A Review of Monetary Policy and the Nigerian Agricultural Sector Performance

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Abstract

Monetary policy involves the process by which the monetary authority of a country using monetary policy variables controls the supply, availability and cost of money in an economy for the sole aim of attaining greater output. The study examines the impact of monetary policy variables on the agricultural sector in Nigeria from 1986 – 2013. Employing the ordinary least square (OLS) regression method, a multiple regression equation to check the economic relationship between agricultural output with Agriculture Gross Domestic Product (AGDP) as the dependent variable, and Money Supply (MS), Interest Rate (INT), Monetary Policy Rate (MPR) and Inflation Rate (INF) as explanatory variables was carried out. The unit root test to check for stationarity of variables and the Johansen cointegration test to establish long run equilibrium relationship between the dependent and explanatory variables were employed. The study revealed that there exist a relationship between monetary policy and agricultural sector performance in Nigeria with an increase in the budgetary allocation to agricultural sector, and the effective utilization of these allocated funds, an effective and prudent management of monetary policies with concessionary low interest rate to encourage investment in the sector all proffered as recommendations to improve the agricultural sector.

Keywords: Monetary policy, Monetary Theory, Money supply, Agriculture, Cointegration
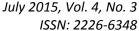All Correspondence to: ajuduaemmanuel@gmail.com

Introduction

Monetary policy includes a number of policies by which a country controls its money stock so as to achieve macroeconomic goals. It is a major economic stabilisation tool which involves measures designed to regulate and control the volume, cost, availability and direction of money and credit in an economy with the aim of achieving of achieving specific objectives (Anyanwu 1993). It involves all action taken by the monetary authorities to affect the monetary base through influencing the availability and cost of credit in pursuance of sustainable growth of output, price stability and a healthy BOP position (Iyoha & Oriakhi 2002).

For most economies, the objectives of monetary policy include price stability, maintenance of balance of payments equilibrium, employment creation, output growth and sustainable development. While the objectives of monetary policy include price stability, full employment and economic growth, targets of monetary policy refer to the variables such as supply of money or bank credit, interest rates which are sought to be changed through the monetary policy instruments such as open market operation and selective credit control etc, so as to attain the laid out objectives (Ahuja 2013).

Contractionary or expansionary depending on existing circumstances, the success of monetary policy in an economy depends on the operating economic environment, the institutional framework adopted and implementation with a view that there is a stable relationship between the quantity of money in an economy and her economic activities with the prime aim being to make sure that money supply is in consonance with the growth level of the economy without committing errors (Nzotta & Okereke 2009).

The manipulation of monetary policy through money supply and interest rate is done by the CBN as the monetary authorities of a country through the use of monetary policy instrument which include Minimum Rediscount Rate, Open Markets Operations (OMO); Cash Reserve Requirements, Liquidity Ratio, among others. Depending on the aim, the central bank reduces or increases the minimum discount rate if the aim is to increase or reduce liquidity and investment, with the commercial banks in turn, increasing or reducing the interest rate charged to borrowers so as to attract borrowing at low interest rate or wade them off. Open Market Operation also involves the buying and selling of treasury bills, treasury certificates, commercial papers etc by the CBN so as to determine the level of money in circulation. The reserve requirement also known as the reserve ratio requires commercial banks to put a certain fraction of their reserves behind their demand and time deposit liabilities. This can be manipulated to reduce the ability of commercial bank to make loans to the public by simply increasing the ratio and enhancing their lending position by reducing the rate (Jhingan 1997).

The qualitative instruments are tools not directed towards the quality or use of credit, but are used for discriminating between different uses of credit. They include special deposits, interest

ceilings, stabilisation securities, selective credit controls; direct credit controls. They are guidelines or administrative order given by the central bank to guide the activities of commercial banks while moral Suasion involves the use of friendly but persuasive instructions by the central bank to persuade commercial banks to adopt a particular policy and operate in a particular direction for the realization of specified government objectives (Gbosi 2005). Monetary policy thus becomes an indispensable and inevitable variable in any economy that it cuts across every sector, agricultural sector inclusive.

The agricultural sector is seen as one of the major sectors in the economy and a key determinant of long run economic development in Nigeria with the sector contributing to development of an economy through production of goods, foreign exchange and exports. In the global world, the contribution of agriculture in food production has been worsening and resulted in food price hikes in 2007 and 2008 (Enoma 2010). This prompted the inclusion of food security in the G-8 Summit in Japan in 2008 and led to the creation of Global Agriculture and Food Security Programme (GAFSP), with countries encouraged to release surplus food stocks, remove export restrictions and raise $22 billion over three years for agricultural investment (Timothy and Sophia 2012).

