External Capital Funding and Staple Food Production in Nigeria

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ABSTRACT

This study investigated the effect of foreign capital inflows (foreign private investment, foreign aids and grants and net export earnings) on index of staple food output in Nigeria. Time series data were obtained from National Bureau of Statistics and Central Bank of Nigeria Statistical Bulletin from 1980-2013. The ordinary least squares (OLS) regression analysis and cointegration/error correction mechanism were employed as the main statistical tools. The E-views 7.1 statistical package was used in analyzing data. Results from the study show that the value of the Error Correction Model (ECM) for staple food output appeared with the right signs (-67.04696) and statistically significant at the 5 per cent level. This implies that the ECM corrected the short run deviation to long run equilibrium. The Durbin Watson value of 2.36778 for staple food output suggests a lesser level of autocorrelation. The coefficient of determination (R^2) showed 58.62% variation in staple food output was explained by changes in the explanatory variables. However the F-ratio of staple food model was not significant. The beta coefficient (β) of current and lag one forms of Foreign Private Investments (FPI), Foreign Aids and Grants (FAG), Net Export Earnings (NEE) and Exchange Rate (EXR) staple food output model was positively signed but not statistically significant. This result revealed that foreign capital inflows (FPI,FAG,NEE, and EXR) has a positive impact but does not significantly affect staple food output in Nigeria. The study recommends that government should put in place a strategy for attracting more foreign investors as well as pursuing an aggressive export promotion drive with a view to increasing the volume of value-added agricultural exports. Attempt should also be made to attract a higher volume of foreign aids and grants by interfacing with international agencies, organizations and financial institutions. Investment of External capital should be channelled to the production of staple foods in order to generate higher growth in the agricultural sub-sector as well as contribute significantly to food security.

INTRODUCTION

The need for foreign capital to complement domestic resources in the economic growth process has been welcomed as a catalyst of development, since it is considered as the central element of the process of economic growth. Its origin does not matter. In the face of resource deficiency in financing long term development, the capital-deficient economies have heavily resorted to foreign capital as the primary means to achieve rapid growth in all sectors of the economy

especially the agricultural sector. Both private and public sectors of the Nigerian economy have utilized the foreign capital to boost their sector capabilities in line with government development plans. Over time, government's plan to stimulate inflow of resources was with expectation to speed up growth and transform the economy especially the agricultural sector in line with classical economist's prescription. In particular, rapid increase in Gross Domestic Product (GDP) and GDP per capita were expected. Other expectations included improved balance of payment, creation of employment opportunities and stimulation of the overall development of the economy.

The need for capital inflow into an import dependent economy like Nigeria is crucial. A cursory look at the data indicates that Nigeria has posted trade imbalances in most fiscal years, suggesting that total payments had exceeded total receipts vis-à-vis total imports to total exports relations (Amadi, 2002). Overall balance of payments deteriorated in 1999, 2002 and 2008 mainly due to increased outflow from capital accounts (CBN, 2009). Much of the capital outflow must be attributed to increased importation, declining exports particularly non-oil subsector, and majorly due to external debt servicing required in filling resource gaps.

Akinlo (2006) have identified debt servicing and reserve creation as fluctuating variables that create dependence on foreign capital in Nigeria. The long run development of an emerging economy like Nigeria's would require persistent and massive investment expenditures that can match the dire need for capital. Also, Akinlo (2006) opined that economists have come to realize that a massive savings-investment gap exists in developing countries. This has led to the arguments that external financing is critical if not inevitable for the sustained growth of countries like Nigeria. The main arguments in this direction is that if these countries gain access to world financial markets and other donor financing, the savings gap could be overcome by financing domestic (excess) investment out of the savings from high income countries i.e. by capital imports. These capital imports can take the form of concessional lending abroad, foreign direct investment (FDI) inflows and portfolio investment by foreigners.

Anyanwu (2004) disaggregated foreign capital into; foreign loans, direct foreign investments and export earnings. Using Chenery and Stout's two-gap model, he observed that FDI has a negative effect on economic development in Nigeria. According to a World Bank report released in 2011,Foreign capital inflow, which comprises Foreign Direct Investment, FDI, (investment in real assets) and Foreign Portfolio Investment (investment in financial assets) in Nigeria for 2010 stands at N7.7 billion (Anderson and Babula, 2008). Conversely, the experience of a small number of fast growing East-Asian newly industrialized nations has strengthened the belief that foreign capital is the central element of the process of economic development especially in the agricultural sector since it could bridge the resource gap of these economies and avoid further build up of debt while tackling the causes of poverty directly (Albuqerque, 2003).Therefore, foreign capital inflow and investment is the transfer of entrepreneurship, management skill, physical capital and human capital. It involves transfer of sophisticated skills in production technology, technical knowledge, general know-how, and managerial capacities.

Statement of the Problem

It is sad to note that Nigeria which during the 60s and 70s was a global powerhouse in a sector like agriculture is today a major importer of agricultural products. The country has experienced a

humiliating decline in productivity in virtually all sectors of the economy. The oil and gas sector which the country hangs on to as its lifeline is also highly susceptible to external shocks that emanate from the roller-coaster ride of world crude oil prices as is the case today. Currently, the oil sector is performing very woefully especially with the plummeting of crude oil prices recently. With the recent development in the oil sector, it is evident the sector alone cannot address the numerous economic challenges that as the core resource base have not been converted into improved living standards as over 54.7 percent of the population continue to live below the national poverty line (World Bank, 2012).

The contribution of agriculture to economic growth of Nigeria in present times is still very low as against what was obtainable during the 1960s. Even with the recent reforms in Nigeria, the country's agricultural sector to a large extent still possesses the characteristics of a peasant economy that was prominent in the pre-independence era (Adewunmi and Omotesho, 2002). In spite of the presence of abundant primary resources required to enhance growth in the sector, it is bedeviled by a host of problems and challenges thereby making breakthroughs and successes almost unachievable in the sector. The capital investment, productivity and income recorded in today's agricultural sector of Nigeria are very low. Production is still dominated by small-scale farms characterized by small, uneconomic and often fragmented holdings, use of simple implements (hoes and cutlasses) and unimproved planting and storage materials.

