



Selected Macroeconomic Variables and Agricultural Sector Output in Nigeria (1987 - 2022)

Dr. Etsemitan, Rita Efe

**Department of Banking and Finance
Delta State Polytechnic, Otefe Oghara, P.M.B 03 Oghara, Delta State, Nigeria
ritaefe123@gmail.com**

ABSTRACT

The study examined effects of selected macroeconomic variables on the agricultural sector in Nigeria for the period (1987-2022). Data for the study were obtained from the Central Bank of Nigeria, Statistical Bulletin, CBN Annual Reports and statement of Accounts. The data were analyzed with econometric techniques; including Augmented Dickey Fuller Tests for Unit Roots and Ordinary Least Square (OLS) Regression methods of analysis were used. Our findings show that gross domestic product and money supply has positive and significant effect on agricultural output, interest rate exchange rate exerted negative and insignificant effects on agricultural output. The study concluded that the selected macroeconomic variables have positive effect on agricultural output in Nigeria which has contributed to the country's growth and development. The study recommended that government should accelerate the rate of economic growth by investing heavily on the agricultural sector. The negative effect of interest rate on agricultural output calls for policy to lower interest rate charged by deposit money banks to farmers. The lowering of interest rate will enable the farmers to borrow more funds for the purpose of agricultural investment and hence increase their productive capacity. Government should also review downwards, the monetary policy rate in order to reduce the cost of borrowing. Government should give incentives to banks who are agriculture sector friendly by reducing the illiquidity their ratio and reimbursing part of the losses incurred by banks who lend to the agricultural sector. This will increase investment in that sector which will increase agricultural production and ultimately promote growth and development.

Keywords: Selected Macroeconomic Variables, Agricultural Sector Output, Nigeria

INTRODUCTION

The role of agriculture in any economy is indeed significant and requires no debate. It is the most dominant sector and indeed a major source of livelihood for its citizens (Oyetade , Shri & Razak, 2015). This is because apart from providing food for the teeming population of the country, it is the only source of raw materials that other sectors look out for before their production could take place (Aroriode, & Ogunbadejo, 2014).

However, animal husbandry provides agro-allied products for industrial growth and development, provision of employment opportunities, especially to the rural population; provision of market for the industrial sector; and provision of the needed linkage between the traditional sector and the modern sector; ensuring food security and thus serving as a catalyst for the growth of the entire economy (Aroriode & Ogunbadejo 2014).

Muftadeen and Hussainatu (2014), posit that the increasing production in agriculture is regarded as the most vital attendant for achieving industrialization. It accounts for about 70 percent of the sectors that

generate employment for the working population (Ojede & Daigyo, 2013). In Nigeria, the mainstay of the economy before the 1970s was the agricultural sector. During this period, the structure of the Nigerian economy was largely agrarian in nature with agriculture, solid minerals and other metals forming the bedrock of the economy.

Agricultural commodities were also the major export earner for the country. Nigeria was a key exporter of rubber, cotton, groundnut, palm oil, cocoa and palm kernel amounting into three per cent and four per cent in the 50s and 60s respectively of the annual rates of output growth for food and agricultural crops (Oyetade, shri & Nor, 2015). Agriculture also was the largest economic activity, contributing 50.2 per cent of the GDP in 1960. The dominance of crude oil as a major export revenue cause the agricultural sector to be neglected and its contributions to the GDP dropped drastically. Several factors apart from the emergence of oil have been identified as causal in the decline factors (Sunday, Ini-mfon, & Daniel, 2012). Finance was identified as a major factor hindering agriculture production. For this reason various programmes, polices as well as institutions have been established with the aim of providing easy finance to the sector. Commercial Banks were at the forefront for this purpose. One of the major inputs identified over the years in the development of the Nigerian agricultural sector has been the agricultural credit (CBN, 2013). The sources for funding the agricultural sector have been micro and macro sources of finance. The micro source relates the use of the commercial bank financing as capital for agricultural activities while agricultural funding through capital mobilization and allocation by government through such agencies as rural banking development programmes, Nigerian Agricultural Cooperative and Rural development Bank (NACRDB) and the Central Bank of Nigeria (CBN) (Aroriode, Ogunbadejo, & Kehinde, 2014).

