

Original Research Article

Credit Financing, Monetary Policy and Performance of the Agricultural Sector of the Nigerian Economy

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Abstract: Monetary policy is critical to a country's economic development and achievement of macroeconomic objectives. The objective and focus of monetary policy may shift from time to time, depending on the country's level of economic development. Adequate financing and monetary policy become an unavoidable component in every economy sector, including the agricultural sector. The results of the ARDL analysis carried out on the relationship between monetary policy and the performance of agricultural sector of Nigeria economy revealed that credit financing and monetary policy significantly affected agricultural output in Nigeria ($Adj. R^2 = 0.998$; $Wald Stat = 4.69$; $\rho = 0.00$). Agricultural credit guarantee scheme had significant weak positive effect on Agricultural output ($\beta = 0.0006$, $t\text{-test} = 15.08$, $\rho = 0.00$); credit to the agricultural sector had an insignificant weak negative effect on Agricultural output ($\beta = -0.03$, $t = -1.16$, $\rho = 0.26$); exchange rate has a weak positive and significant effect on Agricultural output ($\beta = 39.9$, $t = 20.27$, $\rho = 0.00$); inflation rate has a strong positive and significant effect on agricultural output ($\beta = 25.5$, $t = 3.12$, $\rho = 0.01$); real interest rate has a strong positive and significant effect on agricultural output ($\beta = 34.67$, $t = 2.86$, $\rho = 0.00$). It was evidenced in this study that regulation of credit funding and monetary policy factors would enhance the agricultural productivity, increases food supply and promotes growth in the economy.

Keywords: Credit financing, Agricultural credit guarantee scheme, Exchange rate, Interest rate, Inflation rate, Monetary policy.

1.0 INTRODUCTION

Agriculture has always played a significant role in the economy of every country. A country is considered socially, politically, and economically stable if its agriculture sector is stable (UKEssays, 2018). Agriculture has made a substantial contribution to the economic prosperity of industrialized countries such as the United States and Japan. It has also aided them in their industrialization process. In Africa, Agriculture is by far the most important activity. It employs more than two-thirds of the continent's working population and accounts for 30 to 60% of gross domestic product and roughly 30% of each country's export value (Britannica, 2021). The rate of increase in agricultural productivity in Africa is around half that of other developing countries. Low yields are caused by a lack of fertilizer use and improved seed strains, as well as a lack of automation and irrigation, as well as the impact of global climate change. Despite the challenges, Africa's agriculture sector has a promising future. Increasing the usage of technology and improving the inputs (Mzali, 2019). In countries like Kenya, the agricultural sector grew at an exponential rate during the first two decades of independence, complementing the country's economic development. The government's return to the farms effort, land tenure structures, technology, and dependable research and extension services were all credited with this rise.

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In Nigeria, Agriculture as a sector of the economy employs approximately 35 percent of the population by 2020. Despite rising urbanization, the agriculture business is recognized as a substantial contributor to national income and economic prosperity. Despite the presence of oil in the country, agriculture remains the backbone of the Nigerian economy, according to the FAO. It is the principal source of income for the majority of Nigerians. Agriculture is Nigeria's most important sector, contributing the most to the country's GDP. Crop production accounts for 88 percent of total industrial size, with livestock, forestry, and fishery accounting for the remaining 12 percent. In 2014, the sector's GDP was US\$113.64 billion, the highest in the last five years. Low agricultural yields, conflicts such as terrorism and the herdsmen crisis, and the impact of climate change have all reduced the sector's contribution since then. Nigeria's agricultural GDP contribution fell by 31 percent from US\$113.64 billion in 2013 to US \$78.45 billion in 2017 (Pwc, 2018).

In addition, about 24% of gross domestic product is generated by the agricultural sector. The largest contribution is due to crop production, which generates 21.8% of the country's GDP in 2020. NBS (2021), reports that Nigeria's agricultural sector grew by 3.58% in the fourth quarter of 2021, an increase of 2.36% compared to the previous quarter, recording a growth of 1.22%. In real terms, the sector contributes 26.84% to the overall GDP in 2021, lower than the contribution of the fourth quarter of 2020 and less than that of the third quarter of 2021, of 26.95% and 29.94%, respectively. More than 70% of Nigerians are engaged in agriculture mainly at subsistence level. Agriculture is really essential in the Nigerian economy as it includes many activities that reduce the cost of living in the society, so enough agricultural production in a country will tend to reduce the costs that customers pay to get a food basket. That way, agriculture can improve a country's economy by reducing the cost of food.

