

Impact of Agricultural Output on Economic Growth in Nigeria and Ghana (1985-2014): A Comparative Analysis

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ABSTRACT

This paper examined comparatively the “impact of agricultural output on economic growth in Nigeria and Ghana”. Nigeria and Ghana have similar economies and the striking similarities are that both countries have agriculture as the mainstay of their economies and have been experiencing a declining contribution of agriculture to GDP. Since both countries have similar economies, it is interesting to know which of the country’s agriculture output contribute more to their GDP and why so that the other will learn from the experience of the other. That constitutes the problem of this study. The main aim of this study was to investigate the impact of agricultural output in stimulating growth in both countries. A model was formulated to give empirical content to the stated hypotheses which were analyzed via the Vector Error Correction (VEC) Mechanism. Data was collected from relevant sources for 30 year period spanning 1985 to 2014. It was collected for variables such as for the agricultural output, industrial output, services output and Real Gross Domestic Product (RGDP). The study showed, the coefficients of the variables in Nigeria as follows; AGO (-1.97), IDO (2.21) and SVO (-1.81) which implies that the contribution of agriculture to GDP is insignificant in accelerating economic growth as compared to other sectors, however, industrial sector perform better in Nigeria than Ghana while in Ghana the coefficients are AGO (2.52), IDO (0.42) and SVO (1.44), which implies that in terms of contribution to GDP, agriculture contributed to Ghana GDP than other sectors followed by service sector. The paper concluded that there exists a significant difference in the impact of agricultural output oneconomic growth in Nigeria and Ghana. The study therefore, recommended amongst others that; first, the government of Nigeria and Ghana should make efforts in increasing the expenditure in the agricultural sector. Secondly, that, given the potential of the agricultural sector, Commercial Banks, Bank of Agriculture and other financial institutions in Nigeria should channel more loans and credit facilities to the sector in order to encourage farmers to increase output through improved seedlings, adequate manure and proper land usage. Finally, policies aimed at increasing the quality of agricultural outputs should be initiated, implemented and used as major tools that would precipitate economic growth in Nigeria and Ghana. More farm implements and inputsshould be provided to boost output growth.

Keywords: Real gross Domestic product (RGDP), Service Output (SVO), Industrial output (IDO) Agricultural output (AGO)

INTRODUCTION

Background to the Study

Agriculture is the mainstay of Nigeria and Ghana economy and the contribution of agricultural sector to these economies cannot be underestimated when considering its building roles for sustainable development. In terms of employment creation, export and financial impacts, agriculture is an important sector in these countries. The sector provides food for the teeming population, provides raw materials for the industrial sector, (Ogunbayo, Omojolaibi, & Omonona, 2014 & Ghana Statistical Service, 2007):. It also serves as a source of foreign exchange and revenue (through tax) to the government; and contributes to Gross National Products (GNP) amongst others (Oguamanam, 2004). Despite the dominance of these economies by oil and gas in recent time, agriculture still remains the most important source of economic resilience in Nigeria and Ghana. It is on this premise; this research was conducted to comparatively, examine the impact of agricultural output on economic growth between Nigeria and Ghana.

Statement of the Problem

Nigeria and Ghana have similar economies and the striking similarities between Nigeria and Ghana are; both countries are agrarian economies and are oil producing countries. In addition, both countries have been experiencing a decline in contribution of agriculture to growth of GDP. Given the potentials of agriculture in stimulating economic growth, several governments in Nigeria and Ghana have initiated several policies and programmes to attract finance in order to revitalize the sector. Some of these policies were in form of specialized lending to farmers, farm inputs support and agricultural subsidies given to farm inputs. The expectation is that these policies via increased agricultural inputs should be able to translate to positive agricultural output and consequently economic growth in Nigeria and Ghana. The problem however, is that since Nigeria and Ghana have similar economies, it is important to know which of these countries' agricultural output impacts more on economic growth and why so that the other can learn from the experience. This however, constitutes the problem which has already been addressed.

Objectives of the Study

The main aim of this research work was to examine the impact of agricultural output on economic growth in Nigeria and Ghana. The specific objectives of the study were to: compare the impact of agricultural sector output on economic growth to the impact of other major sectors' outputs in Nigeria and Ghana and investigate how agricultural output impacts on economic growth in Nigeria as compared to Ghana.

