



AGRICULTURAL EXPORTS AND ECONOMIC GROWTH IN NIGERIA: A 38 YEARS REVIEW

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Abstract

A growing and sustainable economy is the goal of every nation. Nigeria was considerably described as an agrarian economy during the first decade after independence. However, the discovery of crude oil and the huge inflow of foreign exchange revenues that accompanied the oil boom diverted the attention of the people and government. This led to dwindling of the average annual growth rate of agricultural exports by 17% overtime. By 1996, agriculture accounted for only 2% of exports. The study adopted ex-post facto research design. The study employed 155 observations using 37 years of economic data sourced from Central Bank of Nigeria Statistical Bulletin, Nigeria Bureau of Statistics and World Governance Indicator from 1981-2017. The results revealed that agricultural exports had a significant effect on economic growth of Nigeria ($Adj R^2 = 0.998$; $F(5, 155) = 4114.96$; $p < 0.05$). The study concluded that agricultural exports impacted the economic growth of Nigeria. The study recommended that an effective and committed policy implementation by the government is needed to improve economic growth. Furthermore, the Nigerian government should provide additional funding for the agricultural sector to raise its productivity and increase its contributions to economic growth.

Keywords: *Agricultural Exports, Economic Growth, Sustainable Economy*

Introduction

Globalisation is fast becoming the order of the day as no state can claim to be an island of its own in terms of economic and business activities. The trend of business particularly in this 21st century has made it expedient for all state in

the world to seek to create an international frontier as no state can contain and consume all its products without efforts at looking for and creating market outside its borders. The efforts at creating international frontiers for sales and consumptions of goods and services of any country has multifarious implications ranging from creation of job opportunity, trade by barter to fostering the relationship between two or more countries and many more. These international frontiers created has been one of the major means of promoting and sustaining economic growth. Economic growth takes place when a country's real gross domestic product (GDP) increases in time and it is often seen as an important indicator of welfare and the market created on the global scene can either foster or hinder economic growth. The quality of a country's institutions, which can be determined by the legal and administrative framework within which individuals, firms, and governments interact to generate wealth, has been proven as a factor of economic growth by several studies (Acemoglu, Johnson & Robinson, 2002; Imoughele & Ismaila, 2015; Sylvester & Aiyelabola, 2012).

Nigeria's overall economic performance since independence in 1960 has been unimpressive rising and falling incessantly. Despite colossal amount of foreign exchange derived mainly from its oil and gas resources, economic growth has been weak and the incidence of poverty has increased (Abolagba, Abolagba, Esekhide, Agbonkpolor, Osazuwa, Umar, & Musa, 2016). A critical assessment of pre- and post- independence era reveals that Nigeria was a net exporter of several agricultural products. Prominent among these commodities were groundnut, cocoa, palm kernel, palm oil, rubber and cotton. Income generated from the export of these crops accounted for a greater chunk of the country's GDP. The annual output growth rates for agricultural and food crops were achieved at about 3% to 4%, Osuntogun, Edordu and Oramah (1993). However, literature and available statistics (CBN, 2010; Ekpo & Umoh, 2012; Manyong *et al.*, 2005; Mohammad & Atte, 2006) shows that there has been a serious decline in the contribution of agriculture to the economic growth of the nation. With the discovery of petroleum oil, the huge inflow of foreign exchange revenues that accompanied the oil boom diverted the attention of the government and a considerable number of producers of the traditional commodities, the production of this export crop in Nigeria suffered a reduction in recent years owing to a number of factors such as: low yield, inconsistent production pattern, disease incidence, pest attack and use of simple farm tools,

(Oluyole & Sanusi, 2009) Consequently, Nigeria became a mono economy, driven solely by oil. From the mid-1970s to the 1980s, the average annual growth rate of agricultural exports declined by 17%, (Adama & Ohwofasa, 2015). By 1996, agriculture accounted for only 2 %of exports. This decline is said to be as a result of lack of improved seeds, access to extension services, mechanization, subsistence farming, illiteracy, land ownership, government's weak commitment to its development and most especially low prices of the produce as a result of shrinking from the traditional 12-15 commodities of the 1960s, have been noted as the major setback over these years, as Nigeria is said to be losing about \$4.5 trillion export opportunities (Ewubare, Ajie, & Ojiya, 2017). Nigeria became a net importer of basic food stuff she formerly exported (Bakare & Fawehinmi, 2011). Among several challenges faced by the Nigerian agricultural sector, emerging studies (World Bank, 2013; Ayodele, Obafemi, & Ebong, 2013; FAO, 2014; Shittu, 2017; FMARD, 2017) indicates two key challenges. One is an inability to meet domestic food requirements, and secondly, an inability to export at quality levels required for market success. Despite various efforts made by the Nigerian government to revive and increase the export, there is yet to be seen any significant improvement and self-sufficiency in domestic supply, a country that once led in production and export of these commodities in the world prior to 1965. The efforts to reverse the trend seem to be yielding very limited results, as oil continues to dominate the country's exports while agricultural exports share of Nigeria's total exports remained under 5% for most years since the introduction of Structural Adjustment Programme. A further proof of the extent of this debilitating situation is seen from the rating of Nigeria's ease of doing business as reported by the Trade Economics/World Bank (2018) which reveals a drop from an index of 170 (2013) to 145 (2018) as reported by Okpanachi (2019). It is against this backdrop that we evaluate the interaction between agricultural exports and economic growth of Nigeria from 1981-2018. The paper is structured as follows; introduction, literature review, methodology, results presentation and discussion of findings, conclusions and recommendations.

