

Original Article

Agricultural Export and Economic Growth in Nigeria: Disaggregated Analysis

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Received Date: 12 May 2020

Revised Date: 06 June 2020

Accepted Date: 08 June 2020

Abstract - Agricultural export has been a major source of foreign earnings for decades in Nigeria. The relationship between agricultural export and economic growth has been outlined in several other studies, but disagreements still persist. Previous studies failed to specifically consider cocoa, groundnut and oil palm, which are consistent components of agricultural export. Therefore, this study employed time-series data from the Central Bank of Nigeria statistical bulletin and National Bureau of Statistics to examine the nexus between disaggregated agricultural export and economic growth for the period of 1981-2018. Specifically, the paper examined the causal relationship between the disaggregated agricultural export and economic growth. The study adopted the Ordinary Least Square and granger causality as its major analytical tool to analyze its objectives. The OLS result showed the existence of a strong long-run relationship between cocoa, oil palm and economic growth. Also, the granger causality result showed a uni-directional causality that runs from oil palm and cocoa export to economic growth. Therefore, agricultural export has a significant effect on Nigerian Economic Growth. The paper recommended increased government budgetary on the cultivation of oil palm and cocoa. Grants and incentives should be given to farmers to encourage them.

Keywords - Nigeria, Economic Growth, Oil palm, Groundnut, Cocoa.

I. INTRODUCTION

Agriculture has been the most practised occupation in Nigeria for many years. It is mostly being practised in remote places of the country. Before the discovery of oil, agriculture used to be the main occupation engaging about 65% of the total active population in the country. It has been in operation and has engaged about two-third of the entire population. Agriculture, according to the CBN (2019), attributed between 30 and 40% proportion of the Gross Domestic Product (GDP) to it. Nigeria has been able to provide crops and livestock owing to favourable climate conditions and vegetation. The climatic condition, which has its uniqueness

in the different parts of the country, has made the production of certain cash crops peculiar to a particular region comparatively.

The increase in agricultural export has been a major success story and has really achieved many benefits and foreign earnings to Nigeria. Thus the contribution of export to a nation's economic growth and development cannot be ignored or taken lightly since it is an instrument that facilitates the general development of an economy (Abou-stait, 2005). It is also a major source of foreign exchange and employment opportunities being created to reduce the social costs of unemployment. According to Ijirshar(2015), a rewarding international trade can change an underdeveloped economy into a productive activity through its multiplier effects on the national income since revenue earned via exporting will assist in expanding the level of demand within the economy.

Agriculture has been the most recognized single activity in the Nigerian economy, with about 65% of the total working population involved in it. It is the biggest single sector of the economy, providing for a significant segment of the workforce and constituting the mainstay of Nigeria large remote communities, which makes up for about two-thirds of the population. The proportion of the Gross Domestic Product (GDP) attributed to agriculture holds between 30 and 40% (CBN, 2019).



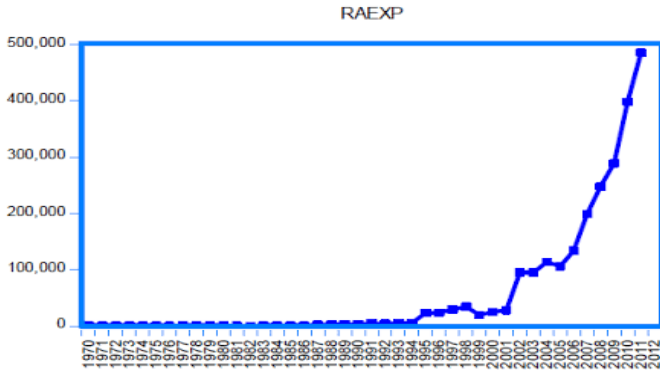
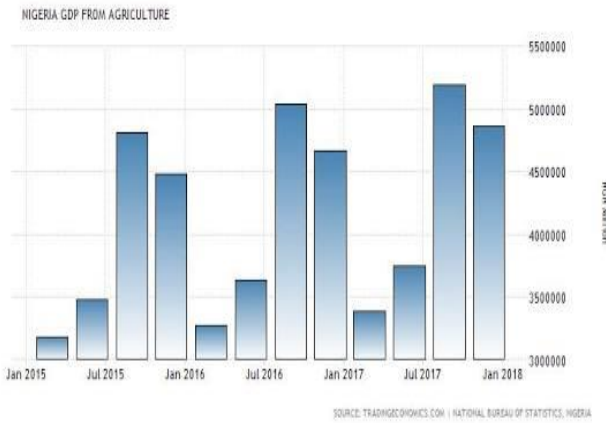


Figure 1. Trend of Agricultural Export in Nigeria (1970-2012).