Research Hypotheses

H₀₁: Agricultural sector outputs have no significant impact on economic growth as compared to other major sector's output in Nigeria and Ghana

H₀₂: Agricultural outputs have no significant impact on economic growth in Nigeria as compared to Ghana.

Significance of the Study

The study will also be important to institutions, students, lecturers, researchers and other thinking minds that might still have the interest to research on the area. Therefore, this study will contribute to the knowledge gap in empirical literature on agricultural output-economic growth nexus thereby

serve as a basis for further research work.

This study will be useful to farmers who are the major stakeholders in agriculture and who are the beneficiaries of agricultural inputs such as: extension services, credit facilities, farm inputs, machineries, government allocation to agriculture, and agro-allied chemical as the findings and the recommendations of this study will help government of Nigeria and Ghana to subsidize these agricultural inputs at affordable rate for farmers thereby increase agricultural output.

Scope of the Study

This study investigated the impact of Agricultural output in Nigeria and Ghana between the period 1985 and 2014. This period is considered relevant because it was characterized by substantial growth in government expenditure on agriculture and it reflects the period of Structural Adjustment Programme (SAP) in Nigeria (1986) and Ghana (1985) which was initiated to restructure and diversify the productive base of these economies to reduce the dependence on oil and imports. The choice of these periods is to empirically examine the extent agricultural output contributes to economic growth in line with Governments' renewed efforts towards stabilizing the sector, since 1985.

LITERATURE REVIEW

Agricultural Output

Many authors have defined Agriculture and agricultural output in different ways but common among these definitions are:

On the other hands, Hornby (2001) in his own view defined agricultural outputs as including both crops and animals that are grown in large quantity which could serve as food. Samuelson & Nordhaus (2003) defined agricultural outputs as various useful goods and services produced to be consumed or used for further production. Similarly, agricultural output is usually measured at the market value of final product of crops, fishery and livestock. In addition, they averred that a major element underlying agricultural output (supply) is the cost of production determined by input prices, technological advance and government policy.

Imahe & Alabi. (2005) described agricultural output as varieties of food and cash crops produced for consumption and export. Among the staple food crops are; cassava, yams corn, coco-yams, cow-peas, beans, sweet potato, Millet, plantains, bananas, rice, sorghum, and a variety of fruits and vegetables. The leading cash crops are cocoa, citrus, cotton, groundnut, (peanuts) palm oil, palm kernel, benniseed, and rubber. These crops were also major exports products of Nigeria and Ghana in the 1960s and early 1970s. Chief among the export destinations for Nigerian and Ghana agricultural exports are Britain, the United States, Canada, France, and Germany.

The working definition of agricultural output in this study is in line with Ikala (2010), Olarinde, & Abdullahi. (2014):, which views agricultural output as increase in crops, animals, livestock, forestry and fishery production. It is the summation or aggregation of the various outputs from the agricultural sector. Thus, the agricultural sector is a prerequisite for industrialization through

increase in outputs, increase in rural incomes and provision of industrial raw materials, provision of a domestic market for industry and above all the release of resources to support the industry. Its importance has therefore necessitated the need for this study.

Economic Growth

Economic growth has been identified as one of the key macroeconomic goals of the society and the issue of growth did not assume prominence until the mid thirties. Several authors have given different definitions to explain the concept as discussed below.

Todaro (2009) defined economic growth as an expansion of the various systems such as education, agriculture etc without a change in structure. The essential ingredient of Todaro's definition is that, for economic growth to occur, the various institutions or systems in an economy must witness expansion even though their structure remains unchanged. Solow (1957) defined economic growth to mean more output without a change in technical and institutional arrangement. This implies that Solow threads the path of Todaro, since expansion of various systems is expected to bring more output. To Solow, the structure may change but the technical and institutional arrangement remains the same.

