



Non-Oil Exports and Manufacturing Sector Growth in an Oil-Rich Country in Africa: Case of Nigeria

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Research Article

Abstract

Purpose: This paper presents an analysis of the effect of non-oil exports on the manufacturing sector growth in an oil-rich country in Africa – Nigeria from 1986 to 2018. In clear terms, we evaluated how manufacturing sector capacity utilization is affected by non-oil exports.

Methods: The Ordinary Least Square (OLS) estimation technique was applied in estimating the model and was lagged by two years. The long-run relationship was determined using the traditional Johansen co-integration methodology. How manufacturing sector growth is affected by non-oil exports was evaluated using the Granger Causality technique. The Augmented Dicky-Fuller (ADF) and Phillips-Perron tests were applied to check the stationarity properties of the data.

Results: The growth in the manufacturing sector in Nigeria has not been significantly affected by non-oil export despite the various non-oil export promotion strategies initiated by the government.

Implication: A major implication of the finding is that the cost and access to financial services for non-oil exporters should be reduced or relaxed by the Central Bank of Nigeria. High-interest rates charged by commercial banks and little disbursement characterized by the volume of commercial banks credit affect manufacturing firms concerning acquiring modern plants and machinery which results in a poor quality of non-oil exports.

Keywords: Non-Oil Exports; Manufacturing Sector; Nigeria.

1. Introduction

Non-oil exports are seen as a quintessential factor for emerging economies to attain economic growth and development. Economic Community of West African States (ECOWAS) to meet this

need, has been prioritizing non-oil exports to decrease food reliance, trade deficit, and strengthen exchange rate (Edeme, Ifelunini & Nkalu, 2016). In the words of Shah, Abrar-ul-haq, and Farooq (2015), every emerging economy wants to attain the desired level of growth and development by utilizing their areas of comparative advantage especially through non-oil export promotion which is considered as pivotal to the realization of growth and development objectives of the government.

Studies have been documented on the alleged linkage between manufacturing activities and non-oil exports. Most of the studies have established the positive influence of non-oil exports on the growth of the manufacturing sector owing to advancements in technology and energy resources which encourage the shift away from traditional forms of fossil-fuel-based energy to alternative energy sources e.g. bio-energy. The contentions can be seen in the classical financial hypotheses of Adam Smith and David Ricardo that the function of international trade is inescapable in the attainment of economic growth, and there exist economic gains by specialization (Shah, Abrar-ul-haq & Farooq, 2015). Amid recession and exchange rate crisis witnessed in the economy during the global meltdown in 2007, and the fall in the price of oil in the international oil market thereafter, there have been calls from various stakeholders for the diversification of the economy. This is to avoid a situation where the economy would be in recession consequent to changes in oil prices in the international oil market. That notwithstanding, it is imperative to note that opposition to the common impression that the Nigerian economy requires diversification, what is required is the expansion of Nigeria's sources of revenue, and the reinforcing exports of non-oil products (Amasike, 2017).

Nigeria which is a nation with different ethnic groups is prone to shocks on its continuous reliance on oil as it is the case in other oil-dependent countries like Venezuela. Although oil is a very rich natural resource unfortunately, it is non-renewable and may not be available one day in the future. Again, oil deposits are exploited only in the Southern part of the country (majorly in the Niger Delta region). Various attempts of oil exploration in the North have not been successful. With frequent agitation by the Niger Delta militants, the revenue base of the country may be affected if no lasting peace is returned in the oil-rich Niger Delta region and restructuring of the economy not properly addressed. Hence, the need for the promotion of non-oil exports to propel the development and growth of the economy as was the case before oil deposits were discovered and explored in large quantity in Nigeria. The dependence on oil threatens the economy as its price is subject to the forces of demand and supply in the international oil market coupled with the possibility of depletion of oil resources in the long-run thus the need to fully utilize available non-oil products of agriculture: crops and livestock (Khalifa, 2016).

