Credit Demand Amongst Farmers in Mukono District, Uganda

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Abstract

The role of credit in promoting economic activity cannot be underestimated. Nevertheless, credit extension to the agricultural sector in Uganda is dismal compared to other sectors. This study uses cross sectional data collected from 127 farmers in Mukono District, Uganda to shed some light on access to, and the characteristics of demand for credit among the farming communities. We employ the binary logit model estimation to analyse demand for credit. The empirical results suggest that the probability of a farmer demanding credit increases with proximity to credit facility, easier application procedures, customary land tenure system and membership to farmers' association. In contrast, the likelihood of credit demand decreases with increasing farm size. Policy options and recommendations including encouragement of forming farmers' associations, leveraging mobile money technologies to reduce distance, and streamlining application procedures could bolster agricultural credit demand in Uganda.

Keywords: *Credit demand; farmers; Mukono District; Uganda – East Africa*

JEL Classification Codes: *E 51, Q 140*

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1. INTRODUCTION

Credit is an important component of a firm and household's survival. It provides a smoother flow of money in times when there are constrictions of cash flows that would otherwise cause disruptions in production and consumption. Ray (1998) observes that credit is needed for fixed capital, working capital, and consumption expenditure. Bhattacharjee and Rajeev, (2010) note that 'access to credit on favourable terms and conditions plays an important role in the overall development of an economy and in poverty eradication'.

On account of the subsistence nature of Uganda's agriculture coupled with low inputs, credit extension to farmers would improve farm productivity thereby enhancing returns on investment. Nonetheless, the inadequate access to credit by farming households due to supply and demand side bottlenecks remains a major limiting factor to Uganda's agricultural productivity. As a result, official credit programmes have been used in an attempt to ensure that credit flows to the agricultural sector to boost productivity (Atieno, 1997). In India, channeling of credit to the agricultural sector dates back to the 1870s and culminated into the two tier cooperative credit structure consisting of short-term and long term arms (Mohan, 2004).

The Government of Uganda (GOU) has had various attempts in the past to remedy the bottlenecks in credit allocation to the agricultural sector. These attempts took the form of low interest rate credit schemes such as Rural Farmers Credit Scheme, Entandikwa – "Start-up Capital" Credit Scheme, Poverty Alleviation Programme, and Bonnabaggawale – "Prosperity for all" Credit Scheme (Kasirye, 2007; Mpuga, 2004; Matovu and Okumu, 2010). The performance of these schemes was varied. The timing of introducing the schemes, mechanism of delivery, and political patronage are cited as some of the causes for the varied performance (Kasirye, 2007). Despite these credit schemes, the supply of credit to the agricultural sector does not meet the demand (Owusu-Antwi, 2010) such that a large proportion of farmers in Uganda are left out (Finscope, 2010).

Studies that have dealt with the agricultural credit problem in Uganda have faced two major limitations namely, concentration on the supply side of the credit markets and paucity of reliable micro-level data to estimate credit demand. Furthermore, where data has been available such as the Uganda National Household Surveys (UNHS) and FINSCOPE surveys, it has been difficult to disaggregate credit demand data into the various purposes such as agricultural credit. Consequently, the credit demand studies in Uganda such as Kasirye (2007) and Mpuga (2008) have focused on the rural credit market in general. Conceptually, a number of areas have been covered namely, credit demand (Kasirye, 2007), credit source (Mpuga, 2008), credit rationing (Okurut et al., 2005), credit constraints (Zeller, 1994), loan repayment incentives (Nkurunziza, 2005), and defaults (Udry, 1994). Therefore, the objective of this study was to predict the odds of a farmer applying for credit, conditional upon information about personal characteristics of the farmer.

The paper is organized as follows. The methodology used to collect the data used for analysis is described in the next section. The estimated model is presented in section three. Descriptive and empirical results are discussed in section four, section five provides policy implications and recommendations, and section six contains concluding remarks.

2. METHODOLOGY

The study was based on a survey conducted between February and March 2013 in the six parishes of Katoogo, Bulika, Namawojjolo, Kasenge, Namubiru, and Mpoma in Nama Division, Mukono District. These parishes were selected because they have been specifically targeted by the agricultural extension officers for monitoring and evaluation of NAADS (National Agricultural Advisory Services) programmes. At the parish level, farmers interviewed were picked using simple random sampling with the parish records maintained by the agricultural extension officers as the sampling frame. Primary data was collected using questionnaires from 127 farmers.The data collected included socio-economic and demographic characteristics of households. Data were analysed using statistical techniques such as descriptive statistics and logistic regression with the aid of the R-statistical programme software.

3. MODELLING CREDIT DEMAND

Demand describes a consumer's desire, willingness, and ability to pay a price for a specific good or service (Whelan & Msefer, 1996). Credit demand has various definitions from scholars such as Doan et al., (2010), Diagne (1999), and Balogun and Yusuf (2011) amongst others. The most commonly used definition is "the probability that an individual answered yes to the question 'did you apply for credit in the last time period?' The farmers that applied for credit and never received were considered to be credit constrained and those that got unconstrained.There are various factors affecting credit demand.