Literature Review

Agricultural Export

The role of agriculture in reforming both the social and economic framework of an economy cannot be over-emphasized. It is a source of food and raw materials

for the industrial sector. It is also essential for the expansion of employment opportunity, for reduction of poverty and improvement of income contribution, for speeding up industrialization and easing the pressure on balance of payment (Folawewo & Olakojo, 2010). Export have been considered as growth-enhancing within the traditional development literature, based on the suggested positive productivity spill overs from the tradable to the non-trade able sector (Edwards, 2004; Amiti & Wei, 2005). The exports of agricultural produce are stimulated by exchange rate differential which increases the nominal income of farmers and improvement in trade policy. As Africans involvement in trade liberalization has improved access to foreign markets which is a critical determinant of export performance. The exports may be indication of available surplus food for market (Allaro, 2011). Adenugba and Dipo (2013), is of the opinion that when the demand for exports is high more production is required, this therefore creates more employment, raises national income and also helps attain a favourable balance of trade and balance of payment position for the exporting economy. This underlines the importance of exports in the growth of an economy

According to Yifru (2015), agricultural export means shipping any agricultural commodity or product whether raw or processed out of the port of a country or selling of agricultural goods produced in the home country to other markets. It can also be referred to as the selling of cultivated products and services used in the sustenance and enhancement of human life that are produced in the home country to other markets. Agricultural exports continue to be the most important source of foreign exchange for the majority of Sub-Saharan African countries (Gilbert, 2009). In light of the aforementioned, the work defines agricultural export as the selling of cultivated products and services used in the sustenance and enhancement of human life that are produced in Nigeria to other markets/country. As such, it investigates agricultural export through the lenses of cocoa export, cotton export, oil-palm export, rubber export and timber export in other to ascertain the interactions on economic growth.

Economic Growth

The economic growth of Nigeria has been dwindling over the years with a higher proceed coming in from the service sector. Agriculture which was a onetime driver of economic growth and a cash cow for the nation has been completely relegated to the background. According to Peng and Almas (2010),

economic growth is a long term rise in the capacity to supply increasingly diverse economic goods to its population. It entails sustainable rise in national output which is a manifestation of economic growth. Beyond the economic sector, the level of economic growth has an impact on the development of society and of the nation. A growth in the economy implies that, if laws remain unchanged existing tax revenues also increase, if the employment rate increases due to economic growth, then the impact is much stronger. Additional public revenue, if well invested can further foster growth in an economy (Olajide, 2010). Classical theorists that was led by Arthur Levis' in 1950s viewed economic development as a growth process of transferring factors of production, especially labour from an agricultural sector characterized by low productivity and the use of traditional technology to a modern industrial sector with higher productivity. Economic Growth is the leading goal of policy makers worldwide (Hernandez, 2011). Countries can experience economic growth with exports of goods through returns of scale, increase efficiency by increased competitiveness at international level and specialization, (Atrkar & Roshan, 2007).

Interestingly, Schumpeter (2005) defined economic growth as “a gradual and steady change in the long run which comes by a gradual increase in the rate of savings and population”. It also implies that economic growth is synonymous with a sustained rise in national output, provision of wide range of economic goods, presence of improved technology and institutional, attitudinal and ideological adjustments. The gross domestic product is monetary value of goods and services which serve as a major growth indicator. This presumes that all sectors of an economy make their inputs to the economic growth of the economy. Agriculture is one of such sectors (Yakubu, 2006). A large body of literatures can be found on the role of exports in economic growth that is known to “export led growth” hypothesis, by scholars, such as, (Amit, 2010, Saad, 2012, Mangir, 2012, Love & Chandra, 2005). A growth in the economy simply implies that, if laws remain unchanged existing tax revenues also increase, if the employment rate increases due to economic growth, then the impact is much stronger. Additional public revenue, if well invested can further foster growth in an economy (Olajide, 2010). From the above, economic growth would be defined as an increase in the market value of the goods and services over time.

Linkage between Agricultural Export and Economic Growth

Several studies (Eno-Abasi, 2017; Imoughele & Ismaila, 2015; Onodugo, Marius & Oluchukwu, 2013; Ebi & Ape, 2014) abound that have linked agricultural export to economic growth. While some scholars have debated that agriculture export should be the basis of economic growth, others asserts that the relations agriculture has with other sectors are too fragile and its ground-breaking structures insufficient for stimulating economic growth. However, the relationship between the agriculture sector and other sectors should not be a competition but rather be viewed as interdependent where supply and demand in sectors can be accommodated through strengthened linkages (Sabry, 2009). In recent time, diverse econometric techniques and data set have been employed by earliest studies to establish the effect of agricultural exports on economic growth. In particular, Pham (2008) & Yoon-Ha Yoo (2008) empirical results indicated that agricultural exports have a positive and significant impact on economic growth when a country has achieved some level of economic development.