Source: National Bureau of Statistics



Source: National Bureau of Statistics

Fig. 1 shows the trend between agricultural exports over the years. There was very low activity in the agricultural sector from the 1970s to 1994. It, however, increased from 1995 and has been on the increase in the quantity (tonnes) by which it is being exported from then till 2018 as depicted by Fig. 2 above. Agriculture, the largest sector after oil, fell from 48% of GDP in 1970 to 20.6% in 1980 and was only 23.3% of GDP in 2005 (NBS, 2019). The sector's contribution to the growth of the Nigerian economy in 2012 stood at 39.21 and 41.93% improvement in the third quarter of 2013. It also recorded a growth rate of 3.83% in the fourth quarter of 2012 as against 5.68 in the fourth quarter of 2011. Output in the third quarter of 2013 stood at 5.08%, up from the 3.89% recorded in the corresponding of 2012 and also higher than the 4.52% recorded during the second quarter of 2013 (NBS). The theoretical relationship between agricultural export and economic growth have been outlined in several other studies such as Verter (2016) among others, but disagreements still persist as the findings have been mixed, inconclusive or rather contradictory as Sanjuan (2015) showed a positively strong relationship among all variables while the other showed weak coefficients. There is,

therefore, a reason for further investigations owing to the causal dynamics between agriculture and economic growth. Also, most of the previous researches concentrated more closely on agricultural export as an entity but failed to disaggregate its composition to know more particularly which of the agricultural product being exported has more effect on economic growth; hence this study seeks to disaggregate what constitutes Nigeria's agricultural export to lay more close and definite empirical focus on the disaggregated agricultural commodities which are oil palm, groundnut and cocoa. The cash crops under study have over the years been consistently exported though, in varying quantity, other cash crops export have not been so consistent, making room for insufficient data hence the concentration on the three selected agricultural products only. Likewise, previous studies that centred on agricultural export and economic growth had their research up to 2015, and this study will therefore extend its data to 2016. The main objective of this study is to examine the effect of disaggregated agricultural export on economic growth in Nigeria and also to determine the causal relationship between some selected agricultural products and economic growth.

II. CONCEPTUAL ISSUES

Many pieces of literature have been reviewed on Agricultural Export and Economic Growth in Nigeria coupled with different economics statistical techniques for analysis. This study also seeks to do a review of previous literatures. Of importance to this study is the theory of absolute advantage as coined by Adam Smith (1776). The theory opined that absolute advantage is the process by which a country conveniently can produce any product at a cheaper amount than any other country. He argued that when a country is into international trade, it should put all resources into the production of the product for which it has an absolute advantage over others. Smith insisted that when a country specializes in the product for which it has an absolute advantage, its total output will increase as well as efficiency in its production. This will, in turn, increase the export base of such a country, which will enhance economic growth and development, the profiting balance of trade, stable exchange rate and many more benefits. A notable less developed country vehemently practising this theory is the Republic of Cote D'iorve, with the greatest cultivation and export of COCOA beans in the world. Cote'diorve concentrated on the agricultural product for which they have absolute advantage creating room for world recognition, increased revenue and economic growth (FAO, 2015). This study seeks to examine if these disaggregated agricultural products on which she has an absolute advantage has over the years had any effect on her economy.

Verter (2016) investigated the impact of economic growth on agricultural export in Nigeria. The study using secondary data employed the Johansen Cointegration and Granger Causality. The study revealed a negative

relationship between the agricultural degree of openness and economic growth. It concluded that domestic industries should be encouraged for Nigeria to experience a favourable trade balance in agricultural trade. Domestic processing firms should be encouraged while the goods the country can cheaply produce be discouraged from being imported. However, the study failed to isolate the components of agricultural export to know particularly which of the components will have a lasting effect on economic growth.