Statistics has shown that the Nigerian agricultural sector received increased credit from commercial banks up to about N7 million in 1970 representing 1.99 per cent of the N37.4 million credits in 1975 representing 2.6 per cent of the total credit by the commercial banks. In 1980, the amount of credit offered by commercial banks to the agricultural sector rose to N462.2 million, representing 7.28 per cent of the entire credit and in 1985, and total commercial banks credit to agriculture rose further to N1310.2 million and constituted 10.77 per cent of the overall credit by the commercial banks. By 1990, total credit to agriculture rose to N4221.4 million and represented 16.24 per cent of the overall credit in the economy. This rose further to N25, 278.7 million in 1995, which also accounted for about 17.49 per cent of the entire credit budgeted the economy (Udoka, 2015).

Statement of the Problem

In spite of Nigeria's rich agricultural resource endowment, there has been a gradual decline in agriculture's contributions to the nation's economy ((Aroriode, Ogunbadejo, & Kehinde, 2014). In the 1960s, agriculture accounted for 65-70% of total exports; it fell to about 40% in the 1970s, and crashed to less than 2% in the late 1990s. The decline in the agricultural sector was largely due to rise in crude oil revenue in the early 1970s. Less than 50% of the Nigeria's cultivable agricultural land is under cultivation. Even then, smallholder and traditional farmers who use rudimentary production techniques, with resultant low yields, cultivate most of this land. The smallholder farmers are constrained by many problems including those of poor access to modern inputs and credit, poor infrastructure, inadequate access to markets, land and environmental degradation, and inadequate research and extension services.

According to Nwaolisa and Ananwude (2016), the inability to capture the financial services requirements of farmers and agribusiness owners who constitute about 70 percent of the population constitute a big problem. The research on the effect of selected macro economic variables on agricultural sector in nigeria has been inconclusive. For instance, Foyeke, Olusola & Adeyemo (2016) posit that selected macroeconomic variables have positive effect on the agricultural sector in Nigeria. While other researchers suggest that selected macroeconomic variables have negative effect on the agricultural sector in Nigeria (Habib, Khan & Wazir, 2016),

However, most of these studies were done in an environment outside that of Nigeria. Again, these studies could not use the core variables that capture the effect of selected macroeconomic variables on

agricultural sector and the results from these studies are conflicting. These shortcomings have somehow contributed to the knowledge gap in the literature, thus warranting a more systematic and comprehensive study on the effects of selected macroeconomic variables on the agricultural sector in Nigeria. This study seeks to improve on the past studies by making use of a broad data set spanning from 1987 to 2019

REVIEW OF RELATED LITERATURE

Conceptual Framework

Macro-economic Variables

Macroeconomic variables are indicators or main signposts signaling the current trends in the economy. Thus Keynes identified some main macroeconomics variables that study the economy as a whole: Gross Domestic Product (GDP), Exchange rate (EXR), Interest Rate, Inflation and Money Supply. GDP is a measure of the annual improvement in the standard of living of the average citizen/resident of a country and it takes into account all the production inside a country, independent of whose ,domestic or foreign, owns the production site. What is important is that the production takes place inside the territory of the country. Exchange rate is the rate at which one nation's currency is exchanged with another country's currency. If one nation's exchange rate is higher than another one, it affects the purchasing power of the lower exchange rate of a particular country. For example, if the naira rate is lower in comparison to American dollar an American will have a higher purchasing power than a Nigerian.

Interest rate is the cost of borrowing money. Rising interest rate signals an expanding economy and when already high interest rate begins to rise even further and faster, it is a sure sign of the onset of inflation. Inflation in an economy can be the result of an increase in aggregate demand that is not accompanied by an increase in aggregate supply. A rise in any component of aggregate demand can bring about demand-pull inflation. Inflation can also result from a decrease in aggregate supply that occurs when businesses find that production inputs prices have risen. Such occurs when labour cost and the price of raw materials have risen. Money supply is the injection of money into the financial system. It is an important macro-economic tool for stabilizing the economy when there is recession

Exchange Rate

Exchange rate refers to the value of one currency (the domestic currency) in relation to another (foreign currency). It can also be defined as the price at which one unit of a country's domestic currency exchanges for any other country's currency in the world.

Osiegbu and Onuorah (2012) posit that exchange rate plays a key role in international economic transactions because no nation can remain in isolation due to varying factor endowments. Movements in the exchange rate have ripple effects on other economic variables such as interest rate, inflation rate, import, export, output, etc. These facts underscore the importance of exchange rate to the economic well-being of every country that opens its doors to international trade in goods and services. The importance of exchange rate derives from the fact that it connects the price systems of two different countries making it possible for international trade to make direct comparison of traded goods. In other words, it links domestic prices with international prices. Through its effects on the volume of imports and exports, exchange rate exerts a powerful influence on a country's balance of payments position.