Looking at the area of Nigeria on the worldwide range and its related climatology, it is not astounding to discover that the nation is blessed with broad prolific agricultural lands, various waterways, streams and lakes, timberland of shifting sorts, and grasslands (Ekiran, Awe & Ogunjobi, 2014). From the assertion of Kautoke-Holaani (2008), non-oil exports through agriculture have in the past taking Tonga out of economic recession and made Tonga one of the fastest-growing economies within countries in the South Pacific Island. Njiforti and Adubi as

cited in Ekiran, Awe and Ogunjobi (2014) noted further that these resources make an impression which demonstrates that in case these colossal resources are well overseen and kept up, there may rise within the nation, a dynamic agricultural sector steady of food and raw materials, self-sufficiency for the increasing population, and manufacturing sector respectively.

Previous studies in Nigeria mostly focused on non-oil exports as it relates to economic growth (see Fiiwe & Turakpe, 2017; Ewetan, Fakile, Urhie & Oduntan, 2017; Ewubare, Ajie & Ojiya, 2017; Eze, 2017; Akpan, Nwosu & Eweke, 2017; Kromtit, Kanadi, Ndangra & Lado, 2017; Ugwu, 2017, etc.). On non-oil exports and manufacturing activities, we found Seyed (2015) and Alam, Abbasi, and Baseri (2014) for Iran. In Nigeria, the available study based on online search was that of Riman, Akpan, Offiong, and Ojong (2013) on the interweaving relationship that exists between oil revenue shock, non-oil export, and industrial output in Nigeria. Subsequently, this study is set out to evaluate how the growth of the Nigerian manufacturing sector is affected by non-oil exports.

Section one serves as the introduction, section two reviews relevant literature, section three describes the technique employed in analysis data, section four presents results, and findings, while section five gives the policy implication.

2. Literature Review

Non-oil exports are part of a country's total domestic exports. In Nigeria, exports are divided into two: oil and non-oil exports. Products from agricultural, mining, quarrying, and industrial sectors outside the crude oil export which are shipped to other nations of the globe are grouped as non-oil exports. The Central Bank of Nigeria (2015) stated that non-oil exports include cashew nuts, cocoa beans, coffee, cotton, cow horns, ginger, groundnuts, Arabic gum, rubber, etc. that are not crude oil. The essential constituent of the non-oil sector is agriculture, and provides the economy with food and fiber, whereas manufactured products are produced by the manufacturing sector. The non-oil export sector dominated by agriculture played significant roles in the economy before the discovery of crude oil. It contributed largely to Nigeria's Gross Domestic Product (GDP) and it was also the primary source of foreign exchange. The exploration of crude oil in Nigeria has had both a negative and positive effect on the economy.

We measured growth in the manufacturing sector in terms of manufacturing capacity utilization. The capacity utilization rate plays a significant part in assessing the economic performance of firms in the manufacturing sector. Capacity utilization is a vital fundamental to be considered when an increment in efficiency and development of a firm's production becomes imperative. Adeyemi and Olufemi (2016) underscored the need that capacity utilization is important because capital is very scarce, and in most scenarios not fully utilized where it is available. Agreeing to Afroz and Roy, as cited in Fiiwe and Turakpe (2017), the hypothesis of economies of scale is of the assumption that a cost-minimizing firm tends to increase the utilization of its capital in case the returns to scale diminishes as its production increases that is, the rate of capacity utilization can be decided endogenously. Hence, the capacity utilization rate remains a vital concept. Within the production process, it is frequently ignored owing to the presence of idle resources that can be promptly put into the production process. This constitutes

a huge issue in clarifying vacillations in the output of firms in Nigeria where underutilization of a few productive types of equipment has ended up uncontrolled in nearly all manufacturing firms.