The contributions of agricultural export to economic growth can be examined through the roles of the sector in the economy. Furthermore, results from cross-country regressions among developing countries show that \$1 increase in GDP results in significantly more poverty reduction when the growth is in agriculture rather than other sectors (Lipton, 2012). A robust and strong export trade is suggestive of how competitive the commodities and services are, and how large the scale of the industrial base of an economy is, this is reflected by the comparative advantages controlled by the country.

In Nigeria, agricultural exports have played a prominent role in economic development by providing the needed foreign exchange earnings for other capital development projects. Earnings from agricultural export will reduce the strain on the balance of payment position and even improve it. A well-developed agricultural export sector will provide employment opportunities for the people with the attendant reduction in social cost of unemployment. Adenugba and Dipo (2013) asserts that when the demand for exports is high more production is required, this therefore creates more employment, increases national income and also helps attain a favourable balance of trade and balance of payment position for the exporting economy. This underlines the significance of exports in the growth of an economy. While accounting for one-third of the GDP, it remains the leading employment sector of the vast majority of the

Nigerian population as it employs two-third of the labour force (Chigbu (2000). This sectoral growth increases the incomes and therefore purchasing power of farmers resulting in a vibrant domestic market for other sectors, hence growth in the economy.

Anyanwu, Ibekwe and Adesope (2010) using correlation matrix found that production of major staples in Nigeria contributed significantly to GDP growth. Also, as observed by Tolulope and Chinonso (2013) in Nigeria, the agriculture sector contributes significantly to economic growth.

Although agriculture export no longer serves as the leading contributor to Nigeria's gross national product and leading foreign exchange earner due to phenomenal growth in the petroleum sector of the economy, agriculture export is still the dominant economic activity in terms of employment and linkages with the rest of the economy (NNPC, 2004).

Methodology

This study adopted an ex-post facto research design which was used in ascertaining the contributions of agricultural exports on economic growth of Nigeria over the period of (1981-2018). Secondary information from 1981-2017 from various sources, such as data from Central bank statistical bulletin, African Development indicators, Food and Agriculture Organization (FAO) and Nigeria Bureau of Statistics was retrieved for the study. This approach is favoured because of its appropriateness in the collection of data from already existing sources over a period of time, in order to ascertain and establish a relationship and effect of the variables of interest.

Model Construction

The hypothesis for the study was tested using the regression tool, derived from the econometric equation developed along the proposition. This approach was selected because the nature of the data gathered which is a time series data fits well into this approach. The predicted model relating agricultural exports to economic growth is presented using the linear regression model as:

$$GDP_t = f(AEXP).....Functional_Model$$

$$AEX = (COTT, OIL, COC, RUB, TIM)$$

$$x_t = \text{Cotton Export (COTT)}_t$$

- $x_2 = \text{Oil Palm Export (OIL)}_t$
- $x_3 = \text{Cocoa Export (COC)}$
- $x_4 = \text{Rubber Export (RUB)}_t$
- $x_5 = \text{Timber Export (TIM)}$

$$GDP_t = \beta_1 COTT + \beta_2 OIL + \beta_3 COC + \beta_4 RUB + \beta_5 TIM + e_t \text{ --- Model Equation}$$

Trends of Agricultural Exports and Economic Growth

This section shows the time series trends of Agricultural exports measured by cotton export (LNCOTT), oil-palm export (LNOIL), cocoa export (LNCOC), rubber export (LNRUB), and timber export (LNTIM) in relation to economic growth measured by GDP. These are shown on Figures 1.1 to 1.5 respectively.