Prior to oil discovery in Nigeria, agriculture was the mainstay of the nation. However, with oil discovery and the oil boom of the 1970s, the sector suffered neglect with the sector's contribution to GDP declining to 35% in 2014 from 65.7% in 1957 leading to food insecurity and increased level of poverty in the country with the poverty level standing at 33.1% in 2013 (NBS 2014). Due to the failing agricultural sector, the Nigerian government became directly involved in boosting the agricultural sector, with several large scale agricultural projects and programmes launched and established while concessionary interest rate structure was employed with direct cheap credit to agricultural sector. Despite these efforts of government in boosting the performance of the sector, the sector is still not witnessing significant development.

1.2   Statement of the Problem

The agricultural sector in Nigeria today has been characterised by low productivity. Recognising this, the Nigerian government introduced series of macroeconomic programmes and policies (both monetary and fiscal policy) aimed at improving the sector performance. However, the share of agriculture contribution to GDP declined from 42.20% in 2007 to 40% in 2010 and to a more worsening rate of 35% in 2013 (CBN 2013). Today, Nigeria is a major net importer of household foods, raw materials etc with the agricultural sector suffering from a host of problems. The need to correct the existing structural distortions in the Nigerian agricultural sector and put the economy on the path of sustainable growth is therefore compelling. Thus, the study tries to investigate the monetary policies and instruments used in promoting agricultural performance in Nigeria and how effective the policies have been in achieving an improved agricultural sector.

1.3   Objective of the Study

The objective of the study is to assess the impact of monetary policies in determining the performance level of agriculture in Nigeria for the period 1986 to 2013 while we also evaluate the performance of the agricultural sector in Nigeria over the years.

1.4   Research Hypothesis

The study would be guided by the following hypothesis

H0: Monetary policy variables have no significant relationship on agricultural performance in Nigeria.

H1: Monetary policy variables have significant relationship on agricultural performance in Nigeria.
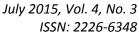
2.0   Conceptual Literature

2.1   Monetary Policy in Nigeria

During the independence era in the 1960s, with the creation of the CBN, the monetary issues that needed prompt attention were the issue of the Nigerian currency, the establishment of a strong financial base and the promotion of domestic financial infrastructures such as the money and capital market institutions and instruments. This led to the introduction of the first Nigerian money market instrument- the Treasury bill and the establishment of the Lagos stock exchange. Between 1964 and 1966 the defense of the BOP was the focus of monetary policy due to the credit expansion policy adopted in 1962 which subsequently led to increase in the demand for imports causing a drain on the foreign reserves. Policy instruments such as discount rate control, interest rate, moral suasion etc were used to reverse the trend with a ceiling of 15% imposed on commercial bank's credit and granting credit to finance imports and construction were restrained, minimum rediscount rate was rate from 4% to 5% in 1965. Thus, a restrictive monetary policy was pursued in Nigeria during this period (Gbosi 2005).

With the end of the civil war in 1970, which disrupted economic activities and an upsurge in wages due to revenues from the oil boom, inflationary trends were noticed in the economy. Anti inflationary measures were introduced with the aim of reducing commercial bank's liquidity and also, encourage the channeling of greater credit to productive sector. Consequently, the monetary authority imposed quantitative interest rate and stabilization securities and advocated sectoral credit allocation to the various sectors of the economy with preference to agricultural sector, manufacturing sector and construction sector (sectors believed will revamp the economy) with a below market lending rate (Imuoghele & Ismaila 2014). Loans and advances to these sectors were fixed at 30 to 40% of banks aggregate loans and advances in the early 1980s, but was reduced by 7% in 1985 while the number of sectors attracting credit was reduced from about 18 in the 1970s to 4 in 1986 (Nwaru 2014).

