

IMPACT OF AGRICULTURAL FINANCING ON ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

This study looks into how agricultural funding affects Nigeria's economic expansion. The study's variables include the overall amount of credit given to agriculture by deposit money banks, the lending rates given by these institutions to agriculture, the loans given by rural deposit money bank branches, and Nigeria's actual gross domestic product. The Central Bank of Nigeria's Statistics Bulletin 2021, which covered the 32-year period from 1990 to 2021, provided the statistics for these variables. The Breusch-Pagan Heteroskedasticity Test, Pearson correlation, Shapiro-Wilk Normality, and Ordinary Least Squares Regression Analysis were utilized to examine the data and test the hypotheses. The results showed that Nigeria's real gross domestic product benefited significantly throughout the period under review from the total credit given by deposit money banks to agriculture and the loans given by their rural branches. However, the results showed that the rates at which deposit money banks lent to the agricultural sector during the period under review had a negative effect on Nigeria's real gross domestic product. Among other recommendations made by the research is that deposit money institutions should keep providing more loans to the agricultural industry. This can be achieved through various means such as flexible repayment terms, and tailored financial products designed specifically for the agricultural industry. The government can also provide incentives to banks to promote lending to the agriculture sector. The report also suggests that the interest rates that deposit money banks charge the agricultural sector be supervised and regulated by the Central Bank of Nigeria, with the rate being set marginally above the rate of current inflation. This strategic move would enable farmers to more easily obtain credit facilities, ultimately stimulating growth within the Nigerian agricultural sector.

Keywords: Agricultural financing, deposit money bank, economic growth, lending rate, total credit

INTRODUCTION

Agricultural financing alludes to the supply of money and financial services to support various aspects of agriculture, including farming activities, agribusinesses, and rural development. It is essential to the agriculture industry by facilitating access to capital, improving productivity, and promoting sustainable growth. Agricultural financing encompasses a range of financial instruments, services, and institutions tailored to meet the unique needs and challenges faced by farmers, agricultural enterprises, and rural communities. Credit is the financial leverage extended to individuals, governments, companies, or organizations by the banking system through loans. According to Okereke (2003), credit includes all of a bank's fund-based and non-fund-based operations, which inherently involve a degree of risk. Nwanyanwu (2012) emphasizes the acknowledged importance of credit in the functioning of an economy, where economic actors seek credit to cover operational costs. For example, farmers access credit to acquire essential farming resources like fertilizers, seeds, and farm infrastructure to bolster their agricultural output.

In response, given the dire state of the agriculture sector, the Federal Government of Nigeria took quick action to give its revival high priority. They accomplished this by ordering deposit money banks, through the Central Bank of Nigeria (CBN), to set aside a certain amount of their lendable funds to support this industry. To assist these banks in achieving this objective, the CBN launched the Agricultural Credit Guarantee Scheme (ACGS) in 1979. This scheme aimed to provide a safety net by guaranteeing the disbursement of credit to farmers via banks that accept deposits. In the realm of agriculture, finance plays an integral role and serves as the cornerstone for modernization. It facilitates various crucial aspects, such as the acquisition of machinery, the provision of training for machinery operation, the commercialization of agricultural products, the transportation of goods and equipment, among other essential activities. It is imperative to recognize the profound interconnections between agricultural finance and the actual production of crops and livestock. Indeed, finance holds immense significance in agriculture, as enhanced productivity hinges on the availability of adequate funds. Farmers can only acquire and utilize the necessary technical inputs when they have the requisite financial resources at their disposal.

Banks that accept deposits are essential to supporting agricultural growth and rural development by providing essential credit facilities to rural farmers. The agrarian sector, deeply rooted in rural areas, underscores the significance of deposit money banks in channeling credit appropriately to these regions. Ogunleye (1999) suggested that deposit money banks should allocate a significant portion of their loanable money at advantageous interest rates to the real sector. This approach was believed to stimulate investments and increase economic output. The banking sector, often regarded as the driving force of an economy, has a pivotal responsibility in empowering various sectors, particularly the real sector. This empowerment, in turn, contributes to overall economic growth and development, ultimately leading to an improved Gross Domestic Product (GDP).

Interest rates were established in Nigeria by the Central Bank of Nigeria (CBN) via administrative directives prior to the financial industry being deregulated in the year 1986. The main goal was to allocate credit to industries that were favored, like agriculture. However, after the economy was liberalized in 2000 and sectoral credit distribution became discretionary, market-determined interest rates began to significantly affect how credit was distributed to the real sector of the economy (Okoye et al., 2016). Despite having significant levels of liquidity, deposit money banks in Nigeria saw lending to the agricultural sector as exceedingly dangerous, according to Olorunsola (2001). However, after the economy was liberalized in 2000 and sectoral credit distribution became discretionary, market-determined interest rates began to significantly affect how credit was distributed to the real sector of the economy (Okoye et al., 2016). Despite having significant levels of liquidity, deposit money banks in Nigeria saw lending to the agricultural sector as exceedingly dangerous (Olorunsola, 2001). For this reason, they were reluctant to lend money to this sector, expressing concerns about the costs and risks associated.

