Effects of Financial Inclusion on Agricultural Output in Nigeria (2009-2024)

Ukoh, Josephine Ekperechukwu (PhD)
Department of Banking and Finance
Nnamdi Azikiwe University, Awka
Je.ukoh@uizik.edu.ng

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Abstract
This study examined the effect of financial inclusion on agricultural output in Nigeria over the period 2009 to 2024. Specifically, the study evaluated the effect of commercial bank loans and advances to the agricultural sector and Agricultural Credit Guarantee Scheme Fund (ACGSF) on agricultural output in Nigeria. The study utilized annual time-series secondary data obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin, covering the period 2009–2024. The data were analyzed using the Ordinary Least Squares (OLS) regression technique with the aid of E-Views 10.0 econometric software. The findings revealed that commercial bank loans and advances had a positive and statistically significant effect on agricultural output in Nigeria. However, the Agricultural Credit Guarantee Scheme Fund had a negative but statistically insignificant effect on agricultural output. Based on these findings, the study recommended that Deposit Money Banks should expand agricultural lending through farmer-oriented credit products, authorities should improve the accessibility and monitoring of ACGSF-backed loans, and banks and financial technology providers should expand mobile banking services and agricultural-focused digital financial products in farming communities.

Keywords: *Loans and advances, Agricultural Credit Guarantee Scheme Fund and Agricultural output*

Introduction

Agriculture has historically been the mainstay of the Nigerian economy prior to the discovery of crude oil in commercial quantities. A significant proportion of the Nigerian population engages in agricultural activities for both subsistence and commercial purposes. Nigeria, often described as the "giant of Africa," occupies a vast land area of about 923,768 square kilometres with an estimated population exceeding 200 million. This makes agriculture a critical sector for food supply, employment generation, and income creation. Umaru and Inusa (2022) noted that agricultural output is crucial in every developing country, particularly Nigeria, where food insecurity, rising food prices, and high food importation remain persistent challenges that require urgent attention. In recognition of the importance of financial inclusion to economic development, successive Nigerian governments and financial regulators have implemented several policies and programmes over time aimed at deepening access to financial services, particularly for rural dwellers and smallholder farmers. One of the earliest interventions was the

establishment of the Agricultural Credit Guarantee Scheme Fund (ACGSF) in 1977, by the Federal Government of Nigeria in collaboration with the Central Bank of Nigeria. The ACGSF was designed to encourage deposit money banks to increase lending to the agricultural sector by providing guarantees of up to 75 percent of the net default on loans granted to farmers and agro-allied enterprises (CBN, 2023). The scheme covers a broad range of agricultural activities, including crop production, livestock, fisheries, forestry, and agro-processing, with particular emphasis on smallholder farmers who often lack the collateral required to access conventional bank credit (CBN, 2022). By reducing lenders' exposure to credit risk, the ACGSF aims to promote financial inclusion in rural areas and enhance farmers' capacity to invest in modern farming technologies and productivity-enhancing inputs. This was followed by the establishment of the People's Bank in 1989, created to provide basic financial services to low-income earners, and the introduction of Community Banking in 1990, which expanded grassroots access to credit. The licensing of Microfinance Banks in 2005 further strengthened financial intermediation for rural dwellers and smallholder farmers. More recently, regulatory reforms, including simplified Know-Your-Customer (KYC) requirements and the cashless policy in 2012, aimed to facilitate account opening, promote digital payments, and expand formal financial services (Ozili, 2022). Collectively, these initiatives were designed to enhance rural participation in the formal financial system, with the expectation that improved access to finance would support investment in modern farming inputs and ultimately boost agricultural productivity and output.

Despite the existence of the ACGSF and other agricultural financing interventions, the level of formal credit reaching core farmers remains relatively low, while food inflation continues to be a major driver of overall inflation in Nigeria. This financial exclusion in the agricultural sector is reflected in the pattern of commercial bank credit allocation. Agriculture has consistently received a disproportionately low share of total bank loans and advances compared to other sectors such as manufacturing, oil and gas, and services. For instance, the agricultural sector received only 8 percent of commercial bank credit in 2000, 1.96 percent in 2006, and 1.67 percent in 2016, before increasing marginally to about 6.16 percent in 2023 (CBN Statistical Bulletin, 2023). This suggests that many rural farmers remain financially excluded and are unable to fully benefit from government-sponsored financing initiatives. Limited access to finance constrains investment in productivity-enhancing assets such as improved seeds, fertilizers, irrigation systems, mechanization, and storage facilities, thereby contributing to low agricultural productivity, rising food prices, and increased food importation.

