Agricultural Sector Performance and Nigeria's Economic Growth

Eze Onyebuchi Michael[1*]

[1]*Department of Economics, Ebonyi State University, Abakaliki, Ebonyi State, Nigeria.*

Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

The study investigated the contribution of agricultural sector output to the growth of domestic economy in Nigeria for the period 1980-2014. Specifically, the study examined the causality between agricultural sector and economic growth, as well as the impact of the sector on the growth of the Nigerian domestic economy. Cointegration test, Vector Error Correction Model (VECM) and Granger causality test were utilized in the analysis. The variables employed in the investigation include real gross domestic product (RGDP), value of agricultural output (VAO), foreign private investment (FPI) and financial development (FD). A stationarity test was conducted through the application of the Augmented Dickey-Fuller (ADF) stationarity test, and the result showed that all the variables except RGDP were non-stationary at level; however, the variables such as VAO, FPI and FD became stationary after first differencing. The cointegration result indicated long run equilibrium relationship among the variables under study. The VECM result on the other hand, showed that value of agricultural output (VAO) has positive and insignificant contribution to real GDP. Thus, it is estimated on average that 1% increase in the value of agricultural sector output (VAO) would lead to 1.9% increase in real GDP. Furthermore, the Pairwise Granger causality result showed that significant causality exist between the two variables, with causality running from agricultural output to RGDP. It therefore, implies that agricultural sector output contributed positively and insignificantly to the growth of Nigerian domestic economy. Therefore, the study

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Corresponding author: E-mail: onyimikey88@yahoo.com;

recommends that government should increase its budgetary allocation on agriculture in order to boost the growth performance of the sector. Similarly, the study recommends that government should strengthen agricultural credit agencies to enable them monitor and ensure efficient disbursement of fund disbursed to farmers in the country. In that, diversion and mismanagement of agricultural sector fund in Nigeria would be discouraged, and hence, agricultural output would improve.

1. INTRODUCTION

Nigeria as a sovereign state is naturally endowed with abundant resources, including both human and material resources [1]. The nation's resources should be fully developed in such a manner that is possible with the mineral deposits of the nation as a whole, which can only be harnessed by rational and efficient utilization of the natural resources. Thus, the importance of resources in any given economy depends on the roles such resources play in economic growth and development of the nation. In developing economies like Nigeria, agriculture constitutes backbone and critical sector of the economy, as the contributions of the sector to the growth and sustainable development of the country cannot be overemphasized. It contributes immensely to economic growth and development of the economy in various ways, such as creation of employment opportunities for the country's workforce, provides food requirement of the economy and industrial raw materials to industries, generates foreign exchange earnings and revenue to the government, and as well eradicates extreme poverty in the country. More so, [2] while explaining the nexus between agriculture and economic growth revealed that poor performance of economic growth in an economy especially, in the developing economies is due to slump in agricultural sector performance.

Agricultural sector in Nigeria has overtime become an important sector of the economy. It has remained the main sector of Nigerian economy despite the discovery of oil in commercial quantities and its attendant boom since 1970s. For example, despite agricultural sector neglect by government at the emergence of oil in 1970s, the sector remained the major employment segment of the economy thereby employing over 60% of the unemployed workforce in country, reduces extreme poverty and as well promotes economic growth of the economy [3]. In the same view, [4] argued that efficient and strong agricultural sector strengthens countries to provide for its fast growing population, create jobs for their workforce, eradicate absolute poverty, feed industries with the required industrial raw materials, generates foreign exchange earnings and revenue to government. This means that agriculture is growth-led factor, which has multiplier effect on socio-economic and industrial development of any economy due to its various contributions to the growth of domestic economy. Similarly, [5,6] and [7] maintained that agriculture as the most critical sector of the Nigeria's economy shield several benefits which is capable of facilitating economic growth and development of the nation, just as the sector did in the past decades. The sector's contribution to total real gross domestic product (RGDP) ranges from 30% to 42%, and has as well engaged over 65% of the country's total workforce.