With the deregulation of the economy through the adoption of the Structural Adjustment Programme (SAP) aimed at achieving fiscal balance and balance of payment equilibrium due to the economic crisis of the early 1980s occasioned by the collapse of world oil price, monetary policy in the era aimed at stimulating output and employment, promote domestic and external stability through a market oriented financial saving and efficiency resources allocation. The SAP

strategy involved the deregulation of the financial system to accomplish a market-oriented financial system characterized by the free entry and free exit of banks and the use of indirect instruments for monetary control that would support efficient financial intermediation so as to increase competition, strengthen the supervisory and regulatory capacity of the CBN, improve the financial structure and redress the financial repression already identified (Oke, 1995). However, some direct control measures were maintained and new ones introduced to check excess liquidity. For instance, Stabilisation Securities were introduced in 1990. Similarly, Special Treasury Bills (STBs) were also introduced in April 1999 and discontinued before the end of 2000. Specifically, under the SAP regime, the objectives of monetary policy has been the stimulation of output and employment and the promotion of domestic and external sector stability while ensuring price stability and inflation control.

2.1.1   Agricultural sector in Nigeria and its Performance

Agriculture constitutes one of the most important sectors of the Nigerian economy. It is also a veritable tool in combating poverty in third world countries and achieving long-term economic development. Although Nigeria depends heavily on the oil industry for its budgetary revenues, the country is predominantly still an agricultural society with approximately 70% of the population engaging in agricultural production at a subsistence level. Based on the varying climatic conditions of regions and the vast and rich soil, the country produces varieties of crops while a significant portion of the agricultural sector in Nigeria involves livestock production, fishing, poultry, and lumbering, hence, agricultural products were major export product in the 1960s and early 1970s with the sector contribution to the GDP standing at 35% in 2013 (CBN 2013).

Due to the sector's importance successive governments have propounded policy programmes and strategies both monetarily and otherwise to revitalise agriculture in Nigeria from 1960 with all programmes aimed at increasing agricultural output for consumption and export, provide inputs and subsidies to small scale farmers, make credit facilities accessible to a large segment of rural farmers, eradicate poverty, create employment and raise the standard of living. These programmes included the Farm Settlement Scheme policy of 1959, the National Accelerated Food Production Programme (NAFPP) launched in 1972, the Agricultural Development Programme (ADP) of 1974 and 1989, Operation Feed the Nation (OFN) in 1976, the River Basin Development Authorities (RBDAs) was launched in 1976, and the Green Revolution (GR) launched in 1980. The Directorate for Food Roads and Rural Infrastructure (DFRRI) launched in 1986, the Better Life Programme (BLP) For Rural Women introduced in 1987, the National Agricultural Land Development Authority (NALDA) , launched in 1992 , the Family Support Programme (FSP)/ Family Economic Advancement Programme (FEAP) launched in 1994 and 1996 respectively, the National Fadama Development Project (NFDP) of the early 1990s , the National Economic Empowerment and Development Strategy (NEEDS) launched in 1999, the National, Special Programme on Food Security (NSPFS) launched in 2002, the Root and Tuber Expansion Programme (RTEP) launched in 2003, Seven Point Agenda of 2007 and Transformation Agenda of 2011.

According to the National Bureau of Statistics (2012), agriculture provided 41% of the country's GDP, with its contribution to the GDP dropping to 35% in 2013 (CBN 2013). Today, less than 50 percent of the country's cultivable agricultural land is being cultivated with smallholder and traditional farmers who use crude agricultural tools cultivating most of this land. This has not been helped by the discovery of oil in the country. (Manyong et al 2003). The sector is bedeviled by problems such as organisational and weak policy, limited access to improved technologies in the form of improved seeds and the use of mainly crude farm tools such as hoes and cutlasses. Also, there are infrastructural inadequacies as the sector suffers from poor road network, lack of storage/processing facilities as well as inadequate irrigation facilities and underfunding leading to the problem of high food importation.

Government has played a more dynamic role in agricultural production by ensuring stability of the financial system as well as guarantee sources of credit to the farmers through the manipulation of interest rate. Concessionary interest rate was given to the sector between 1970 and 1985. However, the SAP programme led to the deregulation of interest rates in 1990 and indirect monetary policy control was put in place. Hence agricultural sector had to compete for funding with the other sectors of the economy leading to the stoppage of sectoral credit allocation policy (Gbosi 2005). This led to increased food import bills and hike in prices with food import increasing from 6.36% in 1991 to 27.02% and 30.56% in 1999 and 2011 respectively (NBS 2012). Due to the above negative impact of SAP and to safe-guard the sector from competition as well as enhance flow of credit, the Agricultural Credit Guarantee Scheme (ACGS) was established in 1977 with the share capital of the ACGS increased from ₦199 million in 1977 to ₦3 billion in 2001. Other financial institutions were formed to complement the funding capacity of ACGS. In 2000, the Nigerian Agricultural Commerce and Rural Development Bank (NACRDB) was formed. The National Micro Finance Policy was also launched in 2006 with the aim of creating accessible and easy credit facilities to rural Nigerians. Also Agricultural Credit Support Scheme (ACSS) was established to provide credit facilities to farmers at single digit interest rate with a view to reduce the cost of agricultural production and increase output on a sustainable basis (Ehinomen & Akorah 2013).

