

PUBLIC EXPENDITURE ON AGRICULTURE AND OUTPUT GROWTH IN NIGERIA

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ABSTRACT

The study empirically evaluated the nexus between public spending on agriculture and Nigerian output growth. The study employed secondary data, the data which spanned from 1981 through 2016. Some statistical tools were used to explore the relationship between the variables of interest. The study examines stochastic characteristics of each time series by correlation LM test, Heteroskedasticity Test. Then, the relationship between growth rate of real GDP and public spending on agriculture was examined using ordinary least square method of analysis. The findings shows that agricultural development in Nigeria has positive impact on the economic growth in Nigeria and that all the variables in the model proved significant, which shows that agricultural sector output has positively impact on the economic growth in Nigeria over the period under study. Based on the findings and conclusion, the study recommended among others that government should provide funds to acquire sophisticated farm tools with increase in her budgetary allocation to agricultural sector in a consistent manner with a view to contributing more to the economic growth of Nigeria.

Keywords: Public Spending, Agriculture and Output Growth

INTRODUCTION

Despite the predominance of the oil and gas sector in Nigeria, agricultural sector still remains source of economic resilience in the economy. Before the discovery of oil in the country in the late 1950s and early 1960s, agriculture was the dominant sector of Nigeria economy. It consisted over 65% of the country's Gross Domestic Product (GDP) and provided the bulk of the foreign exchange earnings through the export of cash crops. The sector is one of the most important sectors of Nigeria's economy as it holds a lot of potentials for future economic development of the nation having played dominant role in the remote past. With the emergence of oil as a major source of government revenue and foreign exchange earner, agricultural sector was neglected which led to the decline of the sector's contribution to the economy (Ijaiya, 2000; Iwayemi, 1994; Ukpong & Malgwi, 1991).

Agriculture is an important sector of Nigerian economy in the world today. Agricultural sector acts as catalyst that accelerates the pace of structural transformation and diversification of the economy, enabling the country to fully utilize its factor endowment, depending less on foreign supply of agricultural product or raw materials for its economic growth. Apart from laying solid foundation for the economy, it also serves as import sector, as it provides readymade market for raw materials and intermediate goods for industries.

However, Government expenditure is referred to as outflow of resources from government to other sectors of the economy (Nurudeen & Usman 2010). Government spending or public spending is sub-divided into current and capital expenditure. Capital expenditure has been defined as payment for non-financial assets used in production while current expenditures are payments for non-repayable transactions within a year, (CBN, 2003).

Agriculture is the bedrock of economic growth, development and poverty eradication in the developing countries. Agriculture has also regarded as the engine and panacea to economic prosperity, Sertoğlu (2017), in the words of Gunnar Myrdal (1984), the battle for long-term economic growth will be won or lost in the agricultural sector. However, how this path leads to economic prosperity is still subject to debate among development specialists and economists. Nigerian economy in past decades strives on the agricultural sector. The sector is reputed as the mainstay of the economy in the early 1960's. It is seen as the key driver for growth and development. In fact, to further buttress the pivotal role the sector plays in the Nigerian economy, the agricultural sector is part of the Millennium Development Goals program of poverty reduction in Nigeria. In most developing countries (low and middle-income countries), the agricultural sector remains, the largest contributor providing inputs, food, employment opportunities, raw materials for other industries, provision of foreign earnings from exportation of the surpluses, and more importantly the enormous advantage of the value added in the various production process (Izuchukwu, 2011).

Inadequate funding of the agricultural sector has been reechoed by several experts as an obstacle to increased agricultural output (CBN, 2007; Bernard, 2009). However, from a nominal point of view, it is evident that in Nigeria, government spending on agriculture continue to increase over the years while empirical evidence have revealed that the performance of the agricultural sector has been inadequate (CBN,2000; Ekerete, 2000).

The agricultural sector in Nigeria which was the main stay of the economy is no longer performing the lead role it was known for. By mid 1970's Nigeria's agriculture started to experience problems, agricultural exports began to decline and food shortages started emerging.

From 1975, emboldened by considerable increased revenue from petroleum, government assumed heavier responsibilities for agricultural production, input supply and marketing; in addition to adopting credit control and other allocative policies in favour of agriculture (Ojo & Akanji 1996).

A country's agricultural sector is expected to play a particularly important role in development performance. At the start of development, the agricultural sector typically constitutes the largest segment of economic activity in developing country. Its contribution to employment is even larger than its share of output. Its performance determines the well-being of a large fraction of the population. It serves as a source of various resources that can be transferred to other faster growing sectors in the economy. It affects both economic well-being and equity, largely due to its sheer size. Its importance also lies in its relation to food production, since meeting national nutritional levels is one of the basic tasks of development. Until the 1970s, the Nigerian economy was predominantly agricultural. However, with the discovery of crude petroleum in commercial quantities in the early 1970s, Mining and Quarrying (in the Industry sub-sector) has since become a major contributor to the country's foreign exchange earnings and the main source of revenue for the economy. Nonetheless, agriculture still remains the mainstay of the Nigerian economy; directly, in terms of volume of employment opportunities it offers, as the sector provides for a significant proportion of the country's labor force; and indirectly, through the important linkages it provides with the rest of the economy. The role of the government in economic management is performed through the formulation and implementation of economic policy generally and fiscal policy in particular. As recognized by the new growth theory, public spending is an important factor for self – sustaining productivity gains and long term growth. For instance, government expenditure can contribute to agricultural growth (and hence poverty alleviation), it has indirectly created rural non – farm jobs and increased wages.

