Microcredit and Farmers' Productivity in Osun State, Nigeria

ABSTRACT

The present work examines micro-credit and farmers' productivity in Osun State, Nigeria. A total of 140 respondents were interviewed using structured questionnaires. Data obtained was analysed using descriptive statistics and Tobit regression model. The research showed there was a significant relationship between household size (β=0.623), farming experience (β=0.858) and loan condition (β=1.29) on the acquisition of credit by farmers. Income generated was used as a proxy for productivity and it was in the minimum of ₦20,000 per planting season. Interest rate had a negative relationship with credit acquisition which implied the majority of the farmers patronised the informal sources of credit. The research showed that loan conditions from informal sources was favourable compared to that from formal sources; and a reason for the high patronage. This, therefore, suggests that formal lending institutions should relax agricultural lending condition and provide credit for agricultural purposes to increase the productivity of farmers.

Keywords: Credit acquisition, Informal sources, Productivity, Tobit Regression model, Loan condition.

INTRODUCTION

A vicious cycle of low-level output, income, savings and investment is characteristic of most developing countries of sub-Sahara Africa (Livelihood and Food Security Trust Fund, (LFTF), 2016). This occurrence is so because many of the populace in the region depend on equity capital (Owner's fund/capital) for business. Equity capital is however insufficient in meeting the expenditure requirements for increased productivity[1]; if eradicating poverty is of utmost importance[2]. As a result microfinance can therefore be used in delivering a full range of commercial and financial services to low-income groups and sub-groups of people in order to achieve economic development, social cohesion, and poverty reduction[3].

[1] much more so agricultural sector
[2] http:// www.sustainable rural livelihoods.

[3] http:// www.developmentgoals.org.

Consequently, Olayide, (2006), Oshuntogun and Oludimu (2010) and Akwaa-Sekyi (2013) stressed the importance of agricultural credit to the overall welfare of farmers saying that credit is required to purchase improved technologies like seeds, fertilizers, herbicides, pesticides, agricultural machinery, equipment etc. for increased productivity and the overall expansion of the farm. It is also required in order to pay salaries of regular staff and wages of farm labour hired for major seasonal tasks. The role of agricultural credit is not restricted to production alone (Boateng and Oduro, 2013). However, according to Adegeye and Dittoh (1985)[4], consumption credit, especially to small farmers is a necessity especially at lean periods; which will provide the necessary impetus to increase labour productivity as well as feeding money before the outright harvest of crops.

Agriculture's contribution to development[5] was hinged on the availability of credit to farmers (Ikpi and Olayemi, 1995). Idachaba, (1984) was of the opinion that one of the problems confronting agriculture in Nigeria was inability of farmers and agro-based entrepreneurs to access farm credit in the right amount, place and form. This assertion although dates way back is still current and a problem plaguing the agricultural financial system till date, hence a justifiable reason to look at the effect availability or non of microcredit has on the productivity of farmers.

Finance (used interchangeably with micro-credit in this study) is very germane to production and productive processes. It has been found to improve the welfare of businesses/people directly or indirectly whereby enhancing the productive capacities of individual firms/farms through investment either in human and/or physical capital (Ugochukwu, 2013). The availability of cash (finance) for productive ventures/investments alongside proper managerial skills has enabled those in business to overcome long-term or short-term constraints faced in businesses which are but not limited to: inability to expand, liquidity constraints (inadequate liquid cash), incapacitated to undertake new investments, inability to boost production, inability to employ qualified staff.

[4] http://www.gdrc.org (the gendering of microfinance in Nigeria).

[5] process of providing food, capital and labour to the industrial sector and increasing the size of products at the international market

Subsequently, it is common knowledge that it is the small and medium-sized businesses as well as the agricultural sector[6] that employs over 70 percent of the population in sub-Saharan Africa. However, these sectors are the most disadvantaged in relation to finance and accessibility to credit. Thus adequate financing of agriculture can never be overemphasised (Food and Agricultural Organization (FAO), 2008); and a reason for this research. In addition, there was an assertion by Zeller et *al.* (2013) that adequate access to credit goes a long way in reducing the opportunity cost of capital. Fair access to credit would help farming household boost their welfare conditions, reduce risk bearing, and help the improvement of risk coping strategies which comes via willingness to adopt new technologies, which would go a long way in increasing production and productivity of farmers (Aliou *et al*., 2000).

