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The Impact of Agricultural Output on Economic Growth In Nigeria (1981-2015)

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Abstract*: The study examined the impact of agricultural output on economic growth in Nigeria. The data were obtained from the CBN statistical bulletin and analysed using econometric methods being the Ordinary Least Squares (OLS), Co-integration, Augumented Dickey Fuller Unit Root test, Error Correction Mechanism (ECM) and Causality tests. The results showed that, livestock and fish production were positively signed and statistically significant at 5 percent. The R^2 and F-statistic indicated the goodness of fit of the model; the DW value (0.34) indicated the existence of serial auto correlation among variables in the model. The Johansen co-integration results showed that there were two co-integrating equations. Results from the ADF test carried out revealed that the variables were stationary at first difference and second difference. The ECM results showed a long-run equilibrium relationship between the dependent and independent variables but no long-run causality relationship. The Causality (Walds) test carried out showed that short run relationship existed between economic growth (GDP); livestock and fish production. Finally, the LM test showed that serial autocorrelation no longer existed in the model. The study therefore recommended that efforts should be made by the government to promote the agricultural sector of the economy so as to boost agricultural productivity and as such improve the growth of the economy.*

Keywords: *Agricultural output, economic growth, Nigeria*

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I. Introduction

Nigeria is a country that is situated in the South of the Sub-Saharan Africa and occupies a total land area of 93 million hectares, which lies between longitude 3^o and 14^oE and latitudes 4^o and 14^oNorth. The ecological diversity of Nigeria ranges between the southern mangrove and the northern Sahel. As a consequence, there is considerable diversity in response to the ecological variability. It is one of the largest countries in Africa, with an estimated population of about 158 million (World Bank, 2010). The country has highly diversified agro-ecological conditions, which makes it possible for the production of variety of agricultural products. Furthermore, agriculture constitutes one of the most significant sectors of the economy (Manyong, et. al., 2005).

Agriculture accounts for about 70% of the working population and contributes with about 60% to the national income. Its contribution to Gross Domestic Product (GDP) accounted for about 40% in 2010 (CBN, 2011). During the early days of independence, Nigeria was food self-sufficient and was well known for its global position in major agricultural commodities and foreign exchange earnings from agricultural exports which have been used over the years to support in financing imports needed for economic growth and development (Akinwumi, 2013).

Preceding the emergence of oil in the early 1960s and 1970s, the production and export of agricultural products such as groundnuts, palm oil, cocoa, cotton, coffee, hides and skin, cattle, to mention a few was what the Nigerian economy was largely dependent on. Contributing about 80% of the Gross Domestic Product (GDP) and accounted for over 70% of employment, the agricultural sector was and still is the backbone of our economy (Ogunkola, 2008).

At the on-set of the oil boom in late 1970s, the Nigerian economy became a mono-cultural one with oil being the major source of income which led to the neglect of all other sectors including the agricultural sector (Ogunjimi *et al.*, 2015). This led to the production hurdles of the agricultural sector which has significantly stifled the performance of the sector. Over the past 20 years, value-added per capita in agriculture has risen by less than 1 percent annually. It is estimated that Nigeria has lost USD 10 billion in annual export opportunity from groundnut, palm oil, cocoa and cotton alone due to continuous decline in the production of those commodities (FAO, 2017). Hence, despite having the largest economy in Africa, the country still experiences an increasing rate of unemployment and poverty (WDI, 2013).

In spite of Nigeria's rich arable land which favours increased agricultural production, the agricultural sector is still growing at a very slow rate. It is only a little over half of the country's agricultural land that is under cultivation (Manyong et al, 2005), hence contributing to the dwindling performance of agriculture in the country. The government have over many years formulated and implemented various policies and projects aimed at putting back the agricultural sector to its vital place in the economy. But with evidence from empirical literatures, no significant success has been achieved due to several problems confronting the performance of the sector (Yusuf, 2014).

Can the rich agricultural endowment be crucial catalysts to the nation's economic growth? The answer to this question is what prompted the researcher's desire to examine the impact of agricultural output on the economic growth in Nigeria from the period 1981-2015

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II. Objectives of the Study

1. Examine the impact of crop production on economic growth in Nigeria.
2. Examine the impact of livestock production on economic growth in Nigeria.
3. Examine the impact of fish production on economic growth in Nigeria.

