



The Relationship between Bank Lending to Agricultural Sector and Agricultural Earnings in Nigeria

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Abstract

This study examined the relationship between bank lending to agricultural sector and agricultural earnings in Nigeria using secondary data obtained from various editions of the Central Bank of Nigeria Statistical Bulletins. Secondary data collected for the selected study variables covered ten years period from 2009 to 2018. The study adopted bank loans and advances to agriculture, interest rate, and inflation as independent variables, while agricultural earnings representing gross national agricultural output was used as dependent variable. The study employed descriptive statistics and multiple regression analysis based on the OLS technique assisted by the E-view 10 computer software as the statistical tools for data analysis. The results revealed that all the independent variables had positive relationship with agricultural earnings. Specifically, bank loans and advances to agriculture had statistically significant effect on agricultural earnings. The regression results also showed that the coefficient of determination (R-squared) value of 0.86 indicates that 86% of changes in the dependent variable (AGE) were explained by the combined effect of changes in the independent variables. The study concluded that bank lending to the agricultural sector has a significant positive relationship with agricultural earnings in Nigeria. The study recommended among others that the CBN should step-up policy making, execution and monitoring of bank lending to agriculture; and that the Federal Government through the Federal Ministry of Agriculture should declare a state of emergency on agriculture and make the sector more attractive and viable for investment.

Keywords: Advances; Agriculture; Bank lending; Development; Earnings; Inflation; Interest rate; Loans.

1. Introduction

1.1. Background of the Study

Bank lending is a strong stimulus to a nation's economic growth and development. Banks as financial institutions are one of the most important components in the drive for a country's development. Banks due to their nature represent the vital platform through which money is mobilized from savings to investment in the various economic sectors (Rasan and Kadhin, 2018). Their services serve as a lubricant for the wheel of the economy of the nation to keep revolving without friction. This very important function of the banks when ignored becomes a very huge hindrance to a nation's development. All through the history of nations (first, second or third world nations) the role of the financial institutions as a primary catalyst for development has been recognized and celebrated. The Central Bank of Nigeria in its 2015 charge to banks reiterated the importance of banks and urged the banks to adhere to operating directives especially to agriculture and enterprise. The CBN's incessant policy emphasis and moral suasion on the management of the banks is to ensure that special directives with emphasis on lending to the agricultural sector, is carried out as a preferred sector.

For a nation to develop, there are always key sector of the system that must engineer the other sectors to pick up. Agriculture has been noted as a key and primary player in this regard. The United State Department of Agriculture Economic Research Services (USDAERS) pointed out that Economic development will of course invariably involve industrialization, but this can be expected to follow automatically upon the growth of the surpluses of the agricultural sector (Landes and Burfisher, 2009). In other words, the surpluses that serve as input to the other sectors are generated primarily by agriculture. It emphasizing that the progressive successive stages in which increased agricultural output and productivity contributes to overall economic development is characterized by a substantial increase in the demand for agricultural production and failure to expand food supplies in pace with growth of demand can seriously impede economic growth. This means that the whole of economic growth of a nation depends on Agricultural production, and agricultural production is not an island, it also depends on the mobilization of investible funds (bank lending) to the farmer.

The objective of bank lending to agriculture is to stimulate the agricultural sector to bring about increased productivity (agricultural earnings) so that the surplus can be deployed to other sectors. In order that Banks will play the very vital role of lending to the agricultural sector, the CBN in collaboration with the Federal Ministry of Agriculture and Rural Development (FMARD) established the Commercial Agricultural Credit Scheme (CACS)

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with particular interest to promote commercial agricultural enterprises in Nigeria. The development finance department of the CBN reserves the mandate to verify and monitor all projects after release of funds to ensure banks fully comply with the objectives of the scheme. In order to maintain strict compliance by the banks, the CBN required that Banks shall be required to secure written consent of the CBN before making any change(s) to the stipulated terms and conditions governing any ongoing CAC facility.

