

Micro-Finance Banks' Intermediation and Cocoa Farming Inputs Financing in Ondo State, Nigeria

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Abstract: Over-reliance on oil export as the main source of revenue in Nigeria has necessitated renewed interest in non-oil earners like cocoa which needed adequate inputs financing to achieve increased output. Majority of the literatures in the study did not focus on the effects of micro-finance banks' intermediation on cocoa farming inputs financing. This study investigated the effects of micro-finance banks' intermediation on cocoa farming inputs financing in Ondo state Nigeria. Primary data were collected from the three senatorial districts of the state. Since the population of the study was unknown the Cochran (1977) method for estimating sample size was adopted to derive a sample size of 423. Questionnaire was used to elicit responses from 423 cocoa farmers who were sampled randomly from each district. Cocoa farming inputs financing was regressed on micro-finance banks' credit products, lending methods and loan conditions to answer research questions one, two and three while cocoa farming outputs was regressed on micro-finance banks' credit and inputs financing to answer research question four. Data were analysed using frequency count, mean, standard deviation and logistics regression. The results from the analysis revealed that micro-finance banks' credit products had positive and significant effect on cocoa farming inputs financing while micro-finance banks' lending methods had positive but insignificant effect on cocoa farming inputs. Also, micro-finance banks' loan conditions were established to have negative and insignificant effect on cocoa farming inputs financing. Jointly the model's exogenous variables were significant. Furthermore, micro-finance banks' credit had positive and significant effect on cocoa outputs while cocoa farming inputs financing was insignificant and jointly the independent variables were significant. It was concluded that micro-finance banks' intermediation activities significantly influence cocoa farming inputs financing and outputs. It was recommended that micro-finance banks should create loan awareness, make loan conditions less stringent, improve loan monitoring and promptly respond to cocoa farmers' loan request.

Keywords: Cocoa, microfinance bank, intermediation, logistic regression, agriculture.

I. INTRODUCTION

Cocoa farming plays dominant role in terms of contribution to economic growth in Ondo State and Nigeria. However, in order to achieve higher cocoa outputs, there is need for adequate farming inputs. Inputs financing is an important factor needed to improve cocoa outputs and strengthening rural economy. The issue of farming inputs financing has received the attention of government and academics in the recent years (Obboh & Ekpebu, 2011, Meludu et al. 2017; Ladigbolu, Olajide, Badiru & Yekinni, 2020). This is because

most cocoa producing countries in Africa, Nigeria inclusive, rely on its exportation which has strengthen trade relationships with industrial nations such as the European countries, America, and Asian countries who are major users of cocoa as raw material. Hence there is need to encourage the financing of inputs for cocoa farming (Nwude & Anyalechi, 2018).

Decline in outputs and export of cocoa outputs can be attributed to several reasons. According to Fashina, *et al.*, (2001) and the Cocoa Research Institute of Nigeria (CRIN, 2003), asserted that most of the cocoa trees in Ondo State and other cocoa producing states in Nigeria are prone to pests and diseases. Ojo and Sadiq (2010) stated that, the decline in cocoa outputs results from lack of cocoa farming inputs such as pesticides, herbicides and other farming implements to boost cocoa outputs. In addition, lack of adequate support from government contributed to falling cocoa outputs in Ondo State and other cocoa producing state (Iyama, 2016; Awotide, Abdoulaye, Alene & Manyong, 2015). These challenges had hindered Ondo State as one of the dominating cocoa producing states in Nigeria from meeting the target set by the Cocoa Association of Nigeria, affected outputs and consequently resulted in huge loss of revenue to the government (Eze, 2018).

The need to improve cocoa farming activities and outputs resulted in different efforts being adopted by government amongst which includes strengthening of microfinance institutions in Nigeria. Governments at the federal level in its efforts had also put in place various strategies and reformation programs in order to revive the cocoa sector (Oseni, 2011). One of the programs was the National Cocoa Rehabilitation Programme, which was set up by the Federal Government in 1999 in order to provide cocoa inputs and organized training for the farmers. The programs also provided seedlings from the Cocoa Research Institute of Nigeria (CRIN) to cocoa farmers (Akanke, 2012). Also, cocoa re-birth programme was launched by the Federal Government in 2005 in order to improve cocoa outputs to meet the demand of the export market, this programme also aimed at improving the livelihood of farmers and reducing poverty in Nigeria (Federal Government of Nigeria, 2006). However, the above programs have added little or no contributions to increase cocoa outputs (Daniel & Kanu, 2012).