However, Nigeria's agricultural production faces the challenge of inadequate financing, especially from rural farmers. Nigeria's agricultural sector faces a variety of challenges, one of which is agricultural finance. Most Nigerian farmers face difficulties in securing agricultural loans due to the lack of collateral needed to obtain loans from financial institutions. Another challenge is that financial institutions are reluctant to lend to the agricultural sector, which is considered a high-risk industry. Also, the nature of agriculture in a self-sufficient economy like Nigeria has some incentives as agriculture is still characterized by low mechanization, high labor input, low productivity and inefficient production. It would have been difficult without it. The government has implemented various monetary policies that create room for credit in the agricultural sector through its impact on the financial sector. Several monetary policies have been developed as part of a movement to achieve most of the goals of increasing productivity and increasing income. These policies aim to stabilize agricultural production, commercialize first-class quality and optimal production, and increase employment opportunities.

Monetary policy can be a macroeconomic policy set by a central bank, a set of tools that a country's central bank provides to bring sustainable economic processes to market by controlling its money supply. This is a demand-side economic policy adopted by the national government to achieve macroeconomic goals such as controlling inflation, controlling employment levels, and maintaining long-term interest rates, including cash supply and interest rate management. This includes government actions that affect economic activity, especially by manipulating the money supply and credit supply and changing interest rates (Britannica, 2021).

Monetary policy is a major factor in a country's economy, and monetary policy includes financial and credit management to promote the government's overall economic policy to achieve set goals. Monetary policy determines the amount of money that flows through the economy (Peek, 2021). In Nigeria, governments have always relied on monetary policy to achieve specific economic goals within the economy. These macroeconomic goals include employment, economic processes and development, and relative price stability. The explanation for monetary policy choices is the undeniable fact that it has a very serious impact on both fiscal and income policies. By implementing effective monetary policy, governments can maintain stable prices, thereby promoting long-term economic growth and maximum employment conditions.

Even within government, the economy continues to be regulated by monetary policy. The Central Bank of Nigeria (CBN) uses monetary policy to manipulate current fluctuations in the economy. Monetary policy has been successfully adopted and implemented in developing countries, so it uses both shrinking and expanding means. Therefore, it is necessary to study how changes in monetary policy affect production. This study examined the extent to which credit financing and monetary policy has impact on performance of the agricultural sector in Nigeria. Using monetary policies such as agriculture credit guarantee scheme (ACGS), credit (CR), exchange rate (EXCR), inflation rate (INFL), and real interest rate (lending rate). The rest of the paper are sectionalized as section two covered the review of extant literature, the adopted methodology was discussed in section three, while section four addressed the results and discussions and the paper was brought into conclusion in the section five accordingly.

2.0 LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Agricultural performance (agricultural output)

Agriculture plays an important role in the country's GDP. The role of agriculture in any economy should not be underestimated. It is an important activity for Nigeria's post-oil economy, the country is still primarily an agricultural society, with about 70% of the population engaged in agricultural production at a self-sufficient level. Agriculture is defined as a major economic activity or profession that supports the majority of the country's inhabitants. The result is food, feed, fiber and fuel. From this, there is a conclusion that plants and animals were first cultivated and developed in an economy without human intervention. However, as agriculture progressed, it became clear that people had to increase food production to feed an ever-growing population. In addition to feeding the growing world population, this sector also produces the raw materials and other related products needed by the production sector. This sector also employs a large number of people, especially in rural areas. Overall economic growth is highly dependent on the growth of agricultural production, and policy makers face the challenge of developing appropriate agricultural policies that can achieve the desired growth rates of agricultural production (Maiadua & Suhasin, 2018).

Nigeria's agricultural sector grew 1.22 percent in real terms in the third quarter of 2021 compared to the same period last year. It also employs more than 36% of the country's workforce, making it the largest employer in the country. Despite its importance to the economy, Nigeria's agricultural sector suffers from many obstacles that negatively impact productivity of which funding challenges, insurgency, insecurity especially in the Northern region as well as instability of the monetary policy instruments are not left out. The challenges have dwindled the level of production, the sector contribution to GDP, increased food imports as a result of population growth, and led to a decline in food supply. For example, Nigeria's total agricultural imports from 2016 to 2019 were 3.35 trillion Newtons, four times the 803 billion Newtons of agricultural exports over the same period. Animal production has long been underutilized.

Small ruminants such as goats (76 million), sheep (43.4 million) and cattle (43.4 million) are the most commonly raised livestock by Nigerian farmers (18.4 million). The northern part of the country's nature is known for livestock. In addition to small and large ruminants, there are 180 million chickens worldwide (FMARD, 2017). Again, local demand dominates production, despite various initiatives by development partners to increase production and protect against diseases such as cross-border animal diseases.