However, this expansion has not translated into a commensurate improvement in agricultural output. A major challenge is that many farmers primarily use digital platforms for basic transactions such as cash withdrawals, transfers, and payments, rather than for accessing productivity-enhancing financial products like credit, savings, and insurance. Even where financial inclusion initiatives succeed in improving access to credit and digital financial services, the transmission of these gains into sustained agricultural output growth remains weak. Many farmers face income volatility and household financial pressures, leading to the diversion of agricultural loans to non-productive uses such as consumption, education, or healthcare.

These challenges raise concerns about the effectiveness of financial inclusion in stimulating agricultural output. Therefore, there is a need to empirically examine the effect of financial inclusion on agricultural output in Nigeria.

The broad objective of the study is to examine the effect of financial inclusion on agricultural output in Nigeria. The specific objectives include to;

1. Analyze the effect of Commercial Bank loans and advances to Agricultural sector on agricultural output in Nigeria.
2. Evaluate the effect of Agricultural credit guarantee scheme fund (ACGSF) on agricultural output in Nigeria

Conceptual Review

The growing importance of financial inclusion is largely connected to its role in promoting economic development and reducing inequality. A financially inclusive economy creates opportunities for individuals and businesses to access funds for investment, production, and consumption activities. According to Ugwuanyi and Okore (2022), access to financial services enables households to save securely, manage financial risks, and invest in productive ventures. For businesses, especially small-scale enterprises and agricultural producers, financial inclusion facilitates access to capital needed for expansion and increased productivity. Financial inclusion became a major policy concern following evidence that a significant proportion of the population lacked access to formal banking services. The Central Bank of Nigeria (CBN) and other financial regulatory authorities introduced several initiatives aimed at expanding access to financial services in Nigeria (Mobolaji, Edith, Onyinye, Chikezie and Ifeanyi, 2024). These initiatives include the establishment of mobile banking systems, agent banking, microfinance institutions, electronic payment platforms, and agricultural financing schemes designed to integrate underserved populations into the formal financial system (Ezeocha, 2024). The National Financial Inclusion Strategy introduced by the CBN sought to reduce the percentage of financially excluded Nigerians substantially by promoting digital financial services and expanding rural banking infrastructure.

Financial inclusion plays a critical role in the agricultural sector because agriculture remains one of the largest contributors to employment and economic activities in Nigeria. In spite its importance, the agricultural sector has historically faced challenges associated with inadequate financing, poor access to credit facilities, low technological adoption, and weak financial infrastructure (Ozili, 2021). Many smallholder farmers operate outside the formal financial system and therefore experience difficulty obtaining loans and other financial services necessary for agricultural production (Ayeomoni, and Aladejana, 2016). Financial inclusion addresses these challenges by providing farmers and agricultural entrepreneurs with access to credit, savings, and digital financial services capable of supporting farming operations and improving productivity.

Commercial Bank Loans and Advances

Loans and advances are credit facilities granted by commercial banks to individuals, businesses, organizations, and government institutions for productive, commercial, and consumption purposes under agreed repayment conditions (Akpanke, Antai, Iheanacho and Aboh, 2022). These facilities are provided to finance investment activities, business expansion, production operations, and other economic activities requiring additional capital. In Nigeria, commercial banks account for more than 60% of total financial intermediation activities, making them central to the mobilization and allocation of funds within the economy (Ezu, 2023). In Nigeria, commercial bank lending has increased significantly over the years. Total commercial bank credit to the private sector increased from approximately ₦15 trillion in 2015 to over ₦40 trillion by 2023, representing an increase of more than 160% within less than a decade. This growth

reflects the increasing role of commercial banks in financing productive activities and supporting economic expansion (Adeyinka, Abiodun and Kayode, 2019). However, access to bank credit remains uneven, particularly among rural dwellers, small-scale enterprises, and agricultural producers who often experience difficulties meeting formal lending requirements.