The effectiveness of these policies remained questionable as the interest rate remained high as well as inflation rate throughout the period. The average interest rate stood at 12.475% between 1970 and 2005, it increased to 17.26 in 2006, stood at 17.59% and 16.79% in 2010 and 2012 respectively (CBN 2012). Also, food inflation rose from 3.9 % in 2006 to 8.2 % in 2007 and 18.0 % in 2008. It fell 15.5% in 2009 and 12.7% in 2010 (NBS 2012).

2.2   Theoretical Framework
Monetary theory examines the relationship between money and economic activities. It seeks to explain how changes in the stock of money affect overall economic activities. It tries to discover and explain how the demand for and supply of money influences prices, interest rates, output, income and employment. It is the foundation for monetary policy formulation (Nwaru 2014).

Classical economists noticed the relationship between money supply and prices of commodities in the market during the evolution of silver and metal money in France in the 16th century. The

classical monetary theory in their study of money, posited that there is a direct and proportionate relationship between changes in the quantity of money and general price level. The theory had its roots with the work of Jean Boldin in the 16th century, John Locke in 1690 who examined the effects of money on trade, the role of interest rate and demand for money in the economy. However, the classical quantity theory of money is today, hinged on the theory of Irvin Fisher (1867-1947). He posited that " Other things remaining unchanged, as the quantity of money in circulation increases, the price level also increases in direct proportion while the value of money decreases and vice versa" (Jhingan 1997). If the quantity of money is doubled, the price level will also double and the value of money will be one half.

Fisher's theory also known as equation of exchange is stated thus,
MV=PT ………………………………………. (1)
Where:
M= actual money stock or money supply
V= the transaction velocity of circulation of money.
P= the average price level
T= the real volume of all market transactions made during a period of time.
Fisher posited that the quantity of money (M) times the velocity (V), must equal average price level (P) times the aggregate transaction (T). The equation equates the demand for money (PT) to the supply of money (MV).

In the equation, T is better replaced with Q "quantity of goods involved" hence the Fisherian equation can be written as MV = PQ.. (2)
Fisher further stated that the average price in the economy (P) multiplied by the amount of transaction (T) when divided by the money stock (M) gives us a volitional element called the average turnover of money or money velocity (V). i.e. PT/M = V.
Doubling the money stock will lead to a doubling of the price level since T and V do not change. Velocity is seen as constant because factors that would necessitate a faster movement in the velocity of money evolve slowly. Such factors include among others, population density, mode of payment (weekly/monthly), availability of credit sources, nearness of stores to individuals etc. Thus it is seen that there exists a direct and proportional relationship between money stock and price level. The theory is based on the assumption of neutrality of money.

Keynes in his book published in 1936 "The General Theory of Employment, Interest and Money" formulated a monetary theory centred on output rather than prices. He disagreed with the classical view and posited that there is an indirect and non-proportional relationship between change in money and price level (Nwaru 2014).

Keynes posited "that economics has been divided into two compartments with no doors or windows between the theory of value and the theory of money and prices." This dichotomy between the relative price level (as determined by demand and supply of goods) and the absolute price level (as determined by demand and supply of money) arises from the failure of the classical monetary economists to integrate value theory with monetary theory.

Consequently, changes in the money supply affect only the absolute price level but exercise no influence on the relative price level (Afolabi 1998).

According to the Keynesian monetary transmission mechanism, given the assumption that the economy is at less than full employment equilibrium, the built-in-policy transmission mechanism works through the financial system to the real sector via interest rate thus, de-emphasizing the role of money direct impact on the real sector. Keynes posited through his assumptions that the quantity of money has an indirect relationship with prices via interest rate, thus an increase in quantity of money will lead to a fall in interest rates which increases volume of investments and raises effective demand through the multiplier effect thereby increasing output, income and employment (Gbosi 2005).

