Asian Journal of Business Management 5(2): 238-251, 2013
ISSN: 2041-8744; e-ISSN: 2041-8752

Submitted: November 20,2012 Accepted: January 11, 2013 Published: April 15, 2013

Linkages amongst Government Spending, Stock Market Development and Output in Nigeria Agriculture

O.C. Omigie, M.A.Y. Rahji, V.O. Okoruwa and A.I. Adeoti
Department of Agricultural Economics, University of Ibadan, Ibadan, Nigeria

Abstract: This study explored the nexus amongst government agricultural spending and its inherent volatility level, total capital employed and turnover of the agricultural sector of the stock market and agricultural output in Nigeria. Time series data from 1978-2008 were employed. Data were analyzed using square of mean-adjusted relative change volatility estimation method, co-integration and error correction model and two-stage-least squares regression technique. There is the existence of a long-run relationship amongst government agricultural spending, total capital employed and turnover of the agricultural sector of the stock market and agricultural output. Government agricultural spending is influenced by its lag (0.42) and agricultural output (-1.94). Total capital employed in the agricultural sector of the stock market is influenced by government agricultural spending (0.15). Total turnover of the agricultural sector of the stock market is influenced by the total capital employed in the sector and the volatility level in government agricultural spending (-0.03). Agricultural output is influenced by government agricultural spending (0.09) and total turnover of the agricultural sector of the stock market (0.23). Government agricultural spending stimulates the development of the agricultural sector of the stock market, while its volatility is an impediment. The agricultural sector of the stock market is an effective window policy makers can exploit to increase agricultural output.

Keywords: Agricultural output, co-integration and error correction model, government spending, stock market

INTRODUCTION

Background of the study: For many developing countries, agriculture is the largest sector in terms of its share in the nation's total Gross Domestic Product (GDP) and employment (Fan *et al*., 2008; Fan *et al*., 2009). More importantly, majority of the world's poor live in rural areas and depends upon agriculture for their livelihood (Binswanger and Townsend, 2000). Hence, agriculture is critical for both economic development and poverty reduction (Armas *et al*., 2012). It therefore follows that in developing countries, government agricultural spending is one of the most important instruments of government for promoting overall economic development and the alleviation of poverty (Ayoola and Oboh, 2000; Fan *et al*., 2000; Fan and Saurka, 2008; Diao *et al*., 2009).

Government agricultural spending can directly increase agricultural output by shifting upward the production frontier as in the case of irrigation (Binswanger *et al*., 1993). It therefore implies that government agricultural spending increases the rate of return to private agricultural investment and thereby leads to greater investment and output in the agricultural sector of the economy (Abdullah, 2000; Al-Yousif, 2000; Ranjan and Sharma, 2008; Corray, 2009).

However, the volatility in government spending has been known to have a differentiated effect among countries. In particular, while it is harmful for economic output and growth for developing countries, it has a small effect on developed countries (Alesina and Tabellini, 2005; Furceri, 2007). Volatility of both government expenditures and revenues is detrimental to economic output and growth (Afonso and Furceri, 2010; Afonso and Jalles, 2012). However, Gong and Zou (2002) was surprised to find out that volatility in government spending in public services as well as in transportation and communication had a positive effect on economic output and growth.

Furthermore, Abu and Abdullahi (2010) found out at some levels of spending, the impact of government spending on the production of goods and services was negative. Therefore they recommended that at a point, government should give way to the private sector to drive the economy in order to prevent the crowding-out effect.

One of the ways the private sector is framed to participate and drive most economies is the nation's stock market. The stock market under general equilibrium plays a vital role in an economy by allocating funds to the most productive sector of the economy and should have a significant link to the overall economy of the country (Dritsaki, 2005; Ake and Ognaliqui, 2010). Studies have also found the existence of an interdependent relationship between the nation's stock market and the economy (Ansotequi and Esteban, 2002; Nasseh and Strauss, 2000; Surya and Suman, 2006). Other studies have also confirmed the

Corresponding Author: O.C. Omigie, Department of Agricultural Economics, University of Ibadan, Ibadan, Nigeria

positive relationship between the stock market development and economic growth (Arestis *et al*., 2001; Capasso, 2003; Mohtadi and Agarwal, 2004; Nieuwerburgh *et al*., 2005; Yartey and Adjasi, 2007; Ujunwa and Salami, 2010).

Against this background, this study investigated the linkages amongst government total agricultural spending in Nigeria and its inherent volatility level, the development (total capital employed and total turnover) in the agricultural sector of the Nigerian stock market and agricultural output of the Nigerian economy.

Statement of the problem: The share of government total agricultural spending in the total government spending in the Nigerian economy is dismally low (Ayoola and Oboh, 2000). It lags behind countries like Burkina Faso, Ethiopia, Mali, Malawi and Senegal. And far from the Comprehensive Africa Agriculture Development Programme (CAADP, 2003) recommended of an allocation of 10% government total spending in the entire economy to the agricultural sector of the economy (Mogues *et al*., 2008; Fan *et al*., 2009). The share of government total agricultural spending in Nigeria was 1.67% of government total spending in the economy in 1978. It increased to 2.50% in 1983 and increased further to 4.59% in 1989. In 1995, it declined to 1.90% and dipped further to 0.59% in 1996. In 2001, it increased to 6.38% and slumped again to 1.31%. It increased again in 2005 to 3.99% and increased further to 5.28% in 2008. In the entire period of the study covered (1978-2008), the average share of government total agricultural spending in the total government spending in the economy was 3.11% (CBN, 2009). And this share of government total agricultural spending in the total government spending reveals large fluctuations (Fan *et al*., 2008; Fan *et al*., 2009). It also points to the inconsistency in government agricultural policy in Nigeria (Garba, 1998).

The share of agricultural output in the total Gross Domestic Product (GDP) of the Nigerian economy in 1978 was 23.28% and increased further to 33.21% in 1983. It increased further to 40.60% in 1988 and increased again to 48.57% in 2002 before declining to 32.85% in 2008. The average share of the agricultural out in the total national output in Nigeria for entire period of study (1978-2008) is 33.02% (CBN, 2009). The problem therefore is that, how can an extreme important sector like the agricultural sector of the Nigerian economy that contributes more than 30% of national output receive less than 5% of government total spending?

CBN (2009) also revealed that the past two and a half decades had witnessed an ever decreasing rate of installed capacity utilization in the manufacturing sector of the Nigerian economy. It had a value of 72.9% in 1978 and dipped to 53.3% in 2007. This declining rate is predominantly noticed in the agricultural (agro-industrial/agro-allied) manufacturing sub-sector of the economy; which currently operates less than 50% installed capacity utilization compared with above 70% a decade and a half ago.

This poor performance of the agricultural manufacturing sub-sector of the Nigerian economy is predominantly noticed in the agricultural (agro-industrial/agro-allied) sector of the Nigerian stock market. This is revealed in the agricultural sector's share of the total market capitalization of the Nigerian stock market. Out of the N285.6 billion of the total market capitalization of the Nigerian stock market, the agricultural sector's share was N1.3402 billion. This is just 0.47% of the total market capitalization of the Nigerian stock market. In 2000, out of the N478.6 billion of the total market capitalization of the Nigerian stock market, the agricultural sector's share was N1.1197 billion; which is 0.23% of the total market capitalization of the Nigerian stock market. In 2007, out of the N13.295 trillion of the total market capitalization of the Nigerian stock market, the agricultural sector's share was N0.03958 trillion; which is just 0.30% of the total market capitalization of the Nigerian stock market. The annual average share of the agricultural sector's share in the entire period covered is less than 1% of the total market capitalization of the Nigerian stock market (The Nigerian Stock Exchange fact book, various issues, www.nigerianstockexchange.com).