Agriculture in developing economies like Nigeria is conceived as a prevailing economic activities or occupation from which livelihood can be derived by the greater number of the population of the country [8]. Hence, a business or an industry employs the knowledge of various sciences in the production of food, feed, fiber and fuel. The definition therefore, recognizes the fact that plants and animals were originally grown and developed in an economy without human interference. But with the evolvement of agriculture, human quest to increase food production for the growing population emerged. In that, people began to exploit the growth of plants and animals to produce the type and quantity of food and other products that would meet needs of human population in the society. According to [9], agriculture contributes to growth and development of an economy in four main ways, and these include product contribution, factor contribution, market contribution, as well as foreign exchange contribution. In Nigeria, the contribution of the agricultural sector to the growth of the domestic economy was relatively significant prior to early 1970s; and however, as

the oil sector emerges as the major export earner of the economy, the agricultural sector's contribution to the growth of the economy declined from 60% in the earlier 1970s to 40%, 30% and less than 26% between 2000 and 2007 [10]. Export crops like cocoa, cotton, groundnut, rubber, palm oil and palm kernel that initially contributed up to 65% and 75% of the foreign exchange earnings and which was the main source of revenue of the government through export product, suddenly declined its contribution to total RGDP due to agricultural sector neglect, as oil sector emerged in the economy. The contribution of the sector to total real gross domestic product in Nigeria declined from 48% in 1970s to 20% and 19% between 1980 and 1985 [11]. The decline in the sector's performance to total RGDP was attributed to high revenue receipt recorded from the sales of crude oil products during the era of oil boom during 1970s to early 1980s, occasioned by the Middle East war of 1973.

Consequently, the shift from the people's oriented agricultural sector to unpopular oil sector in Nigeria resulted to economic crisis such as food insecurity, import dependence, inadequate supply of raw materials to industries, excessive borrowing, balance of payments deficit, high unemployment and inflation rates, among others. In order to correct this distortion and provide a favourable environment for new investments, generate revenue to government, create employment opportunities to the country's workforce and as well to promote the nation's exports, successive governments embarked on infrastructural investment in all parts of the country; the most benefited areas include urban cities. Other aspect of the sector that grew significantly as a result of the development was the service sector, and thereby making urban centres more attractive [12]. The development in turn, influenced the energetic youths who constituted the active labour force of the country to abandon their popular agricultural activities in the rural areas for the cities with the aim to participate in the economic prosperous of the cities. This behaviour in turn resulted to cities' congestions, pollution, high unemployment, food shortage, high inflation, as well as crimes in the society. Although the emergence of crude oil in commercial quantities and its attendant oil boom in 1970s brought a lot of changes in the Nigerian economy including increase in total GDP, foreign export earnings, infrastructural development, government revenue, and a decline in agricultural output level and its contribution to the growth of the domestic economy, it does not mean that the sector has been displaced by the attractive oil sector but has recorded low output due to neglect by government as oil sector became the major foreign exchange earner of the economy. The negative effects of the low productivity of the sector appeared to have led to economic crisis characterized by food insecurity, inadequate supply of raw material to industries, high unemployment and inflation, low income contribution to rural farmers and government in particular, rural-urban drift, excessive borrowing, exchange rate depreciation, import dependence, among others.

In order to correct these anomalies in the economy, revamp the agricultural sector to take its usual central stage in economic activities of Nigeria, successive governments ever since the attainment of independence have tried to address the problems through enunciation of agriculture related policies and programmes. Some of the programmes as enunciated include the establishment of Commodity Market Boards, National Accelerated Food Production Programme (NAFPP), Agricultural Development Projects (ADPs), Operation Feed the Nation (OFN), River Basin and Rural Development Authorities (RBRDA). Others include the Green Revolution Programme (GRP), Directorate of Food, Roads and Rural Infrastructures (DFRRI), National FADAMA phases I to III, National Agricultural Land and Development Authority (NALDA), President Yar' Adua 7-point Agenda. Other measures adopted to increase agricultural output in Nigeria were in terms of credit schemes, which include the Nigerian Agricultural Co-operative and Rural Development Bank (NACRDB), currently referred to as Agricultural Bank of Nigeria (ABN), Rural Banking Scheme established in 1977, etc. [13]. The entire credit schemes as stated above were enunciated by government to enable agricultural credit agencies disburse more agricultural funds to targeted farmers with the primary objective being to ensure food security in the country. To achieve this objective, the Central Bank of Nigeria (CBN) stipulated preferential lending rates for agricultural activities with the farmers enjoying the lower interest rate [14]. More so, in the year 2004, Nigeria under the leadership of former President Olusegun Obasanjo in collaboration with other leaders of the African countries enunciated New Partnership for African's Development (NEPAD), which the central objective was to eradicate extreme poverty and hunger in Africa.

