

## **The role of agricultural financing and food security on economic growth in Nigeria**

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### **Abstract**

*This paper looks at the implications of agricultural financing, food security and Nigeria's economic growth. Scope of the study was from 1981 to 2024 while the data was sourced from the Central Bank of Nigeria (CBN) Statistical bulletin 2024 and World Development Indicators (WDI). Autoregressive Distributed Lag (ARDL) was used to run the regression. The variables used in the study includes the food production index, credit to agriculture, agricultural output, inflation rate, interest rate and gross capital formation. The results showed that agricultural financing and food security had a positive impact on the economic growth at the short run and a negative impact in the long run and the recommendations is for the government to fund the Nigerian agricultural sector; insecurity must be reduced in order to facilitate food security and exchanged rate must be well managed to facilitate agricultural productivity in the economy.*

**Keywords:** Agricultural financing, food security, economy, growth, Nigeria.

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### **1. Introduction**

The major objective of every nation of the world is to achieve an improvement in their per capita incomes, alleviate poverty, create jobs and enhance the overall well-being of their citizens. Economic growth is sometimes viewed as a key development driver, providing the needed resources for the overall improvements in education, infrastructure and health of the nationals (Anam *et al* 2026). However, achieving a sound economic growth does not guarantee sustainable development. This is because growth sustainability is essential in assessing the performance of nations. This is shown in the Sustainable development goals (SDGs) which was adopted by the United Nations some years ago to achieve sustainable development with goal number ten. This was linked with economic performance.

Achieving sustainable economic growth must be accompanied by food security and agricultural financing because agriculture performs an important role in job creation,

production of agricultural goods and services, generation of income and fosters the diversification of the economy (Awotayo *et al* 2025). Over 800 million people around the world were malnourished in recent years, with over 700 million people living in countries that are still developing despite the food security agenda pattern on worldly improvement (Adeyeye *et al* 2017). A strategic pursuit of food security has led to advancement in food technology which makes food to be cheap and accessible to all. This will preserve some perishable foods and foster enlarged storage of edible items.

Food security in a wider plane looks at the availability of a balanced food level in order to meet up with an accelerated consumption. This is to reduce the fluctuations in food output and food prices in a global scale (Ukwe 2025). According to FAO (2020), food security is when all individuals will always have physical and

economic access to enough, less risky, and nourishable food for a healthy and vibrant life.

Food security encompasses producing food that will be enough for every citizen in terms of quality and quantity. To attain this, production in the agricultural setting needs to be put in place with enough and sophisticated environmental knowledge, condition of the climate, market, and its operation. There must be a good knowledge of price mechanism, good network of transport and storage of farm produce to checkmate excesses. It will also not allow man-made and natural disasters to catch people unawares (Elrasheed 2023). In spite of this, Nigeria is still experiencing food security crises. Approximately 12 million Nigerians experienced food insecurity in 2024 which is about 12% of its population as it is projected to rise to 35 million people that will face the food insecurity scourge as at December 2026. (Asaju, & Kwakano 2025) This was caused by the sharp rise in the prices of food items. It reduced the purchasing power of households and made it difficult for several Nigerian families to have access to nutritious food.

Agricultural financing is the acquisition and use of capital for agricultural activities. This can be obtained from various sources which includes personal savings, bank loans, loans from friend/family, cooperative societies, money lenders, government sources, charitable organizations and private companies. (Ayinde *et al* 2020). Murtala (2025) was of the opinion that agricultural finance is credit given to those that are handling farms and ranches. This is to help them in crop planting and harvesting to ensure agricultural productivity. Agricultural sector credit is granted to the farmers in terms of overdraft, short-term, medium-term and long-term credit. This depends on the reason and the time taken for the agricultural project to mature. Such credits

disbursed to farmers to buy farm inputs are paid straight to the agriculture suppliers. This is because they must tender the evidence of agricultural goods delivery to the banks that granted them the credit. This is to prevent the misappropriation of funds which is rampant among Nigeria farmers (Omodero 2021). However, the financing problem has overshadowed the agricultural sector for several years as it received 5.49% of agricultural credit from external sources compared to other sectors of the Nigerian economy that received 39% and 56% in credits (Okunlola & Ayetigbo 2024). This has put a limitation to the finances the farmer will use to enhance agricultural prosperity. This study tends to cover the gaps from other studies through updated scope of study from 1981 to 2024 and it as it combined relationships of the three variables when other studies like Osabohien *et al* (2020) examined the variables separately

For the policy contribution, it will help the monetary authorities and other government parastatals to know if increasing the credit to agriculture actually will lead to the improvement of food security and economic growth in the country or not.

## **2. Literature Review**

Food security is when the citizens of a nation have enough food access for a vibrant and healthy life. Food security includes eating food that is nutritionally viable and safe. (Oke & Ogundokun 2023). This is sometimes referred to as the consumable food availability through the production and processes of preservation up to the time of consumption. Food security is also the availability of food, safety and consumption at individual, household, state, national and global levels. (Gollin *et al*, 2002)

Agricultural financing is the various financial avenues that ensures the success of production, processing and marketing of agricultural products. The main purpose of

agricultural output is to provide financial services to farmers, agricultural industries and other stakeholders in the agricultural sector in order for them to buy equipment and manage the risks involved in the agricultural sub-division of the economies of the West African countries. (Saragih & Ovalti 2026) Categories of agricultural financing includes loans for farmers, agricultural grants, insurance for farmers and leasing of agricultural tools and machineries. Agricultural financing is shouldered by banks of industries, commercial banks, microfinance banks, cooperative societies, agencies of government and some non-governmental organizations.