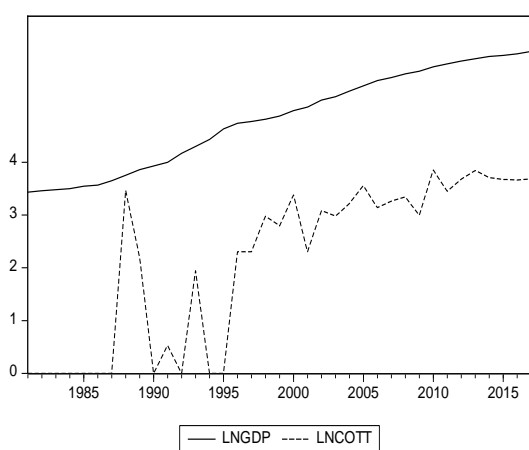


Figure 1.1 Trends of LNGDP and LNCOTT

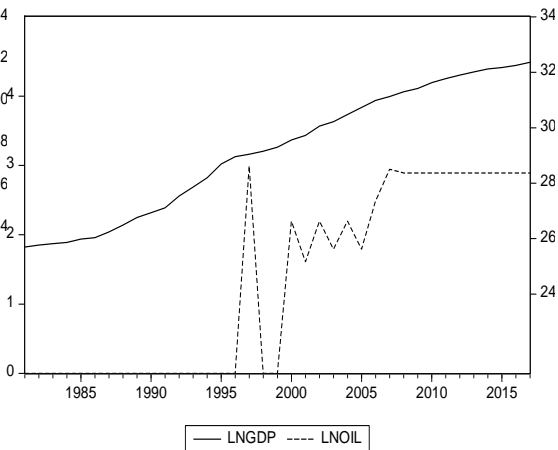


Figure 1.2 Trends of LNGDP and LNOIL

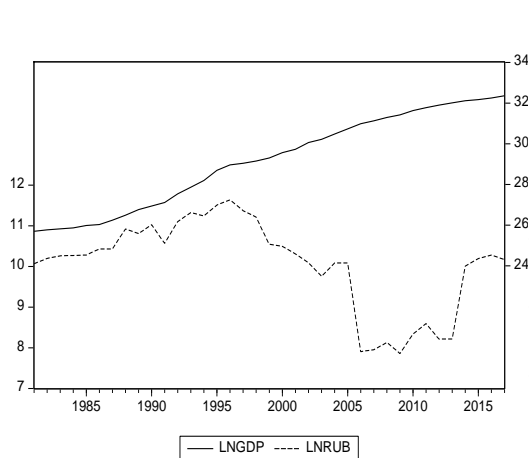


Figure 1.3 Trends of LNGDP and LNRUB

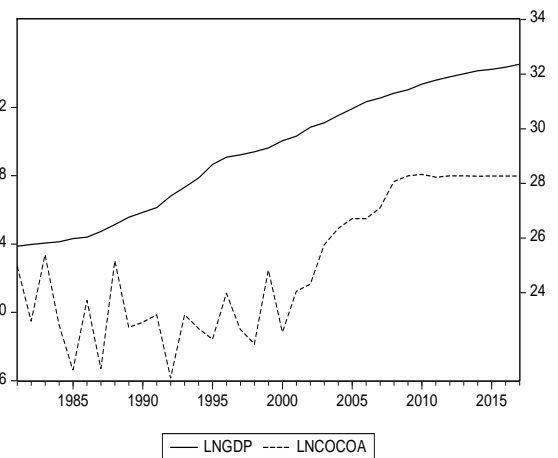


Figure 1.4 Trends of LNGDP and LNCOCOA

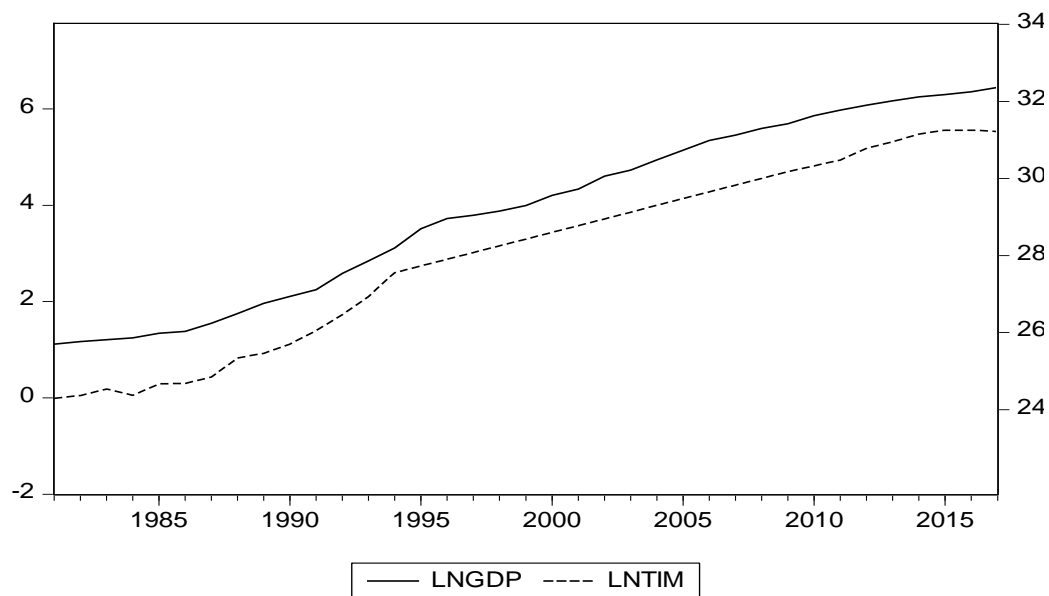


Figure 1.5 Trends of LNGDP and LNTIM

Source: Researcher’s Study, 2019

Interpretation

Figures 1.1 to 1.5 show the trends of each measure of the independent variable in relation to the dependent variable for the period under study. Specifically, it shows that there has been consistent growth in the GDP of Nigeria for the period under study. While there is evidence of fluctuations in the patterns of Agricultural exports measured by cotton export (LNCOTT), oil-palm export (LNOIL), cocoa export (LNCOC), and rubber export (LNRUB); timber export (LNTIM) seem to have been increasing over the years with a similar pattern with GDP. Also, the trends of Rubber export seem to have declined over the period of study.

The trends show that each measure of agricultural exports has a different pattern when compared with the trends of GDP. However, the direction and extent of relationship among these variables cannot be determined from the graphical representation. The next section shows the numerical description of the time series data.

Descriptive Analysis

This section of the analysis provides an overview on the data set while attempt is also made to describe the main attributes of the data. The descriptive analysis of the time series data obtained is done through numerical representation shown

on Table 1., which shows the mean, maximum, minimum, and standard deviation of all variables of Agricultural exports measured by cotton export (LNCOTT), oil-palm export (LNOIL), cocoa export (LNCOC), rubber export (LNRUB), and timber export (LNTIM); and economic growth measured by GDP for the period under study.