Peterson & Estenson (2002) on their own viewed economic growth as the expansion of a nation's capability to produce goods and service its people want. Since the productive capability of an economy depends basically on the quantity and the quality of its resources as well as on its level of technical attainment, to them, economic growth involved the process of expanding and improving these determinants of productive capacity and it is a mere expansion of a nation's ability to increase production of goods and services needed by citizens. Jhingan (2003) described economic growth as the gradual long-run expansion of a nation's capacity to produce goods and services. It is concerned with the slope of potential GDP line- the growth of GDP under the conditions in which unemployment rate is maintained at the natural rate of unemployment. They viewed economic growth as the means by the nation's production possibilities' curve and aggregate supply curve are shifting rightward overtime. Economic growth is not concern with short-run business cycle conditions.

Theoretical Framework

The theoretical framework adopted in this study is the famous Solow neoclassical growth theory. The relevance of this theory is that, it gives room for modification of the model, secondly it borders on its ability to allow for substitution/argumentation of other input variables into the model or introducing the third independent variable into the model. Thirdly, the model provided a better framework for analyzing the impact of agricultural output in open economy like Nigeria and Ghana

Empirical Review

Several empirical studies have been carried out on the impact of agricultural output on economic growth. Empirical evidence on the agricultural output-economic growth relationship is diverse, mostly based on cross-sectional studies that often include a sample of both advanced and developing countries.

Evidence from Nigeria

Oyakhilomen & Zibah (2014) in their work agricultural production and economic growth in Nigeria: implication for rural poverty alleviation used time series data to analyse the data unit root tests and the bounds (ARDL) testing approach to cointegration. The result of the data analysis indicated that agricultural production was significant in influencing the favourable trend of economic growth in Nigeria. Despite the growth of the Nigerian economy, poverty is still on the increase and this calls for a shift from monolithic oil-based economy to a more plural one with agriculture being the lead sector.

Odetola & Etumnu (2013) investigated the contribution of the agricultural sector to economic growth in Nigeria using the growth accounting framework and time series data from 1960 to 2011. They found that the agricultural sector has contributed positively and consistently to economic growth in Nigeria, reaffirming the sector's importance in the economy. The contribution of agriculture to economic growth is further affirmed from a causality test which showed that agriculture growth Granger-causes GDP growth, however no reverse relationship was found. The resilient nature of the sector is evident in its ability to recover more quickly than other sectors from shocks resulting from disruptive events e.g. civil war (1967-70) and economic recession (1981-85) periods. We also find that the crop production subsector contributes the most to agricultural sector growth and that growth in the agriculture sector is overly dependent on growth of the crop production subsector. This indicates the importance of this subsector and probably, lack of attention or investment to the other subsectors.

Oloyede, (2012) analysed the relationship between Agricultural resource and economic growth in Nigeria using Ordinary Least Square regression method. The findings reveal that there exist a positive, cause and effect relationship between agricultural output and gross domestic product in Nigeria. Oji-Okoro (2011) examined the contribution of agricultural sector on the Nigerian economic development using multiple regression analysis. They found that a positive relationship between Gross Domestic Product (GDP) vis a vis domestic saving, government expenditure on agriculture and foreign direct investment between the period of 1986-2007. It was also revealed in the study that 81% of the variation in GDP could be explained by Domestic Savings, Government Expenditure and Foreign Direct Investment.

Evidence from Ghana

Patrick (2014) studied the analysis of the agricultural sector of Ghana and its economic impact on economic growth. The study used time series (1996-2006) data on agriculture, service, industry and the various sub-sectors under agriculture, which includes forestry, fishery, crops/ livestock and cocoa. OLS was employed to estimate the respective impact of agriculture, service and industry on GDP growth. The result of the study revealed that agricultural output had a significantly positive impact on Ghana's growth as compared to the other sectors. Agricultural output (0.35); service output (0.28); industrial sector (0.30). In addition, the study further analysed the effect of the various sub sectors under agricultural sector in GDP growth since the agricultural sector contributed more significantly to GDP. At the end of the study cocoa subsector was identified to be vital to economic growth and development in Ghana.

