EFFECT OF BANK CREDITS ON AGRICULTURAL OUTPUT: EVIDENCE FROM EDO STATE, NIGERIA

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ABSTRACT: This study investigated the effects of bank credits on agricultural output in Edo State, Nigeria. Emphasis was laid on the credits of Deposit Money Banks, BOA (Bank of Agriculture), and microfinance banks. The survey research design was adopted, and farmers from Esan North-East, Esan Central, Esan South-East, Etsako West, Igueben, and Uhunmwonde Local Government Areas (LGAs) of Edo State served as the unit of analysis. The stratified random sampling technique was employed to determine the number of farmers included in the study. These farmers were reached using questionnaires and personal interviews. The quantified version of the collected data was subjected to descriptive analysis, correlation analysis, and joint and individual tests at a 5% level of significance. Findings revealed that the credit of Deposit Money Banks has a positive and significant effect on agricultural output, while the credit of the Bank of Agriculture and microfinance banks has positive, but insignificant, effects on agricultural output. Hence, bank credits have positive effects on agricultural output in Edo State, Nigeria. As such, to enhance the output of the agricultural sector in Edo State, the government of the day should encourage deposit money banks, BOA and microfinance banks to extend more credit to farmers in the state. Nevertheless, measures should be put in place to ensure that farmers repay such loans as they become due. Thus, all existing farmers in the state should be properly registered with the Ministry of Agriculture so that their activities can be properly monitored, allowing the government to serve as a guarantor for these farmers.

Keywords: Bank Credits, Agricultural Output, Deposit Money Banks, Microfinance Bank, Bank of Agriculture.

INTRODUCTION

Nigeria, as a country, has thirty-six (36) states, which exclude the Federal Capital Territory, Abuja. The country has six geopolitical zones: North-Central, North-East, North-West, South-East, South-West and South-South. The South-South region has six states, and Edo State is one of them. The major economic activities in Edo State are agriculture, oil and gas production, manufacturing and tourism. The major agricultural activities in Edo State include crop production, livestock farming, fishing and aquaculture, forestry, agricultural processing, and other ventures such as apiculture (beekeeping), snail farming, mushroom cultivation, and vegetable farming. These agricultural activities are thriving because the state has a favourable climate and soil conditions, which make it a significant contributor to Nigeria's food production and the country's agricultural sector (Olorunsola, Adeyemi, Vallli, Kuffre & Ochoche, 2017). Edo State contributes significantly to Nigeria's national production of crops, including cassava, yams, maize, and rice. Given the State's favourable tropical climate and fertile soil, it produces a wide range of crops, including food crops and cash crops. Statistically, Edo State is the largest producer of cassava in Nigeria, accounting for over 20% of national production. The state is the second-largest producer of yams in Nigeria, accounting for approximately 15% of the nation's production. Also, Edo State is among the top three maize-producing states in Nigeria (BOA, 2022).

Nevertheless, commercial agriculture is capital-intensive. Farmers always look out for agricultural credit to support their business. Such credits are loans and advances extended to farmers for production, storage, processing and marketing of agricultural produce. These credits can be short-term, medium-term, or long-term, depending on their duration. Agricultural credits are sometimes referred to as farm loans or farm credit. Farm credit plays a crucial role in agricultural production, as it enables farmers to reap economies of scale, venture into new fields of production, employ new technologies, and expand their capabilities to provide utilities for a widening market (Ayegba & Ikani, 2023). In essence, the availability of credits enables farmers to switch quickly to new technologies which enhance the achievement of rapid growth and productivity.

In Nigeria, the major sources of agricultural credit include the government (Ministries of Agriculture, the Agricultural Development Programme (ADP), and others); the Bank of Agriculture (BOA) - including Pioneer Micro Credit Disbursements and other schemes; Deposit Money Banks; and microfinance banks. These outlets have at various times extended credits to farmers across Nigeria. However, Deposit Money Banks have been at the driver's seat as the agricultural sector got a total credit of ₦7.0 million in 1970, ₦462.2 million in 1980, ₦4.22 billion in 1990, ₦41.03 billion in 2000, ₦128.41 billion in 2010, ₦1,457.82 billion in 2021, ₦1,812.47 billion in 2022 and ₦44,536.23 billion in 2023. In other words, out of the total sectoral distribution of deposit money banks' credit in Nigeria, the agricultural sector got 1.99 percent in 1970, 7.28 percent in 1980, 16.23 percent in 1990, and 8.07 percent in 2000. By 2010, it fell drastically to 1.67 percent and increased moderately to 5.98 percent in 2021 and 6.16 in 2022; but dropped to 5.06% in 2023 (CBN, 2023). Similarly, microfinance banks are not left out, as in the course of their operations, they have been extending credits to the Nigerian agricultural sector since 1992. According to CBN (2022), loans and advances from microfinance institutions were ₦29.5 million in 1992, ₦98.6 million in 1995, ₦656.6 million in 2000, and about ₦410.21 billion in 2022.