Asiedu (2003) explained that agricultural production landscape in Nigeria which is dominated by small-scale farmers who produce about 85 per cent of the total production still employ rudimentary techniques. The quantity and quality of capital investment in the agricultural sector leaves much to cheer. Also, despite the broad objectives of foreign aid as well as the tremendous increases in the flow of foreign aid to developing countries like Nigeria from time to time, there is controversies about aid effectiveness in the various sector especially the agricultural sector. Also, Nigeria as a country, given her natural resource base and large market size (a population of about 170 million), qualifies to be a major recipient of FDI in Africa and indeed, is one of the top three leading African countries that consistently received FDI in the past decade. For example, the flow of FDI to agriculture in Nigeria for 1980, 1990, 2000 and 2010 was ₦120.8 million, ₦334.7 million, ₦1209 million and ₦1280 million respectively. Inspite of these flows, agricultural output remained very low and its contribution to the GDP for the same period stood at 31%, 39%, 38% and 39% respectively. This shows, the level of FDI attracted especially to agriculture is small compared to the resource base and potential need. There is also a continuing debate on the relationship between foreign aid and economic growth in countries, empirical results by scholars are mixed. It is very difficult to quantify or measure the impact of foreign aid in a country. In Nigeria, sceptics of foreign aid insist that despite the well-intended ideal of impacting economic growth and wellbeing of people in the country, little has actually come from the enormous amount and variety of aid. Most aid projects in Nigeria are subject to failure from its inception. The reasons are partly because most of these financial assistances ended in the private accounts of those who are supposed to administer those projects, also that sometimes donors are not interested in what the money is being used for but what they expected to get in return.

LITERATURE REVIEW

Conceptual Framework

Concept of Foreign Direct Investment (FDI)

Todaro and Smith (2009) defines FDI simply as 'an investment activity in which a firm conducts and controls productive activities in more than one country'. Buttressing this, Eli, Udo and Isituo (2006) define FDI as 'international capital flows in which a firm in one country creates or expands a subsidiary in another'. Also, in his own words, Razin (2002) defines FDI as 'investment in businesses of another country which often takes the form of setting up a local production facilities or the purchase of existing businesses. That is, FDI is an investment made to acquire a lasting management interest (normally 10% of voting stock) in a business enterprise operating in a country other than that of the investor defined according to residency (World Bank, 1996). Such investments may take the form of either "Greenfield" investment (also called "mortar and brick" investment) or merger and acquisition (M&A), which entails the acquisition of existing interest rather than new investment. In corporate governance, ownership of at least 10% of the ordinary shares or voting stock is the criterion for the existence of a direct investment relationship. Ownership of less than 10% is recorded as portfolio investment. FDI comprises not only merger and acquisition and new investment, but also reinvested earnings and loans and similar capital transfer between parent companies and their affiliates. Countries could be both host to FDI projects in their own country and a participant in investment projects in other countries. Ayanwale (2007) describes FDI as investment made to acquire a lasting management interest (usually at least 10% of voting stock) and acquiring at least 10% of equity share in an enterprise operating in a country other than the home country of the investor. FDI has further been explained as the long-term investment reflecting a lasting interest and control, by a foreign direct investor (or parent enterprise), of an enterprise entity resident in an economy other than that of the foreign investor (CBN, 2009).

Equally, Kojima (1997) describe FDI as investment by multinational corporations in foreign countries in order to control assets and manage production activities in those countries. A country's inward FDI position is made up of the hosted FDI projects, while outward FDI comprises those investment projects owned abroad. One of the most salient features of today's globalization drive is conscious encouragement of cross-border investments, especially by transnational corporations and firms (TNCs). Many countries and continents (especially developing) now see attracting FDI as an important element in their strategy for economic development. This is most probably because FDI is seen as an amalgamation of capital, technology, marketing and management. Sub-Saharan Africa as a region now has to depend very much on FDI for so many reasons, some of which are amplified by (Asiedu, 2003). The effort by several African countries to improve their business climate stems from the desire to attract FDI. In fact, one of the pillars on which the New Partnership for Africa's Development (NEPAD) was launched was to increase available capital to US$64 billion through a combination of reforms, resource mobilization and a conducive environment for FDI. Unfortunately, the efforts of most countries in Africa to attract FDI have been futile. This is in spite of the perceived and obvious need for FDI in the continent. The development is disturbing, sending very little hope of economic development and growth for these countries.

Foreign Aids and Grants

Foreign aids are development assistance and other forms of official flows granted by donor organisation and developed countries to developing and less developed countries to make provision for infrastructure and expenditure funding gaps due to inadequacies in revenue and weak taxes (Akinlo, 2004). Foreign aid is defined as any flow of capital to a developing countries for the objective that should be non-commercial from the point of view of the donor on development, poverty reduction, or income distribution grounds and it should be characterized by concessional terms; that is, the interest rate and repayment period for borrowed capital should be softer (less stringent) than commercial terms (Bakare, 2011; Todaro and Smith, 2011). Official Development Assistance (ODA), commonly known as foreign aid is a flow of financial resources from developed countries to developing countries on development grounds.

(Albuquerque, 2003). It is an international transfer of public funds in the form of loans or grants either directly from one government to another (bilateral) or indirectly through multilateral assistance agency such as International Monetary Fund and World Bank (Razin, 2002).

Aid is an official development assistances (ODA) offered by developed world to improve the socio-economic and environmental development of regions in the developing nations (Iyoha and Ekanem, 2011). It is a vital source of external finance for many developing countries like Nigeria. Recent years have seen much progress in increasing the quality and quantity of official aid (UNDP, 2011).

Agricultural Output

Islam (2011) examining the effect of trade liberalization on agricultural exports in Nigeria, observed that the policy had tremendous effects on the level and value of exports in agricultural sub-sector. A regression analysis relating the total value of agricultural produce and the aggregated domestic prices, and other relevant parameters of four commodities accounted for between 65 and 87 percent of the variability in income from the foreign sector of Nigeria agricultural commodity trade between 1990 and 1998. High value of co-efficient of elasticity further confirmed that export trade in these four commodities would dominate the Nigeria agricultural export trade for years to come.

Burhop (2005) evaluated the extent World Bank sponsored Agricultural Development Project (ADP) has gone in Nigeria with a view to identifying the areas of problems. In pursuant of this objective, survey research method was adopted. Data collected through questionnaire were presented in tables and analyzed. The findings revealed among others, that policy approach that excluded the beneficiaries from participating in the project design, planning and implementation is not desirable. Recruitment of extension staff were not based on expertise and professionalism, but on political considerations and parochial interests. The three financiers World Bank, Federal and State governments of Nigeria do not make their contributions as and when due.

