Production Function Paradigm Shift Real Sector and Output Growth in Nigeria

[1]Ologundudu, Mojeed Muhammed (Ph.D.), [2]Ifarajimi, Gilbert Deinde (Ph.D.)

[1]Mountain Top University Economics Department

[2]Caleb University Economics Department

DOI: https://dx.doi.org/10.47772/IJRISS.2025.914MG0092

Received: 06 May 2025; Accepted: 11 May 2025; Published: 12 June 2025

ABSTRACT

The Nigerian economy has been precariously dependent on crude oil, whose price is determined exogenously on the world market, and as a result, Nigeria's growth performance has deteriorated significantly in the last three decades, with adverse attendance effects on low GDP, widespread poverty, low job creation, infrastructural deficit, and general economic and social vices. Scholars and policymakers' emphasis has switched, as expected, to the non-oil sector as a means of boosting and increasing Nigeria's real sector factor productivity output growth. Using standard Cobb-Douglas production function approaches, the study investigated the production function paradigm shift real sector output growth in the Nigerian economy. The Augmented Production Function (APF) was used in the study, along with the Endogenous Growth Model (EGM) and standard tests for mean reversion and co-integration were employed. The finding shows that non-oil exports have an insignificant impact on rate of change in output growth in Nigeria. According to the findings. Apart from empirically providing information that has failed to back up recent claims of non-oil export-led growth in Nigeria, the study has also established a data benchmark for assessing future non-oil export trade performance in terms of its contributions to Nigerian economy real sector output growth.

Keywords: Non-Oil Export, Economic Growth, Endogenous Growth Model, Production function.

INTRODUCTION

Since its independence from colonial authority in 1960, the Nigerian economy has gone through at least three major phases. The first is the colorful age that the colonial masters left behind, which lasted until roughly 1980. In terms of output diversity (staples, food, and cash crops), contribution to gross domestic product (GDP), employment, and export, this phase was marked by a thriving agricultural industry. Due to the Arab-Israeli war in the early 1970s, this first phase saw the first substantial inflow of petro-dollar funding. Over this time period, the rate of growth has been outstanding. The recession in advanced Western economies, which began in the late 1970s as a result of rising interest rates and high production costs, caused Nigerian exports to plummet. The price of crude oil on the international market has also plummeted. Due to the easy flow of foreign cash (forex) in the early 1970s, the agricultural sector had been neglected.

Nigeria's economic performance deteriorated substantially, and by mid-1986, the country had to agree to adopt and implement some far-reaching economic reform measures in order to qualify for multilateral lending institutions' help. This period was known as the era of economic collapse and adjustment, and it lasted until roughly 1995. Despite the fact that reforms were implemented in accordance with liberal economic rational expectation theory, the post-1995 economic performance can be defined as a period of recovery. A close assessment of sectoral performance revealed that agriculture's pre-1980 position had not been regained, and that the contribution of the extractive mineral and quarrying sector to GDP, as well as the contribution of the services sector, had increased over time. In general, and based on the experience of mature capitalist economies, it is expected that as a country develops, the traditional sector's proportion of GDP and employment will drop due to rapid expansion in modern sectors like services.

The situation in Nigeria mentioned above about growth trajectory is not fictitious. It is true, but this is owing to previous administrations' near-complete neglect of the core real sectors, resulting in the observed dominance of the oil and non-oil related sectors. The service industry arose as a direct response to the collapse of real investment as a result of high risk and uncertainty. Since 1986, economic reforms have prioritized financial and exchange rate deregulation, which, when combined with (mis)management of the forex system, has fueled speculative activity. Several financial organizations have emerged in the economy, all vying for a piece of the currency market. As a result, the service sector, which is dominated by financial institutions, grew significantly. The service sector's expansion was aided by interest rate liberalization and a persistent inflationary tendency, which raised the return on speculative activity.

The real (productive) sector in Nigeria has yet to recover since its collapse in the mid-1980s, according to most commentators. Industrial capacity utilization has been at 50% on average since 1996, compared to nearly 80% in the 1970s, according to statistics. As a result, this points to the possibility that factor inputs' contribution to output has decreased over time. There were reports of huge industrial plant closures between 1984 and 1990, yet overall growth rates were encouraging. One reason for this possibility is the behavior of the international crude price. Growth will occur when the international price of crude oil rises and more barrels are poured into the market. However, higher factor usage and productivity may not always follow such expansion.

Nigeria, with a population of more than 200 million people and an estimated national unemployment rate of more than 70%, as well as a poverty rate of more than 85%, cannot afford a growth path that does not increase the use (and productivity) of her abundant labor resource, knowing full well that employment and poverty reduction are inextricably linked. As a result, the lower the poverty rate, the bigger the labor contribution (and share) in aggregate production. To this aim, every meaningful attempt to decrease poverty must take into account the importance of labor inputs to production growth. However, the current trend suggests that inputs (especially labor) are contributing less to aggregate output. This has far-reaching consequences for poverty reduction.