The benefits of having a viable agricultural sector cannot be overstressed. It is in the light of this that the government of Edo State has, over the years, initiated countless policies and programs to reposition the agricultural sector in the state like the Edo State Agricultural Development Programmes (ADP), Edo State FADAMA III Project and Edo State Commercial Agriculture Development Programme (CADP). However, the problem of food shortage still exists; poverty, unemployment, and underemployment are still on the increase in the State. According to the Nigeria Bureau of Statistics (NBS, 2020), the unemployment rate in the state stood at 19 percent, while underemployment was 34.9 percent. Similarly, the poverty rate in 2019 was 11.99 percent. The above gloomy picture is a reflection of what is attainable in Nigeria as a country, and in proffering solution, prior studies has concentrated on national data rather than Edo State in particular (Ngong, Onyejiaku, Fonchamnyo, & Onwumere, 2022; Adewale, Lawal, Aberu, & Toriola, 2022; Onuegbu, Ikeora, & Ogini, 2022; Abdul-Maliq, Ali, & Yua, 2021). Again, over 90 percent of these studies relied on secondary data, which in most cases are misleading as these data are given on a macro scale (Ogbonna & Nnamerenwa, 2022; Ngong, Onyejiaku, Fonchamnyo & Onwumere, 2022; Okuneye & Ajayi, 2021). Hence, the question that readily comes to mind is: have bank credits actually affected agricultural output in Edo State?

Accordingly, the broad objective of the study was to investigate the effects of bank credits on agricultural output in Edo State, Nigeria. The specific objectives were to:

1. determine the extent to which deposit money banks' credits have affected agricultural output in Edo State;
2. ascertain the degree to which BOA (Bank of Agriculture) credits have influenced agricultural output in Edo State; and
3. determine the effects of microfinance bank credits on the output of the agricultural sector in Edo State.

Research Hypotheses

Ho_1: Deposit money banks' credits have not significantly affected agricultural output in Edo State.

Ho_2: BOA (Bank of Agriculture) credits have not significantly influenced agricultural output in Edo State.

Ho_3: The credits of microfinance banks have no significant effect on the output of the agricultural sector in Edo State.

LITERATURE REVIEW

Agricultural Output: Primarily, agriculture involves the cultivation of land, the raising and rearing of animals for the purpose of producing food for humans, feed for animals, and raw materials for industries. It also involves activities such as cropping, livestock, forestry, and fishing, as well as the processing and marketing of agricultural products. Agricultural output relates the

sector's contributions to food supply, export, employment, poverty reduction, gross domestic product, balance of payment etc. (Ngong, Onyejiaku, Fonchamnyo & Onwumere, 2022).

Bank Credit: The term bank credit refers to the amount of money available to a business or individual from a banking institution in the form of overdraft, loans and advances. It is the total amount of money a person, business, or government can borrow from deposit money banks, microfinance banks or development banks, as the case may be (Wilkinson, 2017).

Theoretical Review/Framework

Commercial Loan Theory (Real Bills Doctrine): The first proponent of this theory was John Law in 1705, though Adam Smith popularized it. The theory has it that deposit money banks should only advance short-term, self-liquidating, productive loans to business firms for ease of repayment. It is a traditional banking principle that has implications for agricultural finance among other sectors. The theory emphasizes lending based on self-liquidating, short-term commercial transactions (Mba, 2021). Self-liquidating loans are granted for productive purposes where the transaction itself generates repayment like financing crop production with repayment from crop sale. Short-term in this respect aligns typically with the business cycle of the borrower's operations like seasonal agricultural production. Agricultural credit can come in form of seasonal financing, where loans for inputs like seeds and fertilizers for a cropping season are repaid post-harvest. It can manifest as production loans where short term credits are given to farmers to cover operational costs like labour and other inputs. It can come in the guise of marketing loans that help farmers to bridge the gaps between production and sale of produce (Anthony, Gabriel & Arikpo, 2015). In summary, considering this theory in relation to the agricultural sector, deposit money banks are expected to grant short-term, self-liquidating loans to farmers for financing their working capital needs. These loans are primarily intended for farming activities, and the loan repayment is expected to be sourced from the farm's proceeds.

Financial Intermediation Theory: According to Adeyinka, Akanmu and Innocent (2019), the theory of financial intermediation was first formalized and popularized in the works of Goldsmith (1969), Shaw (1973) and Mckinnon (1973) who see financial institutions playing a pivotal role in economic development, attributing the differences in economic growth across countries to the quantity and quality of services provided by financial institutions. Basically, financial intermediation refers to the process where banks act as middle men between depositors of funds and borrowers of funds, thereby facilitating the flow of funds. In agricultural finance, financial intermediaries play a crucial role in channeling resources to farmers and agribusinesses. These financial intermediaries in agricultural finance are deposit money banks, who offer loans for agriculture but often with stringent collateral; microfinance institutions, who target smallholders; agricultural development banks which are specialized institutions focusing on agro-lending like the Nigerian Agricultural Cooperative and Rural Development Bank; cooperatives, which are farmers' organizations pooling resources; and fintech/digital platforms, which are emerging players using tech for agro-finance access (Andrieş, 2019). Accordingly, financial intermediation starts with financial intermediaries collecting deposits from surplus units (mobilization of savings) to channeling of funds to borrowers needing capital like farmers (allocation of credit), intermediaries assessing and managing credit and liquidity risks (risk management), economies of

scale lower costs as against direct lending/borrowing (transaction cost reduction), and intermediaries screening borrowers and monitoring loans (information asymmetry mitigation) (Adeyinka, Akanmu & Innocent, 2019). It then follows that the key features of the intermediation theory with respect to agriculture are seasonality (agricultural plant-harvest cycles influence loan structures), risk profile (agriculture faces production and market risks like weather, pests and economic downturn), collateral challenges, information gaps and transaction costs.