Agriculture Commercialization and investment in agriculture is widely recognized as an important technology for promoting accelerated modernization, long-term growth and development, thereby reducing industrial poverty. To continue this, the agricultural sector needs to be restructured to occupy an appropriate position in the center of Nigeria's economic activity. In this, credit funding and monetary policy, such as the Agricultural Credit Guarantee System, which was established to provide credit to farmers at single-digit interest rates with the aim of reducing the cost of agricultural production and increasing production over the long term, credit, or government. With this release, Agricultural Credit Institutions will enable additional agricultural financing to eligible farmers with the primary purpose of ensuring national food security, exchange rates, funding, inflation rates, and interest rates is needed. These include agribusiness preferential lending rates set by the Central Bank of Nigeria (CBN), where farmers benefit from lower interest rates and the consumer price index.

2.1.2 Credit Financing

Agricultural credit guarantee scheme

Agricultural credit guarantee scheme is a policy established by the government to ensure that the agricultural sector of the economy received adequate funding through the operation of the financial sector of the economy. For instance, in Nigeria, Agricultural Credit Guarantee Scheme Fund (ACGSF) has been in operation since 1978 briefly after it was enacted into law by Decree No. 20 of 1977. The scheme enforced the banks on the stipulated percentage of their total deposits to be granted as loan to the agricultural sector at a regulated low interest rate. However, despite all the effort to make it easy for the farmers to access credit, farmers still find it challenging to access agricultural credit. And this is due the unwillingness of commercial banks to lend to the sector based on the low returns related to the sector as well as the rigorous frustrating process of accessing the scheme fund (Udoka, 2015).

Loan Credit by Financial Institutions to Agricultural Sector

McGrew (2017) defined credit as the process of providing loan. In which one party transfers wealth to another with the expectation that it will be paid back in full plus interest. Credit is the ability of an individual or organization to obtain goods or services before payment, based on an agreement to pay later (Chao, Fabrizio & Randall, 2016). Sulaimon (2021) affirmed that access to credit can encourage more people to venture into mechanized agricultural business, thereby increasing agricultural output on the aggregate (Sulaimon, 2021). Food and Agricultural Organization (2020) explained that credit is one of the major constraint inhibiting the growth of agricultural sector in Nigeria as most financial

institutions are wary of granting loans to this sector due to high level of unsystematic risk involved in agricultural business

2.1.3 Monetary Policy

Monetary policy deals with the discretionary control of the money supply by financial authorities (central banks and central governments) in order to achieve desirable economic goals. Monetary policy includes government actions aimed at influencing the behavior of the financial sector. The need to regulate the money supply is based on the knowledge that there is a stable relationship between monetary value and economic activity, and that monetary value is not limited to what is needed to support production activities. It leads to unwanted effects such as high prices and inflation (Abata, Kehinde & Bolarinwa, 2012). In Nigeria, monetary policy has been adopted since the Central Bank of Nigeria Act of 1958 was responsible for the formulation and implementation of monetary policy by the Central Bank of Nigeria. This role has facilitated the emergence of a vibrant money market. There, the Treasury Securities, a financial product used for open market operations and government debt raising, grows in quantity and value and becomes an important asset for investors, as is the market. In Nigeria, monetary policy regimes can be different, monetary policy can be tight, or loose, primarily to stabilize prices. Therefore, monetary policy is known to be one of the vital policy instrument used in regulating the economy (Adegbite & Alabi, 2013). Monetary policy determines the amount of money that flows through the economy (Peek, 2021). In summary, monetary policy in the context of Nigeria refers to the actions taken by the Central Bank of Nigeria to regulate the money supply in order to achieve the government's ultimate macroeconomic goals.

Exchange rate

An exchange rate is the value of a country's currency versus that of another country or economic zone. Most exchange rates are free-floating and will rise or fall based on supply and demand in the market. Exchange rate is a strong economic indicator for assessing the overall performance of an economy. Since Nigeria depends largely on importation of capital goods used in agriculture production process, the businesses at large are exposed to foreign exchange risk (Awolaja & Okedina, 2017). Exchange rate connects the price systems of two different countries making it possible for international trade to make direct comparison of traded goods (Agu, 2002).

Inflation rate

Inflation refers to the persistent or continuous increase in the general price level of goods and services in an economy. Inflation means an increase in the cost of living as the price of goods and services rise. Inflation can occur when prices rise due to increases in production costs, such as raw materials and wages (Anidiobu, 2021). Nigerian agriculture faces very great challenges which include the rising food prices. Food price inflation has risen in recent years because of many factors, the future direction of world food prices will depend on whether research and development increases agricultural productivity faster than the growth in world food demand. Recent increase in food prices in the country can be traced to underinvestment in agricultural innovation, natural disasters, mismanagement of natural resources and population growth (Udoh & Isaiah, 2018).