III. Statement of Hypotheses

H_{01}: Crop production does not significantly affect economic growth in Nigeria.
H_{02}: Livestock production does not significantly affect economic growth in Nigeria.
H_{03}: Fish production does not significantly affect economic growth in Nigeria.

IV. Theoretical framework

Olutoye and Olutoye, (2014) examined the contribution of agricultural sector to Gross Domestic Product (GDP) between 1990 and 2013. The Ordinary Least Square (OLS) multiple regression method was used to analyze the data. The results revealed a positive cause and effect relationship between agricultural output and gross domestic product (GDP) in Nigeria. Specifically, the study clearly shows that Agricultural Output has a strong influence on the Gross Domestic Product (GDP) with an estimated contribution of 30.2% between 1970 and 2000 before the neglect of this sector during the oil boom in the 1970s. In order to improve agriculture, government should see that special incentives are given to farmers and basic infrastructural facilities such as stable electricity, good road networks, and adequate water supply are readily provided.

Aroriode and Ogunbadejo, (2014) estimated the impact of macroeconomic policies on agricultural growth in Nigeria using time series data and econometric analysis. The results show that Gross Domestic Product (GDP),Credit Loan to Agriculture (CLA)and exchange rates are significant with positive influences. Income elasticity of agricultural growth was low at 0.939 percent indicating the income inelastic nature of agricultural commodities. There is a positive relationship between the dependent variable (Agricultural Output) and the independent variable (GDP). On the other hand, money supply has an inverse relationship (negative influence) on agricultural production which is contrary to expectations. The interest rate is positive but insignificant which can be explained by the restrictive monetary policies. Equally, a restrictive monetary policy can cause farm incomes to fall.

V. Methodology

Research Design

The research adopted the quasi-experimental design where the econometric analysis techniques of Ordinary Least Squares (OLS), multiple regression, co-integration/error correction methods and granger-causality test.

Sources of Data

The data used were sourced from Central Bank of Nigeria bulletins, several relevant, reputable journals and data from the internet. The study is basically time series based. Data for the study were generated from the Central Bank of Nigeria Statistical Bulletins. The data which are secondary in nature covers the period between 1981-2015. The data shall include those on gross domestic product, livestock, crop and fish production.

Model Specification

The functional and econometric relationship between the dependent variable and the independent variables are provided in the equation below:

$GDP = f(CPRD, LPRD, FPRD)$ 3.1

$\log GDP = a_0 + a_1 \log CPRD + a_2 \log LPRD + a_3 \log FRD + U$

Where;

GDP = Gross Domestic Product
CPRD = Crop Production
LPRD = Livestock Production
FPRD = Fish Production

Log = Natural logarithm
On the a priori, we expect; $a_1 > 0$, $a_2 > 0$, $a_3 > 0$.

VI. Results and Discussions

Table 1 Summary of the OLS Regression Results

Variables	Coefficient	t-cal	t-tab (0.05, 34)	Sig. T	R^2	F-cal (0.05, 4, 34)	F-tab	Sig. F	DW statistics
Constant	3.791785	9.196924	1.697	0.0000	0.9945	1873.269	2.69	0.000000	0.34
CPRD	0.246601	1.600612		0.1196					
LPRD	0.403527	2.202929		0.0352					
FPRD	0.345172	2.660135		0.0123					

Source: *Authors' Computed Result from (E-views 9.0)*

From the table, the R^2 of 0.994 implies that 99.4% variation in the dependent variable is explained the independent variables. The F-value (1873.269) and its corresponding probability value (0.00000) indicate the statistical significance of the model. The model also shows that two independent variables (livestock and fish production) are positively signed and statistically significant at 5 percent. This agrees with the a priori expectation. Although crop production is positively signed, it is not statistically significant at 5 percent. The Durbin Watson value (0.34) also indicates the presence of serial auto correlation of the variables in the model.
The presence of serial auto correlation in the model means that the successive values of the error term are serially dependent or correlated. The result is fairly good and may be misleading when adopted for policy making because of the existence of serial autocorrelation. This could be as a result of the non-stationarity of the time series data used for the study. Therefore, there is need to systematically carry out stationarity (unit root) test and the long run analysis in order to confirm the long run equilibrium of the model.

