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An Empirical Assessment of the Contribution of Agricultural Sector to Nigerian Economy (1970-2012)

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ABSTRACT
The agricultural sector plays a very important role in the overall economic growth and development of a country, of which Nigeria is not exempted. One major reason for this is that the sector provide food, raw materials, employment, foreign exchange which further drives industrialization and thus development. This paper thus analyses the impact of agricultural sector to the economic growth and development (GDP) of the Nigerian economy and also the effect of various subsectors under the agricultural output with the aid of the Ordinary least square technique. Data on relevant variables were collected from the database of the Food and Agricultural organisation, 1970-2012. The data series were examined using econometric models Statistical analyses were performed using Eview 8. The results also indicated that the agricultural sector had a significantly positive impact on the Nigerian growth and development with a coefficient of 1.0286 for agriculture , 0.6693 (Building and construction)1.007 (industry),0.7518 (services) and 1.212 (wholesale). with an R^2 of 0.9995. The findings of this work thus show that various effect of the various subsectors showed they contributed significantly to agriculture and by extension the GDP. Hence it can thus be deduced that a good performance of an economy in terms of GDP growth may therefore be attributed to a well developed agricultural sector. Based on the findings, the following recommendations are pertinent -that Government should provide the enabling environment that will help improve the level of productivity of agricultural sector.
Keywords: Contribution of Agriculture, GDP growth, the Nigerian economy, Eview.

INTRODUCTION

Agriculture has been playing a very important role in contributing to Nigeria's economy. It has been the most important single activity in the Nigeria economy, during the first decade (1961-1971) after independence (Ogen, 2003). From the standpoint of occupational distribution and contribution to the Gross Domestic Product, agriculture was the leading sector contributing about 50% of the Gross Domestic Product (GDP), employing about the same percentage of the working population, and accounting for about 90% of foreign earnings and Federal Government revenue. During this period, Nigeria was the world's second largest producer of cocoa, largest exporter and producer of palm products. Nigeria was also a major exporter of leading commodities such as cotton, groundnut, rubber, hides and skins (Alkali, 1997 cited in Gbaiye, Ogundipe, Osabuohien, Olugbire, Adeniran, Bolaji-Olutunji, Awodele and Aduradola,2013). This situation began to change drastically with the exploration and

exploitation of crude oil. In spite of the predominance of the petroleum sub-sector in Nigeria's economic growth and development, agriculture remains a major source of economic resilience (Ojo and Akanji 1996). The situation has not changed though the principal foreign exchange earner be crude oil. Substantiating this claim in 1993 at 1984 constant factor cost, agriculture accounted for about 37.50% of the Gross Domestic Products (GDP). However, the oil boom in the early 1970s caused a drastic fall in the percentage contribution of the agricultural sector to 35 percent of GDP in the early 1980s.

Similarly, Okolo (2004) described agricultural sector as the most important sector of the Nigeria's economy which holds a lot of potentials for the future economic development of the nation as it had done in the past. Notwithstanding the enviable position of the oil sector in the Nigerian economy over the past three decades, the agricultural sector is arguably the most important sector of the economy.

Tunji (2013) noted that it may come as a surprise to many but Nigeria does rank sixth worldwide and first in Africa in terms of agriculture product output, though the sector has suffered from years of mismanagement, inconsistent and poorly conceived government policies, neglect and the lack of basic infrastructure. Still, the sector accounts for over 33.09% of GDP and two-thirds of employment within the nation. Nigeria is no longer a major exporter of cocoa, groundnuts (peanuts), rubber, and palm oil, and also lost its position as the biggest poultry producer in Africa with corporate poultry output slashed from 40 million birds annually to about 18 million. Despite this scenario, Nigeria still boasts of a robust agricultural production line that includes cassava (tapioca), corn, cocoa, millet, palm oil, peanuts, rice, rubber, sorghum, and yams.

