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MONETARY POLICY AND AGRICULTURAL SECTOR OUTPUT IN NIGERIA (1985-2018)

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Abstract

The agricultural sector output is seen as the main source of revenue to the government before the discovery of crude oil in commercial quantity in 1956. However, the agricultural sector in Nigeria has suffered neglect and continues to face several challenges hindering its performance. In order to revitalize the agricultural sector, there have been concerted efforts by the government through the implementation of monetary policy. Despite these efforts, Nigeria has not achieved the desired level of agricultural output. Arising from this problem, this study investigated the effect of monetary policy on agricultural sector output in Nigeria.

The research covered a period of thirty-four years (1985-2018). The time series data were sourced from Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics.

The model was specified and the hypotheses were tested with the Autoregressive Distributed Lag model. The Augmented Dickey-fuller and stability Tests were carried out to ensure robust regression results.

The results of the study revealed that Agricultural Credit Guaranteed Scheme Fund (ACGS) has positive relationship with agricultural sector output with co-efficient of 0.8091 and probability value of 0.0455. The effect of Agricultural Credit Guaranteed Scheme Fund (ACGS) on Agricultural Sector output (AGDP) is statistically significant. However, money supply and monetary policy rate have negative relationships with the dependent variable (AGDP) with co-efficient of -0.0634 and -6.9262 respectively. The effect of monetary policy rate is statistically significant on agricultural output with the probability of 0.0032 while money supply is not statistically significant with the probability value of 0.1398. Interest rate has direct relationship with Agricultural sector output as a unit increase in interest rate will lead to about 29% increase in the dependent variable (AGDP). It is therefore concluded that monetary policy has a very significant effect on the output of agricultural sector in Nigeria. The study recommended that government should pay more attention to agricultural sector by making tractors and seedlings available to farmers at subsidized rate.

KEYWORDS: Monetary policy, productivity, autoregressive distributed lag, agricultural sector

1.0 INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Economic policy making in many nations of the world is for the achievement of an undeniable degree of financial development and economic growth either in underdeveloped, developing and developed economies. Monetary policy is a financial technique taken by the regulatory authority typically through the apex bank of a country (Central Bank) to impact the economy. It is equipped towards creating stability in the economy and encouraging development.

Monetary policy includes the selection of various monetary tools to impact the supply of money available for use to accomplish price stability, economic growth, employment and equilibrium balance of payment. Uchenna and Alexanda (2014) saw monetary policy as the macroeconomic instruments with which the monetary authority of a nation controls the supply of money, frequently focusing on interest rate to advance economic growth and stability. Monetary authority forms rules directed towards the upgrade and improvement of strategy intended to guarantee optimal performance of the banking industry and furthermore to advance the macroeconomic objectives or goals (Chuku, 2009).

Falade and Folorunso (2015) affirmed that monetary policy assumes significant part in accomplishing macroeconomic objective of price stability, equilibrium of balance of payment, full employment, output growth and sustainable development. These macroeconomic goals can be accomplished either by expansionary or contractionary monetary policy. Expansionary monetary policy is generally formed to enhance the level of economic activities through the increment in money supply and decrease in monetary policy rate while contractionary monetary policy is embraced to direct the economy during boom or inflationary pressure through reduction in money supply and a reduction in the monetary policy rate.

The agricultural sector is one of the significant drivers of development and advancement in most developing nations from time immemorial. Verifiably, agriculture fills in as significant occupation to human and contributed altogether to the economy by giving sources of livelihood to human kinds through the development of plants and rearing of animals for human and industrial utilization. In the early 60's Nigeria was a significant exporter of cash crops and there was the groundnut pyramid in the north and the south was known for cultivation of cash crops like cocoa, palm oil and timber for export. Akinmulegun (2018) believed that agriculture which joins labour, land or soil, animals, plants and sun powered energy in the creation of agricultural output for utilization and sales purpose has been assuming significant part in most non-industrial nations like Nigeria.