It has been contended that commercial or trading enterprises often receive preferential treatment when it comes to securing deposit money banks' credit, yet the agriculture industry faces challenges in accessing loans. Furthermore, when loans are extended to agriculture, they often come with high interest rates and stringent collateral requirements, which deter many potential farmers. The primary focus of Short-term loans have been the focus of Nigerian deposit money banks rather than long-term agricultural projects, which are essential for strong agricultural growth. According to Rahji and Adeoti (2010), agricultural finance is essential to the growth of Nigeria's agricultural industry. Nevertheless,

because of problems including inadequate collateral and the repurposing of agricultural loans for other purposes within the industry, deposit money banks have been less eager to lend to this sector.

Farmers residing in rural areas of Nigeria typically face financial hardship, making it challenging to save and secure funding for their farming ventures. The informal financial markets accessible to them tend to be expensive, while traditionally the agriculture sector is seen by banks and other formal finance sources as a risky area for lending. Moreover, formal funding alternatives are limited in the agricultural sector due to the comparatively lower return on investment and longer repayment periods linked with agricultural activities when compared to commercial ventures. It is contended that even when credit is extended, the interest rates are often exorbitant, which could account for the limited availability of agricultural loans for farmers. Ojo (1988) argued that if interest rates remain unregulated, they may surge, resulting in elevated capital costs and discouraging investments.

A problem to maintaining the viability of economic activity that could encourage the formation of deposit money banks to supply crucial financial support for agricultural production is the dearth of enterprises in rural areas, especially in areas plagued by poverty. Moreover, banks are deterred from investing in farming activities by the costs linked with processing agricultural loans in rural areas. The majority of people in Nigeria live in rural areas where the primary industry is agriculture industry, yet there are still financial difficulties in this sector (Ogunlana & Samad, 2016). Small-scale farmers' ability to increase their agricultural output is limited by the onerous and unequal distribution of financing available to the agricultural sector. According to Nyoro (2002), farmers' access to necessary inputs like seeds, fertilizer, insecticides, and other resources that boost productivity is hampered by a lack of operating capital and low liquidity.

Empirical works have shown that the studies conducted by various researchers for example Odili (2022) and Olaoye et al. (2022), in examining agricultural financing and economic development were delayed in their research because all of the data they used came from 2019. and below. The data used in these studies were not current enough to cover up to the year 2021 except the empirical work of Chukwu et al. (2023) whose data covered up to 2021. Another aspect worth noting is the growing body of research that highlights a correlation between credit from deposit money banks and agricultural output. For instance, Nzotta (1999), Nnamocha and Eke (2015), and Ibe (2014) have all documented positive associations. However, contrasting viewpoints have been presented by scholars such as Ayoola (2010) and Ubah (2009), who argue that agricultural financing does not necessarily stimulate economic growth. Consequently, within academic circles, there is still disagreement about how agricultural financing and economic growth relate to one another. These disparities highlight the necessity of a thorough investigation of how agricultural funding affects Nigeria's economic expansion.

The primary aim of this study is to investigate the influence of agricultural financing on economic growth in Nigeria. More specifically, the study seeks to:

- (i) evaluate the impact of deposit money banks total credit to agriculture on economic growth in Nigeria;
- (ii) determine the impact of deposit money banks' lending rates to agriculture on economic growth in Nigeria;
- (iii) ascertain the impact of loans of rural branches of deposit money banks on economic growth in Nigeria.

The research hypotheses were formulated based on the specific objectives as follow;

Ho₁: The entire amount of credit given by deposit money banks to farmers has no appreciable effect on Nigeria's economic growth.

Ho₂: The rates at which deposit money banks lend to the agricultural sector do not significantly affect Nigeria's economic growth.

Ho₃: Loans from deposit money banks' rural branches don't significantly affect Nigeria's economic expansion.

REVIEW OF RELATED LITERATURE

Agricultural Financing

According to Mufbau (2003), agricultural financing is the process of giving loans to farmers and ranch owners to help with tasks like planting crops, harvesting them, and taking care of their cattle. According to Ugwu (2013), this credit may be given in a variety of ways, such as overdrafts, short-, medium-, or long-term loans, contingent on the goals and gestation length of the project. These credits are usually paid out directly to suppliers for input purchases; proof of delivery is needed to avoid payment diversion, which is a problem that many Nigerian farmers face (Adekanye, 1986; Nzotta, 1999). These monies are necessary for the agriculture industry to continue operating and to provide a positive economic contribution to the country. For this business to operate and survive, large sums of money must be invested in; this is also known as funding, and the banking sector is a vital conduit for this finance. According to Soludo (2004), banks are the main financial intermediaries in Nigeria, allowing money to move from the country's surplus to deficit sectors.