Table 1 Contribution of Agriculture to Gross Domestic Product (1970-2012)

Period	GDP (Million)	Value of Agric output (Million /tones)	Share of Agriculture in GDP (%)
1970-1979	182,056.21	45,826.98	25.17
1980-1989	1,919,034.62	603,993.55	31.47
1990-1999	2,854,827.29	968,958.66	33.94
2000-2012	7,806,895.31	3,180,710.71	40.74

Source: Authors compilation from FAO Statistical Bulletin

The Table 1 shows the contributions of agriculture Nigeria's GDP. The figures indicate that agriculture contribute significantly to the GDP with the highest being 2000 - 2012 period having 40.74. The Federal government has promised to improve this trend due to the present dwindling price of crude oil. Currently the Delta state government is pursuing a policy of Delta beyond oil.

Statement of the Problem

Several studies have focused on understanding the association between agriculture and economic growth, yet there is some disagreement. Some researchers have shown that agriculture affects economic development /growth either positively, negatively or no evidence at all .Some researchers have argued that agriculture should be the foundation of economic growth (Gollin, Parente & Rogerson, 2002; Thirtle, Lin & Piesse, 2003 Coelli *et al* 2003; Tiffin and Irz 2006; Trimmer, 2005.Enu ,2014), others claim that the linkages agriculture has with other sectors are too weak and its innovative structures inadequate for promoting economic growth (Ranis and Fei, 1961; Jorgenson, 1961,and Murphy *et al*.1989; Mundak *et al* ,1989; Rosegrant *et al* 199; Galen et al 2000 cited in Enu,2014).

However, the relationship between the agriculture sector and other sectors should not be a competition but rather be viewed as interdependent where supply and demand in sectors can be accommodated through strengthened linkages (Adelman, 1984; Sabry, 2009).

However, from available literature reports despite Nigeria's rich agricultural resource endowment; there has been a gradual decline in agriculture's contributions to the nation's economy (Manyong et al., 2005; Ekpo and Umoh, 2012; Mohammad and Atte, 2006) as evident in the contribution of agriculture to the GDP of the nation as well as the rising value of food import (CBN, 2010). This development prompted

various government in Nigeria to initiate several agricultural policies/projects and programmes to enhance agricultural productivity in Nigeria; such as the the Agricultural Development Programmes, Operation Feed the Nation (OFN), presidential initiatives in 2004-2005, prominent among which was the cassava projects, the 7-Point Agenda with emphasis on Food security, and the recent Agricultural Transformation Agenda of the last administration. presently the current government is pursing diversification of the economy. (Ehigiamusoe, 2012) opined that despite all the aforementioned policies and programmes, the performance of the Agricultural sector in Nigeria is abysmal in terms of product contribution, factor contribution, market contribution and foreign exchange contribution as well as rising value of food import. Based on the foregone presentation, the questions are: what are the current trends in agricultural contribution to Nigeria economic growth? what is contribution of the agricultural sector to Nigerian economic growth (GDP)and what is the contribution of the agricultural sub sector to Nigerian economic growth (GDP).

Justification of the Study

Several studies, both locally and internationally have been conducted on sectoral contribution to national GDP to economy's. The results of this research will add to the existing body of literature and will also provide useful information for Economic Planning of the nation. We also envisage that the result of this study would help create an awareness of the productivity of the various agricultural subsectors to the Nigerian economy and the policy makers and finally it will provide the necessary tool to enable the nation to adopt strategies for improve diversification of the Nigerians economy, which will help to achieve the growth and development of the economy.

Objectives of the Study

Centrally, the study is intended to ascertain the contribution of the agricultural sector to the Nigerian economy from 1970 to 2013. It will examine the descriptive statistics of the variables. The study also, will accomplish the following: Evaluate the contribution of the agricultural sector to Nigerian economic growth (GDP), and ascertain the contribution of the agricultural sub sector to Nigerian economic growth (GDP).

Research Hypotheses

For the purpose of this research, we have the following null hypotheses:

H_{01}: Agricultural sector has not contributed significantly to the gross domestic product of the Nigerian economy

H_{02}: Agricultural sub sectors has not contributed significantly to the gross domestic product of the Nigerian economy

REVIEW OF RELATED LITERATURE

Enu (2014) carried out a study of the agricultural sector on the Ghana's economy he noted that the sector contributed significantly to the country's economic growth. Similar Aminu and Anono (2012) carried out a study in Nigeria, they noted that the agricultural sector contributed higher than the petroleum sector, though they both possessed a positive impact on economic growth and development of the economy, they further noted that a good performance of an economy in terms of per capita growth may therefore be attributed to a well developed agricultural sector capital.