Many theories have been developed on the positive influence of non-oil exports on the growth and development of any nation. Some of these theories are the Theory of Comparative Advantage, Factor Endowment, Heckscher – Ohlin (H – O) Theory, and Theory of Growth Maximization among others. This research work is anchored on the Theory of Comparative Advantage. This is on the contention that the hypothesis sees international trade as a tremendous interlocking framework of trade-offs, in which countries utilize the capacity to import and exports to shed opportunity costs and reshuffle their variables of production to their most profitable uses. Agreeing to Ian as cited in Adeyemi and Olufemi (2016), all the bunch things we are told about why free trade is nice for us are bubbled down to difficult financial times and weighed against the costs by this hypothesis and its cutting edge consequences. On the off chance that this hypothesis is genuine, no matter how high the costs of free trade are, at that point, we will depend upon the reality that in any economy there are procuring benefits that surpass the costs. Robert (2005) argues that the primary economic objective of a nation is to generate a high and increasing standard of living for its people. The attainment of this goal depends on the high productivity of its employed resources. No nation can be competitive and a net exporter of everything because, the nation's stock of resources is limited, the ideal is for these resources to be used in their most productive manner.

With regard to empirical studies, emphasis have been on non-oil exports and economic growth as in Fiiwe and Turakpe (2017), Simasiku and Sheefeni (2017), Ewetan, Fakile, Urhie, and Oduntan (2017), Ewubare, Ajie, and Ojiya (2017), Eze (2017), Akpan, Nwosu, and Eweke (2017), Kromtit, Kanadi, Nandangra, and Lado (2017), Raj and Chand (2017), Ugwu (2017), Sertoglu, Ugural, and Bekun (2017), Aljebrin (2017), Raheem (2016), Ouma, Kimani, and Manyasa (2016), Edeme, Ifelunini, and Nkalu (2016), Oluwatoyese, Applanaidu, and Razak (2016), Uremadu and Onyele (2016), Alam and Myovella (2016), Adewale (2016), Nguyen (2016), Verter and Becvarova (2016), Mehrara and Baghbanpour (2016), Ramphul (2016), Ogunjimi, Aderinto, and Ogunro (2015), Ekiran, Awe, and Ogunjobi (2014), Olutoye and Olutoye (2015), Nwankwo (2015), Hafeez and Ul-Haq (2015), Forgha and Aquilas (2015), Seraphin and Yinguo (2015), Igwe (2015), Okafor, Eje, and Nwafor (2015), Jafari, Dastjerdi, and Mohseni (2014), Nwanne (2014), Aladejare and Saidi (2014), Nwachukwu (2014) and Ifeicho, Omoniyi, and Olufemi (2014) among others.

On non-oil exports and manufacturing activities, we reviewed the following studies: Ebenyi, Nwanosike, Uzoechina, and Ishiwu (2017) utilized the apparatuses of quantitative observational investigation to assess the effect of trade openness on the Nigerian manufacturing output from 1970 to 2014. The analysis provided evidence that manufacturing sector performance has not been significantly influenced by non-oil exports even when there is the freedom of trade occasioned by trade openness.

A study on the effect of export schemes incentive on agricultural export performance in Nigeria was undertaken by Gatawa, Dantama, and Sani (2017) using quarterly time-series information

from 1990-2014. The Autoregressive Distributed Lag (ARDL) was utilized and the Granger Causality test. The bounds tests utilized in model estimation uncovered that there is a relationship in the long-run between export schemes incentive and agricultural export performance in Nigeria. The granger casualty test showed that there was a unidirectional relationship running from agricultural export performance to export expansion, and from funds for export promotion to agricultural export performance.

Seyed (2015) looked at observationally how industrial production has been influenced by non-oil exports in Iran utilizing auxiliary information over the period from 1961-2010. For observational examination after checking the information for stationarity and co-integration tests, the ordinary least square method was utilized. The study revealed a positive and significant impact of non-oil exports on how industries have performed in Iran.

