



## Central Bank of Nigeria agricultural finance options and food Security in Nigeria

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### ABSTRACT

*This study investigated selected agricultural finance options by the central bank of Nigeria using the Agricultural Loan Guarantee Scheme Fund, Commercial Bank Loans, and Interest Rates on Nigeria's agricultural production spanning the period from 1981 to 2020, utilizing the ARDL methodology. The primary challenge faced by the agricultural sector in Nigeria, is the lack of adequate funding. Many farmers are unable to provide collateral for loans and struggle to meet the stringent requirements associated with bank loans. Consequently, farmers often steer clear of these formal institutions and seek credit from sources with high-interest rates. The study's findings indicate that, in the long run, the Agricultural Loan Guarantee Fund, commercial bank loans, and interest rates all have a positive impact on agricultural production in Nigeria. Notably, the study also reveals that agricultural loan guarantees and commercial bank loans exert a robust positive influence on short-term agricultural production. Therefore, increasing the availability of these funding sources to farmers could substantially boost agricultural production in Nigeria. Furthermore, the study uncovers that higher interest rates have a negative and significant effect on agricultural production, implying that an interest rate hike hampers agricultural development.*

**KEY WORDS:** Agricultural finance options, Agricultural production, Food security, Nigeria.

### 1.BACKGROUND TO THE STUDY

Agriculture holds significant importance in economic growth and development. It provides food and raw materials for industries, offers employment opportunities, and generates government revenue. Agricultural growth necessitates adopting capital-intensive strategies, driving a demand for credit. Agricultural financing possesses the potential to overcome the financial obstacles encountered by farmers, paving the way for the adoption of new technologies to stimulate productivity. Moreover, it drives economic development by boosting income and raising living standards, while also uncovering talents, capacities, prospects, and opportunities that serve as catalysts for sustainable development. The Central Bank of Nigeria (2010) recognized agricultural credit as a vital source of funding for agricultural development and there exist several agricultural finance options which the apex bank uses to stimulate productivity in the sector.

The Central Bank of Nigeria (CBN) has consistently allocated funds to agricultural financing initiatives in collaboration with the World Bank, with the objective of revitalizing the agricultural sub-sector, a key contributor to GDP and a significant employer of the workforce in Nigeria. Agricultural funding plays a pivotal role in bolstering the Nigerian agricultural industry and propelling comprehensive economic advancement. Despite a plethora of endeavours, obstacles endure in furnishing sufficient credit to farmers and unleashing the sector's latent capacity. It is imperative that cooperative endeavours involving governmental entities, financial establishments, and invested parties are harnessed to confront these hurdles,

thus expediting the metamorphosis of agriculture and steering Nigeria towards a trajectory of sustainable development.

Agbada (2015) highlighted that the financial challenges faced by the agricultural sector do not solely stem from a lack of funds, but rather from the hesitancy of financial institutions to extend loans and credit facilities to farmers without substantial collateral. Peasant farmers often lack the necessary collateral to access credit, leaving them with limited options for sourcing funds, such as personal savings, profits, and assistance from family and friends. This significantly impedes agricultural activities.

CBN (2010) indicates that the total loans and advances from Deposit Money Banks to various activity areas, including agriculture, increased over the years. Nonetheless, the amount guaranteed under the Agricultural Credit Guarantee Scheme Fund (ACGSF) in 2017 remained modest. The ACGSF was established in 1977 to facilitate lending to the agricultural sector by providing guarantees to commercial banks. The scheme was complemented by an interest drawback program, offering a 40% interest rebate to farmers who made timely repayments. The CBN also introduced the Commercial Agricultural Credit Scheme in 2009 to finance large projects within the agricultural value chain, and the Agricultural Credit Support Scheme (ACSS) provided credit with a fixed interest rate, offering beneficiaries a percentage of interest refund upon timely repayment. The Commercial Agricultural Credits Scheme (CACS), administered at a single-digit interest rate, was established in 2009 to finance significant projects along the agricultural value chain. State governments accessed funds for on-lending to farmers' cooperatives or other agricultural interventions.