Ekpo and Umoh (2012) revealed that the contribution of agriculture to GDP, which was 63 percent in 1960, declined to 34 percent in 1988, not because the industrial sector increased its share but due to neglect of agriculture sector..However Oji-Okoro (2011) investigate the contribution of agricultural sector on the Nigerian economic development and reveal that foreign direct investment on agriculture contribute the most (56.43), this means that for every unit of change in FDI on agriculture there is a corresponding change of 56.43 unit in GDP in Nigeria.

Suleiman and Aminu (2010) conducted research on the contribution of agriculture, petroleum and manufacturing sector of the Nigerian economy and found out that agricultural sector is contributing higher than both petroleum and manufacturing sectors. The paper reveals that agriculture is contributing 1.7978 units to GDP while petroleum is contributing 1.14 units to GDP which is less than the contribution

of agriculture. Awe and Ajayi (2009) conducted research on the diversification of the Nigerian revenue base for economic development reveals that the R^2 for agricultural revenue was significant when the log of revenue from agriculture was tested on the revenue from agriculture. About 60 percent of the movement could be explained in the relationship. The findings from the study further revealed that dynamic relationship exists between the revenue from the non-oil sector economic development.

Muhammad and Atte (2006) conducted study on production of agriculture in Nigeria and revealed that the negative coefficient of the value (-0.07) of the food imports indicates that as food import increases, domestic agricultural production decreases. While a positive coefficient (286.91) of the GDP growth rate indicates that increase in the GDP also moves domestic agricultural production in the same direction. This shows that increased domestic economic activity has the impact of increasing the domestic agricultural production. This is likely due to the fact that that most economic activity in the country are agriculture related.

DATA AND METHOD OF ANALYSIS

Data Collection

Data were obtained from the database of the Food and Agricultural organization (FAO), spanning through a period from 1970 to 2013 (44 years),

Method of analysis

The research work makes use of the econometric procedure in estimating the relationship between the variables. The ordinary Least Square (OLS) technique was employed in obtaining the numerical estimates of the coefficients of the equation. Since GDP is made up of various subsectors : agriculture ,service ,industry, wholesale, building and construction . While agriculture is made up of various subsector such as crops, livestock, fisheries and forestry sectors. The model used in this work was adopted from the work of Enu (2014) and Akarue (2014) .The resulted equation. Thus:

Models specification

The first regression model is specified as:

$$\mathbf{GDPt = \beta o + \beta_1 AGRICt + \beta_2 INDTRYt + \beta_3 BACt + \beta_4 SERt + \beta_5 WHSALEt + et}$$

GDP = Gross Domestic Product at Basic constant factor,

Where:

AGRIC = agriculture output (₦'M), measured as its contribution to GDP growth.

SER = services output (₦'M), measured as its contribution to GDP growth.

INDTRY = industry output (₦'M), measured as its contribution to GDP growth.

BAC=building and construction output (₦'M), measured as its contribution to GDP growth.

WHSALE=wholesale output (₦'M), measured as its contribution to GDP growth.

ε = error term

The second regression model is specified as:

$$\mathbf{GDPt = \beta o + \beta_1 CRPt + \beta_2 LISTKt + \beta_3 FHYt + \beta_4 FORYt + et}$$

Where:

GDP = Gross Domestic Product at Basic constant factor,

CRP = Crop industry value (₦'M), measured as its contribution to agriculture in GDP.

LISTK = Livestock industry value (₦'M), measured as its contribution to agriculture in GDP.

FHY = Fisheries industry value (₦'M), measured as its contribution to agriculture in GDP.

FORY = Forestry industry value (₦'M) measured as its contribution to agriculture in GDP.

While "et" is the random error term,

βo and β_1- β_5 are the intercept and slope coefficients respectively

Apriori Expectation: b0> 0, b1>0,

RESULTS AND DISCUSSION

Descriptive Statistics

The first step in dealing with most dealing with most time series data is to examine the nature of the data series. This is because the preliminary understating about the nature of time series data is that there is no consistency in the variables over a long period of time.