Commercial bank loans and advances are particularly important to the agricultural sector because agriculture remains one of the largest contributors to employment and economic activities in Nigeria. The sector contributes between 22% and 26% of Nigeria's Gross Domestic Product (GDP) and employs over 35% of the labour force. Despite this contribution, agriculture continues to face major financing challenges due to inadequate access to formal credit facilities (Yahaya and Oni, 2016). Many farmers rely on personal savings and informal borrowing arrangements because of difficulties associated with obtaining bank loans. Agricultural production requires substantial financial resources for the purchase of seeds, fertilizers, pesticides, machinery, irrigation facilities, transportation equipment, and storage infrastructure (Magaji, 2023). Commercial bank loans therefore provide an important source of financing capable of supporting farming operations and improving productivity (Ughulu and Odion, 2023). Data from the Central Bank of Nigeria indicate that commercial bank credit to the agricultural sector increased from about ₦0.6 trillion in 2010 to over ₦2.3 trillion by 2023, reflecting growing attention toward agricultural financing in the country (Magaji and Yisa, 2023).

Agricultural Credit Guarantee Scheme Fund (ACGSF)

The Agricultural Credit Guarantee Scheme Fund (ACGSF) is one of the major agricultural financing programmes established to improve access to credit facilities within Nigeria's agricultural sector. The scheme was established in 1977 by the Federal Government of Nigeria in collaboration with the Central Bank of Nigeria (CBN) and commenced operations in 1978 (Raufu, Fajobi, Dlamini-Mazibuko, Miftaudeen-Raufu and Olalere, 2025). The primary objective of the scheme is to encourage commercial banks and other financial institutions to increase lending to agriculture by reducing the risks associated with agricultural financing. Under the scheme, the Central Bank of Nigeria guarantees a substantial proportion of loans granted to farmers in the event of default, thereby encouraging financial institutions to extend more credit facilities to agricultural producers (Orok and Ayim, 2017).

The ACGSF was introduced because agriculture remains one of the most important sectors of the Nigerian economy, contributing significantly to employment generation, food supply, industrial raw materials, and national income. Despite this importance, many farmers historically faced difficulties obtaining loans from commercial banks due to the high risks associated with farming activities, including climate uncertainties, pest infestations, flooding, price instability, and poor infrastructure (Okunlola and Ayetigbo, 2024). Prior to the establishment of the scheme, formal agricultural financing in Nigeria remained relatively low, with many farmers relying heavily on personal savings and informal borrowing arrangements.

The initial capital base of the ACGSF at inception was approximately ₦100 million, shared between the Federal Government and the Central Bank of Nigeria in the ratio of 60% and 40% respectively Central Bank of Nigeria (CBN, 2023). Over the years, the capital base of the scheme increased significantly in response to the growing financing needs of the agricultural sector. The guaranteed portion of loans under the scheme generally covers up to 75% of the net amount in default, thereby reducing the exposure of lending institutions to credit risk (Chukwu, Onoh and Umoh, 2023).

The scheme covers a wide range of agricultural activities, including crop production, livestock farming, fisheries, agro-processing, storage, and agricultural marketing. Both small-scale and large-scale farmers are eligible to benefit from the programme provided they satisfy the lending conditions established by participating financial institutions (Samaila and Idris, 2023). Through this arrangement, the ACGSF has contributed to improving farmers' access to institutional credit and increasing agricultural investment across different parts of Nigeria (Sulaimon, 2021). The volume of agricultural credit guaranteed under the scheme has increased considerably over the years. Records from the Central Bank of Nigeria indicate that the cumulative value of loans guaranteed under the scheme rose from less than ₦1 billion in the early 1980s to over ₦150 billion by 2023 (CBN, 2006).

Agricultural Output

Agricultural output refers to the quantity and value of agricultural goods and services produced within an economy over a specific period of time. It includes crop production, livestock farming, fisheries, forestry, and other agricultural activities that contribute to food supply, industrial raw materials, employment generation, and national economic growth. Agricultural output is commonly used as a major indicator for measuring the productivity and performance of the agricultural sector in a country (Ayeomoni and Aladejana, 2016). In Nigeria, agricultural output remains an important driver of economic activities because agriculture provides food for the population, raw materials for industries, and employment opportunities for a large proportion of rural households (Ojo, Mustapha and Ismaila, 2022).