Credit Rationing Theory: This theory is notably associated with the work of Joseph Stiglitz and Andrew Weiss in 1981. Credit rationing refers to a situation where lenders limit the supply of credit to borrowers, even if those borrowers are willing to pay higher interest rates. This phenomenon is common in credit markets, including agricultural finance. Generally, the theory states that asymmetric information (information gap), adverse selection, moral hazard, equilibrium credit rationing and regulatory factors are primarily the reasons why lenders like banks limit the supply of credit to borrowers, even when borrowers are willing to pay higher interest rates (Stiglitz & Weiss, 1981). With respect to the agribusiness, Mba (2021) averred that in Nigeria, lenders like deposit money banks, microfinance institutions and development banks limit the supply of credit to farmers and agribusinesses, even if the farmers are willing to accept higher interest rates. This is basically because these lenders have limited information on farmers' creditworthiness and crop risks (information asymmetry), farming faces production risks (weather and pests) and price volatility, land titling issues, asset valuation complexities in agriculture (collateral challenges), seasonality as agricultural cycles influence loan demand and repayment capacity, and transaction cost as serving dispersed rural clients is costly for lenders.

Empirical Review

The literature is replete with studies on bank credit and agricultural output; however, we did not find one that specifically focused on Edo State, Nigeria. However, existing studies are thematically classified as thus.

Studies with Positive and Significant Effects of Credit

Idris and Bawa (2023) examined the impact of commercial bank credit facilities on agricultural real output growth in Nigeria, utilising annual time-series data from 1980 to 2021. The data used for the study were collected from the Central Bank of Nigeria's statistical bulletin and the World Bank's Development Indicators for various years. The ARDL econometric technique was adopted for data analysis, and the results revealed that commercial bank credit facilities to agriculture have a positive and significant effect on real output growth in Nigeria.

Magaji, Usman, and Yusuf (2023) adopted a survey research design to analyse the administration of agricultural loans on agricultural output in Nigeria. Primary data were sourced from commercial banks and agricultural loan seekers in the Federal Capital Territory, Abuja. Descriptive (mean and standard deviation) and logistic regression were used for data analysis. The study revealed that agricultural loan by commercial banks has a positive impact on agricultural output in Nigeria; however, there are barriers to agricultural loan administration by these banks in Nigeria.

Ngong, Onyejiaku, Fonchamnyo, and Onwumere (2022) examined the relationship between bank credit and agricultural productivity in the CEMAC (Central African Economic and Monetary Community) from 1990 to 2019. They measured agricultural productivity using agricultural value added as a percentage of GDP. Meanwhile, domestic credit to the private sector by banks, broad money supply, land, inflation, physical capital, and labour supply were used to represent bank credit. The autoregressive distributed lag (ARDL) properties were utilised for data analysis. Results revealed a long-run co-integration among the variables. Also, it was revealed that domestic credit to the private sector by banks, land, and physical capital have positive impacts on agricultural value added to GDP; while broad money supply, inflation, and labour supply have negative impacts on agricultural value added to GDP.

Adewale, Lawal, Aberu, and Toriola (2022) investigated the impact of farmers' credit on agricultural productivity in Nigeria, utilising data from the World Bank Development Indicators (WDI). The study spanned between 1981 and 2016, and the Ordinary Least Squares (OLS) regression estimation technique was employed for data analysis. The estimation results revealed that agricultural bank credit has a direct and significant effect on agricultural output in Nigeria. Also, bank lending rate and foreign exchange have insignificant effects on agricultural output in the country.

Onuegbu, Ikeora, and Ogini (2022) investigated the association between commercial bank credit and the output of the agricultural sector in Nigeria over a thirty-three-year period (1988–2020). Agricultural output was regressed on bank credit, government expenditure, the Agricultural Credit Guarantee Scheme Fund (ACGSF), and the interest rate, as proxies for bank credit. Data generated on these variables were analysed using the Ordinary Least Squares properties. The study revealed that bank credit to the agricultural sector, government spending on the agricultural sector, and ACGSF have positive and significant effects on agricultural output; while interest rate has a negative and insignificant effect on agricultural output in Nigeria.

