Research Article

Econometric Analysis of Projected Oil and Non-Oil Export Data for Sustainable Growth in Nigeria

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ABSTRACT

Over the past four decades, increasing forecast emphasis has come to be placed on the potential importance of different sectors and their contribution to the sustainable growth of the Nigerian economy. A more common strand of research is existing studies that consider the resource curse hypothesis to show empirically, the actual relationship between natural resources and economic growth. However, these studies have looked at various resource endowment especially oil and metals, with just a few focusing on the non-oil export sector. A preliminary graphical study of the contribution of the non-oil sector to Nigeria's GDP shows that over time, the linkage of non-oil export to the economic growth has been low (less than 20%). Hence, this study will analyze the long-run relationship and also the importance of both oil and non-oil exportation and their impact to sustainable economic growth. The model introduced in this article uses the time series data for non-oil export, oil export, alongside other macroeconomic variables on gross domestic product (GDP). In order to adequately investigate the long-run relationship, statistical forecast was adopted to project the data for future years and thereafter econometric method was adopted to validate the projected data and analyze the direction of causality between the sectors (oil and non-oil) export and economic growth. The result reveals the possible short and long run interaction amidst sectors' export and economic growth, based on the different tests conducted, in order to recommend policies aimed at boosting the level and significance of the sectors' export.

1. Introduction

Of recent, increased emphasis has come to be placed on the potential importance of the non -oil sub-sector of nations' economies such as solid minerals, agriculture etc. The quest for diversification of the national economy and in particular, the importance attached to breaking the dominance of crude oil in the export structure of the economy, has led to a focus on the sector. Yet, it must be recognised from the outset that other non-oil sector extraction has historically been an important contributor to the national economy in the past. Solid minerals and agriculture are natural resources that form part of the earth resources which calls on the human race for exploitation, extraction, development and utilization for sustaining growth of a nation (Mah, 2005; Jordaan & Eita, 2007; Sultan & Haque, 2018; Bardi & Hfaiedh, 2021).

It is undisputable that Nigeria is a country naturally endowed with various kinds of resources to place her amongst the top emerging economies of the world. Unfortunately, the nation has not adequately utilized and benefited from the economic prosperity expected of a nation so richly blessed. Nigeria is a country believed to be too rich to be poor. Ironically, global economic indices from reputable international organizations have consistently categorized Nigeria as an economically backward state. For instance, in 2020, the UNDP human development index ranked Nigeria as 161th and 156th among 189 nations with low per capital income and "low quality of life" respectively (Aigheyisi, 2021; World Bank Development Report, 2021; Panta, Devkota & Banjade, 2022).

However, a glance at the Nigerian economy from its export perspective shows that export is disaggregated into two goods: oil and non-oil exports. These are the major sources of her foreign exchange earnings (Vohra, 2001; Mustapha, 2010). Nigeria's economy has been a mono-product economy ever since the exploration of crude oil started in the 1970s. A closer examination of Central Bank of Nigeria (CBN) Annual report 2020 shows the dominance of oil as the major source of export earnings in the Nigerian economy. Oil accounts for over 80 percent total of export in Nigeria, while non-oil account for less than 20 percent totals of export (CBN, 2020).

Figure 1. Authors' Computation from Microsoft Excel
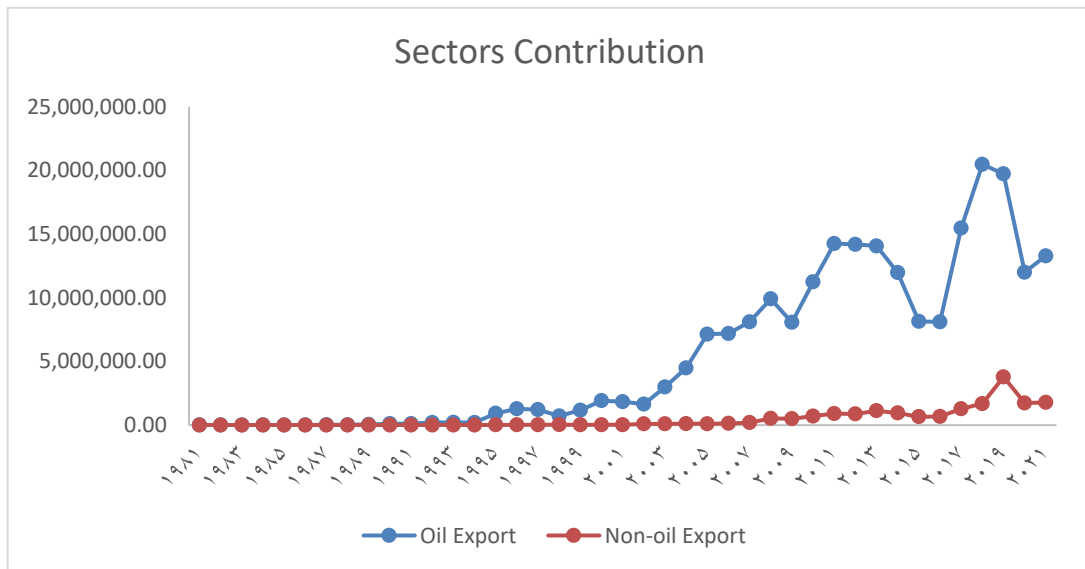
The country's over-dependence on oil has put the nation's economy in a precarious state as possible large income from other non-oil sector such as solid minerals were ignored. It is in this regard that the Nigerian economy is argued to be over 80% dependent on oil. The oil sector has no doubt contributed to Nigeria's economic growth. This is merely a growth without development of the more permanent sectors such as the mineral sector, which, if developed, will lead to the diversification of the economy, as solid minerals development has relationship with several other sectors of the economy. Hence, the major objective of this study is directed towards an analysis of the contributions of the non-oil sector export to the Nigerian economy. The study aims at achieving the objective by measuring the export performance of the sector from its contributions to the GDP and to see if development in oil export led to sustainable development in non-oil sectors of the economy.