Table 2: Descriptive statistics for the various variables

	AGRIC	BUILDING & CON	SERVICE	WHOLESALE	GDP	INDUSTRY
Mean	111616.0	6036.840	42856.07	45503.50	296809.6	89750.66
Median	87503.53	5084.400	28285.33	36984.48	267550.0	108081.0
Maximum	348490.8	19504.62	180862.6	177049.6	888892.7	162985.3
Minimum	1808.700	221.0000	778.3000	512.9000	4219.000	819.1000
Std. Dev.	102796.2	4407.506	45652.80	44071.31	243706.7	55533.47
Skewness	0.906257	1.266058	1.442883	1.482898	0.770362	-0.481188
Kurtosis	2.707883	4.438735	4.266432	4.570510	2.814779	1.907308
Jarque-Bera	6.038881	15.19615	17.79392	20.17854	4.314582	3.798587
Probability	0.048829	0.000501	0.000137	0.000042	0.115638	0.149674
Sum	4799490.	259584.1	1842811.	1956650.	12762813	3859278.
Sum Sq. Dev.	4.44E+11	8.16E+08	8.75E+10	8.16E+10	2.49E+12	1.30E+11
Observations	43	43	43	43	43	43

Table 2 presents the descriptive statistics for the GDP and other variables. All variables show a positive mean returns. Also the sum of squared deviation row represents the net change over the sample period and all were positive. The result also shows that the variables were positively skewed except for industry which was negatively skewed. However, all the variables are normally distributed as showed by the p values of Jarque Bera statistic. As a decision rule any value above 3 shows that the particular variable is normally distributed

Trend analysis results

It could be observed in Figure 1 that the overall share of agriculture to GDP has an downward undulating trend.

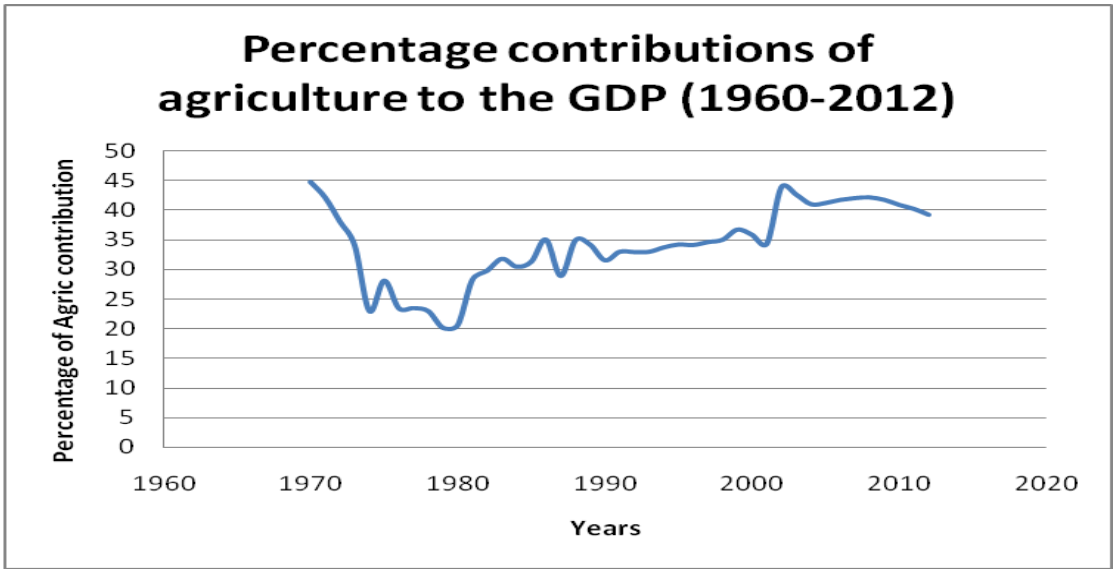

Figure 1

The downward trend however was not steady with 44.74% in 1970 to 22.98% in 1974 . the contribution again increased but later reduced and in 2002 agriculture contribution stood at 43.89% from where it fall downward to 40.19% in 2011 and 39.89% in 2012. The abrupt decline from 1970-1979 resulted in the advent of commercial exploitation of oil resources, which turned the trend against agriculture and its downstream industries. The oil boom, heralded an era of decay and decline in agriculture and its overall contribution to the economy, as evidenced by the Dutch Disease. (Ahungwa *et al* ,2014) . The trend between 1970-1974 periods coincided with the result of the Second National Development Plan (1970-74) which spelt out a more defined approach towards food production as the main nexus of the plan because of the Nigerian civil war which created hardship due mainly to food shortages (Andohol, 2012).