The real significance of government development lies in the fact that it imparts a greater amount of “trickle-down” benefits for the poor in the growth process than growth alone. While economic growth alone often reduces poverty only by increasing mean consumption, government expenditure on agriculture reduces poverty both by increasing mean consumption and improving distribution of income (see Fan, Zhang & Zhang, 2000; Van de Walle, 1996; Galal, 2003). Total expenditure on agriculture, as percentages of overall expenditure, fluctuated from 4.57 percent in the 1986-1993 periods through an average of 4.51 percent per annum in 1994-1998 to 3.53 percent in 1999-2005, reflecting government's intensified efforts to reduce its size. Intense efforts at down-sizing also showed up in declines in the ratio to GDP of this component of public expenditure. As a percentage of GDP, it was 4.38 percent between 1986 and 1993, but thereafter, declined to remain at less than 1.0 percent from 1993 to 2005 (CBN, 2006). Capital expenditure on agriculture exhibited a similar trend. As a percentage of overall expenditure, it was 4.33 percent per annum in 1986-1993, but declined to an annual average of 2.37 percent between 1999 and 2005.

As a ratio of GDP, capital expenditure in agriculture rose impressively from 1.45 in 1970-1979 to 4.32 percent in the years 1980 to 1985. It, however, stayed at less than 1.0 percent between 1994 and 2005. Similarly, per capita expenditure on agriculture was N127.27 and N289.11, respectively, in 1994-1998 and in 1999-2005. On the other hand, the agricultural sector of the Nigeria economy did not attract significant foreign private investment. The distribution of cumulative foreign private capital flow by types of activity between 1970 and 2007 reveals that agricultural sector lagged behind other major sectors (such as mining, manufacturing and services) in terms of share of total foreign private capital. The highest share of total foreign private capital

recorded by the agricultural sector was 4.1 percent of total foreign capital flow in 1978 (CBN, 2008). As a result of the low level of investment in the agricultural sector, output has fluctuated widely and productivity has also declined. On average, the sector grew at the rate of 11.4 per annum between 1960 and 2008. Further analysis of the performance of this sector indicates that the highest annual growth rates were recorded in the 1970s and 1980s, at 13.2 percent and 29.2 percent respectively. During the 1990s, the growth rate dropped to 3.4 percent. It rose at annual growth rate of 6.9 percent during the period 2000-2005, and at 4.2 percent during the period 2005-2008. At the population growth of 2.8 percent, per capita output grew by only 1.4 percent between 2005 and 2008. The deplorable state of the sector is also glaringly reflected in two important statistics: daily per capita calories intake and the unemployment rate. Calories intake deficiency has been a pervasive problem in the country. It stood at 13.80 kcals (kilocalories) per day in 1985-1993 but only rose marginally by the 1994-1998 periods to 18.47 kcals per day. However, this improvement was lost in the 1999 to 2005 period when it fell to 14.23 kcals per day. This was probably due mainly to a combination of low levels of the state of households' real final consumption expenditure, low public spending on agriculture and low foods imports to augment low domestic food production. In the same vein, the unemployment rate remained high at an annual average of 25.73 percent, from 1980 to 1985. This upward trend persisted throughout the period under review. The rate increased from 30.53 percent per annum in the 1986 – 1993 period to 34.38 percent in 1994 to 1998 period, but fell, albeit only marginally, to an annual average of 34.17 between 1999 and 2005 (NBS, 2006). Agricultural production stagnated at less than 1 percent annual growth rate between 1970 and 1982. There was a sharp decline in export crop production, while food production increased only marginally. Thus, domestic food supply had to be augmented with large imports. Food import bill rose from a mere N113.88 million annually in 1970-1974 to N1,964 million in 1991 (CBN,2003). Also, in 1994, the agricultural sector performed below the projected 7.2% of budgetary output (Lawal, 1997). Further contribution of agricultural sector to economic growth has been decreasing continuously after the Structural Adjustment Programme (SAP) period. Presently, in Nigeria, there has been a conflicting view about spending on agriculture; the performance of the agricultural sector had fared better than it was before independence. Theoretically, input-output theory in economics posits that input determines output, which is needed to increase government spending in order to boost economic growth. Therefore there is need to examine the extent to which government expenditure as an input has affected agricultural production which in turn boosts economic growth. It is on this background that there is need to investigate the impact of government expenditure on agricultural sector on economic growth in Nigeria.

Problems particular to the economy of Nigeria include; excessive dependence on imports for consumption and capital goods, dysfunctional social and economic infrastructure, unprecedented fall in capacity utilization rate in industry and neglect of the agricultural sector, among others. These have resulted in fallen incomes and devalued standards of living amongst Nigerians (Anyanwu, 2004). Although, SAP was introduced in 1986 to address these problems, no notable improvement has taken place. From a middle income nation in the 1970s and early 1980s, Nigeria is today among the 30 poorest nations in the world. In view of this, the question is; does the agricultural sector "ceteris paribus" has impact on the economic growth of the nation in view of the Vision 20;2020. The statement to be set to test in this paper is to examine whether there is a

significant relationship between government spending on agricultural sector and economic growth in Nigeria.

The agricultural sector in Nigeria which was the main stay of the economy is no longer performing the leading role it was known for, as far back as 1960s. The agricultural sector has been affected with numerous problems which has been the results of the poor performance of the sector itself. This has attracted various strategies including expansion of public expenditure on agricultural activities by different governments in the country.