Patrick, Prudence & Attah (2013) examined the contribution of the agricultural, service and industrial sectors to economic growth in Ghana. Time series data from 1966 to 2011 on all the variables of interest was obtained from the World Development Indicators 2012 series. The Ordinary Least Squares estimation technique was used for the analysis. The results showed that a 1% increase in the growth of the agricultural sector will cause GDP growth to increase by 0.45. Also, a 1% increase in the growth of the services sector will lead to 0.38% increase in GDP growth. Finally, a 1% increase in the growth of the industrial sector will bring 0.18% increase in GDP growth. All the explanatory variables are statistically significant at the 5% level of significance. It is concluded that the agriculture sector contributed most to the overall growth.

METHODOLOGY

The framework of this paper was designed on quantitative plot using VECM model

Kinds and Sources of Data

The kinds of data required for this study were secondary data. This study used time series data from Nigeria and Ghana. The data required in achieving objective one and two are as follows: Real Gross Domestic Product (RGDP), Agricultural Output (AGO), Industrial Output (IDO), Services output (SVO). The data were sourced from various publications of the Central Bank of Nigeria(CBN), Bank of Ghana, Statistics Statistical Research Information and Development (SRID), Ghana, Ghana Statistical Service, World Development Indicator/Index (CD -ROM), World Bank Data Base,

Method of Data Analysis

The data for this study were analyzed using analytical tools. The analytical tools involve the use of the Augmented Dickey-Fuller (ADF) test, Johansen Co-integration Test and Vector Error Correction Model

Model Specification

Model: Comparatively, evaluate the sectoral impact of agriculture sector on growth against other major sectors in Nigeria and to investigate how agricultural sector outputs impact on economic growth in Nigeria as compared to Ghana. In consonance with the stated objectives and to amplify the analysis, the contribution of the agricultural sector to economic growth in Nigeria and Ghana were measured alongside major sectors of the economy. The dependent variable was transmogrified to RGDP and introduced agriculture, industry, and services as the sectors that form the explanatory variables. The model seeks to investigate how agricultural sector output impact on economic growth in Nigeria and Ghana and comparatively, ascertain which of the two countries is better off in terms of agricultural productivity in the midst of other prevailing sectors of the respective economies. The model is specified in eqn (1.1) below:

$$RGDP = f(AGO, IDO, SVO) \text{-----eqn.11}$$

Where:RGDP = Real Gross Domestic Product

AGO = Agricultural Output

IDO = Industrial Output

SVO = Services Sector

Representing this relationship in a functional long run framework;

$$RGDP_t = \beta_{10} + \beta_{11}AGO_{t-1} + \beta_{12}IDO_{t-1} + \beta_{13}SVO_{t-1} + U_1 \text{-----eqn.12}$$

$$AGO_t = \beta_{20} + \beta_{21}RGDP_{t-1} + \beta_{22}IDO_{t-1} + \beta_{23}SVO_{t-1} + U_2 \text{-----eqn.13}$$

$$IDO_t = \beta_{30} + \beta_{31}AGO_{t-1} + \beta_{32}RGDP_{t-1} + \beta_{33}SVO_{t-1} + U_3 \text{-----eqn.14}$$

$$SVO_t = \beta_{60} + \beta_{61}AGO_{t-1} + \beta_{62}IDO_{t-1} + \beta_{63}RGDP_{t-1} + U_5 \text{-----eqn.15}$$

Error correction model is a very popular model because it allows for the existence of an underlying or fundamental link between variables (the long-run relationship) as well as for short-run adjustments (i.e. changes) between variables, including adjustments to achieve the co integrating relationship. Basically, it is designed for use with non stationary series that are known to be co integrated and as well helps to offers a coherent way to combine the long-and short-run effects.

The use of VEC model in this study in achieving two objectives lies in the predictive and forecasting power especially that it is one of the most flexible methods of analysis because it has more efficient coefficient estimates and tool for authenticating results.

The Vector Error Correction Model is given as:

$$\Delta RGDP_{t-1} = \beta_0 + \beta_1 \Delta AGO_{t-1} + \beta_2 \Delta IDO_{t-1} + \beta_3 \Delta SVO_{t-1} + ECM_{t-1} + v_{t-1} \text{-----eqn.16}$$

A priori Expectations

From the empirical models, it is expected that the explanatory variables are expected to have positive relationships with the dependent variables. For model, symbolically, it is expected that: $\beta_{11} > 0$, $\beta_{12} > 0$, $\beta_{13} > 0$. Similarly, it is expected that the sectoral contributions from industry, and services would have positive relationships with economic growth in Nigeria and Ghana. In general, it is expected that the output from the agricultural sector has an impact on economic growth in both countries.

