THE IMPACT OF NIGERIA AGRICULTURAL SECTOR ON NATIONAL ECONOMIC GROWTH

ONYEMAECHI UGBOH (PhD)
Department of Agriculture
University of Delta Agbor
Delta State

&

BENEDICT AZU (PhD)
Department of Economics
University of Delta Agbor
Delta State

Abstract

This study examined the impact of agricultural sector on economic growth in Nigeria (1981-2020). The main objective of the study is to examine the impact of agricultural sector on economic growth in Nigeria. The study used multiple regressions. The variables under consideration were real gross domestic product as the dependent variable while crop production, livestock production, forestry production and fish production are the independent variables. The Ordinary Least Square (OLS) technique was used in estimating the relationship between the dependent and independent variables. The research result Crop production and livestock production have significant impacts on economic growth in Nigeria. Forestry production and fish production have no significant impacts on economic growth in Nigeria. All the independent variables have positive relationship with economic growth in Nigeria respectively, which implies that as crop production, livestock production, forestry production, and fish production increases, real gross domestic product increase.There is no causality relationship between crop production and economic growth in Nigeria. There is no causality relationship between livestock production and economic growth in Nigeria. There is a uni-directional causality relationship flowing from forestry production to real gross domestic product, between forestry production and economic growth in Nigeria. There is no causality relationship between fish production and economic growth in Nigeria. Based on the findings of the work, the study recommends that there is the need for the Nigerian government and its citizenry to concentrate their combined efforts towards increasing the productivity capacity of the crops with the aim of promoting food security and economic growth among others.

Introduction

Agriculture is the power house of economic growth, and the whole world at large. Agricultural sector has four major contributions to the development of the world; product contribution, factor contribution, market contribution and foreign exchange contribution. Agriculture is a majour source of getting food and raw materials to the industrial/manufacturing sector. It provides raw materials for industries and also speed up industrialization. It involves crop production, livestock production, forestry production, and fishery production, for man's consumption and use; processing and marketing of the agricultural products. Agriculture contributed so much in giving employment opportunity, poverty reduction, and improvement of income redistribution to the society.

Moreso, foreign earnings from exportation of agricultural local materials, helps to reduce the pressure on balance of payment in most African nations. Based on these contributions, agriculture is regarded as

fundamental to the socioeconomic development of the world or the national large (Ahmed, 1993). For instance middle income countries, the agricultural sector is the largest contributor providing inputs, food, employment opportunities, raw materials for other industries, provision of foreign earnings from the exportation of the surpluses, and more importantly the enormous advantage of the value added in the various production process. The role of agriculture in improving the economic structures of an economy cannot be over-emphasized argued that in the process of economic development, nations pass through several stages, namely: traditional stage, the take off stage, drive to maturity and the high mass consumption stage. Agriculture played crucial roles in the first three stages (Traditional society, pre-conditions stage and take-off stages). The agricultural sector has the potential to be the economic springboard from which a country's development can take off. More often, agricultural activities are focused in the less- developed rural areas where there is a critical need for rural transformation, redistribution, poverty alleviation and socioeconomic development, and the urban areas dosent take agriculture seriousand the food product harvested from the rural areas are being taken to urban area for consumption.

In recent times food has become a majour challenge in Nigeria because the nation does not have enough food to take care of its populace not to talk about having food for export. Nigeria export products has drastically reduced such that food export is no longer regarded as a source of foreign international revenue.

Research Questions
This study shall examine the following research questions
i. What is the impact of agricultural sector on economic growth in Nigeria?
ii. What is the causality relationship between agricultural sector, and economic growth in Nigeria?

Statement of Hypotheses
For the purpose of this study, the following hypotheses are tested;
i. H0: Agricultural sector has no significant impact on economic growth in Nigeria.
ii. H0: There is no causality relationship between agricultural sector and economic growth in Nigeria.

National Economic

In the writings of Tadaro (2007) He defined the term economic growth as a process by which the productive capacity of the economy is increased over time to bring about raising level of national output and income. Kuznets (1966) on the other hand views economic growth as a long term process wherein the substantial and sustained rise in real national income, total population and real per capita income takes place.

Empirical Literatures
Examining the contribution of agricultural sector in the Nigerian economic growth found that a positive relationship existed between Gross Domestic Product (GDP) and domestic saving, government expenditure on agriculture.