According to Famogbiele (2013), several schemes like the ACGSF, BOA Ltd, and the NIRSAL, over N300billion has been sunk into the agricultural sector in the last two decades. Agricultural production by nature requires sufficient capital investment if it must take its national place to kick start the development process of the economy. The vast majority of the people that are into agriculture are merely subsistent because of unavailability of funds required to increase scale and increase earnings. The need for finance was espoused by Famogbiele (2013) when he stated that finance is required for the revival and growth of agriculture in Nigeria. Owofemi (2011), and Sanusi (2011), extended the issues bugging agricultural development to include technology, marketing, government extension services, inputs, storage facilities, power, institutional reforms, education and information.

In all, a proper management and administration is required to handle the challenges in the agricultural sector in order to bring about desired growth and development. It is asserted by scholars like Salami and Arawomo (2013) that it is in the agricultural sector that the battle for long-term economic development will be won or lost. Because the battle must be won for the good of the economy, agriculture should be given a laudable place of pride; the business of agriculture must not be relegated as a peasant occupation. The key to accelerated growth of the under-developed economies has been through fundamental changes in both the mental outlook and technical knowledge and skills of the peasant population.

Agriculture in Nigeria contributed over 65% to the GDP of the country before the advent of crude oil (the black gold). All the food, raw materials and foreign exchange the economy needed as at that time was provided by agricultural income. The Centre of Strategic and International Studies (CSIS 2020) noted that among the most enduring and damaging impacts of Nigeria oil and gas resources has been the long, steady decline of the countries agricultural sector. Agriculture, once the primary source of government revenue and foreign exchange earner, now suffers from decades of underinvestment, corruption, policy neglect and lost opportunities. Today, despite its vast agricultural potential, the country is a net food importer with the vast majority of people engaged in agriculture operating at a subsistence level.

1.2. Statement of Problem

Several studies have espoused that finance and availability of credit facilities is primarily important for agriculture to play its role as stimulant to the kick starting of all the other sectors of the economy towards growth and development. It has been further asserted that agricultural finance has a direct positive bearing on agricultural output, and that agricultural surplus is the feeder of the other sectors of the economy to take their start in the drive for economic development (USDAERS), (Landes and Burfisher, 2009). The harmony in terms of conclusions by various studies has necessitated the need for us to explore the impact of the place of the finance variable upon agricultural business in Nigeria. The study adopted bank loans and advances to agriculture, interest rate and inflation as the independent variable; while corresponding agricultural earnings over the 10-year period (2009 – 2018) was taken as the dependent variable.

The general objective of the study was to examine the relationship between bank lending to the agricultural sector and agricultural earnings (gross national agricultural output). However, the specific objectives of the study include:

1. To investigate the relationship between bank agricultural loans and advances (BAL) and agricultural earnings (AGE);
2. To examine the relationship between interest rate (INT) and agricultural earnings (AGE); and
3. To examine the impact of inflation (INF) on agricultural earnings (AGE).

These objectives formed the basis of the research questions addressed and the hypotheses tested in this study.

The study of the relationship between bank lending to agriculture and agricultural earnings in Nigeria is significant in the sense that it provides the managers of the Nigeria economy requisite information to pay attention to the agricultural sector in order for the desired economic diversification for growth can be achieved. Efficient financial and management of the agricultural sector is widely perceived as the long awaited panacea for the growth, development and diversification of the Nigerian economy. Secondly, the study is significant as it offers the operators of the agricultural sector, a sense of importance and focus, as the operators of the sector of the economy assumed to possess the potentials to free the nation from its mono-product economy replete with plethora of hydra-headed challenges. Thirdly, the study is significant because it will engender renewed interest and refocus investment efforts/interest in agriculture both by private and public sector investors. Lastly, this study has provided further reference materials that will be useful to scholars and future researchers.

This study is divided into five sections. Section one dealt with the general introduction; section two deals with the review of related literature, while the methodology is treated in section three. Data for the study, results of analysis and discussion of findings are covered in section four, while the summary, conclusion and recommendations are provided in section five.

2. Review of Related Literature

2.1. Conceptual Clarifications

2.1.1. Bank Lending

The primary function of a bank is to mobilize funds from the surplus unit and loan such funds to the deficit unit. This function of the bank is important to investment and development of the economy. According to [Sanusi \(2012\)](#) the role of financial system in mobilizing and channeling of funds to the real sector of the economy cannot be taken for granted. Sound financial system is recognized as a necessary and sufficient condition for rapid growth and development for every modern economy. Enabling funds to move from one unit to unit is a fundamental necessity for development.