Table 1 Descriptive Statistics

	LNGD P	LNCO C	LNCOT T	LNOI L	LNRU B	LNTI M
Mean	29.170	12.275	2.144	1.327	10.049	2.976
Median	29.300	12.248	2.975	1.609	10.268	3.298
Maximum	32.365	12.808	3.854	2.996	11.635	5.558
Minimum	25.699	11.615	0.000	0.000	7.856	-0.011
Std. Dev.	2.305	0.402	1.547	1.351	1.116	1.896
Skewness	-0.163	0.085	-0.510	0.099	-0.786	-0.260
Kurtosis	1.594	1.591	1.519	1.148	2.514	1.702
Jarque-Bera	3.213	3.107	4.985	5.349	4.176	3.017
Probability	0.201	0.212	0.083	0.069	0.124	0.221
Observation	37	37	37	37	37	37

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Source: Researcher’s Study, 2019

Interpretation

Table 1 shows the summary statistics of all the dependent and independent variables obtained for the period under study. GDP has a mean value of 29.170 and standard deviation of 2.305. The standard deviation measures the extent of dispersion from the mean and depicts the level of volatility of the series. In this regard, 2.305 means there is a high presence of volatility to the tune of 2.305 in GDP when compared with other variables under study. This is further seen and confirmed from the difference and distance between the minimum value (25.699) and maximum (32.365). This depicts that the GDP values varied for the period under study.

Also, Cocoa exports (LNCOC) shows a mean value of 12.275 and a standard deviation of 0.402. This depicts a lower dispersion of LNCOC from its mean value as compared with GDP that has a relatively higher standard deviation value of 2.305. This suggests a lower variation and volatility in the series of

cocoa exports for the period under study. This is further confirmed from the difference and distance between the minimum value (11.615) and maximum value (12.808).

Cotton Export (LNCOTT) and Oil-palm Exports (LNOIL) also shows similar patterns with mean values of 2.144 and 1.327 respectively, and standard deviation values of 1.547 and 1.351 respectively. This equally suggests a lower variation and volatility in LNCOTT and LNOIL which is also confirmed by the differences in their minimum value 0 for both variables, and maximum values of 1.547 and 1.351 respectively. The minimum value of 0 for both variables means either there is unavailability of data to report in some years under review or neither cotton nor oil-palm was exported for some period under review.

Rubber Exports (LNRUB) had a mean of 10.049 and standard deviation of 1.116 which suggests a lower volatility as compared with GDP. The minimum value (7.856) and maximum value (11.635) indicated a low level of variation in the data set. Timber exports (LNTIM) also took a similar pattern of a relatively low volatility, which is seen from its standard deviation value of 1.896. This is further confirmed by the difference between its minimum value (-0.011) and maximum value (5.558).

Also, the skewness of all the variables except the LNCOC and LNOIL, shows negative at -0.163, -0.510, -0.786, and -0.260 for LNGDP, LNCOTT, LNRUB and LNTIM respectively. Indicating that the data series are negatively skewed showing that the left tails are extreme. On the other hand, LNCOC and LNOIL show positive skewness value of 0.085 and 0.099 respectively, showing that the right tail is to the extreme. Also in relation to kurtosis, all variables under study are leptokurtic because the data series are above the threshold of 3. Furthermore, the probability value of Jarque Berra (JB) statistics shows the truthfulness of the skewness and Kurtosis results. This is because JB is a formal test that validates the values in skewness and kurtosis. Since the Null hypothesis for JB is that the series under consideration are normally distributed, based on the probability values for JB in the descriptive Table 4.1 all the series are normally distributed at 5% level of significance adopted for this study.

Although, one of the key assumptions of ordinary least square regression is normality of series which have been met, other diagnostic tests are carried out in the next section.

Diagnostic Tests

Multicollinearity of Independent Variables using Variance Inflation Factor (VIF)

It is essential to determine whether there is a perfect linear relationship among the independent variables (predictors) used in the model. If there is a perfect relationship among the independent variables, then the problem of multicollinearity exists. Thus, the estimates for a regression model cannot be uniquely computed because as the degree of multicollinearity increases, the regression model estimates of the coefficients become unstable and the standard errors for the coefficients can get wildly inflated.

In order to check for multicollinearity, Variance Inflation Factor (VIF) was used. The rule of thumb is that when the VIF is lesser than 10, there is absence of multicollinearity. On the other hand, a variable whose VIF values are greater than 10 may merit further investigation. Also, $1/VIF$ (tolerance) value was used to check on the degree of collinearity, therefore tolerance value greater than 0.1 is comparable to a VIF lesser than 10. It means that the variable could be considered as there is no linear combination of other independent variables while tolerance ($1/VIF$) lower than 0.1 implies a linear combination among the predictors.

