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ASSESSMENT OF AGRICULTURE TO BUSINESS AND ECONOMIC GROWTH IN ECOWAS COUNTRIES

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ABSTRACT: *This study x-rayed agricultural sector as the engine of economic growth in Economic Community of West African Countries (ECOWAS); more so as the agricultural sector employs over 70% of the labour force and provides the means of livelihood for the greater population in the region. Furthermore, it is the believe that improvement in the agricultural sector productivity will likely enhance the per capita GDP growth of the ECOWAS. Data was collected using documentary evidence (secondary data). Time series methods of analysis such as panel unit root tests, panel co-integration test, panel co-integration regression method using fully modified ordinary last squares (FMOLS) model were employed for the analysis. The variables analysed include the GDP per capita (the dependent variable) and agricultural sector output per capita, capita stock per capita, industrial sector output per capita, services sector output per capita and government expenditure per capita (independent variables). The results established that agricultural sector output per capita, capita stock per capita and economic institutions exert no significant impact on per capita GDP of ECOWAS. However, government expenditure, industrial sector output and service sector output, all measured on per capita basis, significantly impacted on ECOWAS countries per capita GDP growth. The study concluded that only Government provision of services per capita, and industry sector output per capita significant stimulated growth in ECOWAS countries. Capital stock per capita and economic institutions did not. The study recommended efficient resources investment and functional institutions to further promote growth in the ECOWAS countries.*

KEYWORDS: Agriculture, Business, Economic Growth, Per Capita GDP.

INTRODUCTION

Agriculture is the sector that employed the largest proportion of the labour force in Economic Community of West African States (ECOWAS). It employed about 70% of work force in ECOWAS countries (UNCTAD data base, 2015). Though, the level of its employment varies across countries, the country with the highest level of employment of labour in Agriculture is Niger with 90% of the labour force as at 2008. Togo had the least with 65% of the work force (estimates from UNCTAD database, 2015 and the world fact book 2008).

Agriculture in low-income countries is usually associated with low productivity (Dercon and Mellor, 2014) and Because of this low productivity of agriculture in low-income countries it was felt, in the 1940s, that a better technology for agriculture was requied to improve output per capita. Consequently, there were investments in agricultural researches and some of which were sponsored in the 1940s by the North American Foundations (Lee and Goldsmith, 1989). Another move to improve agricultural productivity was industrialisation strategy. It was believed that the promotion of industries will lead to increase urbanisation and increase income

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from the population. These would lead to increase in demand for agricultural product. The consequence will be increase in agricultural productivity. It was assumed that the technologies for both agriculture and industrial production would be imported from advanced industrialised countries. It was believed that growth would come about by agriculture releasing labour to the industrial sector and this will increase the marginal productivity of the agricultural sector (Jhingan, 2012). The demand for agricultural product by industrial workers would assist in raising agricultural output. The agricultural sector would provide market for industrial output as well as provides the raw materials needed by the industries. Another move that was made was the introduction of improved varieties of seeds such as rice, maize, the production of improved varieties of seed

Statement of the Problem

The expectation that agricultural output would be increased due to increased demand and that foreign technology would be transferred could not materialised owing to the fact that, technologies from the advanced countries could not fit into the tropical weather in Africa. Agricultural growth was slower than expected and this hindered the growth rate (Wiggins, 2013). Increase in agricultural demand could not translate into one-on-one increase in agricultural output apparently due to the relative difference in the cost of labour to capital of Africa countries as compared to those of the advanced countries. Moreover, there was the problem of skilled labour which was lacking in the low-income countries of Africa. It is in line with the above that this study seeks to evaluate the extent of agricultural contribution to economic growth of ECOWAS Countries, especially in the areas of GDP per capita (the dependent variable) and agricultural sector output per capita, capita stock per capita, industrial sector output per capita, services sector output per capita and government expenditure per capita (independent variables).

Hypotheses

Ho_1: Agricultural sector output per capita does not significantly impact on the GDP growth per capita in ECOWAS sub-region.

Ho_2: Capital stock per capita exerts no significant effect on per capita GDP in ECOWAS sub-Region.

Ho_3: Industrial sector output per capita has not significantly enhance per capita GDP growth of ECOWAS sub-region.

Ho_4: Services sector output or expenditure per capita does not significantly promote per capita GDP growth in ECOWAS sub-region.

Ho_5: Economic institutions have not significantly promoted economic growth in ECOWAS countries.