Economic Growth

According to Jhingan (2005), economic growth is defined as a steady, long-term change brought about by an increase in both savings and population rates. It can also mean the positive development of a nation's output of products and services over a given time frame. The increase in the number of products and services produced in a country serves as a measure of this advancement. According to Jhingan (2003), an economy exhibits growth when it increases its productive capacity, which in turn results in a rise in the output of commodities and services. Economic growth is usually driven by positive external influences and technological innovation. But any economy that wants to grow sustainably has to see a substantial expansion of the financial sector. An efficient deposit money bank is essential to maintaining both a dynamic and long-term economic climate. Countries with a strong financial sector typically grow faster, especially because the size of the banking industry has a major beneficial impact on economic growth (Beck & Levine, 2002 as mentioned in Nnanna, 2004). A sustained increase in net national product or per capita national output over a prolonged period of time is referred to as economic growth. This growth suggests that the rate of rise in total output is faster than the rate of increase in population (Dwivedi, 2006).

Bank Credit and Economic Growth

Technological innovation and positive external factors are typically the drivers of economic growth. However, sustainable development of any economy necessitates significant growth within the financial sector. An effective deposit money bank plays a vital role in fostering sustained economic growth and a dynamic economic environment. Nations with well-established financial institutions tend to experience accelerated growth, particularly as the size of the banking sector exerts a significant positive influence on economic expansion (Beck & Levine, 2002 as cited in Nnanna, 2004). A sustained increase in net national product or per capita national output over a prolonged period of time is referred to as economic

growth. This growth suggests that the rate of rise in total output is faster than the rate of increase in population (Dwivedi, 2006).

According to Akinyele and Osinubi (2006), the banking system plays a major role in the real sector's ability to obtain working capital, which is necessary for obtaining inputs both locally and abroad. On the other hand, Nwanyanwu (2012) noted that bank loans had little effect on the expansion of the Nigerian economy. This is explained by banks' unwillingness to lend money to the private sector for productive uses in agriculture since they would rather concentrate on short-term loans, especially in the fast-moving and high-turnover business of commerce. As such, the real amount of loans made to investors continues to be quite small.

Rhaji (2008) said that a major reason behind the agriculture sector's steady loss in contribution to the Nigerian economy has been the lack of easily available and reasonably priced loans. Similar to this, Ayoola and Oboh (2006) emphasized the need for sufficient capital for all facets of agricultural production, since capital is the basis for gaining access to other vital resources that farmers depend on. Effective use of farm-level credit has been shown to increase net farm incomes, resource productivity, farm operation scale, farming innovations, marketing effectiveness, value addition, and capital accumulation as well as diversified agriculture and net farm incomes.

Lending Rate and Economic Growth

Lending rates, according to Akpansun and Babalola (2012), are a barrier to economic expansion. Iyoha (1996) asserts that the main goal of deregulation under SAP was to enhance financial intermediation by giving banks the ability to efficiently mobilize domestic deposits and distribute investable resources. Interest rate deregulation fosters a more competitive environment for raising and using funds, which in turn leads to an efficient financial sector and more productive companies within it. Interest rate deregulation is supported by a large number of economists as a way to increase investment, boost savings, and eventually improve economic growth.

According to Cargill (1991), interest rates that banks and other lenders charge include a profit margin to cover the lender's risk of default during the loan period as well as compensation for the value of the capital that has been loaned declining mainly as a result of inflation. According to Saunders (1995), interest rates have a big impact on how the economy functions overall by influencing the movement of financial assets, goods, and services both domestically and internationally. Kolawole (2013), referenced by Udoka et al., (2016), suggested that interest rate spreads and agricultural productivity had an inverse relationship. This suggests that a rise in interest rate spreads would probably result in a decline in the nation's agricultural value added.

Rural Deposit Money Banks Loan and Economic Growth

Mahmud (2008) and GOB (2009) contended that agricultural/rural finance has been identified as a critical component supporting the agricultural sector's sustainable growth out of all agricultural reform programs aiming at success. According to Abdullah et al., (2009) and Saboor et al.(2009), prompt and simple financing availability helps farmers buy the equipment and inputs they need for their farms, which boosts output. Siddiqi and Kishwar (2004) reported that increased flow of credit to rural farmers led to heightened demand for inputs, resulting in enhanced crop production. Furthermore, the elasticity of credit amount, number of tractors, irrigation, and use of chemical fertilizers and pesticides in relation to agricultural income indicated that production credit and tube wells have a positive impact on agricultural output.

Empirical Review

Chukwu *et al.* (2023) looked at how agricultural funding affected Nigeria's attempts to reduce rural poverty between 1981 and 2021. Multiple regression analysis was performed using data from the Central Bank of Nigeria's (CBN) Statistics Bulletin. Real gross domestic product was the dependent variable, and the agricultural sector's lending rates, commercial bank credit, government spending, loans from the Agricultural Sector Guarantee Scheme, and loans from commercial banks were the independent variables. The results show that although government expenditure in the agriculture sector boosts Nigeria's GDP, the effect is not statistically significant. On the other hand, lending rates, Agricultural Sector Guarantee Scheme Fund loans, and commercial bank credit all have a strong and favorable influence. Government intervention at all levels is advised in order to boost the performance of the agriculture sector and so improve the economy. The report also recommends government actions to diversify Nigeria's economy, support agricultural credit activities to reduce risk, and grant access to expert staff to monitor loans given to farmers in order to reduce defaults.