Table 2: Results of Variance Inflation Factor

Variable	VIF	1/VIF
LNTIM	6.50	0.154
LNOIL	6.16	0.162
LNCOC	4.14	0.242
LNCOTT	4.00	0.250
LNRUB	2.69	0.372
Mean VIF	4.70	

Source: Researcher's Study, 2019

Interpretation

The VIF result on Table 2 showed that each of the variables VIF value is less than 10 and the degree of collinearity is also compatible with VIF. Thus, there is no perfect linear relationship among the independent variables. Therefore, the results suggest that multicollinearity does not pose a problem on the regression model.

Unit Root Test

The Augmented Dickey-Fuller (ADF) and Philip Perron (PP) unit root test was conducted on each of the series under study. While Table 4.2 shows the unit root test results of each series at level and at first difference, Table 3 shows the summary of unit root test results.

Table

	Augmented Dickey-Fuller (ADF)			Philip Perron (PP)		
	Constant	Constant & Trend	None	Constant	Constant & Trend	None
GDP	-0.795	-0.311	2.552	-0.638	-1.316	6148
COT	-1.731	-4.408*	-0.266	-1.909	-4.384*	-0.171
OIL	-0.485	-5.170*	0.810	-1.466	-5.193*	-0.202
RUB	-1.446	-1.707	-0.127	-1.510	-1.828	-0.118
COC	-0.561	-2.736	0.945	-1.500	-4.308	0.618
TIM	-1.329	-0.718	1.255	-0.971	-1.000	2.462
First Difference						
GDP	-3.158*	-3.234	-1.364	-3.078*	-3.142	-1.098
COT	-7.887*	-7.779*	-7.883*	-20.093*	-22.326*	-9.188*
OIL	-8.645*	-8.513*	-8.267*	-14.573*	-14.449*	-12.215*
RUB	-5.773*	-5.689*	-5.861*	-5.773*	-5.684*	-5.864*
COC	-2.908*	-2.913	-2.752*	-13.911*	-13.709*	-13.103*
TIM	-4.089*	-4.241*	-2.168*	-4.213*	-4.295*	-1.977*

Table 3a: Unit Root Test Results

*significance at 5%

Source: Researcher’s Study, 2019

Table 3b Summary of Unit Root Test Results

	Augmented Dickey-Fuller (ADF)			Philip Perron (PP)		
	Level	First Difference	I(d)	Level	First Difference	I(d)
GDP	-0.311 ^b	-3.158 ^{a*}	I(1)	-1.316 ^b	-3.078 ^{a*}	I(1)
COT	-4.408 ^{b*}	-	I(0)	-	-	I(0)
				4.384 ^{b*}		

OIL	-5.170 ^{b*}	-	I(0)	-	-	I(0)
				5.193 ^{b*}		
RUB	-1.707 ^b	-5.773 ^{a*}	I(1)	-1.828 ^b	-5.773 ^{a*}	I(0)
COC	-2.736 ^b	-2.908 ^{a*}	I(1)	-4.308 ^b	-13.911 ^{a*}	I(1)
TIM	-0.718 ^b	-4.089 ^{a*}	I(1)	-1.000 ^b	-4.213 ^{a*}	I(1)

*implies statistical significance at 5%

^a, ^b, and ^c denotes model with constant, model with constant and trend and model without constant and trend respectively.

Source: Researcher’s Study, 2019

Interpretation

The result for unit root test of ADF and PP shows that Cotton (COT) and Oil-palm (OIL) exports are stationary at level indicated as I(0) on Table 3b, while Gross Domestic Product (GDP), Rubber exports (RUB), Cocoa Exports (COC), and Timber Exports (TIM) are stationary at first difference indicated as I(1). This implies that the multiple linear regression estimates are not the appropriate estimation technique as the series are in different order of integration, thus, bounds co-integration test is performed and the results are shown in the next section.

Regression Result

Since the series under review are in different order of integration as stated in the previous section, bounds co-integration test as proposed by Pesaran, Shin and Smith (2001) is conducted in this section. In order to perform this test, Auto-Regressive distributed Lag (ARDL) model is estimated for the model and bounds co-integration test is performed thereafter, this is shown on Table 4a and Table 4b respectively.

Table 4a: Auto-Regressive Distributed Lag (ARDL) Model

Variables	Coefficient	Std Error	t-Stat.	Prob.
C	9.680	2.434	3.977	0.00*
LNGDP(-1)	0.961	0.192	4.998	0.00*
LNGDP(-2)	-0.347	0.136	-2.545	0.01*
LNCOT	0.012	0.016	0.744	0.46
LNOIL	-0.016	0.025	-0.626	0.53

LNRUB	-0.041	0.019	-2.163	0.03*
LNCOC	-0.091	0.073	-1.244	0.22
LNCOC(-1)	0.149	0.076	1.966	0.06
LNTIM	0.446	0.114	3.914	0.00*
Fixed regressors	Constant			
Number of models evaluated	486			
Selected Model	ARDL(2, 0, 0, 0, 1, 0)			
R²	0.999211			
Adj. R²	0.998968			
F-Statistic	4114.969			
Prob.(F-Stat)	0.00*			
Durbin-Watson stat	2.063			