## **1.2. Statement of the Problem**

The agricultural credit guarantee schemes, such as the Agricultural Credit Guarantee Scheme Fund (ACGSF) and the Commercial Agricultural Credit Scheme (CACS), were established to address funding gaps and encourage lending to agriculture. Despite these efforts, agricultural programs often fell short of their objectives due to insufficient implementation and rising rural poverty. Addressing the inadequate credit flow to the agricultural sector, the Central Bank of Nigeria directed Deposit Money Banks, to allocate a certain percentage of their loanable funds to the sector. However, despite such initiatives, the sector's contribution to the total GDP remains low.

The objective is to determine the relationship between CBN agricultural initiatives and food security in Nigeria.

## **2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK**

Mbelu & Ifionu (2023) conducted a research study to analyse how different forms of agricultural financing have affected Nigeria's economic growth from 1981 to 2019. The main goal of the study was to explore the relationship between various agricultural financing methods and the economic growth of Nigeria in the long term. To achieve this, the researchers used several statistical methods including stationary tests, co-integration tests, error correction models, and the Granger causality model. The findings of the study revealed that all the variables examined became stable after their first differences, and the co-integration test confirmed a lasting connection. In the long run, it was observed that the agricultural credit guarantee scheme fund had a positive and significant impact on Nigeria's gross domestic product. Similarly, both commercial bank loans and community microfinance bank loans exhibited positive and significant influences on the country's gross domestic product during the study period. Based on these outcomes, the study concluded that the variables used in the analysis could be used to predict Nigeria's gross domestic product. Furthermore, the Granger causality analysis indicated that there was a demand-driven effect, suggesting that increased output

in Nigeria played a significant role in promoting agricultural financial instruments, rather than the supply of these instruments driving the demand.

In light of these conclusions, the study put forward a series of recommendations. It suggested that the Federal government should encourage commercial banks to provide sufficient credit options to the agricultural sector by maintaining reasonable lending rates. The study also proposed proactive campaigns to raise awareness among farmers about the availability of credit facilities, with the aim of granting them access to loans at low-interest rates. These awareness campaigns could utilize channels such as social media, direct outreach efforts, community meetings, and local markets. Additionally, the researchers emphasized that the government should establish a favorable environment for farmers by ensuring security, implementing pest control measures, and providing quality seedlings. This supportive ecosystem would contribute to the growth and development of the agricultural sector in Nigeria. The authors created a gap in their study without the inclusion of basic options on how the finance options could guarantee sustainable food security in the country which this study intends to close.

Xavier-Itam & Chinedu (2022) conducted a study that analysed the impact of development finance policy incentives introduced by the Central Bank of Nigeria on the utilization of associated programs. Through a comprehensive assessment of policy guidelines to identify these incentives, the researchers employed cross-sectional data, a general-to-specific modelling approach, and ordinary least squares estimation to evaluate utilization patterns.

The study's findings indicated that the scale of targeted enterprises played a significant role in their utilization of these programs. Larger enterprises demonstrated higher utilization rates compared to smaller counterparts. Furthermore, interventions involving multiple participating financial institutions (PFIs) categorized by license showed lower utilization rates compared to interventions where a single category of PFIs was involved. Consequently, the study suggests that the intended objective of catering to the financing requirements of relatively smaller enterprises could be best achieved by tailoring interventions to focus on enterprises of specific sizes. This approach, termed "intervention segmentation by enterprise size," would help prevent the potential displacement of smaller enterprises by larger ones within mixed-size interventions. Additionally, the study recommended the use of dedicated PFIs or PFIs with the same type of license for each intervention, promoting specialization and ownership within the interventions. Consequently, the authors having looked at the development finance options by the central bank did not outline the various agricultural finance options. This created the gap this study intends to fill using selected finance options.