Notwithstanding there are several studies both for developing and developed countries, the literature on agricultural sector performance and economic growth in Nigeria appears to be scanty. Hence, the purpose of this study is to examine the significant contribution of agricultural sector performance to the growth of domestic economy in Nigeria. Meanwhile, the study is organized as follows; the first section is the introduction; second section deals with both the theoretical and the empirical literature review on agriculture and economic growth; third section discusses the research methods employed in the study while the forth section focused on empirical results and discussions and lastly, the fifth section provides the conclusion section of the study.

2. REVIEW OF RELATED LITERATURE

There have been several theoretical and empirical studies carried out to investigate the relationship between agriculture and economic growth both in developing and developed economies. This section therefore, shows a brief review of the related studies.

Katircioglu [15] investigated the significant relationship between agricultural output and economic development in North Cyprus by employing Johansen co-integration test and the Granger causality test for the period of 1975-2002. The result showed that output growth of agriculture has long run equilibrium relationship with economic growth in the economy. It also showed that bi-directional causality exist between agricultural output and economic development in North Cyprus. The finding also indicated that agricultural sector has significant impact on economic development in the country. [16] studied the determinants of agricultural growth in African agriculture for the period between 1970 and 2006. The study employed Total Factor Productivity (TFP) approach to estimate the determinants of growth in African agriculture. The major finding of the study was the discovery of the easy way of quantifying the impact of output growth in conjunction with the contribution of various inputs materials such as labour, tractor, land and fertilizer to agricultural growth in African agriculture. The result also showed that factor accumulation rather than TFP account has significant impact on the growth agricultural output, and as well discovered that fertilizer is the most physical input contributor to the growth of agriculture in the economy.

More so, [17] studied the links between agricultural output and industrial output in Pakistan by applying autoregressive distributed lag model. Empirical finding of the study indicated that equilibrium long run relationship exists between agricultural output and industrial output in the economy. The result further showed that the output of agriculture has short period adjustment to long run equilibrium state when there is temporary deviation in the long run equilibrium relationship. [18] examined the links between agricultural growth and other growth sectors (manufacturing, transportation, tourism and communication, commerce and services) in the economy of Tunisia using Granger causality test and co-integration approach. The study found long run equilibrium relationship between economic growth and agricultural sector growth in Tunisia.

Oji-Okoro I [19] employed Granger causality technique to examine the contribution of agricultural sector to Nigeria's economic development for the period 1980-2008. The empirical result indicated that GDP alongside government agricultural expenditure have positive impact on agricultural sector, as well as foreign direct investment. The study also revealed that national savings, government agricultural expenditure and foreign direct investment explained 81% variations in GDP. [20] used Granger causality test and Johansen co-integration approach to investigate the causality direction of agricultural value added in 85 countries. The finding of the study showed that agricultural value added in developing economies was causal variable, while in developed economies however, the causality direction was not clear within the period of the investigation. Similarly, [21] investigated the contribution of agriculture and petroleum sectors to economic growth in Nigeria for the period of 1960-2010, using the Augmented Dickey Fuller (ADF) unit root test and Chow breakpoint test. The result showed that agriculture and petroleum sectors have positive impact on economic growth; however, the result further indicated that agriculture has higher contribution to economic growth than the petroleum sector.

[22] examined the causal relationship between agriculture and economic growth in Nigeria, using ordinary least square (OLS) method for the period of 1970-2010. The result indicated that gross domestic product (GDP) has positive causal relationship with agricultural sector output in Nigeria. Similarly, [23] investigated agricultural production in Nigeria for the period of 1980-2005,

using descriptive statistics and regression analysis. The result indicated that agricultural output growth grew at the average of 5.4%, and that the growth rate of the gross domestic product, population growth rate, as well as the consumer price index were the major fundamental factors that affect agricultural production in Nigeria. [24] investigated the significant impact of agriculture, as well as other variables on Nigeria's economic growth and development within the period of 1986 and 2011, using ADF unit root technique, ordinary least square (OLS) method and Newey-West approach. The empirical result indicated that agricultural output has negative and significant impact on life expectancy in Nigeria. More so, agricultural funding was found to have insignificant positive impact on the life expectancy in the country. It was also discovered that real GDP and manufacturing output growth have positive impact on life expectancy.