The monetarist school of thought hold the view that money matters in all economic activities and as such monetary policy is a more viable economic stabilisation measure than fiscal policy. Led by the work of Milton Friedman in 1968, the monetarist argued that money is the most important regulatory instrument in an economy and an excessive expansion of the money supply is inherently inflationary, and as such, the monetary authorities should focus solely on maintaining price stability. Monetarists argue that if the money supply rises faster than the rate of growth of national income then there will be inflation. However, if money supply increases in line with inflation then there will be no inflation. The argument is that when money supply increases, it will eventually decompose itself as increase in the cash balance of individuals and economic agents. People will then find that they hold excess liquidity and will have to spend the excess to restore them to the desired level. Thus he posited that inflation is always and everywhere a monetary phenomenon.

2.3   Empirical Literature

Busari et al. (2006) examined the implications of the exchange rate regime on the ability of monetary policy to stabilize the economy. They found out that monetary policy stimulates growth better under a flexible rate regime but it is accompanied by severe depreciation, which could destabilize the economy and opined that monetary policy would better stabilize the economy if it is used to target inflation directly than be used to directly stimulate growth.

Okonkwo, Egbulonu & Emerenini (2015) examined the impact of monetary policy on manufacturing in Nigeria. Their findings revealed that money supply (MS) and credit to private sector (CPS) exert tremendous pressure on manufacturing.

Abdurrahman (2010) empirically examined the role of monetary policy on economic activity in Sudan for the period 1990 to 2004 and found that monetary policy had little impact on economic activity during the period under consideration.

Saygin and Evren (2010) evaluated sectoral growth cycles and the impact of monetary policy in the Turkish manufacturing industry. They found out that all manufacturing sectors respond to a tightening monetary policy shock with a reduction in absolute output.

Vizek (2006) analyses monetary transmission in Croatia using the Granger causality test and error correction model and concludes that monetary policy affects industrial output through changes in the exchange rate and money supply, while interest rate changes do not have any influence.

Using the Ordinary Least Squares Method, Onyeiwu (2012) studied the effect of monetary policies on selected macroeconomic variables GDP, inflation rate and balance of payment between 1981 and 2008. His findings show that monetary policy exerts a positive impact on GDP growth and Balance of Payment but negative impact on rate of inflation.

Ditimi, Nwosa and Olaiya (2011) examined the effect of monetary policy on macroeconomic variables in Nigeria for the period 1986 to 2009. The study showed that monetary policy had a significant influence in maintaining price stability within the Nigeria economy.

Nwosa and Saibu (2012) investigated the transmission channels of monetary policy impulses on sectoral output growth in Nigeria for the period 1986 to 2009. Using quarterly data, the study showed that interest rate channel was most effective in transmitting monetary policy to Agriculture and Manufacturing sectors.

Imoughele and Ismaila (2014) examined the relationship between manufacturing sector output and monetary policy variables (exchange rate, interest rate, broad money, external reserve and inflation rate), they found out that a long run relationship exist between manufacturing sector output and monetary policy variables in their study indicating a self-adjusting mechanism for correcting any deviation of the variables from equilibrium.

3.0   Method of Study
3.1   Data Analysis Technique

The data analysis technique employed in this study involves the use of the Ordinary Least Square (OLS) regression technique. However, the estimation of the model specified may yield spurious regression if the variables are not stationary. Thus the unit root test using the Augmented Dickey Fuller test (ADF) would be employed in order to check this problem. Also the Co-integration test will also be carried out so as to test for long-run equilibrium relationship between the series of the same order of integration.

3.2   Model Specification

Borrowing from Solow's growth theory, a mathematical form of our model would be built on a single equation model which would involve specifying a multiple regression equation to check the economic relationship between agricultural output as the dependent variable, with Agriculture Gross Domestic Product (AGDP) as a proxy, and the independent variables which comprises of monetary policy variables (i.e. money supply, interest rate, monetary policy rate and inflation rate). It involves testing of the theoretical propositions embodied in these relationships and the estimation of the variables involved which are measured with econometric model that are seen to be causal in nature. The model is specified in a production function form as:

AGDP = f (MS, INR, INF, MPR)……… (1)
Econometrically, the above equation 1, becomes
AGDP = a0 + a1MS + a2INR + a3INF + a4MPR + μ…….. (2)

However, in order to reduce the problem of spurious regression in the analysis, we adopt the log linear model. We thus have
Log AGDP = a0 + a1LogMS + a2LogINR + a3LogINF + a4LogMPR + μ