1.2 STATEMENT OF THE PROBLEM

Nigeria was a significant exporter of agrarian produce like cotton, palm oil, palm bit, cocoa, groundnuts, and rubber and so on before the quick expansion in the oil revenue export. In any case, lately, the oil sector has not actually satisfied expectations. Notwithstanding, both the range and volume of agricultural exports has dropped significantly and the rate at which agrarian produce are imported is disturbing and of incredible worry as it affects the value of the naira (Ammani, 2012).

Afangideh (2006) thought that commercial banks, for example loans simply 5 to 10 percent of their credit portfolios to the areas they see to be safer, similar to the oil and gas, telecommunication and of later, the religion organizations. It is of significance to specify that Nigeria's food import bill is estimated at 5 to 7 billion US dollar, in light of variety in various data sources including the Federal Ministry of Agriculture, National Bureau of Statistics and the World Bank. Ojewale (2017) states that the country's 2017 budget which remains at N7.4 trillion when changed over at the Central Bank of Nigeria (CBN) conversion standard of N305 to $1 gives about $24 billion, by implication, food importation alone is corresponding to about a fourth of the annual national budget.

The agricultural sectors has been faced with diverse problems of inadequacies in the supply and delivery of farm inputs, inadequate agricultural education and extensions, irrigation problems, low level of technology, poor post -harvest processing, poor storage facilities, inconsistent and poorly conceived government policies, shortage of working capital, problems of pests and diseases, pest infestation, negative attitude of people towards farming due to low reward, poor transportation, lack of credit facilities, lack of investment, lack of basic infrastructure, inadequate fertilizers and farm implements, environment hazards, labour and land use constraints. Most of these problems could be solved if appropriate monetary policy is put in place (Anthony, 2010; Awe, 2013; Kemi, 2016).

1.3 RESEARCH OBJECTIVES

The broad objective of the study is to examine the effectiveness of monetary policy on the agricultural sector output in Nigeria. However, the specific objectives are to:

i. examine the effect of Agricultural Credit Guarantee Scheme on Agricultural sector output in Nigeria.
ii. investigate the extent to which bank credit to agricultural sector influence agricultural sector output in Nigeria.
iii. examine the effect of interest rate on agricultural productivity in Nigeria.
iv. evaluate the response of agricultural sector output to monetary policy instruments in the long run.

1.4 RESEARCH HYPOTHESES

The hypotheses formulated for this study are stated in the null form as follows:

i. Agricultural Credit Guaranteed Scheme have no significant effect on agricultural sector output in Nigeria
ii. Bank credit to agricultural sector does not significantly influence agricultural sector output in Nigeria
iii. Interest rates have no significant effect on agricultural productivity in Nigeria.
iv. Agricultural sector output does not significantly respond to monetary policy instruments in the long run.

2.0 LITERATURE REVIEW

2.1 CONCEPTUAL REVIEW

Nigeria is a nation that is richly blessed with fruitful and rich agricultural resources. During the 1960s, the Nigerian economy was significantly determined by the agricultural sector representing around 70% of the nation's gross domestic product (GDP) and 65-70 percent of the country's

exports (Olajide, Akinlabi, and Tijani, 2012). The agricultural sector is viewed as the way into the improvement of the economy through product contribution, market contribution, factor contribution, and foreign exchange contribution (Abayomi, 1997). Likewise, the sector was assessed to be the biggest supporter of Nigeria's non-oil foreign earnings (Iganiga and Unemhilin, 2011). The issue confronting the Nigerian rural economy can be ascribed to inadequate capital and credit for start-up, investment, and expansion.

Governments attempt to control the money supply since they accept that its pace of development affects the rate of inflation. Monetary policy is worried about discretionary control of money supply by the monetary authorities (Central Bank) to accomplish a stated objective or desired economic goals.