Using recent panel data from Nigeria which includes observations from both planting and harvest seasons within an agricultural season, our econometric strategy uses degree days and rainfall deviations from historical means as well as quasi-fixed agricultural capital to instrument for production variables (agricultural revenue or crop production diversity) which are simultaneously determined with consumption. Degree days, the number of days extreme temperatures affect optimal plant growth, have been found to be correlated with reduced yields and agricultural income (Hatfield et al. 2008). We identify the effect of revenue variation on

dietary diversity and diet composition in an empirical application of the no separable household model by using exogenous variation in rainfall and degree days that affect plant growth and agricultural revenue, but do not necessarily change market level prices at harvest which affect consumption patterns. This mechanism through which the exclusion restriction assumption could be violated can be tested in our data.

A small literature has investigated the effects of agricultural production on nutrition primarily via reduced form identification strategies. Muller (2009) found that production of food crops such as beans and certain tubers as well as a category composed of heterogeneous food of high quality had positive impacts on nutritional statuses, while the production of traditional beers and nonfood crops was found to have negative effects for nutrition

Empirical Literature

There are two strands of thought (modernization and dependence hypotheses) on the role of capital inflow in the literature. Modernization hypothesis argues that capital inflow contributes to the development of host country by increasing competition, crowding-in domestic investment, and transfer of technology etc while the dependency hypothesis suggest foreign capital inflow is detrimental to growth and it cannot substitute indigenous growth strategy and that foreign direct investment especially is a tool of exploitation that adversely affects the growth prospect of developing world by crowding-out and displacing domestic investment (Bakare, 2011). There is no clear cut evidence either in support or against either the modernization hypothesis or the dependency hypothesis in the literature. While the proponents of modernization hypothesis (Burnside and Dollar, 2004) argue that capital inflow especially foreign aids appears to be more effective but only in countries with good policies and institutional environment, other studies (Dalgaard, 2004) in support of dependency hypothesis argue that capital inflows such as FDI and foreign aids in particular are rather effective and conditional on countries with more venerable economic conditions. Similarly, Roodman (2004) and Gounder (2001) argue that foreign aids does not have robust long run effects and neither a good policy environment a necessary conditions for aid to be effective.

Evaluation of Literature Reviewed

The study so far has reviewed several theories on the FDI and agricultural productivity. For instance the neo-classical theory of economic growth, the investment theory (the two gap model) and the product cycle theory. These theories analyzed the need of investment in the agricultural sector to foster economic growth. Udoh (2012) employed bounds test and Autoregressive distributed lag (ARDL) modeling approach to analyze both short- and long-run impacts of public expenditure and foreign direct investment on agricultural output growth in Nigeria. The results indicate that an increase in public expenditure has a positive influence on the growth of the agricultural output and that government spending has a relatively higher elasticity than foreign direct investment. Islam (2011) while examining the effect of trade liberalization on agricultural exports in Nigeria, observed that the policy had tremendous effects on the level and value of exports in agricultural sub-sector. A regression analysis relating the total value of agricultural produce and the aggregated domestic prices, and other relevant parameters of four commodities accounted for between 65 and 87 percent of the variability in income from the foreign sector of Nigeria agricultural commodity trade between 1990 and 1998. High value of co-efficient of elasticity further confirmed that export trade in these four commodities would dominate the

Nigeria agricultural export trade for years to come. Ogbanje (2011) examined the fate of the agricultural sector in relation to foreign direct investment in Nigeria. Pearson Moment Correlation analysis was employed in determining the relationship between agricultural FDI and agricultural GDP. Results of the study indicated a positive relationship between FDI to agricultural sector and agriculture Gross Domestic Product (GDP) was significant at 0.001 level of probability. Also, the study has reviewed empirical works relating to FDI and agricultural productivity too. Based on the empirical literature reviewed diverse studies have been conducted on the effect of FDI on agricultural productivity. A survey of these literatures showed positive and negative results. In spite of the divergent views, Udoh (2012) and Islam (2011) are most apt. Specifically, the present study adopts the view of Ogbanje (2010) with slight modification in terms of scope and method of analysis. Therefore, this research adopts index of agricultural productivity, foreign private inflow, exchange rate, foreign aid/grants to agriculture and net export to explain foreign capital inflow to the agricultural sector in the Nigerian economy. It also extends the scope to 2013, which is more current than some of the studies reviewed and applied the econometrics techniques of OLS and cointegration to analyze the data. These are the gaps the study is intended to fill.

METHODOLOGY

The following time series data were employed in the study:

- Agricultural output - Index of staple food output in Nigeria from 1980-2013.
- Foreign private capital inflow to agriculture data in Nigeria from 1980 – 2013,
- Foreign aid and grants to agriculture data in Nigeria from 1980 – 2013,
- Net export earnings data in Nigeria from 1980 – 2013, and
- Exchange rate data in Nigeria from 1980 – 2013.

The necessary information (data) for the variables above was obtained from secondary sources. This includes data from Central Bank of Nigeria Statistical Bulletin, National Bureau of Statistics, Journals, and textbooks among others.

Method of Data Analysis

This study employed quantitative techniques of data analysis. Therefore, the study adopted the Ordinary Least Square method (OLS), the Error Correction Method of Co-integration based on Engle-Granger (1987) co-integration theorem and the Granger Causality test. The reasons for these econometric approaches has become necessary due to the fact that time series data are sometimes subject to variation that may lead to false regression result.

Ordinary Least Square Test

This study employed this test to investigate the relationship that exists between the dependent and explanatory variables. The study chose the OLS method because of the requisite advantages associated with it such as the Best Linear Unbiased Estimate (BLUE) and efficiency.

The Co-integration and Error Correction Model (ECM) Test

The co-integration estimation technique was adopted in analyzing data in this study. Co-integration is an econometric technique used for testing the correlation between non-stationary time series data. Usually time series data are non-stationary due to fluctuations that do characterize such information. Two variables are said to be co-integrated if they have a long run or equilibrium relationship between them or share a common stochastic drift (Gujarati, 2007). Hence, co-integration technique has been developed to address the problem of spurious correlation (false correlation) often associated with some time series data. Meanwhile, an extension of this, in the co-integration technique is the error correction mechanism (ECM) (Engle and Granger, 1987). These authors have established that co-integration is a sufficient condition for an error correction model formulation.