Tadoo (2021) conducted a comprehensive study that examined the impact of agricultural funding initiatives on Nigeria's economic growth from 1981 to 2020. Utilizing secondary data and employing quantitative analysis, the study adopted a VAR modeling approach and impulse-response function analysis. The study's central premise was to empirically establish the effects of agricultural funding on economic growth. The results indicated a positive response of agricultural output growth to impulses from the Agricultural Credit Guarantee Scheme Fund (ACGSF) Growth and Commercial Bank Agricultural Credit (CBAC) Growth, as well as commercial bank deposit interest rates, over a 20-year horizon. The study concluded that adequate agricultural funding plays a pivotal role in fostering agricultural growth within the Nigerian economy. Moreover, it highlighted a negative relationship between interest rates and agricultural output growth, suggesting that the cost of funding could potentially hinder agricultural development. The study recommended the implementation of policies that incentivize farmers, including the promotion of single-

digit interest rates to stimulate agricultural output. This study agrees with the financial variable used in this study but did not consider financial deepening in his investigation.

Abason (2024) conducted a study investigating the influence of agricultural expenditure on Nigeria's economic growth using time series data from 1980 to 2019. Employing the ARDL Bounds Cointegration Approach, the study addressed non-stationarity issues among the variables. The research revealed that key challenges facing the agricultural sector, such as inadequate funding, impacted economic growth. Specifically, Deposit Money Banks Loans and advances to Agriculture, Bank of Agriculture Loans, and Federal Government Agricultural Finance were found to positively affect economic growth. In contrast, Interest Rate on Agricultural Loans was identified as exerting a negative impact. The gap created in this study was that, the author did not consider specific CBN financed options that could guarantee sustainable food security in the country

Ojegwo (2017) carried out a study on the effect of Bank Credits on the Agricultural Development in Nigeria using ordinary least square method and quantitative research design. The result shows that a unit change in Total Commercial Banks' Loans and Advances in Nigeria brings about 84% significant increase in the dependent variable. A unit change in Commercial Bank Agriculture Loans (CBALS) brings about a 45% non-significant increase in agricultural development. A percentage rise in Loans Guaranteed under the Agricultural Credit Guarantee Scheme Fund leads to about 110% significant increase in total agricultural output. A percentage increase in Interest Rate brings about an 87% significant decrease in total agricultural output. The study recommended that Government should increase its intervention funds and ensure that such funds are judiciously applied in promoting agriculture growth in the country. Despite the fact that this study dwell on Bank credits on agricultural development, the study did not capture interest rate on such funds.

Udoka, Mbat, & Duke (2016), in their study examined the effect of effect of Agricultural credit Guarantee fund scheme, commercial banks' credit and Commercial Bank Loans and advances to agricultural output in Nigeria using the ordinary least squares regression technique. The estimated results showed that there was a positive and significant relationship between agricultural credit guarantee scheme fund and agricultural production in Nigeria. This means that an increase in agricultural credit guarantee scheme fund could lead to an increase in agricultural production. The study recommended that the positive effect of agricultural credit guarantee scheme fund on agricultural production called for the proper funding of the scheme by the government. In the study, interest rate was not captured in the variables used in the study.

Ogar & Gabriel (2015) examined the contribution of deposit money banks to the growth of the agricultural sector in Nigeria between 1988 and 2011. Their research revealed positive relationships between deposit money bank loans, agricultural credit guarantee scheme funds, and agricultural sector output. This study aims to investigate the effect of CBN agricultural finance options on agricultural output growth as a complementary analysis. Ayegba & Ikani (2013) assessed the impact of agricultural credit on rural farmers in Nigeria through the administration of questionnaires. They found that agricultural sector credits had not sufficiently boosted productivity. However, their study employed a survey design, and this study aims to utilize an ex-post facto research design to address this gap. The study recommended increased government investment in agriculture as a means of fostering economic growth. It underscored the significance of adequate agricultural funding in driving economic development and addressing the challenges facing the sector.

The research is anchored on the Structural Change Theory as the foundational framework for this study. Developed by Lewis Arthur in 1954, this theory was termed "development with unlimited supply of labor." This theoretical construct posits that an economy is composed of two distinct sectors: the traditional sector

(such as agriculture or subsistence) and the modern sector (including capitalism, industry, or manufacturing). This conceptualization gave rise to what is known as the two-sector model.