Odili (2022) used time series data covering the years 1981 to 2018, this study examined the relationship between funding for the agricultural sector and the productivity of the Nigerian agricultural industry. The Central Bank of Nigeria's statistical bulletin, the National Bureau of Statistics, and the IMF database were the sources of the data. Agricultural Sector Guarantee Scheme (ACGS), Commercial Bank Credit to Agriculture (CBCA), Government Expenditure on Agriculture (GEXA), and Interest Rates (INTR) were used as proxies for the explanatory variables, and Agricultural Gross Domestic Product (AGDP) was used as a stand-in for agricultural sector output. Rainfall was added as a control variable to the model. The Johansen co-integration model was used in the study to confirm the long-term relationships between the variables. The Vector Error Correction Mechanism (VECM) was also applied to investigate the rate at which the variables were adjusted from the short-run dynamics to the long-run equilibrium state. The Agricultural Sector Guarantee Scheme (ACGS) was found to have a considerable and beneficial long-term impact on the Agricultural Gross Domestic Product (AGDP). On the other hand, it was discovered that, during the reference period, Interest Rates (INTR), Government Expenditure on Agriculture (GEXA), and Commercial Bank Credit to Agriculture (CBCA) had negative but significant effects on AGDP. The report suggests that regulations be put in place to prioritize investment in the agricultural sector and diversify the Nigerian economy. This can be achieved by requiring commercial banks to allocate a specific portion of their total advances and loans to the agricultural sector.

Olaoye *et al.* (2022) addressed a relevant issue for policy consideration by delving into the relationship between agricultural finance and economic growth in Nigeria in the twenty-first century. Between 1988 and 2017, agricultural finance becomes a primary concern for farmers and agricultural intermediaries. The nation's Economic Growth (EG) and infrastructure development are thought to be negatively impacted by the steady decrease in agricultural investment from public and private sources. A lot of research has been done on Economic Growth (EG), but Agricultural Finance (AF) hasn't gotten as much attention. This study looks at the possible impact of AF on EG in Nigeria in an effort to close this gap. The study uses an ex post facto research approach and analyzes data at a significance level of 5% using both descriptive and inferential statistics. The study's conclusions show that AF has a favorable impact on EG in Nigeria (Adj R² = 0.941450, F (3, 30) = 156.4357; P = 0.00). In particular,

EG in Nigeria is positively and significantly impacted by agricultural financing. In light of these findings, the study recommends, among other measures, that the government should implement policies aimed at increasing the availability of loans for agriculture to stimulate Economic Growth (EG).

Ogbuabor and Nwosu (2017) used an error correction model, the study investigated the impact of agricultural credit provided by deposit money banks on agricultural productivity in Nigeria. The investigation used annual time series data from 1981 to 2014. The results showed that the variables under examination had an equilibrium relationship. Additionally, it was found that agricultural credit provided by deposit money banks influences agricultural productivity in a favorable and noteworthy way over an extended period of time, although it has a negligible effect in the immediate term. The study suggests implementing strategies to improve and maintain the availability of bank credits for the agriculture sector at reasonable interest rates in light of these findings. Furthermore, steps are recommended to guarantee simple access to land for farming and to mechanize the agricultural sector in order to draw in young people.

Udoka et al.(2016) studied the Agricultural Credit Guarantee Scheme Fund's beneficial effects on agricultural productivity highlight how crucial it is that the government adequately funds the program. Using an ex-post facto research approach, the study also looked at how commercial bank borrowing affected Nigerian agriculture productivity. The Central Bank of Nigeria Statistical Bulletin provided the study's data, and the ordinary least squares regression approach was used to analyze the data. The findings showed a strong and positive correlation between Nigerian agricultural output and the Agricultural Credit Guarantee Scheme Fund. Likewise, agricultural productivity and the credit provided by commercial banks to the agricultural sector showed a strong and positive correlation. Furthermore, it was shown that government spending on agriculture had a positive and significant link with agricultural productivity, while theoretical postulations were supported by a negative relationship between interest rates and agricultural output. The study's conclusion stressed how crucial it is that the government keeps guaranteeing loans made to farmers since doing so would encourage banks to lend more to them and so boost agricultural output.

Ogunlana and Samad (2016) used time series data covering the years 1970 to 2015, the study examined the effect of bank lending on the performance of agricultural production in Nigeria. The estimated results, which came from the Parsimonious Error Correction Model of the Ordinary Least Squares Methodology and the Johansen multivariate co-integration method, showed different degrees of statistical significance within the established model and were inconsistent with economic theory. A long-term relationship between agricultural output, bank credit, interest rates, and demand deposits was revealed by the co-integration test result. However, the parsimonious error-correction model suggested that bank credit, interest rate, and demand deposits had a negative effect on agricultural output. In light of these findings, the study recommended that the agricultural sector needs to be sharpened and carefully managed to stimulate agricultural production for sustained growth and development. Furthermore, the study advocated for the diversification of the economic base from oil to non-oil sectors, particularly focusing on agricultural production.

