GOVERNMENT EXPENDITURE ON AGRICULTURAL OUTPUT: A PANACEA FOR ECONOMIC RECESSION.

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Abstract

The contribution of agricultural sector to the economy cannot be overemphasized when considering its building roles for sustainable development, in terms of employment potentials, export and financial impacts on the economy. The main objective of this paper empirically investigate government expenditure on agricultural output. The study used the error correction mechanism in its methodology. Government expenditure on agriculture has a direct impact on the total agricultural output. These relationships appear to be insignificant as shown from their pro-value. Hence, this indicates the fact that government expenditure has not significantly influenced agricultural output in Nigeria. However, our result shows that government expenditure has a positive impact on agriculture, but the fraction of government expenditure directed to agriculture is less than what the agricultural sector requires, the influence of the expenditure on the sector is therefore insignificant. Credit from financial institutions to the agricultural sector has an inverse relationship with the total agricultural output. The pro- value of the coefficient of credit was statistically significant. The implication is that credit from financial institutions to the agricultural sector is channeled for other purpose or to other sectors. Price of agricultural product had a negative impact on total agricultural output .This means that increase in the price of agricultural output will reduce total agricultural output. This is against the a priori expectation of the study and it is not statistically significant. The study recommends government spending to the agricultural sector.

Keywords: *Agricultural output, agricultural sector, Credit from financial institutions, government expenditure, prices of agricultural product*

Introduction

Economic recession is a downturn in the economy. It is often characterized by symptoms such as rising prices of goods and services, inability of government to meet its financial obligations, exchange rate fluctuations, and poor performance

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of other macroeconomic variables which defines the state of the economy per time. Economic recession is a recurrent issue because of the cyclical nature of the global economy. That is why most countries, especially the developed ones, often diversify the structural base of their economy to withstand any external shock. From historic viewpoint, there was an economic depression in the US in 1930s. Recently, in the dawn of year 2008, there was a global financial and economic meltdown attributable to the collapse of the US mortgage institutions; then the Euro Zone crisis and others. If urgent steps are not taken, the effects of this economic recession may linger Farayibi (2016). There is the need to diversification the structural base of the economy away from oil. We can only do this when the real sectors of the economy such as the manufacturing, agriculture, solid minerals etc. are also taken as priority sectors. It is on this note this paper carried out a study on government expenditure on agricultural output as panacea for economic recession.

Agricultural sector contributes significantly to the nation's economic development by: increasing government revenue through tax; improving the standard of living; infrastructural growth; contribution to Gross National Products (GNP); employment generation; enhance manpower development; It plays a key role by sourcing of food for man and animal and providing raw materials for the industrial sector, provision of employment and foreign exchange to the government, amongst others. Agriculture remains the most important single activity of the Nigerian economy; with about 70% of the working population still engaged in it. Despite the predominance of the oil and gas sector in Nigeria, agricultural sector still remains source of economic resilience in the Nigerian economy Ebere, Chidinma & Osundina, Kemisola (2014)

For many developing countries, agriculture is the largest sector in terms of its share in GDP and employment. More importantly, the majority of the world's poor live in rural areas and depend upon agriculture for their livelihood. Agriculture is therefore critical both for economic development and poverty reduction. It follows that in developing countries spending on agriculture is one of the most important government instruments for promoting economic growth and alleviating poverty in rural areas(Fans and Roa 2007) . There have been many studies of the relationship between government expenditure and agricultural output. Some of these studies have looked specifically at the link between government spending and agricultural growth and poverty reduction (Salami and Arawomo, 2013). Agriculture is the largest sector in many developing countries including Nigeria in terms of their shares in GDP and employment. More importantly, the majority of the world's poor live in rural areas and depend on agriculture for their livelihood. Sustainable agricultural development is therefore imperative in the quest for fighting economic recession. Therefore, agricultural expenditure is one of the most important government instruments for promoting

economic growth and alleviating poverty in rural areas, thereby reducing economic recession of developing countries including Nigeria.

Government expenditure includes all government consumption and investment but excludes transfer payments made by a state. Government acquisition of goods and services for current use to directly satisfy individual or collective needs of the members of the community is classed as government final consumption expenditure. Government infrastructure investment or research spending is classed as government investment (gross fixed capital formation). Government expenditures that are not acquisition of goods and services, and instead just represent transfers of money, such as social security payments, are called transfer payment. The first two types of government spending, final consumption expenditure and gross capital formation, together constitute one of the major components of gross domestic product (Stephen and Lawrence 2014).