2. Theoretical framework - Growth Model
The achievement of sustainable and inclusive growth has been the main aim of most nations of the world, which has created lot of consideration among

the various schools of economic thought extending from the classical to the neo-classical views. In the discussion of growth theory decades, the neo-classical exogenous growth theory has been the dominant school of thought. The Solow-Swan growth model explained that output growth rate is based on two exogenous factors in the long run which are technical progress and growth in labour and capital contributions. This model provided the few links of macroeconomic factors influence on output growth. As a result of this model deficiencies, led to the development of other growth theories such as Feder's model that encompasses other exogenous variables. However, for examining of the relationship between sectorial export and economic growth, this paper will present models based on the existing literatures where a production function framework in which capital, labour, exports and other factors are used as potential explanatory inputs.

Hence, several studies in numerous nations have been conducted and supporting the opinion that exports have a strong positive impact on growth. Some of these studies include Feder, 1982; Ram, 1985; Balassa, 1978; Esfahani, 1991; Rodriguez & Rodrik, 2000; Vohra, 2001; Awokuse, 2008; Aladejare & Saidi, 2014; Opoku & yan, 2019 and so on. However, few studies (Dutt & Ghosh, 1994; Tang, 2006) found that exports does not cause economic growth. Likewise, some studies have been conducted to study the relationship between non-oil exports and economic growth in the literature. The result of these studies varies from one to the other; owing to the difference in methodologies and time frames as well as the variables captured in the models.

Thus, the relationship between export performance and economic growth is being an area given much attention by development economists. This has broadly classified economists into two: those that support the hypothesis that export growth has a positive impact on economic growth (Exports are engine of growth) and those that reject the hypothesis that there is no positive impact on the economic growth. Based on this argument, this study device a mean to project and analyze a possible futuristic picture or view of Nigeria's export towards a sustaining economic growth.

3. Research Methodology

This research involves quantitative analysis of the variables and adopting the method of Autoregressive Distribute Lag (ARDL) econometric statistical technique. The econometric model uses Gross Domestic Product (GDP) as the dependent variable whereas oil export, agricultural output and non-oil

export are considered as independent variables. The data for this study for some years (1981-2020) was extracted mainly from secondary sources (Statistical Bulletin and the Central Bank of Nigeria Annual Report and Statement of Accounts 2020). Also, for year 2021 to 2025 the data was projected based on the previous years and validated from the results of the analysis. Thus, the annual time series data covering from 1981 to 2025 was analyzed through the unit root test, regression analysis and Granger causality test.

4. Estimation Procedure:

The data analysis was done with the appropriate tool based on the economic theory that was developed to overcome the problems of spurious correlation often associated with non-stationary time series data. Hence, the choice of estimation model is based on Pesaran and Shin's view that some of the selected variables are co-integrated, that is at order I (1), and one of the variables at level that is I (0), ARDL can be employed for the short and long run relationship. Thus, the OLS model specification is established as:

$$Y_t = \lambda_0 + \lambda_1 OE_t + \lambda_2 NoE_t + \lambda_3 AgrO_t + \mu_t \tag{1}$$

where:

Y_t denotes Gross Domestic product for current year,

OE_t denotes Oil export,

NoE_t denotes Non-oil export,

$AgrO_t$ denotes Agricultural output,

λ_0 , λ_1 , λ_2 and λ_3 are constants, and

μ_t denotes the error term.