Dawson (2015) reviewed the contribution of agricultural exports to economic growth in some developed countries. The theory considered two theoretical models for its analysis. The first model was an aggregate production function of both agricultural and non-agricultural exports as inputs, while the second was the dual economy model, which comprised the agricultural and non-agricultural models. Each of the models has two subsectors, one producing exports and one producing non-export. The study employed the fixed and random effects models using panel data of 62 LDCs for the period 1974–2005. The results of the study explained the role of agricultural exports on economic growth. It is, however, important to note that this study also failed to itemize the agricultural products being exported by the countries researched to enable one to know specifically which of the products gave a more concise reflection of its effect on the economy.

Ojo&Olufemi (2014) examined the causal relationship between agricultural export and economic growth in Nigeria with the use of time-series data from 1980 to 2012. The Phillips-Peron unit root, Johansen cointegration and error correction techniques were used in this study to estimate the stationarity, the long-run and the short-run dynamics of the research models. The result gotten showed that the long-run determinants of economic growth are agricultural export and output. Another study by Salami (2014) sought to empirically analyze the impact of agricultural export on economic growth in Nigeria using the ARDL approach. The study was conducted using monthly data from January 1999 to December 2012. The result showed a long-run relationship between agricultural export, exchange rate, and foreign earnings. The variables tested showed a direct effect on the short and long-run relationship between agricultural export and economic growth. It is also important to note that the researcher failed to adopt important variables like trade openness which would have made the model all-inclusive of determining factors in international trade.

Sanjuán (2015) studied a larger number of nations (forty-two underdeveloped countries) to examine the impact of agriculture exports on economic growth in underdeveloped countries using panel cointegration techniques. The aim was to evaluate the relationship between Gross domestic product and agricultural and non-agricultural exports for these countries. Their result gave an agricultural export elasticity of GDP of 0.09 and non-agricultural export elasticity of GDP of 0.13. Hence they concluded that they support the export-led growth hypothesis. However, the study failed to properly discuss the unique problems and proffered policy recommendations for each of the countries researched.

Ahungwaetal(2014) employed the ordinary least square regression to analyze the contribution of agricultural export on the Nigerian economic growth. A positive relationship between Gross Domestic Product (GDP) and government spending on agriculture between the periods 1986 to 2007 was discovered. It was also revealed in the study that 81% of the changes in GDP could be explained by domestic savings government spending.

III. METHODS

This study employed the use of secondary data in examining the effect of agricultural export on the economic growth of Nigeria: disaggregated analysis. The study used the Unit root test, Cointegration, Ordinary Least Square and Granger Causalitytests to empirically analyze the result.

The needed data for this research include; data on Real Gross Domestic Product (RGDP), data on cocoa, oil palm and groundnut export, data on exchange rate. The study covered the period 1981-2018. The data for this study was obtained mainly from secondary sources, particularly from the Central Bank of Nigeria (CBN) Economic and Financial Review Bulletin and also from the Publication of the National Bureau of Statistics (NBS). The model for this study was originally coined based on the theory of absolute advantage by Adam Smith, which opined that the economic growth of any country is a function of the product over which she has an absolute advantage. It was on this premise that Ojo and Olufemi (2014) examined the causal relationship between agricultural export and economic growth in Nigeria; the model is specified as follows;

$$RGDP= f (RAGREXP, REXR, ITOP, INFL) \dots\dots\dots Eq(1)$$

The equation is linearized as follow;

$$RGDP= bo+b1RAGREXP+b2REXR+b3ITOP+b4INFL+u\dots\dots\dots Eq(2)$$

Where RGDP is Real Gross Domestic Product, RAGREXP is Real Agricultural Export, REXR is Real Exchange Rate, ITOP is a log of Trade Openness, INFL is the Inflation Rate, and u is the stochastic term.