Theoretical Basis

Theoretically, the viewpoint of agricultural contribution to economic growth has two divergent views. The first view-point sees agriculture as the engine of economic growth –the Agricultural-Led-Growth (ALG) Hypothesis. The advocates of ALG also argued that agriculture influences economic growth through its linkages to other sectors through the supply

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of: (a) labour to industries; (b) food for consumption domestically; (c) markets for industrial goods (d) domestic saving for industrial investment, and (e) foreign exchange needs for importing machines, intermediate inputs and raw materials (Jhinghan 2012; Todaro & Smith 2012).

In contrast, the opponents of ALG argued that agriculture lacks strong linkages to the other sectors of the economy. They also stated that agriculture does not have the innovative ability to promote labour productivity and export growth (Lewis 1955; Jorgenson 1961). It is also argued that agricultural provision of comparative advantage without industrialisation, usually leads to stagnation in growth (Matsuyama 1992).

Because of these contrasting view-points various existing empirical studies have been conducted to ascertain the theoretical view-point that applies in various countries or group of countries (Awokuse, (2009); Diao, (2010); Raza, Ali & Mehboob (2012); Cao & Birchenall (2013). These studies have divergent views on the impact of agriculture on growth.

Review of Literature

There exists empirical literature which investigated the impact of agriculture on economic growth. Some of these are reviewed in this section. Diao (2010) investigated the role of agricultural growth in the Ghanaian economy based on ten year forecast covering the period of 2010-2020. The method of analysis employed is computable general equilibrium (CGE) model based on simulation. The study drew certain conclusions from the analysis of data. First, with high growth in non-agricultural sectors, the agricultural sector would continue to remain an essential sector of Ghanaian economy. It was also established that rapid growth in manufacturing and services sectors can only occur if there is increase in their competitiveness. Second, a broad-based agricultural development is important for not only accelerated economic growth but also for poverty reduction. Third, it was established that the present agricultural practices through land expansion can lead to environmental degradation and failing output level because of deterioration of land through overuse of land. Agricultural output can be increased through increased productivity of the inputs through improved seed, improved application of fertilizer and improved pesticides, among other things. Fourth, the study established that agriculture has significantly positively stimulated Ghanaian economic growth.

Awokuse (2009) examined the contribution of agriculture to economic growth in developing countries. The study was designed to investigate if agriculture can serve as an engine of economic growth in the less developed countries. The study applied data for 15 African, Asian and Latin American countries. The methods of analysis applied are autoregressive distributed lagged model as proposed Pesaran, Shin and Smith (2001) in carrying out regression using error correction model. The study provided evidence in support of agriculture serving as engine of economic growth.

Kopsides (2012) investigated the impact of peasant agriculture on economic growth in South-eastern Europe for the period of 1870-1940 and from 1960- 2010. The study established that agriculture in the South-eastern Europe is demand driven and that peasant farmers are capable of responding to market signers. The study also established that before 1960s, peasant farming made no significant impact on economic growth of Balkan-states (Romania, Bulgaria, Yugoslavia and Greece). The contribution of peasant farming to Balkan states after 1960s was, however, significantly positive.

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Raza, Ali and Mehboob (2012) examined the role of agriculture in economic growth of Pakistan. The study designed to assess the contribution of agricultural sub-sectors to economic growth for the period of 1980-2012. The study demonstrated that all the agricultural sub-sectors contributed significantly positive to economic growth in Pakistan, except forestry, which made no significant impact.

Sahoo and Sethi (2013) explored the contributions of agriculture and industry to economic growth in India. Data were employed covering the period of 1950-2010. The study established that both agriculture and industry made significant contributions to economic growth of India. Adetola and Etumnu (2013) also investigated the impact of agriculture to economic growth. Their country of investigation is Nigeria. The data applied covered the period of 1960-2011 and the method of analysis applied is the Granger causality framework. The result of the data analysed demonstrated that there is only one-way causality, namely that the growth in agricultural output stimulated economic growth but not verse-versa.

Cao and Birchenall (2013) examined the effect of post reformed agriculture on Chinese economic growth. The study applied micro panel data. Labour was assumed to be highly differentiated. The study established that agriculture contributed to the post reformed Chinese economic growth and manufacturing growth through the releasing of labour from agriculture to manufacturing activities.

Salako, Adedina, Aremu, and Egbekunle (2015) examined the interactions among agriculture, economic growth, and development in the Nigerian economy. The study applied vector autoregressive (VAR) model and the variance decomposition analysis. The paper established that agriculture depressed economic growth in Nigeria. Awam and Atam (2015) investigated the influence of agricultural productivity in Pakistan. The data applied in analysing the study covered the period of 972-2012. The paper applied autoregressive distributed lags (ARDL) model in estimating the parameters of the population studied. The study established that agriculture stimulated economic growth in Pakistan.