Abdul-Maliq, Ali and Yua (2021) sought to determine the extent to which aggregate bank credit to the agricultural sector has impacted output growth in Nigeria between 1986 and 2019. They employed the Two-Stage Least Squares (2SLS), regression technique, Breusch–Godfrey LM autocorrelation test and the ARCH test. The study revealed that aggregate bank credits to the agricultural sector and the real effective exchange rate have positive and significant impacts on agricultural output growth in Nigeria during the studied period.

Udoka, Mbat, and Duke (2017) examined the effect of commercial banks' credit on agricultural output in Nigeria, adopting an ex-post facto research design. The Ordinary Least Squares regression technique was employed for data analysis, and the results showed that agricultural credit guarantee scheme funds, government expenditure on agriculture, and commercial banks' credit to the agricultural sector have positive and significant effects on agricultural production in Nigeria. However, the interest rate has an adverse effect on agricultural output.

Ogbuabor and Nwosu (2017) examined the impact of deposit money bank agricultural credit on agricultural productivity in Nigeria using an error correction model and annual time series data for the period 1981-2014. Results indicated that a long-run equilibrium relationship exists

between bank agricultural credit and agricultural productivity. The results also indicated that the deposit money banks' agricultural credit has a positive and significant impact on agricultural productivity in the long run. In addition, results revealed that agricultural land and labour force impact negatively on agricultural productivity both in the long run and short run, while climate change variables (annual rainfall and average temperature) have insignificant effects.

Studies with Negative and Insignificant Effects of Credit

Sulaimon (2021) examined the relationship between the Agricultural Credit Guarantee Scheme Fund (ACGSF) and agricultural performance in Nigeria from 1981 to 2019, employing the standard single-equation regression approach. Agricultural performance was captured using real agricultural Gross Domestic Product (GDP). Results showed an insignificant U-shaped relationship between ACGSF and real agricultural GDP in Nigeria.

Studies with Mixed Effects of Credit

In examining the effects of agricultural sector funding on the productivity of the agricultural sector in Nigeria, Okwuchukwu (2022) utilised time series data spanning the period from 1981 to 2018. These data were obtained from the Central Bank of Nigeria statistical bulletin, the National Bureau of Statistics and the IMF database. Adopting Johansen co-integration analysis and the Vector Error Correction Mechanism (VECM), the study revealed that the Agricultural Credit Guarantee Scheme Fund has a positive and significant long-run effect on the contributions of the agricultural sector to GDP. Also, commercial banks' credits to the agricultural sector, government expenditure on agriculture, and lending interest rate have negative and significant effects on the contributions of the agricultural sector to GDP.

Ogbonna and Nnamerenwa (2022) examined the impact of domestic agricultural financing through government and commercial bank credits on agricultural output performance in Nigeria, utilising time series data from the Central Bank of Nigeria's Statistical Bulletin and the National Bureau of Statistics between 1981 and 2019. The data so obtained were analysed using the OLS multiple regression technique. The study revealed that agricultural performance is negatively influenced by the value of commercial banks' loans and advances to the agricultural sector, and positively influenced by credit allocation to the agricultural sector under the ACGSF (Agricultural Credit Guarantee Scheme Fund) and by government capital expenditure on agriculture.

Okuneye and Ajayi (2021) investigated the effect of commercial banks' credit for agriculture and government agricultural spending on agricultural production in Nigeria between 1980 and 2018. They adopted a robust analytical approach, involving descriptive analysis, unit root tests, co-integration tests, ARDL estimation, ECM estimation, and diagnostic tests. Results revealed that there is a long-run relationship between agricultural government spending, interest rates and agricultural production in Nigeria. Also, there is a significant long-term association between government spending on agriculture and agricultural production in Nigeria. In addition, the study showed that agricultural credits from commercial banks have a strong, negative and insignificant effect on agricultural production in Nigeria.

Lawal, Olayanju, Ayeni and Olaniru (2019) examined the impact of bank credit on agricultural productivity in Nigeria from 1981 to 2015 using the Toda and Yamamoto Granger non-causality analytical technique. The results revealed no long-term relationship between the variables. Additionally, the results revealed a one-directional relationship between the variables, running from ACGSF to agricultural GDP.

METHODOLOGY

Research Design

The study adopted the survey research design because the elements of analysis were individuals, who were farmers from selected LGAs in Edo State, Nigeria.

Population of the Study

The population of this study consists of all the farmers in the eighteen (18) Local Government Areas (LGAs) of Edo State. According to the Ministry of Agriculture of the State, there are approximately 950 registered farmers in Edo State (Department of Planning, Research, and Statistics, Edo State Ministry of Agriculture). This placed the study population at 1,950.

Sample Size Determination

Since the proposed population of the study is finite, the Krejcie-Morgan sample size determination technique was used to obtain a manageable sample size for the study. According to Krejcie and Morgan (1970), the formula for this technique is given as:

$$s = X^2NP(1-P)/d^2(N-1)+X^2P(1-P) \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where:

s   =   Required Sample Size

X^2 =   Table value of Chi-Square for 1 degree of freedom at   the   desired confidence level

N   =   Population size

P   =   Population proportion

d   =   Degree of accuracy expressed as a proportion

Accordingly, the sample size of the study was three hundred and twenty-two (322).