Unit Root Test

The unit root test is the first stage of co-integration and error correction techniques. This test help to stabilize the spurious nature of the time series. A test of stationarity could be Dickey Fuller, Philip Peron and Augmented Dickey Fuller (Gujarati, 2007). But for this study, the Augmented Dickey Fuller (ADF) test is adopted. This is because it takes care of the problem of autocorrelation associated with the Dickey Fuller Test. A unit root model is presented below:

Unit Root Model

$$\Delta Y_1 = \alpha Y_{t-1} + \sum_{i=1}^{m} \Delta Y_{t-} + \delta + Y_1 + \varepsilon_1 \text{ (for levels)}$$

$$\Delta\Delta Y_1 = \alpha \Delta Y_{t-1} + \sum_{i=1}^{m} \Delta\Delta Y_{t-1} + \delta + Y_1 + \varepsilon_1 \text{ (for first difference)}$$

ΔY is the first difference of the series, m is the number of lags and t is the time.
Suppose two variables A (net export earning) and B(exchange rate), used in our analysis are integrated of order 1 and we are interested in finding out the equilibrium relationship between the two variables, then this method suggests a straight forward test whether two variables are co-integrated of order l(I) or not.
Johansen's Test for Co-Integration: The basic argument of Johansen's procedure is that the rank of matrix of variables can be used to determine whether or not the two variables are co-integrated.

Error Correction Model (ECM): According to Iyoha and Ekanem (2011), error correction model (ECM) involves using lagged residual to correct for deviations of actual values from the long-run equilibrium values.

The error correction model for two variables X and Y is stated generally as:

$$\Delta Y_1 = \alpha_0 + \alpha_1 \Delta X_1 + \alpha_2 U_{t-1} + \varepsilon_1$$

Where; α_2 is the degree of adjustment.
The decision in favour of this empirical approach is on the ground that time series data usually fluctuate, resulting in spurious short-run regression result due to cyclical behaviour of business activities. Therefore, the chosen methods of analysis will correct inconsistencies in time series data and provide for long-run relationship amongst the variables in this investigation.

Also to be tested in this research work are the following:

- Test for the co-efficient of determination (R^2) as test to knowing the explanatory power of the variables in the models (goodness of fit of the variables).
- Test of significance (T-test) of each of the parameter estimates.
- Overall significance (F-test) of the explanatory variables in the model.
- Durbin Watson test for autocorrelation

Staple Production Output Model

SUP= f(FPI, FAG, NEE, EXR) ……1

Linear Specification

$SUP_t = b_0 + b_1FPI_t + b_2FAG_t + b_3NEE + b_4 EXR + U_t$ ……..2

Log Linear Specification

$LogSUP_t = Logb_0 + Logb_1FPI_t + Logb_2FAG_t + Logb_3NEE + Log\ b_4EXR + U_t$ ……3

Where:

f = functional sign

b_0 = Autonomous component of agricultural productivity

b_1-b_4 = slopes of macroeconomic fundamentals

SUP = Output of staple Production
FPI = Foreign private investment
FAG = Foreign aids and grant to agriculture
NEE= Net export earnings
EXR = Exchange rate
t = time.

***A priori* expectations**

On the *a priori*; $b_1 > 0$, $b_2 > 0$, $b_3 > 0$and $b_4 > 0$

RESULTS AND DISCUSSION

Table 1: Staples Food Output, Foreign Private Investment, Foreign Aid and Grants, Net Export Earnings and Exchange Rate (1980-2013)

YEAR	SUP	FPI	FAG	NEE	EXR
1980	45.35	120.8	794800000	5091.100	0.540000
1981	46.15	120.5	101520000	-1816.300	0.610000
1982	48.26	120.5	922900000	-2564.100	0.670000
1983	46.15	127.8	123750000	-1401.200	0.720000
1984	52.80	128.5	90100000	1909.700	0.760000
1985	54.54	126.0	868200000	4658.200	0.890000
1986	58.08	128.2	12300000	2937.000	2.020000
1987	44.51	117.3	119360000	12498.90	4.020000
1988	46.82	128.9	184910000	9747.100	4.540000
1989	94.29	134.8	546250000	27111.00	7.390000
1990	100.00	334.7	383270000	64168.20	8.010000
1991	120.76	382.8	378760000	32047.20	9.910000

1992	134.23	386.4	358120000	62460.50	17.30000
1993	140.61	1214.9	427680000	53140.70	22.05000
1994	146.17	1208.5	270420000	43270.40	21.89000
1995	150.61	1209	261450000	195533.7	21.89000
1996	157.39	1209	246750000	746916.8	21.89000
1997	162.25	1209	277230000	395946.1	21.89000
1998	166.89	1209	287100000	-85562.00	21.89000
1999	172.71	1209	209800000	326454.1	102.1100
2000	178.51	1209	245770000	960700.9	102.1100
2001	157.50	1209	263430000	509773.5	112.9400
2002	164.10	1209	419250000	231482.3	126.8800
2003	175.90	12091	384570000	1007651	137.2200
2004	186.90	1209	654310000	2615736	133.5000
2005	199.50	1209	6954730000	4445679	132.1500
2006	215.10	1209	1238334000	4216161	128.6500
2007	210.53	1329.9	1951130000	4397806	125.8300
2008	208.4	1249.9	1271670000	4971688	126.4800
2009	211.3	1262.7	1671210000	3253851	149.9000
2010	210.1	1280.8	2061960000	3917582	150.4800
2011	209.9	1264.5	1776670000	3993678	158.2100
2012	210.4	1269.3	2061960000	4272836	159.3900
2013	210.1	1271.5	1966860000	4061365	161.5000