However, agriculture in Nigeria has witnessed various developmental programmes which were introduced at one time or the other. Some of which focused on credit; some of which were: The Agricultural Credit Guarantee Scheme Fund (ACGSF), a policy instrument of the Federal Government of Nigeria on Agricultural-Credit. The Scheme which was established by Decree 20 of 1977 became operational in 1978. The Nigerian Agricultural Insurance Corporation (NAIC), The World Bank Assisted FADAMA projects I, II and III, The Commercial Agriculture Credit Scheme Rural Finance Institution Programme (RUFIN Programme) 2011-2015, and presently the anchor borrowers' scheme 2016 till date, a collaborative efforts of many development partners like the International Fund for Agricultural Development (IFAD), Agricultural Development Bank (AFDB), the World Bank, the Central Bank of Nigeria and Ministry of Agriculture and Natural resources (African Farmers' Journal, (2018). The objective of these programmes was to strengthen microfinance institutions (MFIs) and establish linkages between these institutions and farmers to create a viable and sustainable rural financial system. The programmes were expected to develop rural financial institutions; enhance access to financial services by rural population to boost the productive capacities of rural-micro and small-enterprises (Nigerian Institute of Social and Economic Research (NISER), 2014). However, the aforementioned has not been accomplished leading to farmers' not been productive.

PROBLEM STATEMENT

The per capita income generated from food produced in sub-Sahara Africa has been on the decline because food production has not been able to keep pace with population growth (Ehui

[6] a lot of farmers are still small farm holders with farm sizes less than2-3 hectares

and Spencer, 2010; Tabsoba, 2009). There is also a new school of thought among development economists that better living standards and the elimination of poverty must be based on the sustained expansion of output which is expected to lead to increases in income, available funds and farmer productivity in the long run (Schmidt-Hebbel, 2006). Thus, the importance of capital to the agricultural sector cannot be overemphasised. However, farmers' lack adequate capital both in acquisition and accumulation; hence, the essence and need for credit[7]. Formal financial institutions are also guided by numerous policies whose impact rather than benefiting the rural populace is more of a pain in the neck because of these following reasons:

i) The cost of loan acquisition compared to the farmer's capacity to pay is too high.
ii) The cost of loan administration by the financial institution is high.
iii) The financial institutions' charge on interest rate and administrative-cost is high.

This has resulted in small-scale farmers finding it difficult to obtain loans from formal sources. In the face of these shortcomings from the formal financial sector, the informal sector has become an alternative to most rural and some urban business people in need of credit. The forecast has been farmers' productivity would grow annually in terms of total output and annual income. It was believed that after borrowing for a number of years and investing in profitable ventures, a borrower would have accumulated sufficient capital to stop borrowing and become independent, thus using retained earnings for the expansion of his/her business. However, real-life situation have not met these expectations because farmers have continued to remain poor, with low productivity despite the supposed availability and intervention of both formal and informal credit sources.

OBJECTIVE OF THE STUDY

The general objective of this study is to assess micro-credit and farmers' productivity in Osun State. The specific objectives are to profile the sources of micro-credit used by farmers; profile the socio-economic characteristics of users of microcredit in Osun state and to identify the determinants of microcredit in the study area.

[7] Credit provides a basis for increased productivity through specialised functions by providing the incentive for the adoption of new technology, and/more efficient utilisation of production factors through the introduction of new outputs.

MATERIAL AND METHODS

The sample frame/target populations for this study were farmers that consistently applied for loans both from formal and informal micro credit-sources. A three stage random sampling technique was adopted in this study. All three agricultural development zones were covered in the survey. The first was the purposive selection of the three ADB zones of Iwo, Osogbo and Ilesa. The second was a proportionate selection of eight local government areas to size from the 30 local governments in the three zones, which were:

(a) Iwo zone: Ayedaade, Irewole and Isokan

(b) Ife/Ilesa zone: Atakunmosa East and Oriade

(c) Osogbo zone: Ede and Osogbo

The third was the random selection of 20 farmers selected at random to give a total of 160 respondents; however, only 140 respondents were eventually used for this study.