The lending function of the bank is to ensure intermediation between surplus and deficit units of the economy and lend funds provided by surplus units to deficit unit as loans and advances. [Sanusi \(2012\)](#), further stated that role of the financial system in mobilizing and channeling of funds to the real sectors of the economy cannot be overemphasized because a sound financial system is recognized as a necessary and sufficient condition for rapid growth and development for every modern economy. Enabling funds to move from unit to unit is a fundamental necessity for development. The expected growth in the real sector will not be realized if banks cannot grant credit to the deficit units of the economy – deposits will be limited and this will setback the ability of the banks to generate income ([Galac, 2001](#)).

For most banks, loanable funds account for about 5% of their total assets and about 1/2 to 2/3 of their revenue. This made lending the first and most important function of banks. The lending function is considered important due to a number of reasons: first, the general public or customer use lending in assessing banks' ability, banks that are willing and able to give loans are considered more stable than those that reject proposals of their customers' for loans. Secondly, lending is a legal requirement by the monetary authority which may stipulate certain percentage of bank lending to preferred sectors like agriculture, small scale industry. Thirdly, lending is used as a tool to implement government monetary policy which affects money supply and demand in the economy. Fourthly, lending affects patterns of production, levels of entrepreneurship and consequently, aggregate output and productivity. The last and perhaps the most important reason why the lending function of banks is crucial and important in every economy is that it is generally accepted that there is positive relationship between bank credit and economic growth and development.

2.1.2. Banking Sector Development

Pre-independent and post-independent Nigeria banking history holds that banking sector dominates the Nigeria financial system as it accounts for about 90% of the total assets in the system. However, the sector's contribution to growth and development is appalling and below expectation according to ([Alabede, 2012](#)).

Banking operation actually started in Nigeria with the establishment of the African Banking Corporation (ABC) in 1892, and 1894 the Bank of British West Africa (BBWA) remained the only bank operating in Nigeria until Barclays Bank (now Union Bank Plc) joined in 1912. The third foreign Bank to operate in Nigeria was British and French Bank Ltd. (Now UBA Plc) which was established in 1949. The first indigenous bank in Nigeria was the National Bank of Nigeria (NBN) which was established in 1933. The second successful indigenous bank was African Continental Bank Ltd (ACB) which started operation in 1947. In 1958 the Central Bank of Nigeria was established through the CBN ordinance of 1958 to play a supervisory role over the Nigeria banking sector.

2.1.3. National Development

National development and growth are about positive change in the national income or the level of production of goods and services by a country over a certain period of time. The indices for economic growth includes, the factors of production, technological change, physical change, physical capital accumulation and Domestic Product (GDP) ([Akinima, 2014](#)) according to [Omarjee \(2018\)](#) consumption of goods and services in the economy is a product of capital and labour. Whereas capital is mobilized from either personal savings from entrepreneurs and or loans from banks, labour is human effort in production. The fact that bank loan are major driver of capital accumulation by entrepreneurs and investors alike, makes banks causal factor in the economic growth consideration. According to [Bayoumi and McLender \(2008\)](#), a 2.5% reduction in overall credit causes reduction in the level of GDP by about 1.5%. [Mamman and Hashim \(2014\)](#) asserted that results from a study of 13 countries supported the causal relationship between bank loan economic growths, but argued that the casualty is time and country bound specific rather than general.

Authors, scholars, politicians, specialists, society and economist defined economic development in different ways. International Economic Development Council (IEDC, 2000) viewed economic development, as the objectives are most commonly expressed as the improvement of quality of life and creation of jobs and wealth. Main while, [Feldman et al. \(2016\)](#) described economic development as a professional practice, an activity, and a concept concurrently. It is the extent of capacities acknowledgement of individuals, firms and community growth in prosperity through the utilization of proficiency towards the responsible production, innovation, lowered exchange costs, and the circulation of goods and services ([McKinnon, 2010](#)).