In light of the aforementioned, the primary goal of this research is to use Cobb-Douglas production function methodologies to investigate the production function paradigm shift real sector output growth in the Nigerian economy. Its goal is to provide a better understanding of the Nigerian economy's growth momentum from 1980 to 2020, focusing on production growth in the oil and non-oil sectors with a specific reference productive factor. The study assesses the influence of factor inputs and other postulated variables to growth in Nigeria from 1980 to 2020 using econometric estimations. The remainder of the study is organized as follows: Section 2 examines the literature and empirical evaluation on growth, as well as a brief overview of Nigeria's aggregate growth profile. Section 3 discusses the methodology and model specification of the study. The nature and measurement of data and results of findings are discussed in section 4, while the summary and conclusion are presented in section 5.

LITERATURE AND EMPIRICAL REVIEW

Many research have used both the econometric and growth accounting approaches to compute TFP growth and analyze the source of output growth model in Nigeria over the years (Ojo and Oshikoya, 2010; Adenikinju and Chete, 2015; Iyoha and Oriakhi, 2015; and Kingsley et al., 2015). Outside of the usage of factor inputs, various factors have been proposed in the literature as credible contributors to real sector output to growth. Some of these claims have been put to the test using a variety of methodologies. Using the growth accounting paradigm, Iyoha and Oriakhi (2010) explore the sources of growth in Nigeria between 1960 and 1996. We used an intense Cobb-Douglas aggregate production function with Hicks-neutral technical change. They found that the average annual rate of growth of per capita income was around 3.96 percent from 1960 to 2000, whereas the average annual rate of growth of capital per worker was 1.95 percent and the average annual rate of growth of TFP was 2.62 percent. According to the report, TFP growth provided 82.7 percent of total per capita income growth from 1960 to 2000.They also noted that between 1960 and 2000, the average annual growth rate of capital per worker was around 10%, which they believe represents only a minor amount of capital deepening. They tentatively attributed the low capital per worker growth rate to a lack of savings and investment at the time.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue XIV May 2025 | Special Issue on Management

Fafchamps (2010), taking a continent-wide view, concluded that commodity price swings have caused tremendous hardship in African countries. He claims that the worst-affected countries are those like Nigeria, where the price of their main export climbed rapidly before suddenly collapsing. This emphasizes the significance of terms of trade (or export price) flexibility in the growth of mono-export countries like Nigeria. Indeed, according to Collier and Gunning (2010), commodity price variations have played a significant role in Africa's issues and will continue to do so unless the continent diversifies its export base. In the Nigerian environment, notably from the late 1970s to the early 1990s, the concept that improvements in international commodity prices determine growth performance is highly significant. Poor growth was caused by the collapse of international commodity prices in the late 1970s, which was caused by a reduction in demand in Western economies. After a long period of time, the price of oil finally rose above US$20 a barrel during the Gulf War in the early 1990s. Following the battle, the price of crude oil plummeted once again. By late 2004, the invasion of Iraq and economic growth in the United States, China, and India had pushed crude oil prices to a two-decade high. Since the late 1970s, Nigeria's actual output growth has followed a cyclical pattern of crude oil price.

One key question is why Nigeria, like most other oil-dependent countries, did not seize the opportunity provided by the early 1970s boom to transition to a path of long-term growth. Recent research has stressed the critical importance of the institutional framework and political governance structure in providing public goods and allowing private actors to engage in this regard (Mkanawire and Soludo 2018; Elbadawi and Schmidt-Hebbel 2008; Oyejide 2018; and Collier and Gunning 2010). The biggest offender has been the governing environment. According to the agreement, the economy was "highly mishandled," with monies being spent on non-productive national ventures or simply embezzled. Fafchamps (2010) argues that continuing to blame Africa's difficulties on external influence may not be the best strategy. He claims that substantial proof attributing Africa's poor economic performance to plundering and looting by foreign powers or multinational corporations is difficult to come across. As a result, he claims that pillage and looting by Africans themselves have recently gotten a lot of attention.

Nigeria's early 1970s oil boom resulted in the neglect of important non-oil sectors such as agriculture and industry. The manufacturing sector's inability to change has been attributed to the import-substitution industrialization (ISI) policy implemented at independence (Olomola, 2014). Because industrial policy was generally inward-looking, trade policy practice at the time was to safeguard domestic businesses. According to an examination of the political economics of Nigeria's industrialization process, huge public industrial undertakings were under the influence of influential bureaucrats who were leveraging them for private gain. As a result, the unspoken goal of protecting the firms was to keep a dominant domestic group's rent. Almost all governmental firms had become a budgetary embarrassment and burden to the state by the time economic reform initiatives began in 1986. They were simply inefficient and uncompetitive. The agricultural industry was generally overlooked due to the relative ease with which oil development and exportation might provide forex (foreign exchange). As a result, the sector became unappealing, resulting in sector and locational labor mobility. The introduction of marketing boards exacerbated the agriculture sector's woes by appropriating part of the incentives intended for farmers. This was a significant impediment to greater output and productivity.