Source: *CBN Statistical Bulletin (Various Issues)*

Trend Analysis of the Variables in the Models

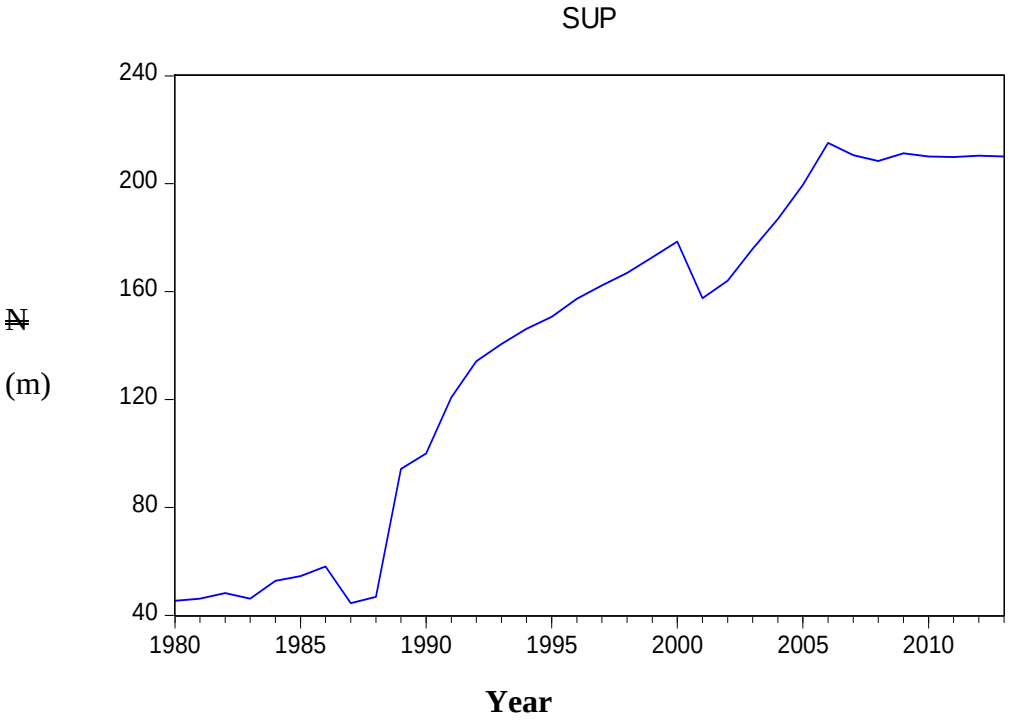

Figure 1: Trend Analysis of Output of Staples

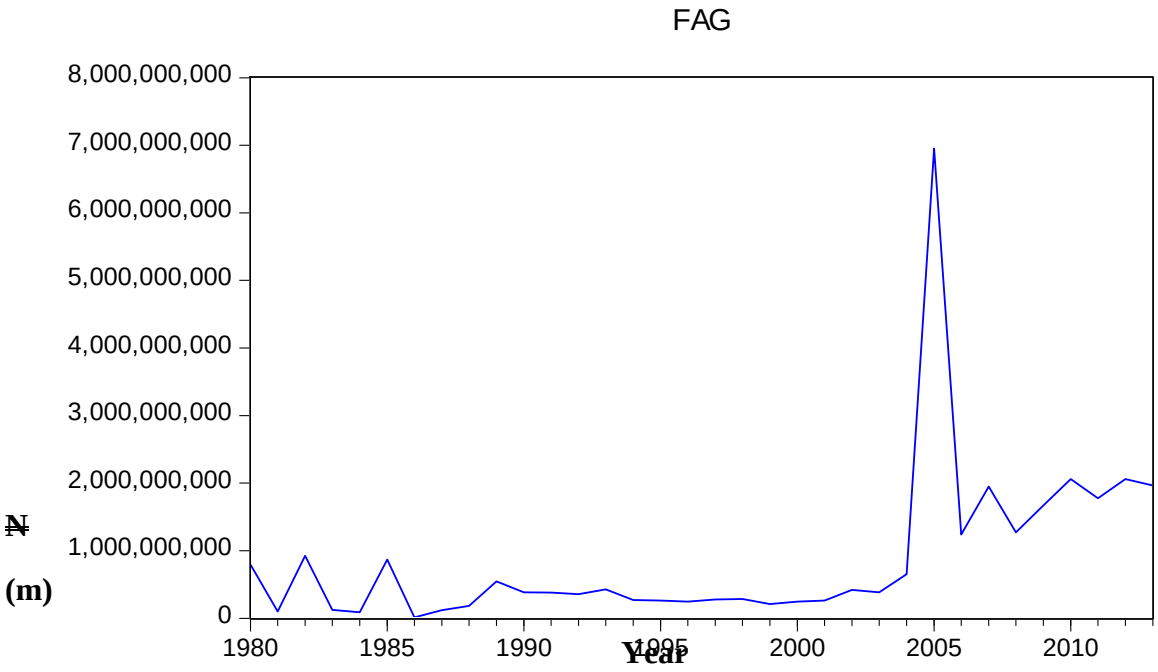

Figure 2 : Trend Analysis of Foreign Aids and Grants to Agriculture

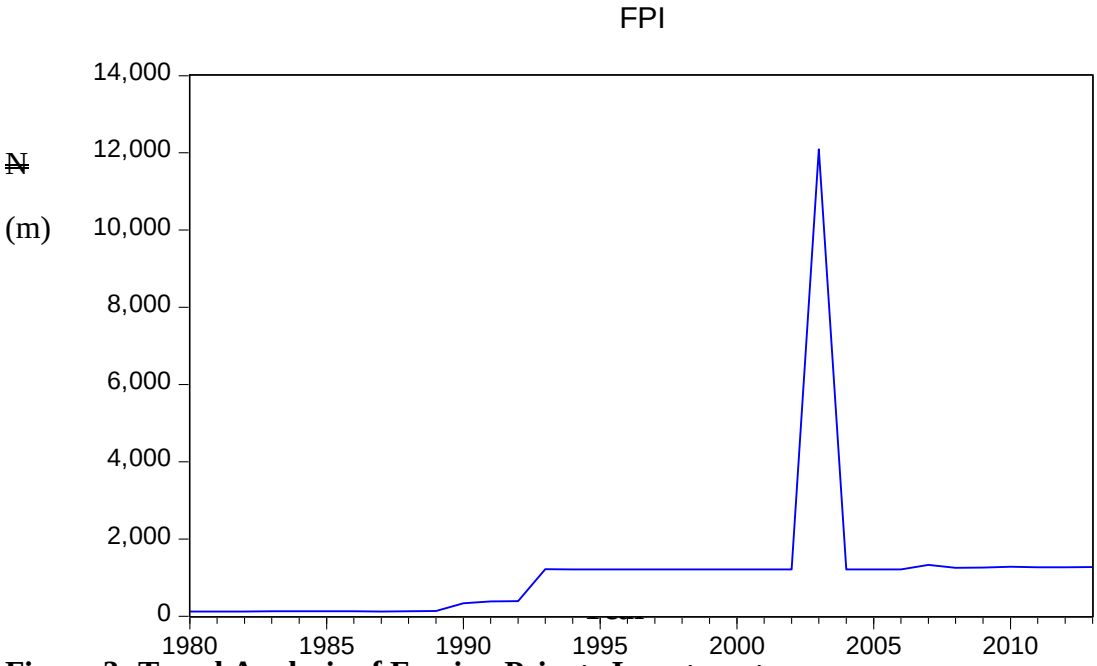

Figure 3: Trend Analysis of Foreign Private Investment

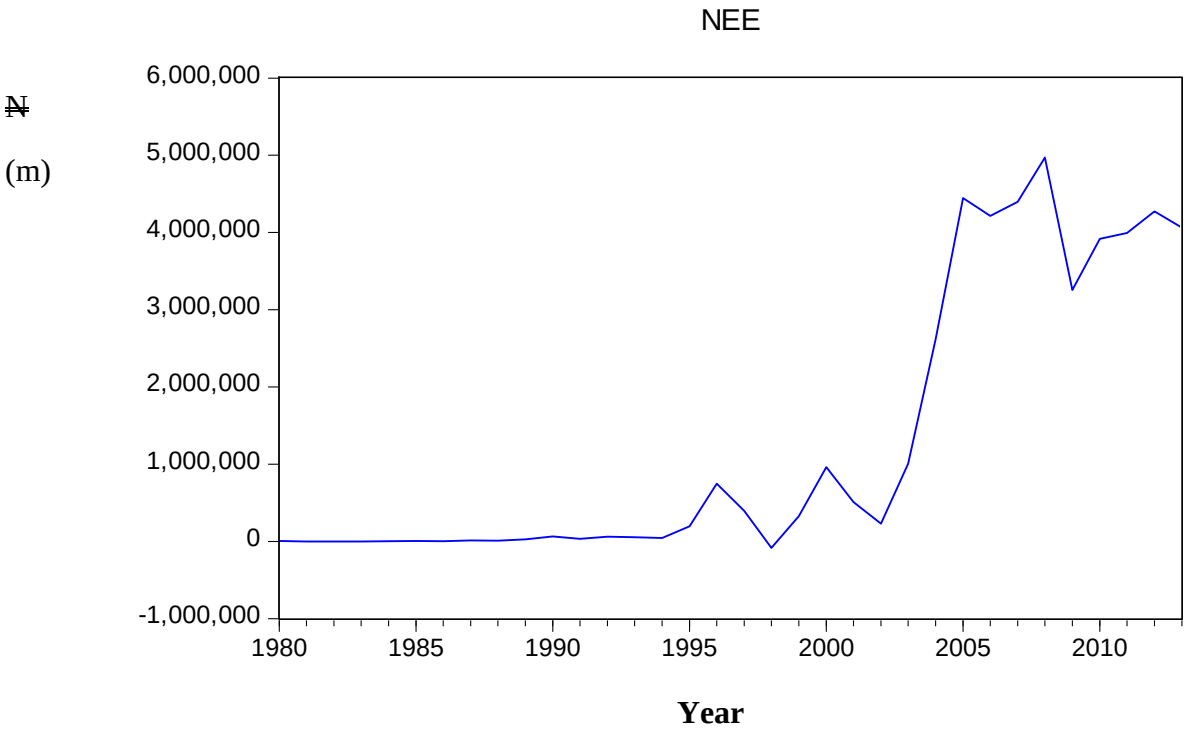

Figure 4: Trend Analysis of Net Export Earning

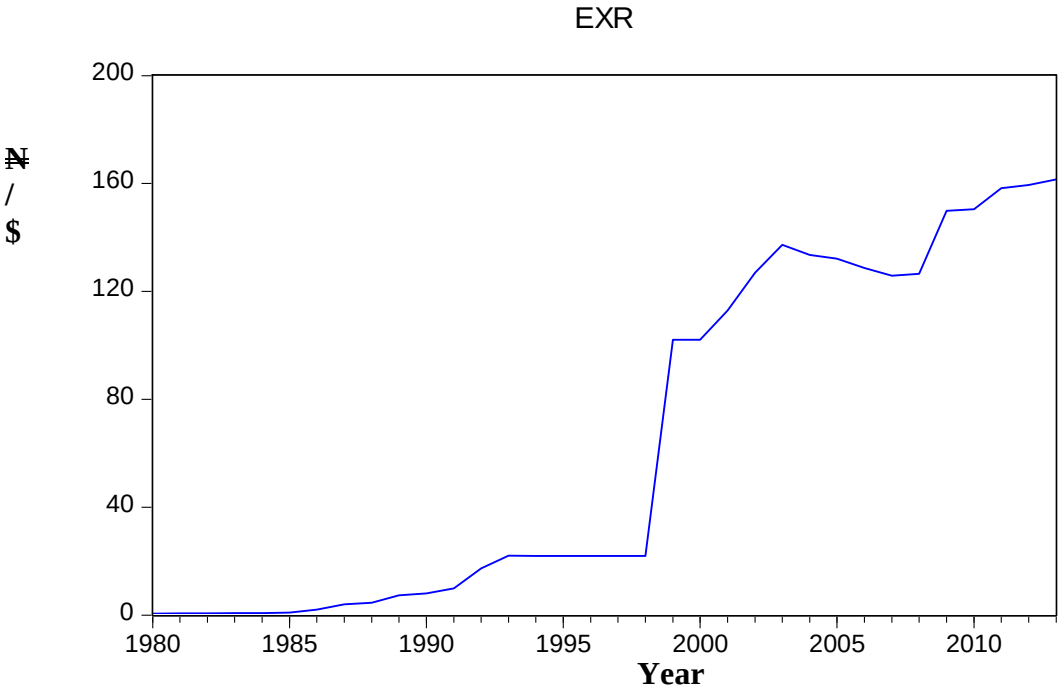

Figure 5: Trend Analysis of Exchange Rate

Regression Analysis at levels

The argument in model specification was tried with both linear and log-linear specifications. The model that provided the best fit was selected on the basis of magnitude of the coefficients of R^2, magnitude and statistical significance of the regression coefficients and expected signs. The log linear specification was selected for staple food model.

Table 1: Regression Analysis Result for Staples Production Output Model

Dependent Variable: LOG(SUP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.350830	0.749651	3.135900	0.0039
LOG(FPI)	0.156885	0.056329	2.785129	0.0093
LOG(FAG)	0.044744	0.037283	1.200139	0.2398
LOG(NEE)	7.52E-10	2.99E-08	0.025185	0.9801
LOG(EXR)	0.181813	0.038661	4.702714	0.0001

R-squared	0.926054	Mean dependent var	4.796365
Adjusted R-squared	0.915854	S.D. dependent var	0.587368
S.E. of regression	0.170383	Akaike info criterion	-0.566483
Sum squared resid	0.841880	Schwarz criterion	-0.342019
Log likelihood	14.63022	Hannan-Quinn criter.	-0.489934
F-statistic	90.79422	Durbin-Watson stat	1.207207
Prob(F-statistic)	0.000000		

Source: Author's *Computation from (E-View 7.1)*

The Durbin Watson value of 1.207 depicts the presence of serial autocorrelation. The presence of serial autocorrelation may be attributed to non-stationarity of time series data that are used for the study. Having identified the presence of autocorrelation in the DW test and multicollinearity from the R^2 test, there is the need to conduct stationarity test and the long run analysis to stabilize the time series.