Historically, agriculture constituted the foundation of the Nigerian economy before the discovery of crude oil. During this period, agricultural exports such as cocoa, palm produce, cotton, rubber, and groundnut contributed significantly to foreign exchange earnings and national income. However, the emergence of the petroleum sector led to a decline in government attention toward agriculture, thereby reducing investment and productivity within the sector (Ayeomoni and Aladejana, 2016). Despite this decline, agriculture continues to contribute substantially to Nigeria's Gross Domestic Product (GDP) and remains one of the largest sources of employment in the country. According to the National Bureau of Statistics (2022), the agricultural sector contributed significantly to Nigeria's GDP in the fourth quarter of 2022, demonstrating the continued importance of the sector to national economic development.

Agricultural output in Nigeria is influenced by several factors including access to finance, government policies, infrastructure, technology, climatic conditions, farm inputs, and market accessibility. Access to agricultural financing plays a particularly important role because farming activities require substantial capital for seeds, fertilizers, irrigation systems, machinery, storage facilities, and transportation. Emaziye (2015) observed that financial constraints remain one of the major factors limiting agricultural productivity among Nigerian farmers, particularly small-scale rural farmers who often lack access to formal credit facilities. Similarly, Abraham (2018) noted that banking sector development and improved agricultural financing significantly enhance farmers' production capacity and productivity levels. The growth of financial inclusion has also contributed positively to agricultural output in Nigeria. Financial inclusion improves farmers' access to banking services, credit facilities, savings opportunities, and digital financial platforms necessary for agricultural investment and expansion.

Empirical Review

Elufisan, Bowale, and Ewetan (2026) examined the moderating role of institutional quality in the relationship between financial inclusion and inclusive growth in Nigeria, employing the ARDL model and Quantile Generalized Method of Moments (QGMM) using time series data from 1990 to 2023. The findings revealed that financial inclusion has a statistically significant positive impact on both aggregated and disaggregated inclusive growth. However, institutional quality exerted a direct cautionary effect on inclusive growth and distorted the positive impact of financial inclusion in the short run.

Adeagbo, Emiola, and Aderinto (2025) examined financial inclusion and agricultural productivity in Nigeria, employing the Autoregressive Distributed Lag (ARDL) model using secondary data which spanned 1980 to 2023 sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin. Loans and advances of commercial banks and rural bank branches served as independent variables, while agricultural output served as the dependent variable. Heteroscedasticity and cointegration tests confirmed the existence of cointegration among the independent variables. From the findings, it was revealed that loans and advances of commercial banks bring to bear a positive and significant effect on agricultural outputs in Nigeria.

Oyasor (2025) examined the impact of agricultural credit and insurance schemes on farm income stability and food security in Nigeria's smallholder agricultural economy, using a simulated microeconomic framework calibrated with representative national data and estimated via production and risk-behavioural models. The analysis demonstrated that access to affordable and timely credit had the most significant positive effect on farm-level income, followed by insurance and input subsidies. The findings revealed strong complementarities among these instruments: credit alleviated liquidity constraints, insurance reduced risk exposure and promoted risk-taking in productive investments, while subsidies enhanced short-term productivity but were less effective in isolation.

Ogunfolaju, Abdulhamid, Kolawole, Akangbe, Olutegbe, and Okonta (2025) investigated the constraints to digital financial services usage among smallholder farmers in North Central Nigeria, using a multistage random sampling procedure to select 812 respondents from Kogi, Kwara, and Niger states. Digital financial services adoption and its constraints served as independent variables, while smallholder farmers' economic resilience and productivity served as dependent variables. The findings revealed that digital financial services were majorly used for purchasing agricultural inputs and checking account balances.

Omodero and Okafor (2025) investigated the effect of treasury bill market operations on the profitability of Nigerian deposit money banks, employing panel data fixed effects regression using data from 2012 to 2023. Treasury bill yields, bank profitability, net interest margin, and private sector credit served as independent variables, while credit to agriculture served as a dependent variable. The research revealed that the crowding-out effect of T-bill investment on private sector credit is significant, with a 1 percent increase in bank T-bill holdings associated with a 0.6 percent decline in loans to the private sector. The study noted that the agricultural sector is disproportionately affected by crowding-out because agricultural loans are perceived as riskier and are often the first to be reduced when banks reallocate portfolios toward government securities. Okonkwo and Nwosu (2025) investigated the effect of mobile banking adoption on financial inclusion and economic growth in Nigeria, employing a mixed-methods approach combining Probit regression for survey data from 2,000 respondents and ARDL for aggregate data from 2010 to 2024. Mobile banking adoption served as the independent variable, while

formal financial account ownership, household income, and agricultural household income served as dependent variables. The study found that mobile banking adoption significantly increases the probability of formal financial account ownership by 32% and has a positive indirect effect on household income through improved savings and credit access. For farming households, mobile banking has been particularly transformative, reducing travel costs to bank branches and enabling timely input purchases through mobile credit products.

