

**PUBLIC SECTOR FINANCING AND AGRICULTURAL OUTPUT IN
NIGERIA**

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ABSTRACT

The study examined public sector financing and agricultural output in Nigeria from 1980 to 2014. The objectives of the study were to examine the impact of; government capital spending on agriculture and agricultural output in Nigeria, government recurrent spending on agriculture and agricultural output in Nigeria and credit to agriculture sector and agricultural output in Nigeria. The study used the unit root test, co-integration/ECM methods to analyze the data collected from CBN statistical bulletin. The estimated ADF unit root and Johansen co-integration tests showed that all the variables were stationary and co-integrated. The estimated parsimonious error correction result shows that the overall model is satisfactory with an R² of 71 percent. The coefficient of the ECM is negatively signed and is statistically significant at the 5% level. Thus, the parsimonious error correction model will correct the deviation from the short run to long-run equilibrium. Moreover, the coefficient of the independent variables (government capital spending on agriculture and government recurrent spending on agriculture) were positively signed. Moreover, the coefficient of the independent variable, (credit to agriculture sector) is statistically significant at 5% level. The results revealed that governments financing in the agricultural sector have greater implication on agricultural output in Nigeria during the period of study. To this effect, since agricultural sector driven economy is key to sustainable development, it is therefore overdue for the Nigerian economy to diversify. Based on these findings, it is therefore recommended that: Government should increase her budgetary allocation to the agricultural sector in a consistent manner because of its potential to diversify from the oil sector.

Also, there should be continuity of sound macroeconomic policy measures in the agricultural sector especially in area of sectorial allocation of credit.

Keywords: FAO, Agricultural Sector, Public Sector Financing

1.0 INTRODUCTION

Public sector financing represents the annual expenditure by the federal government to achieve some macro-economic objectives which may include increase in agricultural output, national productivity and macro-economic constancy in the economy. Agriculture remains the strength of the Nigerian economy; this is because it is the major sector in terms of employment creation (Ajie, Akekere and Ewubare, 2014). With the goal of diversifying her oil base economy, Nigeria is setting much emphasis on financing different areas most particularly agricultural sector, since agriculture has the potential to bring about growth vis-à-vis the provision of raw materials, food, jobs and increased financial stability.

Meanwhile, public sector expenditure, which serves as the bed rock of financing for the agricultural sector has consistently fallen short of the public expectation. For instance, a collaborative study carried out by the International Food Policy and Research Institute (IFPRI) and the World Bank in 2008, publicized that Nigeria's financing on agriculture is under 2% of aggregate government yearly spending consumption. This is significantly below compared to other developing countries like Kenya (6%), Brazil (18%) and 10% goal set by African Leaders Forum, under the Comprehensive Africa Agricultural Development Programme (CAADP).

Notwithstanding poor venture in agriculture, agribusiness has on the average contributed 32% of the nation's GDP from 1996 to 2000 and 42% in the vicinity of 2001 and 2009 (CBN, 2010). According to CBN Governor, in 2011 horticulture represented 40% of the country's GDP, yet it got just a percentage of the aggregate business bank credits (People's Daily, 2011).

According to Obayori (2014), in order to support the growth of the agricultural sector, various governments in Nigeria have initiated different financial policies and programs. Some of these include: Better life for rural dwellers, Agricultural development projects (ADPS) National Centers for Agricultural Mechanization (NCAM), Green Revolution programmed, Operation Feed the Nation (OFN), specialized Universities of Agriculture. Despite the various Agricultural policies and programmes, Nigeria's Agricultural sector is still characterized by low output, attributed to poor funding and neglect (Obayori, 2014). Moreover, Obayori (2014) maintained that the declining contributions of agriculture to the gross domestic product (GDP) could be associated with poor budgetary allocation to agricultural sector. Consequently, there is an urgent

need for the government to revamp the agricultural sector to its past glory through proper funding.

