Microcredit and Farmers' Productivity in Osun State, Nigeria

ABSTRACT

This research examined micro-credit and farmers' productivity in Osun State, Nigeria, 140 respondents were interviewed using structured questionnaires. Micro-credit sources identified in the study area were money lenders, rotational savings associations, farmers in partnership business, banks, co-operatives, non-governmental organizations and Ministry of Agriculture. Data obtained were analyzed using descriptive and Tobit regression model. The Tobit regression model carried out showed that 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 the farmers. The mean amount of loan given by credit providers per season was in the range (₦20, 000 to ₦100, 000) with a year's duration. Income generated used as a measure of productivity was in the minimum of ₦20,000 per planting season. Interest rate had a negative relationship with credit acquisition which implied that majority of the farmers patronized the informal sources of credit. This research's outcome showed that loaning conditions from informal sources were more favourable compared to the formal sources; hence their high level of patronage. This therefore suggests that formal lending institutions should relax agricultural lending condition and provide credit for agricultural purposes in order to increase productivity of farmers.

Key words: 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 are farmers, and majority depends on equity capital (Owner's fund/capital). However, researches have proved that equity capital is insufficient to meet the expenditure requirements for increased productivity in the agricultural sector if eradicating poverty is the main goal[1]. Microfinance has demonstrated its potential for delivering a full range of commercial financial services to a

[1] http:// www.sustainable rural livelihoods.

large group of low-income people in order to achieve economic development, social cohesion, and poverty reduction[2].

Olayide, (2006) 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 needed for increased productivity and the overall expansion of the farm. Credit is needed 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)[3], consumption credit, especially to small farmers is a necessity especially at lean periods; which will provide the necessary impetus to increase labour productivity on farms as well as provision of feeding money before the outright harvest of crops.

Agriculture's contribution to development[4] is 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 farmers and agro-based entrepreneurs do not get farm credit in the right amounts, in the right place, in the right form, and at the time it is most needed; this assertion though 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 productivity of farmers.

Finance (used interchangeably with micro-credit) is very important in relation to production and productive processes; it can improve the welfare of business/people directly or indirectly thereby enhancing the productive capacity 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 enables those in business to overcome some long-term or short-term situations and conditions in form of limitations faced in businesses such as: inability to expand, liquidity constraints (in

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

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

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

adequate liquid cash), incapacitations to undertake new investments, inability to boost production, inability to employ qualified staff to mention but a few.

Furthermore, it is common knowledge that it is the small and medium sized businesses as well as the agricultural sector[5] that employs over 70 percent of the population in sub-saharan Africa; however, the sector is the most disadvantaged in relation to finance and/or accessibility to credit. This is why in agriculture adequate financing can never be overemphasized (Food and Agricultural Organization (FAO), 2008); and a reason for this research. Consequently, 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. Adequate access to credit would help farming household boost their welfare conditions, reduce risk bearing and help them improve on risk coping strategies and a willingness to adopt new technologies which would go along-way in increasing production and productivity of farmers (Aliou *et al*, 2000).

However, agriculture in Nigeria, has witnessed various developmental programmes which were introduced one time or the other. Some of which focused on credit 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 and recently (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 instituitions (MFIs) and establish linkages between these instituions and farmers in order 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 so as to boost the productivite capacities of rural-micro and small-enterprises (Nigerian Institute of Social and Economic Research (NISER), 2014). However, how much of this has actually brought out farmer's productivity?.

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

PROBLEM STATEMENT

The per capita income generated from food production in sub-Sahara Africa has been on the decline because food production has not been able to keep pace with population growth (Ehui and Spencer, 2010; Tabsoba, 2009). Thus the agricultural sector which provides food for this region needs to be enhanced greatly and it must grow sustainably if it must meet the food needs of the growing population. 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 increase 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 over emphasized, many farmers lacks capital acquisition and accumulation; hence, the essence for credit. Credit provides a basis for increased productivity through specialized functions by providing the incentive for the adoption of new technology, and/more efficient utilization of production factors through the introduction of new outputs. Formal financial institutions are guided by numerous policies whose impact is however not significant relative to the rural population because of a number of 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 also high.
iii) The financial institutions' charge on interest rate for administrative-cost is to high.