Real interest rate (lending rate)

Real interest rate is the rate at which interest is paid when the borrower repays the loan, the real interest rate measures the percentage increase in purchasing power the lender receives when the borrower repays the loan with interest. The real interest rate adjusts the observed market interest rate for the effects of inflation. Lending rates remain widely used policy tool that is intended to lower the cost of credit and protect consumers from exorbitant rates (Ferrari, Masetti & Ren, 2018; Bostan & Firtesu, 2019). Interest rate policy in Nigeria is a major instrument of monetary policy with regards to related programmes aimed at boosting agricultural production. Interest rates are expected to rise slowly over the next few years. Higher rates will increase a farm operation's cost of production. Farm operating loans that are around 4% could increase to around 7% over the years (Davis & Emerenini, 2015).

2.2 Theoretical Review

Keynesian theory was propounded by John Maynard Keynes in 1940s. Keynesian believed market economy usually subjected to defective macroeconomic situation due to the volatility nature of the aggregate demand. However, regulated economic policy by the government and the apex bank could inhibit the occurrences of these economic instability (O'Sullivan & Sheffrin, 2003; Binder, 2017). The theory asserted that government intervention is required to assist economies in getting out of recession. The theory opined that necessary actions taken by the government in terms of the fiscal policy measures and that of the apex bank through monetary policy measures can help stabilize economic output, inflation, and unemployment over the business cycle (Fletcher, 1989; Woodford, 2009). According to Keynes, financing and monetary policy has a significant impact on economic activity. It claims that changes in the money supply can permanently alter variables such as the rate of interest, aggregate demand, employment, output, and income. The theory has been applied in several fiscal and monetary policies studies (Andabai, Ikeora & Anah, 2019; Adongo, John, Zeph & Muyima, 2020, Siyanbola, Adegboyega, Adegbie & Ogundajo, 2020; Abiola, Adegbie & Ogundajo, 2020). This

study was anchored on Keynesian theory, it reflects on the relationship between the credit financing, monetary policy and agricultural output.

2.3 Empirical Review

According to Andohol and Abbah (2018) examined the disaggregated subsector components of the Agricultural Credit Guarantee Scheme on Agricultural output in Nigeria between 1978 to 2013. The Vector Error Correction Model (VECM) within the framework of Vector Auto-regressive (VAR) methodology was adopted for the analysis and the result revealed that the cash crop sub sector of Agricultural Credit Guarantee Scheme has a negative and significant relationship with Agricultural Output; opined that the provision for basic infrastructure like good roads, electricity, water and others will go a long way in boosting agricultural production. In like manner, Sulaimon (2021), Florence and Nathan (2020) carried out similar studies in Nigeria context and the outcome shown that Agricultural Credit Guarantee Scheme has significant positive effects on agricultural performance. Ruben, Nyam and Rukwe (2020) examined agricultural credit guarantee scheme fund and its effect on agricultural output in Nigeria using regression analysis, the result of their study revealed that agricultural output in Nigeria is positively and significantly influenced by Agricultural Credit Guarantee Scheme Fund.

According to Osabohien, Mordi and Ogundipe (2020) on access to credit and agricultural sector performance in Nigeria. The Autoregressive Distribution Lag (ARDL) analysis conducted evidenced that credit significantly and positive in explaining the level of agricultural performance in Nigeria. The study opined that farmers should be provided with sufficient access to credit which will enhance their ability to purchase agricultural inputs required to increase productivity. Similar study in Vietnam by Anh, Gan & Anh (2020) on how credit boost agricultural performance using saturation break tests, the autoregressive distributed lag and Toda-Yamamoto-Granger causality test; showed that credit has significant and positive impact on agricultural performance, and that government should focus on expanding credit as well as enhancing the efficiency of agricultural credit. From Uganda, Nakazi & Sunday (2020) studied the effect of commercial banks agricultural credit on agricultural growth with the application of the Autoregressive Distributed Lag (ARDL) analytical tool and found that credit has significant positive impact on Agricultural Output. It was suggested that government should increase access to credit through commercial banks disbursements.