Bakare [25] studied the relationship between sustainable agriculture and rural area's development in Nigeria. Vector Auto Regression analytical technique (VAR) was utilized for the empirical study. The results maintained that agriculture is the main dominant variable of economic growth in the economy. The study also identified that food supply provides sufficient nutrients at a lower cost accessible by the average citizen of the country. [26] examined the significant impact of petroleum dependency on Nigeria's agricultural trade engagement for the period between 1970 and 2003, by employing co-integration technique and error correction modeling (ECM) in the study. The estimation results showed that long run equilibrium relationship exist among the variables of the study. The result also indicated that significant positive relationship exists between oil exports and imports of agricultural products. This implies that oil sector output has negative relationship with agricultural export product of crops in Nigeria. [27] examined the significant impact of agricultural export on economic growth in Nigeria, using multivariate co-integration test and its associated error correction technique, long run and short-run dynamics of the research models respectively. The empirical findings revealed that agricultural export, agricultural output, net capital flow and world price of Nigeria's major agricultural commodities are long run determinants of economic expansion in Nigeria. [28] examined the impact of agriculture exports on the growth of Cameroon for the period of 1975 and 2009, by employing the model of

Cobb Douglas production function. The results indicated that long run equilibrium relationship exists among the variables. The result of the VECM showed that agricultural exports have insignificant impact on economic growth of Cameroon. Similarly, the result also showed that the variables such as coffee and banana exports have significant positive impact on economic growth in the country. However, the result also discovered that cocoa export has insignificant negative impact on the economic growth of the country. [29] investigated agricultural exports contribution to the growth of domestic economy in developing countries by employing panel co-integration approach to analyze data set of forty two developing countries. The result showed that agriculture exports have long run equilibrium relationship with economic growth.

Sunday et al. [30] investigated the significant causal relationship between agricultural productivity and other Nigeria's macroeconomic variables through the application of co-integration approach and its associated vector error correction model. The empirical result demonstrated that short run and long run relationship exist between agricultural productivity and other major macroeconomic variables. The result also demonstrated that industrial capacity utilization rate and exchange rate have positive impact on the output of agriculture. [31] analyzed the performance of agricultural sector in Nigeria using descriptive, as well as empirical analysis to examine the season of the global economic meltdown. In the descriptive study, the indices of performance including agricultural export, agricultural sector performance share of total GDP, index of agricultural production and import were employed to analyze the performance of the economy. Hence, the analysis showed that the indicators of performance used in the analysis were downward trending. It also showed that for the period of the meltdown, the performance of the indicators such as the agricultural GDP and the agricultural export commodities recorded insignificant improvement. While the empirical analysis utilized pool data of the first to fourth quarters for the analysis, which is more analytical compared to descriptive approach. The result showed that agricultural production index (API), exchange rate (EXCR), inflation rate (INF) have significant impact on the export of agricultural sector. It further discovered that agricultural production index (API) has positive impact on the export of agricultural sector.

Ahungwa et al. [32] examined the pattern and significant contribution of agricultural sector to economic growth (GDP) of Nigeria for the period between 1960 and 2012. The results showed that agricultural total GDP has a downward trend, yet it has clear dominance over other sectors. Similarly, the results showed that agriculture has a positive relationship with GDP and contributes significantly to growth of the economy. [33] investigated the significant impact of non-oil exports on economic growth of Nigeria, using co-integration test, conventional test for mean reversion, endogenous growth model (EGM) and augmented production function (APF). The result indicated that non-oil exports have insignificant impact on economic growth of Nigeria. [34] also investigated non-oil exports performance to the growth of domestic economy for the period between 1981 and 2010, using ordinary least square (OLS). The result showed that non-oil exports have insignificant contribution to the growth of domestic economy.

