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ACCESS TO FINANCIAL CREDIT FACILITIES BY FARMING HOUSEHOLDS IN UGANDA

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Abstract

This study set out to examine the determinants of credit access among farming households in Uganda. The study using data extracted from the FINSCOPE Uganda survey data 2013. Descriptive results revealed that access to credit is still very low particularly formal credit access in Uganda. Econometrics results on determinants of credit access based on multinomial logit model revealed that financial literacy, years of education, ownership of land title, location, perception about lending behavior of the bank, distance to the nearest bank and income level are important factors influencing the demand for formal credit. Gender, age and income level were also found to have significant influence on probability of using semi-formal services and while financial literacy, gender, age and income were found to have significant influence on demand for informal credit. These results are pertinent if we want to include over 70% of the farming households who are excluded from credit access and over 90% who are excluded from formal credit services. Since the majority farmers who do not access credit reside in rural areas, the study recommends that credit policies and supportive interventions that target farmers need to be emphasized. For example, policy support interventions aimed at improving credit access as well as interventions that address the constraints and limitations to formal education and extension services should be supported to increase farming households' access to formal credit.

Keywords: financial credit, farming households, farmers' credit, agricultural credit, Uganda

INTRODUCTION

In the recent years, Uganda has been one of fastest growing economy in the Africa. The impressive GDP growth performance has contributed to a significant reduction in poverty levels. For instance, the percentage of the population living below the poverty line declined from 56 per cent in 1992/93 to 44 per cent in 1997/98 and from 31 per cent in 2005/06 to 19.7 percent in 2013. However, in spite of this commendable economic performance, the country continues to face some challenges which have undermined achieving much faster economic growth and socio-economic transformation (NDP, 2010). For example, recent poverty estimates from Uganda National Household Survey 2016/17 showed that poverty levels in the country have increased from 19.7% to 27%. This meant that the number of poor people in Uganda increased from 6.6 million to 10 million people. The report argues that the poverty levels should be blamed on the poor performance of the agriculture sector that supports 80% of the population. Indeed, evidence for many years has shown that the country has not achieved significant productivity growth in agriculture sector) that employs the majority and a source of livelihood for over three quarters of the population and thus we have not witnessed a sufficient release of excess labour from the agricultural sector.

There is no doubt that despite the importance of agriculture in the economy, the sector‘s performance in recent years in terms of production and productivity, food and nutrition security has not been satisfactory partly due to limited access to agricultural finance. For instance evidence indicates that farmers with better access to finance perform and tend to sell their produce to market (Ssewanyana&Bategeka, 2007). In attempt to expand the country‘s financial system and credit, numerous reforms and programs have been promoted since the early 1990s. These included among others the *Entandikwa*scheme (1996), the medium term competitive and Investment strategy (CICS), Rural financial services programme of 2005-2008, Prosperity for all (PSA) of 2008, the National Agricultural AdvisoryServices (NAADS) of 2001, the Microfinance Support Centre (MSCL) of 2005 and Agricultural Credit Facility (ACF) of 2009 (Munyambonera,

Nampewo, Adong and Mayanja , 2012). The intention of these reforms and programs was to strengthen and broaden the financial system but also enhance competition in the financial system. Therefore, although the financial system soundness and efficiency has greatly improved, the degree of diversification of the financial systems and the level of gross domestic savings stands at 9.57 percent of GDP (2013/14), which is very low compared to 23.6 percent, the average for low income countries (Republic of Uganda, 2015).