Data Collection Method

The study relied on primary data collected using a research questionnaire and personal interviews. Thus, for farmers who can read and write, a research questionnaire sufficed, while those who could not read and write were interviewed.

Sampling Technique

For convenience's sake, the 322 farmers used for the study were drawn from six out of the eighteen LGAs of the state. These Local Government Areas are: Esan North-East, Esan Central, Esan South-East, Etsako West, Igueben, and Uhunmwonde. Thus, the 322 farmers used for the study were selected using a stratified random sampling technique, whereby the population was first divided into six homogeneous groups (based on the name of LGA) called strata, and then random selection was made within each group (stratum) until the desired number was ascertained for each LGA. Basically, five of the LGAs produce 53 farmers, while only Igueben produced 57 farmers.

Validity Test

The research instrument (questionnaire) was validated by submitting copies of the questionnaire to experts in the areas of Finance and Agriculture to closely scrutinise, correct and approve the questionnaire. The essence was to ensure that the research instrument actually covered what it ought to cover.

Reliability Test

The research instrument was tested for reliability using the popular test-retest approach technique, which helped to determine the level of consistency of the research instrument. Hence, after administering the validated questionnaire to a select group of respondents twice, there was a high level of agreement (73%) in their responses.

Data Analysis Technique

The data generated via the questionnaire were subjected to simple percentage, descriptive analysis, Ordinary Least Square (OLS) multiple regression analysis, and Pearson Product-Moment correlation analysis. Simple percentage analysis was used to accurately report the demographic attributes of the respondents while descriptive analysis was employed to describe the other data collected. For the descriptive, regression and correlation analyses, the qualitative primary data generated were first quantified using a 5-point Likert scale, where options were coded as follows: strongly disagreed (1), disagreed (2), undecided (3), agreed (4), and strongly agreed (5). The quantified data was subjected to Ordinary Least Square (OLS) multiple regression analysis in order to ascertain the cause effect relationship between the variables considered. The OLS technique is preferred because it produces unbiased, sufficient and efficient estimates. Consequently, joint and individual tests were conducted at 5% level of significance using Fisher's F-test and Student t-test techniques respectively.

However, correlation analysis was used to ascertain the cause-and-effect relationship between the variables considered, and to test formulated hypotheses at a 5% level of significance using the cause-and-effect relationship between the variables. Additionally, the Student t-test approach was used to test formulated hypotheses at a 5% level of significance. The analyses and tests were executed using SPSS (Statistical Package for Social Sciences) software.

Model Specification

$$AGO = F(DBC, BAC, MBC) \qquad \text{……………………………. (2)}$$

Where:

AGO = Agricultural Output in Edo State

DBC = Deposit Money Bank Credits

BAC = Bank of Agriculture Credits

MBC = Microfinance Bank Credits

RESULTS AND INTERPRETATION

Simple Percentage Analysis

Table 1: Demographics Distribution of Respondents

Variables	Options	Frequency	Percentage (%)	Cum. Percent (%)
LGA of Residence	Esan North-East	53	16.46	16.46
	Esan Central	53	16.46	32.92
	Esan South-East Etasko West	53	16.46	49.38
		53	16.46	65.84
	Igueben Uhunmwonde	57	17.70	83.54
		53	16.46	100
	Total	**322**	**100**	**-**

Returned Questionnaires	Esan North-East	28	15	15
	Esan Central	30	16	31
	Esan South-East	32	17	48
	Etasko West	37	20	68
	Igueben	33	17	85
	Uhunmwonde	29	15	100
	Total	**189**	**100**	
Gender	Male	77	41	41
	Female	112	59	100
	Total	**189**	**100**	-
Age	21 – 40	46	24	24
	41 – 50	91	48	72
	51 – 60	33	18	90
	Over 60	19	10	100
	Total	**189**	**100**	-
Highest Level of Qualification	SSCE/GCE	87	46	46
	OND/NCE	33	17	63
	B.Sc./HND	18	10	73
	Post Graduate	21	11	84
	Others	30	16	100
	Total	**189**	**100**	-
Years of Experience	0 - 5 years	27	14	14
	6 - 10 years	39	21	35
	11 - 20 years	56	30	65
	More than 20 years	67	35	100
	Total	**189**	**100**	-

Source: *Survey Research (2025)*

The above table shows that out of the three hundred and twenty-two (322) questionnaires distributed, one hundred and eighty-nine (189) were well filled and returned by farmers in the six local government areas of Edo State considered. This further implies that 59% of the distributed questionnaires were returned. This number was considered appropriate because, according to Anyiwe (2013), the minimum percentage of samples that can be selected out of any given population that is less than a thousand (1000) is 20 percent. Accordingly, the breakdown of the number of returned questionnaires is as follows: Esan North-East, 28; Esan Central, 30; Esan South-East, 32; Etsako West, 37; Igueben, 33; and Uhunmwonde, 29. Thus, further analyses were based on the 189 returned questionnaires.