The Naira exchange rate has witnessed some period of relative stability since the implementation of the Structural Adjustment Programme (SAP) in 1986, its continued depreciation, however, mars the economic performance of the country. The challenge of the combined effect of increase in oil prices and exchange rate instabilities on macroeconomic stability and economic growth for oil producing nations like Nigeria is really enormous. According to Usman (2009), huge inflow of oil revenues in Nigeria are more often associated with expansion in the level of Government spending while periods of dwindling oil revenues are usually accompanied by budget deficits. There is no gain saying that Nigeria relies so much on revenue from oil exports, but, it equally massively imports refined petroleum and other related products.

The increase or decrease of real exchange rate indicates strength and weakness of currency in relation to foreign currency and it is a standard for illustrating the competitiveness of domestic industries in the world market (Razazadehkarsalari, Haghiri & Behrooznia, 2011).

Jhingan (2010) defined exchange rate as the rate at which one currency exchanges for another Exchange rate is said to depreciate if the amount of domestic currency require buying a foreign currency increases, while the exchange rate appreciates if the amount of domestic currency require buying a foreign currency reduces. An appreciation in the real exchange rate may create current account problems because it leads to overvaluation.

Interest Rate

Interest rate is the rate at which interest is paid by a borrower (debtor) for the use of money that they borrow from a lender (creditor). High interest rate crowds out private investment leading to reduced economic growth. On the contrary, it may attract foreign capital inflows which may result into increased debts. It is measured in percentages but will be converted to decimal points for easier analysis.

Interest rate policy in Nigeria is a major instrument of monetary policy with regards to the role it plays in the mobilization of financial resources aimed at promoting economic growth and development. Interest rate is the price paid for the use of money. It is the opportunity cost of borrowing money from a lender. It can also be seen as the return being paid to the provider of financial resources. It is an important economic price. This is because whether seen from the point of view of cost of capital or from the perspective of opportunity cost of funds, interest rate has fundamental implications for the economy either impacting on the cost of capital or influencing the availability of credit, by increasing savings (Babajide, Lawal & Somoye, 2016).

Interest Rate Spread: this is the variation between Nigerian deposit rate and that of their lending rate. In most cases it is considered to equals the difference between Central Bank Monetary Policy Rate and the actual rate at which commercial banks otherwise known as Deposit Money Banks lends to their customers (Anthony , Uzomba & Olatunji, 2013).

Money Supply

The Central Bank defines money supply in two ways: narrow and broad money. Narrow money (M1) is defined to include currency in circulation plus current account deposits with commercial banks. Broad money measures the total volume of money supply in the economy and is defined as narrow money plus savings and time deposits with banks including foreign denominated deposits. There is excess money supply when the amount of money in circulation is higher than the level of total output of the economy. When money supply exceeds the level the economy can efficiently absorb, it dislodges the stability of the price system, leading to inflation or higher prices of goods. In this brief, we shall examine how a change in money supply by the CBN affects people and the economy.

The total stock of money circulating in an economy is the money supply. The circulating money involves the currency, printed notes, money in the deposit accounts and in the form of other liquid assets. Valuation and analysis of the money supply help the economist and policy makers to frame the policy or to alter the existing policy of increasing or reducing the supply of money. The valuation is important as it ultimately affects the business cycle and thereby affects the economy. Periodically, every country's central bank publishes the money supply data based on the monetary aggregates set by them.

Interest rate on the other hand, is regarded as bank rate or monetary policy rate (*MPR*) and it is one of the intermediate monetary policy instruments at the control of Central Bank to control money supply and thus inflation rate. If the apex Bank feels to curtail money supply by reducing the power of participants (commercial banks), it will increase interest rates, while in case of an expansionary monetary policy; the reverse will be the case.

Money supply is the entire stock of currency and other liquid instruments in a country's economy at a particular time. It is an important macroeconomic factor that affects economic activities hence its control by the central monetary authority of any given economy (Mohamed & Sri, 2016).

The reduction of money supply is the traditional means through which central banks fight, moderate or prevent inflation. This is based on the quantity theory of money that inflation is always and everywhere a monetary phenomenon.