Nonetheless, amidst numerous initiatives and programs to expand finance and credit to population, access to formal financial services remains low and remains a huge challenge facing policy makers. For instance, it is noted that access to agricultural credit by the rural community, where the majority, over 80 percent are smallholder farmers, has remained very low and stagnating in the range of 10-20 percent in the last ten years (Kasirye, 2007). There are many economically active poor people who have not accessed financial services. The share of commercial banks' loans to agriculture has been very low compared to manufacturing, trade, and other services sectors, hampering expansion and technology adoption. In 2010, agriculture sector received only 10% of lending from commercial institutions (Lukwago, 2010). Oluka (2007) noted that only 38 percent of Ugandans save, and borrow money from financial institutions. These statistics suggest that the majority of agriculture farmers and the general population are not actively engaged in the formal financial sector and if this trend continues the growth prospects and poverty reduction of the majority of population living in rural areas will be compromised. Therefore, it is essential to expand access to formal financial services so as to improve agricultural productivity and poverty reduction. The key question to policy makers and researchers is why the growth in financial sector has not translated into people's access and demand for financial services in Uganda particularly for agricultural households.

The empirical evidence on determinants of credit access by farming households vary because the credit determinants are country specific (Lensink*et al.* 2007). Therefore, whereas a number of empirical studies have investigated the determinants of households'

demand and access to financial services elsewhere and in Uganda (see Kasirye, 2007; Mpuga, 2004;Okurut*et a.*, 2004; Heikkilä, Kalmi& Olli-PekkaRuuskanen, 2009), the literature is still unclear about the determinants of access to financial credit by Agricultural households. This is mainly because different studies including those in Uganda focus on different factors determining credit access in the general population and few focuses on agriculture households yet evidence shows that credit to agriculture sector has unique characteristics. For instance, the recent available evidence on access to credit in Uganda in have generalize results on determinants of access to credit with no specific reference to farming households. This implies that in Uganda like many other African countries, there are few empirical studies on access to financial credit focusing on farming households.

Nonetheless, Uganda's National Development Plan (NDP) and theMAAIF Development and Investment Strategy (DSIP) emphasize increased access to agricultural financing as afundamental input to the sector transformation. This maynot be achieved if the factors that affect credit accessibility by farming households are notwell understood. Specifically, the aim of this paper was to examine which factors determine access to financial credit of farming households. The key important contribution of this study is that whereas studies in Uganda have tried to examine the factors influencing the demand for credit (Kasirye, 2007, Mpuga, 2004; Okurut*et a.l*, 2004; Heikkilä, Kalmi& Olli-PekkaRuuskanen, 2009; Munyambonera*et al.,* 2012), these studies have not captured the key policy variables particularly level of financial literacy and lending behavior of financial institutions that posit to drive credit demand in Uganda.

LITERATURE REVIEW

Several studies in developing countries on financial credit access by household farmers have considered a broad range of factors that affect financial credit access. The demand for financial credit is influenced by both demand and supply factors (Kasirye, 2007; Hananu*et al*., 2015). On the supply side of the credit market, factors such as the level of interest rates charged on loans is considered to be an important factor influencing credit access. This is mainly because interest rate is considered to main determining factor (price) that influence demand for credit. Indeed, most the studies reviewed on agricultural credit in developing countries concur to the fact that higher interest rates are the major barriers to credit demand particularly in rural areas (Kasirye, 2007; Hananu*et al.,* 2015, Mpuga, 2008; Simon, 2013).

Factors related to borrower's characteristics, the loan terms and conditions imposed by lenders also limit formal credit demand (Zeller, 1994). Schmidt and Kropp (1987) revealed that the type of financial institution and its policy will often determine the access. Where credit duration, terms of payment, required security and the provisions of supplementary services do not fit the needs of the target group, potential borrowers will not apply for credit even where it exists and when they do, they will be denied access.

Nonetheless, numerous studies have found out that numerous socio-economic and demographic household factors such as income, age, age-squared, gender and education level of the household head, marital status family size, land ownership and property rights, primary economic activity of the household head and location, to have significant influenceon credit demand from different strands (evidence Pitt andKhandker, 2002; Jabbar et al, 2002; Barslund and Tarp, 2008; Okurut et al., 2004; Hananu*et al.,* 2015; Mpuga, 2004; Omboi and Wangai, 2011; Tang et al, 2010; Wachira&Kihiu, 2012; and Dzadze*et al.,* 2012). For example, Barslund and Tarp (2008) revealed that countervailing impacts of education, household size, assets, credit history, and secure land rights play a major role on the demand for formal and informal loans. These variables, however with

exception for assets had a statistically significant effect formal or informal credit demand whereas credit institutions have a positive significant impact on the demand for both formal and informal loans.

