An Assessment of the Impact of Government Expenditure and Commercial Bank Credit on Agricultural Output in Nigeria

[1] Lawal Elisha Omotunde*. [2] Mike Duru, [3] Chris Egwaikhide, Saheed Zakaree S.,
[5] Mustapha Mukhtar, [6] Moses Gosele Danpome, [7] Alfa Yakubu, & [8] Ilemobola Solomon Oyefabi

[1] Department of Vocational and Technical Studies, Federal College of Forestry Mechanization Afaka, Kaduna – Nigeria
[2] Department of Economics, Faculty of Social Sciences, Ahmadu Bello University, Zaria – Nigeria
[3, 4, 6, 7, & 8] Department of Economics, Faculty of Management Sciences, Nigerian Defence Academy, Kaduna – Nigeria
[5] Department of Economics, Faculty of Social Sciences, Bayero University, Kano – Nigeria

Corresponding Author's E – mail: omotundeb4real@gmail.com

Abstract

Agriculture plays a crucial role in Nigeria's economy by supporting food security, employment, and agro-based industries. Despite its importance, the sector has experienced limited structural transformation, largely due to policy inconsistencies, inadequate access to formal credit particularly for smallholder farmers and weak implementation of government support programmes. This study examines the impact of government agricultural expenditure and commercial bank credit on agricultural output in Nigeria using annual data from 1982 to 2024. The analysis adopts the Autoregressive Distributed Lag (ARDL) approach to capture both short-run and long-run dynamics among the variables. The long-run results indicate that government expenditure on agriculture has a positive and statistically significant effect on agricultural output, underscoring the importance of sustained public investment in the sector. In contrast, commercial bank credit to agriculture exhibits a negative but statistically insignificant relationship with output, suggesting inefficiencies in the transmission of formal credit to productive agricultural activities. Inflation is found to have a negative and significant impact on agricultural output, reflecting the adverse effects of price instability on production costs and real farm incomes. The study recommends increased and better-targeted public spending on agriculture, improved access to credit for smallholder farmers, and policies aimed at maintaining macroeconomic stability, particularly inflation control, to promote sustainable agricultural growth in Nigeria.
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Keywords: Agricultural output, Government expenditure, Commercial bank credit, Inflation
JEL Classification: Q10, Q14, Q18, E62, O

Contribution to/Originality Knowledge

This study is different from previous studies in that, it jointly analysed government expenditure, and commercial bank credit within a single dynamic framework to explain agricultural output in Nigeria. It extends existing literature by covering a long period (1982–2024) which reflects different policy phases and economic conditions over time. The use of the ARDL approach provides robust evidence on both short-run and long-run relationships, offering practical policy decisions for improving the agricultural sector.

1.0   Introduction

Agriculture has been central to Nigeria's economic development and national livelihood. Beyond its role in food production, the sector sustains employment, income generation, and the supply of raw materials to industries. Statistics show that agriculture accounted for 25.59% of real GDP in the fourth quarter of 2024, although growth slowed to 1.76% year-on-year, reflecting persistent challenges despite its resilience (National Bureau of Statistics [NBS],

2024). The sector also remains a vital employer, engaging close to one-third of the national labour force (World Bank, 2023). However, agricultural productivity has been uneven and often constrained by inadequate infrastructure, insecurity in farming areas, high production costs, and vulnerability to climate variability (World Bank, 2025). These structural weaknesses sparked debate over the adequacy of fiscal and financial policies designed to stimulate agricultural performance.

The two macroeconomic policy tools, which are especially prominent in this debate, are government spending and credit to the commercial banks. Preferably, transformation of agriculture should be supported by the public spending in terms of investments in rural infrastructure, research, extension services, and storage systems. However, the funding has not been sufficient. The federal budget of 2024 allocated ₦362.94 billion to the agricultural sector; this is only 1.32 percent of the total government expenditure. This was not as high as the 10 per cent target of the Maputo and Malabo declarations, but it was much better than 2023 with budgetary allocation of ₦228.4 billion which was just about 1.11 percent of the total ₦21.83 trillion federal budget (BudgIT, 2024; African Union, 2014). The problem extends beyond low allocation to include issues of implementation and efficiency. Evidence shows that recurrent costs often dominate agricultural budgets, leaving limited resources for capital investment that could enhance productivity (Hodjo, 2023; Efanga et al., 2024; Odetola et al., 2025).

Access to commercial bank credit is equally critical because it enables farmers to purchase improved seeds, fertilizers, and machinery and to scale up operations. However, lending to the agricultural sector has remained disproportionately low. As of September 2024, agriculture accounted for only 3.95% of total bank credit, despite contributing almost one-quarter of GDP and employing roughly one-third of the labour force (CBN, 2024; World Bank, 2023). Financial institutions often regard agricultural lending as high-risk, mainly because of inadequate collateral, price fluctuations, and exposure to weather shocks (Fagbemi et al., 2025). High borrowing costs further worsen the problem. With the Monetary Policy Rate raised to 27.59% in November 2024, most small and medium-scale farmers who are the backbone of domestic food production remain excluded from formal financing channels (CBN, 2025).