Anwar, Farooqi, and Khan (2015) analysed the impact of agriculture on economic growth in Paksitan. The data applied covers the period of 1975-2012. The statistical method applied in estimating the parameters of the model is the OLS regression model. The results indicated that agriculture, trade, and industry output stimulated economic growth in Pakistan.

RESEARCH METHODOLOGY

This research work applied macro panel regression model to explain the impact of agricultural output on economic growth of the ECOWAS countries. The study adopts augmented Solow-Swan growth model as proposed by Mankiw, Romer and Weil (1992) and applied in Kolster (2015). The model employed in this study assumed that per capita GDP is determined by agricultural output per capita (A), other approximate determinants of economic growth (X) and other fundamental determinants of economic growth (E).The general form of this model is stated as:

$$g = F(A, X, E, e). \quad (1)$$

Where: g is the growth rate of the economy.

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$$g_{it} = \beta_0 + \alpha_1 A_{it} + \beta_1 X_{it} + \gamma_1 E_{it} + e_{it}. \quad (2)$$

If g is represented by per capita GDP ($GDPPC_{it}$); A is represented by per capita output of agriculture ($AGPPC_{it}$); E is represented by government expenditure per capita ($GOEPPC_{it}$), private capital stock per capita ($PCAPPC_{it}$), manufactured output per capita ($MAPPC_{it}$) and services output per capita ($SERPPC_{it}$); and E is represented by governance ($GOVIN_{it}$) then equation (2) can be stated, using first differencing as:

$$\Delta GDPPC_{it} = \beta_0 + \alpha_1 \Delta AGPPC_{it} + \beta_1 \Delta GOEPPC_{it} + \beta_2 \Delta PCAPPC_{it} + \beta_3 \Delta MAPPC_{it} + \beta_4 \Delta SERPPC_{it} + \gamma_1 \Delta GOVIN_{it} + e_{it}. \quad (3)$$

In the equation (3) above: $\beta s, \alpha and \gamma$ are estimated parameters. The apriori assumptions are: β_0 is lesser than to or greater than zero; $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4, and \gamma_1 > 0$.

RESULTS AND ANALYSIS

The results of analysed data are presented in this section as follows: (a) panel unit root tests; (b) panel co-integration test; (c) fully modified ordinary least squares; and (d) diagnostic tests.

Table 1(a): Unit root test

Variable	No. of Integration	LLC		Breitung		IPS	
		Stat.	*Prob.*	*Stat.*	*Prob.*	*Stat.*	*Prob.*
$AGPC_{it}$	1(0)	3.333	1.00	3.908	1.00	3.835	1.00
	1(1)	-19.55	0.00	-11.7	0.00	-18.67	0.00
$CAPC_{it}$	1(0)	2.505	0.99	2.452	0.99	1.472	0.93
	1(1)	-12.60	0.00	-3.735	0.00	-14.89	0.00
$ECIN_{it}$	1(0)	-3.086	0.00	1.108	0.87	-3.706	0.00
	1(1)	-	-	-1.376	0.08	-	-
$GDPPC_{it}$	1(0)	3.355	1.00	2.360	0.99	3.503	1.00
	1(1)	-17.90	0.00	-15.06	0.00	-16.94	0.00
$SEVPC_{it}$	1(0)	1.975	0.98	1.679	0.95	1.471	0.93
	1(1)	-16.63	0.00	-9.26	0.00	-15.74	0.00
$GOVPC_{it}$	1(0)	1.975	0.98	1.679	0.95	1.472	0.93
	1(1)	-18.28	0.00	-13.60	0.00	-19.43	0.00
$INDPC_{it}$	1(0)	3.090	1.00	3.030	1.00	3.262	1.00
	1(1)	-20.10	0.00	-11.44	0.00	-18.09	0.00

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Table 1(b): Unit root test

Variable	No. of Integration	ADF Fisher Stat.	Prob.	PP Fisher Stat.	Prob.
$AGPC_{it}$	1(0)	22.1	0.849	29.0	0.52
	1(1)	303.53	0.00	554.94	0.00
$CAPC_{it}$	1(0)	31.50	0.39	18.54	0.95
	1(1)	253.80	0.00	335.32	0.00
$ECIN_{it}$	1(0)	66.52	0.00	56.92	0.00
	1(1)	-	-	-	-
$GDPPC_{it}$	1(0)	11.7709	1.00	14.29	0.99
	1(1)	268.6	0.00	266.9	0.00
$SEVPC_{it}$	1(0)	26.29	0.66	25.25	0.71
	1(1)	248.7	0.00	246.7	0.00
$GOVPC_{it}$	1(0)	26.29	0.66	25.25	0.71
	1(1)	338.7	0.00	362.3	0.00
$INDPC_{it}$	1(0)	15.99	0.98	17.03	0.97
	1(1)	302.28	0.00	393.54	0.00