However, the demand for formal loans was largely determined by factors such as land holdings, and hence geared towards production purposes and asset management, while informal credit demand is negatively associated with factors such as age and education and positively associated with a bad credit history and the number of household size, indicating a household's tendency to use informal loans for consumption smoothing rather than investment (Bendig*et al.,* 2009 and Yehuala, 2008). In comparison with Pal (2002) evidence shows that more land holdings and less labor income are significantly increase the probability of formal loan use. Okurut*et al.,* (2004) revealed that age is an important variable influencing access of households' heads to credit. However, as noted by Yehuala (2008),olderindividuals,due to life and business experiences have much better association with cooperatives and other formal credit institutions, and it is hypothesized that elderly may have more access to formal credit facilities.

The role of saving behaviour of the household has also been considered to be an important factor. For instance, Kochar (1997) revealed that household savings and the value of their liquid assets are key determinants for household's need for financial credit. The more household's savings and possession of liquid assets, the higher the probability of accessing credit. Moreover in developing countries asymmetric information, high risks, lack of collateral, lender-borrower distance, small and frequent credit transactions of rural households make real costs of borrowing vary among different sources of credit (Bigsten *et al.,*2003; Etonihu, 2013; and Kosgey,2013).

Nonetheless, Formal financial institutions such as rural banks, savings and credit cooperatives, and special credit programs supported by the government and nongovernmental organizations always favor to give loans to households with diversified asset portfolios and therefore more diversified incomes in MalawiDiagne and Zeller

(2001). Studies point out that several existing informal financial systems which include savings and credit cooperation (SACCOs), NGO type MFIs, Money lenders and money keepers, community based organizations, informal mutual support groups and other traditional systems are given less attention by some households and they resort formal financial institutions. Despite the neglect of informal credit by households, informal credit institutions have an advantage of low or zero interest rate on credit, bendable borrowing terms and fewer constraints on how the loans are used, Boucher and Guirkinger (2007). For example, money lenders usually give instant cash though at high interest rates as compared to the long process and requirements of formal institutions. Money keepers simply save their clients the hassle of formal systems (Quos, formal requirements and the like), while they also help themselves with the little accumulated savings to raise their businesses instead of going for blowing interest rates of the formal financial institutions.

Institutional factors have also been identified as one of the factors limiting access to financial credit to some sections of the population particularly women and the poor rural people. For example, rural women's access to financial resources is limited by biased lending practices that emerge when financial institutions in the area consider them smaller, less experienced and therefore less attractive clients, or when institutions lack the knowledge to offer products tailored to women's preferences and constraints (Njeru and Gichimu, 2014 and Steiner *et al.*, 2009). It is common to find financial institutions refusing to fund women and poor because of their type of activities, when it does not accept female guarantors, when its requirements are not clear or widely known or when, as it is typically the case, loans to women are smaller than those granted to men for similar activities (Fletschner, 2009 and Vissing and Jorgensen 2003). The word "gender" could be said to be an ideology that justifies the allocation of duties on the analysis of social relation and being marked by the economic determinism with all household processes being judged in terms of what they contribute to the development processes. It has often been misunderstood as being about the promotion of women only. However, gender focuses on the relationship between men and women, their roles, access to and control over resources, division of labour and needs.