This poor performance of the agricultural sector of the Nigerian stock market is also revealed in the percentage share of the total turnover (value of total output) of the agricultural sector of the Nigerian stock market in the agricultural output of the Nigerian economy. In 1978, the percentage share of the total turnover of the agricultural sector of the stock market in agricultural output in Nigeria was 0.18% and increased to 0.22% in 1992. It dipped to 0.20% in 2001 and dipped further to 0.19% in 2008. Throughout the entire period of study, the average share of the total turnover of the agricultural sector of the Nigerian stock market in the agricultural output of the Nigerian economy is less than 1%.

Furthermore, the agricultural output of the Nigerian economy is economically unimpressive. The growth rate in the agricultural output lags behind that of food import in the country. In 1980, the growth rate in the agricultural output was 8.67%. It increased to 20.99% and 33.71% in 1990 and 2001 respectively. And by 2008, it dipped to 18.10%. The growth rate in food import in Nigeria for this same period above was 14.61, 64.75, 538.51, 40.99 and 30.77%, respectively (CBN,

2009). The average growth rates for agricultural output and food import throughout the period covered was 27.68 and 40.89% respectively; revealing a gap of about 13.00%. This means that agricultural output of the Nigerian economy is not growing sufficiently enough to meet its local demand, hence the huge food import into the country.

The problem of this study therefore is that: government total agricultural spending is dismally low and volatile, there is poor performance in the agricultural sector of the stock market and agricultural output is economically unimpressive in Nigeria

Research questions that this study intends to answer are:

- Does government total agricultural spending in Nigeria, development (total capital employed total turnover) in the agricultural sector of the Nigerian stock market and agricultural output of the Nigerian economy share common trend?
- Does the level of government agricultural spending and its volatility have any effect on the total capital employed and total turnover of the agricultural sector of the stock market and agricultural output in Nigeria?
- Does the level of total capital employed in the agricultural sector of the Nigerian stock market have any effect on the total turnover?
- Does the turnover of the agricultural sector of the stock market have any effect on the agricultural output in Nigeria?
- Does the level of agricultural output have any effect on government total agricultural spending in Nigeria?

Objectives of the study: The main objective of this study is to explore the linkages amongst government total agricultural spending, development in the agricultural sector of the stock market and agricultural output in Nigeria. The specific objectives are to:

- Investigate the existence of a long-run relationship amongst government total agricultural spending, total capital employed and turnover of the agricultural sector of the stock market and agricultural output in Nigeria.
- Identify the respective determinants of government total agricultural spending, total capital employed and turnover of the agricultural sector of the stock market and agricultural output in Nigeria.

Justification for the study: Numerous studies have linked the agricultural output of a nation's economy to the level of government total agricultural spending (Fan *et al*., 2000; Shintani, 2003; Muhammad-Lawal and Ate, 2006; Jaroensathaponkul and Tongpen, 2007; Qazi *et al*., 2010; Abu *et al*., 2011; Iganiga and Unemhilin, 2011). Some other studies have revealed that the volatility in government spending is harmful for economic output and growth especially in the developing countries (Alesina and Tabellini, 2005; Furceri, 2007; Afonso and Furceri, 2010; Afonso and Jalles, 2012). Other studies have established a significant link between the nation's stock market and to the economy of the country (Dritsaki, 2005; Ake and Ognaliqui, 2010; Ansotequi and Esteban, 2002; Nasseh and Strauss, 2000; Surya and Suman, 2006).

Therefore, the low and volatile nature of government total agricultural spending in Nigeria, the poor performance of the agricultural sector of the Nigerian stock market and the economically unimpressive agricultural output of the economy cannot be a mere coincidence. Yet studies on the nexus amongst the volatility in government total spending in the agricultural sector, the development (total capital employed and total turnover) in the agricultural sector of the stock market and agricultural output in Nigeria are scarce. Hence, this study explored the nexus amongst government total agricultural spending and its volatility level, total capital employed and total turnover of the agricultural sector of the stock market and agricultural output in Nigeria.

Plan of the study: The remaining part of the study is organized as follows. The second section presents the methodology. Section 3 presents the results and discussions and section 4 presents the summary and conclusion.

METHODOLOGY

Scope of study: This study focused on federal government total agricultural spending, total capital employed and total turnover of the agricultural sector of the stock market and agricultural output in Nigeria from 1978 to 2008.

Nature and sources of data: Time series data were employed. These data entail some macroeconomic variables of the Nigerian economy, as well as the capital employed and turnover of the firms that make up the agricultural sector of the Nigerian stock market. The data on macroeconomic variables of the Nigerian economy were collected from:

- Central Bank of Nigeria (CBN)
- **National Bureau of Statistics (NBS) publications:** Data on capital employed and turnover (value of output) of the quoted agricultural firms were sourced from their various issues of their individual

- **Annual reports and statements accounts:** These data were thereafter aggregated to represent the total capital employed and total turnover of the agricultural sector of the Nigerian stock market

Model specification:

Modeling government total agricultural spending in Nigeria: Shabaz *et al*. (2010) revealed that government spending in the Pakistani economy was highly influenced through previous policies in a short span of time. Trade-openness and Gross Domestic Product (GDP) per capita influenced government total spending in Pakistan at significant levels. Foreign investment and unemployment rate were insignificant variables in their model. In a similar investigation, Quijano and Gaecia (2005) revealed that in Philippine, degree of trade openness, private investment, revenue and total outstanding public debts were the significant variables that determined government total spending in the economy. Fan *et al*. (2000) found out that one period lagged value of gross domestic product and the present value of the terms-of-trade significantly affect government spending in the Indian economy.

Harnessing the above authorities, the determining variables for government total agricultural spending in Nigeria are as follow: Treasury bill rate, total trade, agricultural output, total revenue from the non-oil sector, trade openness of the non-oil sector, government domestic debt, per capita GDP, foreign private investment in the agricultural Sector, total population and population growth rate.

The model for government total agricultural spending in Nigeria is expressed as:

$$GTAS = f\ (TBR, AO, TRNOS, TONOS, TT, GDD, PCGDP, FPIA, TP, PGR, U_{1t}) \quad (1)$$

$f_1>0$; $f_2>0$; $f_3>0$; $f_4>0$; $f_5>0$; $f_6>0$; $f_7>0$; $f_8>0$ f_9; $f_{10}>0$

Modeling the development in the agricultural sector (total capital employed and total turnover of the agricultural sector) of the Nigerian stock market: Government total spending in the agricultural sector of a nation's economy can directly increase agricultural output of the country, it increases the rate of return to private agricultural investment and there by leads to greater investment and output in the agricultural sector of the economy (Binswanger *et al*., 1993). Furthermore, positive relationship exists between government spending and private investment in an economy (Jitsuchon and Sussangkarm, 1993; Jansen, 1995).

Monetary and fiscal policies as well as performance of the economy affect private investment in an economy (Uniamikogbo and Enoma, 2001; Ardeni and Freebairn, 2002; Narayanamoorthy and Hanjra, 2006; Fagernas, 2004; Ang, 2007; Jaroensathaponkul and Tongpen, 2007). Availability of banks' credit and loans plays an important role in the development of private sector investment in the agricultural sector of an economy (Binswanger *et al*., 1993; Borensztein *et al*., 1998; Mistikin, 2001; Benchivenga *et al*., 1996; Fagernas, 2004; Ayadi *et al*., 2008).

The determining variables for the development in the agricultural sector of the Nigerian stock were investigated in two parts:

- The investigation of the determining variables for the total capital employed in the agricultural sector of the Nigerian stock market.
- The investigation of the determining variables for the total turnover of the agricultural sector of the Nigerian stock market.

Furthermore, fiscal volatility is an important issue concerning fiscal policy and its effect on economic out and growth (Afonso and Jalles, 2012). Therefore, government spending and its volatility may have positively and negatively affect private investment and long-run economic growth respectively (Sachs and Sala-i-Martin, 1992; Von Hagen, 1992; Furceri, 2007; Afonso and Furceri, 2008; Afonso and Jalles, 2012).