The agricultural sector on the Nigeria economic development multiple data collected and all the result indicated a positive relationship between Gross Domestic Product (GDP) domestic savings, government expenditure on agriculture, and also Foreign Direct Investment (FDI). Investigation was made on the contribution of agricultural sector in nigeria also at petroleum sector to the economic growth and development, of the Nigerian economy between 1980 and 2018 through the application of Augmented Dickey-Fuller technique in testing the unit root property of the series; after which Chow breakpoint test was conducted to test the presence of structural break in the economy. The results of unit root test suggest that all the variables in the model are stationary at first difference and the results of Chow

We have the agricultural sector in nigeria that is making its contribution in the food provisions and needs of the populace also the petroleum sector, though they both possessed a positive impact on the economic growth and development of Nigeria and the world at large. An economy that is productive must have a good background of agriculture.

In the writing of Onunze (2017) in his work titled "the impact of agricultural development on Nigeria economic growth" using an Ordinal Least Square Regression method of analysis found out that agricultural productivity impacted positively on economic growth from the year 1980-2016. Moreso , findings that agricultural development has provided opportunities for community, state economic and the growth of the entire world at large. The growth of the entire world at large relationship between agricultural production and the growth of Nigerian economy with focus on poverty reduction, data were employed in the research at the analysis of the data were done using unit root test, and the bounds (ARDL) testing approach to co-integration. The result of the data analysis indicated that agricultural production was significant in influencing the favorable trend of economic growth in Nigeria.

Ideba, Iniobong, Otu & Itoro (2019) found out the relationship between agricultural public capital expenditure and economic growth in Nigeria over the period 1971 to 2018 using annual data obtained from the Central Bank of Nigeria. The data were analysed using Augmented Dickey- Fuller test, Johansen maximum likelihood test and Granger Causality test. The result of the Johansen co-integration test showed that there exists a long run relationship between all the explanatory variables and the explained variable. The result of parsimonious error correction model showed that agricultural public capital expenditure had a positive impact on economic growth and the world at large.His findings indicates that agricultural public capital expenditure raises the nation's agricultural economic growth.

Agricultural sector to the economic growth in Nigeria using the growth accounting framework and time series data from 1960 to 2015. The study found that the agricultural sector has contributed positively and consistently to the economic growth in Nigeria, the contribution of agriculture to economic growth is further affirmed from a causality test which showed that agricultural growth Granger-causes GDP growth, however no reverse relationship was found.. The study also found that the crop production subsector so much to agricultural sector growth and that growth in the agriculture sector is overly dependent on growth of the crop production subsector. The regression analysis reveals a positive and significant relationship between the agricultural sector and GDP with the sector accounting 66.4 percent of the variation in the economy. It also reveals the dominance in the agricultural sector relative to other sectors of the economy.

Olutoye & Olutoye, (2017) examined the contribution of agricultural sector to Gross Domestic Product (GDP) between 1990 and 2016. 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. proved that an in-depth research on the development of the agricultural sector is essential to its productivity, therefore the agricultural development should start with the empowerment of the poor farmers financially, in the villages, communities, states and Nigeria at large given them all the resources they need in planting and production of crops in Nigeria.

RESEARCH METHODOLOGY
Research Design
The research design adopted is the Ex Post Facto. This study applies econometric procedure in estimating the impact of agricultural sector on economic growth in Nigeria. The Ordinary Least Square (OLS) technique is employed in obtaining the numerical estimates of coefficients in different equations. The OLS method is

chosen because it possesses some optimal properties; its computational procedure is fairly simple and it is also an essential component of most other estimation techniques.

Model Specification

This study shall build a multiple regression model and make use of econometrics procedure in estimating the relationship between agricultural sector and economic growth in Nigeria.