Dependent Variable: LNGDP ***significance at 5%**
Source: Researcher's Study, 2019 **ARDL model**

$$\text{LNGDP}_t = \alpha_0 + \beta_0\text{LNGDP}_{t-1} + \beta_1\text{LNGDP}_{t-2} + \beta_2\text{LNCOT}_t + \beta_3\text{LNOIL}_t + \beta_4\text{LNRUB}_t + \beta_5\text{LNCOC}_t + \beta_6\text{LNCOC}_{t-1} + \beta_7\text{LNTIM} + e_t$$

Table 4b: Bounds Co-integration Tests Result

Test Statistic	Value	K
F-statistic	1.797	5
Critical Value Bounds		
Significance	I0 Bound (lower bound)	I1 Bound (upper bound)
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Researcher's Study, 2019

Interpretation

The ARDL model estimation on Table 4.4a allows for the bounds co-integration tests. The bounds test result on Table 4.4b showed that the f-statistic value of 1.797 is less than the Critical Value Bounds for the upper bound I(1) at 10% level of significance, thus, there is no co-integration as such there is no long-run relationship. Therefore, short run was estimated for the model 1 as shown on Table 4.4a and interpreted in the next section.

Short run model

$$\begin{aligned} \text{LNGDP}_t &= \alpha_0 + \beta_0 \text{LNGDP}_{t-1} + \beta_1 \text{LNGDP}_{t-2} + \beta_2 \text{LNCOT}_t + \beta_3 \text{LNOIL}_t + \\ &\quad \beta_4 \text{LNRUB}_t + \beta_5 \text{LNCOC}_t + \beta_6 \text{LNCOC}_{t-1} + \beta_7 \text{LNTIM} + e_t \\ \text{LNGDP}_t &= 9.680 + 0.960 \text{LNGDP}_{t-1} - 0.347 \text{LNGDP}_{t-2} + 0.012 \text{LNCOT}_t - \\ &\quad 0.016 \text{LNOIL}_t - 0.041 \text{LNRUB}_t - 0.091 \text{LNCOC}_t + \\ &\quad 0.149 \text{LNCOC}_{t-1} + 0.445 \text{LNTIM} \end{aligned}$$

Interpretation

The short run regression estimate on Table 4b shows that LNGDP (-1), LNCOT, LNCOC (-1), and LNTIM have positive effects on LNGDP, while LNGDP(-2), LNOIL, LNRUB, and LNCOC have negative effects on LNGDP. This is indicated by the sign of the coefficients. This result is inconsistent with a prior expectation as it was expected that all measures of agricultural exports will have positive effect on GDP. Also, the probability of the t-statistics show that only LNGDP (-1), LNGDP (-2), LNRUB, and LNTIM are significant at 5% level of significance adopted for this study. This implies that, a 1% increase in LNGDP(-1), LNGDP(-2), LNRUB, and LNTIM will cause a 0.96% increase, 0.35% decrease, 0.04% decrease, and 0.45% increase in GDP respectively.

Furthermore, the adjusted R-square of the ARDL model on Table 4.4a showed that about 99% variations in GDP can be attributed to the proxies of agricultural exports, while the remaining 1% variations in GDP are caused by other factors not included in this model. This shows a strong explanatory power of the model. This is further emphasized by the probability of the f-statistic of 0.00 which shows that the regression result is statistically significant because this is less than 5%, the level of significance adopted for this study.

Therefore, the model is adequate. Hence, the null hypothesis one that Agricultural exports have no significant combined effect on economic growth

of Nigeria from 1981-2017 is rejected. Therefore, Agricultural exports have significant combined effect on economic growth of Nigeria from 1981-2017.

Discussion

The findings of hypothesis one shows that agricultural export has a positive effect on economic growth. This finding is in agreement with the empirical research of Ebi and Ape's (2014) supply response of seven agricultural export commodities from Nigeria between 1970 and 2010. The seven commodities were cocoa, benniseed, rubber, palm-oil, ground nut, cotton seed, and soybeans. The finding also supports the view of Odetola and Etumnu (2013) results on the contribution of agricultural exports to economic growth in Nigeria. The empirical work of Akinlo and Adejumo (2014) also suggests that non-oil export has positive effect on the growth of Nigerian economy. Osabohien, Akinpelumi, Matthew, Okafor, Iku, Olawande and Okorie (2019) results from the ARDL technique revealed that agricultural exports significantly affect Nigeria's economic growth; this suggests that, a 1percent increase in - agricultural export will boost economic growth in Nigeria by approximately 25percent. Therefore, from the results, the study recommended that agricultural export need to be promoted through the increase in agricultural production base.

Additionally, this finding is also in agreement with Abolagba et al. (2010), Chemedo (2001); Abou-Stait (2005); Dawson (2005); Aurangzeb (2006) and Kalu and Okojie (2009) and Verter and Becvarova (2016) and Gilbert, *et al.* (2013). Gbaiye, et al (2013), also suggest on his research on agricultural exports and economic growth in Nigeria, that a long run equilibrium relationship exists between agricultural exports and economic growth. Findings on Twumasi-Ankrah and Wiah (2016) study tested for long-run relation between economic growth and export earnings of cocoa. It is observed that, in the long-run, previous year export earnings of cocoa are positively related to economic growth. In the short run, the results also revealed that the previous GDP has positive effect on current GDP; and higher export earnings of cocoa have positive effect on GDP.