Harnessing the above authorities, the determining variables for the total capital employed in the agricultural sector of the Nigerian stock market are: government total agricultural spending, volatility in government total agricultural spending, bank deposit rate, bank prime lending rate, money supply, bank credit to the private sector, financial deepening of the economy, food import and non-oil export.

The model for the total capital employed in the agricultural sector of the Nigerian stock market is expressed as:

$$TCEASNSM = f\ (GTAS, VGTAS, BDR, PLR, MSS, BCPS, FDE, FI, NOE, Ut) \quad (2)$$

$f_1>0$; $f_3>0$; $f_5>0$; $f_6>0$; $f_7>0$; $f_9>0$ and $f_2<0$: $f_4<0$; $f_8<0$

The determining variables for the total turnover of the agricultural sector of the Nigerian stock market are as follow; total capital employed in the agricultural sector of the Nigerian stock market, government total agricultural spending, volatility in government total agricultural spending, inflation rate, savings sate, Per capita GDP.

Table 1: Description of the variables in the model

Endogenous variables	
GTAS	Government total spending in the agricultural sector of the Nigerian economy
AO	Agricultural output (Gross Domestic Product (GDP) of the agricultural sector) of the Nigerian economy
TCEASNSM	Total capital employed in the agricultural sector of the Nigerian stock market
TTASNSM	Total turnover of the agricultural of the Nigerian stock market
Exogenous variables	
TBR	Treasury bill rate in the Nigerian economy
TRNOS	Total revenue from non-oil sector of the Nigerian economy
IAWP	Index of average world price of agricultural export commodities
TONOS	Trade openness of the non-oil sector of the Nigerian economy = (Total Non - oil Export + Total Non - oil Import) /Total non-oil GDP
TT	Total trade in the Nigerian economy = (Total Export + Total Import)
GDD	Government domestic debt in the Nigerian economy
PCGDP	Per capita gross domestic product in Nigeria = GDP/total population
PGR	Population growth rate in Nigeria
VGTAS	Volatility in government the total spending on Nigerian agriculture
CPI	Composite consumer price index in the Nigerian economy
NOE	Non oil export in the Nigerian economy
FPIA	Foreign private investment in the agricultural sector of the Nigerian economy
SR	Savings rate in the Nigerian economy
BDR	Bank deposit rate in the Nigerian economy
IR	Inflation rate in the Nigerian economy
BCPS	Bank credit to the private sector of the Nigerian economy
MSS	Money supply in the Nigerian economy
NO	(National output) gross domestic product of the Nigerian economy
FDE	Financial deepening in the Nigerian economy = MSS/GDP
GDPGR	Growth rate of the total gross domestic product of the Nigerian economy

The model for the total turnover of the agricultural sector of the Nigerian stock market is expressed as:

$$TTASNSM = f\,(TCEASNSM, GTAS, VGTAS, IR, SR, PCGDP, Ut) \quad (3)$$

$f_1>0$; $f_2>0$; $f_4>0$; $f_5>0$; $f_6>0$ and $f_3<0$

Modeling the agricultural output of the Nigerian economy: Muhammad-Lawal and Ate (2006) revealed that government agricultural spending, gross domestic product growth rate, population and consumer price index, each had a significantly positive effect on agricultural output. Iganiga and Unemhilin (2011) also showed that government capital expenditure in the agricultural sector of the Nigerian economy, consumer price index, bank total credit to the agricultural sector of the economy; annual average rainfall and population growth rate were also significant variables. In a similar study, Abu *et al*. (2011) showed that foreign private investment in agriculture, agricultural export and domestic investment each had a significantly positive effect on agricultural output in Nigeria. But government agricultural spending was negatively insignificant in their model.

Furthermore, Qazi *et al*. (2010) found out that in Pakistan, government agricultural spending, agricultural prices, labor force in agriculture and gross fixed capital formation in the agricultural sector each had a significantly positive effect on agricultural output. The economic literature widely documented the effects of government expenditure on growth and there is a side consensus that higher levels of government expenditure are associated with higher growth rate of economic output (Ashauer, 1989; Barro, 1990; Munnel, 1992; Evans and Karras, 1994a, b; Folster and Henrekson, 2001).

Government spending in the agricultural sector of the Nigerian economy has been volatile (Garba, 1998; Fan *et al*., 2008; Fan *et al*., 2009). And this unstable agricultural policy can be a bottleneck for the growth and development of the agricultural sector of the economy (Shabaz *et al*., 2010). Furceri (2007), Afonso and Furceri (2010) and Afonso and Jalles (2012) found out that government expenditure volatility is harmful for economic output and growth.

Nishat and Saghir (1991), Craigwell and Grandbois (1999), Ahmed (1999, 2000) Dritsaki (2005), Surya and Suman (2006) and Ake and Ognalique (2010) revealed that the stock market responds to the "swings" in the economic activities of the country and, vice-versa.

The determining variables for the agricultural output of the Nigerian economy are as follow: government total agricultural spending, volatility in government total agricultural spending, total population, consumer price index, non-oil export, food import, GDP growth rate, foreign private investment in the agricultural sector, index of average world price of agricultural export commodities, inflation rate and total turnover of the agricultural sector of the Nigerian stock market.

The model for the agricultural output of the Nigerian economy is expressed as (Table 1):

$$AO = f\,(GTAS, VGTAS, TP, CPI, NOE, FI, FPIA, IAWP, IR, GDPGR, TTASNSM, Ut) \quad (4)$$

$f_1>0$; $f_3>0$; $f_4>0$; $f_5>0$; $f_7<0$; $f_8>0$; $f_9>0$; $f_{10}>0$; $f_{11}>0$; and $f_2<0$; $f_6>0$

Methods of data analysis:

Estimation method for volatility in government total agricultural spending: The square of the mean-adjusted relative change method for volatility estimation by Gujarati (2003) was adopted. The estimation procedure is as follows:

Let Y_t = value of the variable in year t:

$$Y^*_t = \text{Log of } Y_t \quad (5)$$

$$dY^*_t = Y^*_t - Y^*_{t-1} \quad (6)$$

Equation (6) is the relative change of Y:

$$d\overline{Y}_t = \text{mean of } dY^*_t \quad (7)$$

$$X_t = dY^*_t - d\overline{Y}^*_t \quad (8)$$

Equation (8) is the mean-adjusted relative change of Y:

$$VOL_t = (dY^*_t - d\overline{Y}^*_t)^2 = (X_t)^2 \quad (9)$$

where,

VOL_t = Volatility in Y in year t

Stationarity and unit root tests: Since the variables with the same order of integration can only be co-integrated and to stem out the problem of spurious regression, so as a first step, the order of integration of all the variables in the study need to be determined. The order of integration of a series refers to the number of times the series need to be differenced for it to become stationary. A stationary series X_t, for example, has a mean, variance and auto-covariance that are constant over time. However, most economic series tend to exhibit non-stationarity. For the purpose of establishing the order of integration (or stationary properties) of the series, the Augmented Dickey-Fuller (ADF) test was conducted on Natural log (Ln) of all variables used in the study.

The Augmented Dickey-Fuller (ADF) test is used to reject the null hypothesis that a series is first difference stationary or $\sim I$ (1) against the alternative hypothesis $\sim I\ (0)$ in this form:

$$\Delta Y_t = \beta_1 + \beta_2 t + \square Y_{t-1} + \alpha \sum \Delta Y_{t-1} + \varepsilon_i \quad (10)$$

where,

Δ = The first difference operator

Y_t = The economic variables

Y_{t-1} = Their lagged differences to ensure that the residuals are white noise

e_t = The stationary random error (Dickey and Fuller, 1981)

Co-integration tests: Co-integration has assumed increased importance in analyses that purports to describe long-run or equilibrium conditions amongst variables. Two or more variables are said to be co-integrated, that is, if they exhibit long-run relationship (s), if they share common trend (s). Once the stationary properties of the individual series are established, linear combinations of the integrated series are tested for co-integration. Should such a linear combination of individual non-stationary series produce a stationary data series, then the variables are co-integrated and unless they integrate, they cannot describe equilibrium relationship.