Uma et al. [35] used Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests, Johansen co-integration test and ordinary least square to investigate the impact of agricultural sector on real gross domestic product (RGDP). The empirical study indicated that the contribution of fishing, livestock and crop production have insignificant impact on agricultural sector output in Nigeria. [36] examined the significant causal relationship between agricultural productivity and employment generation in Nigeria for the period of 1986-2011 by employing Cochrane Orcult iterative method. The empirical results showed that government expenditure on agriculture, government education expenditure represented as human capital development, index of agricultural production and foreign direct investment on agriculture have positive impact on current unemployment with only foreign direct investment on agriculture statistically significant. On the other hand, the impact of government expenditure on educational sector was shown to be negative, though statistically insignificant.

3. RESEARCH METHODS

Following the lead of [37] with modification, the study utilized two econometric methods to achieve empirical results. The first method investigates the long run equilibrium relationship between the variables of the study through the application of [38] co-integration method. The second method examines the long run relationship and short run dynamics between agricultural sector performance and economic growth by employing Vector Error Correction Model (VECM), while the third method employed the Granger causality approach to examine the existence of significant causal relationship between agricultural performance and economic growth. Data for this study is obtained from the Central Bank of Nigeria (CBN) Statistical bulletin of various issues.

3.1 Model Specification

The primary model expressing the relationship between agricultural sector performance and Nigeria's economic growth is shown below.

$$RGDP = f(VAO, FPI, FD) \qquad (1)$$

In linear function, it is specified thus:

$$LRGDP_t = \beta_0 + \beta_1 LVAOt + \beta_2 LFPIt + \beta_3 LFDt + \varepsilon_t \quad (2)$$

Where

LRGDP is the log of Real Gross Domestic Product; LVAO is the log of Value of Agricultural Sector Output; LFPI is the log of Foreign Private Investment; LFD is the log of Financial Development; β_0 is the constant term, ε_t is the error term, t is the time period, while β_1, β_2, β_3 are the parameters of the regression equation.

3.2 Source of Data

In order to investigate the relationship between agricultural sector performance and Nigeria's economic growth, real GDP was used as a proxy for economic growth and value of agricultural output was used to represent the agricultural sector performance. More so, foreign private investment (FPI) and financial development (FD) were used to represent the value of foreign investment and the ratio of broad money (M2) to gross domestic product (GDP) in the economy. The data for the variables used in the study were obtained from the Central Bank of Nigeria (CBN) annual Statistical Bulletin ranging from 1980 to 2014.

3.3 Estimation Procedures

3.3.1 Unit root test

The first estimation procedure involves the test of order of integration of the time series employed

in the investigation. According to [39], several studies have developed various methods of investigating the order of integration of time series. The major ones include the Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) unit root tests. The test of the Augmented Dickey-Fuller relies on accepting alternative hypothesis of stationarity as against the null hypotheses of unit root (non-stationary). Each of the time series used in the study was tested with or without a deterministic trend (t). The model of the Augmented Dickey-Fuller (ADF) test is presented as follows:

$$\Delta y_t = \alpha^0 + \alpha^1 y^{t-1} + \sum_{n=1}^{n} \alpha \Delta y_i + e_t \qquad (3)$$

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \sum_{n=1}^{n} \alpha \Delta y; + \delta_t + e_t \qquad (4)$$

Where;

Y = time series, t = linear time trends, Δ = first differencing operator such that $\Delta y_{t-1} = y_t - y_{t-1}$, α_o = constant term, n = optimum number of lags in the development variable and e_t = random error term. The difference between equation three (3) and four (4) is that the equation three includes only drift, while equation four combined both drift and linear time trend.

3.3.2 Co-integration test

This stage of the estimation procedure involved the investigation of co-integration or otherwise the long run equilibrium relationship among the series that have the same order of integration through the application of the Johansen co-integration approach. In the estimation of the co-integration test, it should be recognized that in the long run, even if the series trended closely in the plane showing that the series trended, the discrepancy among them is constant. When the above conditions are satisfied in the estimation, it therefore implies that the series defined equilibrium long run relationship, as stationary of the series is the difference between them [40]. However, if the co-integration test fails to indicate that the variables under study do not have long run equilibrium relationship, it means that they could not arbitrarily move away from the each other [41]. Thus, maximum likelihood approach developed by [42] was used in the study to test for the long run equilibrium relationship. Thus, model of the co-integration is illustrated as follows:

$$\lambda \text{ trace } (r) = -T\sum_{i=r+1}^{\wedge} \ln(1 - \lambda_t) \qquad (5)$$

Where

T represents the number of usable observations, whereas $\lambda_{1,s}$ represents the estimated eigenvalue from the matrix. However, the trace test (λ trace) estimates the hypothesis, which states that distinct number of co-integrating vector is less than q or equal to q in against to the general unrestricted alternatives q=r. Similarly, rejecting the null hypothesis implies that the series contains unit root and should be differenced at least once for stationarity to be achieved.