RESULTS AND DISCUSSION

This section presents the data in consonance with the stated objectives of the study.

Presentation of results: Impact of Agricultural Output on Economic Growth in Nigeria and Ghana

Unit Root Test (Model 1)

The result of the Augmented Dickey-Fuller (ADF) test is presented below:

Table 1: Stationarity Test (Model)

Variables	ADF Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Prob.	Order of Integration
Nigeria						
RGDP	-5.18	-3.69	-2.97	-2.63	0.0002	I(1)
AGO	-4.80	-3.71	-2.98	-2.63	0.0007	I(1)
IDO	-5.65	-3.69	-2.97	-2.63	0.0001	I(1)
SVO	-4.11	-3.70	-2.98	-2.63	0.0024	I(1)
Ghana						
RGDP	-4.80	-3.72	-2.99	-2.63	0.0000	I(1)
AGO	-4.36	-3.70	-2.98	-2.63	0.0000	I(1)
IDO	-4.68	-3.72	-2.99	-2.63	0.0001	I(1)
SVO	-4.33	-3.71	-2.98	-2.63	0.0000	I(1)

Source: Author's computation from Eviews8

The ADF statistic values for RGDP, AGO, IDO and SVO are -5.18, -4.80, -5.65, and -4.11 respectively in Nigeria. The associated one sided p-values (for 30 observations) are less than 0.05. The result also shows that the statistic t_{α} value is greater than the critical values at 1%, 5%, and 10% for all the variables, so we reject the null hypothesis at the conventional test size., the variables are stationary at first difference series.

Thus similarly, in Ghana we reject the null hypothesis at the conventional test size. The ADF statistic values for RGDP, AGO, IDO and SVO are -4.80, -4.36,-4.68, and -4.33 respectively. The associated one sided p-values (for 30 observations) are also less than 0.05. The result also shows that the statistic t_{α} value is greater than the critical values at 1%, 5%, and 10% for all the variables. Thus, the variables are stationary at first difference series.

Johansen Cointegration (Model 1)

The result of the Trace statistic and Max-Eigen statistic are presented in table 4.10 below.

Table 2: Cointegration Test (Model)

Null Hypothesis	Trace Statistic	0.05 Critical Value	Null Hypothesis	Max-Eigen Statistic	0.05 Critical Value
Nigeria					
$r = 0^*$	57.50361	47.85613	$r = 0^*$	29.46061	27.58434
$r \leq 1$	20.04300	29.79707	$r \leq 1$	10.20596	21.13162
$r \leq 2$	9.837035	15.49471	$r \leq 2$	7.644225	14.26460
$r \leq 3$	2.192810	3.841466	$r \leq 3$	2.192810	3.841466

Note: r represents number of cointegrating vectors. Trace statistic and Max-Eigen statistic indicates 1 cointegrating equations each. * denotes rejection of the hypothesis at the 0.05 level

Ghana

$r = 0^*$	48.70624	47.85613	$r = 0^*$	28.64539	27.58434
$r \leq 1$	22.06085	29.79707	$r \leq 1$	11.81809	21.13162
$r \leq 2$	10.24276	15.49471	$r \leq 2$	6.833210	14.26460
$r \leq 3$	3.409554	3.841466	$r \leq 3$	3.409554	3.841466

Note: Trace statistic and Max-Eigen statistic indicates 1 cointegrating equations each.

Source: Author's computation from Eviews8

The Trace test and Max-Eigen value test shows a long run equilibrium relationship between the variables in both Nigeria and Ghana. Thus, the null hypothesis of no co integrating equation is rejected since their statistics are greater than their respective critical values for the co integrating equations at 5% significance level. This implies a stationary linear combination, as such the non stationary time series are co integrated. The application of the VECM technique will therefore yield informative, non-spurious and dependable results.