The functional form of the model is specified as:

$RGDP = f(CPRD, LPRD, FPRD, FSPRD)$

The mathematical form of the model is specified as:

$RGDP_t = \beta_0 + \beta_1 CPRD_t + \beta_2 LPRD_t + \beta_3 FPRD_t + \beta_4 FSPRD_t$

The econometric form of the model is specified as:

$RGDP_t = \beta_0 + \beta_1 CPRD_t + \beta_2 LPRD_t + \beta_3 FPRD_t + \beta_4 FSPRD_t + \mu_t$

Where:

RGDP= Real Gross Domestic product

Electronic copy available at: https://ssrn.com/abstract=4432800 11

f = functional relationship

CPRD = Crop production

LPRD = livestock production

FPRD = forestry production

FSPRD = fish production

β_0 = Constant

$\beta_1, \beta_2, \beta_3, \beta_4$ are the relative slope coefficient

μ_t = stochastic or error term

Method of Evaluation: The estimated result was evaluated subject to the following tests:

☐ Preliminary Test

☐ Economic Test of Significance (A Priori Test)

☐ Statistical Test of Significance (First Order Test)

☐ Econometric Test of Significance (Second Order Test)

Preliminary Tests

Stationary (Unit Root) Test: The importance of this test cannot be over emphasized since the data to be used in the estimation are time-series data. In order not to run a spurious regression, it is worthwhile to carry out a stationary test to make sure that all the variables are mean reverting, that is, they have constant mean, constant variance and constant covariance. In other words, that they are stationary. The Augmented Dickey-Fuller (ADF) test would be used for this analysis since it adjusts for serial correlation.

Decision Rule: If the ADF test statistic is greater than the MacKinnon critical value at 5% (all in absolute term), the variable is said to be stationary. Otherwise it is non stationary.

Co-integration Test: Econometrically speaking, two variables will be co-integrated if they have a long-term, or equilibrium relationship between them. Co-integration can be thought of as a pre-test to avoid spurious regressions situations (Granger, 1986). As recommended by Gujarati (2004), the ADF test statistic will be employed on the residual.

Electronic copy available at: https://ssrn.com/abstract=4432800 12

Decision Rule: If the ADF test statistic is greater than the critical value at 5%, then the variables are co-integrated (values are checked in absolute term).

Economic Test of Significance (A Priori Test)

These are determined by the principles of economic theory and refer to the sign and size of the parameters of economic relationship.

The expected signs for the parameters associated with the various variables are shown below

A priori Expectation VARIABLES	EXPECTED SIGNS
CPRD	+VE
LPRD	+VE
FPRD	+VE
FSPRD	+VE

Statistical Test of Significance (First Order Test)
These are determined by the statistical theory and aimed at evaluating the statistical reliability of the estimates of the parameters of the model, the most widely used statistical criteria is the square of correlation coefficient (coefficient of determination R^2), T-Test and F-Test of significance.

Test for Goodness of Fit
The coefficient of multiple determinations (R^2) is used to determine the proportion of variation dependent variable that is attributable to variation in explanatory variable. The value of R^2 ranges between 1 and 0 (ie$0 \leq R^2 \leq 1$). The closer to 1 the better the fit, otherwise the worse the fit.

t-Test of Significance
The student t-ratio will be used to test the individual statistical significance of the regression co-efficient. A two-tail test is conducted at 5% level of significance and n-k degree of freedom (df), where n is the number of observation and K is the number of parameter(s) estimated.
Decision Rule: The computed (t^*) will be compared with the critical t-value ($t0.025$). If $t^*>t0.025$, the H0 will be rejected and H1 will be accepted. Otherwise, H0 is accepted and H1 rejected.

f-Test of Significance
f-test statistics is used to test the overall statistical significance of the independent variables. A one-tail test will be conducted at 5% level of significance and (V1/V2) degrees of freedom. Where;
V1= degree of freedom (df) for the numerator: v1=k-1.
V2= degree of freedom (df) for the denominator: v2=n-k.
Decision Rule: If the computed f-ratio(f^*) is compared with the critical f-ratio (**f0.05**). If $f^*>f0.05$, we will reject the null hypothesis and accept the alternative, otherwise, the alternative hypothesis H1 will be rejected and null hypothesis H0 be accepted.

Econometric Test of Significance (Second Order Test)
Autocorrelation Test: The aim of this test is to examine whether the errors corresponding to different observations are serially correlated or not. Uncorrelated errors are desirable. The Durbin – Watson (D-W) statistics at 5% will be used to test for the presence of autocorrelation problem. The region of no autocorrelation remains:
du< d* < (4-du)
Where:
du = Upper Durbin – Watson
d* = Computed Durbin-Watson
Decision Rule: If the computed value of Durbin-Watson lies within the no autocorrelation region, it means there is no presence of autocorrelation problem. But if the Durbin-Watson computed value lies outside the regions there is the presence of autocorrelation problem. If it occurs, to avoid the spurious regression associated with it, we will employ the Durbin Watson Autocorrelation Correction to remove its influence in the model.

