of non-oil export; interest rate (*IRT*) is measured by monetary policy rate; exchange rate (*EXT*) is measured by the annual Naira/Dollars (₦/\$) official exchange rate; credit to private sector (*CPS*) is measured by volume of credit extended to the private sector; and oil revenue (*OIR*) is measured by revenue generated from crude oil sales. Non-oil export, credit to private sector and oil revenue variables are transformed into logarithm form. All data from 1970 to 2011 were obtained from the Central Bank of Nigeria (CBN) statistical bulletin, volume 22, 2011.

Theoretically, it is expected that credit to private sector and oil revenue would have a positive effect on non-oil export. This is because increase in credit to private sector is expected to enhance investment in the economy while increase in oil revenue is also expected to boost the investment capability of the government in providing investment-enhancing facilities necessary to promote the performance of the non-oil sector. Interest rate and exchange rate are expected to have negative effect on non-oil export. This is because increase in interest rate discourages investment and as such would inhibit the export potential of the non-oil sector while an appreciation of the exchange rate would results in increase in the cost of imported raw material/inputs, which will therefore discourage export potential of the non-oil sector.

4. Empirical Result

4.1 Descriptive Statistics

The descriptive statistics of the variables in equation (1) is presented in table 1. The standard deviation shows that exchange rate (*EXT*) is the most volatile variable while non-oil import (*NOE*) is the least volatile among the variables. The skewness statistic shows that all the variables except oil revenue (*OIR*) are positively skewed. The kurtosis statistics reveals that all the variables are platykurtic, suggesting that the distributions are flat relative to normal distribution. Lastly, the Jarque-Bera statistic rejects the null hypothesis of normal distribution for exchange rate at five per cent critical value while the null hypothesis of normal distribution for the others variables are accepted at the same critical value.

Table 1: Summary of Descriptive Statistics

| Variables \ Statistics | LNOE | IRT | EXT | LCPS | LOIR |
|------------------------|--------|--------|---------|---------|---------|
| Mean | 8.5612 | 10.866 | 43.909 | 11.0121 | 11.2874 |
| Std. Dev. | 2.5349 | 5.301 | 57.4984 | 3.0139 | 3.033 |
| Skewness | 0.3146 | 0.4775 | 0.8665 | 0.0852 | -0.0377 |
| Kurtosis | 1.6489 | 2.8168 | 1.9345 | 1.9232 | 1.8471 |
| Jarque-Bera | 3.8874 | 1.6546 | 7.2423 | 2.0799 | 2.3359 |
| Probability | 0.1432 | 0.4372 | 0.0268 | 0.3535 | 0.311 |
| Observations | 42 | 42 | 42 | 42 | 42 |

Source: Authors' computation, 2013.

4.2 Stationarity Test

Before estimating equation (1), this study examines the stationary status of the variables to ensure appropriate regression estimate. The stationary test was carryout using the Augmented Dickey Full and Phillip-Perron tests. From the stationarity estimates presented in table 2, it was observed that all the variables are integrated of order one, that is, the variables are I(1) series.

Table 2: Unit Root Test Result

| Variables | Augmented Dickey-Fuller (ADF) Test | | | Phillip-Perron (PP) Test | | |
|-----------|------------------------------------|----------------------|--------|--------------------------|----------------------|--------|
| | Level | 1 st Diff | Status | Level | 1 st Diff | Status |
| noe | 0.5231 | -6.5268* | I(1) | 0.7850 | -6.5351* | I(1) |
| irt | -2.2152 | -6.8677* | I(1) | -2.0150 | -8.2674* | I(1) |
| ext | 0.5316 | -5.8677* | I(1) | 0.5071 | -5.8666* | I(1) |
| cps | 0.0860 | -4.6124* | I(1) | -0.0773 | -4.3988* | I(1) |
| oir | -1.4925 | -7.1319* | I(1) | -1.5268 | -7.2718* | I(1) |

Source: Authors' computation, 2013. * implies 1% significance level.

As a follow-up to the stationary tests, this study examines the presence of co-integration among the variables in equation (1). The co-integration test was estimated using the Johansen co-integration test and the result is presented in table 3. The Trace and Maximum Eigen value tests clearly reveal the presence of one co-integration equation among the variables. Both tests rejected the null hypothesis of no co-integration for $r=0$ at five percent critical values while the null hypothesis of no co-integration for $r \leq 1$ at five percent critical value could not be rejected.

This is because the statistic values for both tests at $r \leq 1$ were less than the critical values at five percent. The co-integration result suggests that the linear combination of the variables in equation (1) were stationary and there exists a long run relationship among the variables.

Table 3: Summary of the Co-integration Estimate

| Trace Test | | | | Maximum Eigen value Test | | | |
|------------|-------------|------------|---------------------|--------------------------|-------------|------------|---------------------|
| Null | alternative | Stat Value | 95% critical values | Null | alternative | Stat Value | 95% critical values |
| $r=0$ | $r \geq 1$ | 70.943 | 69.819 | $r=0$ | $r=1$ | 34.522 | 33.877 |
| $r \leq 1$ | $r \geq 2$ | 36.421 | 47.856 | $r \leq 1$ | $r=2$ | 14.801 | 27.584 |
| $r \leq 2$ | $r \geq 3$ | 21.620 | 29.797 | $r \leq 2$ | $r=3$ | 13.479 | 21.132 |
| $r \leq 3$ | $r \geq 4$ | 8.141 | 15.495 | $r \leq 3$ | $r=4$ | 7.927 | 14.265 |

Source: Authors' computation, 2013.

4.3 Effect of Oil Revenue on Non-Oil Export

Normalized Co-integration Estimate of Oil Revenue on Non-Oil Export:

$$NOE_t = 0.147IRT_t + 0.011EXT_t + 0.534CPS_t - 1.795OIR_t + \varepsilon_t$$

t: [3.664]* [1.731] [1.800]*** [-5.940]*

Note: * and *** imply 1% and 10% significance level respectively.

The long-run co-integration estimate revealed that interest rate, credit to private sector and oil revenue are significant determinant of non-oil export in Nigeria while exchange rate was insignificant in influencing non-oil export in Nigeria. Contrary to a priori expectation, oil revenue had a significant negative effect on non-oil export –a clear evidence of Dutch Disease Syndrome and an indication that the “oil resource curse” notion is still prevalent in Nigeria. This finding is line with arguments by scholars that huge oil revenue/resource abundant sectors are usually associated with declining growth in other sectors of the economy (Ross, 2003; DeRosa 1992; Owens & Wood 1997; Mayer 1997). The implication of this result is that the oil revenue over the years has not been judiciously utilized in promoting the productivity and export performance of the non-oil sector in Nigeria.

5. Conclusion

This study examined the contribution of the enormous oil revenue generated over the past decades of the performance of non-oil export in Nigeria for the period spanning 1970 to 2011. Utilizing a co-integration approach, the study observed the presence of a long run co-integration among the variables while the long run co-integration estimate showed that oil revenue had a significant negative impact on non-oil export in Nigeria. The study concluded that oil revenue has not enhanced non-oil export in Nigeria; rather oil revenue had strongly impaired non-oil export over the study period. Consequently, this study recommends the need for the current and successive governments to judiciously channel oil revenue to the development of the non-oil sector of the economy (especially manufacturing and agricultural sectors) so as to promote the export potential of the non-oil sector. Further, given that oil is an exhaustible resource, efficient channelling of oil revenue towards the development of the non-oil sector will also enable the government in the achievement of transformation and diversification agendas.

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