Given the background above, the objectives of the study were to: examine the impact of public sector capital financing in agriculture on agricultural output in Nigeria; determine the impact of public sector recurrent financing in agriculture on agricultural output in Nigeria; and examine the impact of agricultural credit on agricultural output in Nigeria.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework: Wagner's Law of Increasing State Activities

Adolph Wagner (1835-1917) was a German economist who based his law of increasing state activities as historical facts from Germany. According to Wagner, there are inherent tendencies for the activities of different layers of a government (such as central, state and local government) to increase both intensively and extensively. From the original version of this theory, it is not clear whether Wagner was referring to an increase in absolute level of public spending, the ratio of government expenditure to GNP or Proportion of public sector in the economy. In any case, Musgrave hopes that Wagner was considering extent of public sector in the economy. Wagner's proposition likewise closed with experimental confirmation that it was similarly connected to a few other government spending which varied broadly from each other. A wide range of government regardless of their kinds (say the federal or state government), has exhibited, the same tendency of increasing public expenditure.

2.2 Empirical Literature:

The empirical works identifying with public spending and the performance of agricultural sector include Iganiga and Unemhili (2011) who studied the effect of government agricultural expenditure and other determining factors of agricultural output on the value of agricultural output in Nigeria using the Vector Error Correction model and found that government capital spending has a positive correlation with agricultural output.

Obi and Obayori (2016) examined the dynamic effect of government spending on agricultural output in Nigeria with the use of co-integration/ error correction mechanism and granger causality test methods. The authors discovered that government capital and recurrent spending on agriculture were positively related to agricultural output.

Oji-Okoro (2011) utilized regression analysis in his investigation on the impact of agricultural sector on the Nigerian economic development. The result showed a positive connection between Gross Domestic Product (GDP), domestic savings, government spending on agribusiness and FDI between 1986 and 2007. In addition, the review showed that 81% of the variability in GDP was explained by domestic savings, government spending and foreign direct investment.

Utilizing secondary data from 1979 to 2007, Lawal (2011) confirmed the measure of federal government spending on agriculture. Remarkable evidence from the analysis demonstrated that government expenditure does not follow a regular pattern and that the agricultural sector and government funding contributed positively to GDP.

Ogwuma (1981) uses econometric analysis to studied public expenditure in Agricultural sector. Based on his report, agricultural financing in Nigeria shows direct relationship between interest rate and loanable funds on the level of Agricultural output. The solid relationship that has been built up between Nigerian's aggregate GDP and the agriculture suggests that the prospects of the non-oil sub-sector and the overall economy are firmly fixing to the performance of the agricultural sector.

Ukeje (2003) presents that in the 1960's, agribusiness contributed up to 64% to the aggregate GDP however progressively declined in the 70's to 48% and it proceeds in 1980 to 20% and 19% in 1985, this was accordingly of oil overabundance of the 1980's. and likewise low agrarian efficiency per sections of land, the fracture of land possessions, the damaged land residency framework portrayed by high leases, the absence of sufficient credit offices the absence of irrigational facilities and reliance on rainfall, the utilization of out of date techniques of production, and the excessive pressure of population on land.

The study of Nenbee (2012) assessed the role of policies among formal and informal credit institutions determining the access of small scale enterprises to credit in Nigeria. The study concludes that given the established network of formal credit institutions, improving lending terms and conditions in favour of small scale enterprise would provide an important avenue for facilitating their access to credit.

In assessing macroeconomic policies adopted in Nigeria and the effect of these polices on agricultural output growth in Nigeria, Eyo (2008) used the OLS econometric technique and reported that country's exchange rate regime has not encouraged agricultural exports lately. Although credit to the sector had no significant effect on agricultural output growths, its availability greatly depends on how high the nominal interest rates are. On the whole, macroeconomic policies that reduce inflation, increase foreign private investment in agriculture, introduce favourable exchange rates, make agricultural credit to have significant effect on

agricultural output growth would-be invaluable in fertilizing government expenditure in the sector and ensure agricultural output growth in Nigeria.