Normality Test: This study will carry out a normality test to check if the residuals, a proxy for stochastic error term follows normal distribution or not. Symbolically, $u_i \sim N(0, \delta_2)$. The normality test that would be used in this study is Jarque-Bera (JB) test of normality.

Decision Rule: If JBtab(2)df is greater than JBcal in absolute values then the residual is normally distributed

Granger Causality Test: Although regression analysis deals with the dependence of one variable on the other, it does not necessarily imply causation. In other words, the existence of a relationship between variables does not prove causality or the direction of influence (Gujarati, 2004). The essence of causality analysis, using the granger causality test, is to ascertain whether a causal relationship exists between two variables of interest. Here is the Granger specification model:

$$RGDP_t = B_0 + \Sigma B_{1i=ni=1} CPRD_{t-1} + \Sigma B_{2i=ni=2} LPRD_{t-2} + \Sigma B_{3i=ni=3} FPRD_{t-3} + \Sigma B_{4i=ni=4} FSPRD_{t-4} + \mu$$

$$CPRD_t = B_0 + \Sigma B_{1i=ni=1} CPRD_{t-1} + \Sigma B_{2i=ni=2} LPRD_{t-2} + \Sigma B_{3i=ni=3} FPRD_{t-3} + \Sigma B_{4i=ni=4} FSPRD_{t-4} + \Sigma B_{5i=ni=5} RGDP_{t-5} + \mu$$

$$LPRD_t = B_0 + \Sigma B_{1i=ni=1} LPRD_{t-1} + \Sigma B_{2i=ni=2} CPRD_{t-2} + \Sigma B_{3i=ni=3} FPRD_{t-3} + \Sigma B_{4i=ni=4} FSPRD_{t-4} + \Sigma B_{5i=ni=5} RGDP_{t-5} + \mu$$

$$FPRD_t = B_o + \Sigma B_{1i=ni=1} FPRD_{t-1} + \Sigma B_{2i=ni=2} LPRD_{t-2} + \Sigma B_{3i=ni=3} CPRD_{t-3} + \Sigma B_{4i=ni=4} FSPRD_{t-4} + \Sigma B_{5i=ni=5} RGDP_{t-5} + \mu$$

$$FSPRD_t = B_o + \Sigma B_{1i=ni=1} FSPRD_{t-1} + \Sigma B_{2i=ni=2} LPRD_{t-2} + \Sigma B_{3i=ni=3} FPRD_{t-3} + \Sigma B_{4i=ni=4} CPRD_{t-4} + \Sigma B_{5i=ni=5} RGDP_{t-5} + \mu$$

Decision Rule: If computed f-value is greater than 5% critical value, then there exist a causal relationship between both variable (values are checked in absolute term).

Data Required and Sources: The data required for this study are secondary time series data on crop production (CPRD), Livestock production (LPRD), forestry production (FPRD), fish production (FSPRD) and Real Gross Domestic Product (RGDP) ranging from 1981-2020. The data are extracted from the 2021 editions of the Central Bank of Nigeria (CBN) statistical bulletin.

Discussion of Findings, Conclusion and Recommendations

This study examined the impact of agricultural sector on economic growth in Nigeria (1981-2020). The focus variables are real gross domestic product (RDGP) as the dependent variable, while crop productions (CPRD), livestock production (LPRD), forestry production (FPRD) and fish production (FSPRD) are the independent variables. The ordinary least squares regression technique and error correction model were used in this model. The findings of the study include:

The results indicate that that crop production and livestock production have significant impacts on economic growth in Nigeria and thus significant variables in determining economic growth in Nigeria respectively. Forestry production and fish production have no significant impacts on economic growth in Nigeria and thus insignificant variables in determining economic growth in Nigeria respectively.

The results show that all the independent variables have positive relationship with economic growth in Nigeria respectively, which implies that as crop production, livestock production, forestry production, and fish production increases, real gross domestic product increases.

The Granger causality test result shows that there is no causality relationship between crop production and economic growth in Nigeria. There is no causality relationship between livestock production and economic growth in Nigeria. There is a uni-directional causality relationship flowing from forestry production to real gross domestic product, between forestry production and economic growth in Nigeria. There is no causality relationship between fish production and economic growth in Nigeria.