3.1 VARIABLES USED IN THE MODEL

Studies that have modeled agricultural credit demand have utilized different variables. Nwaru et al., (2011) used education level, household size, farm income, interest amount, gross farm profit of previous year and farm size while Bokosi (2004) utilised formal education, per capita land owned, number of animals owned per household, household size and gender. Explanatory variables used in credit demand are underpinned by the Life Cycle Hypothesis, the Permanent Income Hypothesis, and Keynes' theory of consumption. The considerable amount of existing literature on credit demand concur that social, individual, institutional, and economic factors are key determinants of credit demand (Mpuga, 2008; Fichera, 2010; Kasirye, 2007; Ferede, 2012).The variables used in the model of this study and their definitions are presented in Table 1.

Table 1: Definition of explanatory variables for credit demand model in Uganda

Variable	Type	Description	Expected Sign
AGEFARM	Continuous	Age of farmer in years	±
FARMAGE	Continuous	Number of years the farm has been in existence	+
MEMFARASS	Categorical	Whether an individual belongs to a farmers' association (1 = Yes; 0 = No)	+
SEXFARM	Binary	Gender of household head (1 = Male; 2 = Female)	±
LANDTEN	Polychotomous	Land tenure system of the farmer (1 = Freehold; 2 = Communal; 3 = Rented)	±
SIZEFARLAN[a]	Categorical	The size of farm land (1 = Small; 2 = Large)	+
APPROC	Categorical	Perception of individual towards ease of application procedure (1 = Easy; 2 = Not easy)	+
INTRATE	Categorical	Perception of individual towards magnitude of interest rates (1 = Low; 2 = High)	-
COLLATERAL	Categorical	Whether loan provider requires collateral or not (1 = No; 2 = Yes)	-
DISTANCE	Categorical	Perception of individual towards the distance from credit provider / institution (1 = Near; 2 = Far)	-

a Size of farm land Less than 1 acre = small; 1 acre or more = Large

3.2 EMPIRICAL MODEL

3.2.1 DETERMINANTS OF CREDIT APPLICATION BY FARMERS

The primary aim of this study was to explain the effects of the explanatory variables on the response probability. A number of studies such as Berger et al., (2001) have identified the credit constraints by considering only the supply and not the demand side of credit access. In order to incorporate the demand side, farmers were asked whether they applied for credit in the previous 12 months. Based on existing literature, the farmers' demand for credit is affected by variables creating a difference in both the capital cost and the returns on capital (Bigsten et al., 2003). The returns on capital factors are not considered in our model due to the nature of available data i.e. farmers are not willing to declare their profits. The capital cost factors included in the model are those that affect the external financing costs like collateral requirements and variables that affect the transaction costs like distance to credit facility, as well as interest rates. In addition demographic characteristics such as age, farm size and membership of farmers' associations are included. The model can be expressed as shown in equation 3.1.

$$Y = \alpha + \beta_i X_j + u \qquad (3.1)$$

Where; X=Vector $\begin{pmatrix} X_1 \\ X_2 \\ X_3 \\ \vdots \\ X_{10} \end{pmatrix}$

Y=0 if the farmer did not apply for credit; Y=1 if the farmer applied for credit; α = the constant; β= the coefficient explaining the independent variable; X_1=Age of the farmer; X_2=Farm age; X_3 = Member Farmer Association; X_4 = Sex of Respondent; X_5= Land Tenure System; X_6 = Size of Farmland; X_7 = Application Procedure; X_8 = Interest rates; X_9 = Collateral requirement; X_{10}= Distance

3.2. FACTORS THAT INFLUENCE THE FARMER'S ABILITY TO ACCESS CREDIT GIVEN THAT THEY APPLIED FOR THE CREDIT

In order to understand the factors that influence the farmer's ability to access credit given that they applied for credit, we used a two-step Heckman / Heckit model. The Heckman model offers a means of correcting for non-randomly selected samples. In this case, there are farmers who did not apply for credit, so using only the proportion that applied (48.8 percent of the total sample) would result into selection bias. To determine whether the farmer was denied credit (Y=1) or not denied credit (Y=0), a binary logit model was estimated. Both probit and logit analyses are well-established approaches in the credit demand studies (Mpuga, 2008; Kasirye, 2007). The choice of whether to use a probit or logit model is a matter of computational convenience (Greene, 1997; Wooldridge, 2009; Gujarati, 2004). Logistic regression is used since the dependent variable is a dichotomous dummy variable and maximum likelihood estimation is applied after transforming the dependent into a logit variable (Garson, 2008). It estimates the odds of a certain event occurring. The dependent variable is a logit, which is the natural log of the odds, that is,

$$\ln \frac{P}{(1-P)} = a + bX \quad \text{..... (3.2)}$$

$$P = \frac{e^{a+bX}}{1+e^{a+bX}} \quad \text{..... (3.3)}$$

where P is the probability of the event occurring, X are the independent variables, e is the base of the natural logarithm and a and b are the parameters of the model. The empirical form of the model used in the study is as follows:

$$PrY = 1 / (1 + e^{-(a+bX)}) \quad \text{..... (3.4)}$$

where Y is the logit for the dependent variable. The logistic prediction equation for the present study was

$$Y = \text{In (odds (event))} = \text{In (prob (event)/prob (non-event))}$$
$$= \text{In (prob (event) / [1 – prob (event)])}$$
$$= b_o + b_1X_1 + b_2X_2 + ... + b_nX_n, \quad \text{..... (3.5)}$$

where b_o is the constant with $X_{1 \ldots} X_n$ independent variables affecting the probability of credit demand and $b_{1 \ldots} b_n$ were the coefficients estimated.

4.0 RESULTS AND DISCUSSION

4.1 DESCRIPTIVE ANALYSIS

4.1.1 GENDER OF HOUSEHOLD HEAD AND CREDIT DEMAND

A total of 127 farmers were interviewed of which 53 percent and 47 percent were female and male, respectively. Sixty two farmers (48.8 percent) applied for credit and 30 farmers (23.6 percent) accessed credit as shown in Table 2.

Table 2: Gender of Household Head and credit demand

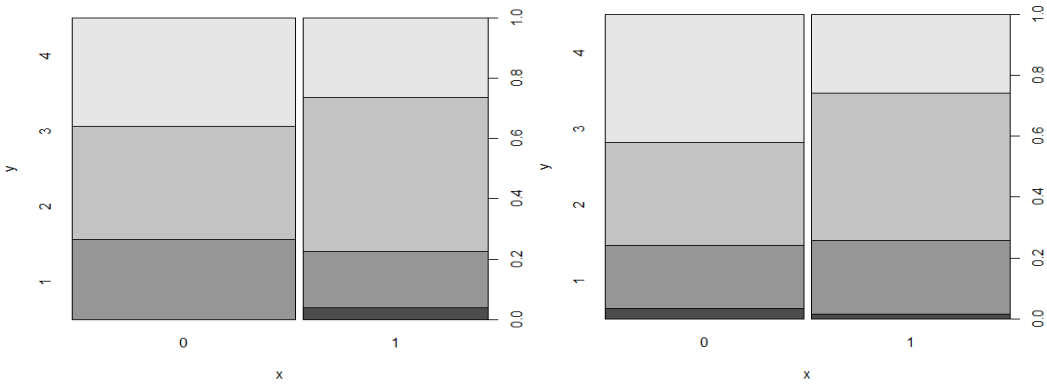
Gender of HH head	Number	Applied for Credit		Accessed Credit	
		YES	NO	YES	NO
Male	67 (52.8%)	28 (22.0%)	39 (30.7%)	11 (8.7%)	17 (13.4%)
Female	60 (47.2%)	34 (26.8%)	26 (20.5%)	19 (15.0%)	15 (11.8%)
Total	127 (100%)	62(48.8%)	65 (51.2%)	30 (23.6%)	32 (25.2%)

Source: Primary data; the figures in parentheses are percentages relative to the entire sample

4.1.2 AGE OF FARMERS AND CREDIT DEMAND

Farmers considered their age a very personal matter and as a result, the questionnaire used class intervals to capture the age groups. Four age groups were categorized namely, below 25 years, 26-35 years, 36-50 years, and above 50 years whose proportion of the total sample were 2.36 percent, 22.83 percent, 41.73 percent, and 33.07 percent, respectively. As shown in Figure 1, the age group 36-50 years had the highest proportion of farmers who applied for credit as well as those who were denied access to credit.

Figure 1: Graphs showing the relationship between the age categories with credit constraint (Left hand panel) and application (Right hand panel)



Source: Primary data; on the y axis 1, 2, 3, and 4 represent age cohorts below 25; 26-35; 36-50; & above 50, respectively

The farmers in the above 50 years category are able to access credit when they apply than the rest, suggesting that credit constraint reduces with age. However, it can be noted that as the farmers grow much older they apply less; this could imply that they have accumulated enough funds from their past years of work and therefore don't have to incur debts for their businesses.

4.1.3 FARM SIZE AND CREDIT DEMAND

Farmers with less than 1 acre of land were considered small while those with more than 1 acre of land were categorized as large. The proportion of farmers with small sized farms was 30.7 percent while 69.3 percent had large farms. The farmers with large farm sizes were more inclined to borrow partly on account of their large number in the sample. Table 3 shows the reasons advanced by farmers for staying out of the credit market in the previous one year.

Table 3: Farm Size and Reasons why farmers did not borrow

Farm Size	Inadequate Collateral	Don't want to incur debt	High Interest Rate	Don't need a loan	Application Procedure too difficult
Small	3	4	0	1	5
Large	3	9	7	3	22
Total	6	13	7	4	27

Source: Primary data

Of the 62 farmers who applied for credit, 27 farmers (43.55 percent) felt the application procedure was too difficult. In addition, seven farmers (11.29 percent) were of the view that interest rates were high.