Since 1986, major reforms have been implemented. Trade and exchange rate liberalization, as well as financial deregulation, are important aspects of the reforms. The contribution of these policy measures on Nigeria's growth has been investigated by researchers. For example, Kingsley et al. (2015) discover no link between openness and economic growth in Nigeria, and so conclude that unfettered openness could harm local industries, the real sector, and government revenue. Miller and Upadhyay (2012) estimate and compare labor and capital elasticities of output per worker across various socioeconomic and geographic categories in a survey of 83 countries, revealing considerable disparities in production technology. They also calculated THP series for each nation classification. Using variables of TFP such as human capital, openness, and distortion of domestic pricing relative to international prices, the article illustrates that an outward-oriented strategy, even if targeted toward lowering price distortion and improving openness, may or may not support growth in specific country groups. Furthermore, they find that human capital plays a reduced impact in boosting TFP growth.

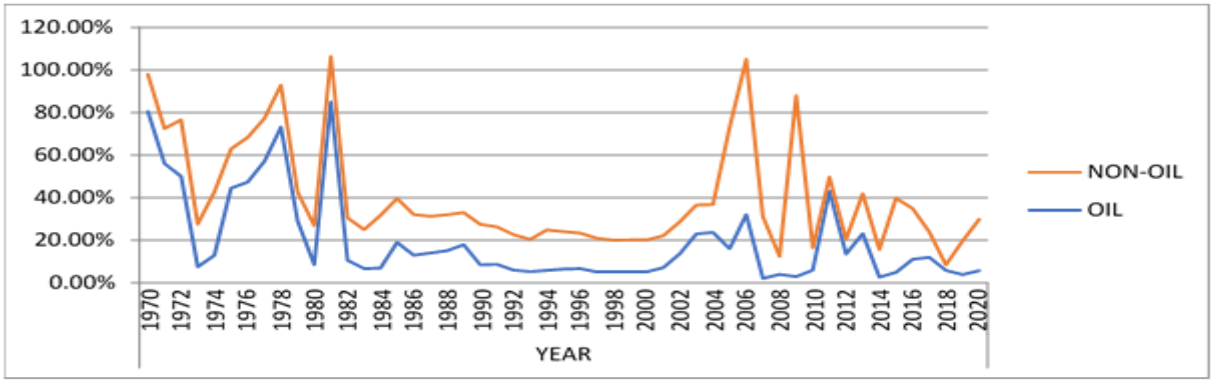
Tahari et al. (2014), on the other hand, looked at growth in Sub-Saharan African (SSA) countries from 1960 to 2002. Their findings demonstrate that SSA's average real GDP growth was low and steadily decelerated until

rising in the second half of the 1990s.This corresponds to the time period labeled "healing period" in this study. They found that factor accumulation was the primary driver of growth, with total factor productivity (TFP) growth playing just a minor role. They further claim that the current growth recovery was accompanied by an increase in TFP growth in the group of countries whose IMF-backed programs were deemed on track. In terms of poverty reduction, the authors argue that, given the SSA region's three and a half percent average annual growth from 1997 to 2002, the region will need to double its growth rate by 2020 if it wishes to halve the share of people living on less than one dollar per day.

Aggregate Growth Profile in Nigeria (1970-2020)

As shown in fig. 1, Nigeria's total output at current factor costs was largely derived from non-oil sectors, with agricultural production dominating. In 1960, non-oil GDP accounted for 99 percent of total output, with agriculture accounting for nearly 80% of total non-oil output. Until 1970, when the non-oil sector accounted for nearly 90% of overall output, this trend was largely maintained. The agriculture sector remained dominant, with around 80% of manufacturing capacity utilized. The non-oil sector's share of GDP continued to decline after the civil war in 1970.Due to the huge surge in oil prices as a result of the Arab-Israeli conflict, the non-oil sector's proportion of GDP fell from 86 percent in 1971 to 68 percent in 1974 by 1978. This circumstance resulted in a massive inflow of foreign currency, contributing to the agriculture sector's continued neglect.

Figure 1: Composition of GDP



Source: Central Bank Annual Report and Statement Income of Various Years

However, the oil industry, which was booming in the 1970s, was unable to absorb the labor that was being released by the agricultural sector. It was dubbed an enclave economy because of this circumstance and the fact that the sector had limited horizontal relationship with the rest of the economy. By 1980, the oil boom was passed, and the non-oil sector's contribution had dropped to around 75%. In terms of methods and modes of production, the agricultural sector has seen little or no modernization. As a result, capital utilization in this industry was low. By 1983, the non-oil sector had increased its share of GDP to almost 85%.This was largely due to the poor international price of Nigeria's principal commodity, crude oil. By this time, the oil sector had contributed around 80% of Nigeria's exports, with the rest coming from the non-oil sector. By 1989, the non-oil sector's proportion of GDP had dropped below 70%, and by 1992, at the height of "Operation Desert Storm," when crude prices were skyrocketing, the non-oil sector's contribution had risen to 53%.