### **Theoretical Review**

#### **Quantity Theory of Credit**

It was formulated by a German scholar Richard Werner in 1993. Central in his theory is a two-way equation of exchange in differentiating between money used for transactions involving the GDP- (looking for nominal GDP) and money used for transactions that does not involve the GDP (knowing the value of transactions that involves assets). His own view was that money is not in form of deposit in banks or other aggregates of the savings in the private sector, as he stressed the point that Banks are not being financial go between that lends the money on ground to the public, but are new money creators through the lending processes. He was of the opinion that growth needs a rise in transactions that are a portion of the GDP, as it will swallow a large chunk of funds to be used for such transactions, as such the quantity of money used for transactions can only increase if banks make more credit to the farmers. The theory examined how credit to agriculture will stimulate agricultural productivity which will improve food security. The increasing output will contribute immensely to Nigeria's economic growth.

#### **Production Based Theory**

Adam Smith (1723–1790), David Ricardo (1772–1833), and Thomas Malthus (1766–1834) all proposed the production theory. The theory emphasized the relationship between output and factors of production, stating that output is the end result of combining factors of production after it has undergone the process of transformation. This theory is based on the idea that increasing agricultural production and productivity is the key to achieving food security in the selected West African sub-region. It highlights the importance of technology, infrastructure, and investment in the agricultural sector of a nation's economy. The limitations of the production theory are that it ignores changes in the techniques of production in the sub-region of West Africa. It also assumes that the rest of the economy remains constant while private businesses and industries make the adjustments to align with their economies, but ignores the risks and uncertainties that overshadows all business decisions. This makes these organizations to be running at big losses especially farmers. The relevance of the theory is that improved access to credit in agriculture by the financial institutions and authorities will make the farmers to increase production of food and cash crops thereby increasing agricultural productivity

#### **Endogenous Growth Theory**

It was proposed by Romer in 1986 and Lucas in 1988. The theory was developed to challenge the neoclassical growth model which opined that economic growth was determined by factors that are exogenous in nature like progress in technology. The endogenous growth model focuses on different areas of human capital, knowledge and innovation. The model shows that there are increasing returns to scale from investing in those factors as they generate positive impediments and spillover effects for the whole economy. The implications of the endogenous theory

are that agricultural financing; food security are interacted concepts because they are affected by economic growth. Tavershima (2025) emphasized the significance the significance of agricultural financing on economic growth. Agricultural financing shows the investment in the sector of agriculture in order to foster growth and development. Economic growth and development is usually affected by several factors such as unpredictable climate, political instability and high debt burdens which reduces the per capita income of the people. To curtail all these externalities, the government should invest heavily in the agricultural sector in order to enhance a rise in economic development. Argun (2020) and Yuan 92024) used the theory to examine its influence in the investment of human capital. It is relevant to this study in the sense that it provides a route through which agricultural financing can influence food security and economic growth in Nigeria through productive investment, improved technology and development in human capital.

### **Empirical Review**

Ezu (2023) assessed the impact of agricultural financing on the Nigerian economy. The work looked at the influence of the loans of bank of agriculture to farmers, commercial bank credit to agriculture and the Agricultural credit guarantee fund on the Gross Domestic Product of the economy. Secondary data for the study was utilized and some statistical methods were also utilized like the Ordinary Least Squares, Granger Causality test and the Breusch Godfrey Serial correlation test. The findings revealed that both the bank of agriculture credit to farmers and the commercial bank credit to agriculture had a significant but favorable relationship with the gross domestic product. Besides a positive and significant statistical relationship also happened between agricultural credit

guarantee scheme fund and the GDP. The limitation of this work was that the researcher looked at agricultural financing without looking at its effect of it on food security and the study was only limited to Nigeria.

Saragih & Ovalti (2026) examined the role of sustainable agriculture in supporting economic development and food security through some reliable sources and their scope of study was from 2019 and 2024. This study aims to synchronize empirical and conceptual findings related to the sustainable agricultural contribution to economic growth and fostering food security. Content and thematic analysis approaches were the method used for analyzing the research. The results of the study showed that sustainable agriculture plays an expedient role in increasing agricultural productivity, increasing the income of farmers, and improving food system security. These findings confirmed that the integration of sustainable agriculture into development policies can promote inclusive economic development while strengthening food security in the long term.

Abah *et al* (2023) looked at the agricultural land use change and food security linkage in Nigeria. Their scope of study was from 1981 to 2023. Historical survey design was used for the research. The data that was used for the study was obtained from the Food and Agriculture organization and the world bank archives. Autoregressive Distributed Lag(ARDL) was used for the regression analysis while the Augmented Dickey Fuller was used to test for the unit root. The results of the unit root test showed a positive relationship between agricultural land use charge and food security. The researchers failed to look at agricultural finance and food security in the West African sub-region but focused on Nigeria instead.

Allaoua and Krelifa (2006) investigated the connectivity between food security and

Algerian economic performance. Their study found out that food security contributes to the stability of the economy by reducing foreign dependence, reducing inflation, and boosting local production. In turn, improved economic performance contributes to agricultural sector financing, developing infrastructure and supporting sustainable production policies, thereby enhancing national food security. The Algerian experience is a clear example of this interdependence, where economic diversification outside the hydrocarbons sector is an essential entry point to achieve balanced development and sustainable food security.

Obour *et al* (2026) investigated on how some low income farmers in the savannah zone of Ghana had to cope with the management of cashew cultivation to enable food and income security for people in the region. They used 216 farmers as a case study and the findings revealed that the cashew farms were struggling to survive due to a decline in agricultural financing from cooperatives and agricultural loan credit schemes. The researchers looked at Ghana without looking at other West African nations.

Mbelu and Ifionu (2022) did an investigation on the implications of agricultural financing on the economic growth of Nigeria. The scope of study they used was from 1981 to 2019. Several tools of analysis were deployed for the work which includes the error correction model, cointegration test and the Granger Causality test. The findings showed a long term connectivity between economic growth and the financing of agriculture. In the long run it was discovered that the agricultural credit guarantee scheme fund and the commercial bank loans had a positive relationship and significant impacts on the gross domestic product of Nigeria. The Granger Causality results showed that it was more of demand rather than supply which showed an output level

rise in the financial instruments of the Nigerian economy. The work was only limited to the Nigerian economy without any mention of food security.