Table 4: Farm Size and credit demand

Farm Size	Number	Applied for Credit		Accessed Credit	
		YES	NO	YES	NO
Small	39 (30.7%)	23 (18.1%)	16 (13.0%)	10 (7.9%)	13 (10.2%)
Large	88 (69.3%)	39 (30.7%)	49 (38.6%)	20 (15.7%)	19 (15.0%)
Total	127 (100%)	62(48.8%)	65 (51.2%)	30 (23.6%)	32 (25.2%)

Source: Primary data; the figures in parentheses are percentages relative to the entire sample

Nonetheless, none of the farmers with a small farm thought interest rates were high. The latter observation suggests that borrowers in microcredit markets have price inelastic demand where they are insensitive to high interest rates (Salazar et al., 2011). Table 4 shows the relationship between farm size and credit application / access.

4.1.4 AGRICULTURAL ACTIVITY AND CREDIT DEMAND

The proportions of farmers involved in agricultural activities are shown in Table 5. Most of the farmers were involved in crop husbandry. This could mainly be explained by their target market. Since 98 percent of the farmers produce for the domestic market, production of food crops would be most appropriate given the availability of the market. Food crop production has the highest number of farmers who applied / accessed credit.

Table 5: Agricultural Activity and credit demand

Agricultural Activity	Number	Applied for Credit		Accessed Credit	
		YES	NO	YES	NO
Cash Crops	16 (12.6%)	7 (5.5%)	9 (7.1%)	4 (3.1%)	3 (2.4%)
Food Crops	94 (74.0%)	43 (33.9%)	51 (40.2%)	19 (15.0%)	24 (18.9%)
Livestock	15 (11.8%)	11 (8.7%)	4 (3.1%)	7 (5.5%)	4 (3.1%)
Forestry	2 (1.6%)	1 (0.8%)	1 (0.8%)	0 (0.0%)	1 (0.8%)
Total	127 (100%)	62(48.8%)	65 (51.2%)	30 (23.6%)	32 (25.2%)

Source: Primary data; the figures in parentheses are percentages relative to the entire sample

4.1.5 LAND OWNERSHIP AND CREDIT DEMAND

The land tenure systems observed in the sample were free hold, customary, leasehold and rented with the respective proportion of farmers for each type being 68.5 percent, 17.3 percent, 3.1 percent, and 1.6 percent. As shown in Table 6, 83.5 percent of the farmers possessed documents that indicated the type of land tenure. Of these only 47 farmers (37.0 percent) applied for credit and only 13 farmers (10.2 percent) accessed credit.

Table 6: Land ownership and credit demand

Land tenure	Number	Possess ownership documents		Applied for Credit		Accessed Credit	
		YES	NO	YES	NO	YES	NO
Freehold	87 (68.5%)	83 (65.4%)	4 (3.1%)	47 (37.0%)	40 (31.5%)	13 (10.2%)	34 (26.8%)
Customary	22 (17.3%)	17 (13.4%)	5 (3.9%)	13 (10.2%)	9 (7.1%)	9 (7.1%)	4 (3.1%)
Leasehold	4 (3.1%)	3 (2.4%)	1 (0.8%)	0 (0.0%)	4 (3.1%)	0 (0.0%)	0 (0.0%)
Rented	14(1.6%)	3 (2.4%)	11(8.7%)	2 (1.6%)	12 (9.4%)	1 (0.8%)	1 (0.8%)
Total	127 (100%)	106 (83.5%)	21(16.5%)	62 (48.8%)	65 (51.2%)	23 (18.1%)	39 (30.7%)

Source: Primary data; the figures in parentheses are percentages relative to the entire sample

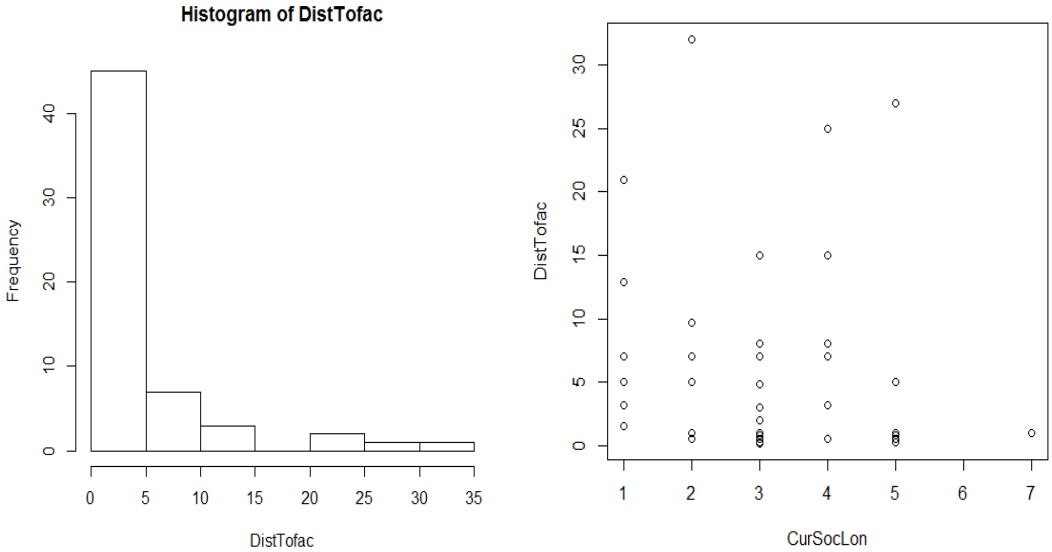
4.1.6 FARMER ASSOCIATIONS AND CREDIT DEMAND