Tables 1a and 1b show that economic institutions represented by CPI are stationary at a level. The other variables are not stationary at a level but they are stationary after first difference. This implies that they are integrated of order one.Since the variables are integrated, it is important to find out if there is co-integration among the variables. This is done applying Kao co-integration as in Table 2.

Table 2: Kao co-integration Test

Test Statistic	t-statistics	Probability Value	Null Hypothesis
ADF Statistic	-11.21	0.0000	No co-integration

Table 2 clearly shows that the variables applied in estimating the coefficient of the population in this study are co-integrated. The reason is that the t-statistic is very high and has a very low probability that is statistically significant at 1% significance level. Since the data applied are co-integrated, it is very essential to apply time-series regression method that takes into account the co-integration nature of the data. This method is called estimation and inference in panel co-integration model (Kao and Chiang, 2000; Phillips and Moon, 1999) based on FMOLS.

Table 3: FMOLS regression model ($GDPPC_{it}$ is the dependent variable)

Variable	Coefficient	Standard Error	t-Statistic	Probability
$D(AGPC_{it})$	0.265245	0.258623	1.025607	0.3063
$D(GOVPC_{it})$	1.976218	0.131877	14.98535	0.0000
$D(CAPC_{it})$	-0.023171	0.085150	-0.272124	0.7858
$D(INDPC_{it})$	0.134189	0.051250	2.618348	0.0095
$D(SEPC_{it})$	1.118442	0.096431	11.59838	0.0000
$ECIN_{it}$	-166.3058	132.1128	-1.258817	0.2095
Adjusted R^2		68.3%		
Durbin-Watson Statistic		2.063		

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The results of estimated coefficients show that the model explains 68% of variations in per capita GDP. The model also shows that all the estimated parameters have their expected signs except capital stock and economic institutions. These variables have negative terms. The diagnostic test of FMOLS results are presented in the succeeding paragraphs in the form of variance inflation factors (VIFs), coefficient variance decomposition (CVD) and Q-Statistic.

Table 4a: Variance inflation factors (VIFs)

Variable	Coefficient Variance	Uncentered VIF
$D(AGPC_{it})$	0.0669	1.547
$D(GOVPC_{it})$	0.0174	1.106
$D(CAPC_{it})$	0.0093	1.147
$D(INDPC_{it})$	0.0026	1.566
$D(sePC_{it})$	0.0073	1.942
$ECIN_{it}$	0.0669	1.547

Table 4a has low VIFs which indicate that the results of FMOLS have low colinearities among the regressors. The reason is that the VIFs are lower than 8. This implies that the colinearities are not up to high to severe colinearities. This is further confirmed by CVD in Table 4b.

Table 4b: Coefficient variance decomposition

EigenValues	17454	0.068	0.0189	0.0083	0.0063	0.0014
Condition	7.89E-08	0.0201	0.0727	0.1668	0.2197	1.0000
	Associated Eigen Values					
Variable	1	2	3	4	5	6
$D(AGPC_{it})$	0.0007	0.9967	0.001	0.006	0.0008	0.0002
$D(GOVPC_{it})$	7.9E-5	0.005	0.925	0.067	0.0026	5.0E-5
$D(CAPC_{it})$	0.008	0.0051	0.271	0.554	0.161	0.0006
$D(INDPC_{it})$	0.0019	0.025	0.002	0.1179	0.448	0.4057
$D(SEPC_{it})$	0.0003	0.222	0.0357	0.2189	0.4822	0.0404
$ECIN_{it}$	1.000	1.E-14	1.E-16	9.E-16	1.E-15	1.E-19

The first section of the Table 4b row one show that no two variables have low conditional values below 0.0001 as the first condition for high to severe multi-colinearity requires. The second condition requires that two or more variables exhibit high Eigen Values up to 0.85 0r more for high to severe multi-coliearity to exist. Thus, on both criteria multi-colinearity does not exist. The test of first-order autocorrelation is presented in Table 4c.

