EFFECT OF MICROFINANCE BANK CREDIT ON OUTPUT OF ARABLE CROP FARMERS IN MINNA METROPOLIS, NIGER STATE, NIGERIA

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ABSTRACT

This study was carried out to examine the effect of microfinance banks' credit on output of arable crop farmers in Minna Metropolis, Niger State, Nigeria. Specifically, the study described the socio-economic characteristics of arable crop farmers (users and non-users of Microfinance Bank Credit), examined the effect of microfinance banks' credit on arable crop production, identify the major constraints associated with microfinance banks' credit. 60 users and 60 non-users of microfinance banks credit were selected for the survey through a multi-stage sampling procedure making a total of 120 respondents. The sample was drawn from two microfinance bank namely Endwell microfinance bank and LAPO microfinance bank. Primary data were obtained using questionnaires administered to the respondent. Data were analyzed using descriptive statistics and multiple regression analyses. The result showed that 38% of the respondents were between the ages of 31 and 40 years, 75% were male, 53% had farming experience of between 11 and 20 years, 58% had family size of 1-5 persons and 88% had formal education at various levels. The result of the regression analysis showed that farm size ($P<0.01$), amount of credit received ($P<0.01$) seeds ($P<0.01$) and farming experience ($P<0.10$) were the factors that influenced output positively while education influenced output negatively. Also, the study identified bureaucratic procedure in accessing the loan, high interest rate and distance to microfinance among others as the most pressing constraints encountered by respondents in accessing the loan. Thus, the study recommended that farmers should apply for microfinance credit through cooperative societies to enhance easy access.

KEYWORDS: Microfinance bank Credit**,** Arable crop, User and non-users, bureaucratic Procedure.

INTRODUCTION

Agriculture is inevitable concomitant to the economics of developing countries as it plays a key role in providing food to the populace and supplying other sectors with raw materials for production of goods and services (Food and Agriculture Organization, 2009). Nigeria is endowed with huge expanse of fertile land, rivers, streams, lakes, forests and grasslands, as well as a large active population that can sustain highly productive and profitable agricultural sector which can ensure self-sufficiency in food and raw materials for the industrial sector as well as providing gainful employment for the teeming population and generate foreign exchange for the economy. Ironically, the reverse is the case. Several factors account for the poor performance of the agricultural sector in Nigeria; these include virtual neglect of the sector, poor access to modern inputs and technology, and lack of optimum credit supply (Enyim, Ewno and Okoro, 2013). Aside the problem of poor access to modern technology, the major bank of agricultural development in Nigeria is low investment finance (Salami and Arawomo, 2014).

Before the discovery of Petroleum in Nigeria, Agriculture used to be the highest foreign exchange resources earner and contribution to Gross Domestic Product (GDP), estimated to about 62.63% in 1960, 48.08% in 1970s, and 20.63% in 1980. Recently due to the growing awareness of the role of Agriculture, the various governments have intensified efforts aimed at transforming from its present subsistence level to a market oriented production. One of those efforts was the ban placed on importation of agricultural products like palm oil, maize and rice.Therefore Microfinance Bank credit is one of the key policy strategies for poverty alleviation and its sustainability is very important.According to Central Bank of Nigeria, CBN (2005), robust economic growth cannot be achieved without well focused programme to reduce poverty through empowering the people by increasing their access to factors of production especially credit through the provision of Microfinance services.

Credit supply to farmers is a widely perceived strategy to increasing agricultural productivity and transformation of rural economy (Awotide, Abdoulaye , Alene, and Manyong 2015). The introduction of easy access and low interest rate credit is the quickest way for boosting agricultural production and raising the income of rural populace (Atieno, 2001; Mahmood, Khalid and Kouser, 2009). Limited access to income opportunities keeps many people in abject poverty because inadequate access to formal and financial services remain a major impediment to the socio-economic choices of the rural small-holder farmers. According to Meguma and Muteye (2000) inadequate financial remains a principal drag in industrial development. This is clearer when the use of obsolete technology, low productivity and a near negative savings and investment level especially in rural communities are brought into focus. These constraints could be traceable to imperfect information between the lenders and borrowers of credit.

There is a need for financial agencies to understand the credit market because some borrowers are unable to obtain the amount of funds they require at a prevailing interest rate and liquidity can be a binding constraint on farmers operation and an inherent problem in agriculture credit market (Efobi and Osabuohien 2011). According to Pham and Lensink (2007); Adebajo (2010) high interest rates, collateral risk, the bureaucratic loan process, asymmetric information and high transaction costs are the major factors deterring the demand for formal credit. Mbah (2009) argues that, although formal and informal financial sectors have been working for a long time in some developing countries in Africa, their contribution to serve the poor section of the community is ambiguous.