The inadequacy of both government expenditure and bank credit has clear implications for agricultural productivity in Nigeria. According to Oniore (2023), despite the expected growth in the economy with the aid of public expenditure, it has had minimal impact in the agricultural sector due insufficient fund allocation and poor targeting. Chanda (2024) also notes that the lending of commercial banks is disproportionately beneficial to large agribusinesses, which makes smallholders farmers, who contribute over 70 per cent of the local food supply, generally underserved. Fagbemi et al. (2025) also note that despite the availability of credit, high-interest rates and weak value-chain connections reduce its effectiveness. This type of endemic imbalance in the macro-economic contribution of agriculture and the financial aid it obtains explains the restriction on growth in its output, food insecurity, and the growth in poverty in rural areas. The paradox is apparent: agriculture makes significant contribution to both GDP and employment but receives an insignificant portion of government expenditure and commercial bank lending. The demographic growth and increase in imports of food in Nigeria also contribute to such a dilemma, which puts an additional strain on the domestic food production.

Empirical research has produced inconsistent data on the effect of government expenditure and bank credit on agricultural output. Some studies find positive and statistically significant impacts, others find weak or negative effects depending on expenditure composition, credit accessibility, and macroeconomic stability (Efanga et al., 2024; Fagbemi et al., 2025). The

question that is left is whether fiscal outlays and credit supply can strengthen each other. Particularly, does infrastructure investment induced by the public expenditure decrease the risk of lending and thus improve the efficiency of credit supply? Limited evidence on this complementarity has constrained policy design for the sector. This study is therefore motivated by the continued inadequacy of both state spending and commercial bank credit in promoting agricultural development in Nigeria. Public spending is far lower than international commitments, and there is limited access to credit which is costly. The conditions have therefore limited the growth of output and limited the ability of agriculture to achieve food security and reduce poverty.

The study will empirically explore how government spending and credit provided by commercial banks affects agricultural production in Nigeria between 1982 and 2024, with the goal of producing evidence to inform more comprehensive and effective policy interventions. The rest of the paper is structured as follows; Section 2 is the literature review, Section 3; methodology, Section 4; discussion of findings while Section 5 concludes the paper.

2.0   Literature Review

2.1   Conceptual Literature

2.1.1   Government Expenditure on Agriculture

Government expenditure on agriculture refers to the share of public funds allocated to support and improve the agricultural sector. Patrick (2023) describes it as budgetary provision for rural infrastructure, extension services, and marketing support. Nurudeen and Usman (2010) view it as spending on agricultural programmes, while Christopher et al. (2022) extend this to include research, innovation, and productivity-enhancing subsidies. In this study, government expenditure refers to public spending on rural infrastructure, research, extension services, subsidy, input support and mechanization. Such expenditure is essential for boosting productivity, raising farm incomes, promoting food security, and supporting rural development in an agrarian economy

2.1.2   Commercial bank credit

Commercial bank credit refers to funds provided by banks to individuals or businesses under agreed repayment terms, enabling the transfer of resources from surplus to deficit units for productive use. Chinweoke et al. (2014) emphasize the role of banks as intermediaries that mobilize savings and channel them into growth-enhancing activities, while the Central Bank of Nigeria (2018) defines bank credit as total loans and advances extended to various economic sectors. Despite agriculture's significant contribution to Nigeria's GDP, credit to the sector remains limited. In this study, bank credit is viewed as loans granted to farmers, processors, and value-chain actors to finance inputs, mechanization, irrigation, and storage. Adequate credit supports modernization and higher productivity, whereas limited access hinders innovation and output.

2.1.3   Agricultural Output

Agricultural output refers to the total amount of goods and services that the agricultural sector produces within a given period of time. Ojima (2024) defines it as the sum of the value of crops, livestock, fisheries, and forestry, and Ewetan et al. (2017) as production that can be used domestically or exported, after intermediate consumption. Towards this study, the agricultural output will include the aggregate worth of the Nigerian production of crops, livestock, fisheries, forestry and value-added processes and packaging. It serves as a measure of sectorial

performance and has far-reaching economic growth, employment and poverty reduction consequences.

2.2   Theoretical Review

This study is based on the Endogenous Growth Theory that was developed by Romer (1986) and Lucas (1988) and which assumes that long-run economic growth is sustained mainly by internal factors, such as technological improvement, human capital buildup, and a long-term investment in infrastructures. The theory argues that the increase in productivity comes as a result of a situation in which governments invest in research, innovation, and industry-specific infrastructure, whereas the adoption of modern technologies and the optimization of production processes are facilitated by private funding. In the agricultural sector, the theory explains the way in which the state spending on rural roads, irrigation, extension facilities, and research institutions creates an enabling environment in which farmers can better exploit credit opportunities to increase output.

Endogenous Growth Theory is relevant to this study because it highlights how internal policy mechanisms and financial structures can shape productive performance within a sector. In assessing the combined influence of government spending and commercial bank credit on agricultural output in Nigeria, the theory provides a useful framework for understanding how public investment and access to finance can interact to support sustained growth in the agricultural sector over time.