Regression Analysis

Table 3 shows the summary of result for the regression result of subsectors on GDP. Majority of the estimated coefficients have the expected signs, thus meeting a priori expectations.

Table 3. Parameters of regression results of agriculture and other components of the GDP against total GDP

Dependent Variable: GDP
Method: Least Squares
Date: 05/18/16 Time: 21:03
Sample: 1970 2012
Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGRIC	1.028676	0.081128	12.67960	0.0000
BUILDING__CONSTRUCTION	0.669344	0.750620	0.891722	0.3782
INDUSTRY	1.006770	0.048834	20.61626	0.0000
WHOLESALE	1.211755	0.144195	8.403560	0.0000
SERVICE	0.751797	0.226781	3.315081	0.0020

R-squared	0.999501	Mean dependent var	296809.6
Adjusted R-squared	0.999449	S.D. dependent var	243706.7
S.E. of regression	5721.936	Akaike info criterion	20.25095
Sum squared resid	1.24E+09	Schwarz criterion	20.45574
Log likelihood	-430.3953	Hannan-Quinn criter.	20.32647
Durbin-Watson stat	2.248239		

Source: Data analysis ,2015

Based on the Durbin Watson statistics from the regression (2.24), It indicates the presence of no autocorrelation since this value (DW = 2.24) falls between 1.5 and 2.5 judging from the rule of thumb. The magnitude of the coefficient of determination, (R^2), and the F statistics show the equation's goodness of fit and significance of estimated relationships. The adjusted $R^2$and unadjusted R^2 imply that the overall fit is satisfactory with an R squared of 0.999501 and 0.99945 respectively, which implies a good fit of the model , Also R^2<DW, which implies that the results obtained is not spurious. The low values of Akaike information and Schwarz criterion, 20.25 and 20.46 respectively confirms further the fitness of the model. Thus based on the above it implies that the model is good and can be used to make inferences.

Table 3.0 also indicated that, a 1% increase in agricultural output will cause GDP growth to increase by 102.86%. This implies that a positive link exists between agricultural output and economic growth and development. It is statistically significant at 5% significance level as indicated by ($p<0.05$). Thus, if we increase agriculture output, then GDP growth will also increase. The positive relationship and statistically

significance of agriculture to GDP according to Anyanwu *et al* (2013) is not surprising. This assertion authenticate the results of Enu (2014), Ahungwa, *et al* (2014) Aminu and Anono (2012), Umaru and Zubairu (2012) and Kola (2011) ,Todaro and Smith (2009), Ogen (2003);]. who variously affirmed the in some cases dominance of agriculture's and contribution to GDP of Nigeria. In regards to this result, the more investments is channelled into the agricultural sector, there is likely going to be an increase in Nigeria's GDP growth especially in the face of dwindling price of crude oil.

Similarly, the findings also revealed that industry has positive relationship with GDP growth. A 1% increase in industry output will cause 100.68% increase in GDP growth. This finding is consistent with Good luck Jonathan (2011) assertion that realization of Nigeria's vision 2020 lies greatly on the manufacturing sector, this was corroborated by Ahungwa, *et al* (2014) and Akarue (2015).

A positive relationship between the services sector and economic growth was indentified. A 1% increase in service output will cause GDP growth to increase by 75.17%, This finding is consistent with Enu (2014) and Ahungwa, *et al* (2014)

The results also indicate that both the coefficient of wholesale sector is statistically significant at 5 percent level as indicated by the probability values of 0.000. This implies that a percentage increase in the contribution of wholesale will increase the GDP by 122.780 percent, higher than other individual sectors, which is consistence to our priori expectation. The significant nature is consistent Ahungwa, *et al* (2014) but as a dominating sector.