Financial literacy is another thought-provoking critical factor that determines whether household farmer goes for financial credit from the different categories of financial institutions in both developing and developed countries, Wachira and Kihiu (2012). Financial literacy therefore takes into account both the borrower or investor's understanding of the financial products and the capability not rejecting the assurance of the financial credit risks and opportunities to make knowledgeable choices where, and which engagements improve their welfare., (Miller *et al.,* 2009). Studies by Guiso and Jappelli (2008) and Hassan and Anood (2009) revealed that households with paucity of financial literacy affects their financial assessments and in turn affects their productivity. Comparably, financially literate farmers normally create modest pressures on financial institutions to offer more suitably priced and transparent amenities, by associating alternatives, asking the right questions, and discussing more effectively the terms of reference of the credit than the financially illiterate household farmers.The findings from study by Wachira and Kihiu (2012) in Kenya established that the probability of a financially illiterate person remaining financial excluded is significantly high calling for increased investment in financial literacy programs to reverse the trend.

In relation to methods, the review of the literature indicates that all empirical studies on the determinants to credit have used binary choice models. The choice has been between logit and probit models. In other studies, Ordinary Least Squares (OLS) regression or Tobit model have estimated for those households that have access to credit to examine which factors significantly explain the size of the credit. Other studies however, have estimated simultaneously the determinants of the size of the formal loan and the probability of access to formal credit using Heckman two step regression model (Lensink*et al.,* 2007). This approach is recommended when estimating binary response models in the presence of sample selection since it takes into account the potential correlation between the selection process and the unobservables that affect the measured response. Heckman (1979) two-step estimation procedure is appropriate if two decisions are involved, such participation in credit market by agricultural households and amount of loan per household. The first stage

of the Heckman model a 'participation equation', attempts to capture factors affecting credit market participation decision. This equation is used to construct a selectivity term known as the 'inverse Mills ratio' (which is added to the second stage 'outcome' equation' that explains factors affecting loan size. The inverse Mill's ratio is used in the second equation to control the bias due to sample selection (Heckman, 1979).Nonetheless, the review shows that recent studies on the determinants of credit have adopted models that explain credit access from different forms simultaneously. The multinomial logistic regressions model or probit have been employed to estimate the significance factors that determine the probability of an individuals' choice of financial service access strand (for examples, see Wachira&Kihui, 2012;Mpuga, 2008 Campero& Kaiser, 2013).

METHODOLOGY

Theoretical and analytical framework

The evidence reveal that credit markets particularly rural credit markets in the developing countries are dual, with the coexistence of formal and informal credit markets; and that both demand and supply factors influence credit demand (see, Tang *et al*. 2010; Kaisrye, 2007). To understand the demand for credit among farming household, economists have used the consumer demand theory (Mpuga, 2004; Omboi and Wangai, 2011). In economics, any rational consumer makes choices. These choices may be pleasant or dismal, but the aspect of choice is asserted to be pervasive (Davis, 2002). The decisions farmers make are as results of scarcity of goods and services. Scarcity, in turn, depends on the individual preferences. Therefore, the fundamental conceptualization of the determinants of any consumer choice begins with individual preference.This study therefore relying on theory of choice attempts to answer the questions, why does a farming household prefer good "A" over good "B" and not good "B" over good "A" in the context of credit demand?We conceptualize that farmers choose an alternative credit form that maximizes their utility from a choice set. The basis of choice reasoning is the utility–maximization framework and resulting models are known as random utility models. This random utility maximization equation is of the form:

$$CA_{ij} = V_{ij} + \varepsilon_{ij} \quad \text{.....(1)}$$

where CA_{ij} represents overall utility for an alternative, V_{ij} is the observed influences of utility and ε_{ij} is the unobserved influences (error).

Suppose that we have a categorical response variable, Credit Access (CA) that has j = 4 categories representing the credit demand choices such that:

CAi=1 if the farming household received credit from formal financial institutions (commercial banks, credit institutions and MDI),

CAi=2 if the farming household received credit from semi-formal financial institutions (SACCOs and MFIs),

CAi=3 if the farming household received credit from informal sources (NGOs, ASCAs, VSLAs, saving clubs, ROSCAs, Welfare/investment club, burial associations and others), and

CAi=4 if the farming household has not received credit from any of the above sources in last 12 months.