However, given the need and renewed efforts of government towards revitalizing the agricultural sector which cocoa farming dominated, focus has been placed on microfinance institutions in Nigeria. Lawal and Abdullahi (2011) asserted that micro-finance banks are the major institutions that provide finance for small and medium scale enterprises including finance for agricultural activities like cocoa farming. The microfinance finance banks replaced the community banks in 2005 due to the lapses of community banks to improve savings and lending activities to the rural sector of the economy (Owenvbiugie & Igbinedion, 2015; Susan & Obamuyi, 2018). In the recent years, microfinance banks have been playing leading role in rendering financial services to rural farmers and business owners who have been neglected by formal financial institutions like the commercial banks. The micro-finance banks are more responsive to local needs through closeness to customers and maintaining good relationships which helps to promote the flow of funds at the rural level. In micro-finance banking, bankers focus on developments of the local areas by providing improved banking services to rural dwellers which promote investments and community developments (Ikhan & Idoko, 2013; Central Bank of Nigeria, 2018; Aladejebi, 2019).

Despite government efforts and strategies aimed at achieving higher cocoa outputs, little has been achieved in Ondo state and Nigeria at large. Government financing strategies of cocoa farming activities have failed to materialize due to poor loan repayment rates, corruption and unsustainable subsidies by government (Akinagbe, 2015). Furthermore, finance (funds) from some donors and multilateral institutions like commercial banks have dropped dramatically, because they perceive cocoa farming to be too risky because of the hazards associated with cocoa farming like pests attack and fire destruction (CBN, 2015; Meludu, *et al.*, 2017). Also, formal financial institutions like commercial banks prefer to lend to large companies and provide services to about 35% of the economically active population in urban areas while the remaining 65% are excluded from access to financial services which affected financing of cocoa farming activities (CBN, 2005).

In spite of the importance of cocoa farming in the achievement and sustenance of food security in Ondo State, the sector has either been abandoned totally or left in the hands of the smallholder farmers who still rely on crude methods of farming (Ali, Jatau & Ekpe, 2016). Also, low level of education among cocoa farmers especially in rural areas have made it difficult for them to access financing from commercial banks (Jude, Simon & Jane 2016). International Cocoa Conference Organization (2000) pointed that as a result of the neglect of the cocoa farming inputs financing by the government and commercial banks, there is need to identifying other major sources of inputs financing for cocoa farming through microfinance banks. Thus, given the role of microfinance institutions in modern economy as a tool of financing small businesses and reducing poverty, there is need

to examine how the intermediation functions of the micro-finance institutions influence inputs financing of cocoa farming in Ondo State.

However, most literature reviewed in this study focused their researches on the general activities of financial intermediations of banks, without being specific on the intermediation activities of micro-finance banks (Sunny, 2013; Awotide, *et al* 2015; Jude, Simon & Jane 2016; Emenuga 2019). Also, some studies investigated the effect of microfinance banks on small and medium scales performance in Nigeria (Ofeimun, *et al.*, 2018; Lawal, Olayanju, Ayeni and Olaniru, 2019; Aladejebi, 2019; Yusufu, *et al.*, 2020). Also, some studies investigated the effect of microfinance on agricultural sector (Omogbe & Aina 2017). Furthermore, Nwude and Anyalechi (2018); Ladigbolu, *et al.*, (2020) focused on the effect of microfinance banks on savings and growth of rural dwellers, these literatures reviewed did not make specific references to cocoa outputs.

Finally, none of the literature reviewed in this study were specific on the effects of micro-finance banks' credit products, lending methods and lending conditions on cocoa farming inputs financing. This study however investigated the intermediation activities of microfinance banks in terms of credit products, lending methods, lending conditions and banks' credits on the inputs financing of cocoa framers in Ondo State which is the major gap.

II. LITERATURE REVIEW

Conceptual Review

Concept of Micro-finance Bank

Okpara (2010) explained micro-finance banks as localized banking because these banks are closer to the rural citizens and have specialized information about local problems, drawbacks and needs. The micro-finance banks' funds are thus channel to cater for local issues only and do not have to be transferred to other areas. As there is no transfer of funds from rural areas to other urban commercial centers, so the developmental initiatives undertaken help to reduce regional disparities over a period of time.