Muhammad– Lawal and Atte (2006) did an analysis of agricultural production in Nigeria, using descriptive statistics and regression analysis. The study reported that the overall agricultural production average growth rate was 5.4% and that GDP growth rate, population growth rate, and the consumer price index were the main factors affecting domestic agricultural production. This study recommended the need to increase per-capital productivity through the introduction of improved technology in agricultural production.

The concentration of Ajinde, Muchie and Olatunji (2011) was on the impact of environmental change on rural profitability in Nigeria. They made use of both descriptive and co-integration analysis techniques to analyze the data collected for the study. The finding proved that the rate of agricultural productivity is persistently higher between 1981 and 1995, followed by a much lower growth rate in the 1996 – 2000 sub-periods. There was variation in the trend pattern of rainfall. Temperature was not relatively constant either. The ADF test shown that agricultural productivity and the annual rainfall were not stationary but became stationary after the differencing. Annual temperature on the other hand is stationary at its level. Temperature change was revealed to exert negative effect while rainfall change exerts positive effect on agricultural productivity. However, previous year rainfall was negatively significant in affecting current year agricultural production in Nigeria.

3.0 METHODOLOGY

The empirical study utilized times series data relating to the dependent and explanatory variables. The research study considered a time series data made up of yearly data of 1980 - 2014 collected through the CBN statistical bulletin and methods of cointegration /ECM was adopted to measure the long run equilibrium relationship between the dependent and the independent variable. Thus, the ECM model is estimate the log-linear form. Thus;

$$\text{LogAPQ}_t = \text{Loga}_0 + \Sigma a_1 \text{LogGCA}_{t-1} + \Sigma a_2 \text{LogGRA}_{t-1} + \Sigma \text{Loga}_3 \text{ACR}_{t-1} + \text{ECM}_{t-1} + U_t \quad (3.1)$$

Where; APQ= Agricultural Production Output, GAS= Government Spending on Agricultural Sector, GCA= Government Capital Expenditure on Agriculture , GRA= Government Recurrent Expenditure on Agriculture and ACR = Agricultural Credit, Log = Natural Logarithm, U = Error Term, t= Time/Period. On the apriori, we expect $a_1 > 0$, $a_2 > 0$ and $a_3 > 0$

4.0 RESULTSAND DISCUSSIONS

This section presented and discussed the various test conducted to ascertain the relationship between the variables under consideration. The unit root test results was presented on table 4.1.

The co-integration test was presented on table 4.2 and the ECM results was presented on table 4.3

Table 4.1: Result of Unit Root Test on Variables

| Variables | ADF Test | Critical Value | | | Order of integration |
|-----------|-----------|-------------------|-------------------|--------------------|----------------------|
| | | 1% critical value | 5% Critical value | 10% critical value | |
| APQ | -5.204447 | -3.639407 | -2.951125 | -2.614300 | 0(1) |
| GCA | -10.79866 | -3.653730 | -2.957110 | -2.617434 | 1(1) |
| GRA | -7.41791 | -3.653730 | -2.957110 | -2.617434 | 1(1) |
| ACR | -5.545235 | -3.639407 | -2.951125 | -2.614300 | 1(1) |

Source: Author's *Computation*

The unit root test in table 4.3 above shows that at various levels of significance (1%, 5% and 10%), the time series were stationary. From the result APQ was integrated of order zero (at level), while the remaining two variables (GCA, GRA and ACR) were integrated of order one (first difference), therefore all the time series in this study are stationary.

Table 4.2: Johansen Co-integration Test Result for APQ Model

| Eigen value | Trace Statistics | 5% critical value | Prob. | Hypothesized N0 of CE(s) |
|-------------|------------------|-------------------|--------|--------------------------|
| 0.912273 | 129.5499 | 47.85613 | 0.0000 | None * |

| | | | | |
|----------|----------|----------|--------|-------------|
| 0.726168 | 49.24374 | 29.79707 | 0.0001 | At most 1 * |
| 0.175109 | 6.500830 | 15.49471 | 0.6363 | At most 2 |
| 0.004481 | 0.148206 | 3.841466 | 0.7003 | At most 3 |

Source: Author's Computation

From the table 4.2 above, it shows that there are two co- integrating equations at 5% level of significance. This is because only two equation trace statistic values were greater than the critical value at 5%. Given that there exists co-integrating equations, the requirement for fitting in an error correction model is satisfied.