2.3   Empirical Review

A number of studies have investigated how government expenditure and bank credit influence agricultural output in Nigeria and other developing economies.

Miftahu and Bawa (2023) used an autoregressive distributed lag (ARDL) model to evaluate the effects of commercial bank credit on the real output growth in Nigeria and found that both the short-run and long-run effects were statistically significant and positive. Similar outcomes were reported by Abubakar and Muhammad (2023), who also found that the provision of credit by banks had a significant positive effect on the agricultural output in the long term, and the interest and inflation rates had negative short-term effects in their research, which investigated the effect of commercial bank agricultural financing on agricultural output in Nigeria during 1981-2020 with the help of the ARDL model.

A positive impact of bank lending on agricultural performance was also reported by Salisu and Alamu (2023) using the data between 1981 and 2021 and examining the impact of bank lending on agricultural activities in Nigeria. More so, Eno and Eze (2023) assessed the connection between agricultural financing and output in Nigeria using ordinary least squares methods between 2011 and 2021 and concluded that credit enhances output but high interest rates reduce the participation of the farmers.

Cross-country analyses reinforce these patterns. Patwary et al. (2023) utilized VECM to analyze the impact of bank agricultural credit on agricultural output as a priority sector and found a strong long-run link between credit, land utilization, and output across developing economies. Also, in the study conducted by Louyindoula et al. (2023) on the impact of agricultural credit on agricultural productivity in the Congo reported that access to agricultural credit in the Republic of Congo raised productivity by about 92%, with participation determined by demographic and institutional factors.

Studies on government expenditure present mixed outcomes. Akpan and Akpanabah (2022) who applied the ARDL approach to examine the effect of government spending on agricultural output in Nigeria from 1980 to 2018 established that both recurrent and capital expenditure significantly enhance output, while Igweze-Ekwunife and Okpala (2022) who used OLS estimation to examine the impact of government expenditure on agricultural output in Nigeria spanning the period between 1986 to 2019 also found positive effects from capital expenditure, savings, and bank credit. In their turn, Najira et al. (2022) used an ARDL model to examine the effects of government agricultural spending between 1981 and 2019. They stated that the effect of capital outlays was negative but statistically insignificant, but the effect of recurrent spending was positive but insignificant. Additionally, the research found out that there was a negative long-run and positive short-run relationship between the agricultural credit growth (ACGSF) and agricultural output.

Upon comparison, Ukpong et al. (2022) analyzed total governmental outlays in connection to the agricultural output during 1990-2020 and found that the coefficient was positive, but statistically insignificant. In their article, Adewale et al. (2022) used ordinary least squares regression to determine the effect of agricultural credit on the productivity during the years 1981 to 2016. Their findings show that the effect of availability of credit on productivity is positive and statistically significant whilst the variables related to lending conditions and exchange rates did not reach a statistically significant level.

Okuneye and Ajayi (2021) resumed the relationship among commercial bank credit to agriculture, government agricultural expenditure, and agricultural production. In a cointegration test, they showed that government spending, interest rates and agricultural output moved together in the long-term, thus suggesting that fiscal policy, financial intermediation and agricultural performance strongly interacted.

Previous studies by Anderu and Omotayo (2020) have indicated that government expenditure has a positive impact on agricultural growth but its effect is inconsistent due to patterns of discrepancy in allocation as confirmed by their analysis of agricultural output growth and government expenditure between 1981 and 2018. Edeh et al. (2020) conducted a complementary study where they analyzed the effect of government expenditure and agricultural output in the same time frame and concluded that capital expenditure has a strong short-term impact, but recurrent expenditure is mostly ineffective.

In this way, the literature shows that the availability of bank credit has always facilitated the agricultural performance (Miftahu and Bawa, 2023; Abubakar and Muhammad, 2023; Adewale et al., 2022). Empirical studies generally show mixed results regarding the impact of government expenditure and commercial bank credit on agricultural output. While several studies find that public spending positively influences agricultural productivity in the long run (Akpan and Akpanabah, 2022; Anderu and Omotayo, 2020), others report weak or insignificant effects (Najira et al., 2022; Ukpong et al., 2022; Edeh et al., 2020) perhaps due to poor implementation and dominance of recurrent expenditure. Similarly, although access to credit is theoretically expected to enhance agricultural performance, empirical evidence reveals that bank lending to agriculture is often inadequate, expensive, and poorly targeted. The effect of inflation is also mixed, with some studies finding negative long-run consequences due to rising input costs.

Despite these contributions, several gaps remain in the literature. First, many studies examine government expenditure and bank credit separately rather than analysing their combined effect within a single framework. Second, few studies incorporate inflation alongside fiscal and

financial variables to assess macroeconomic influence on agricultural output. Third, many existing studies use shorter time spans, limiting their ability to capture structural and policy changes over time. This study therefore fills these gaps by examining the effects of government spending and commercial bank credit individually and combined to study the effects on the agricultural output in Nigeria through an up-to-date dataset and ARDL analytical model.