Arguably, it is a way of assuring that the world is full of qualitative and quantitative resources. More prominently, national development plan of several nations' policy focuses on different activities. In contrast and compared relation, economic development determines economic growth of the nation in an increase of national income per capital: more wider engagement in increasing Gross Domestic Product (GDP) and Gross National Product (GNP) ([Haller, 2012](#)). Development and growth requires multi-massive task from the nation. This included

public participation, private and public collaboration, industry involvement and local and international organization. Markedly, according to (IEDC, 2000) some of the organization that participate in economic development are African Union (AU), South African Development Community (SADC), World Bank and International Monetary Fund (IMF). Economic development is a sustainable term aimed to transform industries and public sector organizations with use of skills and knowledge.

2.1.4. A Case for Agriculture

The pre-independent peasant agriculture contributed over 60% Nigeria's GDP, with the use of local tools and rain-fed agriculture. Nigeria was able to produce enough food to feed its population and even for export (Tolu and Abe, 2011). Pre-independent records according to Akinima (2014) hold that Nigeria hit 70% of all her export, and 95% of her food production. This assertion was supported by Ayunku and Etale (2015)

The three geo-political regions of North, East and West created 1946 and later the Mid-West region in 1963, each strived on the basis of agriculture. For instance, the Northern areas grew animals and cereals such as sorghum, groundnuts, cotton, millet, to mention a few; while the Southern areas grew tuber and tree crops like yam, cassava, cocoa, palm produce, rubber, etc. These provided food, employment, raw material for industries and foreign exchange earnings to government. During the first decade of independence, agriculture made positive contributions in Nigeria's economy. This was because the political leadership continued with the agricultural policies initiated by the erstwhile colonial authority. Thus, the Federal Government of Nigeria initiated programmes for agriculture such as the Operation Feed the Nation (OFN), in 1976; Green Revolution (GR) in 1980; Anchor Borrowers Programme in 2015; Presidential Fertilizers Initiative (PFI) in 2016; Presidential Economic Diversification Initiative (PEDI) in 2017; Food Security Council (FSC) in 2018; Agricultural Development Programme (ADP); and the Directorate for Food, Road and Rural Infrastructure (DFRRI) in 1987.

Nigeria has never lacked programme for agricultural development but had only lacked the drive and political will to push its programmes to fruition. Some of the major constraints identified include lack of commitment of the banking sector to make available credit facilities for farmers, and the absence of committed national institutions for funding agriculture in Nigeria. The second constraint was identified quite early and first attempt at correcting the situation was made by the Federal Government in the National Development Plan for the establishment of Agricultural Credit Banks (ACB). Until the creation of states in 1967, the major agricultural financial agencies were the Eastern Region Development Cooperation, and the Northern Region Development Cooperation. In 1973, Nigeria Agricultural and Corporate Bank (NACB) was established to finance activities such as horticulture, food and cash crop production and the setting up of food processing industries.

To further increase the productivity and reduce the plight of the agricultural sector, the Federal Government through the apex bank (CBN) directed all financial institutions to allow 12% of commercial banks overall lending to agriculture. This attempt of sectorial allocation failed as the banks that fact that such facilities are not secured. To address the problem the Federal Government enacted Decrees 20 of March 1977 established the agriculture credit guarantees scheme (ACGS) in collaboration with the CBN as a form of inducement to commercial banks in repeated of loans granted for agriculture purposes in accordance with the provisions of the Act.

2.1.5. Interest Rate

Interest rate is an important economic price. This is because whether seen from the point of view of cost of capital or from the perspective of the opportunity cost of funds, interest rate has fundamental implication for the economy, by either impacting on the cost of capital or influencing the availability of credit by increasing savings. It is known to determine the level of investment in an economy. The importance of interest rate is hinged on its equilibrating influence on supply and demand in the financial sector. Colander (2001) confirmed this by saying that the channeling of savings into financial assets and the willingness of individuals to incur financial liabilities is strongly influenced by interest rates on those financial assets and liabilities. The lending rate which translates into the cost of capital has direct implications for investment. High lending rates discourage investment borrowing and vice versa. Saving rates on the other hand, when high encourages savings which ultimately translates into increased availability of loanable fund. The snag here is that the high saving rates is bound to translate into high lending rates with attendant negative consequences on investment (Olusoji, 2003).