Statement of the problem

According to Olugbenga and Owoye, (2007), rising government expenditure has not translated to meaningful growth and development, as Nigeria ranks among the poorest countries in the world. In addition, many Nigerians have continued to wallow in abject poverty, while more than 50 percent live on less than US$2 per day. Inadequate funding of the agricultural sector has been raised by experts as an obstacle to increases agricultural output. Indeed this development has led Nigerian government a net importer of all kinds of food items from all over the world. Agriculture remains the bedrock, and the mainstay of Nigerian's economy. It is regarded as the largest employer of labour, and a key contributor to wealth creation and poverty alleviation, as a large percentage of the population derives its income from agriculture (NEEDS, 2004). From various studies, government expenditure on agricultural output is still contentious, hence this paper wants to cover this gap.

[2.1] Theoretical Literature

Wagner's Theory

Wagner formulated his 'law of expanding state activity' towards the end of nineteenth century. His law states that as the per capita incomes in industrialized countries rise, the relative share of the public sector in national output would rise. Wagner's law requires categorizing government expenditure into three areas. The first of these is the administrative and protective functions of government. The second is the cultural and welfare functions of the state which includes expenditure on education, and income distribution. The third involves direct provision of services by the government.

He argued that the first type of increased expenditure arises from the inevitable centralization of economic functions and the increasing complexities in legal relationships that automatically results when there is economic development. His

argument has support from sociology. Sociologist argued that population growth, increased urbanization and division of labor that tend to characterized economic development; tend to increase alienation. This therefore necessitates increase government spending. The second explanation which Wagner found for his law was based on increased need for industrialized nations to spend on culture and welfare. General and popular education is one of such need which the government is forced to spend on. Government is the only institution that can organize resources for supplying a skilled work force to industry and commerce.

Finally, he linked the growth of public expenditure to the need to increase economic developments in cases where there is evidence of market failure. The more industrialized an economy becomes, the greater the degree of monopoly and thus the greater the market failure.

2.2 EMPIRICAL REVIEW

Using time series data, Lawal (2011) attempted to verify the amount of federal government expenditure on agriculture in the thirty-year period 1979 to 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. Akande , Falokun , Taiwo , Ogunwale , & Adeoye (2012) in their work; effects of government budgetary allocation to agricultural output in Nigeria (1995-2009) show that the percentage, degree or amount of budgetary allocation to agricultural sector has a positive relationship with the total agricultural production in the country. This implies that the more the public spending on agricultural sector, the more the improvements in the performance of the agricultural sector. Also, a large degree of change in agricultural output is accounted for by change in budgetary allocation to agricultural sector. Thus, budgetary allocation to agriculture has a large impact on agricultural output.

Ebere, et al (2012) empirically 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 findings also revealed that the sector still encounter some problems like inadequate finance, poor infrastructure, and others. Therefore, the study recommends that it is imperative for the country to develop its agricultural sector through sufficient government spending in order to set-up its economic growth. It emphasizes the need to enlighten farmers, improve and provide infrastructures, accord a priority to the sector in budget allocation,

Idoko, Apeh and Adeshina (2012) investigated the effects government expenditure on agriculture and Agricultural output in Nigeria. Their period of study covers 1975-2010. Their estimation technique is the ordinary least square econometric technique. Their results revealed a positive but insignificant relationship between government expenditure to the agricultural sector and agricultural output within the scope of the research. Adofu, Abula and Agama (2012) examined government budgetary allocation to the agricultural output in Nigeria. Data were obtained from Central Bank Statistical Bulletin. They estimate their model with a multiple regression technique. Their result shows that government budgetary allocation to the agricultural sector has significant effect on agricultural production in Nigeria. The study therefore recommends increase government budgetary allocation to the agricultural sector.

Naftaly, Symon, Aquilars, and James (2014)investigate empirically the contribution of government expenditure on Economic Growth in East Africa. Study focused on disaggregated expenditure over the period from 1980 to 2010. Using balanced panel fixed effect model. Employing LLC test, this study tested for panel unit root and found that only GDP was stationary at level. The findings showed that expenditures on health and defense to be positive and statistically significant effect on growth. In contrast, education and agriculture expenditure were insignificant. This study suggests that for East Africa, the policy of increasing spending on health and defense budget to promote economic growth will be appropriate, but fewer funds should be channeled towards other sectors.