Where
AGDP=   Agricultural Gross Domestic Product
MS=   Money Supply
INR=   Interest Rate
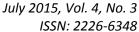INF=   Inflation Rate
MPR=   Monetary Policy Rate
a0, a1, a2, a3, a4=   Parameters
μ=   Error term.
The economic expectations of each the parameters of the explanatory variables in relationship with the dependent variable is stated below as
a1 > 0, a2 < 0, a3 > 0, a4< 0

4. Data Analysis and Presentation of Results

Having tested the null hypothesis (H0) that monetary policy variables have no significant relationship on agricultural performance in Nigeria, we present the result gotten. The study employed secondary data gotten from the Central Bank of Nigeria Statistical bulletin 2013.

4.1   Unit Root Test

Table 4.0: Stationarity Test

	T Statistic.	Critical values 1%	Critical values 5%	Critical values10%	Prob.	Order of integration
LogAGDP	-3.796786	-3.7497	-2.9969	-2.6381	0.000000	I(2)
LogMS	-5.110769	-3.7343	-2.9907	-2.6348	0.000001	I(1)
LogINT	-5.026041	-3.7343	-2.9907	-2.6348	0.000000	I(1)
LogINF	-4.996898	-3.7343	-2.9907	-2.6348	0.000129	I(1)
LogMPR	-5.324177	-3.7343	-2.9907	-2.6348	0.000005	I(1)

Author's computation Eviews 3.1 Output

The table above presents the summary of unit root tests results gotten at levels, first difference and second difference. The Augmented Dickey Fuller test were conducted on all the variables and the result gotten, showed that money supply, interest rate, inflation rate and monetary policy rate were stationary at first difference at 1%, 5% and 10% critical value as their T Statistics values at first differencing is greater than the critical value at 1%, 5% and 10%. However, agriculture GDP, achieved stationarity at second differencing.

4.2   Co-integration Test
Table 4.1   Co-integration Test
 Sample: 1986 2013

 Test assumption: Linear deterministic trend in the data

 Series: LogAGDP LogMS LogINT LogINF LogMPR

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.919284	110.5908	68.52	76.07	None **
0.533451	47.67041	47.21	54.46	At most 1 *
0.452537	28.61063	29.68	35.65	At most 2
0.269178	13.54912	15.41	20.04	At most 3
0.204178	5.709500	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5% (1%) significance level
L.R. test indicates 2 cointegrating equation(s) at 5% significance level
The Johansen co-integration test was used to determine if there exists long-run equilibrium relationship among the variables under study. The result above, showed three cointegrating variables at 5% critical value as the likelihood ratio value of these variables in table was greater than their 5 percent critical value. That is 110.5908, 47.67041 and 5.709500 is greater than 68.52, 47.21 and 3.76. We therefore, reject the null hypothesis and conclude that there exists long run equilibrium relationship between the dependent and independent variables.

4.3   Granger Causality Test
 Table 4.2

 Pairwise Granger Causality Tests

 Sample: 1986 2013

 Lags: 2

Null Hypothesis:	Obs	F-Stat	Probability
LogMS does not Granger Cause LogAGDP	27	0.29625	0.74681
LogAGDP does not Granger Cause LogMS		3.08521	0.06795
LogINT does not Granger Cause LogAGDP	27	5.98375	0.00919

LogAGDP does not Granger Cause LogINT		2.58525	0.10032
LogINF does not Granger Cause LogAGDP	27	0.43897	0.65076
LogAGDP does not Granger Cause LogINF		3.81500	0.03949
LogMPR does not Granger Cause LogAGDP	27	1.40132	0.26943
LogAGDP does not Granger Cause LogMPR		3.29384	0.05801
LogINT does not Granger Cause LogMS	27	1.20331	0.32102
LogMS does not Granger Cause LogINT		2.75299	0.08788
LogINF does not Granger Cause LogMS	27	0.22838	0.79787
LogMS does not Granger Cause LogINF		1.91116	0.17396
MPR does not Granger Cause LogMS	27	0.76066	0.48041
MS does not Granger Cause LogMPR		3.10722	0.06682
LogINF does not Granger Cause LogINT	27	2.68852	0.09245
LogINT does not Granger Cause LogINF		0.63805	0.53874
LogMPR does not Granger Cause LogINT	27	0.81217	0.45801
LogINT does not Granger Cause LogMPR		2.55950	0.10239
LogMPR does not Granger Cause LogINF	27	4.09381	0.03234
LogINF does not Granger Cause LogMPR		1.91953	0.17275

The Granger causality analysis presented in Table 4.2 showed that at 5% significance level, there was no case of bidirectional causality; however, a unidirectional causal relationship was seen running from INT to AGDP, AGDP to INF and MPR to INF.