Monetary policy includes those government activities detailed to control the behaviour of the monetary sector. Nigeria's monetary policy is anchored on the monetary targeting focusing on system and price stability which shows the overriding objectives of monetary policies. The sector remains undercapitalized; most farmers cannot get financial resources needed for output growth using modernized equipment, while the fear among banks in loaning to the sector is still in existence, despite various government policies and agricultural credit schemes (Olomola and Yaro, 2015). Monetary policy hence can be characterized as the mix of planned estimates utilized by central bank in controlling money supply which is an instrument for accomplishing macroeconomic objectives. Monetary Policy is the intentional utilization of monetary instruments (indirect and direct) at the discretions of monetary authorities for instance the central bank cardinal objectives is to ensure growth and stability of the economy through the achievement of macroeconomic objectives of full employment, price and exchange rate stability, and balance of payment equilibrium (CBN, 1992). Monetary policy is basically a program of activity embraced by the monetary authorities, generally the central bank, to control and direct the supply of money with the public and the flow of credit with the end goal of accomplishing pre-determined macroeconomic objectives (Dwivedi, 2005). Monetary policy involves a Government's conventional endeavors to satisfactorily direct the money in its economy to accomplish explicit monetary objectives.

2.2 EMPIRICAL REVIEW

Castro and Teixeira (2012) examined the rural credit and agricultural supply in Brazil within the period 1976-2005. findings revealed that farmers normally have a budget constraint to purchase agricultural inputs (fertilizers, labour, pesticides, etc.), and government credit program might increase agricultural supply.

Friday, Chris, Ikechukwu and Ikpesu (2016) examined the effect of the credit supply, and various commercial bank loan scheme on agricultural sector production using vector autoregressive (VAR) approach. Using time series data sourced from Central Bank of Nigeria Statistical Bulletin over the sample period of 1981-2013, the study found ACGSF to have performed poorly in explaining agricultural sector performance while commercial loans to agricultural sector had a significant impact on agricultural production.. Khan, et al (2011) carried out review on past literature on agriculture credit in the rural area of Pakistan. Their research findings clearly indicated that the importance of agriculture credit has not only developed farming but also furnished every sector of the economy positively.

Akbar and Jabbar (2017) investigated the effect of decision relating to macroeconomic policy on domestic food inflation and production in Pakistan. The researcher found out that covering energy prices would bring a significant improvement in terms of accessibility and availability within the theme of providing food security in their country.

Awe (2013) critically evaluated the mobilization of domestic financial resources for agricultural productivity in Nigeria. Some of the financial resources the study highlighted include credit facilities from Nigerian Bank for Commerce and Industries (NBCI) and credit provided by commercial and merchant banks. The result showed that these resources have a positive relationship with agricultural productivity in Nigeria. However, Tasie and Offor (2013) explored the effects of international fund for agricultural development (IFAD) credit supply on rural farmers in River state, Nigeria. The study was conducted through the administration of questionnaires to rural farmers in the locality and it was ascertain that the IFAD credit programme has contributed significantly to farm output and income and also reduced the level of poverty in that area. Chisasa and Makina (2015) recent study on bank credit and agricultural output in South Africa using co-integration and error correction model (ECM) showed that credit supply has a positive and significant impact on agricultural output in the long run. However, the ECM revealed that bank credit has a negative impact on agricultural output in the short run.

3.0 METHODOLOGY

3.1 SOURCES OF DATA

The data were mainly sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin of 2018. They are secondary data. The scope of the study covers the period between 1985-2018 while the variables are Agricultural Product output (AGDP) the dependent variable, Agricultural Credit Guarantee Scheme Fund (ACGSF), Broad Money Supply(BMS), Monetary Policy Rate (MPR) and Interest Rate.

3.2 MODEL SPECIFICATION

This study would adapt the model of Christopher and Charles (2012) which was used to examine the effect of monetary policy on manufacturing sector in Nigeria. According to Christopher and Charles (2012), $OUT_{agt} = f$ (MPR, TBR, M_2). Where: OUT_{agt} = Output of the Agricultural Sector for current year, MRR = monetary policy rate for previous year. TBR = Treasury bill Rate for previous year - M_2 = Broad Money Supply for previous year.