Two co-integration test techniques are employed in the study. The first is in accordance to the methodology suggested by Johansen (1988) and generalized in Johansen and Juselius (1990). This technique is known as Johansen unrestricted co-integration approach. The process is used investigate the long-run relationship amongst government total agricultural spending, total capital employed and turnover of the agricultural sector of the stock market and agricultural output in Nigeria, i.e., if they share common trend.

The Johansen procedure is based on maximum likelihood estimates of all co-integrating vectors in a given set of variables and provides two likelihood ratio tests for the number of co-integrating vectors. This technique is important when testing for co-integration between more than two variables. The first is based on the maxima Eigen-value, the null hypothesis is that there are at most r co-integrating vectors against the alternative of r+1 co-integrating vectors. The second is based on the trace of the stochastic matrix. The null hypothesis is that there are at most r co-integrating vectors against the alternative hypothesis that there is r or more co-integrating vectors.

The time series X_t, according to Johansen's procedure is modeled as a Vector Auto-Regressive (VAR) model in this form:

$$\Delta X_t = \alpha + \sum Ti X_{t-1} + \pi X_{t-1} + \lambda D_t + \eta_t \quad (11)$$

where,

X_t : The vector of non-stationary series containing government agricultural spending, total capital employed and turnover of the agricultural sector of the stock market and agricultural output in Nigeria

Δ : The first difference

α : The constant term

D_t : The stationary series

η_t : The random error

The second co-integration technique is the Engel-Granger Two Steps (EGTS) co-integration procedure.

This technique was used to investigate the existence of co-integration amongst government total agricultural spending, total capital employed and turnover of the agricultural sector of the stock market and agricultural output in Nigeria and their respective determining variables. In the EGTS procedure, the static long-run regression was estimated for each stochastic equation. The residuals were saved and then tested for stationarity using the Augmented-Dickey Fuller technique. A stationary residual implies that the variables of the equation generating the residual are co-integrated.

Error Correction Model (ECM) and the Two-Stage-Least-Squares (2SLS) regression technique: Assuming the results of the Engel-Granger Two Steps (EGTS) reveal the existence of co-integrated amongst government agricultural spending, total capital employed and total turnover of the agricultural sector of the stock market and agricultural output in Nigeria and their respective determining variables, we then estimate the Error Correction variable for each of the four stochastic equations in the model. Thereafter, the Error Correction Model (ECM) was used to estimate the over-parameterized equations in the model. Using the stepwise regression procedure, the significant variables from each of the over-parameterized equations in the model were obtained, thereby generating the parsimonious error correction equations in the model. The original co-integration regression is specified as follows:

$$A_t = \alpha_o + \alpha_1 B_t + e_t \quad (12)$$

where,

A_t : The dependent variable
B_t : The independent variable
e_t : The random error term
α_o & α_1 : Intercept and slope coefficients respectively

If A_t and B_t are found to be Co-integrated, then there must exist an associated Error Correction Model (ECM) (Engel and Granger, 1987). The usual ECM may take the following form:

$$\Delta A_t + = \sigma_o e_{t-1} + \sum_{j=l}^{T} \sigma_1 \Delta A_{t-j} + \sum_{j=l}^{T} \theta_j \Delta B_{t-j} + V_t \quad (13)$$

where,

Δ : First different operator
e_{t-1} : The error correction term T is the number of Lags necessary to obtain white noise
V_t : Another random disturbance term

If σ_o lies between 0 and -1 and, it is significantly different from zero, then A_t and B_t will have a long-run relationship (Co-integrated).

The error correction term (e_{t-1}) depicts the extent of the disequilibrium between A_t and B_t. This model (ECM) was adopted to estimate the co-integrated stochastic equations in the estimated model for the respective determinants of government agricultural spending, total capital employed and total turnover of the agricultural sector of the stock market and agricultural output in Nigeria.

The model to be estimated for the linkages amongst government total agricultural spending, total capital employed and total turnover of the agricultural sector of the stock market and agricultural output in Nigeria consists of series of equations. It is noticeable that some of the right-hand-side variables in a particular equation appear as independent variables in other equation (s). These right hand-side variables may correlate with the disturbance of the equations in which they appear as dependent variables (Korsu, 2008). To this end, the application of Ordinary Least Squares (OLS) technique to estimate the equations in the model will give biased and inconsistent estimates of parameters. To overcome this problem, the Two-Stage-Squares (2SLS) regression technique was adopted.

RESULTS AND DISCUSSION

Unit root results: Table 2 shows the results of the stationarity test (unit root test) for all the variables included in this study. The results reveal that Bank Deposit Rate (BDR), National Output Growth Rate (NOGR), Population Growth Rate (PGR), Volatility in Government Total Agricultural Spending (VGTAS), Inflation Rate (IR), Trade Openness of the Non-Oil Sector of the economy (TONOS) and Savings Rate (SR) do not possess a unit root.

The null hypothesis of the absence of a unit root is accepted at 1% level of significance for each of the above variables, except for Bank Deposit Rate (BDR) and Population Growth Rate (PGR) that were significant at 10 and 5%, respectively. This implies that these variables are stationary in their levels and their means, variances and auto co-variances (at various lags) remain the same no matter what point they are measured; that is they are time invariant.

On the other hand, Index of Average World Prices of Agricultural Export Commodities (IAWP), Consumer Price Index (CPI), Food Import (FI), Foreign Private Investment in the Agricultural sector of the economy (FPIA), National Output (NO), Agricultural Output (AO), Government Total Agricultural Spending (GTAS), Government Domestic Debt (GDD), Per Capita National Output (PCNO), Total Population (TP), Prime Lending Rate (PLR), Total Revenue from the Non-Oil Sector of the economy (TRNOS), Treasury Bill Rate (TBR), Total Trade (TT), Non-Oil Export (NOE), Financial Deepening of the Economy (FDE), Bank Credit to the Private Sector (BCPS) Money

Table 2: Unit root test result

Ln of variables		Augmented Dickey-Fuller (ADF) test statistic	Conclusion
AWP	Level	-0.2844	I (1)
	Δ level	-4.9668***	
CPI	Level	-0.1013	I (1)
	Δ level	-2.8742*	
BDR	Level	-2.8742*	I (0)
FI	Level	-0.3343	I (1)
	Δ level	-6.9445***	
FPIA	Level	-0.8011	I (1)
	Δ level	-5.2969***	
GDD	Level	-1.6365	I (1)
	Δ level	-5.4258***	
NO	Level	-0.5044	I (1)
	Δ level	-4.2452***	
AO	Level	-0.0183	I (1)
	Δ level	-3.9918***	
NOGR	Level	-4.4622***	I (0)
GTAS	Level	-0.9830	I (1)
	Δ level	-7.1361***	
VGTAS	Level	-3.9885***	I (0)
NOE	Level	-1.0057	I (1)
	Δ level	-4.9668***	
TONOS	Level	-3.7559***	I (0)
IR	Level	-4.6534***	I (0)
PCNO	Level	-0.4719	I (1)
	Δ level	-5.1670***	
TP	Level	-0.4241	I (1)
	Δ level	-16.4860***	
PGR	Level	-2.9900**	I (0)
PLR	Level	-2.3500	I (1)
	Δ level	-7.2772***	
TRNOS	Level	-0.0689	I (1)
	Δ level	-7.0665***	
SR	Level	-5.4773***	I (0)
TCEASNSM	Level	-0.3353	
	Δ level	-5.4734***	I (1)
TTASNSM	Level	-0.1331	
	Δ level	-5.9334***	I (1)
TBR	Level	-2.3072	
	Δ level	-5.8609***	I (1)
TT	Level	-0.0123	
	Δ level	-0.9385***	I (1)
MS	Level	1.9260	
	Δ level	-3.3340**	I (1)
BCPS	Level	2.2529	
	Δ level	-3.8624***	I (1)
FDE	Level	-1.7187	
	Δ level	-4.5553***	I (1)

Result of analysis (2011); ***: Significant at 1%; **: Significant at 5%; *: Significant at 10%

Supply in the Nigerian economy (MS), Total Capital Employed in the Agricultural Sector of the Nigerian Stock Market (TCEASNSM) and Total Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM) possess a unit root.