Long Run Regression Analysis

Unit Root Test for Stationarity (Augmented Dickey Fuller)

A stationarity test is necessary to stabilize the spurious nature in most short run analyses. This will be followed by the Johansen co integration test and the error correction mechanism to determine the equilibrium relationship between the variables used in an analysis.

Table 2: Result of Unit Root of Variables in the Models

Variables	ADF Test	Critical Value			Order of integration
		1% critical value	5% Critical value	10% critical value	
SUP	-4.967926	-3.653730	-2.957110	-2.617434	I(1)= 1st Diff.
FPI	-5.070341	-3.646342	-2.954021	-2.615817	I(0) = At Level.
FAG	-4.247843	-3.646342	-2.954021	-2.615817	I(0) = At Level
NEE	-5.029539	-3.653730	-2.957110	-2.617434	I(1)= 1st Diff.
EXR	-5.835808	-3.653730	-2.957110	-2.617434	I(1)= 1st Diff.

Source: *Author computation from (E-view 7.1)*

The result of the unit root test presented in Table 2 shows that the time series were stationary at various levels of significance of 1%, 5% and 10%. While FPI (foreign private investment to agriculture) and FAG (foreign aids and grants to agriculture) were stationary at

levels. However, all the remaining non stationarity variables become stationary at first difference. That is, NEE (net export earnings), EXR (exchange rate), SUP (output of staple production) were integrated of order one (first difference).

Johansen Test for Co-integration

The cointegration used in this study is the Johansen cointegration test. According to Iyoha and Ekanem, (2011) cointegration deals with the methodology of modeling non-stationary time series variables. The results of the Johansen co-integration test is presented in table 3 below.

Table 3: Johansen Cointegration Test Result for CUP Model

Eigen value	Max-Eigen Statistic	5% critical value	Prob. **	Hypothesized N0 of CE(s)
0.947757	94.45932	33.87687	0.0000	None *
0.634284	32.18874	27.58434	0.00119	At most 1 *
0.406039	16.67013	21.13162	0.1881	At most 2
0.177397	6.249019	14.26460	0.5815	At most 3
0.035095	1.143214	3.841466	0.2850	At most 4

Source:Author's *Computation from (E-View 7.1)*

Note: * denote rejection of the hypothesis at the 0.05 level. **Mackinnon-Haug-Michelis (1999) p-values. Max-eigenvalue test indicate 2 co-integrating eqn(s) at 0.05 level. Due to the

existence of two co-integrating equations, the requirement for an error correction model is fulfilled.

Table 4: Johansen Cointegration Test Result for SUP Model

Eigen value	Max-Eigen Statistic	5% critical value	Prob. **	Hypothesized N0 of CE(s)
0.949953	95.83367	33.87687	0.0000	None *
0.602482	29.52048	27.58434	0.0279	At most 1 *
0.395103	16.08629	21.13162	0.2198	At most 2
0.168333	5.898336	14.26460	0.6263	At most 3
0.048000	1.574097	3.841466	0.2096	At most 4

Source:Author's *Computation from (E-View 7.1)*

Note: * denote rejection of the hypothesis at the 0.05 level. **Mackinnon-Haug-Michelis (1999) p-values. Max-eigenvalue test indicate 2 co-integrating eqn(s) at 0.05 level. Due to the existence of two co-integrating equations, the requirement for an error correction model is fulfilled.

Error Correction Model (ECM)

Error correction model (ECM) is the means of adjusting the short-run behaviour of an economic variable to long-run behaviour. The table below shows the results of error correction test conducted:

Table 5: Parsimonious ECM for SUP Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.935188	3.113446	0.942746	0.3607
D(SUP(-1))	0.508632	0.257488	1.975360	0.0669
D(SUP(-2))	0.352927	0.216212	1.632319	0.1234
D(FPI)	0.000694	0.001136	0.610986	0.5504
D(FPI(-1))	-6.72E-05	0.001685	-0.039889	0.9687
D(FPI(-2))	-0.003106	0.003943	-0.787575	0.4432
D(FAG)	7.48E-09	6.56E-09	1.139869	0.2722
D(FAG(-1))	2.49E-09	2.72E-09	0.912815	0.3758
D(FAG(-2))	8.13E-10	2.00E-09	0.406906	0.6898
D(NEE)	3.62E-06	4.30E-06	-0.842275	0.4129
D(NEE(-1))	2.14E-06	4.45E-06	-0.481337	0.6372
D(NEE(-2))	4.51E-06	4.73E-06	-0.954063	0.3552
D(EXR)	0.134911	0.146890	0.918447	0.3729
D(EXR(-1))	-0.025903	0.139603	-0.185550	0.8553
D(EXR(-2))	-0.338970	0.135131	-2.508450	0.0241
ECM(-1)	-67.04695	24.87696	-2.695143	0.0166
R-squared	0.577640	Mean dependent var		5.220645

Adjusted R-squared	0.155280	S.D. dependent var	11.16570
S.E. of regression	10.26224	Akaike info criterion	7.801140
Sum squared resid	1579.703	Schwarz criterion	8.541262
Log likelihood	-104.9177	Hannan-Quinn criter.	8.042401
F-statistic	1.367649	Durbin-Watson stat	2.367788
Prob(F-statistic)	0.275889		

Source: Author's *Computation from (E-View 7.1)*

Discussion of Trend Analysis of the Variables in the Models

Figure1 revealed that staples output (SUP) moved from its level of 45.35 in 1980 to 52.80 in 1984. Between 1985 and 1989, it rose from 54.54 to 94.29 except for 1987 and 1988 which were 44.51 and 46.82 respectively. Furthermore, between 1990 to 1994 staples output (SUP) radically increased from 100.00 to 146.17. It rose again from 150.61 in 1995 to 172.71 in 1999. It increased from 178.51 in 2000 to 186.90 in 2004. However, between 2005 to 2009, it increased from 199.50 to 211.3 except for 2008 which was 208.4 and then increased steadily except for 2011 which was 209.9.