Sixty six (66) percent of the farmers reported to belong to farmer associations, while the other 34 percent did not belong to any farmer association. Out of all the members that belong to farmer association 56 percent applied for credit while the other 44 of the farmers didn't borrow. All the members in the associations that applied for credit were able to access credit. Farmers' associations provided various services to the members namely, marketing, input supply, credit facilities, standards compliance and training opportunities.

4.1.7 DISTANCE TO CREDIT FACILITY AND CREDIT DEMAND

The data shows that most of the farmers live within 0.5 kilometers from the credit facilities. The details of all the credit sources and their distances are captured in Figure 2.

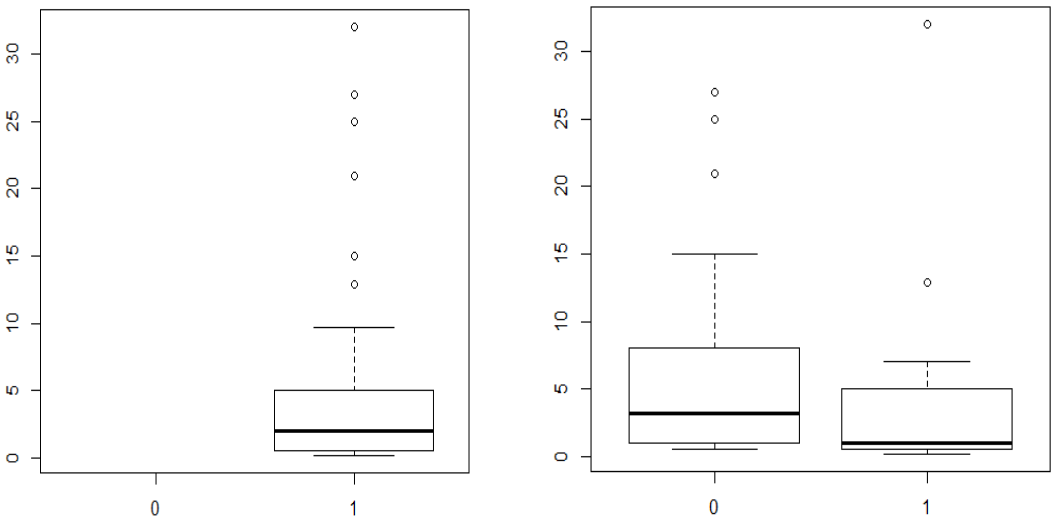
Figure 2: Histogram and graph showing the relationship between distance to credit facility (left hand panel) and current source of loan (right hand panel)



Source: Author's illustration based on primary data

From Figure 3 (left hand panel) it is evident that distance to the credit facility has impact on the farmers' decision to borrow, that is, the nearer the credit facility, the higher the farmer's willingness to borrow. There are more people borrowing if the credit facility is less than 5 kilometers compared to other distance ranges. However closeness to credit source does not greatly influence borrowers' ability to get credit as depicted in Figure 3 (right hand panel). The people in further places are as much likely to access credit as the people close to the credit facilities.

Figure 3: Distance and the decision to borrow (left hand panel) and credit constraint and the distance to credit facility (right hand panel)

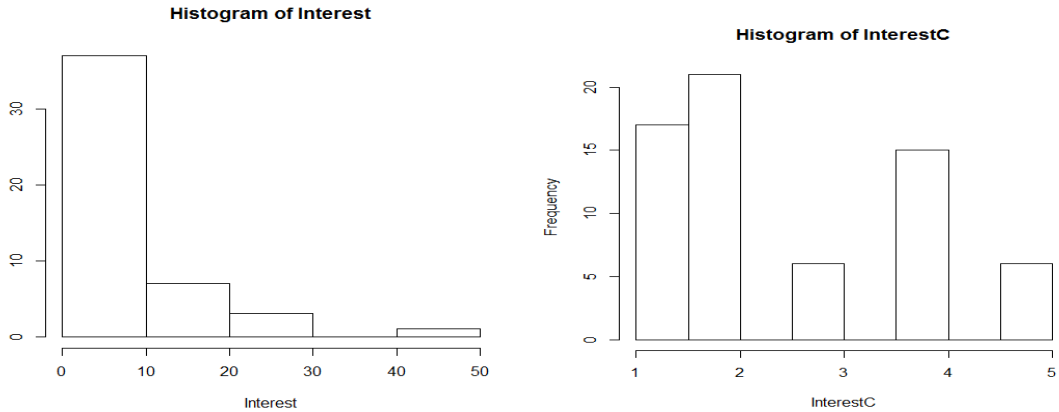


Source: Author's illustration based on primary data

4.1.8 INTEREST RATES AND CREDIT DEMAND

The interest rates charged for the loans vary across financial institutions.