In the 1980s, as the agricultural sector was neglected, capacity utilization in the manufacturing subsector also fell dramatically. Manufacturing capacity utilization fell from 70% in 1980 to 40% in 1992, from a high of 70% in 1980. However, the service sector's contribution to GDP increased from under 15% in 1980 to over 30% in 1992. The growth in the service sector's contribution was mostly attributable to financial sector liberalization, which saw entry restrictions lifted and speculative investment rise due to increasing exchange rate volatility. The non-oil industry contributed for over 70% of GDP and less than 5% of export revenues between 1993 and 1999. The non-oil industry accounted for less than 60% of GDP between 2000 and 2010.As of the end of the first

quarter of 2021, the oil sector's contribution to GDP had dropped to 9.25 percent, while the non-oil sector contributed a significant 90.75 percent to total country GDP, as shown in fig. 1. The cause for the oil sector's poor performance in Nigeria's economy is the recent additional drop in oil prices from $120 per barrel in 2019 to around $68 per barrel in the fourth quarter of 2020.

Estimates of the Production Function and Total Factor Productivity

Growth in TFP is usually considered to represent output growth not accounted for by growth in inputs (Hornstein and Krusell, 2016) Specifying a general production function in the Hicks neutral form, we have:

$$F(K(t), L(t), t) = A(t), L(t)) \quad (1)$$

Where *K* and *L* are respectively, capital stock and labour, *A* (*t*) is measure of TEP and F (.) is the production function. A (*t*) measures the shift in the production function *F* at given levels of inputs. In this form, taking log derivatives with respect to time, t, and rearranging yields:

$$\frac{Y}{Y} = \frac{\partial F}{\partial K}\frac{K}{F}\frac{K}{K} + \frac{\partial F}{\partial L}\frac{L}{F}\frac{L}{L} + \frac{\partial A}{\partial A} \quad (2)$$

Hence, the last term on the right side of equation (2) is interpreted as the growth rate of TFP. This implies that equation (2) can be written as:

$$\begin{pmatrix} Growth \\ rate\ of \\ GDP \end{pmatrix} = \varepsilon_K \times \begin{pmatrix} Growth \\ rate\ of \\ capital \end{pmatrix} \varepsilon_L \times \begin{pmatrix} Growth \\ rate\ of \\ labour \end{pmatrix} + \begin{pmatrix} Growth \\ rate\ of \\ TFP \end{pmatrix} \quad (3)$$

Where ε_K and ε_L stand for the elasticity of output with respect to capital and labour, respectively. The above implies that the Solow residual is a measure of TFP, which presumably changes over time. The problem, obviously, is that ε_K and ε_L are unknown parameters depending on the functional form of F) and it is these parameters that are critical in calculating TFP growth. There are different approaches applied in the Literature to estimate ε_K and ε_L .A very common one 1s to assume perfectly competitive markets and based on cost minimization a necessary condition for equilibrium conditions are given by equalities between the income shares of capital and labour in GDP ($S_K\ and\ S_L$) and the elasticities of output. That is ε_K and ε_L are equal to the income share of each factor ($S_K and\ S_L$). Thus, under constant returns to scale $\varepsilon_K + \varepsilon_L = S_K + S_L = 1$. With appropriate substitution, the growth rate of TFP is calculated by simple subtraction. The result is the well-known Solow residual depicted in equation (3). The assumption of a perfectly competitive input market is a major weakness of this approach.

Another option is to assume a certain parametric form of equation (1) and estimate the production function using either a level or difference regression (Iwata et al., 2013). The output elasticities are produced from the parameter estimates, and the regression residual is used to determine TFP growth. A key flaw in this technique is the assumption of a functional form for the production function. Another option is to use a non-parametric approach, which does not require the assumption of completely competitive input markets or a certain production function functional form (Iwata et al., 2013). Some sorts of local smoothness of the production function are necessary in this technique. The usage of a parametric form, the second method, is used in this study for the following reasons. First, the data needed to compute the share of factors in total output value in Nigeria is extremely untrustworthy. Second, Monte Carlo analyses conducted by Lwata et al. (2013) demonstrate no arbitrary or significant difference between the two parametric forms utilized in the experiment and the non-parametric version. The Cobb-Douglas function is the parametric form used here.