For the purpose of this study, Christopher and Charles (2012) model is modified with the inclusion of Agricultural Credit Guarantee Scheme Fund, Real Interest Rate through which monetary policy influences real sector output. The equation was therefore specified in a functional form as stated below.

AGDP= *f*(ACGSF ,BMS,INT, MPR)…….…...…….…...…….……1

In a linear function, the long run equation from equation (1) can be specified as:

$AGDP=\beta_0+\beta_1 ACGSF + \beta_2 BMS + \beta_3 INT + \beta_4 MPR + U$…….2

The short-run counter-part of equation (3) is thus specified as:

$AGDP=\beta_0+\beta_1\Delta ACGSF + \beta_2\Delta BMS + \beta_3\Delta INT + \beta_4\Delta MPR+ U$……...3

Where:

AGDP = Ratio of Agricultural output to Gross Domestic Product

ACGSF = Ratio of Agricultural Credit Guarantee Scheme Fund to Gross Domestic Product

BMS = Ratio of Broad Money Supply to Gross Domestic Product

INT = Interest Rate

MPR = Monetary Policy Rate

β_0 = Constant

$\beta_1 - \beta_4$ = Coefficient of the Explanatory Variables

μ = error term

3.2 METHOD OF DATA ANALYSIS

At this level of research, using time series data, the researcher estimates the model with autoregressive distributed lag method. This method is to be used for variables that are stationary at level and first difference. In the preliminary test, the following tests shall be conducted.

3.2.1 UNIT ROOT TEST

The study used Augmented Dickey Fuller (ADF) test to determine the presence of unit root, that is, to ascertain stationarity of variables. ADF was preferred to test for unit root because it is the simplest approach in testing for unit root and it is very suitable when dealing with a large and complex set of time series data with unknown orders.

Table 3.0: Augmented Dickey Fuller Test Results

Variable	Method	At Level			At First Difference			Order
		ADF test Statistics	5% critical value	Prob	ADF test Statistics	5% critical value	Prob	
ACGS	ADF	-4.2286	-2.9762	0.0028	-	-	-	I(0)
AGDP	ADF	1.7916	-2.9540	0.3779	-5.2840	-2.9604	0.0001	I(1)
BMS	ADF	-1.8269	-2.9540	0.3614	-4.6997	-2.9604	0.0007	I(1)
INT	ADF	-3.7233	-2.9540	0.0083	-	-	-	I(0)
MPR	ADF	-3.1112	-2.9540	0.0354	-	-	-	I(0)

Source: Author's Computation from e-view

Table 3.0 above presents the summary of the unit root result using Augmented Dickey-Fuller unit root test regression analysis. The result indicates that the variables namely; Output of agricultural sector (AGDP) and Money supply (BMS) are not stationary at level since their respective probability values are insignificant at 5%. Therefore, they became stationary after first difference. However, at level, the data series namely interest rate, agricultural credit guaranteed scheme and monetary policy rate are stationary i.e. I(0) since their respective probability values are highly significant at 5%. This finding implies that the series contain no unit root at the level and at first difference; hence, their seasonal variation has been corrected for, making them fit for regression. With this result a co-integration test is conducted using the Bounds Test to obtain the long-run relationship between the variables.

3.2.2 BOUND CO-INTEGRATION TEST

Table 3.1: Bound Test Result

	Lower Bound	Upper Bound		Lower Bound	Upper Bound
Level of Significant	**$I_{(O)}$**	**$I_{(1)}$**	**Level of Significant**	**$I_{(O)}$**	**$I_{(1)}$**
10%	2.45	3.52	10%	2.57	3.66
5%	2.86	4.01	5%	2.86	3.99
2.5%	3.25	4.49	2.5%	3.13	4.26
1%	3.74	5.06	1%	3.43	4.6
F-Statistics	2.425608		T-Statistics	2.307575	
D.F	4	4	D.F	4	4

Source: Author's Computation (2021)

The table 3.1 above presents the result of F-Bounds Test and T- Bounds Test it indicates no co-integrating vector among the variables as the F statistics of 2.425608 and T statistic of 2.307575 are lower than the lower bound of both tests. This leads to the conclusion that agricultural credit guaranteed scheme (ACGS), broad money supply (BMS), Interest rate (INT) and monetary policy rate do not have long run relationship with agricultural sector output (AGDP) in Nigeria. Hence, we cannot reject the null hypothesis of no co-integration relationship between the independent variables and the dependent variable. The implication of this result is that our analysis will only be limited to short run as there is no long run relationship among the variables.