These variables are non-stationary and attained stationarity only after first difference. The null hypothesis of the absence of a unit root is clearly rejected at 1% level of significance each for all these (non-stationary) variables, except for Consumer Price Index (CPI) and Money Supply (MS) in the Nigerian economy that were rejected at 10 and 5%, respectively. This suggests that each of these non-stationary variables have a time-varying mean or time varying variance or both.

Results of the Johansen unrestricted co-integration test: Table 3 shows the result of the co-integration test amongst the first differences of the natural logarithm (Ln) of Government Total Agricultural Spending in Nigeria (GTAS), Total Capital Employed of the Agricultural Sector of the Nigerian Stock Market (TCEASNSM), Total Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM) and Agricultural Output of the Nigerian economy (AO).

The result of the trace test indicates that there is one co-integrating equation at both 5 and 1% levels, respectively. Furthermore, the result of the max-eigen value test indicates that there is also one co-integrating equation at both 5 and 1% levels. The result reveals that these variables (government total agricultural spending in Nigeria, total capital employed and total turnover of the agricultural sector of the Nigerian stock market and agricultural output of the Nigerian economy) are co-integrated. This means that there is a long-run relationship amongst government total agricultural spending, the development in the agricultural sector of the stock market and agricultural output. Therefore, there is the existence of an equilibrium position amongst these variables and they share common trends.

Table 3: Result of johansen unrestricted co-integration test for government total agricultural spending, total capital employed and total turnover of the agricultural sector of the stock market and agricultural output in Nigeria

Hypothesized No. of CE (s)	Eigenvalue	Trace statistic	5% critical value	1% critical value
None **	0.695621	62.50167	47.21	54.46
At most 1	0.485951	28.00675	29.68	35.65
At most 2	0.249767	8.709068	15.41	20.04
At most 3	0.012857	0.375281	3.76	6.65
Hypothesized No. of CE (s)	**Eigenvalue**	**Max-eigen statistic**	**5% critical value**	**1% critical value**
None **	0.695621	34.49493	27.07	32.24
At most 1	0.485951	19.29768	20.97	25.52
At most 2	0.249767	8.333786	14.07	18.63
At most 3	0.012857	0.375281	3.76	6.65

* (**) denotes rejection of the hypothesis at the 5% (1%) level; Trace test indicates 1 co-integrating equation at both 5 and 1% levels; max-eigen value test indicates 1 co-integrating equation at both 5 and 1% levels; Result of analysis (2011); Trend assumption: Linear deterministic trend; Series: LnGTAS, LnTCEASNSM, LnTTASNSM, LnAO; Lags interval (in first differences): 1 to 1; Unrestricted co-integration rank test

Results of the Engel-Granger-Two-Steps (EGTS) co-integration test: Table 4 shows that the residuals of the static regression between governments total agricultural spending, total capital employed in the agricultural sector of the stock market and agricultural output in Nigeria and their respective determining variables are significantly stationary at 1% each. While that of total turnover of the agricultural sector of the stock market and its determining variables were significantly stationary at 5%.

This reveals that co-integration (long-run relationship) exists between government total agricultural spending, total capital employed and total turnover of the agricultural sector of the stock market and agricultural output in Nigeria and their respective determining variables.

Parsimonious error correction model for government total agricultural spending in Nigeria: Table 5 reveals that 76% of the variability in the present value of Government Total Agricultural Spending in Nigeria (GTAS) is significantly explained by its previous year's value [GTAS (-1)] as well as the previous year's value of treasury bill rate [TBR (-1)] in the economy. Apart from these variables, the present year's values of the Treasury Bill Rate (TBR), Total Revenue from the Non-Oil Sector (TRNOS), Government Domestic Debt (GDD), Trade Openness of the Non-Oil Sector of the economy (TONOS), Per Capita Gross Domestic Product (PCGDP), Agricultural Output (AO) and Total Trade in the Nigerian economy (TT) are also part of the significant explanatory variables that explained the variability in Government Total Agricultural Spending in Nigeria (GTAS).

The coefficients of GTAS (-1) and TONOS are positive and statistically significant at 5% each. The coefficients of TBR, TRNOS, GDD and PCGDP are also positive but statistically significant at 1% each. This implies that an increase (decrease) in each of these variables significantly increases (decreases) the present

Table 4: Engel-Granger-Two-Steps (EGTS) co-integration test result

Static model residuals (Ln of variables)	Augmented Dickey-Fuller (ADF) test statistic	Conclusion
Government Total Agricultural Spending in Nigeria (GTAS)	-4.7841***	Co-integrated
Total Capital Employed in the Agricultural Sector of the Nigerian Stock Market (TCEASNSM)	-4.7291***	Co-integrated
Total Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM)	-3.1407**	Co-integrated
Agricultural Output (AO) of the Nigerian economy	-6.4422***	Co-integrated

Result of Analysis (2011); **: Residual is stationary at 5%; ***: Residual is stationary at 1%

Table 5: Result of the for the parsimonious error correction model for Government Total Agricultural Spending in Nigeria (GTAS), using the Two-Stage-Least-Squares (2SLS) regression technique

Independent variables	Coefficient	S.E.	t-statistic	Probability
ΔLn GTAS (-1)	0.4166**	0.1503	2.7709	0.0122
ΔLn TBR	1.0953***	0.3123	3.5077	0.0024
ΔLn TBR (-1)	-1.1325**	0.4088	-2.7701	0.0122
ΔLn TRNOS	0.9851***	0.2659	3.7047	0.0015
ΔLn GDD	2.1881***	0.4862	4.5003	0.0002
ΔLn AO	-1.9350***	0.6663	-2.9042	0.0091
ΔLn TONOS	0.3731**	0.1456	2.5619	0.0191
ΔLn TT	-1.8470**	0.3868	-4.7748	0.0001
ΔLn PCGDP	1.1986***	0.5463	3.6220	0.0018
ECM (-1)	-0.8803***	0.2103	-4.1849	0.0000
R-squared	= 0.8354		Mean dependent variable	= 0.2354
Adjusted R^2	= 0.7575		S.D dependent variable	= 0.7928
S.E. of Regression	= 0.3904		Sum Squared Residual	= 2.8964
Durbin Watson Statistic	= 2.1349			

Result of analysis (2011); ***: Significant at 1%; **: Significant at 5%; Dependent variable: ΔLnGTAS

Table 6: Result of the for the parsimonious error correction model for Total Capital Employed in the Agricultural Sector of the Nigerian Stock Market (TCEASNSM), using the Two-Stage-Least-Squares (2SLS) regression technique

Independent variables	Coefficient	S.E.	t-statistic	Probability
ΔLn GTAS	0.1495**	0.3251	2.1745	0.0405
ΔLn NOE (-1)	0.2619*	0.1390	1.8842	0.0735
ΔLn BDR	0.9517***	0.2925	3.2532	0.0038
ΔLn PLR	-0.6513*	0.3446	-1.8899	0.0727
ΔLn BCPS	0.7404***	0.2302	3.2168	0.0041
ΔLn FDE	-1.0833***	0.3381	-3.2040	0.0043
ΔLn FDE (-1)	0.9307**	0.4247	2.1915	0.0398
ECM (-1)	-0.5267**	0.1918	-2.7458	0.0121
R-squared	= 0.5688		Mean dependent variable	= 0.2665
Adjusted R^2	= 0.4251		S.D dependent variable	= 0.3688
S.E. of regression	= 0.2797		Sum squared residual	= 1.6426
Durbin Watson statistic	= 1.5060			

Result of analysis (2011); ***: Significant at 1%; **: Significant at 5%; *: Significant at 10%; Dependent variable: ΔLnTCEASNSM

value of Government Total Agricultural Spending in Nigeria (GTAS).