The limitation of resources pose a threat to the survival of micro-finance banks, as there is no much at their disposal after the routine banking services are carried out so, there is little scope for such banks to enter the poorer pockets of the country and ensure banking to all. Another major lag is the lack of specialized staff which only caters for one set of services. The shortage of funds do not allow management to resort to such divisions of labor and most of the officers take care of multiple types of tasks, they have to depend on correspondent banks for transfer of funds at higher prices. Also, there is unhealthy and unwarranted competition between different micro-finance banks, this often leads to waste of valuable resources and time (Ayebe & Ikani, 2013).

Ikhani and Idoko (2013) defined micro-finance bank as a bank that is established for the purpose of catering for provision of finance or credits for investment of small nature, this bank requires small capital base for its establishment and operations. No economy of the world is self-sufficient, most especially Nigeria.

Financial Intermediation/Financial Intermediary

According to CBN (2012), financial intermediation is the process of taking in funds by banks from a depositor and then lending them out to a borrower. The banking business thrives on the financial intermediation abilities of financial institutions that allow them to lend out money at relatively high rate of interest while receiving money on deposit at relatively low rate of interest. A financial intermediary is an institution or individual that serve as a middleman among diverse parties in order to facilitate financial transactions. Common types include commercial banks, investment banks, stockbrokers, pooled investment funds, micro-finance banks and stock exchanges. Financial intermediaries reallocate otherwise un-invested capital to productive enterprises through a variety of debt, equity, or hybrid stake holding structures.

Financial intermediation involves the transformation of mobilized deposits liabilities by financial intermediaries such as banks into bank assets or credits such as loan and overdraft. It is simply the process whereby financial intermediaries take in money from depositors and lend same out to borrowers for investment and for other economic development purposes. According to Theresa and Okoli (2013), financial intermediation is a system of channeling funds from lenders (surplus economic unit) to borrowers (deficit economic unit) through financial institutions.

Financial intermediation is also a process which involves surplus units depositing money with financial institutions (Micro-finance banks) which then lend to deficit units (Iwedi & Igbanibo, 2015). From the above view, micro-finance bank exists as a broker between lenders and borrowers. With financial intermediaries, lenders and borrowers (Cocoa farmers) need no longer transact directly as micro-finance banks act as a link between these units

There are two essential advantages from using financial intermediaries which are cost advantage over direct lending/borrowing and market failure protection (Buckle & Thompson, 1998). Through financial intermediation, the gap between lenders and borrowers are removed, preventing market failure. Some other advantages of financial intermediation according to Central Bank of Nigeria (2015), are reconciling conflicting preferences of lenders and borrowers, risk aversion intermediaries help spread out and decrease the risks and economies of scale, using financial intermediaries reduce the costs of lending and borrowing.

Iwedi and Igbanibo (2015) identified four criteria that distinguish financial intermediaries especially banks from

other financial institutions, these are; their main category of liabilities (deposits) are specified for a fixed sum which is not related to the performance of the portfolio, the deposits are typically short-term and of a more shorter term than their assets, a high proportion of their liabilities are chequeable (can be withdrawn on demand), their liabilities and assets are largely not transferable. All these characteristics of financial intermediaries enable them to reduce or eliminate the problems associated with direct financing.

Constraints in Lending to Cocoa farming

Constraints hinder ones not to achieve a purpose as a result of some limitations or deprivations. Cocoa farmers are constrained if they lack access to credit or cannot borrow as much as they want for farming or investment purpose (Eswaran & Korrwal, 2015). Social capital has been reported to improve access to credit; social capital refers to the ability of people to derive benefits by virtue of their membership in associations (Portes, 1998). Such benefits include access to services and other resources. Some of these constraints in lending to Cocoa farmers in Ondo State are aging and unproductive farmers, inadequate or lack of formal education and shortage of farmland (Omorogbe & Aina, 2017).

Cocoa Farming Inputs Financing

Ajibogun (2019) opined that cocoa inputs are herbicides, pesticides, fertilizers, labour cost, hoes, cutlasses etc. put toward the cultivation of cocoa farmland in order to improve cocoa harvest in a particular season. Input financing has been defined as the present and pro term transfer of purchasing power from a person who owns (credit) to a person who wants it allowing the latter opportunity to command another person's capital for cocoa farming purposes but with confidence in his willingness and ability to repay at a specific future date.