The findings by Okoro, (2013) indicate that in the long run, money supply has significant inverse effects on inflationary pressure in Nigeria. The findings by Bernhard, (2013) show the weak unidirectional causality from money supply to core consumer prices in Nigeria. The findings by these two scholars have raised doubt about the validity of the quantity theory of money.

The quantity theory of money states that the change in the price level is directly and proportionately related with the change in money supply. If the money supply rises without a corresponding increase in output, the additional money supply will simply bid up prices. The quantity theory of money is based on the belief that there is only one channel through which the impact of an increase in money supply is transmitted to the price level. Specifically, it is based on the perception that the impact of an increase in money supply is only transmitted directly to the price level (Nwoko, Ihemeje & Anumadu, 2016).

Theoretical Framework

This study anchored upon the Solow Growth Model or Neo-classical Growth Theory. This model asserted that an economy's growth rate is dependent on two factors. The main work on neo-classical growth theory model was done by Robert and Trevor in 1946 and was extended in 1956 by Harrod-Domar model. The work of Harrod-Domar was extended and expanded by Solow who adds labour as a factor of production and making capital labour ratios flexible unlike in the Harrod-Dommar model where they are fixed. The Solow growth model shows how an increase in capital and labour force and advancement in technology can influence entire economic growth and development. The model specification is that output is a function of capital and labour that is $V=f(K,L)$

Where V = output, K =capital and L =Labour.

Some of the assumptions of the models are ;

- All savings in the economy are channeled to investment opportunities and augmentation of physical capital stock (Kuleratne, 2001)
- Depreciation of capital rate is assumed to be zero
- No technical progress
- Population growth rate assumed to be fixed.

The summary of the Solow growth model shows that an increase in output is dependent on a higher rate of savings via higher stock of capital (Mankiw, 2002). The model indicates that a long run increase in labour will reduce the level of output if there is no improvement in technological progress that will enhance the efficiency of labour. The theory therefore concludes that the long run equilibrium growth rate depends on two exogenous variables: the rate of population growth and rate of technological change (Froyen, 2007). Froyen (2007) further posits that the theory provides little reference to the importance of finance in economic growth other than making reference to savings which does not affect the growth at long run. This theory has bearing to the study because financial development comes in form of technical innovations into the financial system that spurs growth of the system and enhances services to the economy and agricultural sector in particular.

Empirical Review

Eneji , Dimis and Rose (2017) examined the impact of economic recession on macroeconomic stability and sustainable development in Nigeria. The study used multiple regression analysis of time series data on selected macroeconomic variables in two econometric models. The results show negative impact of these variables on economic growth and sustainable development. The recession impacted on socioeconomic and political lives in Nigeria, and should be studied to find the root causes and proffer solutions for sustainable economic development.

Babajide, Lawal and Somoye (2016) examined the relationship between macroeconomic variable volatility and stock market return within the context of Blanchard (1981) extension of the Hicks (1937) IS-LM hypothesis, using exponential general autoregressive conditional heteroskedascity estimation techniques to analyze monthly data sourced on the Nigerian economy from January 1985 to December 2013. Their result showed that stock prices responded significantly to innovations in the interest rate and the real gross domestic product (RGDP),

Davis and Emerenini (2015) investigated the impact of interest rate on investment in Nigeria. Multiple regressions were used as the statistical method for the study which revealed that high interest rate negatively affects investment. In line with the findings, the study made the following suggestions; that relevant monetary authority should evolve policies that will encourage savings and reduce prime lending rate to genuine investors, among others.

Diala, Kalu, and Igwe-Kalu (2016) examined the relationship between commercial property market and foreign exchange markets in Nigeria from 2000 to 2010 with the aim of determining the effects of Naira/US Dollar exchange rate volatility on commercial property returns in Nigeria. This study was motivated by the progressive Naira/Dollar exchange rate regime and its potential consequences on real estate investment decision making. The Exponential Generalized Auto-Regressive Conditional Heteroscedasticity (EGARCH) was used in establishing the relationship between exchange rate volatility and property investment returns volatility in Nigeria. It was found that there exists a positive insignificant relationship between commercial property returns and Naira/US Dollar exchange rate movement in Nigeria.

Chandio et al. (2016) analyzed the impact of formal credit on agricultural output in Pakistan by using secondary data from 1996 to 2015. The findings show that formal credit has a positive and significant impact on agricultural output.