The model was therefore modified to accommodate the disaggregated agricultural products and therefore expressed as;
 $\ln\text{RGDP} = f(\text{INCocoa}, \text{InGnut}, \text{InOilpalm}, \text{EXCH}, \text{TOP}) \dots \text{Eq}(3)$

The linear form of equation (iii) is as follow;
 $\ln\text{RGDP} = \Omega_0 + \Omega_1 \ln\text{COCOA} + \Omega_2 \ln\text{OILPALM} + \Omega_3 \ln\text{GNUT} + \Omega_4 \text{EXCH} + \Omega_5 \text{TOP} + \mu \dots \text{Eq}(4)$

Stochastic form as;
 Where, $\ln\text{GDP}$ = log Real Gross Domestic Product
 $\ln\text{Cocoa}$ = log of Cocoa
 $\ln\text{GNUT}$ = log of Groundnut
 $\ln\text{OILPALM}$ = log of Oilpalm
 EXCH = exchange rate
 TOP = Index of Openness
 Ω_0 = constant intercept
 $\Omega_0 - \Omega_1$ = slope of coefficients of the explanatory variables captured in the model, U_i = stochastic disturbance term

IV. RESULTS

A. Unit Root Test

Testing for the existence of unit roots is an important concern in the study of time series models. However, in order to test for the stationary of the time series data used in this research work, the Augmented Dickey-Fuller (ADF) Unit Root test was used with a 5% critical value. Table 1 reveals the result of the unit root test, which is presented below

Table 1. Unit Root Result

Variable	ADF test statistics	T-statistics at 5 % level	P-value	Order of Integration
INRGDP	-9.531631	-2.951125	0.0000**	I(1)
InCOCOA	-7.448080	-2.951125	0.0000**	I(1)
InGNUT	-6.906348	-2.954021	0.0000**	I(1)
InOILPALM	-9.091423	-2.951125	0.0000**	I(1)
EXCH	-9.383976	-2.951125	0.0000**	I(1)
TOP	-4.431148	-2.951125	0.0013**	I(1)

Source: Researcher’s computation (2018)

Table 1 shows the unit root test using Augmented Dickey-Fuller Test. The results show that log of Real Gross Domestic Product($\ln\text{RGDP}$), log of Cocoa($\ln\text{COCOA}$), log of Groundnut($\ln\text{GNUT}$), Exchange Rate(EXCH) and Trade Openness (TOP) were stationary at the first level difference, and it is seen that the t- statistics is greater than the critical value at 5% level of significance.

Table 2. Johansen Co-integration Test

Hypothesized No of CE(S)	Trace Statistics	Max-Eigen Statistics	Critical value at 5% level	Prob. for Trace	Prob. For Eigen
None	121.5148	52.98670	95.75366	0.0003**	0.0011**
At most 1	68.52806	26.06310	69.81889	0.0631	0.3169
At most 2	42.46496	18.20571	47.85613	0.1461	0.4781
At most 3	24.25925	14.53968	29.79707	0.1897	0.3225
At most4	9.719575	9.382900	15.49471	0.3029	0.2557
** indicate statistical significance					
Trace test indicates 1 co-integrating equation(s) at the 0.05% level.					
* denotes rejection of the hypothesis at the 0.05 level					
**MacKinnon-Haug-Michelis (1999) p-values					

Source: Researcher’s computation (2018)

Table 2 shows the Johansen Co-integration Test result. The findings showed both Max-Eigen statistics and Trace Statistics. The findings show that at none, both Max-Eigen statistics and Trace Statistics were statistically significant.

Table 3. Granger Causality Test

Null Hypothesis	Obs	F-statistics	Probability
EXCH does not Granger Cause LRGDP	34	5.91302	0.0070
LRGDP does not Granger Cause EXCH		3.35087	0.0491
	34	1.20403	0.4534
		0.81296	
LNGNUT does not Granger Cause LRGDP	34	2.26864	0.1215
LRGDP does not Granger Cause LNGNUT		0.90763	0.4146
LNOILPAM does not Granger Cause LRGDP	34	2.34585	0.0007
LRGDP does not Granger Cause LNOILPAM		0.75069	0.4810
TOP does not Granger Cause LRGDP		1.26056	0.2986
LRGDP does not Granger Cause TOP		2.22644	0.1260

Granger causality implies the presence of feedback from one variable to the other. Engle and Granger, Hendry and Granger opined that the existence of co-integration is the basis for causality. Following this theory, if two variables have long-run (co-integrating) relationship, then causality must exist in at least one direction. The relationships of particular interest in this work relate to the nexus between contribution of (log)Oilpalm, (log)Gnut and (log)Cocoa, exchange rate(EXCH) and trade openness(TOP).