Figure 4: Histograms showing the interest charged on the credit (left hand panel) and the interest rate categories (right hand panel)



Source: Author's illustration based on primary data

The interest rates range from 0 percent to as high as 50 percent as depicted in the histogram (Figure 4). The histogram indicates the classes (1) Didn't know, (2) zero, (3)1-9, (4)10-19, (5) 20 and above. A substantial number of farmers were even not aware at how much they had acquired loans. This implicitly indicates that the respondents are not bothered by the interest rates at which they acquire credit.

4.1.9 COLLATERAL AND CREDIT DEMAND

Table 7 shows that the sources of credit were: government aided schemes (3), micro finance institutions (2), relative and friends (5), private money lenders (4), commercial banks (1) and farmer association (7). The biggest number of respondents (39 percent) borrowed from government aided schemes. Other credit sources had the following proportions: micro finance institutions (19 percent); relatives and friends (18 percent); money lenders (13 percent); commercial banks (10 percent); and 2 percent from farmer associations.

Table 7: Land ownership and Credit Demand

Source of Credit	Offered Collateral		No Collateral offered	
	Small Farm size	Large Farm size	Small Farm size	Large Farm size
Commercial Bank	0	6	0	0
Microfinance Institution	3	7	1	1
Government aided schemes	2	5	8	8
Private money lenders	0	1	3	4
Relatives and Friends	0	0	4	7
Farmer Groups	0	0	1	0

Source: Primary data

The use of collateral is mostly reflected in the formal and semi-formal sector, whereas almost all loans within the informal sector were obtained without collateral. Although we also see a high number of uncollateralized loans in the semi-formal sector, it is mainly because the government credit schemes that offer credit to farmers are subsidized and some of them do not require any form of security to acquire funds for agricultural purposes. A sum of 24 farmers offered collateral for the loans they acquired while 36 of the members acquired credit without offering any form of security. The assets used as collateral by those who applied for loans included land, personal belongings and other items; with the respective percentages i.e. 41 percent, 45 percent and 14 percent. Providing guarantors is another form of security required by most lending institutions. In the sample we find that 62 percent of the farmers who borrowed had guarantors while 38 percent did not. The relationships between the respondents and the guarantors included trade/business partners, family members and friends.

Table 8 shows the applications received by the lending institutions, successful applicants as well as those that failed.

Table 8: Land ownership and Credit Demand

Source of Credit	Applied	Accessed	Denied
Commercial Bank	6	4	2
Microfinance Institution	12	4	8
Government aided schemes	24	13	11
Private money lenders	8	5	3
Relatives and Friends	11	3	8
Farmer Groups	1	1	0
	62	30	32

Source: Primary data

The farmers acquired loans for the following reasons: improve productivity (44 percent), add to capacity (26 percent), produce new output and consumption (11percent), replace old equipment and produce new output (4 percent), and repayment of existing loan (2 percent). Cognisant, of the fact that education level is a major determinant of agricultural credit demand such as Nwaru et al., (2011), pretesting the questionnaire indicated that most farmers were not very forthcoming regarding their education. The hesitation by farmers to respond to this question prompted the researchers to eliminate the variable.

4.2 THE CREDIT DEMAND MODEL OF FARMERS IN MUKONO DISTRICT

4.2.1 FACTORS THAT INFLUENCE WHETHER A FARMER APPLIED FOR CREDIT

As shown in Table 9, the factors that were significant were: distance to credit facilities; application procedures; farm size; land tenure system; and being a member of farmer associations. In contrast, age, farming experience, gender, land tenure system leasehold/rented land tenure system, interest rates and collateral requirement were not statistically significant at the $p = 0.01$, $p = 0.05$ and $p = 0.1$ significance levels.

Table 9: Binomial logistic regression showing credit application factors amongst farmers in Mukono District