This study finding is also in line with the findings of Oluwaseun *et al.* (2013) that suggests the existence of a long run relationship between agricultural exports and economic growth and the relationship is elastic in nature meaning that a unit increase in agricultural exports would bring a more than proportionate increase in the Real Gross Domestic Product in Nigeria. Further

result of this hypothesis supports the findings of (Ekiran, 2014; Ojo & Akanji, 2006) that examined the relationship between agricultural export and economic growth and found that, agricultural exports are long run determinants of economic expansion.

Additionally, studies (Abolagba, Onyekwere, Agbonkpolor, & Umar (2010); Okoruwa, Ogundare and Yusuf (2003); Azu (2009) research on the impact of agricultural export commodity prices on Nigeria's economic growth suggest that agricultural export did not only impact positively on the economy, it is also sustainable. Shida (2008) linked agricultural exports and economic growth, the study found that, in GDP equation, agricultural export was statistically significant.

While Sanjuan-Lopez and Dawson (2010) researched the contributions of agricultural exports to economic growth of 42 selected under developed. The results showed that 33 developing countries had positive elasticity for agricultural exports. The causal relationship between economic growth and exports in Jordan was researched by Ruba, Thikraiat and Shatha (2014). The study found that there is a causal relationship going from the economic growth to Export, and not vice versa. Izuchukwu (2011) found a positive causality i.e. a positive relationship between the agricultural sector and the Nigerian economy. Evidence from, Matthew, Fasina, Olowe and Adegboye (2010) study has shown a positive impact on economic growth in less developed countries, including Nigeria, from agricultural exports.

Ahmed and Sallam (2018) examined the long and short-term relationship between agricultural exports and economic growth in the agricultural sector from 1970 to 2013 using co-integration analysis models, error correction model (ECM) and generalized autoregressive conditional heteroscedasticity (GARCH). They found that there was a positive relationship between agricultural exports and economic growth in the long and short terms. Several scholars also found positive causality using varying econometric techniques ranging from cross sectional to panel approach (Oluwatoyese, 2013; Ahungwa, Haruna & Abdsalam 2014; Olajide, Akinlabi & Tijani 2012; Ebere, 2014)

The research finding contradicts that of Faridi (2012); Forgha and Aquilas (2015) where agricultural exports were found not to have a significant effect on economic growth. However, these did not come as a surprise given that so far, scientific studies on primary exports and growth have concentrated on cocoa, coffee, banana, rubber and other exports like oil, with the neglect of timber

exports. Studies which concentrate on the link between timber exports and economic growth are relatively absent in the literature, probably because timber is considered more as a natural resource than an agricultural commodity. In a related study, Syed, Muhammed and Rana (2015) found agricultural export on microeconomic performance to have a negative relationship with economic growth.

Post Estimation Test

In order to validate the regression result of the ARDL model estimates, Table 4.5 shows the post estimation test result of linearity, homoscedasticity, serial correlation and normality.

Table 4.1.5 Post Estimation Tests Result

Test	F-statistics	Probability	
Ramsey Reset Test	0.950	0.351	
Heteroskedasticity Test:	2.207	0.061	
ARCH			
Ljung-Box Q-statistics			
AC	PAC	Q-Stat	Prob*
-0.050	-0.050	0.0971	0.755
-0.018	-0.020	0.1096	0.947
0.089	0.088	0.4316	0.934
-0.078	-0.070	0.6843	0.953
Jarque-Berra		Probability	
2.089		0.352	

*significance at 5%

Source: Researcher's Study, 2019

Interpretation

From Table 4.5, the p-value of the f-statistics for the Ramsey reset test of 0.351 greater than the 5% level of significance shows that the null hypothesis that there are no omitted variables is accepted. Also, the ARCH LM Heteroskedasticity Test shows a p-value of 6% greater than the 5% level of significance; as such, the null hypothesis that there is no heteroskedacity is accepted. Furthermore, the Ljung-Box Q-statistics for high-order serial correlation shows that there is no serial correlation as the p-values are greater than 0.05. Also, the Jarque Berra statistics indicate that the model is normally

distributed as its p-value is greater than 5% the level of significance for the study.

Therefore, the ARDL model estimation is correctly specified and the underlying assumptions of linear regression are satisfied.

Conclusion and Recommendation

The study concludes that aggregate agricultural exports of Nigeria had a positive and significant impact on real GDP. Thus, the exportation of varieties of agricultural products is beneficial to the Nigerian economy. As such, to further accentuate the level of growth in Nigeria, the government must ensure proper management of capital and recurrent expenditure in order to enhance productive capacity and accelerate the growth process. Government should increase its level of expenditure, thereby providing more funding in the agricultural sector to raise its productivity and increase its contribution to economic growth in Nigeria. Government expenditure can accelerate productivity and export in the agricultural sector in Nigeria, it is important to formulate policies aiming at promoting export thereby boosting the economic growth of the nation. Nigerian government should create favourable conditions and policies in order to mobilize domestic savings from small depositors, especially small scale farmers to enable them purchase modern mechanized farm tools to promote higher productivity in the agricultural sector. The Central Bank of Nigeria should come out with stable policy guideline to enable the commercial banks disburse loans to farmers at a very lower interest rate, in order to help them expand their production capacity.

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