2.1.6. Inflation

Inflation occurs when there is an increase in the price of goods and services. This increase is seen as inflation when it is persistent above the specified benchmark. There are various types of inflation known in literatures – demand Pull, which arises as a result of an increase in aggregate demand without corresponding increase in supply; Supply-push or cost push inflation happens when a reduction in supply caused by an increase in the cost/price of the commodity produced (Anochiwa and Maduka, 2015). It can also be structured inflation, which arises as a result of changes in monetary policy. This type of inflation is also known as a built in inflation. Available data from the CBN statistical bulletin (2018) on the trend of inflation indicates that the inflationary trend of the country has become alarming since 1980 until 2018. The trend shows that Nigeria had only maintained single digit inflation for only 14 years in the past 38 yrs. The situation is attributed to failure of the monetary and fiscal policies (Al Taeshi, 2016; Eggoh and Mohammad, 2014; Olu and Idi, 2015). The impact of inflation will potent a lot of hindrances on agricultural credit.

2.2. Theoretical Framework

2.2.1. Resource Mobilization Theory

The theoretical framework of this study is impinged on the theory of resource mobilization. The Resource Mobilization (RM) theory is a social/organizational network theory on resource mobilization propounded in the 1970's. Resources mobilization is the process of getting resources (men, material, money, machine, management.) from resource providers, using different mechanisms to implement organization's work for achieving the pre-determined organizational goals. It deals in acquiring the needed resources in a timely cost effective manner. Resource Mobilization advocates upon having the right types of resources at the right time, at the right price, with making right use of required resources, thus ensuring optimum utilization of the same (Curtis, 2008; Hertzman, 1990). Beside the interest in networks and mobilization the RM theory has been deeply interested in organization, survival and change overtime.

Scholars not only examine change in response to shift in the economic and political environment but in response to an internal drive to stabilize financial base and grow the scope of activities. The RM theory in its economic and developmental interest has a very strong practical implication for the subject of this study, as the agricultural sector actually need resources to engage in optimum production that will bring about increased foreign exchange earnings, domestic food security, and raw material for industry. Agriculture needs a focused RM on the 5Ms (Man, Money, Material, Machine and Management).

2.3. Empirical Review

There has been a consensus among scholars that there is a relationship between bank lending and economic growth/development. However, scholars seem to have some divergence on the causality between bank lending and economic growth (Oluitan, 2009). This difference in thought has brought about two broad categories which classified by Babikir and Babiker (2007) as the demand-following relationship, and the supply-following relationship. The proponents of the demand-following hypothesis argued that economic growth is a causal factor for bank lending, and not the reverse.

This school of thought draw their convictions from the earlier work of scholars like Robinson (1952) who advocates that the economic growth naturally propels banks to finance enterprise. Gurley and Shaw (1967) hold that increasing demand for financial services stimulate banks to provide more credit. In order to sustain the focus of this school of thought, Oluitan (2009) is of the opinion that policy makers should focus less on measures leading to increasing bank lending and concentrate more on legal, regulatory and policy regions that boost the functioning of markets and banks. Muhsin and Eric (2000), in their study on turkey concluded that economic growth leads to financial sector development.

On the other hand, the proponents of the supply-leading hypothesis are of the belief that bank lending is a veritable tool for attainment of economic growth and development. The hypothesis was originally credited to the works of Schumpeter (1934). Schumpeter holds that efficient allocation of savings by means of identification and funding of entrepreneurs who invest such funds in innovation and produce of goods and services, thus leads to economic growth and development. This view was supported by scholars like McKinnon (1973), Shaw (1973), Fry (1988), and Greenwood and Jovanic (1990).

Similarly, Diego (2003) had similar results from the study of 15 European Union economics using panel estimate technique to assess the mechanisms through which policy changes have influences the economic growth/development of the countries. Habibullah and Eng (2006), conducted casualty testing analysis on Asian developing countries and also found that bank lending promotes economic growth and development. The IMF (2008), Global Financial Stability Report indicated a statistically significant impact of credit growth on GDP growth. It was specifically established that a credit squeeze and spread evenly over three quarters in USA will reduce GDP growth by about 0.8% and 1.4% points year-on-year respectively assuming no other supply shocks to the system (Oluitan, 2009).

In addition, studies were conducted to test the old Schumpeterian hypothesis, for example, Jao (1976) cross-section data average 1967 – 1972 in 44 developing counties and 22 developed countries to study the relationship between bank lending and economy growth/development. The study found out that the money balance-GDP ratio and growth of per capital real money balances (proxy of financial intermediation variable) had a strong posture relationship with economic growth (Tang, 2003).