Subsequently, the gender distribution of the farmers shows that out of the 189 respondents, 77 (41%) were male, while 112 (59%) were female. This implies that the gender distribution of the respondents is skewed towards females. For age distribution, Table 1 shows that 46(24%) of the respondents were between the ages of 21 and 40; 91(48%) of them were between 41 and 50; 33(18%) of the farmers fell into the age bracket of 51 and 60; while 19(10%) of them were over sixty years. Hence, 90 percent of the respondents were at most 60 years of age.

The table equally shows that 87(46%) of the respondents had SSCE/GCE as their highest level of education; 33(17%) had OND/NCE as their highest educational qualification; 18(10%) had B.Sc./HND as their highest level of educational qualification; while 21(11%) had postgraduate qualifications. However, 30(16%) of the farmers had no recognised academic qualification as some only had primary education. As such, the majority of the respondents had SSCE/GCE as their highest educational qualification. Finally, the table shows that 27(14%) of the farmers have been into farming for between 0 and 5 years; 39(21%) of them have between 6- and 10-years farming experience; 56(30%) of the respondents have between 11-20 years farming experience; while 67(35%) have been into farming business for over 20 years. Thus, 65% of the respondents have less than 21 years of farming experience.

Descriptive Analysis

Table 2: Result of Descriptive Analysis

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Agricultural Output in Edo State	189	21	25	22.92	1.342
Deposit Money Bank Credit	189	21	25	22.92	1.340
Bank of Agriculture Credit	189	20	25	22.79	1.375
Microfinance Bank credit	189	21	25	22.85	1.345
Valid N (listwise)	189				

Source: SPSS Output

The table above shows that the descriptive analysis carried out covered the minimum, maximum, mean and standard deviation scores of variables. Accordingly, out of a maximum score of 25 (a strongly agree score of 5 multiplied by the number of statements under each variable, which is 5),

the mean score of "Agricultural Output in Edo State" is 22.92, varying from score 21 to score 25, with a standard deviation score of 1.342. In the same vein, the average score of "Deposit Money Bank Credit" is also 22.92, varying from a score of 21 to a score of 25 with a standard deviation of 1.340. The variable "Bank of Agriculture Credit", another subset of bank credits, has a mean score of 22.79 and ranges from a minimum score of 20 to a maximum score of 25, with a standard deviation of 1.375. The last considered variable, "Microfinance Bank credit", from Table 2, has an average score value of 22.85 and ranges from a score of 21 to a score of 25, with a standard deviation of 1.345.

Table 3: Response Rate on Agricultural Output (AGO)

Statement Options		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	40	21.2	21.2	21.2
	Agreed	29	15.3	15.3	36.5
	Undecided	56	29.6	29.6	66.1
	Disagreed	35	18.5	18.5	84.7
	Strongly Disagreed	29	15.3	15.3	100.0
	Total	189	100.0	100.0	

Source: SPSS Output

The table above shows that with respect to the questionnaire statements under the variable Agricultural Output in Edo State, 40(21.2%) of the respondents strongly agreed with the five statements, 29(15.3%) agreed with the statements presented, 56(29.6%) were undecided with the statements, 35(18.5%) disagreed with the said option; while 29(15.3%) strongly disagreed with the statement options in the questionnaire as it concerns agricultural output in the State.

Table 4: Response Rate on Deposit Money Bank Credit (DBC)

Statement Options		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agreed	40	21.2	21.2	21.2
	Agreed	28	14.8	14.8	36.0
	Undecided	57	30.2	30.2	66.1
	Disagreed	35	18.5	18.5	84.7
	Strongly Disagreed	29	15.3	15.3	100.0
	Total	189	100.0	100.0	

Source: SPSS Output

For the variable Deposit Money Bank Credit (DBC), table 4 revealed that 40(21.2%) of the respondents went for the first option (strongly agree) in all five statements, 28(14.8%) of the respondent went for the second options (agree), as 57(30.2%) opted for the undecided option in all five statements. However, 35 (18.5%) opted for the fourth option (disagree), while 29 (15.3%) of the farmers chose the fifth option (strongly disagree).

Table 5: Response Rate on Bank of Agriculture Credit (BAC)

Statement Options		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	44	23.3	23.3	23.3
	Agreed	35	18.5	18.5	41.8
	Undecided	54	28.6	28.6	70.4
Valid	Disagreed	27	14.3	14.3	84.7
	Strongly Disagreed	29	15.3	15.3	100.0
	Total	189	100.0	100.0	

Source: SPSS Output

Table 5 contains a breakdown of responses to statements on the variable Bank of Agriculture Credit. Accordingly, the table implies that 44(23.3%) of the respondents agreed strongly to the statements under the said variable, 35(18.5%) agreed to the statements, 54(28.5%) went for the undecided option, 27(14.3%) opted for the disagreed option, while 29(15.3%) went for the strongly disagreed option in each case.