Notwithstanding, this expenditure on agricultural sector has perhaps been on the increase without expressly translating to corresponding expansion or increase in economic growth. There is still the massive importation of rice, fish, wheat and other agricultural products into the country, even when the present President Buhari and his team place a ban on the importation such. It is evident that in Nigeria, government spending on agriculture continues to increase over the years while empirical evidence have revealed that the performance of the agricultural sector has not been impressive (Ekerete, 2000).

Theoretically, input-output theory in economics posits that input determines output, which is needed to increase government spending in order to boost economic growth. Therefore there is need to examine the extent to which government expenditure as an input has affected agricultural production which in turn boosts economic growth. It is on this background that there is need to investigate the impact of government expenditure on agricultural sector on economic growth in Nigeria is important. Problems particular to the economy of Nigeria include; excessive dependence on imports for consumption and capital goods, dysfunctional social and economic infrastructure, unprecedented fall in capacity utilization rate in industry and neglect of the agricultural sector, among others Eberé & Osundina (2012).

Further contribution of agricultural sector to economic growth has been decreasing continuously after the Structural Adjustment Programme (SAP) period. Presently, in Nigeria, there has been a conflicting view about spending on agriculture; the performance of the agricultural sector had fared better than it was before independence.

These have resulted in fallen incomes and devalued standards of living amongst Nigerians (Anyanwu, 2004). Although, SAP was introduced in 1986 to address these problems, no notable improvement has taken place. From a middle income nation in the 1970s and early 1980s, Nigeria is today among the 30 poorest nations in the world. In view of this, the question is; does the agricultural sector “*ceteris paribus*” has impact on the economic growth of the nation in view of the Vision 20;2020. It is on this note that this study set to investigate the nexus between public spending on agriculture and Nigerian output growth. From the identified problems in the study, the following research questions are designed to help discover the purpose of the study: i. does public agriculture spending have any impact on economic growth in Nigeria? ii. does public spending have any significant effect on agricultural output in Nigeria?

Agriculture is the art and science of crop and livestock production. In its broadest sense, agriculture comprises the entire range of technologies associated with the production of useful products from plants and animals, including soil cultivation, crop and livestock management, and the activities of processing and marketing. The term agribusiness has been coined to include all the technologies that mesh in the total inputs and outputs of the farming sector. In this light, agriculture encompasses the whole range of economic activities involved in manufacturing and distributing the industrial inputs used in farming: the farm production of crops, animals and animal products, the

processing of their materials into finished products and the provision of products at a time and place demanded by consumers.

Agriculture was the key development that led to the rise of human civilization, with the husbandry of domesticated animals and plants (i.e., crops) creating food surpluses that enabled the development of more densely populated and stratified societies. Agriculture encompasses a wide variety of specialties and techniques, including ways to expand the lands suitable for plant rising, by digging water channels and other forms of irrigation. Cultivation of crops on arable land and the pastoral herding of livestock on rangeland remain at the foundation of agriculture. In the past century there has been increasing concern to identify and quantify various forms of agriculture (e.g. perm culture or organic agriculture) and intensive farming (e.g. industrial agriculture). Interestingly, the Nigerian economy, during the first decade after independence could reasonably be described as an agricultural economy because agriculture served as the engine of growth of the overall economy (Ogen, 2003).

From the standpoint of occupational distribution and contribution to the GDP, agriculture was the leading sector. During this period Nigeria was the world's second largest producer of cocoa, largest exporter of palm kernel and largest producer and exporter of palm oil. Nigeria was also a leading exporter of other major commodities such as cotton, groundnut, rubber and hides and skins (Alkali, 1997). The agricultural sector contributed over 60% of the GDP in the 1960s and despite the reliance of Nigerian peasant farmers on traditional tools and indigenous farming methods, these farmers produced 70% of Nigeria's exports and 95% of its food needs (Lawal, 1997). However, the agricultural sector suffered neglect during the hey-days of the oil boom in the 1970s. Ever since then Nigeria has been witnessing extreme poverty and the insufficiency of basic food items. Historically, the roots of the crisis in the Nigerian economy lie in the neglect of agriculture and the increased dependence on a monocultural economy based on oil. The agricultural sector now accounts for less than 5% of Nigeria's GDP (Olagbaju & Falola 1996) The neglect of the agricultural sector and the dependence of Nigeria on a mono- cultural, crude oil based economy have not augured well for the well-being of the Nigerian economy.

Several cross-country (Ghura, 1995., Devarajan *et al.*, 1996., Guseh, 1997., Kelly, 1997., Alexiou, 2009) and country-specific (Knoop, 1999., Alexiou, 2007, Irmén & Kuehnel, 2008., Hussain, 2011, Dandan, 2011) studies have been carried out across the globe to examine the relationship between government expenditure and economic growth, but their data periods, methodologies and findings differ from some studies indicating that government expenditure has a negative impact on economic growth and others positing that government expenditure has a positive impact on economic growth. The incongruent findings of the studies could be attributed to the short data periods of some of the studies, which must have affected the reliability of the inferences drawn from such studies. The inconsistencies between the methodologies and time series analyses of most of the studies must have also accounted for the variations in the findings of the studies.

Ogwuma (1981), studied on public expenditure in Agricultural sector using econometric analysis. Based on his report, Agricultural financing in Nigeria shows positive relationship between interest rate and loanable funds on the level of Agricultural output.