3.0   Methodology

This study assessed the impact of government expenditure and commercial bank credit on agricultural output in Nigeria from 1982-2024.

3.1   Source of Data

The study used secondary annual time series data. The data for all the variables were obtained from the Central Bank of Nigeria Statistical Bulletin (CBN, 2024). The variables are taken as agricultural output, government spending on agriculture, commercial banks credit to agricultural sector and inflation rate.

3.2   Variables and Measurement

The variables on which data were obtained from CBN Statistical Bulletin (2024) are agricultural output (AGOUT), government expenditure on agriculture (GEA), commercial bank credit to agriculture (CBCA), and inflation rate (INF). However, Inflation rate is included as a control variable because it affects the real value of government expenditure and bank credit, thereby influencing farmers' purchasing power and overall agricultural output. Controlling for inflation ensures more accurate estimation of policy impacts.

3.2.1   Model Specification

This study adapted and modified the model of Anderu and Omotayo (2020), who analyzed the impact of government expenditure on agricultural output in Nigeria (1981–2018) using the ARDL framework.

The ARDL method is especially appropriate to the current analysis due to two main reasons. First, it can accommodate variables that are integrated of varying orders i.e. I(0) or I(1). Second, it allows the short-run and long-run effects to be estimated simultaneously in a single regression equation (Pesaran, Shin, and Smith, 2001).

The functional form of the model, following Anderu and Omotayo (2020), is given as:

$$AGOUT = f\left(GEX, GCF, EXC, INT, IND, INF, GDP\right) \qquad (1)$$

The above functional relationship of the model can be transformed to econometric form as presented below:

$$AGOUT = \alpha_0 + \alpha_1 GEX_t + \alpha_2 GCF_t + \alpha_3 EXC_t + \alpha_4 INT_t + \alpha_5 IND_t + \alpha_6 INF_t + \alpha_7 GDP_t + \mu_t \quad (2)$$

 Where,

AGOUT = Agricultural Output, GEX = Government Expenditure, GCF = Gross Capital Formation,   GCF = Gross Capital Formation, EXC = Exchange Rate, INT = Interest Rate, IDV = Industrial Value, INF = Inflation Rate and GDP = Gross Domestic Product. α_0 = Constant, α_1- α_7= parameters to be estimated, μ= Error term.

For the purpose of achieving valid results, the high decimal series are hereby log for accurate analysis as;

$$\log AGOUT_t = \alpha_0 + \alpha_1 \log GEX_t + \alpha_2 \log GCF_t + \alpha_3 EXC_t + \alpha_4 INT_t + \log GDP_t + \mu_t \quad (3)$$

Thus, the ARDL model can be expressed as;

$$\Delta \log AGOUT_t = \alpha_0 + \sum \alpha_1 \Delta \log AGOUT_{t-1} +$$
$$\sum \alpha_2 \Delta \log GEX_{t-1} + \sum \alpha_3 \Delta \log GCF_{t-1} +$$
$$\sum \alpha_4 \Delta EXC_{t-1} + \sum \alpha_5 \Delta INT_{t-1} + \sum \alpha_6 \Delta IDV_{t-1} +$$
$$\sum \alpha_7 \Delta IFN_{t-1} + \sum \alpha_8 \Delta \log GDP_{t-1} + \mu_t \quad (4)$$

The original model proposed by Anderu and Omotayo (2020) included agricultural output as the dependent variable and explanatory variables such as government expenditure, gross capital formation, exchange rate, interest rate, industrial value, inflation rate, and gross domestic product. However, this study modifies the specification to better reflect its research focus. Gross capital formation, exchange rate, interest rate, industrial value, and gross domestic product are excluded to reduce model over-parameterisation and possible multicollinearity, as these variables largely capture broad macroeconomic conditions rather than sector-specific financing effects. Commercial bank credit to agriculture (CBCA) is introduced in place of these variables because it directly measures the flow of financial resources to the agricultural sector and more accurately represents private investment in agricultural activities. This modification strengthens the model's ability to assess the combined impact of government expenditure and bank credit on agricultural output in Nigeria. Moreover, inflation rate (INF) was retained as a control variable to account for price-level effects on both public expenditure and agricultural credit in real terms. Accordingly, "the modified functional relationship is expressed as:

$$AGOUT = f\left(GEX, CBAC, INF\right) \quad (5)$$

Transforming the above into a linear log-form econometric model gives:

$$\ln AGOUT_t = \alpha_0 + \alpha_1 \ln GEA_t + \alpha_2 \ln CBCA_t + \alpha_3 INF_t + \mu_t \quad (6)$$

Where:
ln AGOUT= Agricultural Output (proxy by agriculture's contribution to GDP)
lnGEA = Government Expenditure
lnCBCA = Commercial Bank Credit to Agriculture
INF = Inflation Rate (control variable)
µt = Error Term
$\alpha 0$–$\alpha 3$= Parameters to be Estimated.
t = Time Period
ln = Natural Log Transformation which was employed to stabilize variance and allow for elasticity interpretation of coefficients.