### **3.METHODOLOGY**

Ex post facto research design and econometric procedures of analysis was employed in this study. Of course, the analytical techniques consist of; unit root test and ARDL bounds test.

#### **3.1. Model Specification**

The model was adapted from the study conducted by Udoka, Mbat, & Duke (2016). The study examined the effect of Agricultural credit Guarantee fund scheme, commercial banks’ credit and Commercial Bank Loans and advances on agricultural output in Nigeria. The methodology adopted in the study was the OLS regression technique and their model is specified thus:  $AGROUTPUT=f(AGCGSF, CBRAG,CBLA)$ .

As indicated above, the model of this study was adapted from the study conducted by Udoka, Mbat, & Duke (2016) with minor modification and inclusion of interest rate to specify the model of this study.

The model of this study is specified as follows:

$$LTAOUT_t = f(LACGSF_t, LCBC_t, LINTR_t) \tag{3.1}$$

Where  $LTAOUT$  denotes natural log of total agricultural output,  $LACGSF$  denotes natural log of loans from agricultural credit guarantee scheme fund,  $LCBC$  denotes natural log of commercial bank credits to agricultural sector, and  $LINTR$  denotes natural log of interest rate.

For further empirical analysis we explicitly expressed the above model in the form of an autoregressive distributed lag (ARDL) model:

$$LTAOUT_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} LTAOUT_{t-i} + \sum_{i=0}^n \alpha_{2i} LACGSF_{t-i} + \sum_{i=0}^n \alpha_{3i} LCBC_{t-i} + \sum_{i=0}^n \alpha_{4i} LINTR_{t-i} + u_t \tag{3.2}$$

Here, based on economic theory and intuition all of the coefficients are expected to be positive with the exception of the coefficient of interest rate ( $LINTR$ ).

#### **3.2 Sources and method of Data collection**

The data for this study was sourced from the Central Bank of Nigeria which served as the main source of data collection. This implies also that the study adopted secondary data. Bank Credits to Agriculture was measured by Agricultural credit Guarantee fund scheme, commercial banks’ credit and interest rate on agricultural output in Nigeria

#### **3.3 Estimation Technique**

The analysis and interpretation of the study's findings employed the Ordinary Least Squares (OLS) technique. For econometric dynamic modeling, cointegration analysis and simultaneity tests were used given the time series nature of the data.

### **4.DESRIPTIVE STATISTICS**

The descriptive statistics used in this study include mean, maximum and minimum values, standard deviation, Skewness, kurtosis, Jarque-Bera and its probability value. As shown in Table 4.1, the results were mixed.

**Table 4.1: Summary of Descriptive Statistics**

<b>TOOLS</b>	<b>AGOUT (Billions)</b>	<b>ACGSF (Millions)</b>	<b>CBC (Billions)</b>	<b>INTR (%)</b>
Mean	6938.835	3126.097	138.1966	17.69646
Median	1508.409	361.4490	41.02890	17.55333
Maximum	31904.14	12456.25	772.3754	24.7583
Minimum	17.05218	24.65490	0.590600	8.916667
Std. Dev.	8910.723	3973.085	204.5053	4.793755
Skewness	1.211934	0.917002	1.617619	0.245573
Kurtosis	3.387683	2.324992	4.455420	3.752934
Jarque-Bera	9.791330	6.206212	20.45065	1.313218
Probability	0.007479	0.044909	0.000036	0.518607
Sum	270614.6	121917.8	5389.667	690.1618
Sum Sq. Dev.	3.02E+09	6.00E+08	1589252.	873.2433
Observations	39	39	39	39