Chris and Mbat., (2016) examined the effect of commercial banks' credit on agricultural output in Nigeria. ex-post facto research design was adopted for the study. Data for the study were collected from published articles and the Central Bank of Nigeria Statistical bulletin. Ordinary Least Squares Regression technique was employed. The estimated results showed that there was a positive and significant relationship between agricultural credit guarantee scheme fund and agricultural production in Nigeria. This means that an increase in agricultural credit guarantee scheme fund could lead to an increase in agricultural production in Nigeria; there was a positive and significant relationship between commercial banks credit to the agricultural sector and agricultural production in Nigeria. This result signified that an increase in commercial banks credit to agricultural sector led to an increase in agricultural production in Nigeria. Again, there was a positive and significant relationship between government expenditure on agriculture and agricultural production in Nigeria and a negative relationship between interest rate and agricultural output also confirmed theoretical postulations. This is because an increase in the rate of interest charged farmers for funds borrowed discouraged many farmers from borrowing and thus less agricultural investment.

METHODOLOGY

Research Design

An ex-post facto research design will be adopted for this study because the data are time series data which were sourced from the, Central Bank of Nigeria Statistical Bulletin, CBN Annual Reports and Statement of Accounts. The independent variables are gross domestic product, interest rate, money supply and exchange rate (x) while agricultural sector is the dependent variable (Y) which will be proxied by agricultural output (AOT)

Model Specification

The model which is adopted for the study is the model of Muftaudeen and Hussainatu (2014) which examined macroeconomic policy and agricultural output in Nigeria

The model is stated thus:

$$AOT = f(GDP, ITR, M_2)$$

Where:

- AOT = Agricultural Output.
- GDP= Gross Domestic Product
- ITR = Interest Rate.
- M₂ = Money Supply
- € = Error term

The model will be modified as follows

$$AOT = f(GDP, ITR, M_2, EXR)$$

$$AOT = \beta_0 + \beta_1 GDP + \beta_2 ITR + \beta_3 M_2 + \beta_4 EXR + \mu \text{-----} 1$$

Where:

- AOT = Agricultural Output
- GDP= Gross Domestic Product
- ITR = Interest Rate
- M₂ = Money Supply
- EXR= Exchange Rate
- b₀ = the constant
- B₁- b₄ = the coefficients of the explanatory variables
- U_t = Error term

β₀ and μ are the constant and error term respectively while β₁, β₂, β₃, and β₄ are the coefficient of selected macroeconomic variable on agricultural sector output in Nigeria

Method of Analyses

The data will be analyzed with econometric techniques involving descriptive statistics, Augmented Dickey Fuller tests for Unit Root and the Ordinary Least Square (OLS) for test of hypotheses.

DATA ANALYSIS

Descriptive Statistics

Table 1: The Descriptive Statistics

	AOT	GDP	ITR	M ₂	EXR
Mean	2.332788	205053.1	2234.52	4067.800	3146.800
Median	0.078000	72542.00	405.0000	2489.000	681.0000
Maximum	0.578000	406992.0	65374.00	42348.00	7616.000
Minimum	0.012000	2153.000	107.0000	143.0000	356.0000
Std. Dev.	0.135964	103868.6	23906.85	5837.354	2833.232
Skewness	2.467154	1.342420	1.820587	1.290438	0.606183
Kurtosis	9.953294	4.165351	4.828068	3.111696	1.613795
Jarque-Bera	75.72468	8.923340	17.29165	6.951451	3.532703
Probability	0.000000	0.011543	0.000176	0.030939	0.000956
Sum	3.319700	2701327.	328363.0	129695.0	68920.00
Sum Sq. Dev.	0.669046	2.59E+11	1.37E+10	8.18E+08	1.93E+08
Observations	32	32	32	32	32

Computed by the Author with E-View Version 9.0

The variables of the study shown on Table 1 above indicate that agricultural output (AOT) has mean of 2.33 with minimum value of 0.012 and maximum value of 0.578 respectively. However, the standard deviation is 0.135 indicating low variation in agricultural output (AOT). This means that the value of

selected macroeconomic variables in Nigeria is relatively predictable and less risky. This is capable of encouraging investment in Nigeria.