Loto (2011) investigated the impact of sectoral government expenditure on economic growth in Nigeria for the period 1980-2008 and applied Johansen cointegration technique and error correction model. The results inferred that in the short run expenditures on agricultures and education were negatively related to economic growth. However, expenditures on health, national security, transportation, and communication were positively related to economic growth, though the impacts were not statistically significant. Abu and Abdullahi, (2010) examined the effect of government (consumption) expenditure on agricultural growth for a sample of 96 countries, and discovered a negative effect of government expenditure on growth of real output.

Junko and Vitali (2008) investigate the impact of government expenditure on economic growth in Azerbaijan because of the temporarily oil production boom (2005) which caused exceptionally large expenditure increase aimed at improving infrastructure and raising incomes. Azerbaijan's total expenditure increased by a cumulative 160 percent in nominal value from 2005 to 2007 (i.e. from 41 percent of non-oil GDP to 74 percent) in their research reference which were made to Nigeria and Saudi Arabia (1970-89) who have also experienced oil boom and increased government expenditure over the years. The study simulated the neo-classical growth model tailored to the Azeri conditions. Their analysis suggested that the evaluated fiscal scenario poses significant risks to growth

sustainability and historical experience indicates that the initial growth performance largely depends on the efficiency of scale-up expenditure.

Komain and Brahmasrene (2007) examined the association between government expenditures and economic growth in Thailand, by employing the Granger Causality Test. The results revealed that government expenditures and economic growth are not co-integrated. Moreover, the results indicated a unidirectional relationship, as causality runs from government expenditures to growth. Lastly, the results illustrated a significant positive effect of government spending on economic growth.

3.1 **METHOD OF STUDY**

This study made use of secondary data which were collected from the Central Bank of Nigeria Statistical Bulletin. The estimation technique adopted is error correction mechanism.

3.2 **Theoretical Framework**

The study modifies Barro (1990), which introduces a new factor in the aggregate production function – public expenditure. The author assumes an indivisible and non-explosive public expenditure. In fact, each firm benefits from all public expenditure, but their use by a particular firm does not decrease the quantity available for the others. The economy then displays endogenous growth if – and only if – public expenditure increases with physical capital (since decreasing returns are neutralised). Barro (1990) examined an endogenous growth model that suggests a possible relationship between the share of government spending in GDP and the growth rate of per capita real GDP. The key feature of Barro's model is the presence of constant returns to capital that broadly includes private capital and public services. To the extent that public services are considered an input to production, a possible linkage arises between the size of government and economic growth.

3.3 **Model Specification**

This study adopts Barro (1990) model which, examined an endogenous growth model that suggests a possible relationship between the share of government spending in GDP and the growth rate of per capita real GDP. The key feature of Barro's model is the presence of constant returns to capital that broadly includes private capital and public expenditure. To the extent that public services are considered an input to production, a possible linkage arises between the size of government spending and economic growth. Barro therefore specifies his model as follows:

$$grgdp = f(GOV\_SPEND, GOV\_INV, GOV\_CONSUM) \quad .. \quad (3.0)$$

This study modifies Barrow model and specify as follow:

The functional form of the equation is given as:

$TAO = F(GEA, PIA, CFIA)$ 3.1

TAO = Total Agricultural Output;

GEA =Government expenditure on agriculture

PIA= Price of agricultural product

CFIA= Total credit from financial institutions to the agricultural sector

Equation 3.1 is specified in an operational or linear form as follows;

$$TAO = \alpha_0 + \alpha_1 GEA + \alpha_2 PIA + \alpha_3 + \alpha_3 CFIA + u. \quad 3.2$$

α_0 is the intercept, α_1 - α_3 are parameters to be estimated

Based on economic theory, the expected sign or presumptive sign of the parameter estimates are

$\alpha_1 \alpha_2 \alpha_3 > 0$

The ADF test informs that any dynamic specification of the model in the level of their series is likely to be inappropriate and may be plaque by problems of spurious regression (Gujarati, 2007).

To test for unit root; we assume that: $\phi_p(B) = (1-B)\phi_{p-1}(B)$ …….3.3

Where;

$\phi_{p-1}(B) = 1 - B - \ldots$ $p-1$ has unit roots lying outside the unit circle.