3.3.3 Pairwise granger causality test

The fourth step would be the test of significant causal relationship between agricultural sector performance and Nigeria's economic growth through the application of the Pairwise Granger causality approach. The essence of this test is to explore the significant nature of the causality relationship, as well as to determine which of the two variables including the value of agricultural sector output (VAO) and real gross domestic product (RGDP) that granger causes the occurrence of the other in Nigeria. Thus, the model is specified as thus:

$$RGDP_t = \alpha_0 + \sum \alpha_{1t} RGDP_{t-1} + \sum \alpha_{2t} VAO_t + \sum \alpha_{3t} FPI_t + \sum \alpha_{4t} FD_{t-1} + e_{1t} \qquad (6)$$

$$VOA_t = \beta_0 + \sum \beta_{1t} RGDP_{t-1} + \sum \beta_{2t} VAO_{t-1} + \sum \beta_{3t} FPI_{t-1} + \sum \beta_{4t} FD_{t-1} + e_{1t} \qquad (7)$$

Where

$RGDP_t$ represents the Real Gross Domestic Product at current period (t), VAO_t is the Value of Agricultural sector output at current period (t), FPI_t is the Foreign Private Investment at period (t), FD is the Financial Development, e_t is the error term. Rejecting or accepting H_0 in equation 6 and 7 suggest that growth in the economy do or do not granger causes growth of agricultural sector output, foreign private investment and financial development. However, to reject or accept the null hypothesis, H_0 indicates that the variables do (do not) granger causes growth. Thus, the test of causality relationship would avail the study the opportunity to explore the nature of relationship existing between the two variables, which could be; no causality relationship, unidirectional relationship, bi-direction or causality of feedback between

agricultural sector performance and economic growth in Nigeria.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1 Unit Root Test Results

The time series behaviour of each of the variable is tested through the applications of both the Augmented Dickey-Fuller (ADF) unit root test and Philips-Perron (PP) unit root test, mainly to find the stationarity of the individual variables employed in the investigation. Hence, the results of both the Augmented Dickey-Fuller (ADF) test and Philips-Perron (PP) test are shown in the above Tables 1 and 2 in both at level and first difference. In the estimation, the results of the tests indicate that all variable were not stationary at level. However, the results provided strong evidence indicating that all the variables became stationary at first difference at 5% and 10% critical values. Therefore, the study rejects the hypothesis of non-stationarity, and concludes that there is stationarity among the variables. This means that the variables are integrated of

the same order one 1(1). Thus, there is need to proceed with co-integration analysis in order to examine the existence of long run equilibrium relationship among the variables under study.

4.2 Co-integration Test Results and Analysis

The results of the cointegration test are shown in the Tables 3 and 4.

The result of the co-integration test showed that there is existence of long run equilibrium relationship among the variables. The results showed the trace statistic and the maximum eigenvalue statistic as estimated the Johansen co-integration test. In the estimation result of the co-integration test, both the trace statistic and the maximum eigenvalue statistic showed that long run equilibrium relationship exist among the variables at 5% critical value, which implies that long run equilibrium (co-integrating) relationship exist between agricultural sector performance and economic growth in Nigeria within the period under investigation.