TOOLS OF DATA ANALYSIS

Both descriptive statistics and econometric tools were used in analyzing data obtained from this survey; these include means, frequencies, tables and the Tobit, regression model. The Tobit regression model (Tobin, 1958; Smith, 2006) was used to estimate the determinant of farmers' credit use or acquisition on productivity (income) (Nkonya *et al.,* 2011).

The Tobit model used in this analysis was specified as:

$$Y_i = X_i\beta_i + \varepsilon_i \quad (1)$$

Y_i can be expanded to equation 2 below as:

$$Y_i = \alpha + \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + \text{----------} + \beta X_n + \varepsilon_i \quad (2)$$

However, since the tobit regression model is not a linear model, this can further be explained that the observations Y_i must be censored or truncated since the true model is not linear. Based on the Amemiya (1984) and Adesina and Zinnah, (1993) the log likely hood for the tobit regression can be expressed as:

$$Y_i = 0 \text{ if } Y_i^{*[8]} < Y_i \quad (3)$$

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[8] Y_i is the raw credit amount declared by farmers, however, due to inconsistencies in responses of respondents or farmers, some negative values where obtained. Thus a need for the use of the truncated regression model (tobit) to censor out credit amount or values lower than zero, thereby making use of credit amounts that was reported positive (Y_i*).

Based on normal distribution,

Y_i = the amount of credit used per farmer,

Y_i is the observed dependent variable,

Y_i* = the latent or censored amount of credit used per farmer, it can also be expressed as the solution to utility maximization of credit use to set of constraints per Farmer, ε_i are assumed to be independently normally distributed,

i.e. $\varepsilon_i \sim N(0, \sigma^2)$ which signifies that $Y_i \sim N(X_i\beta, \sigma^2)$.

Hence : $Y_i = Y_i^*$

While Xs are the independent variables which are specified as:

X_1 = Gender (1=Male, 0= female), X_2 = Age (years), X_3 = Household size, X = Educational level (1= Educated, 0= Otherwise), X_5 = Primary occupation, X_6 = Farming Experience (1= has farming experience, 0= Otherwise), X_7 = Source of Loan (1= Access to loan, 0= Otherwise), X_8= Loan Duration (months), X_9 = Interest Rate (%), X_{10} = Income (₦), X_{11} = Loan Condition (1= Favourable, 0= Otherwise), ε_i = the model error and is assumed to be independently distributed, i.e. N (0, σ^2).

RESULTS AND DISCUSSIONS

SOCIO-ECONOMIC CHARACTERISTICS OF FARMERS

Farmers both male (61.3%) and female (38.7%) as shown in table 1 participated in farming activities in the study area. Those involved in food and cash crops production were 25.8%, 9.7% in livestock production, 8.1% agricultural processing, 16.1% in agricultural marketing while 4.8% sold farm inputs as seen in table 2. Table 2 also showed the enterprise for which loans acquired was used.

Table 1: Sex of farmers

Sex	All Samples		Ilesa		Osogbo		Iwo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Female	24	38.7	3	17.6	17	54.8	4	28.6
Male	38	61.3	14	82.4	14	45.2	4	71.4
Total	62	100.0	17	100.0	31	100.0	10	100.0

Table 2: Enterprise for which loans was used.

Enterprise	All Samples		Ilesa		Osogbo		Iwo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Crops (Food & Cash)	16	25.8	7	41.2	7	22.6	2	14.3
Livestock Production	6	9.7	1	5.9	5	16.1		
Agricultural Processing	5	8.1	1	5.9	4	12.9		
Agricultural Marketing	10	16.1			5	16.1	5	35.7
Selling of Farm Inputs	3	4.8			1		3	21.4
a ,c, d	14	6.5	2	11.8	2	6.5		
No Response	18	29.0	6	35.3	8	25.8	4	28.6
Total	62	100	17	100	31	100	14	100

Farmers (66.1%) were able to improve on output based on the acquisition of credit as shown in table 3, below. While in table 4, 27.4% of the respondents were able to plough back as a result of loan acquisition; and 22.6% used the proceed from their farming activities as educational support.