Namubiru *et al.* (2022) examined the relationship between road networks and household food security in Acholi sub region, northern Uganda, using a mixed-methods approach. Quantitative data were collected from 384 respondents through structured questionnaires, while qualitative data were obtained via face-to-face interviews. Data were analyzed using Pearson correlation and standard regression. The findings indicated a positive and significant association between road networks and household food security, with road infrastructure accounting for 10% of the variance in food security. The study highlighted the critical role of road networks in improving household food security and contributed to policy discussions by reinforcing the importance of infrastructure development in addressing food security challenges

Isaaka *et al* (2025) examined the relationship between economic growth and food security across the eight members of the West African Economic and Monetary Union (WAEMU). The analysis used panel data for the regression assessment. The scope of study they used for the research was from 2001 to 2016 and the data they used was retrieved from the Worlds Development indicators. Findings showed that food insecurity will have a negative impact on the economic growth if it is not solved. Some variables like flow of agricultural development was significant at 10% while gross fixed capital formation from the agricultural aspect was significant at 5%. However, the study failed to look at the food security and economic growth of other west African countries as it only looked at only eight member states under the monetary west African regional bloc which is the gap that this study needs to cover.

Oktiani & Khoirunurrofik (2024) examined the relationship between road infrastructure and food security in Indonesia, with additional consideration for irrigation development and other contextual variables. Using panel data from 508 regencies and cities between 2018 and 2021, and applying the Generalized Method of Moments (GMM), the study found that sustained road construction positively influenced food security outcomes. It also highlighted the significant roles played by Gross Regional Domestic Product (GRDP), sanitation access, and water availability in improving national food security. The authors focused on Indonesian food security without mentioning anything pertaining to West African states

Svoke & Kodmon (2025) investigated on the bridging the funding gap by advancing sustainable food security in West Africa to achieving the number two of the sustainable development goal. Secondary data was obtained from the World Development Indicators while the scope of study they utilized was from 2000 to 2022. Panel data was used for the regression and the findings showed that there were differences in the undernourishment, food security and the projects of the African Development bank groups (AfdB) in the regional bloc. The regional bank have been financing several projects for decades but due to differences in the political and economic climate of those regions, some of those projects have not made headway. However, the researchers avoided agricultural financing by some institutions which will go a long way in solving the problems of food insecurity in the African sub region.

Murtala (2025) assessed agricultural financing and food security outcomes in Nigeria from 2014 to 2024. Monetary authorities in Nigeria provided the secondary data and the study found out that agricultural financing experienced a

sharp rise but did not lead to food security improvements. He said this was caused by insecurity issues in the country, loss of farm produce and use of crude implements lead to the financing effectiveness. He recommended that aligning agricultural credit with mechanization was essential in fostering agricultural productivity.

Oyamendal, *et al* (2024) investigated the contribution of agricultural financing to food contribution in Nigeria using 1981 to 2022 as the scope of study. Food Production Index was used to measure food security while some indicators for financial sectors were used for agricultural financing. The study found that that government expenditure on agricultural loans has a negative effect on food security in Nigeria and the recommendation was that the credit to agriculture should be given to small scale farmers in enhancing agricultural productivity from the lower level.

Ajiboye *et al* (2025) looked at Nigeria's normal duty in the relationship between the mobilization of agricultural credit and food security. The scope of their study was from 2000 to 2023 with secondary data obtained from the CBN yearly bulletin. Econometric methods like the Autoregressive Distributed lag was used for the study and the results showed that the mobilization of the credit from agriculture had a negative impact on food security. Urbanization had a negative impact on food security also. Though the work recommended some agricultural research credit schemes to alleviate the problem, the researchers limited their work to Nigeria without considering other sister West African countries

Wudil *et al.* (2022) reviewed the sophisticated and interrelated challenges affecting food security in Sub-Saharan Africa, in contrast to the global trend of improved agricultural productivity over the past 50 years. While other regions have benefited from expanded irrigation, policy

support, and technological progress, Sub-Saharan Africa has experienced a worsened food insecurity, especially since 2015, further exacerbated by the Ukraine conflict and COVID-19. The study identified several key obstacles to achieving SDG 2, including weak economic growth, gender inequality, high inflation, poor infrastructure, climate change, and low agricultural investment. Adesina *et al* (2024) looked at the technologies for agricultural transformation and food securities in Africa using some selected West African countries. The results of the research showed that agricultural technologies helped the low income farmers to achieve a high level of agricultural output as it has brought an improvement in various varieties of food crops like maize, beans, rice, sorghum and yam.

Pawlak and Małgorzata (2020) assessed the importance of agriculture in making food security a reality in developing countries where Nigeria belongs. The study stressed on the fact that food security has turned to a serious issue to countries with different stages of economic development. Even though the sector for agricultural play an important function in ensuring a sustained food increase in both advanced and upcoming countries of the world, it should be noted that the existing literature study are related to the abundance of food and access to food instead of the health and nutrition parameters of food security which is the focus of this paper. The study also pointed it out that food shortages has led to hunger, malnourishment and sustenance of food security is a barrier that most greatly affects upcoming countries with low levels of GDP per capita, which usually also suffer from worsened agricultural rules and deficiencies in infrastructural parameters. The study used cluster analysis as the results showed that physical and/or economic food scarcity impacted the

producers of crude oil with different stages of economic development, situated in different continents, such as Iraq, Angola, Nigeria, or Ecuador. The study failed to look at the impact of agricultural financing and food security on economic growth.