Table 2 Unit Root Test Results for Stationarity

Variables	ADF Test	1% critical value	5% critical value	10% critical value	Order of integration
GDP	-8.807383	-4.273277	-3.557759	-3.212361	I(2) 2nd difference
CPRD	-5.326942	-4.262735	-3.552973	-3.209642	I(1) 1st difference
LPRD	-7.291029	-4.284580	-3.562882	-3.215267	I(2) 2nd difference
FPRD	-5.849872	-4374307	-3.603202	-3.238054	I(2) 2nd difference

Source: *Authors' Computed Result from (E-views 9.0)*

The stationarity test presented in table 2 showed that the variables are non-stationary at levels as indicated by their corresponding probability values. It was found that the variables are difference stationary with GDP, LPRD, and FPRD being stationary at order two (second difference) and CPRD stationary at order one (first difference). Hence, the entire variables in this study are stationary although at order one and two. This therefore means that the best regression results will not be obtained when the above variables are used to estimate the model. The reason for this is that using the OLS regression techniques at levels in estimating the model would lead to spurious regression results since none of the variables were stationary at levels.

Table 3 Test for Co-integration

Eigen value	Trace statistics	5% critical value	Prob.**	Hypothesis of CE(s)
0.670908	72.35565	47.85613	0.0001	None*
0.528245	35.67888	29.79707	0.0094	At most 1*
0.210172	10.88616	15.49471	0.2186	At most 2
0.089666	3.100146	3.841466	0.0783	At most 3

Source: Authors' Computed Result from (E-views 9.0)

Trace statistics indicates 2 co-integration equations at the 0.05 level.
*Denotes rejection of the hypothesis at the 0.05 level

The co-integration test results are presented in table 3 reveals that the trace statistics show that 2 co-integrating equations exist in the model because the value of the trace statistic is greater than the 5 percent critical value.

Thus, the null hypothesis of no co-integration, among the variables was rejected. There is thus, a long-run equilibrium relationship among the variables. Given that there are 2 co-integrating equations, the requirement for fitting in an error correction model is satisfied.

Table 4 Error Correction Model (ECM) Result

Dependent Variable: D(GDP)
Method: Least Squares
Date: 06/22/17 Time: 17:03
Sample (adjusted): 1984 2015
Included observations: 32 after adjustments
D(GDP) = C(1)*(GDP(-1) + 16.9609585762*CPRD(-1) - 1385.86211787 *FPRD(-1) + 136.360478646*LPRD(-1) - 7340074.81421) + C(2) *D(GDP(-1)) + C(3)*D(GDP(-2)) + C(4)*D(CPRD(-1)) + C(5)*D(CPRD(-2)) + C(6)*D(FPRD(-1)) + C(7)*D(FPRD(-2)) + C(8)*D(LPRD(-1)) + C(9)*D(LPRD(-2)) + C(10)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.159965	0.038011	4.208381	0.0004
C(2)	-0.725815	0.301122	-2.410371	0.0247
C(3)	0.318421	0.253819	1.254519	0.2228
C(4)	-0.390088	0.648862	-0.601188	0.5539
C(5)	0.820959	0.551902	1.487509	0.1511
C(6)	10.17007	73.60675	0.138168	0.8914
C(7)	436.4924	121.7096	3.586342	0.0016
C(8)	79.94120	29.25441	2.732621	0.0122
C(9)	-146.6992	35.38659	-4.145616	0.0004
C(10)	1322852.	367278.2	3.601771	0.0016

R-squared	0.941641	Mean dependent var	2936936.
Adjusted R-squared	0.917767	S.D. dependent var	3308900.
S.E. of regression	948869.1	Akaike info criterion	30.61424
Sum squared reside	1.98E+13	Schwarz criterion	31.07228
Log likelihood	-479.8278	Hannan-Quinn criter.	30.76606
F-statistic	39.44205	Durbin-Watson stat	2.314366
Prob(F-statistic)	0.000000		

Source: *Authors' Computed Result from (E-views 9.0)*
The error correction term ECM denoted by C(1) is positively signed and this is contrary to the rule of thumb.