The long run relationship existing between the variables is shown in the model below:

Estimated Long Run for the Model

The estimated model is given as:

$$InRGDP_t = \beta_{10} + \beta_{11}InAGO_{t-1} + \beta_{12}InIDO_{t-1} + \beta_{13}InSVO_{t-1} + U_1$$

The numerical values of the theoretical parameters are given in table 4.11 below:

Table 3: Long Run for the Model

	Nigeria			Ghana		
	Coefficient	S. E	T Statistic	Coefficient	S E	T Statistic
C	3.27			6.39		
AGO	-1.21	0.54	2.25	2.52	0.43	5.88
IDO	1.92	0.54	-3.55	0.42	0.12	-3.63
SVO	-0.55	0.21	2.6	1.44	0.29	-4.98

Source: Author's computation from Eviews8

Table 3 is the long run model showing the sectoral impact of key sectors of Nigeria and Ghana economies. It shows that -1.21 is the coefficient of AGO and tells us that with the influence of IDO and SVO held constant in Nigeria, as AGO increases, say, by one dollar, on average, RGDP goes down by 1.21 dollars (₦193.87). On the other hand, as AGO increases on average (by a dollar) in Ghana, other variables held constant, RGDP increases by \$2.71 (¢10.84). Conversely, the coefficient of SVO suggests that, other variables held constant, an increase in services by one dollar will decrease RGDP in Nigeria by \$0.55 (₦88.12). Contrarily, an increase in SVO by \$1 in Ghana will also increase RGDP proportionately by \$1.44 (¢4).

Conversely, the coefficient of IDO shows that an increase in industrial output in Nigeria, by say, a dollar, will cause real output to increase by \$1.92 (₦307.62). Similarly, in Ghana, an increase in IDO by a dollar will increase real output by 22 cents (¢88). The intercept value of 3.27 in Nigeria means that if the values of AGO, IDO and SVO were fixed at zero, the average level of RGDP in Nigeria would rise by \$3.27 (₦523.92). In Ghana, the result shows that even if the values of AGO, IDO and SVO were fixed at zero, the average level of agricultural output would increase by \$6.39 (¢25.56).

The result further reveals that in Nigeria, the coefficients of AGO and SVO do not conform to a priori expectation having negative signs showing there is an indirect relationship between AGO, SVO and RGDP in Nigeria. The coefficient IDO conforms to a priori expectation displaying the expected positive sign implying there is a direct relationship between IDO and RGDP in Nigeria. More so, the coefficients of AGO, IDO and SVO are statistically significant (i.e. $1/2b_1 > S.E.$). In Ghana, AGO, IDO and SVO conform to a priori expectation. It reveals a positive relationship between AGO, IDO, SVO and RGDP in Ghana. The coefficient of SVO however conforms to a priori expectation and postulates a positive relationship with RGDP. In addition, the coefficients of AGO, IDO and SVO are statistically significant in Ghana.

Vector Error Correction Method (Model)

The error correction model is given as:

$$\Delta \ln RGDP_{t-1} = \beta_0 + \beta_1 \Delta \ln AGO_{t-1} + \beta_2 \Delta \ln IDO_{t-1} + \beta_3 \Delta \ln SVO_{t-1} + ECM_{t-1} + v_{t-1}$$

The mathematical coefficients of the stochastic model thus become:

Table 4: Vector Error Correction Model (Model)

Error Correction Estimates

Variable	Nigeria			Ghana		
	Coefficient	Standard Error	T statistics	Coefficient	Standard Error	T statistics
ECM	-0.23	0.053	-4.34	-0.04	-0.02	1.79
RGDP	-0.34	0.21	-1.65	0.43	0.24	1.79
D(AGO(-1))	-0.18	0.86	-0.21	-0.06	0.05	-1.20
D(IDO(-1))	-0.19	0.26	-0.73	-0.01	0.04	-0.33
D(SVO(-1))	1.01	1.22	0.83	0.05	0.03	1.77
C	-0.03	0.17	-0.15	0.01	0.005	2.64
Diagnostic Statistics						
R ²	0.84			R ²	0.82	
\bar{R}^2	0.77			\bar{R}^2	0.69	
F Statistic	8.4			F Statistic	7.2	
F _{0.05}	2.71			F _{0.05}	2.71	

Source: Author's computation from Eviews8

The table above shows the short run estimates of the VEC model used in estimating the impact of the major sectors in Nigeria and Ghana on economic growth. In both Nigeria and Ghana, the coefficients of SVO display sign that conforms to a priori expectation while the coefficients of AGO and IDO does not. Furthermore, unlike the long run model which shows that all the variables are statistically significant, all the parameter estimates are not statistically significant in the short run in Nigeria and Ghana.