Table 4.3: Parsimonious Error Correction Model

| Dependent Variable: DLOG(APQ) | | | | |
|-------------------------------|-------------|-----------------------|-------------|----------|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 0.130912 | 0.102366 | 1.278863 | 0.2156 |
| DLOG(APQ(-1)) | -0.094319 | 0.266587 | -0.353804 | 0.7272 |
| DLOG(APQ(-2)) | 0.039562 | 0.221124 | 0.178914 | 0.8598 |
| DLOG(APQ(-3)) | 0.004638 | 0.140049 | 0.033118 | 0.9739 |
| DLOG(GCA) | 0.069721 | 0.119891 | 0.581539 | 0.5674 |
| DLOG(GCA(-1)) | 0.099664 | 0.136024 | 0.732697 | 0.4722 |
| DLOG(GRA) | 0.051490 | 0.133653 | 0.385252 | 0.7041 |
| DLOG(GRA(-1)) | 0.130732 | 0.144195 | 0.906630 | 0.3754 |
| DLOG(ACR) | -0.040983 | 0.017234 | -2.378011 | 0.0794 |
| DLOG(ACR(-1)) | -0.235907 | 0.097369 | -2.422817 | 0.0250 |
| ECM(-1) | -0.841348 | 0.311995 | -2.696672 | 0.0139 |
| R-squared | 0.705705 | Mean dependent var | | 0.058810 |
| Adjusted R-squared | 0.558558 | S.D. dependent var | | 0.645733 |
| S.E. of regression | 0.429032 | Akaike info criterion | | 1.416853 |
| Sum squared resid | 3.681371 | Schwarz criterion | | 1.925687 |
| Log likelihood | -10.96121 | Hannan-Quinn criter. | | 1.582720 |
| F-statistic | 4.795912 | Durbin-Watson stat | | 1.713119 |
| Prob(F-statistic) | 0.001414 | | | |

Source: Author's Computation

The estimated parsimonious error correction result as shown in table 4.3 shows that the R^2 is 71 percent. The coefficient of ECM is negatively signed and is statistically significant at the 5% level. Thus, the parsimonious error correction model will correct the deviation from the short run to long-run equilibrium. Also, the Durbin Watson value of 1.7 which is not too far from 2.0, suggests a lesser level of autocorrelation. The F-statistic of 4.79 with the probability of 0.0014 is significant at the 5% level, meaning that the three independent variables are significant in explaining the level of agricultural output in Nigeria during the period of study.

Moreover, the current and lag one forms of the independent variables (GCA and ACR) were rightly signed, meaning that both government capital spending on agriculture (GCA), government recurrent spending on agriculture (GRA) were positively related to agricultural output. Meanwhile, the current and lag one form of the independent variable, credit to agriculture (ACR) is negatively signed and statistically significant at 5% level. Meaning that credit to agricultural sector impact on agricultural output during the period of study.

5.0 CONCLUSION AND RECOMMENDATIONS

The results revealed that public financing in the agricultural sector have greater implication on agricultural output in Nigeria during the period of study. Evidence is drawn from the ECM results. To this effect, since agricultural sector driven economy is key to sustainable development, it is therefore well over due for the Nigerian economy to diversify. The negative perception and orientation of the average Nigerian about agriculture sector should be disabused so that these sectors can contribute optimally to economy.

Based on these findings the study recommended that: Government should increase her budgetary allocation to the agricultural sector in a consistent manner because of its potential to diversify from the oil sector. Also, there should be proper monitoring of fund allocated to agriculture to facilitate an effective utilization of such fund. There should be continuity and consistency of macroeconomic policy measures in the agricultural sector especially in area of sectorial allocation of credit and government should domesticate the food and agricultural organization (FAO) recommendation that 25 percent of capital budget allocation should be assigned to the agricultural sector.

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