$-\phi_{p-1}B$

$\phi_{p-1}(B)(1-B)Y_t = \alpha_0 + a_t$

$$\phi_{p-1}(B)Y_t = \alpha_0 + a_t$$

$$Y_t = \alpha_0 + \sum_{j=1}^{p-1} \alpha_j Y_{t-j} + \alpha_0 + a_t \text{ ----------3.4}$$

Hence, testing for a unit root is equivalent to testing $\alpha = 1$ in the following model;

$$Y_t = \alpha + Y_{t-1} + \sum_{j=1}^{p-1} \alpha_j Y_{t-j} + \alpha_0 + a_t \text{----------3.5}$$

Or; $Y_t = (\alpha + Y_{t-1} + \sum_{j=1}^{p-1} \alpha_j Y_{t-j} + \alpha + \alpha_0 + a_t$

ADF test equation then becomes:

; (□□□□□□□□□----------3.6

$\Box Y_t$ □□□$Y_{t\Box 1}$ □□□□□□$_j$ □$Y_{t\Box\Box j}$ ----------3.7

□□□□$_0$ □□a_t

The method of data analysis is the Vector Error Correction Model. The regression equation form for VECM is as follows:

$$\Delta Y_t = \alpha_1 + p_1 e_1 + \sum_{i=0}^{n} \beta_i \Delta Y_{t-1} + \sum_{i=0}^{n} \gamma_i \Delta X_{t-i} + \sum_{i=0}^{n} \delta_i Z_{t-i} \quad \ldots\ldots\ldots\ldots \quad 3.8$$

$$\Delta X_t = \alpha_2 + p_2 e_{t-1} + \sum_{i=0}^{n} \beta_i \Delta Y_{t-1} + \sum_{i=0}^{n} \gamma_i \Delta X_{t-i} + \sum_{i=0}^{n} \delta_i Z_{t-i} \quad \ldots\ldots\ldots\ldots \quad 3.9$$

In VECM, the co-integration rank shows the number of co-integrating vectors. A negative and significant coefficient of the ECM (i.e e_{t-1} in the above equation) indicates that any short-term fluctuations between the independent variables and the dependent variables will give rise to a stable long-run relationship between the variables. VECM is to evaluate the short-run properties of the co-integrated series.

4.1 PRESENTATION AND ANALYSIS OF RESULT

Previous section discussed the theoretical framework and model specification. The objective of this section is to empirically assess the effects of government expenditure on agricultural output.

4.2. UNIT ROOT TEST

This study makes use of Phillip Perron Unit Root test. Choice of Phillip Perron was based on better results output, ADF test for unit root was also carried out,but the results from ADF were not as robust as the results from Phillip Perron. According to the unit root test all variable were stationary at first difference, except government expenditure on agriculture (GEA) that was stationary at levels.

Table 4.1: Unit Root Test Using Phillip Perron

Variables	PP Calculated	Critical values	Order of Integration
TAO	-9.945927*	1%= -4.2712 5%= -3.3562	1(1)
GEA	-5.242203*	1%= -4.2505 5%= -3.5468	1(0)
PIA	-5.164786*	1%= -4.2605 5%= -3.5514	1(1)
CFIA	-7.000346*	1%= -4.2605 5%= -3.5514	1(1)

Source: Extracted from E-views 7.1 Computer prints out.

*Significant at 1 percent, **significant at 5 percent,

4.3: Co-integration Test

Table 4.3. Co-integrating Vector

Cointegration with unrestricted intercepts and no trends in the VAR
Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix 32 observations from 1983 to 2015. Order of VAR = 3.

List of variables included in the cointegrating vector:

TAO GEA PIA CFIA

List of eigenvalues in descending order:

.98656 .80812 .73623 .37406 .019990

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r =	r =	137.8956	33.6400	31.0200
r<=	r =	52.8277	27.4200	24.9900
r<=	r =	42.6461	21.1200	19.0200
r<=	r =	14.9919	14.8800	12.9800
r<= 4	r = 5	.64615	8.0700	6.5000

Table **4.3** above reports the co-integration test results for the model. Maximal Eigen value statistics tests indicate 4 co-integrating relationship or vector at the 5% level of significance. To determine co-integrating test, we compare the Maximal Eigen value statistics to the critical value in order to determine the number of co-integrating equations. If the Maximal Eigen value statistics is greater than the critical value there is co-integrating equation. For example at rank 1 the Maximal Eigen value statistics is 137.8956 greater than the critical value 33.6400. The Maximal Eigen value statistics value test indicates 3 co-integrating relationship or vector at the 5% level of significance. Thus, the vector error correction model is estimated based on 4 co-integrating vectors.