Kuwornu, Ohene-Ntow and Asumiing (2013) opined that for small holder farmers to achieve higher cocoa output, timely access to short-term finance for input such as seedlings, fertilizer, pesticides, herbicides, machines services, transport, labour and fuel is fundamental. Small-holders existing cocoa farmers in developing countries however often face extreme barriers to input financing.

Onumah et al. (2014) identified sources of input financing of existing cocoa farming as micro-finance banks, money lenders, family support and personal savings. The researcher of this study realized that the most prominent sources of input finance of cocoa farming in the study area are mainly from micro-finance banks. Existing Cocoa farmers in the study area do not have access to financial services especially those from financial institutions like commercial banks. Only about 10% has access to financial services provided by micro-finance banks. The bulk of credit they received from financial institutions goes into paying for labour services.

III. THEORETICAL REVIEW

Financial Intermediation Theory

This theory started from the work of Gurley and Shaw (1960). The financial intermediation theory is based on the theory of informational asymmetry and agency theory, which outlines the core function of financial institutions in intermediating between the surplus and deficit unit. Also, it involves reduction in transaction cost as a result of information asymmetry. The various financial intermediation theories include,

- i. The savings mobilization intermediation theory of micro-finance banks, micro-finance handbook (2012) says that micro-finance banks collect deposit and then lend these out just like other non-bank financial intermediaries.
- ii. The payment services theory of micro-finance banks, Caskey (1994) opined that micro-finance banks offer payment services either with savings services or separately for a fee, if payment services are done with savings the micro-finance banks can pay an artificially low interest rate on customer deposit accounts cover the cost of those services. Otherwise, a fee is charged to cover these costs which include personnel, infrastructure and insurance costs.
- iii. The credit creation theory of micro-finance banks, Waterfield and Duval (1996) explained that this theory does not consider micro-finance banks as financial intermediaries that gather deposits to lend out, but instead argues that each individual micro-finance bank create credit and money newly when granting a bank loan. The theory differs in their accounting treatment of bank lending as well as in their policy implications. Since according to dominant financial intermediation theory, micro-finance banks are virtually identical with other non-bank financial intermediaries, they are not usually included in the economic models used in economics or by central bankers. Moreover, the theory of micro-finance banks as intermediaries provides the rationale for capital adequacy-based micro-finance bank regulation (Gurley & Shaw, 1960).

Empirical Review

Achieving higher economic growth and development requires a functional agricultural sector which cocoa farming plays a leading role in Nigeria. However, in order to achieve effective cocoa farming activities and outputs, there is need for the provision of adequate finance for the purchase of cocoa farming inputs (Zeller, Diagne & Mataya, 2017; Ladigbolu, *et al.*, 2020). Micro-finance banks play important role in financing the activities of small and medium scale enterprises including cocoa farming which requires small capital base for running of farming activities and the purchasing of cocoa farming inputs like pesticides, herbicide, fertilizers, sprayers and other equipment (Nelson, Paul &

Olumorin, 2020). Furthermore, micro-finance banks offer flexible loan agreement to farmers which allows them to pay for preferred inputs in installments. Pre-harvest finance allows farmers to access quality inputs that will increase outputs and crop quality, thus increasing farmers' income while ensuring a more reliable supply for cocoa buyers (Leonard, Gordon & Jane, 2013).

However, studies have been conducted in developed countries on the intermediation of financial institutions. Hans (2015) investigated the effect of financial intermediation on monetary policy in England. Secondary data were obtained from Federal Reserve Bank of England. Douglas (2013) investigated the relationship among financial intermediaries, ownership structure and the provision of venture capital to SMEs in Japan. Secondary data were adopted which indicate individual owner-manager structure (financial disintermediation) give rise to smaller portfolios of entrepreneurial firms and more advice to entrepreneurs. The study revealed that there is significant relationship between financial intermediaries and SMEs funding. Santiago, Francisco and Gregory (2016) studied the effect of bank lending and financing constraints on SMEs investment in Chicago by adopting secondary data from cash flow financial statement of the selected firms. The study showed that investment is sensitive to bank loans for unconstrained firms but not for constrained firms. Also, Selina (2013) studied the relationship among financial intermediation, growth and micro-finance in Turkey. Data from Turkey's largest micro-finance organization were collected to test if loan increase borrower income in the sample, using saving deposit as a proxy for borrower income. The study showed that bank's financial intermediation and micro-finance credit contribute positively to growth in Turkey. Adli (2015) examined the methods, problems and impact of financing SMEs in Swedish using the survival index value (SIV) model. Secondary data were adopted and analyzed using correlation and regression analysis. Findings revealed that accessibility to finance contribute positively to the survival of SMEs in Sweden.