Table 6: Response Rate on Microfinance Bank Credit (MBC)

Statement Options		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	42	22.2	22.2	22.2
	Agreed	32	16.9	16.9	39.2
	Undecided	55	29.1	29.1	68.3
Valid	Disagreed	32	16.9	16.9	85.2
	Strongly Disagreed	28	14.8	14.8	100.0
	Total	189	100.0	100.0	

Source: SPSS Output

For the third explanatory variable, Microfinance Bank Credit, table 6 revealed that 42(22.2%) of the farmers used for the study strongly agreed with all the five statements presented under the aforementioned variable, 32(16.9%) agreed with the said statements, 55(29.1%) of them were undecided, 32(16.9%) disagreed with the said statements, while 28(14.8%) strongly disagreed with the statements.

Regression Analysis

Table 7: Table of Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.745	2.787		6.008	.000
	Commercial bank credit	.268	.071	.268	3.781	.000
	Bank of agriculture credit	.093	.069	.095	1.347	.180
	Microfinance bank credit	.094	.071	.094	1.329	.186

 a. Dependent Variable: Agricultural output in Edo state
Source: SPSS Output

Table 7 shows that commercial bank credit, Bank of Agriculture (BOA) credit, and microfinance bank credit have positive effects on agricultural output in Edo State, Nigeria. The regression coefficients of these variables are 0.268, 0.093 and 0.094, which further implies that a unit increase in the value of these credits results in 0.268, 0.093 and 0.094 unit increases in agricultural output in Edo State, respectively. The table equally shows that only commercial bank credit has a significant effect on agricultural output in Edo State. Hence, the effects of Bank of Agriculture (BOA) and microfinance bank credits on agricultural output in Edo State are insignificant.

Joint Test

Table 8: ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.841	3	9.280	5.524	.001[b]
	Residual	310.804	185	1.680		
	Total	338.646	188			

a. Dependent Variable: Agricultural output in Edo state
b. Predictors: (Constant), microfinance bank credit, bank of agriculture credit, commercial bank credit
Source: SPSS Output

Result of joint test puts the value of F-statistic at 5.524 with a probability value of 0.001; which implies that commercial bank credit, Bank of Agriculture (BOA) credit, and microfinance bank credit have a joint significant effect on agricultural output in Edo State, Nigeria.

Model Fitness Test

Table 9: Model Summary Table

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.887[a]	.787	.767	1.296	2.304

a. Predictors: (Constant), microfinance bank credit, bank of agriculture credit, commercial bank credit
b. Dependent Variable: Agricultural output in Edo State
Source: SPSS Output

The model summary table shows that the value of R^2 (coefficient of determination) is 0.787, which implies that the explanatory variables of the model (commercial bank credit, Bank of Agriculture credit, and microfinance bank credit) have a joint effect of about 78.7% on agricultural output in Edo State. This gives a good model fit and shows that the model is adequate, reliable and significant.

Correlation Analysis

Table 10: Result of Correlation Analysis

		AGO	DBC	BAC	MBC
AGO	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	189			
DBC	Pearson Correlation	.253**	1		
	Sig. (2-tailed)	.000			
	N	189	189		
BAC	Pearson Correlation	.076	.077	1	
	Sig. (2-tailed)	.298	.290		
	N	189	189	189	
MBC	Pearson Correlation	.076	-.074	-.017	1
	Sig. (2-tailed)	.302	.309	.816	
	N	189	189	189	189

**. Correlation is significant at the 0.01 level (2-tailed).
Source: SPSS Output

Table 10 shows that Deposit Money Bank credit, Bank of Agriculture (BOA) credit, and microfinance bank credit have positive effects on agricultural output in Edo State, Nigeria. The correlation coefficients of these variables are 0.253, 0.076 and 0.076, which further indicates a weak correlation between the variables. The table equally shows that only the deposit money bank credit has a significant effect on agricultural output in Edo State. Hence, the effects of Bank of

Agriculture (BOA) and microfinance bank credits on agricultural output in Edo State are insignificant.

DISCUSSION OF FINDINGS

The study majorly revealed that Deposit Money Banks, microfinance banks and Bank of Agriculture (agricultural development bank) credits have the expected positive effects on agricultural output in Edo State. This outcome agrees with most of the studies reviewed earlier (Magaji, Usman & Yusuf, 2023; Idris & Bawa, 2023; Ngong, Onyejiaku, Fonchamnyo & Onwumere, 2022; Adewale, Lawal, Aberu & Toriola, 2022). This implies that an increase in bank credits in general leads to an increase in agricultural output. Thus, an increase in the aggregate loans of Deposit Money Banks, Bank of Agriculture, and microfinance banks has the expected multiplier (direct) effect on agricultural output in the State. Again, given the longer value chain of the green sector, where no output from the sector is a waste, it is not surprising that bank credits to the sector enhance agricultural output. Specifically, such loans on one hand generate incomes in the form of wages to businessmen who sell agricultural inputs; to labourers who do manual jobs; and others in the agricultural industry. On the other hand, outputs from these inputs end up as input for others in the industry, and the process continues with the end being increased aggregate output of the sector.