This has resulted into small-scale farmers finding it difficult to get loans from formal sources. In the face of these shortcomings from the formal financial sector, the informal sector has been a good alternative to most rural and some urban business people in need of credit. The forecast has been that farmers' productivity would grow annually in term of the total output or the annual income available to farm families. 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, observations have not confirmed these expectations based on forecast/real life occurrences, as farmers according to literatures and life experiences in Nigeria have continued to remain poor and have low productivity despite the availability 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 and the loan procurement conditions; profile the socio-economic characteristics of users of micro credit in Osun state and to identify the determinants of micro credit use by farmers in the study area.

MATERIAL AND METHODS

The Sample frame/target populations for this study are farmers that consistently apply for loans from micro credit-sources alongside the micro-credit sources. A 3 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 zone, Osogbo zone and Ilesa zone. The second was a proportionate selection of three local government areas to size from the 8 local government 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 180 respondents, however only 140 respondents were eventually used for this study.

TOOLS OF DATA ANALYSIS

Both descriptive statistics and econometric tools were used to analyze data obtained from this survey, this included means, relative frequencies and tables as well as a 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:

$$Y_i^* = X_i\beta + \varepsilon_i \quad (1)$$

$$Y_i = Y_i^*$$

$$Y_i^* = \alpha + \beta Z_1 + \beta Z_2 + \beta Z_3 + \beta Z_4 + \text{----------} + \beta Z_n + \varepsilon_1 \quad (2)$$

Y_i^* are the latent variables generated by the regression model

Hence: $Y_i^* = \beta A_0 + \varepsilon_i$ (3)

$Y_i = IA^*$ if $IA^* > I\,Ao$ (4)

$Y_i = 0$ if $Y_i^* < Y_i$ (5)

Where IA = amount of credit used in Naira, and

Y_i^* = the solution to utility maximization of credit use to set of constraints per Farmer,

Y_0 = the minimum amount of credit used per farmer, ε_i are assumed to be independently normally distributed i.e. $\varepsilon_i \sim N(0, \sigma^2)$ which signifies that $Y_i \sim N(X_i\beta, \sigma^2)$. This can further be explained that the observations Y_i must be censored or truncated and the true model is not linear. Based on the Amemiya (1984) and Adesina and Zinnah, (1993) the log likely hood can for the tobit regression can be expressed as:

LnT = Φf(yi) ΦF(0) (6)

$$\text{LnT} = \sum Lnf(yi) + \sum Lnf(0) \quad (7)$$

Y_i is the observed dependent variable, where 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),U_0 = the model error and is assumed to be independently distributed, i.e. N (0, σ^2).

RESULTS AND DISCUSSIONS

SOCIO-ECONOMIC CHARACTERISTICS OF FARMERS

The study found that gender is no barrier to participation in farming activities in the area, as both male (61.3%) and female (38.7%) participated in agricultural marketing, farming (food and cash crops), agricultural processing, selling of farm inputs, e.t.c as shown in tables 1-4. Some of the factors that influenced the eventual decisions of farmers in the study area to borrow from a particular microcredit sources includes delay in disbursements, availability of collateral, enterprise for which loan will be used, grace period allowed by credit sources, age of farmers, household size of respondents, educational status, benefit derivable from loan, loan conditions, repayment mode and the amount of loan that will eventually be collected.

Table 1: Gender of farmers

Grace Period in Months	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

Source: Field Survey 2013/2014.

Table 2: Enterprise for which loans were 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

Source: Field Survey 2013 / 2014.

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

Source: Field Survey 2013/ 2014.

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

Source: Field Survey 2013/ 2014.

The oldest farmer in the study area was in the ages range 41-60 (Table 5) years. This in effect shows that there is need for more farmers aged between 21 and 40 years to be given more incentive and encouragement to participate in farming activities, since age is an important characteristic for increasing productivity. Farmers with larger households (table 6) have a greater tendency to collect loans in order to improve the standard of living of their families.

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

Source: Field Survey 2013/2014.

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

Source: Field Survey 2013/2014.

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

Source: Field Survey 2013/2014.

This research was able to identify two major sources of microcredit used by farmers in the study area: the informal sources and the formal sources. The informal sources were: individual moneylenders, rotational savings associations, partnerships, and co-operatives. These sources were mostly patronized by the farmers sampled in this survey. It was found that the loan procurement conditions of the informal sources were more favourable than those of the formal sources. Some of the respondents however indicated that they collect loans from the formal sources but not as frequently as from the informal sources. Examples of formal sources were the Banks, co-operative, NGOs, State Ministry of Agriculture.

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, Profit & Plough back	20.0	29.0	5.0	20.8			4.0	33.0
Personal Contribution	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

Source: Field Survey 2013/2014.