In developing countries, there are studies conducted on the intermediation process of financial institutions. For instance, Gesellschaft (2010) examined agricultural finance in Sierra Leone using secondary data which was sourced from the Statistical Bulletin of the Bank of Sierra Leone and the German Ministry of economic cooperation and development (BMZ). It was found out that there is a positive relationship between agricultural finance in Sierra Leone which brings about high output in agriculture and increase farmers' income. Dalberg (2015) studied the assessment of financial services landscape for smallholder farmers in Ghana, Kenya and Tanzania. Secondary data were used in this study, data were collected from the Statistical Bulletin Banks of each countries, it was noted that financial services from banks form each countries supported agriculture activities. Cleland, Jiri and Tomas (2015) examined the effect of rural banking on rural farmers in Ghana using primary data with the aid of questionnaire administered

to 220 respondents. Using descriptive statistics to analyze data, it was found that rural bank had positive impact on rural farmers. Mairura, Namusonge and Kabare (2015) investigated the role of financial intermediation on the growth of small and medium manufacturing enterprises in Kenya. The study employed both primary and secondary data through questionnaires containing both closed and open ended questions. The data were analyzed using descriptive statistics such as frequency, percentages, means and standard deviation as well as inferential statistics such as ANOVA, multiple linear regression and correlation analysis. The findings showed that most of the respondents agreed with the fact that, they received a lot of support from the financial intermediaries which enhance business growth.

In Nigeria, Sunny (2013) investigated the impact of commercial banks' credit on agricultural development in Nigeria by employing primary and secondary data which were analyzed using linear regression model. It was revealed that agricultural credit guarantee scheme fund and government fund allocation to agriculture produced significant and positive effect on agricultural productivity. Through the adoption of Endogenous Switching Regression Model, Awotide, *et al* (2015) examined the impact of access to credit on agricultural productivity in Nigeria. Primary data were collected using questionnaires and it was found that access to credit had significant positive impact on cassava productivity. Jude, Simon and Jane (2016) examined the relationship between financial intermediation and agricultural output in Nigeria from 1981 to 2014. Secondary data were obtained from Central Bank of Nigeria Statistical Bulletin. Ordinary least square method was used for data analysis. Findings of the regression analysis revealed that deposit money banks' credit significantly and positively influenced agricultural output while banks' lending rate had inverse and insignificant impact on agricultural output.

Omorogbe and Aina (2017) conducted a study on effect of microfinance banks on agricultural lending in Nigeria through the selection 18 micro-finance banks (MFBs). Questionnaires and interview were the main method of data collection. The data were analyzed with the use of descriptive statistics and Logit regression. It was indicated that staff size and branch network significantly influenced the distribution of credit to famers while lack of collateral and low education served negatively affect the distribution of credit. Nwude and Anyalechi (2018) examined the impact of microfinance activities on rural economic growth and savings in Nigeria from 2000 to 2015. The ordinary least square regression was used as the technique of analysis. The findings showed that the introduction of micro finance banking in Nigeria have not contributed to agricultural productivity but had assisted in increasing rural savings habits in Nigeria. Lawal, Olayanju, Ayeni and Olaniru (2019) examined the effect of bank credit on agricultural productivity in Nigeria based on secondary data sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin analyzed Johansen Co-Integration Test and

Vector Auto regression Estimates and it was found that bank credit contributed significantly to agricultural sector growth. Emenuga (2019) investigated the effect of commercial bank on real sector development in Nigeria from 1981 to 2017 by sourcing data from Central Bank of Nigeria Statistical Bulletin. ADF unit root test, Johansen co-integration test and error correction model techniques where employed as analytical tools. The result showed that commercial banks' credit to Agriculture and Agricultural credit guarantee scheme are positively related to Agricultural development while interest rate was found to be negatively related to Agricultural development in Nigeria.