Kawagoe *et al* (1985) compares estimated Cobb-Douglas coefficients from studies that estimated separate equations for developed countries and developing countries. Kawagoe, Hayami and Ruttan investigated effects of investments in agriculture to agricultural productivity and

economic growth. They split their sample of forty-three countries into twenty one developed countries and twenty two less developed countries. They found all the convectional variables as well as technical education to be important in explaining output levels for the developed countries. For the less developed countries, land and fertilizer were not found to be significant explanatory variables, but livestock was more important when compared to the developed countries.

Ekpo (1995) examined government capital expenditure on private investment using OLS approach with an annual data from 1960-1990. The result indicates that capital expenditures on transport and communication, agriculture, health and education positively influence private investments in Nigeria. Hence the study focuses in covering the research gap by investigating the actual relationship between agriculture spending and economic growth in Nigeria.

Gunning (1997)'s empirical results of econometric investigation of five Sub-Saharan African countries showed that there is statistical evidence of a long-term relationship between agriculture expenditure and economic growth. Gunning concluded that agriculture expenditure has a positive impact on economic growth and emphasized that for developing countries to develop and foster economic growth, there is need for increasing agriculture expenditure which facilitates investments on agriculture technology which would increase agricultural productivity thus output and help boost economic growth and development.

Kormain & Bralimasrene (2000) studied the economy of Thailand. They made use of the granger causality tests. Their finding suggests that government expenditure and economic growth are not cointegrated but indicated a unidirectional relationship. This is so because according to them, causality runs from government expenditure to growth, and also detected a significant positive effect of government spending on economic growth.

Fan et al (2000) using state level data for 1970 – 1993, developed a simultaneous equation model to estimate the direct and indirect effects of different types of government expenditure on rural poverty and growth in India. Agriculture growth and food price changes were identified as important contributing factors to the decline in rural poverty in the areas around Saith, Ahluwalia, Srinivasan, Ghose, Gaiha, Bell and Rich. The primary purpose of the study was to investigate the causes of the decline rural poverty in India and particularly to determine the role that government investment have played, using a pooled time-series, cross state data set.

Ajao (2000) of the Agriculture Economics and Extension Department in Nigeria carried out a study examining effects of agricultural productivity, due to increased agriculture expenditure, on economic growth for Sub-Saharan African countries in the context of diverse institutional arrangements using data envelopment analysis method. Time series data for a thirty year period (1970-1999) which consisted of information on agriculture production and means of production such as records of agriculture production, rural population and number of tractors in use, fertilizer use, agricultural areas as well as gross domestic product was used. A decomposition of total factor productivity measure revealed that agriculture expenditure facilitates technological change and have got a positive impact on economic growth and development which leads to reduction of poverty in Sub-Saharan African countries. Indeed agriculture provides the main stimulus to our national economic growth despite the small farm holdings and primitive productive systems (Ekerefe, 2000).

As noted by the World Bank (2000) agricultural and rural sector had suffered neglect and under investment in the last twenty years. The World Bank in its report called for greater investment in agriculture in developing countries. They warn that the sector must be placed at the

centre of development agenda of the countries, if the goals is reducing poverty and hunger by 2015 are to be realized.

Dorward *et al.*, (2002), despite potential positive returns to public spending on agriculture, few policy makers currently consider investment in agricultural development the best bet for poverty reduction. There are a number of reasons for this: One, recognition that achieving agricultural growth in remote and marginal rural areas - where much of the rural populace are now concentrated – is more difficult. Two, the perception that many of agriculture’s problems are seen as lying outside the agricultural sector – for example, in roads and telecommunications infrastructure, in health and education. Three, uncertainty regarding how best to invest in agriculture. Much of the investments called for more focus on research and extension, but policy makers have doubts about their effectiveness but concerned about recurrent costs and fiscal commitments, and are experimenting with private/public models for finance and delivery. Four, increasing recognition of the importance of non-farm incomes and activities to the livelihoods of the rural poor. This is a reason politicians would rather prefer to invest in Motorbike popularly known as “okada” rather than investing in agriculture in rural areas.

As noted by Samuelson & Nordhaus (2003), nowhere can the changes in government’s role be seen more clearly than area of government spending. They stressed that a sound public expenditure policy produces food effects both on production and distribution.

Egbuna (2003) posited that over the past two or three decades, the dominant role of agriculture in the economy, especially in term of enduring food security, has led government to massive importation of same basic food terms especially grains like rice, beans and millet.

Fan & Rao (2003) analyzed the impact of different types of government spending on overall GDP growth across 43 developing countries between 1980 and 1998 using OLS method and found mixed results. In Africa, government spending on agriculture and health was particularly strong on promoting economic growth. Among all types of government expenditures, agriculture, education and defense contributed positively to economic growth in Asia. According to them, in Latin American, health spending had a positive growth promoting effect. And that structural adjustment programmes has a positive growth promoting effect in Asia and Latin America, but not in Africa. They averred that the structural adjustment programme hurt economic development in Africa.

For many developing countries, agriculture remains the gate way to several desired ends which includes poverty reduction, rural transformation, employment generation, food securing and improved national health profile of the citizenry (Okpanachi, 2004).

Study by Cheminqui (2005) opines that an increase in government expenditure devoted to these three priority areas such as agriculture, education and health will affect the economy through increase in sectorial or economy wide Total Factor Productivity (TFP). He pointed out that good education and health care help the poor, lead more productive lives and increasing the return on investment.