Adolphus and Deborah (2014), looked at how banks financed Nigeria's manufacturing and agricultural industries between 1981 and 2010. Both descriptive and inferential methods were used in the analysis of the data, which were taken from the Central Bank of Nigeria Statistical Bulletin (2010). To evaluate the association, two multiple regression models were estimated. The descriptive findings revealed that

there was a discrepancy in the way Nigeria's commercial and merchant banks funded agricultural as opposed to industry. The manufacturing sector received an average of 32.0% to 36.8% bank credit, while agricultural received an average of 9.0% to 10.1%. Over the course of the time, the manufacturing sector contributed an average of 5.4% to GDP, while agriculture contributed 33.5% on average. The GDP contribution of agriculture and the amount of loans from commercial banks were shown to have a relatively poor association, according to inferential results. Nonetheless, there was a strong positive association found between the GDP contribution of agriculture and merchant bank loans.

Ogbanjeet al.(2012) examined the effects of loans from commercial banks on Nigeria's agriculture industry between 1981 and 2007. The Central Bank of Nigeria provided secondary data for the research. The model was estimated using the ordinary least squares approach. The study's conclusions showed that loans from commercial banks increased agricultural GDP. As a result, loans from commercial banks have significantly aided Nigeria's agricultural development.

Theory Underpinning the Study

Financial Intermediation Theory

This theory emphasizes the role of financial institutions serve a vital role in transferring savings from investors to debtors. including farmers. Effective financial intermediation in agriculture can help mobilize savings and allocate capital efficiently to agricultural projects. As a result, agricultural financing can lead to increased agricultural output and overall economic growth. The Financial Intermediation Theory was primarily developed by Franklin Allen and Anthony Santomero in the early 1990s. Their seminal paper titled "What Do Financial Intermediaries Do?" was published in the Journal of Banking and Finance in 1997. In this paper, Allen and Santomero introduced and formalized the concept of financial intermediation and looked at how important these middlemen are to the economy.

The notion of financial intermediation emphasizes how important financial institutions are to connecting savers and borrowers within the agricultural sector. By providing access to capital, mitigating risks, mobilizing savings, promoting efficiency, and supporting infrastructure development, financial intermediaries contribute significantly to agricultural financing and, subsequently, economic growth. Understanding and optimizing this relationship is essential for policymakers, as it can lead to sustainable agricultural development and overall economic prosperity.

This study is underpinned by financial intermediation theory because theory emphasized the vital role the financial institutions play in connecting savers and borrowers within the agricultural sector. By providing access to capital, mitigating risks, mobilizing savings, promoting efficiency, and supporting infrastructure development, financial intermediaries contribute significantly to agricultural financing and, subsequently, economic growth.

METHODOLOGY

Ex post facto research methodology was used in this study to investigate the relationship between agricultural financing and economic growth in Nigeria. The study's population consisted of all Nigerian deposit money banks. The study's data came from the Central Bank of Nigeria (CBN) statistical bulletin. It included aggregated annual time series data on the total credit provided by deposit money banks to agriculture, the lending rates charged by these banks to this industry, the loans made by deposit money banks to their rural branches, and the real gross domestic product of Nigeria. Since time series data were the main focus of this investigation, all deposit money banks in Nigeria were included in the

sample size. Consequently, the sample size was the entire population. The years 1981 through 2022 were included in the study. For this investigation, time series data covering 41 years (1981–2022) made up the sample size. Due to data availability and the current administration of Nigeria's emphasis on agriculture-based economic diversification, this timeframe was chosen for the study. For the analysis, the multiple regression approach was used. The rationale behind this technique selection was that the ordinary least squares (OLS) estimator is considered the most dependable of all estimators.

Model Specification

The dependent variable in this study is economic growth, which is represented by the real gross domestic product (RGDP). The independent variable is agricultural financing, which is proxied by Deposit Money Banks Total Credit to Agriculture (DMBTCA), Deposit Money Banks' Lending Rates to Agriculture (DMBLRA), and Loan of Rural Branches of Deposit Money Banks (LRBDMB). The functional linear equation, adapted from Chukwu et al. (2023) and Udoka et al. (2016), is presented as follows:

$$RGDP = f(DMBTCA + DMBLRA + DMBLRA + LRBDMB)$$

Econometrically, the above function is rewritten into a model as follow:

$$RGDP_t = \beta_0 + \beta_1 DMBTCA_t + \beta_2 DMBLRA_t + \beta_3 DMBLRA_t + \beta_4 LRBDMB_t + \mu_t \dots \dots \dots (\text{Model})$$

Where:

RGDP = an indicator representing real gross domestic product (dependent Variable);

β_0 = Intercept term (a constant);

β_1 = Coefficient of Deposit Money Banks Total Credit to Agriculture;

β_2 = Coefficient of Deposit Money Banks Lending Rates to Agriculture;

β_3 = Coefficient of Loan of Rural Branches of Deposit Money Banks;

$RGDP_t$ = an indicator representing Real Gross Domestic Product (Dependent Variable)

$DMBTCA_t$ = a predictor representing Deposit Money Banks Total Credit to Agriculture (Independent Variable);

$DMBLRA_t$ = a predictor representing Deposit Money Banks Lending Rates to Agriculture (Independent Variable);

$LRBDMB_t$ = a predictor representing Loan of Rural Branches of Deposit Money Banks (Independent Variable);

t = Time series

f = Functional relationship.