Equation 6 is re-arranged into ARDL form to examine whether there exists a long-run relationship among the variables. The long-run form of the model can be specified as:

$$\Delta \ln AGOUT_t = \alpha_0 + \sum \alpha_1 \Delta \ln AGOUT_{t-1} + \sum \alpha_2 \Delta \log GEA_{t-1}$$
$$+ \sum \alpha_3 \Delta \ln CBCA_{t-1} + \sum \alpha_7 \Delta IFN_{t-1} + \mu_t \tag{7}$$

The parameter $\alpha 0$ and   represent the intercept and disturbance error term, t= time, $\sum$ is summation sign, ln is the natural log transformation and Δ is the difference operator respectively. Equation (7) test the null hypothesis $\alpha 1 = \alpha 2 = \alpha 3 = \alpha 4 = \alpha 5 = \alpha 6 = 0$ there is no cointegrating relationship between the variables against the alternative of cointegration using the bound testing procedure to test long-run relationship of the model. Then the ARDL technique provides a unified framework for testing and estimating co-integration relations in the context of a single equation. However, since the ARDL procedure is sensitive for a given lag length, the number of appropriate lags in the dependent variable will be chosen by the Akaike Information Criteria (AIC) to ensure that the errors are white noise (Pesaran, Shin, & Smith, 2001). However, in order to measure the speed of adjustment from the short run dynamic to longrun equilibrium, the short-run model is specified by also including the error correction term as follow,

$$\Delta \ln AGOUT_t = \alpha_0 + \sum \alpha_1 \Delta \ln AGOUT_{t-1} + \sum \alpha_2 \Delta \log GEA_{t-1}$$
$$+ \sum \alpha_3 \Delta \ln CBCA_{t-1} + \sum \alpha_7 \Delta IFN_{t-1} + \lambda ECT_{t-1} + \mu_t \tag{8}$$

Where λ is the coefficient of the error correction term which measures the speed of adjustment from the short-run dynamics to the long-run equilibrium, ECT is the error correction term, and μt represent the error term. In theory, the coefficient λ is expected to be significant and negative for short-run convergence to take place.

4.0   Discussion of Results

Table 1: Results of the ADF Unit Root Test

Variables	ADF @ Level	ADF @ First Diff.	Remark
LAGOUT	-0.742	-6.086**	I(1)
	(-2.933)	(-2.935)	
LGEA	-2.655	-9.002**	I(1)
	(-2.937)	(-2.935)	
LCBCA	-0.954	-7.227**	I(1)
	(-2.933)	(-2.935)	
INF	-3.673**	- - - - - -	I(0)
	(-2.935)		

Note: ** denotes stationarity order
C V means critical value @5%
Source: Computation Output Using E-views 10, 2025

The stationarity of the data was tested using the Augmented Dickey Fuller (ADF) unit-root test. As shown in table 1, the ADF test values reveal that at the first difference, I(1), LAGOUT, LGEA and LCBCA are stationary but INF is at the level, I(0). Based on the decision rule, the null hypothesis of non-stationarity is rejected when the ADF test statistics is greater than the critical values or the associated p-value is less than the 5 percent level of significance and the series is considered stationary. In case of non-satisfaction of these conditions, no rejection of the null hypothesis can be made, and this indicates non-stationarity. Integrated variables of order zero, I(0), are not differentiated, but instead modeled at their levels, where other variables

are differentiated according to the level of integration. As the analysis indicates, there is a mixed integration order, which includes I(0) and I(1). Therefore, the ARDL bounds-testing method is reasonable to discuss the long-run relationship between the variables since ARDL can use series of different integrated orders.

Table 2:Presents the Lag Length Criteria for F-Bound Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-297.5130	NA	41.43740	15.07565	15.24454	15.13672
1	-142.7570	270.8230	0.040421	8.137849	8.982289*	8.443172
2	-131.2074	17.90186	0.051829	8.360370	9.880361	8.909951
3	-97.16120	45.96237*	0.022469*	7.458060*	9.653603	8.251899*

Source: Computation Output Using E-views 10, 2025

Table 2 presents the lag-order selection results using five criteria: AIC, SIC, HQ, FPE, and LR. Most criteria indicated an optimal lag length of three, except SIC which suggested one. Consequently, a lag of three was used for the F-bound cointegration test, following AIC as a balanced choice. This selection ensures accurate representation of the dynamic relationships among variables. It also minimizes risks of over fitting and loss of degrees of freedom, strengthening the reliability of the cointegration results.

Table 3: ARDL Bound Testing for Cointegration Analysis   H0:   No cointegration.

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	10.9108	10%	2.72	3.77
K	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61

Source: Computation Output Using E-views 10, 2025

Table 3 presents the F-bound test results examining the long-term relationship between agricultural output (LAGOUT) and government expenditure (LGEA), commercial bank credit (LCBCA), and inflation (INF). The F-statistic of 10.91083 exceeds the 5% critical values of 3.23 and 4.35, indicating a significant cointegration among the variables. This leads to the rejection of the null hypothesis of no long-run relationship, confirming that the variables move together over time. The findings imply that changes in fiscal spending, credit availability and inflation have sustained impacts on agricultural performance. Consequently, these factors are crucial for promoting long-term growth and stability in the agricultural sector.