The Production Function Theoretical Framework

Consider how a Cobb-Douglas production function can be used to represent an economy's output. Let's call the output level Yt (GDP), Kt is the stock of physical capital, Lt is employment, and and are parameters at the technological level. The Cobb-Douglas production function looks like this:

$$Y_t = A_t K_t^a L_t^\beta, \qquad 0 < a, \beta < 1 \qquad (4)$$

We allow for the possibility of non-constant returns to scale by not restricting $(\alpha + \beta)$ to equal one. Dividing equation (4) by the labour force (L) expresses output and the physical capital stock on a per worker basis as:

$$y_t = A_t K_t^a L_t^{\alpha+\beta-1} \qquad (5)$$

Where y is real GDP per worker, and k is the per worker stock of physical capital. The production functions display increasing constant, or decreasing returns to scale as $\alpha + \beta$ is greater than, equal to, or less than one, respectively. Rewriting equation (4) in natural logarithms yields the following:

$$\text{In } y_t = In\ A_t + \alpha\ In\ k_t + (a + \beta - 1)\ In\ L_t \qquad (6)$$

Equation (6) implies that one can easily test the assumption of constant returns to scale by testing that the coefficient of *InL* equals zero. A regression of equation (6) in first difference form will produce TFP growth as the residual. There is some controversy in the empirical literature on the number, nature, and types of inputs to put in the production function. For example, Mankiw, Romer, and Weil (2012) advocate including human capital in the production function on both theoretical and empirical grounds. Islam (2015) finds that human capital does not contribute significantly to explaining output in the Mankiw- Romer-Weil specification. Miller and Upadhyay (2012), however, do find a significant role for human capital in their estimations. Including human capital implies that equation (4) is written as:

$$y_t = A_t K_t^a (L_t H_t)^\beta \qquad (7)$$

Where H_t is an index of human capital, and thus $L_t H_t$ is a skilled-adjusted measure of labour input. Hall and Jones (1999) postulate the following relationship in specifying human capitals augmented labour: Hi = Li expφEdi, where Edi is the average number of years of schooling of the labour force, and the parameter φ the productivity of workers with Edi years of education relative to those with no schooling. From equation (6) if we let $g_t, \equiv\ \Delta$ In A_t to be TFP growth, then the residual of the regression of equation (6) in first difference is a measure of THP growth.

Real Sector Output Growth

The growth rate of TFP, as shown in equation (3), is a "all inclusive" variable that represents "everything" that modifies the production function. The aggregate production function can fluctuate due to a variety of factors. In fact, according to Levine and Renelt (2012), there are about 50 potential variables that can influence economic growth. The TFP growth rate per worker in equation (6) does not have to represent only technological change, and it may not even represent any. TFP growth can be influenced by measurement mistakes in production, physical capital, and human capital. Deviations in social and private marginal products can, but do not have to, result in higher returns in terms included in TFP growth (Barro, 1999). Alterations in property rights and the economic regime might also cause TEP changes to appear. When it comes to determining the primary factors of THP growth, Jadresic and Zahler (2015) provide three hypotheses: the TFP is the result of I good policies, (ii) just plain luck, or (iii) a sound institutional attitude. Loayza and Soto (2012) categorize the variables that are likely to influence growth into five categories, namely transitional convergence, cyclical reversion, structural policies and institutions, stabilization policies, and external conditions, by redefining the above set of variables and focusing on variables that have received frequent attention in the literature.

In general, this means that we'll have an estimating equation of the following form:(8)

Where gt denotes TFP growth, t is the time trend, which accounts for exogenous shifts in the production function, and Z denotes a column vector of non-input elements that effect growth, as explained above. (row vector) and (parameters to be estimated) are the parameters to be estimated. After extracting TFP growth, equation (8) can be approximated directly or replaced into the first difference form of equation (6). In this investigation, we chose the first option.

Methodology and Model Specification

The Augmented Production Function is the model that was employed in this investigation. Following Obwona (2010) and Egwaikhide (2015) in estimating the impact of foreign direct investment on Nigerian economic growth, we define the country's aggregate production function as follows:

$Y=F(L,K,A)$	(1)

Where$Y$ = Gross domestic product (GDP),

L = labour force,

K = capital stock, and

A = total factor productivity (TFP) of growth in output.

Total factor productivity (i.e. A) is a function of private investment (P_{INV}) and trade policy measured by index of trade openness (DOP).

Therefore,

$A = g(P_{INV}, DOP)$	(2)

The substitution of (2) into (1) transformed (1) to:

$Y = f(L, K, P_{INV}, DOP)$	(3)

It is expected that private investment will affect growth through export trade. This in Nigeria is categorized into oil and non-oil export trade. We therefore substitute oil export (OX) and non-oil export (NOX) for P_{INV} in the model.

i.e.		
PINV =	H (OX, NOX)	(4)
This transforms (3) to:		
$Y = f(L, K, OX, NOX, DOP)$		(5)
Taking natural log of equation (5), and specifying it in dynamic econometric form, we transform it to:		
$l_nY = \alpha_0 + \alpha_1 l_nL_t + \alpha_2 l_nK_t + \alpha_3 l_nOX_t + \alpha_4 l_nNOX_t + \alpha_5 l_nDOP_t + \square_t$		(6)
Where	l_n = natural logarithms,	
	OX = oil export,	
	NOX = non-oil export,	

DOP = the index of trade openness,

$\square$ = the error term, L and K are as already defined while t is the time subscription.