Alam, Abbasi, and Baseri (2014) surveyed the linkage that exists between exports and economic growth in the Iran industrial sector. The authors applied the panel models with fixed and random effects estimates. The regression output depicted that the Iran industrial sector performance was significantly affected by exports.

Riman, Akpan, Offiong, and Ojong (2013) explored the causal nexus that exists between a shock in oil revenue, non-oil export, and industrial output in Nigeria from 1970-2010. Vector Autoregressive (VAR) model and co-integration technique were used to examine the long-run relationship, while the Vector Error Correction Model (VECM) was used to analyse the short-run relationship of the variables. The Johansen co-integration analysis suggested that a long-run relationship exists between a shock in oil revenue, non-oil export, and industrial output in Nigeria.

Riman, Akpan, Duke, and Mbotto (2011) studied the relationship between industrial production, non-oil exports, and Nigeria's economic growth in the long-run utilizing information from 1970 – 2007. Vector Error Correction Mechanism (VECM) was utilized to set up the co-integrating relationship between industrial production, non-oil exports, and GDP. It was uncovered from the study the presence of a positive and significant unidirectional relationship that runs from industrial production to non-oil exports. It was apparent within the period studied that the current policies on improving the manufacturing sector do not adequately promote non-oil trade.

3. Methodology

The Ordinary Least Square (OLS) estimation technique was applied in estimating the model and was lagged by two years. The long-run relationship was determined using the traditional Johansen co-integration methodology. The effect of non-oil exports on manufacturing growth was estimated using the Granger Causality technique. The Augmented Dicky-Fuller (ADF) and Phillips-Perron tests were applied to check the stationarity of the data. The study has a total number of observations of thirty-three (33) that is, from 1986 to 2018. The data on an annual basis were collected from the Central Bank of Nigeria (CBN) statistical bulletin of 2019. The dependent variable is Manufacturing Capacity Utilization (MCU). Non-Oil Export (NOEXP) is

the independent variable which is the value of the total non-oil export earnings by Nigeria. A modified model of Mohsen (2015) for a study in Namibia was adapted, thus:

$$LnGDP = a_0 + \beta_1 lnOX + \beta_2 lnNOX + \varepsilon_t \tag{Equ. 1}$$

Where: a_0 is the intercept; β_1 and β_2 are the slope coefficient of the model; $LnGDP$ is the natural log of the real gross domestic product; $lnOX$ is the natural log of real oil exports; $lnNOX$ is the natural log of real non-oil exports, and ε_t is the error term.

We modified the model as stated in the functional form in Equ. 2 and econometric form as in Equ.3.

$$MCU = f(NOEXP) \tag{Equ. 2}$$

$$LogMCU_t = a_0 + \beta_1 LogNOEXP_t + \varepsilon_t \tag{Equ. 3}$$

Where:

MCU is manufacturing capacity utilization, $NOEXP$ is non-oil exports, a_0 is the coefficient of the constant; β_1 is the slope coefficient of the model, and ε is the error term.

4. Results and Findings

The descriptive properties of the data are elucidated in Table 1. The mean of the data is 46 for MCU and 254406.5 for $NOEXP$, while the median is 43.80 and 34100 for MCU and $NOEXP$ respectively. The maximum and minimum values are 60.50 and 29.29 for MCU and 1130200 and 600.0 for $NOEXP$. The data standard deviation is 10.23 and 355586.9 for MCU and $NOEXP$ respectively. Only MCU that was not positively skewed towards normality. The Kurtosis value shows that the leptokurtic nature of the data as evidenced by the Kurtosis statistics that are not up to the benchmark of three (3). However, the data are in the trend of the normal distribution as revealed by the significant p-values for all the data. This is to say that the data follow a normal distribution.