Madugbe, Onyeoma, and Anyiwe (2025) examined the impact of fintech-driven financial inclusion on economic growth in Nigeria, employing the ARDL model using quarterly time series data from Q1 2011 to Q4 2023. Financial inclusion measured through banking penetration and credit to the private sector served as independent variables, while real GDP per capita and agricultural GDP served as dependent variables. The long-run results indicate that financial inclusion and credit to the private sector play significant roles in driving sustained economic growth. The study found that fintech-driven financial inclusion has been particularly beneficial for the agricultural sector, with mobile money platforms enabling farmers to access credit, make digital payments for inputs, and receive payments for produce without traveling to physical bank branches in urban centers. Mukaila (2024) investigated microcredit via digital innovation platforms and its impact on fish farms' yield and income in Nigeria, employing econometric analysis of fish farmers' data. Microcredit accessed through digital innovation platforms served as the independent variable, while fish farms' yield and income served as dependent variables. The study, published in the Agricultural Finance Review, found that digital innovation platforms seek to enhance farmers' access to finance, production, and farmers' income. The study identified factors influencing fish farmers' access to microcredit from digital innovation platforms and provided empirical evidence on the impact of this microcredit on fish farm productivity.

Ugwu, Okafor, and Nwankwo (2024) investigated the impact of government-owned financial inclusion programs on economic growth in Nigeria, employing the Difference-in-Differences (DiD) approach and ARDL model using data from 2005 to 2023. The Microfinance Policy Framework, National Financial Inclusion Strategy, and Agricultural Credit Guarantee Scheme served as independent variables, while GDP and agricultural output served as dependent variables. The study found that government-led financial inclusion programs have had a moderate positive impact on GDP, with program effects becoming statistically significant approximately three years after implementation. The Agricultural Credit Guarantee Scheme was identified as one of the most effective programs, with guaranteed loans to smallholder farmers showing higher repayment rates and measurable productivity impacts compared to non-guaranteed agricultural lending. Ayinde, Olarewaju, Miranda, Omotesho, and Ayinde (2023) investigated the relationships between financial inclusion, gender, and household welfare among smallholder maize farmers in Nigeria, employing a robust seemingly unrelated regression (SUR) model using baseline data collected from a randomized control trial survey. Multidimensional indices for financial inclusion and farmers' household welfare were computed, with consumption expenditure, employment, assets, and social amenities serving as dependent variables. The results show that male-headed households are more financially included and have better welfare status than female-headed households, and that financial inclusion significantly influences the welfare status of farmers.

Methodology

The research design adopted in this study is the ex-post facto (after the event) design. The study makes use of already existing data, as no attempt is made to control or manipulate the relevant variables.

Sources and Nature of Data

The data for this research was obtained mainly from secondary source, particularly from the Central Bank of Nigeria (CBN) Statistical Bulletin. The data is quantitative in nature and presented in time-series form covering the period from 2009 to 2024. The data are numerical and appropriate for econometric analysis, and they include financial inclusion indicators such as Commercial Bank loans and advances, Agricultural Credit Guarantee Scheme Fund (ACGSF), mobile banking transactions, and Point of Sale (POS) transactions, as well as agricultural output in Nigeria.