α_1, α_2, α_3, α_4, α_5 are the elasticities of labour force, capital stock, oil export, non-oil export and index of openness respectively.

Ordinarily, a priori expectations are that all metrics will be favorable, but given that Nigeria's non-oil economy is still in its infancy, openness here can have a good or negative impact on growth. Nigeria's non-oil trade could be stifled by international trade competition, resulting in a negative impact on economy.

Data Description and Sources

Annual data from 1980 to 2020 was used to calculate economic growth, which was calculated using the natural log of real gross domestic product. The size of the employable population is used to calculate the labor force. Gross fixed capital formation as a percentage of GDP is used to estimate capital stock. Annual figures for GDP, gross fixed capital creation, oil exports, non-oil exports, and imports are published by the Central Bank of Nigeria (CBN). The ratio of "non-oil export plus non-oil import to GDP" will be used to construct the openness index.

Empirical Analysis of Results

Because the variables in the model, which are macroeconomic aggregates, may be non-stationary, regression models based on them are likely to produce erroneous results, and the conclusion will be skewed toward detecting significant connections among variables. To avoid this undesirable result, the time-series aggregates were tested for stationarity using the Johansen cointegration test, which looked for the presence or absence of a unit root. The following table (1) summarizes the findings:

Table 1: Results of Augmented Dickey-Fuller Stationarity Tests

Variables	ADF Test Statistics	Critical Value	Order of Integration
Y	-13.01808	1%	I(2)
L	-6.98091	1%	I(1)
K	3.060520	5%	I(1)
OX	-3.683560	5%	I(2)
NOX	-7.598846	1%	I (2)
DOP	-8.360934	1%	I (1)

Table1: Contd.,

Source: computed by the Authors from result of ADF stationarity tests

The outcome of the stationarity tests necessitated a test of the existence or nonexistence of a long run relationship (cointegration test) between the dependent variable (Y), and the set of independent variables. This is to avoid a spurious regression situation, giving the coinciding of the other of integration of the dependent variable and two of the independent variables (i.e OX and NOX).

Table 2: Result of Cointegration Test

Variable	Test Statistics	Critical Value	Order of Integration
Residual	0.805708	1%	I (2)

Source**:** Authors computation from result of cointegration test.

Table 3: **The Long Run Regression Model**

Dependent Variable	**Independent Variables /Constant**	**Coefficients**	**T-Values**
Y			
	C	6.5366	3.9247*
	L	-0.0320	-0.4840*
	K	0.3196	2.4701*
	OX	0.3375	3.4837*
	NOX	0.0033	2.2301*
	DOP	-0.2719	-0.1465*
	R^2	0.70	
	Adj R^2	0.63	
	t-stat	45.60	
	D-	1.98	

Source: Authors computation from result of long run regression model

Note: Indicate significant at 5% level

This study has justification for analyzing data using a traditional long-run regression model, the results of which are described in table (3). According to the results of the research, the explanatory factors account for roughly 70% of changes in the dependent variable, as measured by the coefficient of multiple determination (R-squared). The relevance of the entire model is demonstrated by the F-statistics result. The absence of an autocorrelation problem in the model is revealed once more by the Durbin Watson statistics. Second, a review of the model's other strengths—specifically, in relation to the variables in the model—shows that all of the explanatory variables, with the exception of labor force (L), are consistent with a priori predictions. At the conventional level, three of these compounds, K, OX, and NOX, are noteworthy.

Table 4: White Heteroscedasticity Test

No of Observations	**R^2 Auxiliary**	**Df**	**n.R^2 Auxiliary**	**$X^2_{0.05}$(K)**
30	0.890898	21	26.72694	32.6705

Source: Author’s computation from result of heteroscedasticity test and chi-square table analysis.

The white heteroscedasticity test confirms that the CNLRM's homoscedasticity assumption is not violated, hence the variances are constant over time. The study, on the other hand, suspects collinearity between K and NOX,

based on their high pair-wise correlation figure. Rather of eliminating any of the variables as a means of resolving the issue, the study elected not to do so because they are critical variables. According to Gujurati and Sangeetha (2007), the collinearity problem is not a severe issue when it comes to prediction. It's just a sample phenomena that doesn't break any regression rules.The premise that the residuals are regularly distributed is rejected by the Jarque-Bera (JB) test of normality. The analysis produced a JB statistic of 8.330537, with a chance value of 0.015526 for reaching this result. This result is due to the fact that the JB test of normality is an asymptotic test, and our sample size of 30 observations may not be adequate. The Ramsey specification test, with a probability value of 0.0056, suggests that the model is well specified.