According to Awolaja and Okedina (2017) studied the asymmetric effect of exchange rate on agricultural output in Nigeria, 1981-2017, using NARDL proved that real exchange rate and agricultural output both in aggregate and sectoral are co-integrated. It was found that both aggregate and sectoral agricultural output are negatively and significantly affected by the exchange rate. In contrast, study with same methodological approach by Adekunle, Tihamiyu, Odugbemi and Innocent (2016) could not find any evidence in support of the asymmetric effect of real exchange rate volatility on agricultural output in Nigeria. It was suggested that fiscal and monetary authorities in Nigeria should work in unison at ensuring that the full potentials of the agricultural sector are harnessed for the growth and development of the country. In addition, Obiagel (2020) examined the effect of exchange rate on agricultural sector output in Nigeria. The study made use of econometric techniques involving Augmented Dickey Fuller tests for Unit Roots and the Ordinary Least Square (OLS), and the result indicated that nominal exchange rate and money supply has positive and significant effect on agricultural sector output while interest rate and inflation rate has negative and insignificant effect on agricultural sector output. The study recommends that, there is need for government to ensure the implementation of policies that will encourage local agricultural growth in order to reduce import, by providing price policy, perfect market and credit facilities to work side by side with crude oil production.

According to Agbonkhese & Ughulu (2020) which adopted a vector autoregressive (VAR) to examine the effect of inflation rate on the growth of agricultural sector in Nigeria; the results showed that inflation rate negatively impacted and retard the growth of the agricultural sector. Contrarily, Oboh, Tule & Ebuh (2019) which examined the impact of monetary policy on agricultural sector performance in Nigeria, the study employed the Autoregressive-Distributed Lag (ARDL) approach found that inflation has insignificant effect on the agriculture value added. According to Akpaeti, Agom and Frank (2019) on the analysis of the effect of inflation on farmers' income in Nigeria 1970 to 2017 using co-integration and Error Correction Model (ECM). The results showed that inflation has positive and significant effect on agricultural performance. The study therefore recommends that the Federal Government and the Central Bank of Nigeria alongside other stake holders in the economy must formulate viable and practicable monetary policies that would curtail inflation and bring them under effective control inflation rate must be monitored and curtailed to a single digit inflation rate so that growth can be sustained.

Asekome and Ikojie (2018) studied the relationship between agricultural investment, lending interest rate, deposit interest rate and agricultural output. The study employed the ARMA Least Square technique and found that lending interest rate has significant but negative impact on agricultural investments in Nigeria. Similar result was obtained by Iliyasu (2019). Also, Donny & Ibeinmo (2021) investigated the impact of money supply, interest rate, credit to the agricultural sector and broad money growth rate on the performance of agricultural sector in Nigeria from 1981 to

2018. The Autoregressive Distributed Lag (ARDL) econometric technique was employed and the result showed that interest rate (i.e. lending rate) had a positive but insignificant impact on agricultural sector performance.

Summarily, lots of studies have been conducted on credit financing, monetary policy and performance of agricultural sector with divergent conclusions. Based on the review of literature carried out, this paper therefore formulated the achieved objective, the answered question and tested hypothesis as:

Research objective: *to evaluate the effect of credit financing and monetary policy on the performance of agricultural sector in Nigeria*

Research Question: *To what extent does the performance of the agricultural sector in Nigeria influenced by the credit financing and monetary policy instruments?*

H₀: *Credit financing and monetary policy instruments insignificantly affect the performance of the agricultural sector in Nigeria.*

3.0 METHODOLOGY

This study made use of an *ex-post facto* research design as it considers the past event relationship between the dependent and independent variables, using secondary data. The required data was sourced from the CBN statistical bulletin and World bank data. The time frame of 40 years (1981-2020). This study establishes the relationship between monetary policies and performance on agricultural sector of the Nigeria economy. It examined a cause and effect relationship between credit financing, monetary policy and agricultural performance proxy by Agricultural output and the credit financing and monetary policy (independent variable) proxy by Agricultural credit guarantee scheme (ACGS), Credit (CR), Exchange rate (EXCH), Inflation rate (INFL) and Real interest rate (LR)). To accomplish this, descriptive statistics was employed. Descriptive statistics to analyze the data collected from the CBN Statistical bulletin and World bank. Also, ARDL regression analysis was adopted for the analysis. The optimal lag length selection using Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ) was determined. Also, relevant post estimation tests for the assumptions of linear regression estimate was carried out, namely; Ramsey Reset Test for the linearity, Glejser Test for Heteroskedasticity, Breusch-Godfrey test for Serial Correlation, Jarque-Bera test for Normality test and CUSUM test for stability of the model. The model to capture the effect of credit financing and monetary policy on agricultural production are stated below with the independent variables as Agricultural credit guarantee scheme (ACGS), Credit (CR), Exchange rate (EXCH), Inflation rate (INFL) and Real interest rate (LR) while the dependent variable is Agricultural GDP.