### 3. Methodology

#### Theoretical Framework

It is based on the endogenous growth theory which was postulated by David Romer and Robert Lucas. They examined how national output can be generated in an economy through the factors of human capital, knowledge, innovation, and increase in technology. The theory is relevant to this work in the sense that the population of people provides the human capital for development which will give rise to innovation and advancement in technology. The relationship is represented thus

Population-----Labour force-----Human capital-----Productivity-----Economic Growth

A large population will increase the supply of labour for entrepreneurs, researchers and innovators and if Nigeria can invest heavily in education, skills, health sector and technological aspect, it will go a long way for the nation in achieving a long term economic growth

#### Model Specification

Economic growth is an indicator in macroeconomics which shows the upsurge in the yearly value of the goods and services of a nation. A long-term economic growth is calibrated by the Gross Domestic Product (GDP). GDP is sensitive to changes in price as it is used to measure the aggregate output of a nation (ABS, 2023). This brought up the need to differentiate between real and nominal GDP. The real Gross Domestic Product is the acceleration in the value of goods and services which is not as a result of price changes. In order to look at the effect of agricultural financing and food security on the economic growth

in Nigeria, we specify and estimate the dynamic growth model in the first equation

$$GDP_t = f(FPIN_t, CAG_t, AGO_t, INFR_t, INTR_t, EXR_t) \quad (1)$$

Where  $GDP$  is the dependent variable. The explanatory variables  $AGO$  denotes agricultural output,  $FPIN$  stands for food production index,  $INFR$  means inflation rate,  $INTR$  means interest rate,  $EXR$  means exchange rate while  $CAG$  means Credit for agriculture.

The economic model in equation 1 was converted to equation 2 with the logged variables of Gross Domestic Product ( $GDP$ ) and Food Production Index ( $FPIN$ ) with an error term which is as follows

$$LGDP_t = \alpha_0 + \beta_1 FPIN_t + \beta_2 CAG_t + \beta_3 LAGO_t + \beta_4 INFR_t + \beta_5 INTR_t + \beta_6 EXR_t + \varepsilon_t \quad (2)$$

Where the coefficients of  $\beta_1, \dots, \beta_6$  denotes the parameters,  $\alpha_0$  shows the constant term

$\ln$  denotes log,  $t$  represents time,  $\varepsilon_t$  stands for the error term.

Apriori Expectation:  $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0, \beta_5 < 0, \beta_6 < 0$

#### Data requirement and sources

The data used for this study consists of data on the Gross Domestic Product, agricultural output, foreign direct investment, inflation rate, interest rate and gross capital formation for the period covering from 1981 to 2024. The research work makes use of secondary time series data which was collected from World Bank, Central Bank of Nigeria Statistical Bulletin and the National Bureau of Statistics. The choice for this period was based on data availability. Augmented Dickey Fuller was used to check the statistical properties of the data.

#### Techniques of Estimation

##### Unit root test

Time series data are prone to spurious regression. We subject our data to unit root test to avoid this. We tested for the stationarity of the series using the Augmented Dickey Fuller (ADF) tests

$$\Delta y_t = \alpha_0 + \gamma_1 Y_{t-1} + \sum_{i=1}^p \delta_i \Delta Y_{t-1} + \varepsilon_1 \quad (3)$$

Where  $Y_t$  is the log of the variable in the time period  $t$  while  $t$  denotes the time trend,  $p$  indicates the lag length  $\Delta Y_{t-1}$  indicates the first difference at  $Y_t$  for

example  $Y_{t-1} - Y_{t-2}, \gamma = \left[ \sum_{i=1}^p \alpha_i \right]$

and  $\delta_1 = \sum_{j=1}^p \alpha_j$  while  $\varepsilon_t$  is the stochastic error term with the mean 0.

The ADF test assumes a null hypothesis of a unit root in the  $Y_t$  series against the alternative of no unit root in the  $Y_t$  series. The equation 3.8 is in first difference which makes us to test if the variable  $Y_t$  is a stationary series and contains the unit root if the estimated coefficient  $Y$  is equal to zero. The ADF test is a null hypothesis of a unit root in the  $Y_t$  series against the alternative of no unit root in the  $Y_t$  series. Therefore  $H_1: \gamma = 0$  which implies that there is a unit root and  $H_1: Y < 0$  which shows that there is no unit root.

##### Cointegration

The study used the ARDL bound testing approach for cointegration. An advantage of the ARDL bound testing is that it accommodates several variables with different orders of cointegration which makes it applicable even when the series is showing a non-uniform integration order. ARDL is preferable to this work than other regression models like the Ordinary Least Squares (OLS) because OLS does not give the error correction adjustment and may give misleading results especially if the series that are non-stationary are present. Besides the ARDL is usually robust in cases of small sample sizes and it ensures a more reliable estimates in the long run

relationships. This flexibility makes the model to capture the cointegration regardless of a situation where the variables are integrated at I(0) and I(1) while fostering the accuracy and reliability of the long run model. This study employs the Autoregressive Distributed Lag (ARDL) model developed Pesaran et al (2001). The ARDL model is useful in order to know if the order of integration is first order or mixed and does not put a restriction on sample size. Equation 3 shows the short run and the long run dynamics of equation 2.

$$\begin{aligned} \Delta \ln GDP = & \alpha_0 + \sum_{k=1}^n \alpha_1 \Delta \ln GDP_{grt-k} + \\ & \sum_{k=1}^n \alpha_2 \Delta FPIN_{t-k} + \sum_{k=1}^n \alpha_3 \Delta CAG_{t-k} + \\ & \sum_{k=1}^n \alpha_4 \Delta \ln AGO_{t-k} + \sum_{k=1}^n \alpha_5 \Delta INFR_{t-k} + \\ & \sum_{k=1}^n \alpha_6 \Delta INTR_{t-k} + \sum_{k=1}^n \alpha_7 \Delta EXR_{t-k} + \\ & \beta_1 \ln GDP_{t-1} + \beta_2 FPIN_{t-1} + \beta_3 CAG_{t-1} + \\ & \beta_4 \ln AGO_{t-1} + \beta_5 INFR_{t-1} + \beta_6 INTR_{t-1} + \\ & \beta_7 EXR_{t-1} + \\ & \varepsilon_t \dots\dots\dots(4) \end{aligned}$$