Table 4" ARDL Long-run estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGEA	0.202	0.085	2.378	0.024**
LCBCA	-0.054	0.128	-0.421	0.677
INF	-0.014	0.005	-3.014	0.005*

Source: Computation Output Using E-views 10, 2025

Table 4 illustrates the relationship between the variables with the coefficient of government expenditure on agriculture (LGEA) in the long-run demonstrating a statistically significant positive impact on agricultural output (LAGOUT) in Nigeria at the 5 per cent level of significance. LGEA has a coefficient of 0.202 meaning that a one per cent growth in LGEA will lead to an approximate growth of 0.20 per cent in LAGOUT, thus confirming LGEA as a prominent determinant of agricultural growth. The same observation can be made in accordance with Akpan and Akpanabah (2022), Igweze-Ekwunife and Okpala (2022), Ukpong et al. (2022), and Anderu and Omotayo (2020), who also found a positive correlation between LGEA and agricultural output. It however deviates with the findings of Najira et al. (2022) who found that government expenditure has a negative impact on agricultural output in the period under study. The optimistic, notable effect of government spending on the agricultural production can be due to the government spending on infrastructure, research, and farm inputs, which increases the output and promotes the continued growth of the sector.

On the other hand, commercial bank credit to agriculture (LCBCA) however, has a negative but insignificant impact on agricultural output in the long run with an estimated coefficient of -0.054. This means that, a one percent rise in LCBCA would lead to a long-run reduction of about 0.054 percent agricultural produce. The outcome is contrary to the economic theories which hold credit to agriculture as an output triggering factor. It implies that the credit provided by the formal sector failed to give rise to significant changes in agricultural production within the review period. The observation could be indicative of structural inadequacies of the financial system in Nigeria such as a small distribution of agricultural credit, high cost of borrowing, fund diversion, and poor infrastructure complement. This result is with the findings of Igweze-Ekwunife and Okpala (2022), Osabohien et al. (2022), Miftahu and Bawa (2023), Abubakar and Mohammed (2023), Salisu and Alamu (2023), Kumari and Garg (2023), Florence and Nathan (2020), Eno and Eze (2023), Patwary et al. (2023), and Louyindola et al. (2023), who found that bank credit has positive impact on agricultural output in their studies.

Agricultural output is affected negatively in the long run by the inflation rate (INF) and the coefficient of the effect is negative, statistically significant, and has a coefficient of -0.014. It shows that an increment in the inflation rate by one percent would result in a long-run decrease in agricultural output by 0.014. The adverse impact of inflation on agricultural production can be manifested through the increase in the cost of inputs, the decrease in the buying power of farmers, and the loss of value of the accessible credit. High inflation in the Nigerian situation does not only deter investment in modern farm practices, but also the efficacy of government spending and credit intervention, thus limiting agricultural productivity. The result is in line with the findings of Abubakar and Mohammed (2023) but contrary to the result of Kumari and Garg (2023) who found that inflation rate has positive influence on agricultural output in his study.

Table 5: Results of Parsimonious ARDL Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.378	0.188	7.329	0.000***
D(LGEA)	-0.017	0.010	-1.602	0.120*
D(LGEA(-1))	-0.064	0.011	-5.440	0.000***
D(LGEA(-2))	-0.087	0.011	-8.119	0.000***

D(INF)	0.0003	0.001	0.514	0.611
D(INF(-1))	0.001	0.001	2.676	0.012**
D(INF(-2))	0.002	0.001	3.470	0.001***
(ECT (-1)), *	-0.142	0.021	-6.940	0.000***

R-squared	0.735	Mean dependent var	0.053
Adjusted R-squared	0.677	S.D. dependent var	0.071
S.E. of regression	0.040	Akaike info criterion	-3.420
Sum squared resid	0.051	Schwarz criterion	-3.082
Log likelihood	76.391	Hannan-Quinn criter.	-3.297
F-statistic	12.698	Durbin-Watson stat	2.169
Prob(F-statistic)	0.000		

Note: * ** *** indicate significant at 1%, 5%, and 10% levels, respectively.
Source: Computation Output Using E-views 10, 2025

Table 5 shows the results of the short-run relationship between agricultural output (LAGOUT) and its independent variables (i.e. government expenditure to agriculture (LGEA), commercial bank credit (LCBCA), and inflation rate (INF)). The result revealed that there exists a negative relationship between government expenditure to agriculture in the current year (D(LGEA)), previous one and two years (D(LGEA(-1)), D(LGEA(-2))) respectively. Their coefficients as revealed in table 5 are -0.017, -0.064, and -0.087.These implies that a percent increase in these variables will lead to about 0.071%, 0.064%, and 0.087 decrease respectively in agricultural output in the short-run. The short-run negative effect of government expenditure on agricultural output may arise from delays in budget implementation, inefficiencies, and dominance of recurrent spending, which limit immediate benefits.