A-priori Expectations: $\beta_1, \beta_3 > 0, \beta_2 < 0$

Variables Definition and Measurement

Table 1: Variables Measurement

Variables	Type	Measurement	Justification
Real Gross Domestic Product	Dependent Variable	After factoring in inflation, this represents the comprehensive value of goods and services in Nigeria.	Ogunlana and Samad (2016); Ogbaje, Yahaya and Kolawole (2012).
Deposit Money Banks Total Credit to Agriculture (DMBTCA).	Independent Variable	This denotes the aggregate loans disbursed to the agricultural sector by deposit money banks in Nigeria.	Ogunlana and Samad (2016); Ogbaje, Yahaya and Kolawole (2012)

Deposit Money Banks Lending Rates to Agriculture (DMLRA).	Independent Variable	This represents the interest rate applied to the entirety of loans extended to the agricultural sector by deposit money banks in Nigeria.	Ogunlana and Samad (2016); Udoka, Mbat and Duke (2016).
Loan of Rural Branches of Deposit Money Banks (LRBDMB)	Independent Variable	This signifies the sum of loans provided to rural residents by deposit money banks in Nigeria.	Siddiqi and Kishwar (2004).

Source: Researcher's Variables Definitions and Measurement

DATA ANALYSIS AND DISCUSSION OF FINDINGS

Appendix A presents a forty-one-year time series dataset spanning from 1990 to 2021, comprising information on Real Gross Domestic Product (RGDP), Total Credit to Agriculture by Deposit Money Banks (DMBTCA), Lending Rates to Agriculture by Deposit Money Banks (DMLRA), and Loans from Rural Branches of Deposit Money Banks (LRBDMB).

Data Analysis and Results

Using the Shapiro-Wilk Normality Test, Pearson Correlation, Heteroscedasticity Test, Ordinary Least Square Regression, and descriptive statistics, the dataset was examined using Stata 15 software. Appendix B contains the detailed results, which are based on the data given in Appendix A and are also included for reference.

Descriptive Statistics

Table 2 summarises the descriptive statistics of the data set.

Variable	Obs	Mean	Std. Dev.	Min.	Max.
RGDP	32	43327.67	19581.71	21462.73	72393.67
DMBTCA	32	246.3031	341.7149	4.22	1457.82
DMLRA	32	24.50563	4.408924	18.36	36.09
LRBDMB	32	103.0572	226.0508	1.6	988.59

Source: Researcher's Computation using STATA 15 software

Table 2 A thorough spread during the study period is suggested by the research, which shows that the Real Gross Domestic Product (RGDP) spans from a minimum value of 21,462.73 to a maximum value of 72,393.67. A mean value of 43,327.67 falls within this range. Additionally, the RGDP's standard deviation is 19,581.71, which is less than the mean and indicates comparatively slow development over the studied period. Comparably, the data for Deposit Money Banks Total Credit to Agriculture (DMBTCA) show a significant variation across the research period, with a minimum value of 4.22, a maximum value of 1,457.82, and a mean value of 246.3031. All of these values are within this range. Furthermore, DMBTCA's standard deviation is 341.7149, which is higher than the mean and indicates significant increase during the period under consideration.

A thorough distribution during the study period is indicated by Table 2, which also shows that the lending rates to agriculture by deposit money banks (DMLRA) range from a minimum value of 18.36 to a maximum value of 36.09. A mean value of 24.50563 falls within this range. Additionally, the

DMBLRA's standard deviation is 4.408924, which is less than the mean and indicates comparatively slow growth during the time under consideration. Furthermore, Table 2 shows that there was a significant variation in the loans given by rural branches of deposit money banks (LRBDMB) during the course of the study period. The loans vary from a minimum value of 0.61 to a high value of 399.96, with a mean value of 108.1676 within this range. Furthermore, LRBDMB's standard deviation is 109.9109, which is higher than the mean and indicates rapid growth during the period under consideration.