Furthermore, Aladejebi (2019) assessed the impact of microfinance banks on the growth of SMEs in Lagos metropolis. Questionnaire was used to collected data from 209 respondents. It was discovered that microfinance banks had significant effect on SMEs. Yusufu, *et al.*, (2020) examined the relationship between micro finance bank and the growth of small medium enterprises in Nigeria. Data were collected from 100 SMEs operating Abuja analyzed with simple linear regression. Findings revealed that micro finance banks domestic fund transfer services contribute to the growth of small and medium enterprises. Ladigbolu, *et al.*, (2020) assessed constraints to microfinance banks' services among rural dwellers in Oyo West Local Government, 105 respondents were sampled using questionnaire to collect data and analyze descriptively. It was found that while rural dwellers benefited from microfinance banks, amount was generally low due to high interest rate and short repayment time.

IV. DATA AND METHODS

Research Design

The study employed cross-sectional and quantitative methods of social research. The study utilized two-stage sampling procedure. Each Senatorial District was treated as a cluster out of which the LGAs where there is presence of a micro-finance bank shall be listed. From this list, 2 LGAs in each Senatorial District was selected through balloting at the first stage. From the customers' register of micro-finance banks in the selected LGAs, the list of customers who are identified as cocoa farmers shall be obtained and used as the sampling frame. In the second stage, systematic sampling technique shall be applied to select cases as respondents. The cocoa farmers whose ages range from 18 years to 64 years, who have been engaging in financial transaction with the micro-finance bank at least 5 years prior to the survey, irrespective of their sex are eligible to participate.

Population and Sampling Method

The population for this study consists of male and female cocoa farmers aged 18 - 64 years, who have been in financial relationship with a micro-finance bank in the selected areas for at least 5 years prior to the survey. The study's sample size was determined by applying the Cochran

(1977) method for estimating sample size when margin of error and confidence interval for the true estimates of the population value are known and the proportion of attribute is unknown but can be estimated:

$$n = \frac{Z^2 P(1-P)}{e^2}$$

Where;

z = the standard normal value corresponding to 95% confidence level for 2-tail test; z = 1.96.

p = the proportions of cocoa farmers who have or do not have chance of being funded micro-finance banks are equal as 0.5

e = level of significance (acceptable degree of error) = 5% or 0.05

Although it may not be plausible, it is assumed that every cocoa farmer has equal chance of being funded to produce cocoa. Therefore, the proportion of being funded or not being funded is assumed, at worst case scenario, to be 50% (0.5). This indicates that an Ondo State cocoa farmer aged 18-64 years, who had been in transaction with a micro-finance bank for at least 5 years before the survey has equal chance of 0.5 of risk exposure or no exposure p and q respectively. Therefore, estimating the sample size for the margin of error of 0.5 with the 95% confidence level is determined as follows:

$$n = \frac{(1.96^2)(0.5)(0.5)}{0.05^2}$$

$$n = \frac{0.9604}{0.0025}$$

$$n = 385$$

The confidence level is the expected percentage of times that the actual value will fall within the stated precision limits. Normal derivation of 95% confidence level and Z-score of (1.96) will be adapted in this research which implies that there is 95 chances in 100 (or 0.95 in 1) that the sample represent the true condition or sample population.

For this study, 10% of the sample size derived above was added to the above estimated sample size to derived 423 sample size for a robust result, despite suggestions from Cochran’s formula (1977). The study will employ two-stage sampling technique; in the first stage Ondo State will be divided into 3 senatorial district (Ondo Central, Ondo North, and Ondo South) comprising of 18 Local government area. In the second stage, 141 respondents who are existing cocoa farmers and also have 5years and above customers’ relationship with the micro-finance banks will be randomly selected from each of the senatorial district of Ondo State (Ondo North, Ondo South, Ondo Central), making the total of 423 respondents.

V. METHOD OF DATA ANALYSIS

This study employed logistic regression model to investigate the effect of micro-finance bank’s intermediation on cocoa farming inputs financing in Ondo state. The dependent variable Y=1 is the situation when cocoa farming inputs financing is being enhanced by micro-finance banks’ intermediation and Y=0 is the situation when cocoa farming inputs financing is not being enhanced by micro-finance banks’ intermediation. Therefore, F(Y) must always be positive (since P ≥ 0) and F(Y) must always be less than 1 (since P ≤ 1). P should be constrained such that 0 ≤ P ≤ 1.