The building and construction sector was also found to significant at 5% with a coefficient of 0.6693. This implies that a percentage increase in the contribution of building and construction sector will increase the GDP by 66.93%, this is however the lowest compared to other sectors of the economy.

Table 4. Parameters of regression results of agriculture Sub sectors against total GDP

Dependent Variable: GDP
Method: Least Squares
Date: 06/07/15 Time: 20:05
Sample: 1970 2012
Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1542.787	4301.973	-0.358623	0.7219
CROP	1.560225	0.113349	13.76484	0.0000
FISHING	4.491541	3.018272	1.488116	0.1450
FORESTRY	-1.587952	12.20302	-0.130128	0.8972
LIVESTOCK	14.42368	3.889046	3.708796	0.0007

R-squared	0.997627	Mean dependent var	296809.6
Adjusted R-squared	0.997378	S.D. dependent var	243706.7
S.E. of regression	12479.99	Akaike info criterion	21.81058
Sum squared resid	5.92E+09	Schwarz criterion	22.01538
Log likelihood	-463.9276	Hannan-Quinn criter.	21.88611
F-statistic	3994.517	Durbin-Watson stat	1.344602
Prob(F-statistic)	0.000000		

Source: Data analysis ,2016

From Table 4 the value of the Durbin Watson statistics is 1.34.This implies that the estimation is not spurious since R^2<DW. The F statistic which is 3994.517 is also statistically significant at 5% level with a probability of 0.00000. The adjusted W (0.997627) and unadjusted R^2(0.997378) imply that the overall

fit of the model is very satisfactory In addition; this implies the overall regression model is statistically significant and therefore, can be used to make inferences.

From Table 4, based on the findings a 1% increase in crops will cause GDP growth to increase by 156.0225%. This implies a positive link exist between crops and economic growth. This indicates that crops do have a substantial significant effect on Nigeria's GDP growth. This result is at variance with Enu (2014), but consistent with Ighodaro,(2006) Olayide and Essang,(1976).

The coefficient of forestry is negatively signed and is statistically insignificant judging from the probability value of 0.8972. A 1% increase in forestry will cause GDP growth to decrease by 158.7952%, all other things remaining the same. This indicates that forestry do not have a substantial or statistically significant effect on Nigerian's GDP growth in the long run. This result obtained is consistent with Foster and Rosenzweig, (2003), Faleyimu (2013) and Enu (2014). CBN (2004) noted that the performance of forestry in GDP contribution contrasts sharply with the rising profile of resource extraction from the sub-sector and as a major revenue generation in the Ministry of Agriculture, and other Ministries where they are located. This problem may not have been unconnected with lack of transparency, accountability and high level of corruption that had eaten deep into the fabric of the sub-sector. Faleyimu (20130 further noted that the declining export role of forest produce in the national economy is partly due to the over-exploitation of the high quality timbers in the previous decades and partly to the inability of the forest departments and the timber trade to develop the secondary species which now constitute the main timber contents of the forest estate.

The coefficient of fishery is negatively signed and is statistically insignificant from the probability value of 0.1450. A 1% increase in fishery will cause GDP growth to decrease by 449.1541%, all other things remaining the same. This indicates that fishery do not have a substantial or statistically significant effect on Nigeria's GDP growth and this is also true judging from the p- value. This result obtained is consistent with Enu (2014) but at variance with Faleyimu (2013)

CONCLUSION AND RECOMMENDATIONS

Based on the analysis presented above it is apparently clear, that agricultural sector contributes significantly to Nigeria's GDP. The finding showed agricultural sector on the average contributes about 34.21 percent to the economy from 1970-2012, while crop and livestock were the significant sub sectors that contribute significantly to the agricultural sector. Olajide, et al,2013, noted that the negative perception and orientation of the average Nigerian about agriculture sector should be disabused so that these sectors can contribute optimally to GDP. However, with the fall in crude oil prices agriculture is a sure way to increase economic growth.

It is recommended that Government should do the following

1. Increase her budgetary allocation to the agricultural sector
2 Emphasis should be on the crop and livestock subsectors while not neglecting the fishery and forestry sub sectors.
3 The provision of infrastructural facilities and the development of the manufacturing sector which will provide the necessary drivers for the agricultural sector since they will be the consumers of the excess raw materials to avoid wastage.

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