Table 3: Benefit Derived from Credit Acquisition

Benefits	All Samples		Ilesa		Osogbo		Iwo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Improved output	41	66.1	11	64.7	23	74.2	7	50.0
Stay in business	2	3.2	1	5.9			2	14.3
More investment	4	6.5	12	70.6			3	21.4
No Response	15	24.2	5	29.4	8	25.8	2	14.3
Total	62	100.0	17	100	31	100.0	14.0	100.0

Table 4: Profitability of Enterprise Due to Loan

Other benefits	All Samples		Ilesa		Osogbo		Iwo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Plough back	17	27.4	3	17.6	8	25.8	6	2.9
Diversification	6	9.7	3	17.6	2	6.5	1	7.1
Educational Support	14	22.6	5	29.4	8	25.8	1	7.1
Poultry Houses	3	4.8			3	9.7		
a – c	4	6.5			1	3.2	3	21.4
b – d	2	3.2	1	5.9	1	3.2		
No Response	16	25.8	5	29.4	8	25.8	3	21.4
Total	62	100	17	100	31	100	14	100

The oldest farmer in the study area was in the age range 41-60 (Table 5) years. This in effect showed that there is a need for more farmers aged between 21 and 40 years to be given more incentive and encouragement to participate in farming activities. Farmers (79.1%) with household size 4-7 were in the majority as shown in table 6.

Table 5: Age of farmers in years

Age in years	All Samples		Ilesa		Osogbo		Iwo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
21 – 40	17	27.3	3	29.5	6	19.2	6	42.7
4 1 – 60	38	61.2	10	59	67.8	7	7	49.7
61 – 80	7	11.2	2	11.8	12.8	1	1	7.1
Total	62	100	17	100	100	14	14	100

Table 6: Household Size

Household size	All Sample		Ilesa		Osogbo		Iwo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
0-3	6	9.7	1	5.9	3	9.7	2	14.3
4-7	49	79.1	15	88.1	26	83.9	8	57.1
>8	7	11.3	1	5.9	2	6.4	4	28.5
Total	62	100.0	17	100.0	31	100.0	14	100.0

Table 7: Primary occupation

Primary occupation	Examples						Iwo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Farming	33	53.2	12	70.6	16	51.6	5	35.7
Transporter	2	3.2			2	6.5		
Selling of farm input	20	32.3	1	5.9	11	35.5	8	57.1
Civil servant	6	9.7	4	23.5	1	3.2	1	7.1
Private practice	1	1.6			1	3.2		
	62	100.0	17	100.0	31	100.0	14	100.0

This research was able to identify sources of credit to farmers in the study area as rotational savings associations/monthly contributions, profit, plough back which can be classified as informal sources of credit. Some respondents obtained collect loans from the formal sources but not as frequently as from the informal sources. Examples of these formal sources were the

Banks, co-operative, NGOs, State Ministry of Agriculture. The mean interest rate charged by credit providers in the study area was approximately 5 percent for each loan given and this seemed affordable to the credit users who patronised the informal credit providers as compared to the interest rate charged by their formal counterparts (18-35%). The mean amount of loan given by the credit providers ranged from ₦20, 000 to ₦100, 000, and the loan duration in months is more than a year. Income generated by the farmers was used as a measure of productivity, and the minimum per annum was found to be N20, 000.

Table 8: Sources of Funds

Sources	All Samples		Ilesa		Osogbo		Iwo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Cooperative Banks	3.0	4.3	3.0	12.5	15.0	45.5		
Monthly Contributions,	20.0	29.0	5.0	20.8			4.0	33.0
Plough back	13.0	18.8	7.0	29.2	3.0	9.1	3.0	25.0
Profit	16.0	23.2	8.0	33.3	4.0	12.1		
Ministry	1.0	1.4			2.0	6.1		
Banks	2.0	10.1	1.0	4.2				
Grants	7.0	2.9			3.0	9.1	4.0	33
Bank deposits	6.0	8.7			5.0	15.2	1.0	8.3
Deposits, Grants, Savings	1.0	1.4			1.0	3.0		
Total	69.0	100.0	24.0	100.0	33.0	100.0	12.0	100.0

TOBIT REGRESSION RESULTS

The male to female ratio had a negative but significant effect on loan acquisition in this study; there was a 10percent level of significance with credit use (1.233) and gender of

respondents from the Tobit regression outcome. This typified the extent of male to female participation in farming activities that would warrant the use of credit. This further implied that for a farmer to be male reduced the farmers' request for an acquisition of credit by 1.23. This is however contrary to the fact that there were more male farmers in the inferential statistics obtained from this study, which should have been a reason for more credit demanded. It, however, corroborates the outcome of Khandker and Binswanger (2011) that women value more finance and use of credit in production and for productive activities.