Nevertheless, Deposit Money Banks' loans have a significant effect on agricultural output in Edo State, while those of the Bank of Agriculture (BOA) and microfinance banks have insignificant effects on the output of the agricultural sector in the state. This may be because deposit money banks are the most popular type of banks in the Nigerian banking industry, and they extend the highest amount and volume of loans to farmers. Also, the gestation period of some agricultural products discourage microfinance banks from venturing meaningfully into the sector. The perceived lengthy process involved in accessing BOA loans discourages most farmers. The insignificant effects of Bank of Agriculture (BOA) and microfinance banks credits on agricultural output in the Edo State can as well be attributed institutional inefficiencies, loan sizes, repayment conditions, and farmers' perceptions.

CONCLUSION, POLICY IMPLICATIONS AND RECOMMENDATIONS

Based on the foregoing, the study concluded that bank credits have a positive impact on agricultural output in Edo State, Nigeria. However, only the effect of deposit money bank credit was significant. Hence, it follows that if the government of the day wants to enhance the output of the agricultural sector in Edo State, in particular, and Nigeria in general, it should encourage deposit money banks, BOA, and microfinance banks to extend more credit to farmers in the state and the country at large. Hence, the study to a very large extent contributed to bridge knowledge gap in theory, practice and literature by showing how the use of primary data confirms macro-level findings on the effects of bank credits on agricultural output in the Nigerian context.

Nevertheless, there should be measures in place to ensure that such loans are repaid by farmers as soon as due. In this regard, all existing farmers in the state should be properly registered with the Ministry of Agriculture so that their activities can be monitored. Thus, the government should

be free to stand as guarantors for these farmers. Finally, as some farmers have complained, the interest rates charged by these banks are excessively high, and this issue should be addressed. In this respect, the state government should work closely with the federal government to see that such rates are reduced, provided that the former can stand as surety for the registered farmers.

Limitations and Suggestions for Further Studies

This study was saddled with some notable limitations. The first is the attitude of the respondents in accepting and filling out the distributed questionnaires as requested. This necessitated that the researchers visit the respondents more frequently than expected. The second is a methodological constraint, as the study focused on a cross-section of farmers in Edo State, rather than all the farmers in the State. The third is that the study relied on self-reported data. As such, the study advocates for a longitudinal research approach going forward, where secondary (panel) data will be relied on to drastically reduce the self-reported bias of respondents.

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APPENDIX 1: QUESTIONNAIRE SAMPLE

Section A

Instruction: Please tick accordingly and fill the dotted lines where necessary.

1. Gender: Male ( )   Female ( )
2. Marital Status: Single ( )   Married ( )   Divorced ( )
3. Age: 18-30 ( )   31-40 ( )   Above 40 ( )
4. State of Origin …………………………………………………………………..
5. Local Government Area: ………………………………………….………….
6. Years of Experience: …………………………………………………………

Section B

Instruction: Indicate the extent to which you agree or disagree with each of the following statements with regards to Bank Credits and Agricultural Output in Edo State, Nigeria.

Note:

SA   =   Strongly Agree

A = Agree

U = Undecided

D = Disagree

SD = Strongly Disagree

A.	Agricultural Output in Edo State (AGO)	SA	A	U	D	SD
1.	Agricultural output in Edo State is a vital component of the State's economy					
2.	Crops like cassava and maize, and animal productions such as chickens and goats are prominent agricultural outputs in Edo State					
3.	Edo State's agricultural sector provides income and employment for a significant portion of the State's population					
4	Inadequate funding has remained one of the major challenges facing Edo State's agricultural sector					
5.	Credit from banks has helped out in ameliorating funding challenges faced by farmers in Edo State					
B.	Deposit Money Bank Credits (DBC)					
6.	Deposit Money Banks in Edo State have assisted farmers with adequate credit in the State					
7.	Farmers in Edo State find it difficult to approach DMBs for agricultural credit					
8.	Adequate collateral demand by DMBs has affected agricultural output in Edo State adversely					
9.	High bank lending rate has remained a key challenge faced by farmers in the State					
10.	Deposit Money Banks are discouraged from lending to farmers because of the gestation period of most agricultural products					
C.	Bank of Agriculture Credits (BAC)					
11.	The presence of the Bank of Agriculture (BOA) is not felt by farmers in Edo State					
12.	The bureaucratic process involved with accessing BOA loan has remained a time long challenge for farmers					
13.	The entire BOA loan application process is shrouded in secrecy and it discourages farmers in the State					
14.	To enhance the performance of the BOA, they should solely focus on agricultural loans and advances while neglecting marketing and trading activities					
15.	There should be more than one branch of BOA in each state of the federation in order to enhance agricultural output in Nigeria					
D.	Microfinance Bank Credits (MBC)					

16.	Microfinance banks are expected to play a vital role in providing agricultural credits to farmers					
17.	Microfinance credit enable farmers to make informed decisions about their farming practices					
18.	Farmers in Edo State find it easier to access credit from microfinance banks than DMBs and BOA					
19.	Microfinance banks are closer to Edo farmers that Deposit Money Banks and Bank of Agriculture					
20.	The issue of high interest rate and heavy collateral from microfinance banks are still challenges faced by Edo farmers					

Thank you so much for your time.