Table 1. Augmented Dickey Fuller (ADF) unit root test trend and intercept

| Variables | Level | | | 1st difference | | | Remarks |
	ADF statistic	5% critical value	10% critical value	ADF statistic	5% critical value	10% critical value	
RGDP	-12.94250	-3.557759	-3.212361	-39.69219	-3.562882	-3.215267	1(1)
VAO	-0.927088	-3.557759	-3.212361	-3.943915	-3.562882	-3.215267	1(1)
FPI	-1.408059	-3.557759	-3.212361	-4.590941	-3.562882	-3.215267	1(1)
FD	-2.242476	-3.557759	-3.212361	-5.532169	-3.562882	-3.215267	1(1)

Source: Researcher's compilation from E-view 7

Table 2. Phillip Perron (PP) unit root test trend and intercept

| Variables | Level | | | 1st difference | | | Remarks |
	PP statistic	5% critical value	10% critical value	PP statistic	5% critical value	10% critical value	
RGDP	-8.488033	-3.557759	-3.212361	-34.85966	-3.562882	-3.215267	1(1)
VAO	-0.927088	-3.557759	-3.212361	-3.811820	-3.562882	-3.215267	1(1)
FPI	-1.608746	-3.557759	-3.212361	-4.629462	-3.562882	-3.215267	1(1)
FD	-2.252600	-3.557759	-3.212361	-6.615404	-3.562882	-3.215267	1(1)

Source: Researcher's compilation from E-view 7

Table 3. Result of the Johansen co-integration rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical value	Prob.**
None *	0.659870	51.07934	47.85613	0.0241
At most 1	0.311079	17.64805	29.79707	0.5921
At most 2	0.170136	6.096584	15.49471	0.6841
At most 3	0.010119	0.315291	3.841466	0.5744

Source: Researcher's compilation from E-view 7

4.3 Vector Error Correction Model (VECM) Analysis

The estimation results below depict the test of Vector Error Correction Model (VECM) as shown in Table 5.

The estimation results indicate the value of ECM to be -0.235412, with its associated t-statistical value as -3.46842. The negative value of the ECM implies that the relationship among the variables met the a priori expectation and as well satisfies stability requirement. This claim is further supported by the t-statistical value, which indicates that the variables for the study are statistically significant. The ECM result also showed that the speed of adjustment between the short run dynamics and the long run

Table 4. Result of the Johansen co-integration rank test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	Prob.**
No. of CE(s)	Eigen value	Statistic	Critical value	
None *	0.659870	33.43129	27.58434	0.0079
At most 1	0.311079	11.55147	21.13162	0.5922
At most 2	0.170136	5.781293	14.26460	0.6415
At most 3	0.010119	0.315291	3.841466	0.5744

Source: Researcher's compilation from E-view 7

Table 5. Vector error correction model (VECM) test

Cointegrating Eq:	CointEq1			
LRGDP(-1)	1.000000			
LVAO(-1)	-0.531016			
	(0.05065)			
	[-10.4836]			
LFPI(-1)	0.442733			
	(0.06562)			
	[6.74727]			
LFD(-1)	-0.312259			
	(0.05753)			
	[-5.42765]			
C	-9.781071			
Error Correction:	D(LRGDP)	D(LVAO)	D(LFPI)	D(LFD)
CointEq1	-0.235412	0.276433	-0.453754	0.067038
	(0.06787)	(0.27007)	(0.45211)	(0.29929)
	[-3.46842]	[1.02357]	[-1.00364]	[0.22399]
D(LRGDP(-1))	-0.021004	-0.027053	0.105600	0.041982
	(0.02524)	(0.10045)	(0.16815)	(0.11131)
	[-0.83206]	[-0.26933]	[0.62800]	[0.37715]
D(LVAO(-1))	0.019018	0.373528	-0.052453	-0.210750
	(0.05193)	(0.20662)	(0.34590)	(0.22898)
	[0.36624]	[1.80779]	[-0.15164]	[-0.92040]
D(LFPI(-1))	-0.005204	0.038487	0.311055	0.025213
	(0.03781)	(0.15044)	(0.25185)	(0.16672)
	[-0.13764]	[0.25582]	[1.23506]	[0.15123]
D(LFD(-1))	-0.016886	0.252015	-0.213567	0.098106
	(0.04840)	(0.19260)	(0.32243)	(0.21344)
	[-0.34884]	[1.30847]	[-0.66237]	[0.45964]
C	0.046183	0.131598	0.115557	0.064533
	(0.01334)	(0.05306)	(0.08883)	(0.05880)
	[3.46324]	[2.48014]	[1.30091]	[1.09746]
R-squared	0.478480	0.211969	0.093115	0.061089
Adj. R-squared	0.374176	0.054362	-0.088262	-0.126693