Model Specification

This study adapts and modifies the study used by Adeagbo, Emiola, & Aderinto (2025). They examined the effect of financial inclusion and agricultural productivity in Nigeria. The functional relationship is specified as follows:

APD = f(CBLA, CBRD, RCBL, NCBBr) …… (i)

where

APD = Agricultural Productivity

CBLA = Commercial Bank's Loan to Agricultural Sector

CBRD = Commercial Bank's Branches Rural Deposits

RCBL = Rural Commercial Bank's Loan

NCBBr = Number of commercial Bank's Branches

Putting equation (ii) above in econometric and logarithm form it gives

$\ln APD_t = \beta_0 + \beta_1 \ln CBLA_t + \beta_2 \ln CBRD_t + \beta_3 \ln RCBL_t + \beta_4 NCBr_t + \mu$ …….. (ii)

β_0 to β_4 are vectors of the variables, μ = error term, t = time trend. On the a priori, β_0 to $\beta_4, > 0$.

However, this present study modified the previous study as stated follows:

AGOUT = f(CBLA) ..... (1)

AGOUT = f(ACGSF) ..... (2)

The econometric form of this model is therefore formulated as:

$AGOUT = a_0 + \beta_1 CBLA + \beta_2 ACGSF + ut$ ..... (3)

Where:

AGOUT = Agricultural Output

CBLA = Commercial Bank Loans and Advances

ACGSF = Agricultural Credit Guarantee Scheme Fund

a_0 = Constant parameter

β_1–β_2 = Coefficients of explanatory variables

ut = Error term

The a priori expectation is $\beta_1 > 0$, $\beta_2 > 0$

Description of Variables

Agricultural Output (AGOUT): This refers to the total level of agricultural production in Nigeria over time. It captures the performance of crop production, livestock, forestry, and fishing activities and serves as the dependent variable in this study.

Commercial Bank Loans and Advances (CBLA): This represents credit extended by deposit money banks to the agricultural sector. It reflects the level of financing available to farmers and agribusinesses.

Agricultural Credit Guarantee Scheme Fund (ACGSF): This is a government-backed financial intervention aimed at encouraging banks to lend to the agricultural sector by reducing lending risks. It promotes access to credit for farmers.

Method of Data Analysis

The data collected in this study was analyzed using a linear regression model. The Ordinary Least Squares (OLS) technique was employed to estimate the relationship between financial inclusion variables and agricultural output in Nigeria. The estimation was carried out using EViews 10.0 econometric software.

Criteria for Result Interpretation

The interpretation of results was based on regression coefficients, p-values of the t-statistic, R-squared, and F-statistic.

Regression Coefficients: These measure the direction and magnitude of the relationship between dependent and independent variables. Positive coefficients indicate a direct relationship, while negative coefficients indicate an inverse relationship.

P-values of the t-statistic: This is used to determine the statistical significance of each explanatory variable. A p-value less than 0.05 leads to rejection of the null hypothesis, while a value greater than 0.05 leads to acceptance.

R-squared: This measures the explanatory power of the model, showing the proportion of variation in agricultural output explained by financial inclusion variables.

Test of Research Hypotheses

The hypotheses of this study were tested using probability values (p-values). The decision rule states that if the p-value is less than 0.05, the null hypothesis is rejected, otherwise it is accepted.

Data Analysis

Descriptive Statistics Summary of Data

Table 1: Descriptive Statistics Summary of Data

	AGO	CBLA	ACGFS
Mean	28113.48	873.3842	7980383
Median	22738.03	527.0945	8362665
Maximum	56478.98	2854.51	12456251
Minimum	11625.44	128.406	4068332
Std. Dev.	14851.94	808.9574	2498554
Skewness	0.705721	1.279244	-0.15013
Kurtosis	2.133972	3.480844	2.109527
Jarque-Bera	1.828116	4.518051	0.588732
Probability	0.400894	0.104452	0.745004
Sum	449815.7	13974.15	1.28E+08
Sum Sq. Dev.	3.31E+09	9816181	9.36E+13
Observations	16	16	16

***Source**: Eview 10.0 Output*

Table 1 show the descriptive statistics results for the entire sample of the study. We observed that for the full sample, the mean (or standard deviation) values for Agricultural Output (AGO), Commercial Bank Loans to Agriculture (CBLA), Agricultural Credit Guarantee Fund Scheme (ACGFS), are 28113.48, 873.3842 and 7980383 (or 14851.94, 808.9574 and 2498554), respectively. The maximum and minimum values for the five variables are found between 12,456,251 and 1.27, respectively. The skewness has both negative and positive values, which shows a negatively and positively skewed distribution. Specifically, ACGFS has a negative skewness value of -0.150130, while AGO and CBLA have positive skewness values of 0.705721, and 1.279244 respectively.