It has been asserted that agriculture provides the bulk capital required for industrial take off in West African countries, agricultural export provides necessary foreign exchange required for the purchase of necessary raw- materials, manufactured goods and capital equipment for the country (Ogbole, 2006).

Maku (2009) discovered that both government expenditure and private investment have no significant influence on economic growth in Nigeria, and that the rate of government expenditure to

real GDP has been rising since the enactment of the Structural Adjustment Programme (SAP) without contributing significantly to economic growth in Nigeria.

Nurudeen & Usman (2010) used the data period of 1970 to 2008 in their study, and the estimation results showed that Total Capital expenditure (TCAP), Total Recurrent expenditure (TREC), expenditures on Transport and Communication (TRACO), Education (EDU), and Health (HEA), including Inflation (IFN) and overall Fiscal Balance (FISBA), are statistically significant in explaining changes in economic growth. However, expenditures on Defence (DEF) and Agriculture (AGR) are not significant in explaining economic growth.

Through an augmented Solow model, Usman *et al.* (2011) posited that expenditure on administration, education, transportation and communication has a negative impact on economic growth in the short run, while FDI and expenditure on health and other services have a positive impact on economic growth.

Loto (2011) investigated the growth effect of sectoral expenditures on economic growth and discovered that expenditures on national security, transportation, and communication were positively related to economic growth, but were not statistically significant. Meanwhile, expenditure on education, though negative, was not significant; expenditure on agriculture was negatively related to economic growth; and expenditure on health was positively related to economic growth.

Iganiga & Unemhilin (2011) studied the effect of federal government agricultural expenditure and other determinants of agricultural output on the value of agricultural output in Nigeria. A Cobb Douglas Growth Model was specified that included commercial credits to agriculture, consumer price index, annual average rainfall, population growth rate, food importation and GDP growth rate. The study performed comprehensive analysis of data and estimated the Vector Error Correction model. Their results showed that federal government capital expenditure was found to be positively related to agricultural output.

Oji-Okoro (2011) employed multiple regression analysis to examine the contribution of agricultural sector on the Nigerian economic development. They found that a positive relationship between Gross Domestic Product (GDP) vis a vis domestic saving, government expenditure on agriculture and foreign direct investment between the period of 1986-2007. It was also revealed in the study that 81% of the variation in GDP could be explained by Domestic Savings, Government Expenditure and Foreign Direct Investment.

Loto (2011) investigates the growth effect of government expenditure on economic growth in Nigeria for the period 1980 to 2008, with a particular focus on five sectoral expenditures, including security, health, education, transportation communication and agriculture. The result indicates that in the short run, expenditure on agriculture was found to be negatively related to economic growth. The impact on education, though also negative and was not significant. The impact of expenditure on health was found to be positively related to economic growth while expenditures on national security transportation and communication were positively related to economic growth, their impact were not statistically significant.

Using time series data, Lawal (2011) attempted to verify the amount of federal government expenditure on Agriculture in the thirty-year period 1979 – 2007. Significant statistical evidence obtained from the analysis showed that government spending does not follow a regular pattern and that the contribution of the agricultural sector to the GDP is in direct relationship with government funding to the sector.

Ebere & Osundina (2012). Study examined the impact of government expenditure on agriculture on economic growth in Nigeria over the years. A time series data of 33 years sourced from the Central bank of Nigeria was used. Ordinary Least Square (OLS) technique of data analysis was used in evaluating the secondary data. GDP was used as a proxy to economic growth, while agricultural output and government expenditure on agriculture were used as indicators of government expenditure on agriculture. From the findings; agricultural output, government expenditure and GDP are positively related. It was found that a significant relationship exist between government expenditure in the agricultural sector and the economic growth in Nigeria. The study modeled along with these variables: Real Gross Domestic Product, Agricultural sector output and Total Government Expenditure. The findings also revealed that the sector still encounter some problems like inadequate finance, poor infrastructure, and others.

Itodo, Apeh and Adeshina (2012) examined the impact of government expenditure on agriculture and Agricultural output in Nigeria from 1975-2010, using Cob-Douglas production function and OLS econometric technique to estimate a multiple regression of agricultural output against some variables. The results revealed a positive but insignificant relationship between government expenditure to the agricultural sector and agricultural output within the scope of the research.

In Nigeria, Nasiru (2012), employed the Granger Causality test to examine the relationship between government spending and economic growth, and the results showed that while government capital expenditure causes economic growth, there was no observable causal relationship between recurrent government expenditure and economic growth. The policy implication of this finding is that any reduction in capital expenditure would have negative repercussions on economic growth in Nigeria.

Okezie *et. al.*, (2013), empirically analysed the relationship between Nigerian government expenditure on the agricultural sector and its contribution to economic growth using time series data from 1980 to 2011. The results however concluded that a very weak causality exist between the two variables.

Similarly, Uger (2013), examined the impact of federal government's expenditure on the agricultural sector in Nigeria using data spanning from 1991-2010. The results also concluded a weak relationship between the variables using a simple regression analysis.

The studies established the existence of widespread inequality in the government expenditure and agricultural output financing as well as wide disparity in the share of financial burden by different stakeholders in the agricultural sectors.

Several cross-country (Ghura, 1995., Devarajan *et al.*, 1996., Guseh, 1997., Kelly, 1997., Alexiou, 2009) and country-specific (Knoop, 1999., Alexiou, 2007, Irmen and Kuehnel, 2008., Hussain, 2011, Dandan, 2011) studies have been carried out across the globe to examine the relationship between government expenditure and economic growth, but their data periods, methodologies and findings differ from some studies indicating that government expenditure has a negative impact on economic growth and others positing that government expenditure has a positive impact on economic growth. The incongruent findings of the studies could be attributed to the short data periods of some of the studies, which must have affected the reliability of the inferences drawn from such studies. The inconsistencies between the methodologies and time series analyses of most of the studies must have also accounted for the variations in the findings of the studies.