5. Analysis and Result

The results of the analysis are presented in Table 1 to Table 5, where the root unit or stationarity test outcome presented in Table 1 suggested the use of ARDL method since the order of integration are mixed at I (0) and I (1). The bound test result presented in Table 2 and 3 reveals the selected model used for the analysis and the absence of no co-ingration (the existence of long run based on the fact that the ECT cofficient (cointeq(-1)) is negative and

significant at 1 percent (Table 4: -5.553804; 0.0000***). Table 5 presents the various tests conducted to check the capability, normality and stability of the model for the examined time frame (1981 to 2025) which validates the projected data values.

Table 1: ADF and PP Unit Root Test

Variable	ADF		PP		Result
	Constant	**Trend and Constant**	**Constant**	**Trend and Constant**	
GDP	4.264064***	3.93359**	4.493905***	4.297317***	I (0)
AgriO	5.217682***	5.602059***	5.277733***	5.656231***	I (1)
OilE	6.47716***		5.934531***	6.003069***	I (1)
		6.414208***			
NonOilE	0.027383	1.968116	12.93704***	23.80360***	I (1)

Notes: ***, **, * indicates dismissal of the invalid speculation of a unit root at the 1%, 5%, and 10% centrality level respectively. No reference mark shows that the arrangement is non-stationary.

Table 2: ARDL Estimate

Selected Model: ARDL (2,0,0,1)		
R-Squared 0.482220	0.556189	Adjusted R-Squared
F-Statistic 0.000029	7.519267	Prob.(F-Statistic)

Source: Authors' computation from EViews 12.

Table 3: ARDL Bound Test Statistics and Critical Value (Restricted Intercept; No Trend)

Computed F-statistic = 5.552054 (lag structure, k=3)		
Bounds Level I (1)	**Lower I (0)**	**Upper**
Critical Bounds Value (1%)	4.27	5.412
Critical Bounds Value (5%)	3.078	4.022

Narayan (2005) critical value for 5% significance level is I (0) =5.235, I (1) = 6.135 and for 1% significance level is I (0) = 7.740, I (1) = 8.650. Source: Authors' computation from EViews 12.

Table 4: ARDL Error Correction Regression (Restricted Intercept; No Trend)

	Coefficient		T-statistic Prob.
C	2.420284	2.100681	0.0427**
D(Agric)	0.004378	4.733440	0.0007***
D(OilE)	1.850000	0.769861	0.4464
D(NonoilE)	8.110000	0.6051511	0.5489
CointEq(-1)	-0.518703	-5.553804	0.0000***
F-Statistic	5.552054	Prob.(F-Statistic)	0.000000

Notes: ***, **, * indicates the 1%, 5%, and 10% centrality level respectively.
Source: Authors' computation from EViews 12.

Table 5: Diagnostic Tests

Tests Probability		Statistics
a. Normality Test: F-statistics 0.758292		0.553394
b. Breusch-Godfrey Serial Correlation LM test:		
F-statistics 0.4771		0.756449
Obs R-squared 0.4001		1.831858
c. Heteroskedasticity test:		
F-statistics	1.982933 0.0939	
Obs R-squared	10.68105 0.0987	
d. Ramsey Reset test: F-statistics	1.759843	0.1932

Source: Authors' computation from EViews 12.

Figure 2. CUSUM Test for Stability
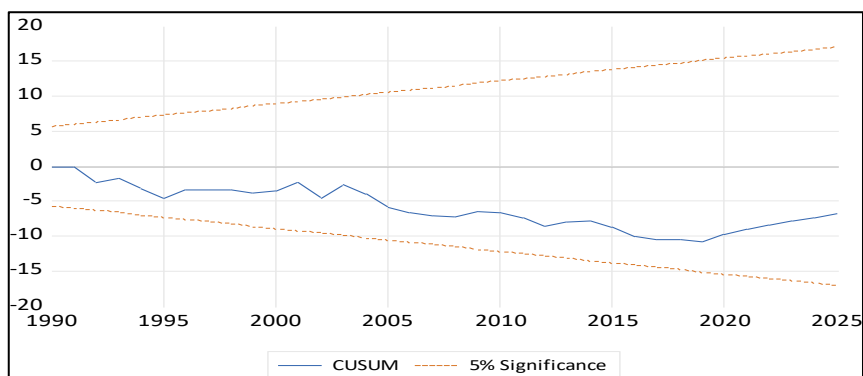
5. Conclusion

The paper has investigated and was able to establish the relationship among GDP, agricultural output, non-oil and oil export; with the possibility of Granger causality among the variables during from the period 1981 to 2025 in Nigeria. The study findings exhibit that the variables are co-integrated, so there is long run relationship among them. The findings make it evident that the agricultural output is a good indicator for predicting GDP outlook and for the non-oil sector export. The study hereby recommend policies that will aid increase of the exportable goods through the expansion of output base and diversification of the export base to includes more non-oil sector like agriculture, solid minerals etc should be prioritized for improvement and sustaining of the nation's growth.

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