The coefficient of TBR (-1) is negative and statistically significant at 5%. The coefficients of AO and TT are also negative but statistically significant at 1% each. This implies an increase (decrease) in each of these variables significantly decreases (increases) Government Total Agricultural Spending in Nigeria (GTAS).

The lagged error correction term ECM (-1) is negative and statistically significant at 1%, which confirms that long run equilibrium relationship (co-integration) exists amongst the variables in the GTAS function. The coefficient is (-0.88), implying that about 88% of the disequilibrium between the short-run and the long-run in Government Agricultural Spending in Nigeria (GTAS) is covered up within a year.

Parsimonious error correction model for total capital employed in the agricultural sector of the Nigerian stock market: Table 6 reveals that 43% of the variability in the present value of the Total Capital Employed in the Agricultural Sector of the Nigerian Stock Market (TCEASNSM) is significantly explained by the previous values of Non-Oil Export [NOE (-1)] and Financial Deepening of the Nigerian Economy [FDE (-1)].

Apart from these variables, the present year's values of Government Total Agricultural Spending in Nigerian agriculture (GTAS), bank Deposit Rate (DPR), Prime Lending Rate (PLR), Financial Deepening (FDE) and Bank Credit to the Private Sector (BCPS) in the Nigerian economy are also part of the significant explanatory variables that explained the variability in the Total Capital Employed in the Agricultural Sector of the Nigerian Stock Market (TCEASNSM).

The coefficient of NOE (-1) is positive and statistically significant at 10%. The coefficients of BDR and BCPS are also both positive but statistically significant at 1% each. While the coefficients of GTAS and FDE (-1) are also positive but statistically significant at 5% each. This implies that an increase (decrease) in each of these variables significantly increases (decreases) the present value of the Total Capital Employed in the Agricultural Sector of the Nigerian Stock Market (TCEASNSM).

The coefficients of PLR and FDE are negative but are statistically significant at 10 and 1% respectively. This implies an increase (increase) in each of these variables significantly decreases (increases) the Total Capital Employed in the Agricultural Sector of the Nigerian Stock Market (TCEASNSM).

The lagged error correction term ECM (-1) is negative and statistically significant at 5%; which confirms that long run equilibrium relationship (co-integration) exists amongst the variables in the TOCEASNSM function. The coefficient is (-0.5267), implying that about 53% of the disequilibrium between the short-run and the long-run in the Total Capital Employed in the Agricultural Sector of the Nigerian Stock Market (TCEASNSM) is covered up within a year.

Parsimonious error correction model for the total turnover of the agricultural sector of the Nigerian stock market: Table 7 reveals that 51% of the variability in the present values of the Total Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM) is explained by the previous year's values of the Volatility in Government Total Agricultural Spending [VGTAS (-1)] and Inflation Rate [IR (-1)] in Nigeria.

Apart from these variables, the present year's values of the Total Capital Employed in the Agricultural Sector of the Nigerian Stock Market (TCEASNSM), Volatility in Government Total Agricultural Spending (VGTAS) and Inflation Rate (IR) in Nigeria are also part of the variables that explained the variability in the Total Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM).

The coefficients of TCEASNSM and IR (-1) are both positive and statistically significant at 1% each. The coefficient of IR is also positive but statistically significant at 5%. This implies that an increase

Table 7: Result of the for the parsimonious error correction model for Total Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM), using the Two-Stage-Least-Squares (2SLS) regression technique

Independent variables	Coefficient	S.E.	t-statistic	Probability
Constant	0.1273**	0.0500	2.5446	0.0189
ΔLn TCEASNSM	0.3770***	0.1165	3.2365	0.0040
ΔLn VGTAS	-0.0326**	0.0714	-2.1915	0.0398
ΔLn VGTAS (-1)	-0.0311*	0.0162	-1.9241	0.0680
ΔLn IR	0.0783**	0.0284	2.7599	0.0117
ECM (-1)	-0.2841*	0.1505	-1.8881	0.0729
R-squared	= 0.6198		Mean dependent variable	= 0.2430
Adjusted R^2	= 0.5112		S.D dependent variable	= 0.2820
S.E. of regression	= 0.1972		Sum squared residual	= 0.8166
Durbin Watson statistic	= 2.0519		F-statistics	= 5.7059
Prob. (F-statistics)	= 0.0012			

Result of analysis (2011); ***: Significant at 1%; **: Significant at 5%; *: Significant at 10%; Dependent variable: ΔLnTTASNSM

Table 8: Result of the for the parsimonious error correction model for Agricultural Output (AO) of the Nigerian economy, using the Two-Stage-Least-Squares (2SLS) regression technique

Independent variables	Coefficient	S.E.	t-statistic	Probability
Constant	0.0710***	0.0202	3.5084	0.0029
ΔLn GTAS (-1)	0.0887***	0.0166	5.3256	0.0001
ΔLn GDPGR	-0.0520***	0.0146	-3.5620	0.0026
ΔLn FI	0.0541*	0.0277	1.9493	0.0690
ΔLn FPIA	-0.0983*	0.0540	-1.8205	0.0874
ΔLn NOE	0.1527***	0.0330	4.6315	0.0003
ΔLn NOE (-1)	-0.1379**	0.0482	-2.8621	0.0113
ΔLn AWP (-1)	0.1027*	0.0511	2.0095	0.0617
ΔLn TTASNSM	0.2272***	0.0578	3.9326	0.0012
ΔLn TTASNSM (-1)	0.2698***	0.0709	3.8030	0.0016
ΔLn IR	0.0399***	0.0103	3.8888	0.0013
ΔLn IR (-1)	0.0436***	0.0100	4.3839	0.0005
ECM (-1)	-0.5276***	0.1257	-4.1970	0.0007
R-squared	= 0.9372		Mean dependent variable	= 0.2332
Adjusted R^2	= 0.8901		S.D dependent variable	= 0.1679
S.E. of regression	= 0.0557		Sum squared residual	= 0.0496
Durbin Watson statistic	= 2.4273		F-statistics	= 19.9052
Prob. (F-statistics)	= 0.0000			

Result of analysis (2011); ***: Significant at 1%; **: Significant at 5%; *: Significant at 10%; Dependent variable: ΔLnAO

(decrease) in each of these variables significantly increases (decreases) the present value of the Total Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM).

The coefficients of VGTAS and VGTAS (-1) are both negative but statistically significant at 1 and 10%, respectively. This implies a decrease (increase) in each of these variables significantly decreases (increases) the Total Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM).

The lagged error correction term ECM (-1) is negative and statistically significant at 10%; which confirms that long run equilibrium relationship (co-integration) exists amongst the variables in the TTASNSM function. The coefficient is (-0.2841), implying that about 28% of the disequilibrium between the short-run and the long-run in the Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM) is covered up within a year.

Parsimonious error correction model for agricultural output of the Nigerian economy: Table 8 reveals that 89% of the variability in the present value of Agricultural Output of the Nigerian economy (AO) is significantly explained by its previous year's value and the previous year's values of Government Total Agricultural Spending in Nigeria [GTAS (-1)], Non-Oil Export [NOE (-1)], Index of Average World Price of agricultural export commodities [IAWP (-1)], Total Turnover of the Agricultural Sector of the Nigerian Stock Market [TTASNSM (-1)] and Inflation Rate in Nigeria [IR (-1)].