In the equation 4 above,  $\beta_1 \dots \beta_7$  are the long run parameters while  $\alpha_0 \dots \alpha_7$  are the short run parameters.  $\alpha_0$  is the drift component,  $\Delta$  is the difference operator while  $\varepsilon_t$  is the error term. ARDL Bound test is used to confirm the presence of a long run cointegrating relationships and it also compares the upper and lower bound critical values which was provided by Pesaran et al (2001) with the value of the F-Statistic. If the F-Statistic is higher than the upper bound critical values, we reject the null hypothesis which shows that there is an existence of the cointegrated variables in the model. But if the upper bound critical values are higher than the F-statistic, the null hypothesis is accepted indicating the absence of cointegration among the variables in the model. The error correction coefficient that shows the speed of adjustment from the short run disequilibrium to the long run equilibrium is shown in equation 4.

$$\begin{aligned} \Delta \ln GDP_t = & \alpha_0 + \\ & \sum_{k=1}^n \alpha_1 \Delta \ln GDP_{t-k} + \sum_{k=1}^n \alpha_2 \Delta FPIN_{t-k} + \\ & \sum_{k=1}^n \alpha_3 \Delta CAG_{t-k} + \sum_{k=1}^n \alpha_4 \Delta \ln AGO_{t-k} + \\ & \sum_{k=1}^n \alpha_5 \Delta INFR_{t-k} + \\ & \sum_{k=1}^n \alpha_6 \Delta INTR_{t-k} + \sum_{k=1}^n \alpha_7 \Delta EXR_{t-k} + \\ & \phi ECM_{t-k} + \varepsilon_t \dots\dots\dots(5) \end{aligned}$$

Where  $\Delta$  is the first difference operator,  $\phi$  denotes the coefficients of the error correction term which shows the adjustment speed in the long run equilibrium after a shock in the short run.

### Description of the variables

**i. Gross Domestic Product(GDP)**-This is the total money value of all final goods and services produced in a nation over a given period of time. It is used to measure the size and performance of an economy like Nigeria. It is in three approaches which are output approach, expenditure approach and income approach

**ii. Food Production Index(FPIN)**-It is sued to capture the changes in the food production of food crops in comparism to the reference or base period. It, measures the relative level of agricultural food production in a country over a given period of time. Food production index covers edible commodities such as cereals, vegetables, fruits, meat, milk, pulses and so on.

**iii. Credit to Agriculture(CAG)**-These are the loans and other financial resources that is provided to the agricultural sector by the financial institutions. This is to enhance agricultural development.

**iv. Agricultural Output(AGO)**-This is the total amount of crops, livestock and other produce from the farm that is produced by a nation or a farm over a period of time. It includes crops, livestock and animal products.

**v. Inflation Rate(INFR)**-This is the persistent rise in the general price level of goods and services in an economy over a period of time. It is measured by the consumer price index. It also measures the rising cost of living of the citizens in an economy

**vi. Interest rate (INTR)**-It is an essential macroeconomic variable that influences borrowings, investments, savings and consumption. High rate of interest gives rise to unaffordable loans which reduces the access of farmers to agricultural credit while low rate on interest encourages borrowings and investment including agriculture.

**vii.Exchange Rate (EXR)**-This is the price of the currency of a nation which is expressed in terms of another currency. It can be in form of fixed exchange rate, floating exchange rate, nominal exchange rate and real exchange rate

#### 4. Results and Discussion

##### Descriptive Statistics

The table below shows the descriptive statistics of the variables that were used in the study as the mean values of the variables in the study shows their average level as LGDP is 4.541, FPIN is 70.562, cag is 60.215, LAGO is 3.276, INFR is 21.794, INTR is 17.376 and EXR is 150.768. The standard deviation that measured the degree of dispersion has the exchange rate (EXR) as the highest standard deviation of 239.570 indicating that the exchange rate showed the highest fluctuations over the time period. LGDP showed the lowest standard deviation of

0.243 which is an evidence of a relatively stable economic growth in comparison with the other variables. The skewness statistics reveals the symmetry of the data distribution as the variables of LGDP, CAG, INFR, INTR and EXR are positively skewed with distributions at the longer right tails at 0.151, 0.972, 4.878, 0.362 and 4.120 while FPIN and LAGO are negatively skewed at -0.024 and -0.448. The Kurtosis values indicates the peakness of the distributions. CAG of 3.058 has a 3 benchmark which is a normal distribution. INFR and EXR are highly leptokurtic at 28.818 and 23.191 with heavy tailed distributions and extreme observations. The Jarque Bera test and its extreme values analyzes if the variables are normally distributed or not. If the probability value is higher than the 5% significance level, it is a sign of normality while the value below 5% significance level is a non-normality sign. LGDP was not normally distributed at 0.092, FPIN was normally distributed at 2.393, CAG at 0.031 was not normally distributed., LAGO at 0.129 was normally distributed, INFR at 0.000 was not normally distributed. INTR at 0.326 was normally distributed while EXR at 0.000 was not normally distributed.