In a study conducted by Fritz (1984), it was discovered that financial intermediation brings about economic development at the early state of economic growth/development and the direction of causation was reversed at a later stage. This assertion is supported by the works of Rousseau and Wachtel (1998) who examined the link between the intensity of financial intermediation and the economic performance of five industrialized countries. The duo discovered that financial intermediation played an important role in the rapid industrial transformation of those countries.

Tang (2003) and Swiston (2008) asserted that bank lending alone cannot lead to economic development growth, that monetary policies are important to make bank loans perform desired impact. This is an important input to the supply – leading hypothesis. Credit availability is an important driver of the business cycle according for over 20% of the typical contribution of financial factors to growth. A net tightening in lending standard of 20% reduces economic activities by 0.75% after one year and 1.25% after two years (Swiston, 2008). The key funding of all the studies are that financial inter-mediums (proxy deposit money banks – DMBS), have significant positive impact on productivity or factors of production which leads to increase in real GDP and economy growth/development.

3. Methodology

3.1. Research Design and Source of Data

This study adopted the ex-post facto research as the study is based on events that occurred in the past. Therefore, time series secondary data on bank agricultural loans and advances, interest rate and inflation figures as well as agricultural earnings were collected from various annual reports of CBN Statistical Bulletin for the period covering 2009 to 2018; and this source of data is considered the most reliable for this kind of study.

3.2. Model Specification

The study adopted agricultural earnings (AGE) as the dependent variable; while bank agricultural loans and advances (BAL), interest rates (INT) and inflation (INF) as independent variables. The popular model adopted was that used by previous researchers such as [Etale and Bingilar \(2016\)](#), which stated as follows:

$$AGE = f(BAL, INT, INF)$$

The above model was translated into an econometric equation in the form of:

$$AGE = \alpha + \beta_1 BAL + \beta_2 INT + \beta_3 INF + e \quad \text{Equation 1}$$

Where:

AGE = Agricultural earnings (the dependent variable)

BAL = Bank agricultural loans and advances (independent variable)

INT = Interest Rate (second independent variable)

INF = Inflation (third independent variable)

α = Intercept or Constant

β_1 , β_2 , and β_3 = coefficients of the independent variables to be determined.

e = Error term of the equation

3.3. Methods of Data Analysis

This study employed descriptive and multiple regression analysis assisted by the E-view 10 computer software as the statistical techniques for the evaluation of data. The multiple regression analysis based on the OLS technique possesses the unique properties of best linear unbiased estimator compared to other estimation techniques.

4. Results of Data Analysis and Discussion of Findings

4.1. Presentation of Data

The essence of banks agricultural financing is meant to generate more agricultural earnings and national development. In other words, the volume of banks agricultural financing should influence the volume of agricultural earnings, all things being equal. In the evaluation of banks agricultural lending, this study adopted the volume of bank loans and advances to the agricultural sector to represent agricultural financing (BAL) based on the assumption that this variable will as well significantly influence the volume of annual agricultural earnings (that is, gross national earnings from agriculture), all things being equal. Annual data for the study variables were collected from various annual reports of the CBN Statistical Bulletin for the period 2009 to 2018. The data is presented in [Table 1](#).

4.2. Results of Data Analysis and Discussions

4.2.1. Descriptive Statistics

[Table 2](#) shows that AGE, BAL, INT, and INF have mean of 18.18, 0.37, 17.07 and 11.65 respectively. On the other hand the maximum value of AGE, BAL, INT; and INF are 27.37; 0.56; 18.99; and 18.60 respectively, while their minimum values are 11.60, 0.13, 16.02, and 8.00 respectively. [Table 2](#) further shows that the standard deviation of the variables are AGE, 5.00; BAL, 0.16; INT, 0.81; and INF, 3.30. The indication from observations in the set of data is that the variability about the mean is higher in agricultural earnings (i.e. the values of AGE are more widely spread or dispersed than those in the other variables); while bank loans advances to agriculture (BAL) is the least dispersed. The Jarque-Bera statistics and the associated probability values also shows that AGE, BAL, INT and INF are normally distributed with probabilities of 0.73, 0.63, 0.18 and 0.52 which are greater than 0.05 respectively.