However, this study intends to fill the gap in the literature by looking into the nexus between public expenditure on agriculture and economic growth in Nigeria, using secondary data spanning from 1981 through 2016. Specifically, the study intends to determine the relationship between public agriculture expenditure and economic growth in Nigeria; and to examine the relationship between government expenditure and agricultural output in Nigeria.

MATERIALS AND METHODS

Model Specification

Model specification is a mathematical expression showing the interrelationship between the economic relationship existing between economic variables (dependent and independent). The model is a three-variable model and stated covers the Gross Domestic Product (GDP) at constant prices as the dependent variable to capture economic growth while agricultural sector output and government expenditure (General) were the independent variables to capture government expenditure on agriculture in Nigeria.

Taking inference from Solow growth model, which was subsequently modified by Mankiw, Romer & Weil (1992) and is termed the “Augmented Solow growth model”, Solow (1956) postulated that economic growth resultant from the accumulation of physical capital and an expansion of the labor force in conjunction with an “exogenous” factor, technological progress, that makes physical capital and labor more productive (Udah, 2010) and Ebere & Osundina (2012).

For the purpose of this research work the above was adopted and build upon, proxing economic development with Gross Domestic Products (GDP); industrialization (proxy by agricultural sector output); and government expenditure to check government commitment on the provision of infrastructural facilities that will attract investor. With this adjustment incorporated into the model, it can therefore be specified in the form expressed below:

Harrod-Domar model $Y = F(K, L)$

The adopted model is specified as follows:

$$\text{GDP} = f(\text{AGOUT}, \text{TGE}) \dots\dots\dots 3.1$$

Where:

GDP = Gross Domestic Product

AGOUT = Agricultural Sector Output

TGE = Total Government Expenditure

The model in its stochastic form is presented as;

$$\text{GDP} = \beta_0 + \beta_1\text{AGOUT} + \beta_2\text{TGE} + \mu \dots\dots\dots 3.2$$

Where:

GDP = Gross Domestic Product

β_0 = Intercept β_1 = Partial slope coefficient of agricultural sector output. β_2 = Partial slope coefficient of total government expenditure

μ = the stochastic error term which denotes other explanatory variables not specified in the model

GDP as a variable is used to measure economic growth in Nigeria, it is the dependent variable.

AGOUT is an independent variable, is the annual total of Agricultural sector output

TGE is an independent variable, is the annual total of Government Expenditure

A Priori Expectations

The a priori expectations of this model were based on the knowledge of the economic theory. This implies that government expenditure on agricultural sector have a positive sign and thus denoting a positive relationship with GDP (economic growth) which is expected to exist. It is also expected that the coefficient of total government expenditure should be positive.

Thus the following is the a priori expectation of the model is:

$$\beta_0 > 0, \beta_1 > 0, \beta_2 > 0.$$

Estimation Technique

R^2 is a statistic that gave some information about the goodness of fit of a model. In regression, the R^2 coefficient of determination is a statistical measure of how well the regression line approximates the real data points. An R^2 of 1 indicates that the regression line perfectly fits the data. R^2 the rule of thumb is that the R^2 should be equal and greater than 60% anything lesser than that is not acceptable result rather it is a spurious result.

The adjusted R^2 . The explanation of this statistic is almost the same as R^2 but the adjusted R^2 will penalize you for adding independent variables (K in the equation) that do not fit the model. Why? In regression analysis, it can be tempting to add more variables to the data as you think of them. Some of those variables will be significant, but you can't be sure that significance is just by chance. The adjusted R^2 will compensate for this by that penalizing you for those extra variables.

T-test: statistics

T-test is used to estimate population parameter, i.e. population mean, and is also used for hypothesis testing for population mean. Though, it can only be used when we are not aware of population standard deviation. A two-tailed test is conducted as 5 percent level of significance. When this is done, the computed t ratio (t_{cal}) is compared with the theoretical t (t_{tab}). Statistically, the t-statistics of the variables under consideration is interpreted based on the following statement of hypothesis.

H₀: The individual parameters are not significant.

H₁: The individual parameters are significant.

Decision Rule:

If t-calculated > t-tabulated, we reject the null hypothesis {H₀} and accept the alternative hypothesis {H₁}, and if otherwise, we select the null hypothesis {H₀} and reject the alternative hypothesis {H₁}.

Level of significance at 5%

Degree of freedom: n-k

Where n = sample size.

K: Number of parameter.

F-Test: statistics

An F-test is any statistical test in which the test statistic has an F-distribution under the null hypothesis. It is most often used when comparing statistical models that have been fitted to a data set, in order to identify the model that best fits the population from which the data were sampled. Exact "F-tests" mainly arise when the models have been fitted to the data using least squares.

This measures the overall significance of the entire regression plane. The impact of the explanatory variables actually have a significant influence on the dependent variable. The computed F with ratio F^* is compared with the theoretical F with V_1 and V_2 , N-K degree of freedom.

$$\text{Where } F^* = \frac{R^2/K-1/}{(1-R^2)/(N-K)}$$

V_1 → degree of freedom for numerators

V_2 → degree of freedom for denominator

K → total number of parameter estimates

N → sample size

Decision Rule:

If computed F is higher the critical value F i.e. if $F > F_{0.025}$, reject the null hypothesis if otherwise accept it.