Granger causality between LNOILPALM, LNCOCOA and LRGDP shows that a unidirectional causality runs from LNOILPALM and LNCOCOA to LRGDP. Hence, LNOILPALM and LNCOCOA Granger cause LRDGP at the 5% level of significance.

B. Ordinary Least Square Regression Result

Table 4. Least Square Regression Estimates (lnRGDP as dependent Variable)

Regressor variable	Coefficient	t-statistic	Prob.
C	-0.003736	-0.375993	0.8072
EXCH	0.0389	0.870162	0.001**
InOILPALM	0.158288	8.795938	0.0000**

TOP	0.000136	0.835783	0.6473
InCOCOA	0.003953	1.3112	0.0221**
InGNUT	-0.029235	-1.528643	0.1376
R-squared	0.878307		
Adjusted R-squared	0.852230		
Prob. (F-Statistics)	0.0000		
Durbin-Watson Stat	-2.120607		
** indicates statistically significant			

Source: Researcher's computation (2018)

Table 4 shows the least square regression result. The findings showed that log of cocoa (InCOCOA), an exchange rate (EXCH), and log of Oil palm (InOILPALM) were statistically significant at a 5% level of significance, while trade openness (TOP) and log of groundnut (InGNUT) were not significant. The R^2 was 0.87, which indicates that the explanatory variables were able to explain the dependent variables adequately by 87%, while the 13% that remains is attributed to the random term.

V. DISCUSSIONS

Table 2 shows that there exists a long-run relationship among all the variables under study. This is so because the trace statistics show a higher value above the 0.05 level of critical value. Therefore, the alternative hypothesis, which states that there is a long-run relationship among all the variables under study, will be accepted.

Table 4 present the result of the estimates. It indicates the effect of agricultural export on economic growth, a case of Cocoa, Oil palm and Groundnut Beverages. It shows that EXCH, TOP, COCOA, GNUT and OIL PALM have a positive effect on RGDP. The P- the value of EXCH, OIL PALM and COCOA is significant, while GNUT shows an insignificant relationship with RGDP. The positive relationship that exists between OIL PALM and RGDP implies that a unit change in RGDP is caused by 38.9% changes in EXCH; likewise, OIL PALM, TOP, COCOA and GNUT all have a positive coefficient value of 0.0158288, 0.000136 and 0.003953 respectively. However, a unit change in GNUT will have a decreasing effect on RGDP and vice-versa.

The value of the adjusted R-squared for the model is 0.87 or 87% which implies that exchange rate, cocoa, oil palm, groundnut and trade openness explains about 87% of the systematic variation in the real gross domestic product of the study within the period in Nigeria. While the remaining 13% variation is explained by other variables outside the model. This shows that the result judging from the goodness of fit is reliable for further economic usefulness.

VI. CONCLUSION AND RECOMMENDATIONS

The study showed from the result that a long-run relationship exists between agricultural export and economic growth in Nigeria. This translates that a unit increase in the disaggregated agricultural exports with a particular interest in oil palm, cocoa and groundnut will bring about a more than proportionate increase in the Real Gross Domestic Product in Nigeria.

It has also been evidently made clear that less focus has been given to the components of agricultural products over the years. The study also revealed from the 'Johansen co-integration test' conducted that RGDP and cocoa, oil palm and groundnut are significantly co-integrated, indicating a valid relationship at 0.05 or 5%. It is therefore recommended that in Nigeria's development policies, efficient availability of agricultural innovations is of a high priority. These include improved seeds, fertilizers and other resources that will be of help to the farmers. Likewise, the ability to trade Nigerian agricultural products in the international market should be increased. This can be more enhanced through crop specialization and connecting farmers more directly to the available markets through modern innovations. Lastly, it is recommended that credit and grant providing institutions like Commercial Banks, cooperative societies, etc., very much adhere to their mode of operation in order to ensure the availability of finance as at when due.

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