$$AGRUT_t = \alpha_0 + \alpha_1 ACGS_t + \alpha_2 CR_t + \alpha_3 EXCH_t + \alpha_4 INFL_t + \alpha_5 LR_t + \varepsilon_t \dots\dots\dots \text{Equation 1}$$

4.0 RESULTS, INTERPRETATION AND DISCUSSION OF FINDINGS

4.1. Preliminary Analysis

The result of the descriptive statistics describing the statistical features of the series in the distribution and the stationary test (Augmented Dickey-Fuller test) are presented in Table 1 and Table 2 respectively.

Descriptive Statistics

Table 1: Descriptive Statistics

	ACGS	AGRUT	CR	EXCR	INF	IR
Mean	3155944.	8216.517	5914.408	104.044	14.667	0.434
Median	544997.2	4932.755	647.665	110.081	11.700	4.326
Maximum	12456251	18348.18	29051.61	381.000	76.800	18.180
Minimum	24654.90	2303.510	8.570	0.636	0.200	-65.857
Std. Dev.	3926360.	5530.399	8726.284	104.876	15.397	14.440
Skewness	0.903	0.533	1.286	0.927	2.405	-2.680
Kurtosis	2.346	1.733	3.263	3.074	8.985	12.584
Jarque-Bera	6.151	4.572	11.136	5.735	98.262	200.971
Probability	0.046	0.102	0.004	0.057	0.000	0.000
Observations	40	40	40	40	40	40

Source: Researcher’s Computation (2022)

Interpretation

The wide variations in the values of the mean and the median, as well as the high values of standard deviation is an indication that the series are widely dispersed. None of the skewness was within the threshold of 0; all the series are positively skewed except interest rate. The values of the Kurtosis revealed that credit, exchange rate, inflation and

interest rate are leptokurtic while ACGS and AGRUT are platykurtic. The ρ -value of the Jarque-Bera statistic of all the series except agricultural output proved that the series violated the normal distribution assumption. However, the adoption of ARDL as the regression estimation technique is appropriate in this situation based on the nature of the series in the distribution.

Result of the Stationary Test

Unit Root Test (Augmented Dickey Fuller (ADF) is used to test for stationary in the series and the result is presented in Table 2.

Table 2: Result of the Unit Root Test (Augmented dickey Fuller (ADF) test

Series	Equation Spec.	Augmented Dickey Fuller			Remarks
		T-tab 5%	@ I(0)	@I(1)	
ACGS	None	0.05	0.996	0.000	I(1), Intercept
	Intercept	0.05	0.552	0.000	
	Intercept & Trend	0.05	0.954	0.000	
AGRUT	None	0.05	0.941	0.392	I(0), Intercept
	Intercept	0.05	0.026	0.000	
	Intercept & Trend	0.05	0.629	0.000	
CR	None	0.05	0.862	0.000	I(1), Intercept
	Intercept	0.05	0.667	0.000	
	Intercept & Trend	0.05	0.738	0.000	
EXCH	None	0.05	0.757	0.005	I(0), Intercept
	Intercept	0.05	0.083	0.047	
	Intercept & Trend	0.05	0.906	0.004	
INFL	None	0.05	0.153 0.013	0.000	I(0), Intercept
	Intercept	0.05	0.011	0.001	
	Intercept & Trend	0.05		0.006	
LR	None	0.05	0.999	0.000	I(1), Intercept
	Intercept	0.05	0.999	0.002	
	Intercept & Trend	0.05	0.539	0.338	

Source: Researcher’s Computation (2022)

In Table 2; the result revealed that agricultural output, exchange rate and inflation are stationary at level while agricultural credit guarantee scheme, credit and interest rate are stationary at first difference. This implies that series are stationary at different integration order; therefore, cointegration test was conducted to know if the series would converge with time (in the long run), even if there are shocks in the short run, which may affect movement in the individual series. Therefore, ARDL (testing for bounds test, cointegration and long run form) was used to estimate each of the models.

Optimal Lag Length Criteria

Prior to the main estimation, the most appropriate lag length for the model was first determined using VAR Lag Order Selection Criteria. The result of the test is shown in Table 3.

Table 3: Result of the Optimal Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-302.838	NA	1044398.	16.694	16.955	16.786
1	-273.415	47.712*	225106.0*	15.158*	15.462*	15.265*
2	-273.289	0.197	236546.6*	15.205	15.533	15.328
3	-273.091	0.301	247757.9*	15.639	15.639	15.386

Source: Researcher’s Computation (2022)

*indicates lag order selected by the criterion

The results of the optimal lag length selection using Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ) revealed that the appropriate lag length for this model is 1. In real terms, it implies that it would take one (1) year before the impact of the independent variables could be felt on the dependent variable, although this is only applicable when estimating the short-run model as every shock in the short run would have converged in the long run.