Test for Autocorrelation (Durbin-Watson Test)

Durbin–Watson statistic is a test statistic used to detect the presence of autocorrelation (a relationship between values separated from each other by a given time lag) in the residuals (prediction errors) from a regression analysis. It is named after James Durbin and Geoffrey Watson.

One of the underlying assumptions of the ordinary least regression is that the succession values of the random variables are temporarily independent. In the context of the series analysis, this means that an error $\{U_t\}$ is not correlated with one or more of previous errors $\{U_{t-1}\}$. The problem is usually dictated with Durbin Watson $\{DW\}$ statistics.

The durbin-watson's test compares the empirical dL and du in d-w tables to their transforms $\{4-dL\}$ and $\{4-dU\}$.

Decision Rule:

If $d^* < DL$, then we reject the null hypothesis of no correlation and accept that there is positive autocorrelation of first order.

If $d^* > \{4-dL\}$, we reject the null hypothesis and accept that there is negative autocorrelation of the first order.

Source of Data

The secondary data was collected from the CBN statistical bulleting 2016 edition and other relevant data were also collected from the Manufacturer Association of Nigeria (MAN).

RESULTS AND DISCUSSION

This chapter focuses mainly on the analysis and interpretation of the empirical results. Furthermore, the chapter provides an empirical platform for accepting or rejecting the hypothesis formulated for the purpose of achieving the objectives in this research work.

Presentation of Data

The data used were obtained through secondary method and the data obtained were sourced on **GDP** in Nigeria (proxied for Economic Growth), **AGOUT**(Agricultural Sector Output) and **TGE** (Total Government expenditure) as presented in appendix I.

Regression Result

Dependent Variable: GDP

Method: Least Squares

Date: 03/03/17 Time: 07:10

Sample: 1981 2015

Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGOUT	9.400918	1.645118	5.714433	0.0000
TGE	11.46100	4.682172	2.547796	0.0020
C	-2961.469	1434.010	-2.065166	0.0471
R-squared	0.948734	Mean dependent var		17827.15
Adjusted R-squared	0.944529	S.D. dependent var		28092.36
S.E. of regression	6556.458	Akaike info criterion		20.49611
Sum squared resid	1.38E+09	Schwarz criterion		20.62942
Log likelihood	-355.6818	Hannan-Quinn criter.		20.54213
F-statistic	296.0951	Durbin-Watson stat		1.890236
Prob(F-statistic)	0.000000			

Source: Author's Computation.

Model Estimation

$$GDP = \beta_0 + \beta_1 AGOUT + \beta_2 TGE + \varepsilon$$

$$GDP = -2961.469 + 9.400918 + 11.46100$$

$$S.E. = (1434.010) \quad (1.645118) \quad (4.682172)$$

$$T.Stat = 2.065166^* \quad 5.714433^* \quad 2.547796^*$$

$$R^2 = 0.948734$$

$$\bar{R}^2 = 0.943529$$

$$F\text{-Statistic} = 296.0951$$

$$D.W. = 1.89$$

Interpretation of Result

The above result shows that the R^2 is 0.948734, which shows that the model explains about 95% of the variations in the growth rate of the GDP in Nigeria were accounted for by the included explanatory variables of contribution of agricultural sector output and total government expenditure while the remaining 5% were captured by the error term. The adjusted coefficient of determination (adjusted R^2) is given as 0.943529 this means that precisely 94% of the variations in the growth rate of the Gross Domestic Product of Nigeria were accounted for by the included variables, after the co-efficient of determination has been adjusted to make it insensitive to the number of included variables. This result is in line with the theoretical foundation of economic theory by (Wagner, 1883, Keynes (1936), Peacock & Wiseman (1961) as well as Musgrave (1969) who argued that

there is a direction of causality between public expenditure and economic growth. Such that public expenditure is a consequence of economic growth as posited by Wagner (1883) and the other is by Keynes (1936) who stated that public expenditure is a tool adopted by the government to reverse economic downturns by borrowing money from the private sector and then returning it to them through various spending programmes, hence, economic growth is an outcome of public expenditure.

Both variables conform to the a priori expectations in that the coefficients have positive signs. The Total output in the agricultural sector (AGOUT) has a positive and significant effect on economic growth in Nigeria. 1% increase in agricultural output will increase economic growth of Nigeria tremendously by 9.4%.

Also, total government expenditure (TGE) has a positive and significant effect on economic growth in Nigeria. As total expenditure increases, economic growth increases. This result shows that 1% increase in total government expenditure will increase economic growth by 11.5%.

Test of Significance of Parameters

This involves tests for the significance of each variable in the model. This can be done either by standard error, T-statistics or probability test. In this study, the T-statistics test is employed in order to determine if the parameter estimates are statistically meaningful or relevant.

T-statistic: At 5% level of significance using a t-distribution table with 30 degrees of freedom i.e. t^* is 2.042, which implies that acceptance region is $-2.042 < t < 2.042$ i.e. t calculated greater than t -table, accept H_0 i.e. Null hypothesis while t calculated less than t -table, reject Null hypothesis and accepts H_1 i.e. alternative hypothesis. Therefore, null hypothesis is accepted for β_1, β_2 , that they are not statistically significant.