DISCUSSION OF FINDINGS

The results of the analysis show that the major variable of interest (non-oil export) is statistically significant and positive, although its contribution to driving Nigerian economic growth throughout the study period is minuscule. The Nigerian economy grows by 0.03 percent for every unit increase in non-oil exports. The non-oil sector of the Nigerian economy is woefully underdeveloped, as evidenced by this result. If this analysis is extended further, it suggests that a fast-growing non-oil sector is essential for non-oil exports to be able to stimulate and impact the rate of change in the Nigerian economy.

When we look at the other variables in the model, such as capital contribution (K), we can see that a unit increase in capital has a 32 percent positive influence on economic growth. This contribution is still below average, indicating the underdevelopment of Nigeria's industrial capital in terms of both depth and capacity. The scope of this study does not include a response to the question of how much of the available capital is used in the non-oil industry. Another result is that oil exports provide a considerable positive contribution to the growth of the Nigerian economy, as projected. However, in terms of size, a 34 percent rise in growth for every unit increase in oil export is not as large as one might assume, but that is the finding of this study. This means that, in order for the non-oil sector to have a major impact on the economy's growth for balance and diversity, it must be raised to around 97 percent of current levels.

SUMMARY AND CONCLUSIONS

This study looked at the impact of non-oil export trade on Nigerian economic growth, with the goal of confirming or refuting allegations that non-oil exports had contributed to the country's recent economic success. The contributions of Nigeria's level of industrial capital and oil export, which are widely thought to be the key drivers of growth in Nigeria, were analyzed in the process of accomplishing this goal. The findings suggest that, during the study period, the openness of the economy was not a substantial factor determining Nigeria's rate of change in economic growth. The negative impact of the labor force (albeit minor) reflects the fact that its growth has exceeded the increase of the industrial capital base required to absorb such levels of labor growth. As a result, Nigeria's industrial sector has reached the point where labor returns are diminishing. Only the development of the industrial capital base will be able to fix this.

The main conclusions of this study attribute fluctuations in Nigeria's economic growth to three model variables. These are the following variables: the economy's capital stock, oil exports, and non-oil exports. Non-oil exports, while important and favorable in terms of contributing to Nigeria's economic growth, have a little and insignificant impact on the pace of change in growth. This result has effectively debunked and discredited assertions that Nigeria's recent economic growth has been fueled by non-oil exports. The study also discovered a high positive association between Nigeria's capital stock and oil exports, with a unit change in either of these changing economic growth by 32 percent and 34 percent, respectively.

The fact that the oil industry accounts for the majority of Nigeria's industrial capital can be deduced from this. If the research is taken further, it implies that Nigeria's economic growth is fueled by oil exports and the level of capital stock. Because Nigeria's industrial capital is primarily oil capital, which is owned and controlled by foreign people, the country's economic progress can be managed from outside the country.

Finally, because there hasn't been a recent time series analysis that provides empirical verification of the importance of non-oil exports to Nigeria's economic growth, this study was done to fill that gap in the literature. The study's main finding is that there is a positive time series relationship between non-oil exports and economic growth in Nigeria, despite the non-oil sectors very low industrial capital base. Previous attempts to expand Nigeria's production base in the non-oil sector through the implementation of policies such as import substitution and export promotion strategies failed due to ineffective implementation and a lack of political will on the part of successive Nigerian administrations. As a cure, this report suggests that the non-oil sector's capital base be developed both in depth and capacity by implementing well-thought-out public-private partnership (PPP) initiatives in important sectors of the economy. PPP will be the catalyst for growth and development in critical industries and sub-sectors such as power, mining, and agriculture, as well as the transportation sector.

Furthermore, the study has established an empirical baseline for evaluating future claims of improvement in the health of the non-oil sector in terms of its contributions to the nation's economic growth by successive regimes.