4.4.   Model Estimation

In estimating the model, the ordinary least square method was used to identify the nature of relationship that existed between the dependent variable and explanatory variables.
Table 4.3
 Dependent Variable: AGDP

Method: Least Squares

Sample: 1986 2013

Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LogC	4.344481	0.089224	48.69202	0.0000
LogMS	0.167726	0.011566	14.50198	0.0000
LogINT	-0.032146	0.002627	-5.817150	0.0226
LogINF	0.007165	0.005323	-1.461405	0.0580
LogMPR	-0.003581	0.002792	-1.282857	0.2129

R-squared	0.935719	Mean dependent var	5.254778
Adjusted R-squared	R- 0.924032	S.D. dependent var	0.159830
S.E. of regression	0.044053	Akaike info criterion	-3.241275
Sum squared resid	0.042694	Schwarz criterion	-3.201305
Log likelihood	48.75721	F-statistic	80.06204
Durbin-Watson stat	1.502288	Prob(F-statistic)	0.000000

Source: Author's computation Eview 3.1

LogAGDP = 4.34+ 0.168LogMS + 0.0321LogINT - 0.0072LogINF - 0.0036LogMPR

T-Stat   (48.69)   (14.50)   (-5.82)   (-1.461)   (-1.283)

T Prob.   (0.000)   (0.000)   (0.0226)   (0.0580)   (0.213)

R^2 = 0.936, Adjusted R^2 = 0.924, F-statistic =80.06, Prob(F-stat) = 0.000000
Durbin Watson = 1.502288

The interpretation of the model based on the selected economic variables as shown in table above, shows that the coefficient of multiple determination (R^2) of 0.936 indicates that 93.6% of total variation in the dependent variable can be explained by the explanatory variables, other variables not included in the model explains the remaining 6%. The test of significance from our result showed that two variables (MS and INT) were statistically significant for the period under

review at 5% level of significance while at 10% level of significance, INF was statistically significant. This is due to the fact that their T probability values of 0.0000, 0.0000 and 0.0226 are all less than 0.05 (5% level of significance), while the T probability value of INF at 0.0580 is less than 0.10 (10% level of significance). We therefore reject the null hypothesis. The F Stat value also shows that the entire regression model was fit and further confirms the value of the R2, while the Durbin Watson value of 1.502288 tend towards 2, hence we conclude that there exist no serial autocorrelation.

The coefficient of money supply (0.168), interest rate (- 0.032) and monetary policy rate (-0.0036) all appeared with the expected signs and conformed to expectations. This shows that a 1% increase in money supply, will lead to an increase in AGDP by 0.168% this is in line with the new quantity theory of money that an increase in money base will directly increase output. Also, a 1% increase in interest rate reduces AGDP growth by 0.032% and a 1% increase in monetary policy rate reduces AGDP by 0.0036%. However, the coefficient of inflation rate (0.0072) appeared with a positive sign and did conform to expectations. This shows also shows that a 1% increase in inflation reduces AGDP by 0.0072%.

5.   Conclusion

The need for a viable agricultural sector cannot be undermined due to the important role it plays in the Nigerian economy. The study attempted to empirically investigate the monetary policy variables on agricultural sector performance in Nigeria for the period 1986 to 2013 using the OLS regression method. The analysis was done using four monetary variables (money supply, interest rate, inflation rate and monetary policy rate) to determine the sector performance. The study has so far highlighted that there exist a relationship between monetary policy and agricultural sector performance in Nigeria. Thus, the following recommendations were reached

The Government should increase the budgetary allocation to agricultural sector in a consistent manner due of the primary and vital importance it plays in the national economy, hoping that with proper monitoring of fund, it would contribute more significantly to the economy of the country.

An effective utilization of these allocated funds is also advocated and all areas of wastage blocked.

Concessionary low interest rate should be implemented, as it encourages rural farmers to borrow and invest in large scale agricultural activities.

There should be an effective and prudent management of monetary policies on the part of the monetary authorities.

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