**Table 1: Descriptive Statistics**

|             | LGDP  | FPIN    | CAG     | LAGO   | INFR     | INTR   | EXR      |
|-------------|-------|---------|---------|--------|----------|--------|----------|
| Mean        | 4.541 | 70.562  | 60.215  | 3.276  | 21.794   | 17.376 | 150.768  |
| Median      | 4.503 | 71.365  | 47.245  | 3.645  | 14.115   | 16.920 | 116.089  |
| Maximum     | 4.899 | 119.820 | 184.710 | 4.760  | 219.000  | 31.650 | 1486.567 |
| Minimum     | 4.205 | 23.830  | 9.360   | 1.232  | 0.690    | 8.920  | 0.637    |
| Std. Dev.   | 0.243 | 29.609  | 51.080  | 1.133  | 33.486   | 4.671  | 239.570  |
| Skewness    | 0.151 | -0.024  | 0.972   | -0.448 | 4.878    | 0.362  | 4.120    |
| Kurtosis    | 1.415 | 1.858   | 3.058   | 1.802  | 28.818   | 3.836  | 23.191   |
| Jarque-Bera | 4.771 | 2.393   | 6.938   | 4.099  | 1396.557 | 2.243  | 871.871  |
| Probability | 0.092 | 0.302   | 0.031   | 0.129  | 0.000    | 0.326  | 0.000    |

**Source:** Eviews 12 output

### Unit Root Test

The Unit Root Test results show a mixed order of integration as CAG, LAGO and INFR were integrated at order zero while LGDP, FPIN, INTR and EXR are integrated of order one thus the data

satisfies the key requirement for the application if the Autoregressive Distributed Lag(ARDL) to examine the short run and the long run relationships among the variables.

**Table 2: Unit Root Test Table**

| Variable | Adf Level             | Adf First Diff        | Pp Level              | Pp First Diff         | Remark |
|----------|-----------------------|-----------------------|-----------------------|-----------------------|--------|
| LGDP     | -0.973<br>(0.754)     | -4.135***<br>(0.000)  | 0.337<br>(0.978)      | -4.021***<br>(0.000)  | I(1)   |
| FPIN     | -0.457<br>(0.889)     | -4.631***<br>(0.000)  | 0.505<br>(0.985)      | -11.096***<br>(0.000) | I(1)   |
| CAG      | -4.066***<br>(0.000)  | -5.705***<br>(0.000)  | -4.459***<br>(0.000)  | -5.741***<br>(0.000)  | I(0)   |
| LAGO     | -4.459***<br>(0.000)  | -4.118***<br>(0.000)  | -4.426***<br>(0.000)  | -4.169***<br>(0.000)  | I(0)   |
| INFR     | -14.299***<br>(0.000) | -17.095***<br>(0.000) | -10.728***<br>(0.000) | -29.020***<br>(0.000) | I(0)   |
| INTR     | -2.597<br>(0.101)     | -7.012***<br>(0.000)  | -2.592<br>(0.102)     | -7.031***<br>(0.000)  | I(1)   |
| EXR      | 0.767<br>(0.992)      | -6.462***<br>(0.000)  | -1.453<br>(0.101)     | -6.589***<br>(0.000)  | I(1)   |

Source: EvIEWS 12 output

### ARDL Bounds Test

The results of the ARDL Bounds test in table 3 shows that the computed F-Statistic of 10.840 which is above the critical bounds critical values at 10%,5%,2.5% and 1% therefore the null hypothesis of no long

run relationship cannot be rejected which indicates the presence of a long run equilibrium relationship among the variables. This gives room for the application of the ARDL.

**Table 3: Bounds test**

| Test Statistic | Value  | Signif. | I(0) | I(1) |
|----------------|--------|---------|------|------|
| F-statistic    | 10.840 | 10%     | 1.99 | 2.94 |
| K              | 6      | 5%      | 2.27 | 3.28 |
|                |        | 2.50%   | 2.55 | 3.61 |
|                |        | 1%      | 2.88 | 3.99 |

Source: EvIEWS 12 output

### ARDL Short Run

The short run results in table 4 below revealed that the food production index (FPIN) had an unfavorable relationship with the national output as a unit rise in the

food production index decreased economic growth by 0.001 units at 10% level of significance (Yuan *et al* 2025). This is not in line with the apriori expectations the incidence of bandits and kidnappers killing

farmers in their farms has led to food scarcity and expensive agricultural products. Inflation rate also had an inverse relationship with the national transformation as a unit rise in inflation rate led to the decline of economic ascendancy by 0.28 units at 10% significance level. This is in line with the apriori expectation as inflation rate has reduced the purchasing power of the citizens in purchasing agricultural products in the nation (Gbadebo 2025). The lagged inflation rate has a positive effect on economic transformation as the inflation of the first period will have a positive effect on the inflation of the current period as people will be able to engage in some activities to cushion the negative effect on

inflation (Ivachenko *et al* 2025). Exchange rate had a negative implication on economic prosperity as a unit rise in the exchange rate led to the decline of the economic growth by 0.010 units. This is in line with the apriori expectation as a high exchange rate leads to the devaluation of the domestic currency and makes the prices of goods and services to be very high. This is related to the previous work done by Oluwafemi (2026)

The error correction term is negative and significant at 1% level which confirms the existence of a stable long run relationship and it shows that 63% of the deviations in the short run are corrected within one period.

**Table 4: ARDL Short run**

| Variable     | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------|-------------|------------|-------------|-------|
| D(FPIN)      | -0.001      | 0.001      | -1.858      | 0.073 |
| D(INFR)      | -0.028      | 0.002      | -2.030      | 0.051 |
| D(INFR(-1))  | 0.024       | 0.001      | 4.546       | 0.000 |
| D(EXR)       | -0.010      | 0.002      | -0.092      | 0.927 |
| CointEq(-1)* | -0.653      | 0.006      | -10.342     | 0.000 |