Apart from these variables, the present year's values of the Gross Domestic Product Growth Rate (GDPGR), Food Import (FI), Foreign Private Investment in the Agricultural Sector (FPIA), Non-Oil Export (NOE), Inflation Rate (IR) in Nigeria and Total Turnover of the Agricultural Sector of the Nigerian Stock Market (TTASNSM) are also part of the significant determinants of the Agricultural Output of the Nigerian economy (AO).

The coefficients of GTAS (-1), NOE, TTASNSM, TTASNSM (-1), IR and IR (-1) are positive and statistically significant at 1% each. The coefficients of FI and IAWP (-1) are also both positive and statistically significant at 10% each. This implies that an increase (decrease) in each of these variables significantly increases (decreases) the present value of Agricultural Output of the Nigerian economy (AO).

The coefficients of GDPGR and FPIA are negative and statistically significant at 10% each. The coefficient of NOE (-1) is also negative but statistically significant at 1%. This implies an increase (decrease) in each of these variables significantly decreases (increases) the Agricultural Output of the Nigerian economy (AO).

The lagged error correction term ECM (-1) is negative and statistically significant at 1%, which confirms that long run equilibrium relationship (co-integration) exists amongst the variables in the GDPA function. The coefficient is (-0.53) implying that about 53% of the disequilibrium between the short-run and the long-run in the Agricultural Output of the Nigerian economy (AO) is covered up within a year.

CONCLUSION

There is a long-run relationship amongst government total agricultural spending, total capital employed and turnover of the agricultural sector of the stock market and agricultural output in Nigeria.

Government agricultural spending positively influences both the total capital employed in the agricultural sector of the stock market and agricultural output of the economy. The volatility in government total agricultural spending adversely influences the turnover of the agricultural sector of the stock market, while the total capital employed in the agricultural sector of the stock market positively influence the total turnover of the agricultural sector of the stock market. The total turnover of the agricultural sector of the stock market also positively influences the agricultural output of the economy, while the agricultural output of the economy adversely influences government total agricultural spending.

Government agricultural spending enhances the development of the agricultural sector of the stock market, while the volatility in the agricultural spending is an impediment. The agricultural sector of the Nigerian stock market is an effective window policymakers can exploit to increase agricultural output of the economy.

REFERENCES

Abdullah, H.A., 2000. The relationship between government expenditure and economic growth in Saudi Arabia. J. Admin. Sci., 12(2): 173-191.

Abu, N. and U. Abdullahi, 2010. Government expenditure and economic growth in Nigeria, 1970-2008: A disaggregated analysis. Bus. Econ. J., BEJ-4: 1-11.

Abu, G.A., I.D. Ekpebu and J.I. Okpe, 2011. Foreign private investment and agricultural production in Nigeria (1986-2006). J. Soc. Sci., 26(1): 47-55.

Afonso, A. and D. Furceri, 2008. EMU enlargement, stabilization costs and insurance mechanisms. J. Int. Money Financ., 27(2): 169-187.

Afonso, A. and D. Furceri, 2010. Government size, composition, volatility and economic growth. Eur. J. Polit. Econ., 26(4): 517-532.

Afonso, A. and J.J. Jalles, 2012. Fiscal Volatility, Financial Crises and Growth. School of Economics and Management, Department of Economics, Technical University of Lisbon Working Paper No. 06/2012/DE/UECE.

Ahmed, M.F., 1999. Stock market, macroeconomic variables and causalities: The Bangladesh case. Saving Develop., 23(2): 109-130.

Ahmed, M.F., 2000. Impact of dividend and retained earnings on stock prices in Bangladesh: An empirical investigation. Saving Develop., 24(1): 5-31.

Ake, B. and R.W. Ognaliqui, 2010. Financial stock and economic growth in developing countries: The case of doula stock exchange in Cameroon. Int. J. Bus. Manag., 5(5): 33- 41.

Alesina, A. and G. Tabellini, 2005. Why is Fiscal Policy often Procyclical? National Bureau of Economics Research, Working Paper, No. 11600.

Al-Yousif, Y., 2000. Does government expenditure inhibit or promote economic growth: Empirical evidence from Saudi Arabia. Indian Econ. J., 48(2).

Ang, J.B., 2007. Financial deepening and economic development in Malaysia. Econ. Papers, 26(3): 249-260.

Ansotequi, C. and M.V. Esteban, 2002. Co-integration for market forecast in Spanish stock market. Appl. Econ., 34(7): 843-858.

Ardeni, P.G. and J. Freebairn, 2002. The Macroeconomics of Agriculture. In: Gardner, B. and G. Raussr (Eds.), Handbook of Agricultural Economics. Elsevier Science Publishers, U.S.A., pp: 1456-1485.

Arestis, P., P.O. Demetriades and K.B. Luintel, 2001. Financial development and economic growth: The role of the stock market. J. Money Credit Bank., 33: 16-41.

Armas, E.B., C.G. Osorio, B. Moreno-Dodson and D.E. Abriningrum, 2012. Agriculture Public Spending and Growth in Indonesia. The World Bank, East Asia Region, Poverty Reduction and Economic Management Unit. Policy Research Working Paper No. 5977.

Ashauer, D.A., 1989. Is public expenditure productive? J. Monetary Econ., 23: 51-63.

Ayadi, O.F., E.O. Adegbite and F.S. Ayadi, 2008. Structural adjustment, financial sector development and economic prosperity in Nigeria. Int. Res. J. Financ. Econ., 15: 318.

Ayoola, G.B. and V.U. Oboh, 2000. A model of public expenditure to reveal the preference for agriculture in the budget. J. Rural Econ. Develop., 14(1): 56-73.

Barro, R., 1990. Government spending in a simple model of endogenous growth. J. Polit. Econ., 95(5): 103-126.

Benchivenga, V.R., B.D. Smith and R.M. Star, 1996. Equity markets, transaction costs and capital accumulation: An illustration. World Bank Econ. Rev., 10(2): 241-265.

Binswanger, H.P. and R.T. Townsend, 2000. The growth performance of agriculture in Sub-Saharan Africa. Am. J. Agric. Econ., 82(5): 1075-1086.

Binswanger, H.P., S.R. Khandker and M.R. Rosenzweig, 1993. How infrastructure and financial institutions affect agricultural output and investment in India. J. Develop. Econ., 41: 337-366.

Borensztein, E., J.D. Gregorio and J.W. Lee, 1998. How does foreign investment affect economic growth? J. Int. Econ., 45: 115-135.

CAADP, 2003. Comprehensive Africa Agriculture Development Programme Framework for Food Security and Poverty Reduction in Africa. Retrieved from: http://www.nepad-caadp.net.

Capasso, S., 2003. Stock Market Development and Economic Growth: A Matter of Informational Problem. Retrieved from: http://www. sec. man. ac. uk/cgber/discusi.htm.1-31.

CBN, 2009. Central Bank of Nigeria Statistical Bulletin. Retrieved from: www. cenbank. org/OUT/2010/PUBLICATIONS/STATISTICAL BULLETINS/2009/INDEX.HTML.

Corray, A., 2009. Government expenditure, governance and economic growth. Comp. Econ. Stud., 5(13): 401-408.

Craigwell, R.C. and C. Grandbois, 1999. The performance of the securities exchange of Barbados. Saving Develop., 22(4): 433-455.

Diao, X., M. Nwafor, V. Alpuerto, K.T. Akromov and S. Salau, 2009. Agricultural Growth and Investment Options for Poverty Reduction in Nigeria. Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI) and RESAKSS-West Africa, International Institute of Tropical Agriculture (IITA).

Dickey, D.A. and W.A. Fuller, 1981. Likelihood ratio statistics for autoregressive time series with a unit root. Econometrica, 49(4): 1057-1072.