In Nigeria the adjusted R² value of 0.77 means that about 77% of the variations in economic growth is explained by AGO, IDO and SVO. This is high considering that the maximum value of R² can at most be 1. The coefficient of about 0.77 shows that agricultural output, industrial output, services

output and economic growth are strongly positively correlated. The same is the case in Ghana which shows that 82% of the variations in RGDP is accounted for by AGO, IDO and SVO. The adjusted R^2 of 0.69 shows a strongly positive correlation between the dependent and independent variables.

The study also finds out that AGO, IDO and SVO are jointly significant in Nigeria and Ghana. The F statistic shows the overall significance of the estimated model in both countries. The result reveals that the log likelihood of obtaining an F value of as much as 8.4 (Nigeria) or 7.2 (Ghana) or greater is simultaneously less than zero, leading to the rejection of the hypothesis that together AGO, IDO and SVO are jointly irrelevant in explaining changes in economic growth in Nigeria and Ghana. This buttresses the overall goodness of fit of the models. Thus, the overall prediction power of the econometric model is statistically significant.

The coefficient of the error correction term is statistically significant in both Nigeria and Ghana. In both countries this coefficients are correctly signed. In Nigeria, the magnitude of -0.23 indicates that if there is any deviation, the long run equilibrium is adjusted speedily where about 23% of the disequilibrium may be removed in each period. This shows that the speed of adjustment to where RGDP will equilibrate even when there is initial disequilibrium is at the rate of 23%. In Ghana, the magnitude of -0.04 shows that the speed of adjustment to where RGDP will equilibrate even when there is initial disequilibrium is 4% which is slower than that of Nigeria. This implies that in Ghana, if there is any deviation, the long run equilibrium is adjusted slowly where about 4% of the disequilibrium may be removed in each period.

The result also reveals that in the short run, a unit change in AGO in the previous year will lead to an decrease in RGDP by 18 cents (₦28.84) in Nigeria and 0.6 cents (¢0.24) in Ghana. Similarly, a unit change in IDO in the previous year will cause RGDP to decrease by \$0.19 (₦30.44) and \$0.01 (¢0.04) in Ghana. Conversely, a unit change in the previous year in SVO will increase RGDP by \$1.01 (₦161.82) in Nigeria and by \$0.05 (¢0.2) in Ghana.

Test of Hypotheses

The hypothesis as stated earlier in the introductory part of this work is as follows:

Hypothesis 1

H₀₁: Agricultural sector outputs have no significant impact on economic growth as compared to other major sector's output in Nigeria and Ghana

Hypothesis 2

H₀₂: Agricultural outputs have no significant impact on economic growth in Nigeria as compared to Ghana.

Decision Rule

If $\frac{1}{2}b_i > S.E$, we reject the null hypotheses and accept the alternative, otherwise we accept the null hypothesis and reject the alternative.

Model

Based on the decision rule, the coefficients of AGO, IDO and SVO are statistically significant in

Nigeria. In Ghana, the same is the case, as the coefficients of AGO, IDO and SVO are statistically significant while that of IDO is not statistically significant. Comparatively, the models also revealed that agricultural output is significant in stimulating growth in Ghana and Nigeria. However, the agricultural sector in Ghana thrives better in accelerating growth than Nigeria agricultural sector. Therefore, we accept the alternative hypothesis and conclude that there exists a significant difference in the sectoral impact of agricultural output to economic growth to impact of other major sectors in Nigeria and Ghana and reject the null hypothesis that there no exists a significant impact of agricultural output on economic growth in Nigeria as compared to Ghana.