4.0 AUTOREGRESSIVE DISTRIBUTED LAG RESULT

In order to achieve the study objectives, an ARDL estimation technique is employed to conduct an empirical analysis. This estimation technique is employed based on the fact that some of the variables are stationary at levels and some are stationary at first difference.

Table 4.0 Interpretation of Autoregressive Distributed Lag Results (Short Run)

Variable	Short-Run Estimation Coefficient	Std. Error	t-Statistic	Prob.
$\Delta AGDP_{t-1}$	0.725673	0.118881	6.104205	0.0000
$\Delta ACGS$	0.809174	0.004205	1.634887	0.0455
ΔBMS	-0.063402	0.071170	3.631570	0.1398
ΔBMS_{t-1}	0.164101	0.080404	-2.040954	0.0424
ΔINT	0.294551	0.038835	0.374680	0.7112

ΔINT_{t-1}	-0.078279	0.036606	2.138415	0.0429
ΔMPR	-6.926202	0.049269	-1.553144	0.0032
ΔMPR_{t-1}	-0.076114	0.048116	-1.581883	0.1268
C	0.283757	0.574831	0.493636	0.6261
R^2	0.823464			
F-Statistic	13.99374			
Prob.(FStat)	0.000000			
Durbin Watson	1.75			

Source: Author's Computation (2021)

The Table 4.0 above presents a autoregressive distributed lag model result and it reveals the effect of ratio of agricultural guaranteed credit scheme (ACGS) to gross domestic product (GDP), ratio of money supply to GDP, interest rate and monetary policy rate on ratio of agricultural sector output to gross domestic product in Nigeria. The result reveals that in the previous period of ratio of agricultural sector output to gross domestic product has a positive and significant effect on agricultural sector output indicating that rises in previous period of agricultural sector output ratio to gross domestic product will lead to rise in agricultural sector output in the current period. The coefficient is 0.725673 with the probability value of 0.0000.

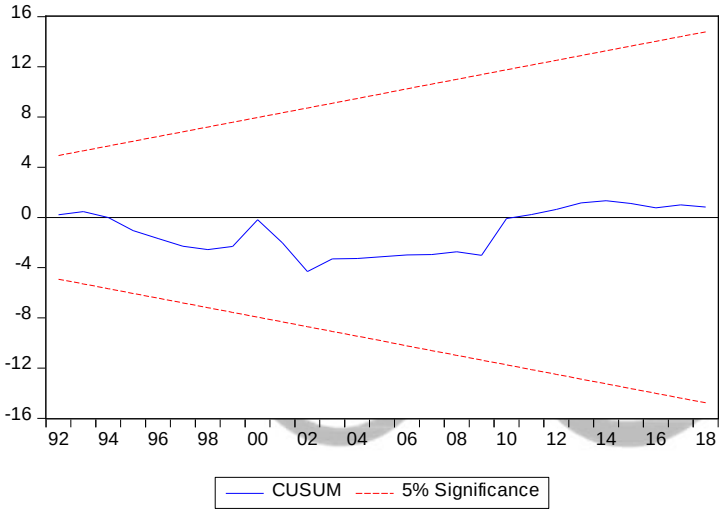
The short run result shows that the ratio of agricultural credit guaranteed scheme to GDP has positive and significant effect on ratio of agricultural sector output to GDP with a coefficient of 0.8091 and probability value of 0.0455 which implies that a percentage increase in credit to agricultural sector will lead to 8% increase in agricultural sector output and its effect is statistically significant. The ratio of broad money supply (BMS) to GDP has a coefficient and probability value of -0.0634 and 0.1398 respectively. This indicates that 1% increase in the ratio of broad money supply (BMS) will lead to about 6.3% decrease in the ratio of agricultural sector output to gross domestic product in Nigeria in the current period, the effect is statistically insignificant while a unit change in the ratio of broad money supply to gross domestic product will cause about 16% increase in the ratio of agricultural sector output to gross domestic in the previous period. The effect is statistically significant with probability value of 0.0424.