Coefficients:	Estimate	Std. Error	z value	ME	Pr(>|z|)	Signif.
(Intercept)	-2.877	1.460	-1.971	-0.718	0.049	*
Age	-0.030	0.019	-1.545	-0.007	0.122	
Farmage	0.016	0.026	0.628	0.004	0.530	
MeFarAss	1.053	0.573	1.837	0.254	0.066	.
SexResO	0.599	0.503	1.191	0.150	0.234	
as.factor(Landten)2	1.780	0.751	2.370	0.395	0.018	*
as.factor(Landten)3	0.019	0.748	0.026	0.005	0.980	
as.factor(Sizefarlan)2	-1.040	0.524	-1.984	-0.254	0.047	*
AppProc	1.239	0.502	2.469	0.299	0.014	*
InterestRate	0.235	0.327	0.720	0.059	0.472	
Collateral	0.557	0.516	1.079	0.138	0.281	
Distance	2.084	0.545	3.826	0.520	0.000	***
Signif. Codes: '**' 0.01 '*' 0.05 '.' 0.1						
No. Obs			127			
Log likelihood			-56.617 (df=12)			
Likelihood ratio statistic			58.666 (df=11)			
pchisq(58.6661,12,lower.tail=F)[1]			3.95E-08			
McFadden pseudo R squared			0.341			
Bptest			BP = 9.007, df = 11, p-value = 0.621			

Source: R statistical software output

The fitted probabilities of credit demand increases per unit increase in these explanatory variables namely, member farmer association, customary land tenure system , easier application procedure, low interest rate and being nearer to credit facilities. Being nearer to credit facility is significant at all levels. Both easier application procedure and customary land tenure system are significant at 5 percent level. Membership in farmer association is only significant at 10 percent level.

4.2.2 FACTORS THAT INFLUENCE WHETHER A FARMER ACCESSED CREDIT FOLLOWING APPLICATION

Table 10: Showing two step estimation results for credit access factors amongst farmers in Mukono District

Probit selection equation:	**Estimate**	**Std. Error**	**t value**	**Pr(>|t|)**	**Signifi.**
(Intercept)	-1.652	0.837	-1.973	0.051	.
Age	-0.019	0.011	-1.671	0.098	.
Farmage	0.010	0.015	0.643	0.521	
MeFarAss	0.638	0.327	1.950	0.054	.
SexResO	0.341	0.288	1.186	0.239	
as.factor(Landten)2	0.905	0.416	2.174	0.032	*
as.factor(Landten)3	0.006	0.443	0.013	0.990	
as.factor(Sizefarlan)2	-0.624	0.301	-2.072	0.041	*
AppProc	0.708	0.287	2.465	0.015	*
InterestRate	0.157	0.192	0.819	0.415	
Collateral	0.408	0.307	1.327	0.188	
Distance	1.194	0.303	3.944	0.000	***
Outcome equation:	**Estimate**	**Std. Error**	**t value**	**Pr(>|t|)**	**Signifi.**
(Intercept)	0.783	0.465	1.685	0.095	.
Age	0.015	0.006	2.484	0.015	*
Farmage	-0.007	0.007	-1.117	0.267	
MeFarAss	-0.339	0.174	-1.950	0.054	.
SexResO	-0.154	0.131	-1.175	0.243	
as.factor(Landten)2	-0.232	0.172	-1.348	0.181	
as.factor(Landten)3	-0.030	0.198	-0.153	0.879	
as.factor(Sizefarlan)2	-0.082	0.144	-0.567	0.572	
AppProc	-0.195	0.148	-1.316	0.191	
InterestRate	-0.035	0.087	-0.405	0.686	
Collateral	0.208	0.156	1.334	0.185	

Signif. codes: '**' 0.01 '*' 0.05 '.' 0.1

Multiple R-Squared:0.2799, Adjusted R-Squared:0.1114

121 observations (62 censored and 59 observed)

Source: R statistical software output

Considering the outcome equation, age of the farmers and being a member of farmer associations are the only significant variables. Low Interest rates are not significant as indicated in Table 10. The fitted probability of being credit constrained increases per unit increase in age. Age is significant at 5 percent level. While fitted probabilities of being credit constrained decreases per unit increase in obtaining membership in farmer associations and low interest rates. Being a member of farmer association is only significant at 10 percent level whereas low interest rate is insignificant at all levels.

Membership to farmer association was significant and positively influenced the probability of a farmer demanding for credit. The positive effect of membership to a farmer association could be attributed to the services provided by the association in terms of financial management training and the social capital such membership confers. The aspect of training provides information and mentorship about savings and credit as observed in the work of Huppi and Feder (1990) who studied cooperatives and group lending in developing countries. In addition, membership to a farmer's association provides social capital which is critical in small scale credit access as found out by Darie (2012) who studied farmers in Masaka, Uganda.

The regression results provide evidence that customary land system is an important factor in influencing farmer's demand for credit. This is because people who have lived with the customary land tenure for a long time, clearly understand how the system operates. This result is in line with Deininger (2003) who suggests that farmers who have secure and long-term land rights are likely to invest a lot of their effort to make long term investments leading to economic growth. The significance of the relationship between application for credit and customary land tenure suggests that lenders are willing to accept such land as collateral. The acceptance of such land as collateral is probably motivated by the fact that it is communally owned. The community that owns the land is likely to serve the role of peer monitoring to the member who staked the land as collateral. From the peer monitoring hypothesis by Hoff and Stiglitz (1990), this should reduce monitoring costs on the lender's part and minimize default either strategic or unintended. The capacity to access credit using customary land could explain the observation by Mugambwa (2007) that it is possible to achieve economic development under this land tenure system.