Source: Researcher's compilation from E-view 7

Table 6. Pairwise granger causality test

Null hypothesis	Obs	F-statistic	Prob.
LVAO does not Granger Cause LRGDP	32	54.2518	4.E-08
LRGDP does not Granger Cause LVAO		0.42316	0.5205

Source: Researcher's compilation from E-view 7

equilibrium relationship is 23.5%. In theory, ECM shows length of period it would take to correct temporary short run disequilibrium within the long run equilibrium relationship among the variables under review. The results also indicated that the value of agricultural sector output (VAO) has positive contribution to the growth of domestic economy (RGDP) in Nigeria. Thus, it is estimated on average that 1% increase in the value of agricultural sector output would result to 1.9% increase in real GDP. Similarly, the result showed that both the foreign private investment (FPI) and the financial development (FD) have insignificant impact on economic growth in the Nigeria's economy.

4.4 Pairwise Granger Causality Test Analysis

This test is applied to examine the causality between agricultural output and economic growth in Nigeria. Hence, the results of the results are shown below.

The use of Pairwise Granger causality approach in the determination or classification of variables into independent and dependent variables is based on the direction of flow of influence of the variable on the other [43]. In the estimation result above, the result indicated that significant causality runs from the value of agricultural sector output (VAO) to real GDP. This implies that unidirectional relationship exists between real GDP and VAO. A unidirectional causality between the value of agricultural sector output and real gross domestic product growth (RGDP) implies that increase in agricultural sector leads to increase in RGDP in the economy. The evidence of this claim is supported by the p-value of 4.E-08 of the VAO – RGDP as indicated in Table 6. Hence, since 5% level of significance is greater than the p-value, the study concludes that significant causality runs from VAO to real GDP in the Nigerian economy.

5. CONCLUSION

The study examines the significant contribution of agricultural sector performance to the growth of domestic economy in Nigeria for the period

1980-2012. Cointegration test, vector error correction model (VECM) and Pairwise Granger causality test were used in the analysis. The variables used the study include real GDP as the dependent variable while the independent variables are value of agricultural sector output (VAO), foreign private investment (FPI) and financial development (FD). A stationarity test was conducted through the applications of both the Augmented Dickey-Fuller (ADF) test and Philip-Perron (PP) test at 5% and 10% level significance. The unit root test results indicated that all the variables were not stationary at level, but become stationary at first difference, which implies that the variables are integrated of the same order at first difference I(1).

The cointegration test showed evidence of long run equilibrium relationship among the variables since the estimation result indicated at least one co-integrating equation. Furthermore, the results of the vector error correction model (VECM) indicated that the value of agricultural sector output (VAO) has positive and insignificant contribution to the growth of Nigerian domestic economy. Thus, it is estimated on average that 1% increase in the value of agricultural sector output (VAO) would lead to 1.9% increase in real GDP of Nigeria. Similarly, the result showed that both the foreign private investment (FPI) and the financial development (FD) have insignificant impact on economic growth in Nigeria.

Finally, the result of the Pairwise Granger causality test indicated that unidirectional causality exist between the value of agricultural sector output (VAO) and real GDP in Nigeria. Specifically, the result showed that causality runs from the value of agricultural sector output (VAO) to real GDP, which implies agricultural output granger causes real GDP. Thus, in the literature however, the various studies reviewed showed that agricultural sector has positive contribution to the growth of domestic economy. Thus, the findings sustained the fact that the causality, which run from agricultural sector output (VAO) to economic growth (RGDP) is a confirmation of the contribution indicating that agricultural sector

performance actually has positive contribution to economic growth in Nigeria, although statistical insignificant.

Based on the findings above, the study therefore recommends that government should improve its budgetary allocation on agriculture in order to boost the growth performance of the sector, as well as its contribution to the growth of the domestic economy. Similarly, government is advised to avoid inconsistencies in its agricultural policies and programmes; rather it should embrace stable, consistent and sustainable agricultural policies as that would help to improve agricultural performance in the country. The study as well recommends that government should strengthen agricultural credit agencies in order to monitor and ensure efficient disbursement of fund disbursed to farmers. In that, diversion and mismanagement of agricultural sector fund in Nigeria would be discouraged, and hence, improve agricultural output in the economy.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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