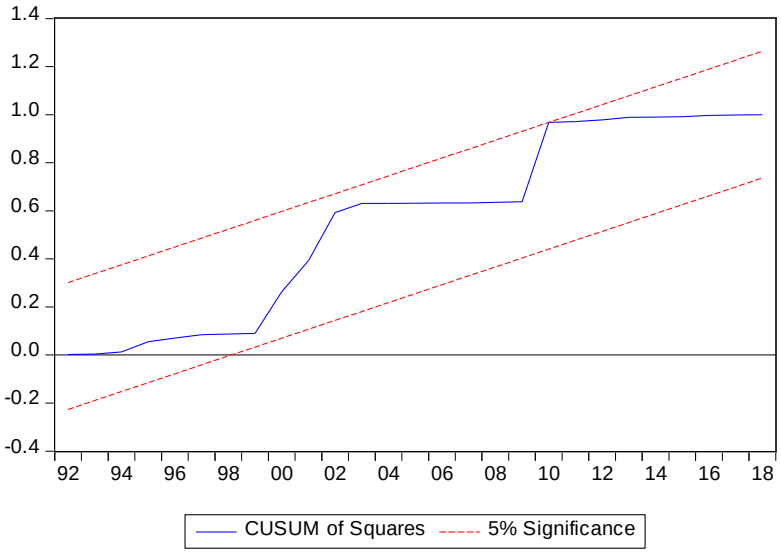
The short run result for interest rate in the current period has a positive coefficient of 0.294551 which is not significant at 5% which implies that a unit increase in interest rate will lead to 29.4% increase in the ratio of agricultural sector output to gross domestic product in Nigeria. However, in the previous period, interest rate is found to be negative and have significant effect on agricultural sector output with coefficient of 0.078279 indicating that 1% increase in interest rate will lead to 7.8% fall in the ratio of agricultural sector output to gross domestic period in Nigeria.

From the table at both current and previous period of monetary policy rate in the short run, they have negative relationship with the level of the ratio of agricultural sector output as they have

coefficients of -6.926202, -0.076114 and probability value of 0.0032 and 0.1268 respectively. It indicates that 1% increase in monetary policy rate will lead to 69% fall in the output of agricultural sector in the current period and 7% fall in previous period. The effect of current period is statistically significant while in the previous period, it is not statistically significant. From the table above, F-statistics is (13.99374) the probability of F statistics is (0.000000).This is a clear indication that the whole regression is statistically significant due to the observed effect of monetary policy instruments on agricultural sector output within the considered period. Hence, the null hypothesis is rejected and the alternative hypothesis is accepted which indicates that Monetary policy have significant effects on agricultural sector output in Nigeria within the period considered.

4.1 STABILITY TEST





The result above shows the stability test for the regression model. A relatively stable regression model as Cusum and Cusum of squares' lines are within 0.5% acceptable region and it is indicated in the result above that the regression model is relatively stable.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The results revealed that there is no long-run equilibrium relationship between the monetary policy variables agriculture guaranteed credit scheme (ACGS), money supply (BMS), interest rate (INT) and monetary policy rate (MPR) and agricultural output (AGD) and it was concluded that monetary policy has a very significant effect on the output of agricultural sector in Nigeria. It is therefore recommended that government should pay more attention to agricultural sector by making tractors and seedlings available to farmers at subsidized rate. Furthermore, farmers should enjoy required technical training and the government should increase budgetary allocation to the sector.

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