The aim of the study was to access the effect of microfinance bank credit use on the output of arable crop farmers in Minna Metropolises, Niger State, Nigeria.
The specific objectives of the study are to:-

i. describe the socio-economic characteristics of arable crop farmers' users and non – users of microfinance banks' credit in the study area?
ii. determine the effect of microfinance bank credit on arable crop production; and
iii. identify constraints to arable crop production by the users and non-users of microfinance credit in the area.

The hypothesis of the study state that, there is no significant difference in the output of the users and non-users of microfinance bank credit in the study area.

Statement of hypothesis

Ho: there is no significant difference in the output of the users and non-users of microfinance bank credit
H_A: there is significant difference in the output of the users and non-users of microfinance bank credit

METHODOLOGY

Study Area

Minna is a city in the Middle belt of Nigeria with an estimated population of 304,113 (NBS, 2006). It is the capital of Niger State and it is located on Latitude 9°36'N Longitude 6° 32' E. It has a mean annual temperature of 32°C and wind Speed of 6 km/h. The climate of Minna is sub humid with mean annual rainfall of about 1284 mm and a distinct dry season of about 5 months duration occurring from November to March. Cotton, guinea corn and ginger are the main agricultural products of the city. Yam is also extensively cultivated throughout the city. The economy also supports cattle trading, brewing, sheanut processing and gold mining. Traditional industries and crafts in Minna include leather work and metalworking,

Source of Data and Sampling Procedure

The data were collected from primary sources only, using a well-structure questionnaire in Minna Metropolis, Niger State, Nigeria. The population of this study consists of all the arable crop farmers in the study area. Multistage random sampling procedure was adopted for this study and the frame was provided by Microfinance Banks (MFBs). The first stage involved the random selection of two microfinance banks (Endwell MFB and LAPO Minna MFB) from the four MFBs (FUT, College of Education, Endwell and LAPO) in Minna due to their active provision of financial services to arable crops farmers. The second stage involved the random selection of four villages (Maikunkele village, Matumbi village Kengiwa and Kadina village). In the third stage, 60 users (15 from Maikunkele, 15 from Matumbi village, 15 Kengiwa and 15 from Kadina village) where randomly selected from the list of registered users obtained from the MFB while systematic sampling was used to select 60 non-users (15 from Maikunkele, 15 from Matumbi village, 15 Kengiwa and 15 from Kadina village) from the selected villages. In all one hundred and twenty respondents were sampled from Minna Metropolis as shown in table 1.

Table 1: Selected registered farmers with MFBs and area councils for users and non-users

MFB	Area council	Arable crop farmers	USERS	Non-Users
ENDWELL and LAPO	Maitunbi	30	15	15
	Makunke le	30	15	15
	Kengiwa	30	15	15
	Kadina	30	15	15
TOTAL	**4**	**120**	**60**	**60**

Sources: Endell and Minna MFBs, 2017.

METHOD OF DATA ANALYSIS

Descriptive statistics such as frequency distribution, percentage and mean was used to describe the socio economic characteristics of the farmers and constraints faced by farmers (users and non-users of microfinance credit) involved in arable crop production in the study area. Multiple regression was used to determine the effect of microfinance bank credit on arable crop production. The multiple regression was also used to derive the sum of square residuals which was subjected to a chow test.

Model Specification

Regression analysis

Multiple regression analysis was used to determine the effect of microfinance bank credit on production. The model is expressed in implicit form as indicate in equation (1):

$Y = f(X_1, X_2, X_3 X_4, X_5, X_6, X_7, X_8)$…… (1)

Where:

Y = Output (kg)
X_1 =Farm size (hectare)
X_2 = Fertilizer (kg)
X_3 = Credit amount from microfinance bank (~~N~~)
X_4 = quantity bought/used (kg)
X_5 =Capital inputs (depreciations on hoes, cutlasses, sickle, knapsack sprayer, rent on land, interest)
X_6 = Labour (man days)
X_7 = educational level (years)
X_8= farming experience (years)
b_0 = Constant
e = [Error term]

Four functional forms namely Linear function, Cobb- Douglas (Double- log), Semi-Log and Exponential was tried and the best fitted was chosen based on the magnitude and signs of coefficient of the multiple determination R^2. The model is expressed in explicit form in the following equation:

Linear equation

$Y = a + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \cdots \ldots \ldots \ldots \beta_{10}X_{10} + e$…… (2)

Double- log function

$Log\ Y = a + \beta_1 logX_1 + \beta_2 logX_2 + \beta_3 logX_3 + \cdots \ldots \ldots \ldots \beta_{10} logX_{10} + \log e$…… (3)

Semi – log Function

$Y = a + \beta_1 logX_1 + \beta_2 logX_2 + \beta_3 logX_3 + \cdots \ldots \ldots \ldots \beta_{10} logX_{10} + \log e$…… (4)

Exponential function

$\log Y = a + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \cdots \ldots \ldots \ldots \beta_{10}X_{10} + e$…… (5)

Where

Y, X_1, X_2, X_3, to $X_{10,}$ are as defined in equation 1
$\beta_1 - \beta_{10}$ are coefficients to be estimated
a is constant term
e is an error term

Chow Test Statistics

The Chow test, proposed by econometrician Gregisory Chow in 1960, is a test of whether the coefficients in two linear regressions on different data sets are equal. The Chow test is often used to determine where the independent variables have different impacts on different subgroups of the population. It is requires the sum of squared residuals from three regressions, one from each sample group and one from the pooled data. If the F-chow is greater than the F-table, then there was programme impact on the participants, but if otherwise then no impact. This was also used to test the null hypothesis that there is no significant difference in the output of the users and non-users of microfinance bank credit in the study area.

Chow test is represent by the following formula:

This is expressed mathematically as:

$$F = \frac{[\{SSR_C - (SSR_1 + SSR_2)\} / K]}{([SSR_1 + SSR_2] / n - 2k}$$

Where;

SSR_C = the sum of squared residuals from the regression in which b_1 and b_2 are assumed to be the same, b has dimension k, and there are n observations in total.
SSR_1 = The sum of squared residuals from a the regression of sample 1
SSR_2 = The sum of squared residuals from a the regression of sample 2
$n = n_1 + n_2$ the total number of observations is and
k = the number of parameters is.

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

The result presented in Table 2 shows that the age distribution of both users and non-users of microfinance bank credit and most of the respondents were within the age range of 31-50 years corresponding to 76.7% for users and 70.0% for non-users. The age factors differential between these categories of farmers agrees somewhat with findings by Adewuyi, *et al*. (2006) in similar study involving categories of farmers it also revealed that 68.3% and 80% of users and non-users were male respectively, while 31.7% and 20% where female for users and non-users respectively. This shows a wide level of imbalance. Reason for this is that people's cultural background which usually placed men as the head of the family, while women are usually associated with domestic works only. This implies that majority of the users were male and were into small scale farming whom can endure the difficulties involved in accessing loan/credit facility. This finding agrees with that of Olaleye (2000) that small-scale farming is being carried out mostly by males, while females are involve in light farm operation such as processing, harvesting and marketing also majority of the respondents were married corresponding to 65.0% for users and non-users 45.0% and 86.70%and 88.30% of users and non-users had one form of formal education or the other also 51.70% and 50.0% for users and non-users had farming experiences of 11 -20 years, in their household most of the users (48.3%) and non-users (58.3%) respectively have 1 – 5 persons. 91.70% of users belong to a cooperative society.

Table 2: Distribution of Respondents According to Socio - Economic Characteristics

Variables	Users		Non Users		Pooled	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Age						
20-30	8	13.30	6	10.0	14	11.7
31-40	27	45.00	22	36.7	49	40.8
41-50	19	31.70	20	33.3	39	32.5
51-60	5	8.30	11	18.3	16	13.3
61above	1	1.70	1	1.7	2	1.7
Total	60	100.00	60	100.0	120	100.0
Mean		40.6		41.8		41.2
Educational level						
Never been to school	5	8.3	5	8.3	10	8.3
Primary	22	36.7	15	25.0	37	30.8
Secondary	19	31.7	11	38.3	30	25.0
Post –secondary	11	18.3	23	18.3	34	28.3
Non-formal education	3	10.0	6	10.0	9	7.5
Total	60	100.0	60	100.0	120	100.0
Mean		2.9		3.3		3.1
Farming experience						
1-10	13	21.7	16	26.7	29	24.2
11-20	31	51.7	30	50.0	61	50.8
21-30	16	26.7	14	23.3	30	25.0
Total	60	100.0	60	100.0	120	100.0
Mean		16.2		16.8		16.5
Farmers group						
No	5	8.30	13	21.7	18	15.0
Yes	55	91.70	47	78.3	102	85.0
Total	60	100.00	60	100.0	120	100.0

Source: Field Survey, 2017

The result in Table 3 shows that 45.00% and 23.30% of users and non – users acquired land through communal and leasehold respectively, most of the users 71.60% cultivated 0.1 - 2.0ha while the non – users cultivated 86.60% has farm size ranging from 0.1 – 2.0ha respectively, majority of the users has 33.30% received amount ranging from ₦300,001 to ₦400,000.