Dritsaki, M., 2005. Linkages between stock market and macroeconomic fundamentals: A case study of Athens stock exchange. J. Financ. Manag. Anal., 18(1): 38-47.

Engel, R.F. and C.W.J. Granger, 1987. Co-integration and error correction: Representation, estimation and testing. Econometrica, 55(2): 251-276.

Evans, P. and G. Karras, 1994a. Are government activities productive? Evidence from a panel of U.S. States. Rev. Econ. Stat., 76: 1-11.

Evans, P. and G. Karras, 1994b. Is government capital productive? Evidence from a panel of seven countries. J. Macroecon., 1: 271-280.

Fagernas, S., 2004. Analyzing the Distributional Impacts of Stabilization Policy with A GCE Model: Illustrations and Critique for Zimbabwe. Retrieved from: www.odi.org.uk.

Fan, S. and A. Saurka, 2008. Tracking Agricultural Spending for Agricultural Growth and Poverty Reduction in Africa. ReSAKSS Issue Brief, No. 5. Washington, DC.

Fan, S., P. Hazell and S. Thorat, 2000. Government spending, agricultural growth and poverty in India. Am. J. Agric. Econ., 82(4): 1038-1051.

Fan, S., B. Yu and A. Saurkar, 2008. Public Spending in Developing Countries: Trends, Determination and Impact. In: Fan, S. (Ed.), Public Expenditure, Growth and Poverty: Lessons from Developing Countries. International Food Research Institute and Baltimore, Md: Johns Hopkins University Press, Washington, DC.

Fan, S., B. Omilola and M. Lambert, 2009. Public Spending for Agriculture in Africa. Regional Strategic Analysis and Knowledge Support System (ReSAKSS) Working Paper No. 28. Retrieved from: http://www.resakss.org/index.php:pdf = 42375.

Folster, S. and M. Henrekson, 2001. Growth effects of government expenditure and taxation in rich countries. Eur. Econ. Rev., 45(8): 1501-1520.

Furceri, D., 2007. Is government expenditure volatility harmful for growth? A cross-country analysis. Fisc. Stud., 28(1): 103-120.

Garba, K.P., 1998. Is government policy unstable? An analysis of the stability of Nigerian agricultural policies, 1970-1993. Afr. J. Econ. Policy, 5(1): 79-102.

Gong, L. and H.F. Zou, 2002. Effects of growth and volatility in public expenditures on economic growth: Theory and evidence. Ann. Econ. Financ., 3: 370-406.

Gujarati, D.N., 2003. Basic Econometrics. United States Military Academy, West Point. Tata McGraw-Hill Publishing Co., Ltd., New Delhi.

Iganiga, B.O. and D.O. Unemhilin, 2011. The impact of federal government agricultural expenditure on agricultural output in Nigeria. J. Econ., 2(2): 81-88.

Jansen, K., 1995. The macroeconomic effects of direct foreign investment: The case of Thailand. World Develop., 23(2): 193-210.

Jaroensathaponkul, J. and S. Tongpen, 2007. Impacts of government spending on Thailand's agricultural sector. Kasetsart J. Soc. Sci., 28: 385-395.

Jitsuchon, S. and C. Sussangkarm, 1993. Thailand. In: Lance, T. (Ed.), The Rocky Road to Reform. M.A.l MIT Press, Cambridge, pp: 149-170.

Johansen, S., 1988. Statistical analysis of co-integration vectors. J. Econ. Dyn. Control, 12: 231-254.

Johansen, S. and K. Juselius, 1990. Maximum likelihood estimation and inference on co-integration with applications to the demand for money. Oxford Bull. Econ. Stat., 52: 169-210.

Korsu, R.D., 2008. Exchange rate and balance of payments adjustment in Sierra-Leone. Ph.D. Thesis, Department of Economics, University of Ibadan, Ibadan, Nigeria.

Mistikin, F.S., 2001. The Economics of Money, Banking and Financial Market. 6th Edn., Addison Wisley Longman, New York.

Mogues, T., M. Morris, L. Freinkman, A. Adubi, S. Ehui, C. Nwoko, O. Taiwo, C. Nege, P. Okonji and L. Cheke, 2008. Agricultural Spending in Nigeria. International Food Policy Research Institute (IFPRI) Discussion Paper 789, Washington, D.C. U.S.A.

Mohtadi, H. and S. Agarwal, 2004. Stock Market Development and Economic Growth: Evidence from Developing Countries. pp: 1-18. Retrieved from: http//www.edu/mo.htadi/PAN-4-01.Pdf.

Muhammad-Lawal, A. and O.A. Ate, 2006. An analysis of agricultural production in Nigeria. Afr. J. General Agric., 2(1): 1-6.

Munnel, A., 1992. Why has productivity growth declined? Productivity and public investment. New England Econ. Rev., 1990(Jan): 3-22.

Narayanamoorthy, A. and M. Hanjra, 2006. Rural infrastructure and agricultural output linkages: A study of 256 Indian districts. Indian J. Agric. Econ., 61(3): 444-459.

Nasseh, A. and J. Strauss, 2000. Stock prices and domestic and international macroeconomic activity: A co-integration approach. Quart. Rev. Econ. Financ., 40(2): 229-245.

Nieuwerburgh, S.T., F. Buelens and L.L. Cuyvers, 2005. Stock Market Development and Economic Growth in Belgium. Retrieved from: http:// www. unitar.org/dmf/resource_center_/documentSeries/Document13/odife/2devaf... 1-34.

Nishat, M. and A. Saghir, 1991. The stock market and the Pakistani economy. Saving Develop. Quart. Rev., 25(2): 131-146.

Qazi, M.A.H., M. Summaira and M. Masood, 2010. Government expenditure, agricultural product prices and agricultural growth: A case of Pakistan. Middle East. Financ. Econ., 7: 55-62.

Quijano, J.M. and D.R. Gaecia, 2005. Causality and Determinants of Government Spending and Economic Growth: The Philippines Experience. Mimeo, Retrieved from: www. ecomod. org/files/papes/1458.doc.

Ranjan, K.D. and C. Sharma, 2008. Government expenditure and economic growth: Evidence from India. ICFAI Univ., J. Pub. Financ., 6(3): 60-69.

Sachs, J. and X. Sala-i-Martin, 1992. Fiscal Federalism and Optimum Currency Areas: Evidence for Europe for the United States. CEPR Discussion Papers 632, C. E. P. R. Discussion Papers.

Shabaz, M., H.U. Rehman and N. Amir, 2010. The impact of trade and financial-openness on government size: A case study of Pakistan. J. Qual. Tech. Manag., 6(1): 105-108.

Shintani, M., 2003. The Process of Agricultural Growth in Thailand: Analysis of Long-Term Economic Statistics for the Period of 1950-1997. Kyushu University Press, Japan.

Surya, B.G.C. and N. Suman, 2006. Stock market and economic development: A causality test. J. Nepalese Bus. Stud., 3(1): 44-52.

Ujunwa, A. and O.P. Salami, 2010. Stock market development and economic growth: Evidence from Nigeria. Eur. J. Econ. Financ. Admin. Sci., 25: 44-53, ISSN: 1450-2275.

Uniamikogbo, S. and A. Enoma, 2001. The impact of monetary and fiscal policies on manufacturing industry in Nigeria: A simultaneous equation model. Niger. Econ. Financ. Rev., 6(1): 107-117.

Von Hagen, J., 1992. Fiscal Arrangements in a Monetary Union- Some Evidence from the US. In: Fair D. and C. de Boissieux (Eds.), Fiscal Policy, Taxes and the Financial System in an Increasingly Integrated Europe. Kluwer Academic Publishers, Deventer.

Yartey, C.M. and C.K. Adjasi, 2007. Stock Market Development in Sub-Sahara Africa: Critical Issues and Challenges. IMF Working Paper WP/07/209, pp: 1-33.