The Binary Logistic Regression model is expressed as:

$$[p/(1-p)] = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n \quad (3.1)$$

However, this study formulated two models to investigate the effects of micro-finance bank’s intermediation on cocoa farming inputs financing in Ondo state. The first model regressed the effect of micro-finance bank’s credit products, micro-finance bank’s lending methods and micro-finance bank’s loan conditions on cocoa farming inputs financing while the second model regressed the effect of micro-finance bank’s credit and cocoa farming inputs financing on cocoa outputs.

Model 1:

$$CFIF = f(MBCP, MBLM, MBLC) \quad (3.2)$$

$$CFIF_t = \beta_0 + \beta_1 MBCPt + \beta_2 MBLMt + \beta_3 MBLCt + e \quad (3.3)$$

By decomposing “Model 3.3 into Logit model, we have:

$$CFIF_t = \beta_0 + \beta_1 MBCP + \beta_2 MBLM + \beta_3 MBLC + e \quad (3.4)$$

Where:

- CFIF = Cocoa Farming Inputs Financing
- MBCP = Microfinance Banks’ Credit Products
- MBLM = Microfinance Banks’ Lending Methods
- MBLC = Microfinance Banks’ Loan Conditions

- β₀ = Constant
- β₁ – β₃ = Coefficient of the parameters

E = Error term

Model 2.

$$CO = f(MBC, CFI) \quad (3.5)$$

$$CO_t = \beta_0 + \beta_1 MBCt + \beta_2 CFI + e \quad (3.6)$$

By decomposing the Model 3.6 into Logistic model, we have:

$$CO_t = \beta_0 + \beta_1 MBC + \beta_2 CFI + e \quad (3.7)$$

Where:

CO = Cocoa Outputs

MBC = Microfinance Banks' Credits

CFI = Cocoa Farming Inputs

β_0 = Constant

$\beta_1 - \beta_2$ = Coefficient of the Parameters

e = Error term

Data Analysis and Presentation

Binary Logistic Regression Result for Model 1

The first model formulated in this research investigated the effect of micro-finance banks' credit products, micro-finance banks' lending methods and micro-finance banks' loan conditions on cocoa farming inputs financing.

Table 1: Overall Significance Test

Dependent Variable	Wald	Df	Prob.
Cocoa Farming Inputs	10.912	1	0.001

Source: Authors' Computation, 2022

Table 1 shows the overall significance result of the micro-finance banks' credit products, micro-finance banks' lending methods and micro-finance loan conditions on cocoa farming inputs financing. The Wald statistic value is given as 10.912 with a corresponding probability value of 0.001 which is significant at 5%. This indicate that micro-finance banks' credit products, micro-finance banks' lending methods and micro-finance banks' loan conditions have joint significant effects on cocoa farming inputs financing.

Table 2: Coefficient Parameters

Dependent Variable: Cocoa Farming Inputs Financing		
Independent Variables	Coefficients	Prob.
MBCP	2.684	.000
MBLM	0.114	.693
MBLC	-0.187	.200
Constant	-13.689	.000

Source: Authors' Computation, 2022

Table 2 shows the regression result on the effects of micro-finance banks' credit products, micro-finance banks' lending methods and micro-finance banks' loan conditions on cocoa farming inputs financing. The result shows that micro-finance banks' credit products have positive and significant effect on cocoa farming inputs financing with a coefficient of 2.684. This implies that a unit increase in the micro-finance banks' credit products will lead to 2.684 increase in cocoa farming inputs financing. This suggest micro-finance banks' credit products are effective and sufficient to improve cocoa farming inputs financing.

Also, it is discovered that micro-finance banks' lending methods have positive but insignificant effect on

cocoa farming inputs financing with a coefficient of 0.114. This suggests that a unit increase in micro-finance banks' lending methods will bring about 0.114 increase in cocoa farming inputs financing with a coefficient of 0.114.

Finally, the regression result reported in table 2 reveals micro-finance banks' loan conditions have negative and insignificant effect on cocoa farming inputs financing with a coefficient of -0.187. This implies that a unit increase in micro-finance banks' loan conditions will lead to 0.187 decrease in cocoa farming inputs financing.

Binary Logistic Regression Result for Model 2

The second model is formulated to ascertain the effect of micro-finance banks' credit on cocoa outputs while controlling for cocoa farming inputs financing.