TABLE 4.4 Short Run Dynamics: Vector Error Correction

ECM for variable TAO estimated by OLS based on co-integrating VAR(3)
Dependent variable is dTAO 32 observations used for estimation from 1983 to 2015

Regressor	Coefficie	Standard Error	T-
Intercept	-84.3154	95.7901	-.88021[.390]
dTAO1	.90020	.44244	2.0346[.057]
dGEA1	3.5512	3.8347	.92608[.367]
dPIA1	-4.6705	10.5135	-.44424[.662]
dCFIA1	-20.0261	4.1260	-4.8536[.000]
dTAO2	1.6622	.33720	4.9293[.000]
dGEA2	1.7271	2.9349	.58847[.564]
dPIA2	-56.7131	11.9655	-4.7397[.000]
dCFIA2	-19.3674	3.9520	-4.9006[.000]
ecm1(-1)	-885.8692	164.3018	-5.3917[.000]

R-Squared .96974 R-Bar-Squared .94788

F-stat.F(13, 18) 44.3654[.000] , DW-statistic2.0164

Table 4.4 above present the short run result, the coefficient of the first lag of government expenditure on agriculture (GEA) is 3.55 while that of the second lag is 1.73. This implies that the first and second lag of government expenditure on agriculture both have a direct impact on the total agricultural output (TAO),but not statistically significant as shown by their pro value. The first and second lags of the price of agricultural product (PIA) have negative impact on total agricultural output (TAO).This means that a unit increase in the price of agricultural output will reduce TAO by -4.67, -56.71 respectively.

The first and second lag of the credit from financial institutions to the agricultural sector both have an inverse relationship with the total agricultural output (TAO). The coefficients of the first and second lag of credit from financial institutions are -20.03 and -19.95 respectively, with a pro- value of .000 and .000 respectively which shows that both are statistical significant. The implication is that a unit increase of credit from financial institutions to the agricultural sector, reduces total agricultural output by -20.03 and -19.95 respectively. By implication credit from financial institution to agricultural sector is channeled to other sectors. This signifies the fact that the second lag of total agricultural output has a direct impact on current total agricultural output, and this relationship is statistically significant at 0.05 level. It can be inferred from this result that the past output on agriculture significantly influences the current output.

The coefficients of error correction terms for TAO model had the right sign and is significant at 1% levels. The usefulness of the error correction models produces better short-run forecasts and hence provide the short-run dynamics essential to obtain long-run equilibrium.

The coefficient of determination (R^2) value is **.**96974 , this implies that 97 per cent of the total variation in total agricultural output (TAO) is explained by changes in the explanatory variables. Subsequently, 3 per cent is unexplained due to error term. The adjusted coefficient of determination (R^{-2}) Value of .94788 implies that 95 per cent of the total variation in total agricultural output (TAO) is explained by changes in the explanatory variables when the coefficient of determination is adjusted for degree of freedom. This implies that 5 per cent is unexplained due to error term. Durbin Watson Statistic of 2.0164 indicates that there is absence of serial autocorrelation. The F – test with a value of 44.3654 with a pro value .000 suggests that the variables are significant factors to be considered in changing the level of the total agricultural output (TAO). The negative sign of the Error Correction Mechanism in the equation suggests that the speed of adjustment between the short-run dynamic and the log-run relationship is satisfactory.

5.0 SUMMARY/CONCLUSION Government expenditure on agriculture has a direct impact on the total agricultural output (TAO). These relationships appear to be insignificant as shown from their pro-value. Hence, this indicates the fact that government expenditure has not significantly influenced agricultural output in Nigeria. However, our result shows that government expenditure has a positive impact on agriculture, but the fraction of government expenditure directed to agriculture is less than what the agricultural sector requires, the influence of the expenditure on the sector is therefore insignificant. Credit from financial institutions to the agricultural sector has an inverse relationship with the total agricultural output (TAO). The pro- value of the coefficient of credit was statistically significant. The implication is that credit from financial institutions to the agricultural sector is channeled for other purpose or to other sectors. Price of agricultural product had a negative impact on total agricultural output (TAO).This means that increase in the price of agricultural output will reduce total agricultural output. This is against the a priori expectation of the study and it is not statistically significant. This study found that a change in total government expenditure towards the agricultural sector does not necessary translate to growth in the output of the agricultural sector. Trends on government expenditure towards the agricultural sector has maintained a rising trend for the period of this study, but this rising trend in government expenditure never had a significant impact on the total output of the agricultural sector. This findings is in consonance with Omanukwue (2005) who asserted that a large proportion of the funds allocated to agriculture does not go directly to farmers. As a result, government policies towards revamping the agricultural sector has been of little effect.

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