Source: Eviews 12 output

#### **ARDL LONG RUN**

Food Production index in the long run had a positive relationship with economic prosperity in the long run as a unit rise in the food production index increased economic growth by 0.169 which is in accordance with the apriori expectation. This is because the food production index is an indication of the abundance of food for all the citizens in an economy This is in line with Atchadé, & Nougbodé, (2024). Credit to Agriculture (CAG) has a positive relationship with the economic growth as a unit rise in credit to agriculture increased economic ascendancy by 0.002 units at a non-significant level which is in tandem with the apriori expectation. This is because credit to agriculture makes loans and subsidies to farmers thereby

accelerating agricultural productivity in the Nigerian federation (Okunlola & Ayetigbo 2024). Agricultural output had a favorable correlation with economic prosperity as a 1% rise in agricultural output accelerated economic growth by 0.823% at 10% significance level which is in conformity with the apriori anticipation. This is because agricultural output generates incomes for individuals and increases the government revenue as confirmed by Tossou 2025. Inflation rate has an inverse connectivity with economic growth as a unit rise in inflation decreases economic growth by 0.010 unit at 10% level of significance. It is in synchronization with the apriori expectation as inflation leads to a persistent rise in general price level of goods and services which is dangerous to

the economy. This is when the purchasing power of the people to purchase food crops will reduce drastically which is dangerous for the Nigerian economy (Echebiri *et al* 2022). Interest rate had a favorable influence on economic growth as a unit rise in the interest rate accelerated economic growth by 0.013 units at a 10% insignificant level which is not in synchronization with the apriori anticipation. This is because interest rate motivates people to save to solve future emergencies like burials, naming ceremonies, payment of hospital bills and so on (Ansar, *et al* 2023). It also controls

the high rate of inflation in an economy like Nigeria. Exchange rate also had a favorable effect on economic transformation as a unit rise in exchange rate increased economic growth by 0.002 units at an insignificance level. This opposes the apriori expectation as high exchange rate promotes international trade as it makes many businesses to take part in imports and exports of goods and services (Ou, 2025).

The constant term is 3.951 and it is statistically significant as it depicts the expected economic growth level when all the explanatory variables are constant.

**Table 5: ARDL Long run**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|-------|
| FPIN     | 0.032       | 0.022      | -1.408      | 0.169 |
| CAG      | 0.002       | 0.002      | -0.016      | 0.988 |
| LAGO     | 0.823       | 0.477      | 1.724       | 0.095 |
| INFR     | -0.010      | 0.006      | -1.807      | 0.081 |
| INTR     | 0.013       | 0.013      | 1.012       | 0.320 |
| EXR      | 0.002       | 0.002      | 1.435       | 0.162 |
| C        | 3.951       | 0.194      | 20.349      | 0.000 |

**Source:** EvIEWS 12 output

### **Implications of findings based on the control variables**

The coefficient of inflation rate revealed that inflation rate exerted an unfavorable influence on economic growth. This shows that the economic instability that has overshadowed the nation for years could weaken the role of agricultural financing and food security o the performance of the economy. Subsequently agricultural financing policies should be accompanied with price stability measures in order to reduce the cost of agricultural inputs Interest rate findings showed that the cost of borrowing changing methods have implications for the growth of the economy. Favorable interest rate will make credit from financial institutions to be more accessible to the farmers. This will

promote agricultural productivity and maintain economic stability

Exchange rate findings has its own implications on the economy as the high exchange rate will lead to the rise in the cost of imported agricultural machineries and fertilizers. This brings up the need for exchange rate policies that will have positive implications for agricultural fiance and food security in the Nigerian economy.

### **DIAGNOSTIC TESTS**

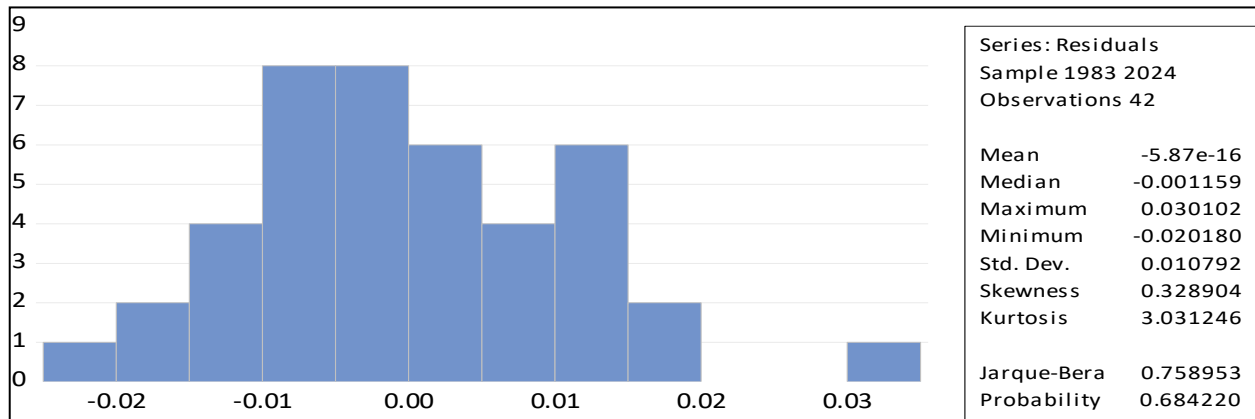
#### **Jacque-Bera Histogram Normality Test**

The mean of the Jacque-Bera Test in the table below shows that the residuals are concentrated at zero as expected in a model of regression. The standard deviation of 0.328 shows a relatively small dispersion of the residuals. The skewness of 0.329 is close to zero which shows that it is relatively skewed in the positive angle and

it is symmetric. The kurtosis of 3.031 revealed that it is close to the 3 benchmark which shows that the distribution has a normal peak. The statistic of Jacque-Bera is 0.7589 with a 0.684 probability values

which means that the null hypothesis of normality cannot be rejected. This means that the residuals are normally distributed

**Table 6:** Normality Test of Jacque-Bera



Recursive residuals which is used to know if the estimated ARDL coefficients are stable over the sample period. The blue line shows the CUSUM statistic while the two

shows that the ARDL is stable structurally as there is no evidence of structural breaks or instability in the period of study therefore the model is good for policy analysis.