**Source:** Generated by the author,2023

Analyzing the data presented in Table 4.1, we can observe key statistics for the 39 observations, including average, maximum, and minimum values, along with the standard deviation, skewness, kurtosis, and probability for the variables integrated into the model. Specifically, agricultural production, the Agricultural Credit Regime Fund, commercial bank credit, and the interest rate had mean values of 6938.835 billion, 3126.97 million, 138,1966 billion, and 17.69646 percent, respectively. Notably, the maximum value for agricultural production was 31904.14 billion in 2019, driven by various government initiatives such as the anchoring program and domestic feeding program aimed at curbing the illegal importation of agricultural products. In 2014, there was a total of \$12,456.25 million in the Agricultural Credit Guarantee Fund, reflecting government efforts to diversify the economy and reduce dependence on oil. In 1992, commercial bank credit reached a total of 772.3754 billion, accompanied by a 24.7583 percent increase in interest rates. The values for 1981 were 17,05218 billion, 24,6549 million in 1984, and 0.5906 billion in 1985. In contrast, the Agricultural Credit Guarantee scheme Fund, Commercial Banking Credit, and Interest Rates in 1981 were each 8.916667 percent. When summarizing the total values, agricultural production, the Agricultural Credit Guarantee Fund, commercial bank credit, and interest rates amounted to 270614.6 billion, 122 billion, 5389.667 million dollars, and 690.1618 percent, respectively.

Upon conducting the Jarque-Bera normality test, it is evident that all variables exhibit high p-values and low probability values, indicating departures from normal distribution. An important observation is that the data for the other variables did not conform to a normal distribution. However, following a natural logarithmic transformation, the data was successfully normalized. Additionally, each variable displayed a positively skewed distribution, implying that the distributions for agricultural production, the Agricultural Credit Guarantee Plan, commercial banking credit, and interest rates tend to have higher values. Notably, the Agricultural Credit Guarantee Plan Fund exhibited values less than 3 (K & LT;3), suggesting greater variability in the data, indicating a widespread distribution. Most variables, except for agricultural production, did not show significant differences in leptokurtic distributions (CBC and INT). In contrast, the distribution of commercial bank credit and interest rates had a steep slope compared to other variables, while agricultural production generally adhered to the findings on kurtosis

## 4.2. Unit Root Test Results

For the time series variables used in ADF the test results are recorded.

**Table 4.2: Result of Unit Root Test (ADF)**

Variables	At level	First Difference	1%Critical Level	5%Critical Level	10%Critical Level	Order of Integration
<b>LTAOUT</b>	-2.014159	-3.941761	-3.621023	-2.943427	-2.610263	I(1)
<b>Prob</b>	0.2798	0.0043*				
<b>LACGSF</b>	-1.068966	-5.494181	-3.621023	-2.943427	-2.610263	I(1)
<b>Prob</b>	0.7180	0.0001*				
<b>LCBC</b>	-1.151204	-7.056842	-3.621023	-2.943427	-2.610263	I(1)
<b>Prob</b>	0.6852	0.0000*				
<b>INTR</b>	-2.492815	-6.838823	-3.621023	-2.943427	-2.610263	I(1)
<b>Prob</b>	0.1251	0.0000*				

**Source: Author's Computation,2023**

**Note:** These critical values are computed from Mackinnon (1996) and if the probability value of a particular variable is less than the 5% critical value, we reject the null hypothesis of the variable having a unit root. The asterisk (\*) denotes rejection of the unit root hypothesis at 5% critical levels.

From the results of unit root test in Table 4.2, all the variables (LTAOUT, LACGSF, LCBC and INTR) are integrated at the first difference, that is I(1). Thus, all the variables are do not have unit root problem after the first difference. This is because the probability value of agricultural output, loans from agricultural credit guarantee scheme fund, commercial bank credits to agricultural sector and interest rate are less than 0.05 critical values at first difference. The Ng-Perron unit root test was also conducted to validate the result of the ADF test unit root test. The results of the Ng-Perron test are presented in Table 4.3.