The easing of application procedures has a significant impact on credit demand. The study found that easing the application procedures by one unit increases the marginal contribution to the probability to apply for credit by 29.9 percent compared to having complex procedures. The findings of this study corroborate the findings of Namasaka (2007) whose findings strongly suggest that regulatory application frameworks and credit access are strongly related. The probability of applying for loans decreases per unit increase in large farm size. The negative relationship could be attributed to the fact that large farms have sufficient resources for their needs. In addition, the persistent credit rationing when loans are being approved could be discouraging to the large farms. The discouragement could arise if the final loan amount approved is below the value required. The findings of the study are in agreement with Kumar and Francisco (2007) whose findings show that size strongly affects credit demand. Kumar and Francisco (2007) postulate that size effects on credit demand are more evident for longer term maturities.

Distance from financial institution had a positive effect on the probability of applying for credit. This could be on account of lower transaction costs for going to the financial institution for the borrower as well as the lender to monitor the borrower. In addition, this deals with the challenge of information asymmetry (Hoff and Stiglitz, 1990) common in developing country credit markets.

There is a positive relationship between interest rates and loan application. Lowering interest rates by one unit would increase the marginal contribution to the probability to apply for credit by 5.9 percent. This finding is in agreement with Keynes (1936) who suggests that investment is partly induced by interest rates and investment demand. In this study however, the observed

relationship was not significant. In other words, interest rates are not a limiting factor in credit constraint. It is not unusual to find a farmer who accessed credit without necessarily knowing the interest rate. This is in line with the findings of Karlan and Zinman (2008) who postulated that loan amounts are more critical in the case of developing countries than the rate of interest.

5. POLICY IMPLICATIONS AND RECOMMENDATIONS

This study showed that socio-economic and demographic characteristics of households are important determinants of credit demand. Some policy issues could be drawn from these results when programmes for improving credit access by small scale entrepreneurs and / or farmers are designed.

The positive correlation of membership to farmer association with credit demand is crucial regarding the need to encourage farmers to join such organizations. Beyond providing social capital for use when applying for credit, they can be used for technological transfer awareness, quality control for produce, and mutual insurance (Ray, 1998). Indeed, they provide more organic groupings that can be utilized by governments interested in influencing rural finance rather than adhoc set-ups that normally arise whenever a government rural finance package is announced.

Land is the most important asset to a peasant farmer. Nevertheless, the mixed mode tenure system in Uganda implies that the farmer rarely has full control of the ownership except in leasehold and freehold tenure systems. Consequently, credit providers may be wary of extending credit to individuals who own only user rights under the mailoland tenure system. However, capacity to access customary land titles and pledge it as security points to the possibility that the use of the title as collateral has been sanctioned by the group. Since the group would not want to lose their land, they serve as peer monitors to the one borrows based on the customary land title. The implication is that in its effort to modernize agriculture, government can still encourage use of customary land as a viable alternative to individualized mailoland, leasehold and freehold tenure systems.

The direct relationship between the ease of application procedures and credit demand is indicative of the need for financial services providers to reduce the bureaucratic nature of the procedure of accessing loans. The co-existence of formal and informal providers in developing countries' credit markets is partly explained by the bureaucratic procedures prevalent in formal financial services providers (Daniel, 2010). As a way of increasing access to formal financial services and products, streamlining these procedures with a view of leaving only the necessary minimum would go a long way in promoting credit demand.

The inverse relationship between credit demand and farm size suggests that large farmers are unlikely to go through with the loan application if credit rationing is likely. The endowments of such large land owners imply that they are more sensitive to credit rationing and interest rate changes. Hence, financial services providers ought to design products that take such customers into perspective given that they possess the necessary collateral to guarantee their loans.

Distance to financial institution from farmer's dwelling having a positive effect on credit demand suggests that credit providers ought to establish service points closer to the clientele.

However, establishing a service point is a function of many factors including potential clientele and infrastructural capacities of the region. Given that the latter factor is a major hindrance in most developing countries, leveraging technologies like mobile money could be a potential solution to deal with this challenge.

Insensitivity to interest rate changes by farmers is largely a result of the fact that credit is scarce in Uganda. On account of the low numbers of banked people and poor saving culture, the deposits available to financial services providers to lend clients are low. This coupled with a relatively high fiscal deficit of the government implies that farmers who manage to get access to credit are relatively insensitive to interest rate changes. The implication is that there is unfulfilled appetite for credit which both private and public stakeholders ought to address.

6. CONCLUSIONS

The need to modernize agriculture through mechanization and agro-processing form the backbone to Uganda's development strategy (Poverty Eradication Action Plan (PEAP). Nonetheless, mechanization and agro-processing cannot take off without sufficient credit to fund these activities. Hence there is a need to boost credit access through encouraging credit demand. Factors identified as promoting credit demand include proximity to credit facility, application procedures, farm size, land tenure system, and membership to farmers' association. Mechanisms of leveraging these factors to enhance credit demand have been highlighted in the policy options.

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