Recommendations

Sequel to the findings of this research, the following recommendations are suggested

There is the need for the Nigerian government and its citizenry to concentrate their combined efforts towards increasing the productivity capacity of the crops with the aim of promoting food security and economic growth.

Government should provide the resources to help the poor farmers to bring about mechanized agriculture to the rural areas and make available fertilizers and many other improved crops seedlings this will go along way to improve agricultural products output.

References

Abogan, O P., Akinola, E., and Baruwa, O. (2016), 'Non-oil export and Economic growth in Nigeria,' *Journal of Research in Economics and International Finance, 3(1), 1-11.*

Akintola, G. (2017). *Problems of agricultural development in Nigeria Accessed online on May*, https://www.naij.com/1097406-problems-agricultural-development-nigeria.html

Aminu, U. and Anono, A. (2019), 'An Empirical Analysis of the Contribution of Agriculture and Petroleum Sector to the Growth and Development of the Nigerian Economy,' *International Journal of Social Science and Education, 2(4), 1-11.*

Amire, C. M. (2016). The Effect of Agricultural Productivity on Economic Growth in Nigeria. *Journal of Advances in Social Science and Humanities, 2(4).*

Anyanwu, J. C. (1997). The structure of the Nigerian economy (1960-1997). Joanee educational publishers. *Scientific Research Journal (SCIRJ), Volume V,* Issue X, October 2017 7 ISSN 2201-2796 www.scirj.org © 2017, Scientific Research Journal

Central Bank of Nigeria, Statistical Bulletin (2021)

Granger, C.W.J. (1986) Developments in the Study of Cointegrated Economic Variables. *Oxford Bulletin of Economics and Statistics*, 48, 213-227.

Gujarati, D.N. (2004). Basic Econometrics. 4th Edition, McGraw-Hill Companies.

Ideba, E.E., Iniobong, E., Otu., W. and Itoro, N. (2019), 'Analysis of Agricultural Public Capital Expenditure and Agricultural Economic Growth in Nigeria,' *American Journal of Experimental Agriculture, 4(4), 443-456.*

Izuchukwu, O. (2017). *Analysis of the contribution of agricultural sector on the Nigerian economic development.* World review of business research, 1(1), 191-200.

Kuznets, S. (1973). *Modern economic growth: findings and reflections.* The American economic review, 63(3), 247-258.

Odetola, T. and Etumnu, C. (2017). *Contribution of Agriculture to Economic Growth in Nigeria.* The paper was presented at: The 18th Annual Conference of the African Econometric Society (AES) Accra, Ghana at the session organized by the Association for the Advancement of African Women Economists (AAAWE), 22nd and 23rd July, 2013

Oguntade, A. E., & Mafimisebi, T. E. (2015). Pricing and operational efficiencies in the livestock feed market in Ondo State, Nigeria. *Revista de Economia e Agronegócio–REA, 8(2).*

Oje-Okoro I (2019) *Analysis of the Contribution of Agricultural Sector on the Nigerian Economic Development.* World Review of Business Research 1: 191-200.

Onunze .M.T (2017) *The impact of agricultural development on Nigeria economic growth (1980-2016)*

Organisation for Economic Co-operation and Development OECD. (2001). *Measuring Productivity: Measurement of Aggregate and Industry-level Productivity Growth:* OECD Manual. Organisation for Economic Co-operation and Development.

Oyinbo O, Rekwot GZ (2018) Agricultural production and Economic Growth in Nigeria: Implication for Rural Poverty Alleviation. *Quarterly Journal of International Agriculture 53: 207-223.*

Rostow, W. W. (1960). T*he process of economic growth* (No. HB199 R65 1960).

Singh, B. B., Ehlers, J. D., Sharma, B., & Freire Filho, F. R. (2002). *Recent progress in cowpea breeding.* FATOKUN, CA; TARAWALI, SA; SINGH, BB; KORMAWA, PM, 22-40.

Todaro, M. P. and Smith, S. C. (2003). *Economic development.* 8th ed, Singapore: Pearson Education.

Tolulope, O. and Chinonso, E. (2019). *Contribution of Agriculture to Economic growth in Nigeria.* Paper presented at the 18th Annual Conference of the African Econometric Society, Accra, Ghana. pp. 1-28.