Discussion of Findings

The first objective was to analyse the impact of the agricultural sector on economic growth in relation to other major sectors in Nigeria and Ghana. The result revealed that in Nigeria, the coefficients of AGO and SVO do not conform to a priori showing there is an indirect relationship between AGO, SVO and RGDP in Nigeria. The coefficient IDO conforms to a priori implying there is a direct relationship between IDO and RGDP in Nigeria, which has been majorly influenced by the oil sector. The mismatch in the sign of AGO can be explained by the neglect of the agricultural sector in Nigeria after the oil boom. Services became lucrative in Nigeria in the light of the rebasing exercise which saw a surge in output from the sector. Prior to that time, its impact on economic growth was undermined which may explain the negative sign.

In Ghana, AGO, IDO and SVO conforms to a priori expectation implying a positive relationship between AGO, IDO and SVO and RGDP in Ghana. The positive sign shows a high level of interdependency between the industrial and agricultural sector in Ghana. In addition, the Ghanaian sector is diversifying away from the agricultural sector which may explain the robustness of the sectors. The need for services is on the increasing need and this has spurred its demand, which explains the positive relationship it has with economic growth in Ghana. Comparatively, on the sectoral impact, the industrial sector performed better in Nigeria than in Ghana. However, the agricultural sector performed better in Ghana than in Nigeria. This shows that Ghana's utilization of inputs has translated into improved agricultural output which in turn has stimulated economic growth. However, the Nigerian government has not managed to effectively initiate the needed change to boost output in the sector. Based on the result, the industrial sector remains the sector with the highest potential for growth in Nigeria while in Ghana it remains the agricultural sector.

The second objective was to investigate how agricultural sector output impact on economic growth in Nigeria as compared to Ghana, the results shows that, the coefficients of the three major sectors in Nigeria are given as: AGO (-1.97), IDO (2.21) and SVO (-1.81) while in Ghana the coefficients are AGO (2.52), IDO (0.42) and SVO (1.44).The result revealed that in terms of contribution to GDP, agriculture contributed to Ghana GDP than service sector other sectors followed by industrial sector while in Nigeria the contribution of agriculture to GDP is insignificant compared to other sectors.

CONCLUSIONS AND RECOMMENDATIONS

Summary

This paper aimed at investigating the impact of agricultural output on economic growth in Nigeria and Ghana. The study built one model to give empirical content to the main objectives and hypothesis testing. As a result of the techniques employed the study found out that; Agricultural outputs have significant impact on economic in Ghana than Nigeria. Which implies that agricultural sector in Ghana thrives better in accelerating economic growth than the agricultural sector in Nigeria.

In Nigeria, the industrial sector thrives better than the agricultural and services sectors. The indirect relationship between both the agricultural and services sectors and economic growth shows lack of interdependency between the two sectors. This is explained by the transfer of resources from the agricultural sector to the industrial sector accounting for the mismatch. Based on the results, the industrial sector remains the sector with the highest potential for growth in Nigeria while in Ghana it remains the agricultural sector.

Conclusion

This study concludes that agricultural outputs have significant impact on economic growth in Ghana within the study period while in Nigeria the impact of agricultural output is not significant. On the sectoral analysis it was revealed that the industrial and services sector contribute more to growth than agriculture in Nigeria as compared to Ghana.

Recommendations

Based on the findings of the study, the following recommendations are hereby made:

Given the potential of the agricultural sector, Commercial Banks, Bank of Agriculture and other financial institutions in Nigeria and Ghana should channel more loans and credit facilities to the sector in order to encourage farmers to increase output through improved seedlings, adequate manure and proper land usage. It is also recommended that the condition for loans should be relaxed and the interest rate on loans should be reduced to enable farmers to obtain loans even without collateral securities.

The Ghanaian government should provide basic infrastructure in the industrial sector to support and harness the output derived from the agricultural sector to ensure interdependency between the sectors.

Furthermore, the Ghanaian government should channel the surplus labour from agricultural sector into industry and services in order to boost sustained economic growth. In addition, both the Nigerian and Ghanaian government should provide more tractors and agricultural machineries to replace labour and boost output in the sector.

Finally, policies aimed at increasing the quality of agricultural outputs should be initiated,

implemented and used as major tools that would precipitate economic growth in Nigeria and Ghana. More farm implements and inputs should be provided to boost output growth.

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