Table 3: Distribution of Respondents According to Institutional Factors

Variable	Users		Non – Users	
	Frequency	Percentage	Frequency	Percentage
Forms of land tenure				
Purchase	2	3.30	4	6.7
Rent	14	23.30	6	10.0
Gift	4	6.70	12	20.0
Leasehold	3	5.00	14	23.3
Inheritance	9	15.00	13	21.7
Allocation	1	1.70	7	11.7
Communal ownership	27	45.00	4	6.7
Total	60	100.00	60	100.0
Farm size				
0.1-1.0	20	33.30	38	63.3
1.1-2.0	23	38.30	14	23.3
2.1-3.0	16	26.70	5	8.3
3.1-4.0	1	1.70	2	3.3
Total	60	100.0	1	1.7
Types of labour used				
Family	15	25.00	24	40.00
Hired	45	75.00	36	60.00
Total	60	100.00	60	100.00
Crop type				
Maize	35	58.30	25	41.7
Millet	13	21.70	12	20.0
Rice	12	20.00	23	38.3
Total	60	100.00	60	100.0
Credit amount				
1-100,000	4	6.70		
100,001-200,000	17	28.30		
200,001-300,000	15	25.00		
300,001-400,000	20	33.30		
400,001-500,000	2	3.30		
400,001-500,000	2	3.30		
500,000above	2	3.30		
Total	60	100.00		

Source: Field Survey, 2017

Effect of Microfinance Bank Credit on Arable Crop Farmers in the Study Area

The regression estimate of the effect of microfinance bank credit on arable crop farmers' is presented in Table 4 The result shows that Cobb-Douglas functions was the lead and chosen equation because it has the highest R^2 square value (0.9858) and also has the highest significant variables. The F-ratio was 963.22 and was significant at 1% level of probability; this implies that the whole model was statistically fit. The coefficient of multiple determination (R^2) of 0.9858 indicate that 98.58% variation in the output of the arable crop farmers was explained by the explanatory variables included in the model, while the remaining 1.42% not explained is as

a result of variables that are not included in the model as well as errors in the estimation. The coefficient of farm size, credit amount, seed, and farming experience were positive and significant at 1%, 1%, 1% and 10% level of probability respectively. This implies that a unit increase in these variables holding other variables constant will lead to an increase in the output of the arable crop farmers by 0.53, 0.01, 0.46 and 0.03 respectively, only the educational level was found to be negatively related to output and was statistically significant at 5% probability level (-0.0398258). This may be due to certain factors that may beyond the farmer's control. In essence, the farm size, credit amount, seed, farming experience and educational level are the significant factors affecting the production of the arable crop farmers in the study area.

Table 4.3: Regression Estimation of Factors Affecting Arable Crop Farmers

Variable	Linear	Cobb-Douglas	Exponential	Semi-log
Farm size	1102.01	0.53	0.40	1336.94
	(17.70)***	(29.64)***	(10.72)***	(8.44)***
Fertilizer	-9.91	-0.01	0.02	-86.66
	(0.61)	(-0.12)	(1.54)	(-0.84)
Credit amount	0.00	0.01	1.65e-07	20.51
	(1.73)*	(6.18)***	(0.99)	(1.55)
Seed	36.59	0.46	0.01	1442.21
	(21.69)***	(39.92)***	(9.49)***	(14.00)***
Labour	9.23	0.07	0.00	224.95
	(2.06)**	(1.46)	(0.83)	(0.50)
Capital input	-0.04	-0.03	-0.00	309.60
	(-0.43)	(-1.36)	(-2.19)**	(1.76)*
Farming experience	10.09	0.03	-0.00	133.16
	(2.03)**	(1.92)*	(-0.53)	(1.02)
Educational level	-70.88	-0.04	-0.03	-71.58
	(-1.96)**	(-2.21)**	(-1.49)	(-0.44)
Constant	-569.01	5.96	6.84	-5335.66
	(-1.66)*	(24.63)***	(33.73)***	(-2.47)***
R – squared	0.96	0.99	0.86	0.87
Adjusted R-squared	0.95	0.99	0.85	0.87
F-ratio	309.13***	963.22***	85.61***	99.31***