Table-1. Annual figures of the study variables

S/N	YEAR	AGE	BAL	INT	INF
		NTrillion	NTrillion		
1	2009	11.60	0.14	18.99	12.00
2	2010	13.05	0.13	17.59	11.80
3	2011	14.04	0.26	16.02	10.30
4	2012	15.82	0.32	16.79	12.00
5	2013	16.82	0.34	16.72	8.00
6	2014	18.02	0.48	16.55	8.00
7	2015	19.64	0.45	16.85	9.00
8	2016	21.52	0.53	16.87	18.60
9	2017	23.95	0.53	17.58	15.40
10	2018	27.37	0.56	16.72	11.40

Source: CBN Statistical Bulletin

Table-2. Descriptive statistics

Date 02/23/21 Time 15:15 Sample: 2009 2018				
	AGE	BAL	INT	INF
Mean	18.18300	0.374000	17.06800	11.65000
Median	17.42000	0.395000	16.82000	11.60000
Maximum	27.37000	0.560000	18.99000	18.60000
Minimum	11.6000	0.130000	16.02000	8.000000
Std. Dev.	5.002597	0.160430	0.816603	3.302945
Skewness	0.467830	-0.378963	1.282441	0.878203
Jorque-Bera	0.618598	0.915389	3.335202	1.286369
Probability	0.733961	0.632741	0.188699	0.525616
Sum Sq. Dev.	225.2338	0.231640	6.001560	98.18500
Observations	10	10	10	10

Source: E-view 10 Output

4.2.2. Regression Results

Table 3 shows the results of the multiple regression analysis. From the results, the independent variables combined significantly explained 87% of changes in the dependent variable with a probability of F-statistics value of 0.005004. This means bank loans and advances to agriculture significantly affected agricultural earnings as the P-value 0.005 is less than the critical value of 0.05. Also, the adjusted R-squared value of 0.798830 indicates that the model used for this study is a proper and good fit to test the study hypothesis. Furthermore, the Durbin-Watson statistics value of 1.388925 (i.e. approximately 1.4 indicates the non-existence of serial auto correlation among the dependent variables).

The regression results used to verify the relationship between bank loans and advances to agriculture (BAL) and agricultural earnings (AGE) indicated strong significant relationship between the independent variable (BAL) with a coefficient of determination of 29.96 and P-value of 0.0019. This means bank loans and advances to agriculture (BAL) had a strong positive effect on agricultural earnings (AGE). Also the probability of F-statistic value (0.005004) of the regression model used implies that the bank loans and advances had a strong statistically significant positive relationship with agricultural earnings. The regression results have expressly shown that bank loans and advances to agriculture has a positive statistically significant relationship with agricultural earnings.

Table-3. Multiple Regression Results

Dependent variable: AGE				
Method: Least Squares				
Date: 02/23/21 time 15 time 15:16				
Sample 2009 2018				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.466088	19.35329	-0.282437	0.7871
BAL	29.96496	5.715546	5.242712	0.0019
INT	0.685163	1.128681	0.607048	0.5661
INF	0.064191	0.258648	0.248179	0.8123
R-squared	0.865887	Mean dependent var S.D. dependent var Akaike info criterion Schwarz criterion Hannan-Quinn Criter Durbin-Watson stat		18.18300
Adjusted R-squared	0.798830			5.002597
S.E. of regression	2.243763			4.743360
Sum squared resid	30.20684			4.864394
Log likelihood	-19.71680			4.610586
F-statistic	12.91277			1.388925
Prob(F-statistic)	0.005004			

Source: E-view 10 Output

4.3. Test of Hypothesis

The calculated P-values of the independent variables were used in testing the study hypothesis in the following sections.

Hypothesis 1: There is no significant relationship between bank loans and advances to agriculture (BAL) and agricultural earnings (AGE).

From table 3, the co-efficient of BAL is 29.96496 with a P-value of 0.0019. This means BAL has a positive significant relationship with AGE at 5% level of significance and 95% confidence level. Therefore, the null hypothesis was rejected. A unit increase in BAL will result to 29.96 units increase in AGE.