Age a continuous variable had no significant effect on credit acquisition of farmers, with a coefficient value of 0.989; this implied that credit use was not limited to any age group among the respondents sampled. Household size was significant at 1percent as shown in Table 10. It had a negative sign indicating an inverse relationship with credit use. This can be explained as smaller households would be easier to manage and overall demand for basic necessities will be lesser (Akwaa-Seki, 2013). While credit consumption would be relatively higher for larger households thus giving rise to a higher need of credit which may be an explanation for the significance of the coefficient (0.623) at 1percent.

Educational level with a coefficient of 0.639 (Table 9) was not significant at any level; the number of years in school did not impact on loan acquisition in this study. The result also showed that respondents were involved in other activities apart from farming in consonance with the research of Salmann (2012). Farming experience significant at 5percent was a determinant (0.858) of loan acquisition; thereby suggesting that a farmer who had increased productivity as his main goal but with limited cash resources would seek out other means of improving on him/herself; hence the reason why many farmers who had a good number of years in farming embraced credit as a means of mitigating on farming problems.

Sources of the loan had no significance from the Tobit regression outcome, the time duration before loans were paid back was significant (0.281) 1percent. The interest rate was significant and positive with a coefficient of 0.387 at 1percent. The positive nature of the interest rate coefficient could be as a result of respondents' dealings with informal sources of credit, who charged lower interest rates with less stringent loan conditions. Therefore an increase in interest rate by these informal sources was acceptable since it wasn't as high when compared to the interest rates from Banks and other formal finance houses (Boateng and Oduro, 2018).

Conditions under which loans were given were significant (1.290) at 1percent. The loaning conditions could be seen as good or stringent. Many of the farmers found the loaning conditions of informal sources better compared to formal sources whose loaning conditions were more stringent. The Tobit regression showed that there was a significant relationship between age, household size, farming experience, loan conditions, interest rate and loan duration on the acquisition of credit by the farmers to increase productivity and income. Interest rate which was expected to have a negative relationship with credit acquisition was, however, positively related to the acquisition of credit based on the Tobit regression results. This was as a result of farmers' patronage of informal sources of credit than the formal sources. This can further be explained as loaning conditions and duration of informal sources was more favorable compared to the formal sources[9].

Table 9: Parameter Estimates for Tobit Regression Model.

Variable	Coefficients	t – value
Sex	- 1.233	- 1.910**
Age	- 0.989	- 0.249
Household size	- 0.623	- 2.740***
Educational level	0.639	0.898
Primary Occupation	0.486	0.650
Farming Experience	0.858	2.346**
Sources of loan	0.630	0.840
Loan Duration	0.281	6.442***
Interest rate	0.387	5.663***
Loan Income	0.761	1.490
Loan Condition	1.290*	1.686*

Note: *** = significant at 1percent; ** = significant at 5percent; * = significant at10percent.

CONCLUSIONS

This study was able to show that there were more males (61.3%) farmers than females (38.7%), more farmers (79.1%) had a household size in the range 4-7; farmers in the age group 41-60 years was 61.2%. Farming (53.2%) was the major activity of the respondents, with plough back (27.4%) and educational support (22.6%) recorded as the profit acquired

[9], However, the amount of credit received from these sources is smaller when compared to that from the formal credit providers.

after acquisition of credit. Farmers (66.1%) were able to achieve improved output as the benefit derived from acquisition of credit. It was also discovered that the minimum amount of money that accrued to a farmer as income was in the range of ₦10, 000 – ₦20, 000 (not monthly depending on the planting season).

RECOMMENDATIONS

There is a need to create more awareness for female farmers on the need to acquire credit to increase productivity. It is also suggested that credit conditions for female farmers be greatly reduced to engage them. There is a need to support farmers who have more experience in farming as well as those in the process of starting up based on the outcome of this research.

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