The mean interest rate charged by credit providers in the study area is approximately 5 percent of each loan given and this seems affordable to the credit users who patronize 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.

TOBIT REGRESSION RESULTS

The male to female ratio was had a significant effect on loan acquisition by farmers 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 will warrant the use of credit. Gender in this wise does not mean that men in the study area were more involved in farming activities than the women; rather it showed there were more male headed farming families than females. Age a continuous variable had no significant effect on credit acquisition of farmers, with a coefficient value of 0.989, thus implied that credit use was not limited to any age group among the respondents sampled. Acquisition of credit knows no barrier age wise in the families or households surveyed. Household size was significant at 1percent as shown in Table 10. It had a negative sign indicating an inverse relationship with the credit use. This can be explained a smaller household would be easier to manage and their total 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 count on loan acquisition in the farming business. Furthermore, primary occupation in the study area varied with the prevalent situations, some farmers' primary occupation was livestock (especially selling of goats and rams at particular seasons). The result also showed that respondents were found to be involved in other activities apart from farming in consonance with the research of Salmann (2012). However farming experience which was significant at 5percent with a coefficient of 0.858 was a determining factor of loan acquisition, a farmer who had increased productivity as his main goal with limited cash resources will seek out all means of improving on himself, hence the reason why many farmers who had a good number of years in farming embraced credit as a means of alleviating some of their problems and bringing them closer to a point where they can be counted as better off. Sources of loan had no significance from the Tobit regression outcome, however, it could be seen that majority of the credit users opted for informal sources of credit. This many farmers found less stringent when compared to formal lending sources; thereby farmers opted for NGOs, money lenders, rotating savings associations as well as co-operatives, the coefficient 0.630 for loan sources was not significant at any level. The time duration before loans were paid back was another factor that was significant from

the Tobit regression (0.281) significant at 1percent, the shortest time period of waiting was between 0 – 3 months depending on the source from which the loan was gotten. 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 the fact that many of the respondents dealt with informal sources of credit who charged lower interest rates with less stringent loan conditions, thus an increase in the interest rate by the informal sources is okay and not as high when compared to Banks and finance houses (Boateng and Oduro, 2018). Conditions under which loans were given was 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 when 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 for increasing their productivity and income. Interest rate which was expected to have a negative relationship with credit acquisition was, however, discovered to be positively correlated based on the Tobit regression results. This is as a result of the fact that majority of the farmers patronize informal sources of credit and to them the loaning conditions and duration given by these sources is more favourable when compared to the formal sources. However, the amount of credit received from these sources is smaller when compared to that from the formal credit providers.

Table 9: Parameter Estimates for Tobit Regression Model.

Variable	Coefficients	t – value
Gender	- 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*

Source: Field Survey 2013/2014.

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

CONCLUSIONS

This study showed that farmers interacted with in the course of the course of this study wanted to increase their productive capacities and income but were incapacitated by lack of funds, high interest rate to stringent conditions on loans from formal financial institutions. Hence making credit available with favorable conditions would increase farmers' productivity tremendously; otherwise the involvement of farmers in agricultural activities would continue to reduce. It was also deduced that farmers derived various benefits from loan collected and if the loaning conditions were more favorable more farmers will demand for more. This research further discovered that the minimum amount of money that accrues to a farmers as income was in the range of ₦10, 000 – ₦20, 000 (not monthly depending on the planting season the farmer was operating) this quite small and limiting for farmers that wishes to increase production, plough back as well as provide for his/her needs

RECOMMENDATIONS

More attention should be paid to informal sources of credit by policy makers in agriculture their effect on rural farmers is significant. It was discovered that this group of people had the confidence of many of the farmers who prefer them to the formal financial institutions. There is 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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APPENDIX

Table 10: Socio-economic and Demographic Variables used in the Tobit Model.

Variables	Unit or Type	Description
Gender	Binary	1 = if gender is male 0 = otherwise
Age	Continuous	Age of household heads in years
Household size	Continuous	Number of individuals in each household
Educational Level	Binary	0 = No formal education 1 = Formal education
Primary Occupation	Binary	1 = Farming 0 = Otherwise(selling of farm inputs, Transporter)
Farming experience	Continuous	No of years in farming business
Source of Loan	Binary	1 = formal sources of loan 0 = Informal sources of loan
Loan Duration	Continuous	Time taken before loan is paid back
Interest rate	Continuous	Different interest rates charged by credit sources
Income	Continuous	Amount generated from activities involved in
Loan Condition	Binary	1 = Good 0 = otherwise

Source: Field Survey 2013/2014.