Unit Root Test

Table 2: Unit Root Test Results using Augmented Dickey-Fuller (ADF)

Variables	T-ADF	Lag Length	5% Level	Prob.	Remark	Decision
AGO	-5.114774	1(2)	-3.119910	0.0017	Stationary	Reject H0
CBLA	-4.883202	1(1)	-3.098896	0.0021	Stationary	Reject H0
ACGFS	-4.400344	1(2)	-3.119910	0.0056	Stationary	Reject H0

***Source:** Computer Analysis using E-views 10.0*

The summarized unit root test from Table 2 displays the tests for stationarity properties of the series following the Augmented Dickey-Fuller (ADF) statistics. AGO and ACGFS were stationary at the second difference, while CBLA was stationary at the first difference. As reported, the ADF statistics for the respective variables were all more negative than the critical values at a 5% significance level. The reported P-values were all less than the 0.05 chosen level of significance, for which cause, the Null Hypothesis of the presence of unit root in all the

variables is convincingly rejected. Accordingly, AGO and ACGFS are integrated of order two, I(2), while CBLA is integrated of order one, I(1).

Test of Hypotheses

Test of Hypothesis One

H_{O1}: Commercial bank loans and advances have no significant effect on agricultural output in Nigeria.

H_{II}: Commercial bank loans and advances have a significant effect on agricultural output in Nigeria.

Table 3: OLS Regression Output

Dependent Variable: LOGAGO
Method: Least Squares
Date: 08/16/26 Time: 07:26
Sample: 2009 2024
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGCBLA	0.550663	0.029684	18.55071	0.0000
C	6.599478	0.191459	34.46939	0.0000

R-squared	0.960908	Mean dependent var	10.11693
Adjusted R-squared	0.958116	S.D. dependent var	0.518465
S.E. of regression	0.106107	Akaike info criterion	-1.532263
Sum squared resid	0.157623	Schwarz criterion	-1.435690
Log likelihood	14.25811	Hannan-Quinn criter.	-1.527318
F-statistic	344.1289	Durbin-Watson stat	1.078475
Prob(F-statistic)	0.000000		

***Source**: Eview 10.0 Output*

Interpretation of Result

The coefficient of LOGCBLA is 0.550663, indicating a positive relationship between Commercial Bank Loans and Advances and Agricultural Output in Nigeria. It implies that a 1% increase in Commercial Bank Loans and Advances is associated with an approximately 0.5507% increase in agricultural output, holding other factors constant. This positive relationship is consistent with the a priori expectation, as increased bank lending can provide farmers and agricultural businesses with the financial resources required for production, acquisition of inputs, and expansion of agricultural activities. The probability value of 0.0000 is less than the 5% level of significance. This indicates that Commercial Bank Loans and Advances have a positive and statistically significant effect on Agricultural Output in Nigeria during the period under review.

Decision

The OLS regression result indicates that Commercial Bank Loans and Advances have a positive and statistically significant effect on Agricultural Output in Nigeria, since the probability value of 0.0000 is less than the 5% level of significance. Therefore, the null hypothesis is rejected, while the alternative hypothesis is accepted. It is concluded that Commercial Bank Loans and Advances have a significant effect on Agricultural Output in Nigeria during the period under review.

Hypothesis Two

H_{O2}: Agricultural Credit Guarantee Scheme Fund has no significant effect on agricultural output in Nigeria.

H_{I2}: Agricultural Credit Guarantee Scheme Fund has a significant effect on agricultural output in Nigeria.

Table 4: OLS Regression Output

Dependent Variable: LOGAGO
Method: Least Squares
Date: 08/16/26 Time: 07:27
Sample: 2009 2024
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGACGFS	-0.451894	0.379142	-1.191887	0.2531
C	17.27486	6.006906	2.875832	0.0122

R-squared	0.092123	Mean dependent var	10.11693
Adjusted R-squared	0.027275	S.D. dependent var	0.518465
S.E. of regression	0.511345	Akaike info criterion	1.612926
Sum squared resid	3.660638	Schwarz criterion	1.709499
Log likelihood	-10.90341	Hannan-Quinn criter.	1.617871
F-statistic	1.420594	Durbin-Watson stat	0.092965
Prob(F-statistic)	0.253119		