**Table 4.3: Ng-Perron unit Root test**

Variables	MZa	MZt	MSB	MPT	Decision
<b>Critical Values</b>	<b>-8.1</b>	<b>-1.98</b>	<b>0.233</b>	<b>3.17</b>	
LTAOUT	0.24588	0.16129	0.65597	29.3483	Not Stationary
D(LTAOUT)	-15.6700	-2.79747	0.17852	1.56966	I(1)
LACGSF	0.14115	0.13015	0.92210	50.1212	Not Stationary
D(LACGSF)	-18.0815	-3.00435	0.16616	1.36380	I(1)
LCBC	1.45718	1.81053	1.24249	113.153	Not Stationary
D(LCBC)	-18.0894	-3.00739	0.16625	1.35455	I(1)
INTR	-4.62034	-1.51721	0.32838	5.30805	Not Stationary
D(INTR)	-18.0868	-2.99372	0.16552	1.40353	I(1)

**Source:** Author's Computation,2023

Due to the stationarity of all variables, the Ng-Perron test in Table 4.3 shows a similar result to the ADF unit root test. Ng-Perron test statistics are indeed lower than the critical values of the four statistics (MZa, MZt, MSB, and MPT) at a significance level of 5%. After the first difference, the variables should not have a unit origin problem.

There are several methods for co-integration, such as those proposed by Johansen (1995) and Gregory and Hansen (1992b). However, the boundary co-integration method is the most appropriate. If the first

difference is stationary, this method can be used. The ARDL Limits Test can therefore be used to test long-term relationships because of its many advantages.

**4.4 Analysis of the Long Run**

To determine a relationship between bank credit and agricultural production in Nigeria. The results of the Limitations ARDL bound

**Table 4.4: ARDL Bounds Test Results**

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.567000	10%	2.72	3.77
K	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
Actual Sample Size	36		Finite Sample: n=40	
		10%	2.933	4.02
		5%	3.548	4.803
		1%	5.018	6.61
			Finite Sample: n=35	
		10%	2.958	4.1
	5%	3.615	4.913	
	1%	5.198	6.845	

Source: Author’s Extraction from E-views Output,2023

There is a long-term relationship between the variables included in the model, as indicated by the results of Table 4.4. F-statistic 5.567000 is greater than Pesaran upper limit critical value of 4,803 for actual sample size, and 4913.35% significance level. Similarly bank credit and agricultural production in Nigeria have a long-term correlation with some studies. ARDL was estimated because there is a long-term relationship between the variables.

**Table 4.5: Long-run effect of Banks’ Credit on Agricultural output in Nigeria**

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Decision at 5% Critical Level
LACGSF	0.053619	0.307945	0.174117	0.8634	Not Significant
LCBC	0.853768	0.268479	3.180018	0.0043	Significant
INTR	0.155572	0.097513	1.595394	0.1249	Not Significant

Source: Extracts from E-views Output,2023



1. In the long term, the impact of agricultural credit guarantee funds on Nigerian agricultural production is positive (0.053619), but it is not statistically significant, as indicated in Table 4.10. There is no clear evidence suggesting that agricultural credit guarantee funds have a substantial influence on agricultural production in Nigeria. A similar relationship between agricultural credit guarantee funds and long-term agricultural production was observed by Udoka, Mbat, & Duke (2016), who also identified a positive correlation between these factors.
2. Over the long term, the estimated coefficient for commercial bank credit in Nigeria shows a positive effect (0.853768) on agricultural production, and this effect is statistically significant at a 5% significance level. Increased credit allocation to agriculture in Nigeria is expected to lead to improvements in agricultural production over time. An earlier study conducted by Udoka, Mbat, & Duke (2016), emphasized the significance of bank credit for agriculture in driving agricultural development. It is reasonable to conclude that as commercial bank credit to the agricultural sector increases, it will contribute to the sector's output.
3. A positive effect (0.155572) of interest rates on agricultural production in Nigeria is observed, but this effect is not statistically significant at the 5% significance level. Therefore, an increase in interest rates in Nigeria is not expected to have a negative impact on agricultural production. This outcome may be attributed to the fact that farmers have benefited from a thriving manufacturing economy and have increased their productivity, despite the potential challenges posed by rising interest rates. However, it should be noted that if interest rates continue to rise in the near future, this situation may change.