*** = Significant at 1% level of probability, ** = Significant at 5% level of probability, *Significant at 10% level of probability.
Note: Figures in parenthesis are t values
Source: Field Survey 2017

Constraints to Accessing Microfinance Bank Credit by farmers in the Study Area

The result in Table 4 illustrate that bureaucratic procedure in accessing the loan, high interest rate and microfinance bank is far away which account for 76.70%, 63.30% and 41.70% respectively are the major constraints faced by the respondents in accessing microfinance bank credits' in the study area. This agree with the findings of Ajibi (2016) who found that lack of knowledge on loan usage, lack of guarantor and mode of repayment were the major constraints faced by farmers in accessing microfinance bank credit in Nasarawa State.

Table 4 Constraints Encountered By Farmers in Accessing Microfinance Bank Credit in the Study Area.

Constraints	*Frequency	Percentage (%)	Rank
Bureaucratic procedures	92	76.70	1st
High interest rate	76	63.30	2nd
Microfinance bank is far away	50	41.70	3rd
Loan officers not always available	48	40.00	4rd
Unavailability of security/collateral	36	30.00	5th
Late disbursement of loan	23	19.20	6th
Illiteracy	23	19.20	6th
Total	348		

Source: Field survey, 2017
Note: * multiple responses

Hypotheses Testing

Chow Test on Arable Crop Farmers

Chow test was used to test the null hypothesis (H_{01}) that, there is no significant difference in the output of the users and non-users of microfinance bank credit in the study area.

Table 5: Chow test determining the effects of Microfinance Bank Credit on Arable Crop Farmers in the study area

	Pooled	**Users**	**Non-users**
Residual sum of square	51.86	26.22	32.89
Number of observation	120	60	60
Parameters	9	9	9
Degree of freedom	111	51	51

Source: Field Survey, 2017.

Using chow test

$$F = \frac{\{SSRC-(SSR1+SSR2)\}/K}{\frac{SSR1+SSR2}{n-2K}}$$

Where;
SSR_C = sum of squared residuals from the regression in which Users and Non users are assumed to be the same, b has dimension k, and there are n observations in total.
SSR_1 = sum of squared residuals from a the regression of Users
SSR_2 = sum of squared residuals from a the regression of Non users
n = $n_1 + n_2$ the total number of observations is and
k = the number of parameters is.
SSR_C = 51.89

SSR_1 = 26.22
SSR_2 = 32.89
n_1 =60
n_2 =60

n = $n_1 + n_2$ = 60 +60 = 120
k = 9

$$F = \frac{\{SSRC-(SSR1+SSR2)\}/K}{\frac{SSR1+SSR2}{n-2K}}$$

$$F = \frac{\{51.89-(26.22+32.89)\}/9}{\frac{26.22+32.89}{120-2*9}}$$

$$= \frac{\{51.86-59.11\}/9}{102}$$

$$= \frac{-7.25/9}{102}$$

$$= \frac{-0.81}{102}$$

F = 7.89

F calculated = 7.89
F tabulated = 1.94

The result showed that the calculated F-value (7.89) was greater than the tabulated F-value (1.94) at 5% confidence interval; this implies that formal microfinance bank credits had a significant effect on the users of microfinance bank credit production. Hence, the null hypothesis was rejected. This agrees with the study of Ellis Kofi Akwaa-Sekyi (2013) that there is significant large effect of rural credit on labour force employed by farmers, capital for farming, output and income of farmers.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the findings, the study concluded that microfinance bank's credit had a positive effect on users. Therefore, the hypothesis that there is no significant difference between the output of users and non-users was rejected.

Recommendations

Based on the findings, the study recommends that

1. Microfinance banks should create awareness and sensitize farmers on importance of early loan application of forestalls any unforeseen delays and bureaucratic bottlenecks associated with credit approval.
2. Microfinance banks should develop a stringent measure such as monitoring, credit risk management, and supervisory and regulatory frame work to curb incessant possible diversion of credit among beneficiaries which may likely affect loan repayment.
3. Government through the support of Central Bank of Nigeria (CBN) should introduce intervention fund in Agricultural sector at low interest rate and should be made accessible to farmers across the country through microfinance only.

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