Gross Domestic Product has a mean of 205 with a minimum value of 115 and maximum values of 408 respectively. Interest rate has a mean of 223 with minimum value of 107 and maximum values of 653 respectively. Money supply has a mean of 406 with minimum value of 143 and maximum values of 423 respectively. Exchange rate has a mean of 314 with a minimum value of 356 and maximum values of 761 respectively.

Unit Root Test

Table 2: Summary of the Unit Root Result

Variables	T-statistics	Probability	Order of Integration
AOT	-6.088595	0.0000	1(0)
GDP	-3.867397	0.0063	1(0)
ITR	-4.619034	0.0010	1(0)
M ₂	-5.531824	0.0001	1(0)
EXR	-9.281478	0.0000	1(0)

Source: Computation from E-view Version 9.0

The table above shows that agricultural output, gross domestic product, interest rate, money supply and exchange rate attained stationarity at level. Therefore, all the variables are stationary at 1(0)

Table 3. Ordinary Least Square Regressions

Dependent Variable: AOT
 Method: Least Squares
 Date: 06/03/23 Time: 09:42
 Sample: 1987 2022
 Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.301739	0.146105	2.065220	0.0532
GDP	2.031447	0.021113	2.963169	0.0043
ITR	-0.313365	0.019159	-0.587643	0.3852
M ₂	3.251443	0.033448	2.626423	0.0023
EXR	-1.217301	0.012804	-1.236732	0.6324
R-squared	0.750802	Mean dependent var		0.433810
Adjusted R-squared	0.738503	S.D. dependent var		0.077941
S.E. of regression	0.058403	Akaike info criterion		-2.638627
Sum squared resid	0.054575	Schwarz criterion		-2.389931
Log likelihood	32.70559	Hannan-Quinn criter.		-2.584654
F-statistic	4.904765	Durbin-Watson stat		2.343716
Prob(F-statistic)	0.004661			

Source: E-view Version 9.0

It can be observed that the regression line have a positive intercept as presented by the constant (c) = 0.301739 which is statistically significant at 0.05%.

Gross Domestic Product (GDP): The coefficient of gross domestic product is positive at 2.031447 with t-Statistic of 2.963169 and probability value of 0.0043 which means that gross domestic product has

positive and significant effect on agricultural output (AOT), a unit increase in gross domestic product (GDP) will cause agricultural output (AOT) to increase by 2.031447 units.

Interest Rate (ITR): The coefficient of interest rate is negative at -0.313365 with a t-statistics value of -0.587643 and a probability value of 0.3852 which is highly insignificant. This shows that interest rate has a negative and insignificant effect on agricultural output. A unit increase in interest rate will cause agricultural output to decrease by -0.313365 units.

Money Supply (M₂): The coefficient of money supply is positive at 3.251443 with t-statistics value of 2.626423 and a probability value of 0.0023 which means that money supply has positive and significant effect on agricultural output. A unit increase on money supply will cause agricultural output to increase by 3.251443 units.

Exchange Rate (EXR): The coefficient of exchange rate is negative at 1.217301 with a t-statistics value of -1.236732 and a probability value of 0.6324. This indicates that exchange rate has a negative and insignificant effect on agricultural output. A unit increase in exchange rate will cause agricultural output to decrease by 1.217301 units

The Adjusted R-squared is 0.738503 which means that 74% of total variation in agricultural output can be explained by the variables, namely GDP, ITR, M₂ and EXR while the remaining 26% is due to other stochastic variables. The Durbin-Watson statistics at (2.343716) which means the model is free from autocorrelation. The F-statistic is 0.004661 which means that all the explanatory variables in the study have significant effect on agricultural output within the period under study.

Test of Hypotheses

The statistical significance of the individual parameters was used to test the hypotheses. These tests were conducted at 5% level of significance

Test of Hypothesis One

Stage One: Restatement of Hypothesis in Null and Alternate form:

Ho₁: Gross Domestic Product has no significant effect on Agricultural Sector in Nigeria

Hi: Gross Domestic Product has significant effect on Agricultural Sector in Nigeria

Stage Two: Analysis of the Regression Results,

Table 4: OLS on Effect of Macroeconomic Variables on Agricultural Product

Variable	Coefficient	t-Statistic	Probability	Conclusion
Constant	0.301739	2.065220	0.0532	Statistically Positive and Significant
GDP	2.031447	2.963169	0.0043	Statistically Positive and Significant
ITR	-0.313365	-0.587643	0.3852	Statistically Negative and Insignificant
M ₂	3.251443	2.626423	0.0023	Statistically Positive and Significant
EXR	-1.217301	-1.236732	0.6324	Statistically Negative and Insignificant