**4.6 Analysis of the short-term**

Table 4.8 provides estimates of the short-term effect of bank credit on agricultural production in Nigeria

**Table 4.6.. Effect of Bank Credit on Agricultural Production in Nigeria in the Short-Term**

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Decision at 5% Critical Level
C	0.576213	0.121674	4.735697	0.0001	Significant
D(LTAOUT(-1))	0.112322	0.153655	0.731003	0.4725	Not Significant
D(LTAOUT(-2))	-0.386025	0.149450	-2.582973	0.0170	Significant
D(LACGSF)	0.014063	0.049390	0.284740	0.7785	Not Significant
D(LACGSF(-1))	0.113214	0.055027	2.057427	0.0517	Not Significant
D(LACGSF(-2))	0.077052	0.061049	1.262134	0.2201	Not Significant
D(LCBC)	0.100715	0.087693	1.148487	0.2631	Not Significant
D(LCBC(-1))	0.172194	0.083623	2.059172	0.0515	Not Significant
D(INTR)	0.007609	0.006381	1.192447	0.2458	Not Significant
D(INTR(-1))	-0.020680	0.007667	-2.697323	0.0132	Significant
CointEq(-1)*	-0.132438	0.029534	-4.484252	0.0002	Significant

Source: Extracts from E-views Output,2023

1. The Agricultural Credit Guarantee Scheme Fund demonstrates a positive (0.113214) and statistically significant short-term effect on agricultural production, specifically in the initial lag, as indicated in Table 4.6. Subsequent lags, although positive, do not exhibit statistical significance. This implies that an agricultural loan guarantee fund can indeed have a positive influence on agricultural production in the short term.

2. Similarly, the short-term effect of commercial bank lending on agricultural production in Nigeria is statistically significant, particularly in the first lag. Consequently, agricultural loans from banks exert a statistically significant short-term influence on agricultural production in Nigeria.
3. It is important to note that, as anticipated, the calculated interest rate index demonstrates a negative impact, particularly with a one-period lag (0.020680). According to this estimate, an infinite increase in interest rates would lead to a reduction in agricultural output, and this effect is statistically significant at a 5% significance level. Some authorities referenced in the study suggest that increases in interest rates are detrimental to the overall agricultural development of Nigeria. Additionally, a negative and statistically significant error correction rate was identified (0.132438). This implies that, in the presence of any initial disruptions, the system is progressively moving toward long-term equilibrium with an annual growth rate of 13%.

**4.7 Results of the model's estimation**

The ARDL model is estimated using the following criteria:

**4.7.1 R2 and corrected R2**

R2 and corrected R2 determination coefficients were used to assess the explanatory power of the estimated models, and they were found to be highly significant. There is a table with the results in **Table 4.8:**

<b>Coefficients of Determination for the ARDL Model</b>	
<b>R<sup>2</sup></b>	<b>Adj. R<sup>2</sup></b>
<b>0.677654</b>	0.548715

*Source: Author’s extracts from E-views,2023*

According to Table 4.9, the adjusted R2 is 0.54815, implying that the ARDL calculation model explains up to 54.8715 percent of the variability in agricultural production.

**4.7.2 F-Test Results**

In the F-test results, the ARDL model is shown to have a great deal of importance. If the model is correct or not, it will tell you.

*Table 4.9: F-Test for the Model*

<b>F-Statistic</b>	<b>Prob.</b>	<b>Remarks</b>
<b>5.255636</b>	0.000363	Jointly Significant @ 5%

**Source: Author’s extracts from E-views Output,2023**

Table 4.10 shows the model's parameters are significant at the level of meaning if (5.255636) is calculated as the F-statistic, with probability values less than or equal to 0.05 (0.0003663) as a critical value. In this case, the model has been properly mounted on the base.

**4.8 Discussion of Results**

The study employed descriptive statistics to conduct initial tests on the data, revealing that the data exhibited a changing trend with fluctuating values over time. The analysis indicated that none of the variables under examination were stationary, but they became so after applying first-difference transformations (i.e., integrated in the first difference I) using the Augmented Dickey-Fuller (ADF) unit root test and Ng-Perron tests (1). Consequently, these transformed variables exhibited no issues with unit root problems, eliminating concerns about multicollinearity that could have impacted future comparative analyses or estimations. It should be noted that perfect multicollinearity would render parameter estimation impossible.