REFERENCES

1. Adenikinju, A.F and LN. Chete (2015). Productivity, market structure and trade liberalisation in Nigeria. AERC Research Paper 126.
2. Amaghioyeodiwe, L and A.O. Folawewo (1998). Government investment policy on transport and economic growth: The Nigerian experience. In; Rekindling Investment for Economic Development in Nigerian. Selected papers for the 1998 Annual Conference. The Nigerian Economic Society.
3. Ariyo, A. (1998). Investment and Nigeria's economic growth: Reflections and policy issues. In; Rekindling Investment for Economic Development in Nigeria. Selected papers for the 1998 Annual Conference. The Nigerian Economic Society.
4. Barro, Robert J. (1999). Notes on growth accounting. Journal of Economic Growth 4 June):119-37.
5. Cheng B. and H. Huang (2004). The sources of economic growth in developing economies: Growth accounting based on non-parametric estimation. hkustasc.hku.hk/users/ndts/presentation/growthaccounting-pdp
6. Collier, P. and J. W. Gunning. (2010). Explaining African economic performance. Journal of Economic Literature, 37(1): 64-111, March.
7. EIbadawi, L and K. Schmidt-Hebbel. (2008). Instability and growth in the world. Journal of African Economies, 7, Supplement 2:116-168.
8. Egwaikhide, F. (2015): A new date based on physical capital stock: Sources, Methodology And results. Rivista de Analisis Economico, 8, pp. 37-59
9. Fafchamps, M. (2010). Engines of growth and Africa's economic performance www.economics.ox.ac.uk/members/marcel.fafchamps/homepage/engine.pdf
10. Hall, Robert E. and Charles I. Jones, (2010). Why do some countries produce so much output per worker than others? Quarterly Journal of Economics 114: 83- 116.
11. Hornstein, Andreas, and Per Krusell. (2016). Can technology improvements cause productivity slow-downs? NBER Macroeconomics Annual, MIT Press, pp. 209-59.
12. Islam, N., (2015). Growth empirics: A panel data approach. Quarterly Journal of Economics 110, 1127-1170.
13. Iwata, S., M. S. Khan, and H. Murao, (2013). Sources of economic growth in East Asia: A non-parametric assessment. International Monetary Fund Staff Papers, Vol. 50 No. 2:157-177.
14. Iyoha, A. Milton and Dickson Oriakhi (2015). Explaining African economic growth performance: The case of Nigeria. Revised interim report on Nigerian case study prepared for the African Economic Research Consortium. Research project titled Explaining African Economic Growth Performance.
15. Jadresic, Esteban and Roberto Zahler (2015). Chile's rapid growth in the 1990s: Good policies, good luck, or political change?, IME Working Paper 153.
16. Johansen (1988). Statistical analysis of cointegrating vectors. Journal of Economic Dynamic and Control, Vol12, pp 231-54.
17. Johansen and Juselius (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. Oxford Bulletin of Economics and Statistics, Vol 52, No2, 169-210.

18. Kingsley, K. O., G. O. Oji and A. Adenuga. (2015). Is trade openness valid for Nigeria's long run growth: A cointegration approach? http://econwpa.wustl.edu:80/eps/it/papers/0412/0412009.pdf
19. Levine, Ross and David Renelt (2012). A sensitivity analysis of cross-country growth regressions. American Economic Review, 82(4):942-963.
20. Loayza, V. N. and R. Soto (2012). The sources of economic growth: An overview published in Economic Growth: Sources, Trends, and Cycles. Edited by Norman Loayza and Raimundo Soto, in Series on Central Banking, Analysis, and Economic Policies. Santiago.
21. Mankiw, N. G., D. Romer, and D. N. Weil (2012). A contribution to the empirics of economic growth. Quarterly Journal of Economics 107, 407-437.
22. Miller, S. M. and M. P. Upadhyay (2012). Total factor productivity, human capita and outward orientation: Differences by stage of development and geographic regions. University of Connecticut, Department of Economics Working Paper Series. No: 2002-33.
23. Mkanawire, T. and C. Soludo (2018). African Perspectives on Structural Adjustment: Our Continent Our Future. African World Press, Nairobi, Kenya, 2018. An IDRC-CODESIRA Publication.
24. Obwona, C.O (2010). Total factor productivity in Kenya: The links with trade policy. AERC Research Paper No.119.
25. Odusola, A.F (1998). Human capital investment and the empirics of economic growth in Nigeria. In; Rekindling Investment for Economic Development in Nigeria. Selected papers for the 1998 Annual Conference. The Nigerian Economic Society.
26. Ojo, O and Temitope Oshikoya (2010). Determinants of long-term growth in Africa. Journal of African Economies, Vol. 4 No. 2, Oxford University Press.
27. Olomola, S.A (2014). Macroeconomic policies and long run economic growth in Nigeria (1980-2019). In Leading Issues in Macrocosmic Management and Development. (Eds) Abdul Ganiyu Garba, Festus Egwaikhide and Adeola Adenikinju. The Nigerian Economic Society.
28. Oyejide, A., (2010). Trade policy and regional integration in the development context: Emerging patterns, issues, and lessons for Sub-Saharan Africa, Journal of African Economies, 7, 5upplement 1: 105-145.
29. Sachs, Jeffrey, and Anderw Warner (2010). Fundamental sources of long run growth. American Economic Review 87(2): 184-88.
30. Soludo, C.C (2010). Investment in the growth process: A measure of the economist's ignorance in Africa. In; Rekindling investment for Economic Development in Nigeria. Selected papers for the 1998 Annual Conference. The Nigerian Economic Society.
31. Tahari, A., D. Ghura, B. Akitoby, and E. B. Aka. (2014). Sources of growth in Sub-Saharan Africa. IMF Working Paper Series No: 04/176. September