Conversely, the short-run result in table 5 revealed that inflation rate in the current year D(INF) and its previous one and two years (D(INF(-1)), D(INF(-2))) has positive impact on agricultural output within the year under review with coefficients values of 0.0003, 0.0013, and 0.002 respectively. This implies that a percent increase in these variables will cause an approximately increase of about 0.0003%, 0.0013%, and 0.002 % in agricultural output in the short-run. Table 5 shows further results, particularly the slope coefficient of the error correction term (ECT (-1)), which is negative and statistically significant at the 5% significance level. The coefficient of -0.142 signifies that about 0.142% of the disequilibrium which occurs in the short-run is corrected over the long-run. In other words, the annual speed of adjustment from short-run shocks or divergence to longrun equilibrium is as high as 0.142%.

The findings in Table 5 indicate that 74% of the variation in agricultural output (LAGOUT) is explained by fluctuations in the independent variables (government expenditure to agriculture, commercial bank credit to agriculture, and inflation rate) highlighting the model's robust explanatory capacity. The Durbin-Watson statistics of 2.169 indicates that the model is free from serial correlation. This insight necessitates further scrutiny to verify the robustness of the findings and ascertain the validity of the statistical inferences derived from the model.

Table 6: Results of the Diagnostic Test

Test	F-statistics	Obs* R-squared	Probability
Serial Correlation	1.453	5.742	0.250
Heteroscedasticity	2.030	16.469	0.067
Ramsey Reset	0.511	-	0.481
Jaque Bera	6.818	-	0.033

Source: Computation Output Using E-views 10, 2025"

Table 6 presents post-estimation diagnostic tests assessing the reliability of the estimated coefficients and the validity of the model's conclusions, covering serial correlation, heteroskedasticity, functional-form misspecification, and residual normality. The Breusch-Godfrey test showed a p-value of 0.250, exceeding the 5% threshold, indicating no serial correlation. The White test produced a p-value of 0.067, suggesting homoskedastic residuals with constant variance. Ramsey's RESET test returned a p-value of 0.481, confirming that the model is correctly specified. The Jarque-Bera test further indicated normally distributed residuals, validating the regression's statistical inferences. Generally, the diagnostic checks confirm that the model satisfies key statistical assumptions, supporting the credibility of the estimated coefficients and conclusions.

5.0   Summary, Conclusion and Recommendations

The study examines the impact of government spending and commercial bank credit on agricultural growth in Nigeria over the period between 1982 - 2024 using the ARDL model adapted from the work of Anderu and Omotayo (2020) and modified by including these variables (agricultural output, government expenditure on agriculture, commercial bank credit and inflation rate). Results show that public expenditure significantly boosts agricultural performance, while bank credit and inflation negatively affect the sector, highlighting the need for stronger fiscal support, better credit mechanisms, and effective inflation management.

The study calls for increased investment in capital-intensive projects such as irrigation, rural roads, storage facilities, research, and extension services to drive long-term productivity gains. It further notes that the negative effect of bank credit on agricultural output reflects structural barriers like high interest rates, stringent collateral demands, and limited access for smallholder farmers. Addressing these constraints requires concessional lending, risk-sharing arrangements, and tailored loan products for different categories of farmers. The adverse effect of inflation reinforces the need for sound macroeconomic policies that ensure price stability and strengthen domestic input supply chains. All these factors together indicate that Nigeria should implement a combined policy framework that would combine focused state expenditure, cheap agricultural financing, and strong macroeconomic stability to open the potential of the sector.

REFERENCES

Abubakar, M. M., & Muhammad, M. Y. (2023). Impact of agricultural financing on agricultural output: The role of commercial banks. Journal of Global Social Sciences, 4(14), 103–117.

Adewale, A. T., Lawal, O. A., Aberu, F., & Toriola, A. K. (2022). Effect of credit to farmers and agricultural productivity in Nigeria. East Asian Journal of Multidisciplinary Research, 1(3), 377–388.

Akpan, J. E., & Akpanabah, U. B. (2022). Government spending and agricultural output in Nigeria. International Journal of Education and Social Science Research, 5(4), 325–361.

Anderu, K. S., & Omotayo, E. O. (2020). Agricultural output and government expenditure in Nigeria. Jurnal Perspektif Pembiayaan dan Pembangunan Daerah, 8(2), 101–110.

BudgIT. (2024). Analysis of Nigeria's 2024 federal budget. BudgIT Foundation. https://yourbudgit.com

Central Bank of Nigeria. (2018). Annual economic report 2018. https://www.cbn.gov.ng

Central Bank of Nigeria. (2024). Statistical bulletin: Credit allocation by sector (November 2024). https://www.cbn.gov.ng

Central Bank of Nigeria. (2025). Monetary policy communiqué, January 2025. https://www.cbn.gov.ng

Chanda, R. (2024). A study of the factors that affect agribusiness financing in Zambia: A case study of smallholder farmers in Chibombo district (Doctoral dissertation). University of Zambia.