Table 1: Data Descriptive Properties

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	P-value	Obs
MCU	46.00387	43.80000	60.50000	29.29000	10.22572	-0.191127	1.520361	5.016622	0.041283	33
NOEXP	254406.5	34100.00	1130200.	600.0000	355586.9	1.178870	2.868898	7.202499	0.027290	33

Source: E-views 10.0 Output data

The statistical reliability of the estimated model was determined by performing diagnostic tests. These tests as shown in Table 2 unveiled that there was no issue of serial correlation, heteroskedasticity, and Ramsey Reset specification. This is on the notion that the p-values of the three tests: serial correlation, heteroskedasticity, and Ramsey Reset specification are insignificant at a 5% level of significance.

Table 2: Diagnostic Test

Tests	F-statistic	P-value
Serial Correlation	0.483373	0.6228
Heteroskedasticity	1.480220	0.2440
Ramsey Reset specification	1.041070	0.3082

Source: E-views 10.0 Output data

Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) tests were used to check for stationarity of data to ensure that the variables are free from stationarity defects linked with most time-series data. The ADF and PP results in Tables 3 and 4 show that all the variables are stationary at first difference as such, inferences made from the analysis will not be spurious.

Table 3: ADF Test Result

Variables	ADF Test Statistic	Test Critical Value at 1%	Test Critical Value at 5%	Order of Integration/Remark
MCU	-3.649944 (0.01)*	-3.679322	-2.967767	1(1)/Stationary
NOEXP	-3.364737 (0.02)*	-3.752946	-2.998064	1(1)/Stationary

Source: E-views 10.0 Output data

Table 4: PP Test Result

Variables	PP Test Statistic	Test Critical Value at 1%	Test Critical Value at 5%	Order of Integration/Remark
MCU	-3.658280 (0.01)*	-3.679322	-2.967767	1(1)/Stationary
NOEXP	-4.838775 (0.00)*	-3.679322	-2.967767	1(1)/Stationary

Source: E-views 10.0 Output data

The long-run relationship was assessed using the Johansen co-integration technique. The traditional approach which is Johansen co-integration requires the data to be integrated at the same level before the co-integration relationship is estimated. The stationarity test performed proved that the data were integrated at the same order that is, order one 1(1) which provides the basis for using the Johansen co-integration approach. Table 5 provides an insight that there is no long-run relationship between non-oil exports and manufacturing capacity utilization. This is based on the argument that the Trace test and Max-eigenvalue test indicate no co-integrating equation at a 5% level of significance.

Table 5: Johansen Co-integration for MCU and NOEXP

Unrestricted Cointegration Rank Test (Trace) MCU and NOEXP				
Hypothesized Number of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob.**
None	0.147349	6.071428	15.49471	0.6871
At most 1	0.048727	1.448670	3.841466	0.2287
Unrestricted Cointegration Rank Test (Maximum Eigenvalue) MCU and NOEXP				
Hypothesized Number of CE(s)	Eigen Value	Maximum Eigen Statistic	0.05 Critical Value	Prob.**
None	0.147349	4.622758	14.26460	0.7885
At most 1	0.048727	1.448670	3.841466	0.2287

Source: E-views 10.0 Output data

According to the output in Table 6, non-oil exports are positively but insignificantly related to manufacturing capacity utilization. When non-oil exports are held constant as revealed by the constant coefficient of 6.569069, manufacturing capacity utilization would be 6.57%. When non-oil exports increases by a unit, manufacturing capacity utilization would appreciate by 2.75%. The Adjusted R-square shows that 89.20% of changes in manufacturing capacity utilization

were as a result of fluctuation in non-oil exports. This is statistically significant as depicted by the F-statistic and P-value of 78.12 and 0.00 respectively. The Durbin Watson value of 2.1 shows no autocorrelation in the model.