Hypothesis 2: There is no significant relationship between interest rate (INT) and agricultural earnings (AGE)

From table 3, the co-efficient of INT is 0.685163 with P-value of 0.5661 which greater than 0.05 (5% level of significance). This again means INT has a positive relationship with AGE, but the relationship is not significant at 5% level (based on the P-value of 0.5661). In this case the null hypothesis is accepted because the interpretation is that a unit change in INT will bring about 0.68 unit increase in AGE.

Hypothesis 3: There is no significant relationship between inflation (INF) and agricultural earnings (AGE).

From [Table 3](#), we again observed that the coefficient of INF is 0.064171 with P-value of 0.8123 (which again is greater than 0.05). This means that INF has a positive relationship with AGE but with a P-value of 0.8123, it has a not significant link with AGE at 5% level of significance. The null hypothesis in this case is also accepted. The economic interpretation, with a coefficient of 0.064, is that a unit change in INF will bring about 0.064 units increase in AGE.

Overall, the result of data analysis in the study has shown that bank lending to the agricultural sector has significant positive association with agricultural earnings for national development in Nigeria.

5. Summary Conclusion and Recommendations

5.1. Summary

From our analysis of data and interpretation of results, the findings of this study can be summarized as follows:

1. Bank lending to the agricultural sector (BAL) had a positive statistically significant association with agricultural earnings (AGE) with a P-value 0.0019 and a coefficient of determination of 29.96496;
2. Interest Rate (INT) had a positive but not significant relationship with agricultural earnings (AGE) with a P-value of 0.5661 and coefficient of determination of 0.685163; and
3. Inflation (INF) had a positive relationship with agricultural earning (AGE), but the relationship is not significant because it had a P-value of 0.8123 and a coefficient of determination of 0.064191.
4. The study revealed that bank lending to the agricultural sector can significantly bring about increase in gross national agricultural output through agricultural earnings which ultimately contribute to national development as agriculture can guarantee food security, raw materials supply to the industrial sector and provide employment.

5.2. Conclusion

This study examined the relationship between bank lending to agricultural sector and agricultural earnings in Nigeria using secondary data obtained from various editions of the Central Bank of Nigeria Statistical Bulletins. Secondary data collected for the selected study variables covered ten years period from 2009 to 2018. The study adopted bank loans and advances to agriculture (BAL), interest rate (INT), and Inflation (INF) as independent variables, while agricultural earnings (AGE) representing gross national agricultural output was used as dependent variable. The study employed descriptive statistics and multiple regression analysis based on the OLS technique assisted by the E-view 10 computer software as the statistical tools for data analysis. The results revealed that all independent variables had positive relationship with agricultural earnings. Specifically, bank loans and advances to agriculture had statistically significant effect on agricultural earnings. The regression results also showed that the coefficient of determination (R-squared) value of 0.86 indicates that 86% of changes in the dependent variable (AGE) were explained by the combined effect of changes in the independent variables. This is statistically significant with an overall probability of F-statistic value of 0.005004 (at 5% level of significance). The study concluded that bank lending to the agricultural sector has a significant positive relationship with agricultural earnings in Nigeria.

5.3. Recommendations

The following recommendations are made based on the findings of this study:

1. The (CBN) should step-up policy making, execution and monitoring bank lending to agriculture. Possibly, the Federal Government through the Federal Ministry of Agriculture should declare a state of emergency on agriculture and make the sector more attractive and viable for investment;
2. It is on record that the agricultural sector provided 70% of Nigeria's exports earnings in the mid-1960s and early 1970, and over 95% of Nigeria's domestic food production. Agriculture has been espoused by scholars like [Salami and Arawomo \(2013\)](#) that it is in the agricultural sector that the battle for long-term economic development will be won or lost. We recommend that the agricultural sector be made to function properly to reclaim the lost glory; and
3. Since finance and the agricultural sector is critical for national development, the institutional control systems within the economy should maximize efforts to ensure that agriculture receives a special interest rate, and be shielded from inflationary effects.

6. Contribution to Knowledge

The study contributed to knowledge by incorporating the effects of interest rate and inflation into bank lending to agricultural sector which is a major deviation from previous studies. By so doing the study has extended the frontiers of existing literature. Future researchers would therefore find this study as a useful reference material.

Suggestions for Further Study

It is suggested that future studies on this topic be carried out covering order sectors of the Nigeria economy with intention to make cross – sectorial evaluation.

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