Furthermore foreign private investment (FPI), which stood at 120.8 in 1980 increased to 128.5 in 1984. It then fell slightly to 126.0 in 1985 and then increased to 134.8 in 1989. Between 1990 to 1994, it increased drastically from 334.7 to 1208.5. It then fell steadily from 1995 to 1999 (1209). It fell in 2000, 2001, 2002 to 1209 respectively. Then increased drastically to 12091 in 2003 and then fell sharply to 1209 again in 2004. In addition, foreign private investment which stood at 1209 in 2005 increased to 1262.7 in 2009 and then rose or increased steadily throughout the years of study.

The above table also shows that foreign aids and grants to agriculture (FAG) which was 794800000 in 1980 fell to 90100000 in 1984. It fell from 868200000 in 1985 to 546250000 in 1989. Between 1990 to 1994, it fell again from 383270000 to 270420000. From 1995 to 1999 it fell from 261450000 to 209800000. From 2000 to 2004 it increased drastically from 245770000 to 654310000. It fell sharply in 2005 from 6954730000 to 1671210000 in 2009. However it increased in 2010 to 2061960000 and fell to 1966860000 in 2013.

The above table shows that in 1980 net export earnings (NEE) which stood at 5091.100 decreased to 1909.700 in 1984. It increased from 4658.200 in 1985 to 27111.00 in 1989. Between 1990 to 1994, it fell from 64168.20 to 43270.40. It increased from 195533.7 in 1995 to 326454.1 in 1999. From 2000 to 2004 it increased from 960700.9 to 2615736. By 2005 to 2009 it fell from 4445679 to 3253851. Then increased steadily throughout the years to 2013.

Table 5 also revealed that the exchange rate moved from its level of N0.54: US $ 1.00 in 1980 to N0.89: US $ N1.00 in 1985. Between 1986 and 1993 when structural adjustment program (SAP) was introduced, it rose from N2.02: US $1.00 to N22.05: US $1.00 from 1994 to 1998, there was a stable exchange rate of N21.89: US $1.00 this is as a result of exchange rate policy that was completely revised in 1994 with the re-introduction of fixed exchange rate regime. Furthermore between 1992 and 2013 the exchange rate rose again from N102.11: US $1.00 to N161.50: US $1.00

Discussion of Short Run Log-Linear Result for Output of Staples Production Model

The short run result of **Staples Production Output model** as reported in Table 1 , shows that the coefficient of R^2 is 0.926, indicating that the variation in output of staples production explained by foreign private investment to agriculture, foreign aids and grants to agriculture, net export earnings and exchange rate is 93 percent. Thus, the explanatory power of the model estimated is 93 percent. The coefficient of FPI (foreign private investment to agriculture) variable appeared with positive sign and statistically significant. Also, the regression coefficient of FAG (foreign aids and grants to agriculture) appeared with positive sign but statistically not significant at 5 percent level. Moreover, the regression coefficient of NEE (net export earnings) appeared with positive sign and statistically not significant at 5 percent level. Also, the estimated result for EXR (exchange rate) is positively related with output of staples production and statistically significant. The overall model is significant at 5 percent level given the F-value of 90.79 which is greater than the F-table value of 3.47. The Durbin Watson value of 1.207 depicts the presence of serial autocorrelation. The presence of serial autocorrelation may be attributed to non-stationarity of time series data that are used for the study. Having identified the presence of autocorrelation in the DW test and multicollinearity from the R^2 test, there is the need to conduct stationarity test and the long run analysis to stabilize the time series.

Discussion of Unit Root Test for Stationarity

The result of the unit root test presented in Table 2 shows that the time series were stationary at various levels of significance of 1%, 5% and 10%. While FPI (foreign private investment to agriculture) and FAG (foreign aids and grants to agriculture) were stationary at levels. However, all the remaining non stationarity variables become stationary at first difference. That is, NEE (net export earnings), EXR (exchange rate), CUP (output of crop production), SUP(output of staple production) and FUP(output of fish production) were integrated of order one (first difference). Having established stationarity of the variables, the Johansen cointegration test will be conducted to establish the long –run relationship among the variables.

Discussion of Johansen Test of Cointegration

Cointegration for Output of Staples Production Model

Table 3 shows that there are two co- integrating equations at 5% level of significance. Meaning that two variables are co-integrated at 5% significance level. Conclusively, there exists a long-run equilibrium among the variables. This is because, the Max-Eigen Statistics values of only two variables are greater than the critical values at 5% significant level. Due to the existence of two co-integrating equations, the requirement for an error correction model is fulfilled.

Parsimonious Error Correction Results for Output of Staples Production Model

The analysis of result in Table 5 shows that the coefficient of ECM appeared with the right sign and statistically significant at the 5% level. Meaning that the ECM will correct the short run deviation to long-run equilibrium. The Durbin Watson value of 2.367788 which is approximately 2.0 suggests a lesser level of autocorrelation. The overall model is satisfactory given the value of R^2 (0.586212). This simply means that 59 percent of the systematic variation in output of staples production is explained by the ECM. The F-statistic of 1.367649 is not significant at the 5% level.

Moreover, the current form of the independent variable FPI is positively signed but statistically not significant. While both its lag one and two forms are negatively signed and statistically not significant. For the two lag length periods, the coefficients of the independent variables FAG and NEE were positively signed but statistically not significant. Meanwhile, the coefficient of the lag two form of exchange rate is negatively signed and statistically significant. But the current and lag one forms were not statistically significant.

Based on these results, we accept the null hypothesis of the research which states that there is no significant relationship between foreign capital inflow and output of staples production.

CONCLUSION AND RECOMMENDATIONS

What we could conclude from the above results in the model is that foreign capital inflow (proxied by foreign private investment to agriculture, foreign aids and grants to agriculture, net export earnings and exchange rate) will to a large extent contribute positively to agricultural output (proxied by staple food output) in Nigeria but does not have significant impact during the period under review. The study recommends that:

(1) Government should put in place a strategy for attracting more foreign investors capable of generating a higher volume of foreign private investment that can have a significant impact on agricultural output. To this end, government should create an enabling environment and put in place appropriate policies for the influx of foreign investors.

(2) An aggressive export promotion drive should be vigorously pursued with a view to increasing the volume of value-added agricultural exports. This will increase the volume of net export earnings accruable to the agricultural sector and which can produce significant impact on agricultural output.

(3) Attempt should be made to attract a higher volume of foreign aids and grants by interfacing with international agencies, organizations and financial institutions. This is in view of the strategic role of agriculture in food security and poverty alleviation. A higher volume of foreign aids and grants to the agricultural sector is expected to have a significant impact on staple food output.

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