Table 3: Overall Significant Test.

Dependent Variable	Wald	Df	Prob.
Cocoa Outputs	18.163	1	0.000

Source: Authors' Computation, 2022

Table 3 shows the overall significance of micro-finance banks' credit and cocoa farming inputs financing on cocoa outputs. The Wald statistic and probability values are given as 18.163 and 0.000 respectively. The probability value of 0.000 is less than 5% significant level which implies that both micro-finance banks' credits and cocoa farming inputs financing significantly influence growth of cocoa outputs in Ondo state.

Table 4: Coefficients parameters

Dependent Variable: Cocoa Outputs		
Independent Variables	Coefficients	Prob.
MBC	0.498	0.000
CFI	0.087	0.203
Constant	-7.719	0.000

Source: Authors' Computation, 2022

Table 4 reports the regression coefficient result of the effects of micro-finance banks' credit and cocoa farming inputs financing on cocoa outputs. The result reveals that micro-finance banks' credit has a coefficient and probability values of 0.498 and 0.000 which implies that micro-finance banks' credit has positive and significant effect on cocoa outputs. This suggest that a unit increase in micro-finance banks' credit will lead to 0.498 increase in cocoa outputs.

Finally, the control variable, cocoa farming inputs financing is found to have positive but insignificant effect on coca outputs with a coefficient of 0.087. This implies that a unit increase in cocoa farming inputs financing will lead to 0.087 increase in cocoa outputs.

VI. FINDINGS, CONCLUSION AND RECOMMENDATIONS

Cocoa farming is one of the major activities of farmers in Nigeria and Ondo state where land is fertile. Cocoa farming is germane to the growth of Nigeria and provide employment opportunities to most of the population in Ondo state. The significance of cocoa farming can be seen from its contribution to export performance, foreign reserves generation, employment creation and materials for local industries. However, the neglect of the agricultural subsector by commercial banks in the recent years has resulted in the need for farmers to explore other means of finance through the micro-finance institutions. Thus, this research investigated the micro-finance banks' intermediation on cocoa farming inputs financing in Ondo state.

It was found that, the micro-finance banks' credit products had positive and significant effect on cocoa farming inputs financing which implies that credit products of the micro-finance banks help to finance the purchase of farm inputs such as land, seedlings, pesticides, herbicides, fertilizers and machineries. Also it was established that micro-finance banks' lending methods had positive but insignificant effect on cocoa farming inputs financing which results from the fact that the lending methods of micro-finance banks were mainly based on individual lending which was found to be ineffective by farmers. However, it was discovered that, micro-finance banks' loan conditions had negative and insignificant effect on cocoa farming inputs which was largely due to high interest rate, small farm size and poor education of farmers. Furthermore, it was also established that the micro-finance banks' credit had positive and significant effects on cocoa outputs which indicate that the granting of credit to purchase farming inputs will lead to increase in productivity of cocoa outputs. Finally, the control variable, cocoa farming inputs financing was found to have positive but insignificant effect on cocoa outputs.

The study concluded that that micro-finance banks' intermediation significantly influence cocoa farming inputs and outputs through credit products and flow of banks' credit to farmers. The study recommended that, micro-finance banks should contribute to cocoa farming by making credit available at ease, reviewing the conditions for securing loan. More also, credits should be provided to cocoa farmers on time because farmers will not get maximum profit regarding their plans if there is delay in the completion procedure for taking credits. The Central Bank of Nigeria (CBN) can also help to achieve this if efforts are put into simplifying the loan conditions in terms of time-lag, acceptance of security, documentation and disbursement of loan.

Furthermore, micro-finance banks should be encouraged to adopt more effective lending methods. Credit should be given in group rather than individually which was believe to be ineffective by farmers. Group lending will ensure that farming inputs are purchased in large quantities

and at discount. Finally, micro-finance banks through the government should organize quarterly training for cocoa farmers on how to apply herbicides and other farming inputs before the banks will grant credits. This can also be stated in the lending condition of the micro-finance banks that cocoa farmers who do not attend training for a number of time will not be eligible to request and get credit, so that credit granted will be efficiently utilized and not diverted to other purpose aside cocoa farming. This can only be achieved only if the micro-finance banks partner with the agricultural research institutes in the state on the advantages of good cocoa farming practices such as utilization of improved seeds varieties, pest and diseases control.

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