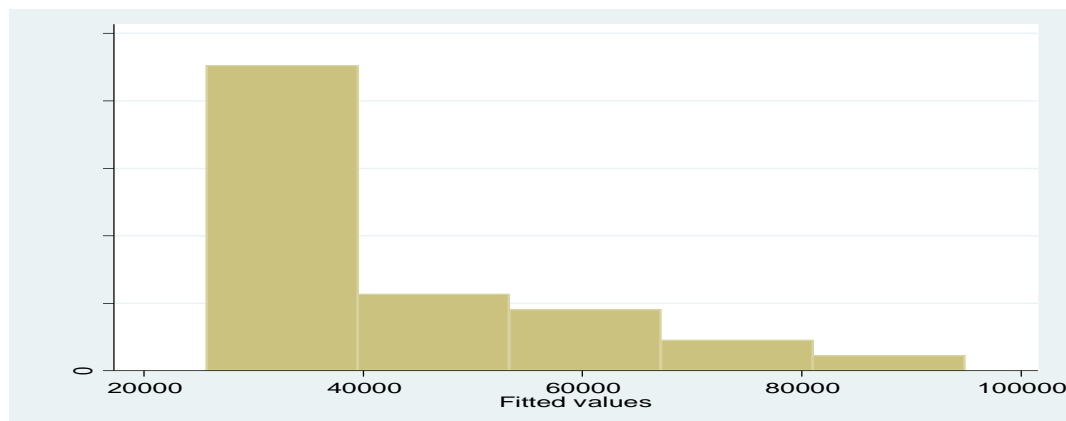
Shapiro-Wilk Normality Test

The results of the normality test, which was conducted using the normal distribution curve and the Shapiro-Wilk test, are shown in Table 3 and Figure 1 below.

Variable	OBS	Pr(Skewness)	Pr(Kurtosis)	Adj chi2(2)	Prob>chi2
Residual	32	0.81079	6.312	3.825	0.00007

Source: Researcher's Computation using STATA 15 software

Figure 1: Normal Distribution Curve



A residual Adj. chi of 3.825 and a corresponding probability value of 0.000, which is less than 0.05, are shown in Table 3 above. This indicates that there is a normal distribution around the mean in the residual. This result is further supported by the normal distribution curve shown in Figure 1 above. Therefore, it may be concluded that one of the basic presumptions of linear regression—that is, the requirement for properly distributed residuals—has been satisfied.

Pearson Correlation

The dataset's Pearson correlation matrix is shown in Table 4 below, showing the strength of the association between the variables.

Variable	RGDP	DMBTCA	DMBLRA	LRBDMB
RGDP	1.0000			
DMBTCA	0.8098	1.0000		
DMBLRA	0.2650	0.4081	1.0000	
LRBDMB	0.5060	0.3474	0.2175	1.0000

Source: Researcher's Computation using STATA 15 software

The purpose of the correlation matrix is to determine how closely the proxies of an independent variable and the dependent variable are related. It is also used to find possible correlations between the independent variable proxies, which aids in locating any multicollinearity problems in the model. As can

be seen from the correlation coefficient of 0.8098, the results from Table 4 show a strong and almost 81% positive association between Deposit Money Banks Total Credit to Agriculture (DMBTCA) and real gross domestic product (RGDP) in Nigeria. Additionally, with a correlation value of 0.2650, the data shows a roughly 27% positive and weak association between the real gross domestic product (RGDP) in Nigeria and the lending rates to agricultural (DMLRA) of deposit money banks.

Additionally, the correlation coefficient of 0.5060 in the table shows a moderate and positive relationship of almost 51% between loans from rural branches of deposit money banks (LRBDMB) and real gross domestic product (RGDP) in Nigeria. Last but not least, all of the coefficients fall below Gujarati's (2003) proposed threshold of 0.80, indicating that the correlations among the proxies of independent variables themselves appear to be moderate. This is a requirement for regression analysis.

Variance Inflator Factor (VIF) Results

Table 5: Variance Inflator Factor (VIF)

Variable	VIF	I/VIF
DMBTCA	1.31	0.763270
DMLRA	1.21	0.826971
LRBDMB	1.15	0.872438
Mean VIF	1.22	

Source: Researcher's Computation using STATA 15 software, 2021.

Collinearity diagnostics tests were performed with an emphasis on the Variance Inflation Factors (VIF) and the Inverse Variance Inflation Factors (1/VIF) in order to further evaluate the lack of multicollinearity among the exogenous variables. There is no problem with multicollinearity in the data, according to the results shown in Table 5. Gujarati (2003) suggests that the VIF and 1/VIF values are below the threshold of 10 and 1, respectively, which serves as evidence of this. Regression analysis requires that the variables be free of multicollinearity, which implies that the variables have been chosen and fitted inside the same regression model adequately.

Heteroscedasticity Test

Table 6: Heteroscedasticity test

Type of test	Chi2	P-Value
Heteroscedasticity Test	2.78	0.0952

Source: Researcher's Computation Using STATA 15 software

Heteroscedasticity analysis is done to make sure the study's data are robust. The results of the investigation show that it is free heteroscedasticity, which satisfies the fundamental linear regression model's assumptions. The heteroscedasticity test findings, which are shown in table 6 and display a chi-square value of 2.78 with a p-value of 0.0952, corroborate this conclusion. These results are consistent with the homoskedasticity assumption of linear regression, which includes constant error variance.

Robust Ordinary Least Regression result

The robust ordinary least square regression model used to estimate this model is shown in Table 7 below.