***Source**: Eview 10.0 Output*

Interpretation of Result

The coefficient of LOGACGFS is -0.451894, indicating a negative relationship between Agricultural Credit Guarantee Scheme Fund and Agricultural Output in Nigeria. It implies that a 1% increase in Agricultural Credit Guarantee Scheme Fund is associated with an approximately 0.4519% decrease in agricultural output, holding other factors constant. This negative relationship is not consistent with the a priori expectation, as increased credit guarantee support would ordinarily be expected to improve farmers' access to financing and consequently enhance agricultural production. However, the probability value of 0.2531 is greater than the 5% level of significance. This indicates that Agricultural Credit Guarantee Scheme Fund has a negative but statistically insignificant effect on agricultural output in Nigeria during the period under review.

Decision

The OLS regression result indicates that Agricultural Credit Guarantee Scheme Fund has a negative and statistically insignificant effect on Agricultural Output in Nigeria, since the probability value of 0.2531 is greater than the 5% level of significance. Therefore, the null hypothesis is accepted, while the alternative hypothesis is rejected. It is concluded that Agricultural Credit Guarantee Scheme Fund has no significant effect on agricultural output in Nigeria during the period under review.

Discussion and Conclusion

The study examined the effect of financial inclusion on agricultural output in Nigeria, using Commercial Bank Loans and Advances, Agricultural Credit Guarantee Scheme Fund. The study found that commercial bank loans and advances have a positive and statistically significant effect on agricultural output in Nigeria. The coefficient of 0.550663 indicates that a 1% increase in commercial bank loans and advances is associated with approximately a 0.55% increase in agricultural output. This finding suggests that increased access to bank credit provides farmers and agricultural businesses with the financial resources needed to purchase inputs, acquire machinery, employ labour, and expand production activities.

The finding is consistent with Adeagbo, Emiola, and Aderinto (2025), who found that loans and advances of commercial banks have a positive and significant effect on agricultural output in Nigeria. It also agrees with Obilor (2019), who reported that financial inclusion, including loans and advances, positively and significantly affects economic growth and agricultural GDP. Similarly, Udoka (2016) found a positive relationship between commercial bank credit and agricultural production in Nigeria. The significant positive effect observed in this study indicates that credit availability remains an important channel through which the financial system supports agricultural production in Nigeria. The study found that the Agricultural Credit Guarantee Scheme Fund (ACGSF) has a negative and statistically insignificant effect on agricultural output in Nigeria. The coefficient of -0.451894 indicates that a 1% increase in the ACGSF is associated with an approximately 0.45% decrease in agricultural output, although this relationship is not statistically significant. The negative and insignificant result suggests that increases in the amount of credit guarantee support provided through the scheme have not translated proportionately into higher agricultural production during the period examined. One possible explanation is that the existence of a credit guarantee does not necessarily mean that farmers effectively receive or utilize the guaranteed credit. This finding contrasts with Ugwu, Okafor, and Nwankwo (2024), who found that government-led financial inclusion programmes, including the Agricultural Credit Guarantee Scheme, had a moderate positive effect on GDP and agricultural output, with the effects becoming significant after some years. The difference may reflect differences in methodology, study period, and the measurement of agricultural performance. The finding also differs from Oyasor (2025), who reported that agricultural credit had a significant positive effect on farm income and food supply resilience.

Recommendations

Based on the findings of the study, the following recommendations are proposed:

1. Deposit Money Banks should expand agricultural lending by developing credit products specifically suited to farmers' production cycles. Banks should provide seasonal loans with repayment schedules aligned with harvesting periods, simplify loan application procedures, and

use agricultural production records and cash-flow assessments as part of credit appraisal. This would enable farmers to obtain adequate financing for seeds, fertilizers, equipment, labour, and other inputs when they are actually required.

2. The authorities responsible for the Agricultural Credit Guarantee Scheme should address the weak transmission of guaranteed credit to farmers by improving accessibility and monitoring disbursement. Participating banks should be required to publish clear eligibility requirements, reduce unnecessary documentation and collateral barriers for qualified smallholder farmers, and report the actual number and value of loans reaching beneficiaries. Regular monitoring should also be conducted to ensure that guaranteed funds are disbursed to genuine agricultural producers and utilized for approved agricultural activities.

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