The ECM result indicates a speed of adjustment of 15.99 percent that is the system corrects the previous period's disequilibrium at the rate of 15.99 percent annually. The ECM term is significant (PV=0.0004<0.05) implying that there is a long-run equilibrium relationship. However, there is no long run causality of the independent variables on the dependent variable (GDP) as indicated by the positively signed ECM term.

Table 5 Causality Test Results

Effects	Chi-square value	Prob.	Remarks
CPRD → GDP	2.836632	0.2421	Not Significant
FPRD → GDP	13.82104	0.0010	Significant
LPRD → GDP	17.61688	0.0001	Significant

Source: *Authors' Computed Result from (E-views 9.0)*

The causality result as presented in table 4.6 reveals that two independent variables (LPRD and FPRD) have a short run causality on the dependent variable (GDP) as indicated by their chi-square probability values of 0.0010 and 0.0001 respectively while CPRD does not have causality on the dependent variable (GDP) as indicated by its chi-square probability value of 0.2421. The result here corresponds with the OLS regression result for the double log form of the model.

VII. Testing the Hypotheses

From the result above, the null hypothesis that crop production does not have significant impact on economic growth in Nigeria is accepted. The null hypothesis that livestock production does not have significant impact on economic growth in Nigeria is rejected and the alternative accepted. Also, the null hypothesis of fish production do not have significant impact on economic growth in Nigeria is rejected and the alternative accepted.

However, after the ECM, the Breusch-Godfrey Serial Correlation (LM test) shows that there is no serial auto correlation because the chi square (prob.) is greater than 0.05. Therefore, the null hypothesis of no serial autocorrelation is accepted. Hence, the successive values of the error term are not serially correlated.

VIII. Conclusion

The study was focused on the contributions of the agricultural sector to the growth of the economy over the years and using its findings as a basis to determine the impact of agricultural output on economic growth in Nigeria. It was asserted from the study that agricultural production/output have impact on the economic growth in Nigeria especially livestock and fish production. Therefore, there is urgent call to the government to make much more conscious efforts towards improving agricultural productivity in Nigeria. Based on the findings of this study, the following are recommended;

1. The Nigerian government should consider promoting the agricultural sector of the economy so as to boost agricultural productivity and as such improve the growth of the economy because based on this study, agricultural productivity have impact on the growth of the economy.
2. The government should intensify efforts towards improving crop production in order to increase its share of contribution to the nation's GDP.

References

[1]. Akinwumi, A (2013). Transforming Nigeria's Agriculture. A Speech delivered at the Inauguration of the Agriculture and Food Security Center, Earth Institute of Columbia University, New York, USA
[2]. Aroriode, O. R.,& Ogunbadejo, H. K.(2014).Impact of Macroeconomic Policy on Agricultural Growth in Nigeria.*Journal of Agriculture and Veterinary Science*,7(11), 234-244.
[3]. Central Bank of Nigeria(2011). Annual Report for the Year Ended 31st December 2011. Available at: http://www.cbn.org.ng.
[4]. Food and Agriculture Organization (2017). Nigeria at a glance. http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/. Accessed on 12th February, 2017.
[5]. Manyong, V. M.., Ikpi, A., Olayemi, J. K., Yusuf, Y., Omonana, B. T., &Okoruwa, V.,(2005).*Agriculture in Nigeria: Identifying Opportunities for Increased Commercialization and Investment. IITA*, Ibadan, Nigeria. 159.
[6]. Ogunkola E O, Bankole A S, Adewuyi A (2008). China-Nigeria Economic Relations, AERC Scoping Studies on China-Africa Relations [Revised Report submitted to the African Economic Research Consortium (AERC), February, 2008] www.aercafrica.org/documents/ china_africa_relations/Nigeria.pdf pp2-3
[7]. Olutoye E., A., &Olutoye A. T. (2014).Assessing Agricultural resource and Nigerian Economic Growth.*Journal for Finance of Micro, Small & Medium Scale Enterprise in Nigeria*, (22), 371-381
[8]. World Bank Statistics (2010).World Bank National Accounts Data. Available:www.worldbank.org
[9]. Yusuf S. A. (2014). Role of Agriculture in Economic Growth and Development: Nigeria Perspective. Available:http://mpra.ub.uni-muenchen.de/55536.

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