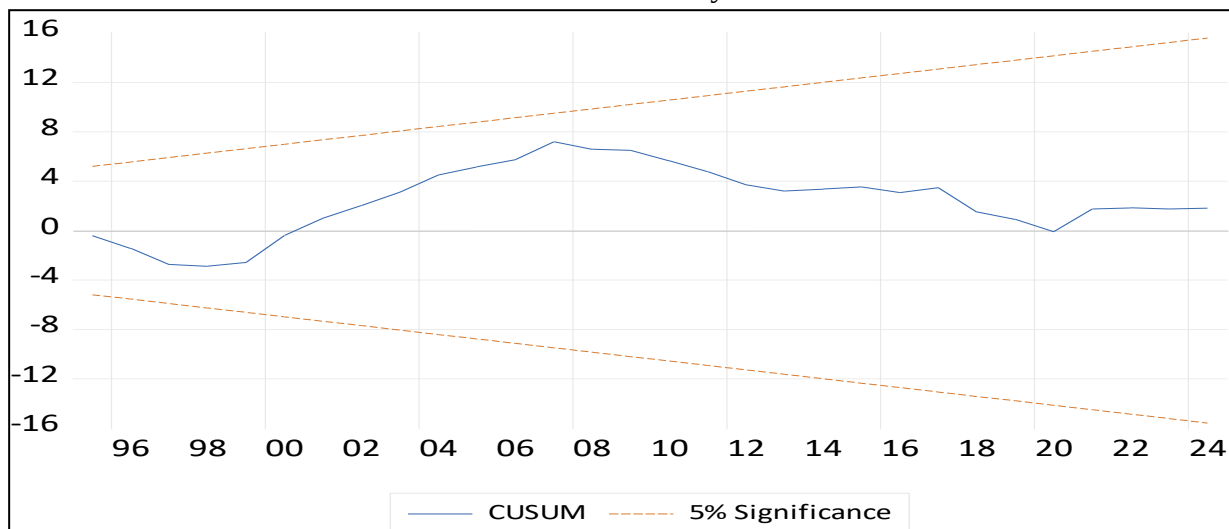
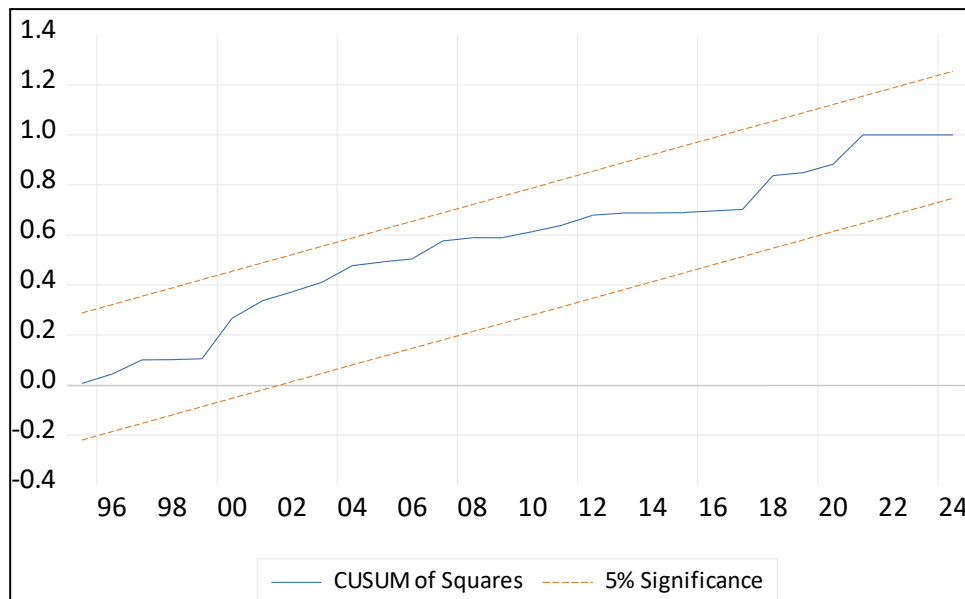


Figure 1: Graph of the Cumulative Sum of the Residuals(CUSUM)

Figure 2 presents the CUSUM of Squares stability test for the estimated ARDL model. The CUSUMSQ plot falls inside the 5% critical bounds throughout the sample period which showed that the model is stable at the structural level. Since the CUSUMSQ does not cross the critical boundaries, the null hypothesis of the

stability of the parameters cannot be rejected as this shows that there are no structural breaks in the residuals variance. This implies that the null hypothesis of the stability of the parameters cannot be rejected. This makes the estimated model to be stable for good policy analysis, forecasting and statistical inference.



**Figure 2: CUSUM of Squares**

## 5. Conclusion and Recommendations

The study investigated how an access to agricultural finance influences food security which contributed to economic prosperity. It established how agricultural financing plays an important role in accelerating agricultural productivity and improves food availability for everyone as access to finance makes farmers to buy seedlings for their farms, modern farm machineries and modern technologies. This increases agricultural output and ensures a better food security. The study concludes that agricultural finance is a critical driver of food security and economic growth in Nigeria. This is because a massive financial agricultural support increases agricultural output, creates jobs and improves food security. The study therefore recommends that the food security should be improved by a continuous government investment in the agricultural sector in form of loans, subsidies, awards and gifts to farmers. Findings also showed that the credit to agriculture was positive therefore

government should not stop funding the agricultural sector but should continue the feat with proper monitoring and evaluation. Agricultural output showed a positive result therefore the government should purchase drones and helicopter gunships to tackle the high rate of insecurity. This will go a long way in increasing agricultural output in the nation. The findings showed inflation as being unfavorable therefore the government should encourage local production of agricultural products and reduce dependency on imports. Interest rate showed a positive result from the finding therefore the authorities should use the high interest rate to discourage unnecessary loans and it will also make families to invest in productive agricultural projects and ignore unproductive agricultural projects. The findings also displayed a negative oriented exchange rate which means that the authorities should focus more on exports than imports to reduce the negative implications of exchange rate on the economy.

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