Chinweoke, N., Onydikachi, M., & Nwabekee, C. E. (2014). Financial intermediation and economic growth in Nigeria (1992–2011). The Macrotheme Review, 3(6), 124–142.

Christopher, N., Abdu, S. Z., & Batiyak, U. I. (2022). Impact of government spending on agricultural output in Nigeria (1990–2022). International Journal of Advanced Research in Accounting, Economics and Business Perspectives, 7(2), 14–25.

Edeh, C. E., Ogbodo, J. C., & Onyekwelu, U. L. (2020). Impact of government expenditure on agriculture on agricultural sector output in Nigeria (1981–2018). International Journal of Research and Innovation in Social Science, 4(10), 15–26.

Efanga, U. O., Offiong, A., & Takon, S. M. (2024). Government funding and agricultural sector output in Nigeria: The moderating effect of corruption. Journal of Development Economics and Finance.5(2),321-340.

Eno, E. J., & Eze, F. O. (2023). Relationship between agricultural financing and agricultural output in Nigeria. Global Journal of Finance and Business Review | GJFBR 6(1) 16-28

Ewetan, O., Fakile, A., Urhie, E., & Oduntan, E. (2017). Agricultural output and economic growth in Nigeria. Journal of African Research in Business & Technology, 2(1), 1–9.

Fagbemi, F., & Oke, D. F. (2025). Agricultural credit–productivity nexus: Additional evidence from Nigeria. Modern Agriculture, 3(1). https://doi.org/10.1002/moda.70010

Florence, N., & Nathan, S. (2020). The effect of commercial banks' agricultural credit on agricultural growth in Uganda. African Journal of Economic Review, 8(1), 162–175.

Hodjo, M., Dalton, T., & Nakelse, T. (2023). Does public spending trigger agricultural productivity growth in Africa? Journal of African Development, 24(1), 65–104. https://doi.org/10.5325/jafrideve.24.1.0065

Igweze-Ekwunife, A. E., & Okpala, C. J. (2022). Impact of government expenditure on agricultural output in Nigeria. International Journal of Research and Innovation in Social Science, 6(2), 433–440.

International Monetary Fund. (2024). Nigeria: 2024 Article IV consultation staff report. https://www.imf.org

Keynes, J. M. (1937). The general theory of employment. The Quarterly Journal of Economics, 51(2), 209–223.

Kumari, A., & Garg, V. (2023). Impact of credit on sustainable agricultural development in India. Journal of Sustainable Finance & Investment, 13(1), 560–571.

Louyindoula, H. Z., Bouity, C. A., & Owonda, F. (2023). Impact of agricultural credit on productivity. Theoretical Economics Letters, 13(6), 1434–1462.

Lucas, R. E., Jr. (1988). On the mechanics of economic development. Journal of Monetary Economics, 22(1), 3–42.

McKinnon, R. I. (2010). Money and capital in economic development. Bloomsbury Publishing.

Miftahu, I., & Bawa, S. S. (2023). Effect of commercial bank credit facilities to agriculture on real output growth in Nigeria. Journal of Development Economics and Finance, 4(2), 359–374. https://doi.org/10.47509/JDEF.2023.v04i02.05

National Bureau of Statistics. (2024). Foreign trade in goods statistics (Q4 2023). https://www.nigerianstat.gov.ng/elibrary

Nurudeen, A., & Usman, A. (2010). Government expenditure and economic growth in Nigeria, 1970–2008: A disaggregated analysis. Business and Economics Journal, 2010(4), 1–11.

Okafor, C. A. (2020). Commercial banks' credit and agricultural development in Nigeria. International Journal of Business & Law Research, 8(3), 89–99.

Okuneye, B. A., & Ajayi, F. O. (2021). Commercial banks' credit, government expenditure and agricultural output in Nigeria: An error correction model. KIU Journal of Social Sciences, 7(1), 73–82.

Osabohien, R., Mordi, A., & Ogundipe, A. (2022). Access to credit and agricultural sector performance in Nigeria. African Journal of Science, Technology, Innovation and Development, 14(1), 247–255.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289–326. https://doi.org/10.1002/jae.616

Romer, P. M. (1986). Increasing returns and long-run growth. Journal of Political Economy, 94(5), 1002–1037. https://doi.org/10.1086/261420

Schumpeter, J. A. (1911). The theory of economic development. Harvard University Press.

Shaw, E. S. (1973). Financial deepening in economic development. Oxford University Press.

Ukpong, U. M., Uduak, A., Ekere, S. A., & Akpan, E. O. (2022). Government expenditure and agricultural sector output in Nigeria. American Journal of Arts and Human Science, 1(4), 20–26. https://doi.org/10.54536/ajahs.v1i4.682

World Bank. (2023). Employment in agriculture (% of total employment) – Nigeria. World Development Indicators. https://data.worldbank.org

World Bank. (2025). Nigeria development update: Turning the corner (June 2025). https://www.worldbank.org