Table 6: Q-Statistics

Period (Year)	Auto-Correl.	Partial Auto-Co	Q-Statistic	Probability
1	-0.029	-0.029	0.2049	0.651
2	-0.351	-0.352	30.766	0.000
3	0.025	0.002	30.923	0.000
4	-0.046	-0.192	31.446	0.000
5	-0.003	-0.002	31.448	0.000
6	-0.011	-0.116	31.481	0.000
7	-0.130	-0.158	35.774	0.000
8	-0.025	-0.117	35.938	0.000
9	-0.081	-0.256	37.615	0.000
10	-0.104	-0.266	40.387	0.000

Table 4c shows that there is no auto-correlation of the first-order. The reason is that the probability of the Q-Statistic is lower than the significance level at 1%. This result agrees with

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the Durbin Watson statistic value of 2.06 which reject the null hypothesis that the FMOLS has first-order auto-correlation.

The results of FMOLS show that agricultural output per capita has no significant impact on per capita GDP growth of ECOWAS countries. The reason is probably due to the existence of surplus labour force in agriculture in the ECOWAS countries. The results also show that capital stock and economic institutions have not significantly impacted on per capita GDP growth in the region.

The FMOLS results, however, show that government expenditure per capita, service sector output per capita and industrial output per capita have engendered per capita GDP growth of ECOWAS. The results show that government expenditure per capita has the highest impact on per capita GDP growth in ECOWAS. The service sector output and the industrial output per capita exhibit the second and the third highest contribution to per capita GDP increase in ECOWAS countries. The above agrees with previous literature (Diao, 2010; Awokuse, 2009; Kopsides 2012; Raza, Ali & Mehboob, 2012; Sahoo & Sethi, 2013; Adetola & Etumnu 2013; Cao & Birchenall, 2013; Salako, Adedina, Aremu, & Egbekunle, 2015; Anwar, Farooqi, & Khan 2015).

SUMMARY OF FINDINGS

Capita stock per capita exerts no significant impact on per capita GDP in ECOWAS sub-region, apparently due to inefficiency of investment of resources in the ECOWAS sub-region due to corruption and diversion of public investment for private purposes. In some cases, public investments are poorly executed so that funds invested in providing infrastructures do not yield the desired results. Furthermore, investments in public resources are destroyed as it happened in Liberia, Mali and Nigeria due to civil wars and religious militants and other militancy. In either of these cases the effect of capital stock on economic growth may be hampered and public investments in be adversely affected.

Economic institutions have not promoted economic growth in ECOWAS countries. The reason is probably due to the economic institutions in the ECOWAS region not attaining the threshold to engender economic growth.

Government provision of services per capita or government expenditure per capita has promoted per capita GDP growth in ECOWAS sub-region, due to the government provision of services generating externalities that promotes the productivity of private sector activities.

Industrial sector output per capita stimulated per capita GDP in ECOWAS countries. The reason being attributed to industrial sector's disposition engage in backward and forward linkages with other sectors in the economy. It might also be related to the capability of the industrial sector transferring technologies to the other sectors in the economy.

The service sector output per capita has enhanced per capita GDP growth of the ECOWAS sub-region, owing to possible increase in the size of modern services in the ECOWAS sub-region like communication, information technology, industrial services, and transportation services. These services employed high skilled labour capable of having high marginal productivity and increasing output level significantly.

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CONCLUSION

The study concluded that, while agricultural output contributes significantly to GDP growth per capita in ECOWAS sub-region in areas such as Government provision of services per capita (government expenditure per capita), industrial sector output per capita, and service sector output per capita; it does not do so in terms of Capita stock per capita and Economic institutions.

Recommendations

The study recommends the following:

To ensure that agricultural output stimulates economic growth in the ECOWAS sub-region, agricultural processing industries and other manufacturing outfits should be established. These would employ surplus labour engaged in agricultural sector in ECOWAS countries. Specifically:

To ensure that capital stock per capita enhances growth in ECOWAS capita GDP, efficiency in use of capital must be improved and corruption in official offices be checked. Conflicts that lead to destruction of public utilities must be minimised.

Hasten the improvement of the quality of economic institutions so as to reach the threshold where economic institutions will stimulate growth in ECOWAS countries.

Since government expenditure has not attained the optimum size in ECOWAS countries increasing government spending will increase the productivity of the private sector and by extension promotes economic growth of ECOWAS countries.

Industrial sector output per capita in ECOWAS countries should be enhanced to further encourage technology transfer as well as backward and forward linkages to other sectors of the economy; since this may lead to increase investment in ECOWAS countries thereby, enhancing economic growth of these countries.

Encourage continuous expansion of the modern service sector in ECOWAS sub-region so as to further promote economic growth of ECOWAS countries

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