From the regression result in the table above, it is evident that the calculated t-statistic value of **AGOUT** was $5.714 >$ table value of 2.042. we can conveniently concluded that the Null hypothesis of the Public spending on agriculture has no significant impact on the economic growth in Nigeria is rejected at 0.05% level of significant and then accept the Alternative hypothesis that the Public spending on agriculture has significant impact on the economic growth in Nigeria under the period of investigation.

Likewise, the result in the table above, it was revealed that the calculated t-statistic value of **TGE** was $2.55 >$ table value of 2.042. we then concluded that the Null hypothesis of the total government expenditure has no significant effect on economic growth in Nigeria is rejected at 0.05% level of significant and then accept the Alternative hypothesis that the total government expenditure has significant impact on economic in Nigeria under the period of investigation.

F-statistic accounts for the joint significance of the variables. Thus, with the value of (296.0951) it shows that both the explanatory variables and dependent variables are jointly significant and are capable of explaining the variations or changes in the Gross Domestic Product.

Durbin Watson: it explains whether there is autocorrelation between the errors of the variables of the model. The result of d-statistics = 1.8 implies that there was no presence of positive serial autocorrelation between the errors of the variables of the model.

Diagnostics Statistics**Serial Correlation LM TEST****Table:4.4: Serial Correlation LM Test:**

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	10.07916	Prob. F(2,30)	0.0004
Obs*R-squared	14.06628	Prob. Chi-Square(2)	0.0900

Source: Author's Computation, 2016.

Null Hypothesis: No Serial correlation in the residuals (u)

Alternative Hypothesis: There is serial Correlation in the residuals

Since the p-value (0.0900) of Obs*R-square is more than 5% ($p > 0.05$), we cannot reject null hypothesis meaning that residuals (u) were not serially correlated.

Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	7.335589	Prob. F(2,32)	0.0024
Obs*R-squared	11.00232	Prob. Chi-Square(2)	0.0404
Scaled explained SS	15.55691	Prob. Chi-Square(2)	0.0004

Source: Author's Computation

Null Hypothesis: Residual (u) are Homoscedastic

Alternative Hypothesis: Residuals (u) are Heteroscedastic

The p-value (0.0404) of **Obs*R-squared** shows that we cannot reject null hypothesis. So residual do have constant variance which is desirable. That is, the residuals are not Heteroscedastic.

Discussion of Findings

The study revealed that government expenditures on agriculture being a critical sector of the economy has relationship with the economic growth under the year of study. This is in line with the study of CBN (2012) that between 1960 and 2011, an average of 83.5% of agriculture GDP was contributed by the crops production subsector making it the key source of agriculture sector growth. The food production role of the agriculture sector depends largely on this subsector as all the staples consumed in the nation comes from crop production, 90% of which is accounted for by small-scale, subsistent farmers.

The total government expenditure (TGE) has a positive and significant effect on economic growth in Nigeria. As total expenditure increases, economic growth increases. This result shows that 1% increase in total government expenditure will increase economic growth by 11.5%. This result supported the theoretical foundation of economic theory by (Wagner, 1883, Keynes (1936), Peacock and Wiseman (1961) as well as Musgrave (1969) who argued that there is a direction of causality between public expenditure and economic growth. Such that public expenditure is a consequence of economic growth as posited by Wagner (1883) and the other is by Keynes (1936) who stated that public expenditure is a tool adopted by the government to reverse economic downturns by borrowing money from the private sector and then returning it to them through various spending programmes, hence, economic growth is an outcome of public expenditure.

The work of Iganiga and Unemhilin (2011) was also in support of this studied that, the effect of federal government agricultural expenditure and other determinants of agricultural output on the value of agricultural output in Nigeria and their results showed that federal government capital expenditure was found to be positively related to agricultural output.

The results of the regression show that there is a positive relationship between the gross domestic product and the Agricultural Output. The estimated model shows agricultural sector for the period of analysis has significant influence on macroeconomic output level. The explanatory power of the regression model with an adjusted R2 of 0.94 is impressive.

Also the overall significant of the study was explained by the f-statistics which it shows that both the explanatory variables and dependent variables are jointly significant and are capable of explaining the variations or changes in the Gross Domestic Product.

CONCLUSION AND POLICY RECOMMENDATION

Agriculture is an important sector of Nigerian economy. In the world today, agricultural sector acts as the catalyst that accelerates the pace of structural transformation and diversification of the economy, enabling the country to fully utilize its factor endowment, depending less on foreign supply of agricultural product or raw materials for its economic growth, development and sustainability.

This research work examined the nexus between public expenditure on agriculture and economic growth in Nigeria using annual time series data from 1981-2015. The results of regression analyses showed a significant impact of government spending on agricultural sector on both the agricultural output response, total public expenditure and economic growth. This study therefore concluded that a significant nexus exists between public spending on agricultural sector output and economic growth in Nigeria.

From the findings and conclusion in the study, the following recommendations were made. Conscious effort should be made by government at all levels towards increasing budgetary allocation to the agricultural sector.

Government should encourage the financial sector to set aside funds for agricultural financing as well as encourage flexibility in accessing loans to enhance agricultural production. Government should provide funds to acquire sophisticated farm tools with increase in her budgetary allocation to agricultural sector in a consistent manner with a view to contributing more to the economic growth of Nigeria.

For any nation, to grow, especially in Nigeria, the focused of government on the agricultural sector should not be overlooked, thus, the government should direct its spending efforts in productive means, through increase, improve and encourage the output of the agricultural sector as previously shown. This will create better avenues for job creation, growth and high productivity.

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