Source: Computed from E- view 9.0

Stage Three: Decision

From table 4, since the probability value is less than 5% (0.0043<0.05) with coefficient value of 2.031447 and t-Statistic of 2.963169, the study rejects the null hypothesis and accepts the alternative hypothesis: This implies that gross domestic product has significant effect on agricultural sector in Nigeria

Hypothesis Two

Stage One: Restatement of Hypothesis in Null and Alternate Form:

Ho₂: Interest Rate has no significant effect on Agricultural Sector in Nigeria

Hi: Interest Rate has significant effect on Agricultural Sector in Nigeria

Stage Two: Analysis of the Regression Results

Stage three: Decision

Table 4, reveals that the probability value is more than 5% (0.3852>0.05) with coefficient value of -0.313365 and t-Statistic of -0.587643, the study accepts the null hypothesis and rejects the alternative hypothesis and submit that interest rate has no significant effect on agricultural sector in Nigeria

Hypothesis Three

Stage One: Restatement of Hypothesis in Null and Alternate Form

Ho₃. Money Supply has no significant effect on Agricultural Sector in Nigeria.

Hi. Money Supply has significant effect on Agricultural Sector in Nigeria

Stage Two: Analysis of the Regression Results

Stage Three: Decision

From table 4, since the probability value is less than 5% ($0.0023 < 0.05$) with coefficient value of 3.251443 and t-Statistic of 2.626423 the study rejects the null hypothesis and accepts the alternative hypothesis: which means that money supply has significant effect on agricultural sector in Nigeria

Hypothesis Four

Stage One: Restatement of Hypothesis in Null and Alternate Form:

Ho₄. Exchange rate has no significant effect on Agricultural Sector in Nigeria

Hi. Exchange Rate has significant effect on Agricultural Sector in Nigeria

Stage Two: Analysis of the Regression Results,

Stage Three: Decision

From table 4, since the probability value is more than 5% ($0.6324 > 0.05$) with coefficient value of -1.217301 and t-Statistics of -1.236732, the study accepts the null hypotheses and rejects the alternative hypotheses: which means that exchange rate has no significant effect on agricultural sector in Nigeria.

DISCUSSION OF FINDINGS

The result of the ordinary least square (OLS) indicates that gross domestic product has positive and significant effect on agricultural sector output. The results of our findings are consistent with the work of Yakubu and Shehu, (2013) which found that gross domestic product has positive effect on agricultural output

Interest Rate: The result shows that interest rate has a negative and insignificant effect on agricultural output. This agrees with the work of Alex and Ebieri, (2014), in which interest rate was found to have negative relationship with agricultural output.

Money Supply: The result shows that money supply has positive and significant effect on agricultural output. The result confirms the findings of Anthony and Chukwudi (2015) which indicate that money supply has positive and significant relationship with agricultural output

Exchange Rate: our findings show that exchange rate has a negative and insignificant effect on agricultural output. This collaborates the findings of Uchenna and Garry (2015), on this issue

The Adjusted R-squared is 0.738503. This means that 74% of total variation in agricultural output can be explained by the variables, GDP, ITR, M₂ and EXR while the remaining 26% is due to other stochastic variables. The Durbin-Watson statistics at (2.343716) shows that the model is free from autocorrelation. The F-statistics is 0.004661 indicating that all the explanatory variables in the study have significant effect on agricultural output within the period under study.

CONCLUSION

The study concludes that macroeconomic variables have positive effect on agricultural output in Nigeria and consequently enhanced economic growth and development in Nigeria within the period under study.

RECOMMENDATIONS

The study made the following recommendations;

The positive effect of gross domestic product on agricultural output calls for more government spending on the agricultural sector as such spending will provide the needed fund for farmers to increase their agricultural production. The negative effect of interest rate on agricultural output calls for policy to lower interest rate charged by deposit money banks to farmers. The lowering of interest rate will enable the farmers to borrow more funds for the purpose of agricultural investment and hence increase their

productive capacity. The monetary authorities (Central Bank of Nigeria) should pay special attention on broad money supply by manipulating instruments like the liquidity ratio, reserve ratio, among others which directly affects the monetary aggregate to enhance the banking sector credit in Nigeria. Exchange rate policy should aim at enhancing the value of the naira to reduce the cost of importing agricultural inputs

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