After determining the most appropriate lag length, the ARDL bound test was carried out to ascertain the existence of long-run relationship between the independent variables and the dependent variable (AGRUT). The result of the ARDL bound test is presented in Table 4.

Table 4: Result of the ARDL Bound Test

Test Statistic	Value	K
F-statistic	11.11	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
5%	2.62	3.79

Source: Researcher’s Computation (2022)

As displayed in Table 4, the result of the bound test with the F-Stat of 11.11 which is higher than the value of the upper bound at 5 per cent implies that long run relationship exists between the agricultural output, credit financing and monetary policy measures. Thus, the study estimated the ARDL long-run equation and presented the result in Table 5.

Table 5: Long Run Regression Model and Post-Estimation Tests

Variable	Coefficient	Std Error	t-Stat.	Prob
C	2700.926	174.669	15.463	0.000
ACGS	0.001	0.000	15.087	0.000
CR	-0.032	0.027	-1.162	0.262
EXCR	39.886	1.967	20.279	0.000
INF	25.506	8.161	3.125	0.007
IR	34.679	12.085	2.869	0.011
Adjusted R-squared		0.998		
F-Statistics		876.45		
Prob(F-stats)		0.000		
Diagnostic Tests	Statistics	Probability		
Normality test (Jarque-Bera)	0.07	0.96		
Breusch-Pagan LM Serial Correlation Test	1.10	0.308		
Heteroskedasticity: Glejser	1.73	0.134		
Ramsey Reset	8.50	0.11		
Durbin – Watson Test	2.413			

Interpretation

The result of the Ramsey Reset Test, assessing the model for linearity assumption showed the linear relationship exists between the explained and the explanatory variables ($\rho = 0.11$). The ρ -value of Glejser Test of 0.13 explained the consistencies in the variations of the residuals of the model; also, ρ -value of Breusch-Godfrey test of 0.308 proved that the model is not suffering from serial correlation problem; likewise, the ρ -value of the Jacque-Bera test as displayed in of 0.96 (see appendix) confirmed that the model is normally distributed. Lastly, the graph of the CUSUM test for stability with the line lying in-between the upper and the lower bound (not crossing one another) implies that the parameters of the model do not suffer from any structural instability over the period of study. That is, all the coefficients in the error correction model are stable. Thus, the model passed all the assumptions of regression estimate and the ARDL long run estimation result is presented and explained.

ARDL Long Run Estimation

$$AGRUT_t = \alpha_0 + \alpha_1 ACGS_t + \alpha_2 CR_t + \alpha_3 EXCH_t + \alpha_4 INFL_t + \alpha_5 LR_t + \varepsilon_t$$

$$AGRUT_t = 2700.9 + 0.001 ACGS_t - 0.031 CR_t + 39.8 EXCH_t + 25.5 INFL_t + 34.6 LR_t + \varepsilon_t$$

The result of the ARDL long run analysis for Agricultural credit guarantee scheme on Table 5 shows that: agricultural credit guarantee scheme ($\beta_1 = 0.001, \rho = 0.00$), exchange rate ($\beta_3 = 39.9, \rho = 0.00$), inflation ($\beta_4 = 25.5, \rho = 0.01$), and interest rate ($\beta_5 = 34.67, \rho = 0.01$) positively and significantly affect agricultural output in Nigeria. The magnitude of the effect estimated by the coefficients proved that an increase in the agricultural credit guarantee scheme would yield 0.001 percentage contribution to GDP by agricultural sector; a naira increase in exchange rate would cause a 39.9 percent increase in percentage contributed to GDP by agricultural sector; as inflation rate increased by a percent agricultural sector contribution to GDP would increase by 25.5 percent; and that a percentage increase in real interest rate would cause a 34.67 percent increase in percentage contributed to GDP by agricultural sector in Nigeria. Contrarily, credit to the agricultural sector has negative but insignificant effect on agricultural output in Nigeria ($\beta_2 = -0.03, \rho = 0.26$), indicating that a percentage increase in credit to the agricultural sector would cause a 0.03 decrease in agricultural output in Nigeria;

The value of the coefficient of multiple determination (adjusted R^2) of 0.998 implies that credit financing and monetary policy is responsible for 99.8% changes in agricultural output while the other 0.2% changes in agricultural output is caused by other factors not covered in the model. At the level of significance of 0.05, the p-value of f-

statistic 4.69 is 0.00, which is less than 0.05 level of significance. Therefore, the study did reject the null hypothesis which states that there is no significant relationship between credit financing, monetary policy and agricultural output in Nigeria. Therefore, the performance of agricultural sector in Nigeria is significantly affected by credit financing and monetary policy.