Table 6: OLS Regression of Non-Oil Exports and MCU

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCU(-1)	1.256252	0.187804	6.689176	0.0000
MCU(-2)	-0.411787	0.192849	-2.135280	0.0427
NOEXP	2.75E-06	2.70E-06	1.015690	0.3195
C	6.569069	3.885751	1.690553	0.1034
R-squared	0.903607	Mean dependent var		46.44552
Adjusted R-squared	0.892040	S.D. dependent var		10.43347
S.E. of regression	3.428153	Akaike info criterion		5.429362
Sum squared resid	293.8058	Schwarz criterion		5.617955
Log likelihood	-74.72575	Hannan-Quinn criter.		5.488427
F-statistic	78.11841	Durbin-Watson stat		2.142848
Prob (F-statistic)	0.000000			

Source: E-views 10.0 Output data

The effect of non-oil exports on manufacturing sector growth in Nigeria was assessed using the granger causality test. The granger causality test in Table 7 dispels there is no causal relationship between manufacturing capacity utilization and non-oil exports in Nigeria as causality does not flow from either direction at a 5% significance level. This implies that non-oil exports have no significant effect on manufacturing capacity utilization.

Table 7: Granger Causality Result for Non-Oil Exports and MCU

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
NOEXP does not Granger Cause MCU	32	0.00026	0.9873	No Causality
MCU does not Granger Cause NOEXP		1.78280	0.1930	No Causality

Source: E-views 10.0 Output data

The Johansen co-integration result provides evidence that non-oil exports were not related to manufacturing sector growth in Nigeria. This shows that the role of non-oil exports in contributing to the growth of an economy is not felt in Nigeria. It also affirms the reality on the ground that Nigeria is largely dependent on oil revenue for her expenditure, and the continued reliance on oil revenue would in the long-run affect the economy if the country does not diversify to non-oil revenue. Our result could not confirm the earlier study of Riman, Akpan, Offiong, and Ojong (2013) who in their analysis suggested that a long-run relationship exists between oil revenue shock, non-oil export, policy/regime shift, and industrial output in Nigeria. Furthermore, our result refutes the findings of Riman, Akpan, Duke, and Mbotto (2011) who predicted a long-run relationship between industrial production, non-oil exports, and economic growth in Nigeria.

Evidence emanating from the OLS regression result points to a positive but insignificant relationship between manufacturing capacity utilization and non-oil exports. This calls for diversification from oil to non-oil exports to improve our earnings from foreign trade. The granger causality analysis discloses that non-oil export has no significant effect on manufacturing sector growth. Put differently, non-oil exports have not contributed significantly

to the growth of the Nigerian manufacturing sector growth within the period studied. This supports the finding of Ebenyi, Nwanosike, Uzoechina, and Ishiwu (2017) which inferred that the manufacturing sector output in Nigeria is not affected by trade openness. This would be due to the lack of attention given to non-oil exports, especially agriculture following the exploration in large quantities of crude oil in the Niger Delta areas.

5. Conclusion and Policy Implications

In this study, we evaluated how the Nigerian manufacturing sector growth is affected by non-oil exports from 1986 to 2018. Trade theories have recognized the role of exports in stimulating economic growth and development, especially in developing countries. Before the discovery of oil: in the 1950s and 1960s era, non-oil exports through agricultural products were the mainstay of the Nigerian economy. However, that is not the case today as successive governments have bent on oil exports to the detriment of non-oil exports. Considering the result of our analysis, we conclude that the growth of the manufacturing sector in Nigeria has not been significantly affected by non-oil export despite the various non-oil export promotion strategies by the government.

A major implication of the finding of this study is that cost and access to financial services for non-oil exporters should be reduced or relaxed by the Central Bank of Nigeria. High-interest rates charged by commercial banks and little disbursement characterized by the volume of commercial banks credit affect manufacturing firms concerning acquiring modern plants and machinery which results in a poor quality of non-oil exports. The Central Bank of Nigeria should through commercial banks, development banks (e.g. Nigeria Export-Import Bank) provide a hedging operation by taking a reverse position in the forward market or using options to provide the exporter with foreign exchange at a competitive rate.

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Conflict of Interest: The authors declare no conflict of interest.

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