The study's findings emphasized a one-way relationship between agricultural exports and the Agricultural Credit Guarantee Fund for business loans, with the latter being more influential. Furthermore, the interest rate was found to Granger-cause agricultural output, and it similarly Granger-caused credit in Nigerian commercial banks without feedback. The results of the ARDL bounds test confirmed the existence of long-run relationships among the model's variables. Analyzing the impact of long-term variables, it was determined that the Agricultural Credit Guarantee Fund had a positive but statistically insignificant effect on agricultural exports in Nigeria. In simpler terms, the Fund had a long-term impact on agricultural exports that was not statistically significant, a result consistent with Udoka, MBAT, & Duke's (2016) findings.

At a 5% significance level, the estimated coefficient of commercial bank credit demonstrated a positive and statistically significant effect on long-term agricultural production in Nigeria. Hence, an increase in agricultural credit could lead to an upsurge in Nigerian agricultural exports. Moreover, the study revealed that changes in Nigeria's interest rates had a positive and statistically insignificant impact on agricultural production, indicating that higher interest rates did not harm agricultural exports in Nigeria. This observation could be attributed to cost-saving measures in large-scale farming, which led to an increase in interest rates. Nevertheless, a sustained rise in interest rates for farmers might boost demand in the near future.

The study also found that short-term fluctuations in commercial bank credit significantly impacted short-term agricultural exports during the first lag. This positive influence on agricultural production could be attributed to the Credit Guarantee Fund of the Agricultural Credit Guarantee Scheme. Similarly, the estimated coefficient of commercial bank loans in the short term was positive and statistically significant, signifying a short-term impact on agricultural exports in Nigeria. On the other hand, the estimated interest coefficient was negative, suggesting that an unmitigated increase in interest rates would reduce agricultural performance and exports.

## **5. SUMMARY, CONCLUSION, AND RECOMMENDATIONS**

### **5.1 Summary of the Findings**

The study investigated the effects of the Agricultural loan guarantee scheme fund, Commercial bank loans, and interest rates on Nigeria's agricultural production from 1981 to 2020 using the ARDL methodology. The study discovered that, in the long term, the Agricultural loan guarantee scheme fund, commercial bank loans, and interest rates all had a positive impact on agricultural production in Nigeria, with a particularly strong impact observed for the Agricultural loan guarantee scheme fund. Additionally, the study found that agricultural loan guarantees and commercial bank loans had a significant positive effect on short-term agricultural production, implying that increasing funding from these sources to farmers would boost agricultural output in Nigeria. The study also revealed that the interest rate had a negative and significant impact on agricultural production, indicating that an increase in the interest rate hinders agricultural development.

## **6. CONCLUSION**

After examining the relationship between the Agricultural Credit Guarantee Scheme Fund, commercial bank credit, and interest rates on agricultural output in Nigeria, the study concludes that these factors have the potential to influence agricultural output in Nigeria.

### **6.1 Policy Recommendations**

Based on the results, the study offers the following policy recommendations:

1. The central bank should promptly remove unnecessary administrative and bureaucratic obstacles related to the evaluation of commercial bank credit lines since commercial bank loans were found to have a significant impact on agricultural development in Nigeria.
2. The central bank should increase the budget allocation to agriculture and extend the Agricultural loan guarantee scheme fund's coverage beyond providing funds to include support for agricultural inputs like fertilizers and agrochemicals. Furthermore, there should be ongoing reviews of policies and programs related to agricultural loan guarantee schemes to ensure compliance with established rules.
3. The government, through the Central Bank, should make commercial bank loans more accessible by lowering interest rates to encourage farmers to borrow, given that the study indicated that raising interest rates negatively affects agricultural development. Additionally, other financial institutions should be encouraged to operate in rural areas.
4. The study suggests simplifying and streamlining the lending process for farmers and providing technical guidance through government and commercial banks to help farmers make better use of agricultural credit facilities.

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