DISCUSSION OF FINDINGS

The significant positive relationship between Agricultural credit guarantee scheme and agricultural output discovered agreed with the findings of Sulaimon (2021) who studied agricultural credit guarantee scheme fund (ACGSF) and agricultural performance in Nigeria and found that Agricultural Credit Guarantee Scheme has significant positive effects on agricultural performance. It also aligned with the findings of Ruben, Nyam and Rukwe (2020) who examined Agricultural Credit Guarantee Scheme fund and its effect on Agricultural output in Nigeria and found that agricultural Credit Guarantee Scheme Fund has a positive effect on agricultural output in Nigeria.

However, the study did not align with the findings of Andohol and Abbah (2018) studied Agricultural credit guarantee scheme and agricultural output in Nigeria found that Agricultural Credit Guarantee Scheme has a negative relationship with Agricultural Output; Kenny (2019) who examined the role of agricultural sector performance on economic growth in Nigeria and found that Agricultural Credit Guarantee Scheme Fund has an insignificant impact on the agricultural domestic production.

The insignificant negative impact of credit to agriculture on agricultural output in Nigeria obtained negated the findings of Osabohien, Mordi and Ogundipe (2020) who studied access to credit and agricultural sector performance in Nigeria and found that Credit is significantly and positive in explaining the level of agricultural performance in Nigeria. Anh, Gan & Anh (2020) also studied whether credit boost agricultural performance evidence from Vietnam and their results indicate that credit has significant and positive impact on Agricultural Performance. Nakazi & Sunday (2020) studied the effect of Commercial Banks Agricultural credit on Agricultural growth in Uganda and found that credit has significant positive impact on Agricultural Output.

The findings of this paper of significant impact of exchange rate agricultural output in Nigeria aligned with the findings of Awolaja and Okedina (2017) but negates the report of Adekunle *et al.*, (2016) as their study was indifferent to the relationship between real exchange rate volatility and agricultural output in the Nigerian economy.

The significant positive effect of inflation on agricultural output in Nigeria obtained in this paper is in line with the findings of Akpaeti, Agom and Frank (2019) who studied the effect of inflation on farmers' income in Nigeria 1970 to 2017 and the results showed that inflation has positive and significant effect on agricultural performance. The study was in contrast with that of Agbonkhese & Ughulu (2020) who studied the Agricultural Sector and Macroeconomic Policy Variables in Nigeria and found that inflation rate will impact negatively and retard the growth of the agricultural sector. Oboh, Tule & Ebuh (2019) examined the impact of monetary policy on agricultural sector performance in Nigeria and found that in the long run, the findings suggested that inflation do not significant effect on the agriculture value added.

This paper found that real interest rate has a strong positive and significant effect on agricultural output in Nigeria. This aligned with the findings of Donny & Ibeinmo (2021) but not in tandem with Iliyasu (2019) and Asekome and Ikojie (2018) as both obtained significant negative impact of interest rate on agricultural growth.

5.0 CONCLUSION AND RECOMMENDATIONS

The study examined the effect of credit financing and monetary policy on agricultural output in Nigeria. Conclusively, all the explanatory variables, agricultural credit guarantee scheme, interest rate, exchange rate, inflation rate significantly impact the performance of the agricultural sector in Nigeria except for the credit availability to this sector. However, the significant positive impact of interest rate, exchange rate, and inflation could only be justified by regulatory policies established by the government such that the sector could use official rate in acquiring implements and tools, obtained low-interest rate credit through the statutory scheme. On the contrary, it faults the believe of nature as it is expected that inflation, exchange rate volatility should impair the performance of the economy at large with agricultural sector inclusive. Based on the findings of this study, it is therefore recommended that:

1. The government should improve its funding in the agricultural sector in order to grow the economy. The government should improve her budgetary allocation to agriculture at all level as this will improve the economy.
2. Policy makers like the bank of industry, central bank of Nigeria should ensure that more loans are provided for agricultural activities as this will help grow the economy.
3. The public should be encouraged to go into agriculture and access credit facilities either as individuals or as a cooperative society so as to encourage economic growth.
4. The government should reduce the requirements of the credit scheme for smallholder farmers in order to achieve greater inclusiveness and better agricultural productivity

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Appendix