Variable	Coefficients	t-value	Prob.
Cons.	41400.93	3.59	0.001
DMBTCA	43.53694	6.66	0.000
DMLRA	-455.2743	-0.94	0.358
LRBDMB	22.90224	2.48	0.020
Adj. R. sq	0.6920		
F-statistic	24.22		
Prob. >F	0.0000		

Source: Researcher's Computation using STATA 15 software

Table 7 above demonstrates that the combined effect of deposit money banks' lending rates to agriculture (DMLRA), total credit to agriculture (DMBTCA), and loans to rural branches of deposit money banks (LRBDMB) with (Adj. R-sq of 0.6920) predicts 69% variation of real gross domestic product (RGDP). With a P-value of 0.000 and an F-statistic of 24.22, the model was found to be appropriate for the research. This suggests that the independent variables have been appropriately incorporated and utilized, and the study's model is fit.

Discussion of Findings

This study shows that the overall amount of credit provided by Deposit Money Banks to the agricultural sector positively affects Nigeria's real gross domestic product. This implies that an increase in the total amount of credit given by Deposit Money Banks to the agricultural sector would result in a 43.53694 unit increase in Nigeria's real gross domestic product. The findings are in line with the researcher's initial predictions and the tenets of financial intermediation theory, which highlights the crucial function financial institutions play in facilitating the transfer of funds between agricultural savers and borrowers. Financial intermediaries play a major role in financing agriculture and, by extension, economic growth through facilitating access to finance, reducing risks, mobilizing savings, encouraging efficiency, and assisting with infrastructure development. This observation is consistent with Ogbuabor and Nwosu's (2017) empirical findings. On the other hand, Chukwu et al.'s empirical findings (2023) contradict it.

The study also shows that Nigeria's real gross domestic product is negatively impacted by deposit money banks' lending rates to the agricultural sector. This implies that Nigeria's real gross domestic product would decline by -455.2743 units in response to an increase in deposit money banks' lending rates to the agricultural sector. This outcome defies the financial intermediation theory, which highlights the critical role financial institutions play in bringing together savers and borrowers within the agriculture sector, and is in line with the researcher's initial predictions. Financial intermediaries play a major role in financing agriculture and, by extension, economic growth through facilitating access to finance, reducing risks, mobilizing savings, encouraging efficiency, and assisting with infrastructure development. This outcome is in line with the empirical discoveries made by Ogbanje et al. (2012) and Chukwu et al. (2023). It does, however, run counter to Adolphus and Deborah's (2014) empirical findings.

In the end, the study found that loans from deposit money banks' rural branches significantly boost Nigeria's actual gross domestic product. This suggests that an increase in these loans would result in a 22.90224 unit increase in Nigeria's real gross domestic product. This result is in line with the researcher's initial predictions as well as the tenets of financial intermediation theory, which highlights the crucial role financial institutions play in facilitating the connection between savers and borrowers in

the agriculture industry. Financial intermediaries play a crucial role in financing agriculture and, by extension, economic growth by facilitating access to finance, reducing risks, mobilizing savings, encouraging efficiency, and assisting with infrastructure development. This outcome is also in line with the empirical discoveries made by Udoka et al.(2016) and Chukwu et al. (2023).

CONCLUSION AND RECOMMENDATIONS

The total amount of credit given by deposit money banks to the agriculture sector and Nigeria's economic growth are positively correlated. This suggests that any rise in the overall amount of credit given by deposit money banks to the agricultural sector will result in a proportionate acceleration of Nigeria's economic growth. This shows that supporting greater bank loan availability through investments in the agriculture sector has a positive impact on Nigeria's overall economic performance. It emphasizes how much agriculture contributes to the expansion of the national economy.

Nigeria's economic growth is marginally hampered by deposit money banks' lending rates to the agricultural sector. This suggests that the pace of economic growth in Nigeria is negligibly lower for every unit increase in deposit money banks' lending rates to agriculture, with no discernible impact on the country's overall growth. Therefore, in order to promote Nigeria's economic growth, the central bank of Nigeria must carefully consider monetary policy actions relating to lending rates in the agricultural sector.

Nigeria's rural deposit money bank branches' loan disbursements and the growth of the nation's economy are strongly and favorably correlated. This suggests that Nigeria's economic growth increases in tandem with each rise in loans from these rural branches. The lending operations of deposit money banks' rural branches contribute significantly to Nigeria's economic expansion. These loans most likely give rural enterprises and individuals access to capital, which promotes economic activity, the development of jobs, and general economic growth.

Based on the study's findings, the following suggestions are made.

- i. Deposit money banks should continue to expand their lending allotment to the agricultural industry. This is attainable. Through various means such as flexible repayment terms, and tailored financial products designed specifically for the agricultural industry. The government can also provide incentives to banks to promote extending credit to the agriculture sector.
- ii. The interest rates that deposit money banks give to the agriculture industry should be monitored and controlled by the Central Bank of Nigeria, by establishing interest rates slightly above the prevailing inflation rate. This strategic move would enable farmers to more easily obtain credit facilities, ultimately stimulating growth within the Nigerian agricultural sector.
- iii. Deposit money institutions should be required by the Central Bank of Nigeria to set aside at least 10% of their loanable capital for rural dwellers to bolster economic growth in Nigeria.

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