This implies that the farming households' choice of whether to borrow any credit from formal, semi-formal, and informal source or not as a polychotomous choice between four mutually exclusive alternatives. It assumed that the probability of farmer choosing credit demand alternative i over alternative j is equal to the probability that the utility of i being greater than (or equal to) the utility of j after evaluating all alternatives in a given choice set of j=1,2..,...*m*alternatives. Therefore, given the polychotomous nature of this categorization this study exploits a polychotomous choice framework to determine the factors that influence farmers' decisions for deciding to borrow from formal, semi-formal, informal sources or not all. With a polychotomous choice variable, a choice has to be made between multinomial logit (MNL) or multinomial probit (MNP). In this study, we chose amultinomial logit model to analyze the choice of alternative CAs. The multinomial logistic regression is considered appropriate because it does not assume normality,

linearity, or homoscedasticity assumptions. Nonetheless, MNL has been found to be more robust than MNP even in cases where IIA assumption has been violated (Kropko, 2010)[1]. Equation (1) can be rewritten as,

$$CA_{ij} = X_{ij}^{1}\beta + \varepsilon_{ij} \quad \text{..... (2)}$$

where*CAij*is the average utility, $\varepsilon_{ij}$is a random error, $X_{ij}$is the set of explanatory variables, and β is a vector of unknown parameters. According to Madala (1997), the model assumes the choice probabilities are dependent on household characteristics. Therefore, the probability associated with the household's demand for credit is assumed to follow an underlying logistic distribution and can be described as (Greene, 1997):

$$P_{ij} = \frac{e^{\beta_i' X_i}}{1 + \sum_{k=1}^{m-1} e^{\beta_i' X_i}} \quad j = 1,2,\ldots,m-1$$

..... (3)

where *Pij*represents the probability that *CA=j,* for *j*=1,2,...*m*, *m* is the number of choices, *X* represents the set of household factors that could potentially influence credit choices for farming household *i*, and β is a set of estimated parameters thatdescribe the influence of *X* on the probability of preferring a given credit choice.

Model specification and estimation

Given the fact that farming households are facing four exclusive credit choices, we estimated a multinomial logit model which models the four choices simultaneously. We used the choice of formal creditas the base and compare the choices of semi-formal, informal and no credit access with the base. The potential independent variables used in model include the demographics (age, age squared marital status, gender, and education) of

[1]Multinomial logit models are valid under the Independence of Irrelevant Alternatives (IIA) assumption that states that characteristics of one particular choice alternative do not impact the relative probabilities of choosing other alternatives (Vijverberg, 2011).

the household head, household characteristics (employment status, ownership of land title, location (rural/urban), and income level).

We included a composite index for household perception about lending behavior of formal financial institutions. The index was generated from eleven (11) items using principal component factor analysis. The items asked about the household perception about interest rate charged, grace period to start repaying the loan, trust, convenience of repayment schedule, affordability of collateral security, documentation required for a loan, safety of services offered, customer care, contract understanding, unofficial loan charges and the time it takes to get a loan. The index captured the institutional lending behavior of formal financial institutionverse other financial institutions. Since the growing literature as demonstrated that financial literacy impacts significantly financial market participation and therefore financial literacy has become an important goal of policy makers (Cole andShastry, 2007; Wachira&Kihiu, 2012), we included dummy variable to capture financial literacy. Financial literacy was based on household's ability to understand and internalize basic financial literacy. Specifically, the household was considered financially literate if he/she got right at least two questions out of three on interest rates, discount rates and money lending[2] (EPRC, 2013). Distance to nearest commercial bank is included to capture the transaction costs of borrowing from formal credit markets. Distance to nearest credit financial institutions may also reflect the availability of formal, semi-formal and informal credit supply. It facilitate the interpretation of results, relative probabilities are calculated and presented for the choice of credit demand.

Data type and source

The current study is based on FinScope III survey data 2013 for Uganda, a nationally representative survey collected by REEV Consult International during the period June -

[2] The three questions were: (1) If you were offered a loan with 5% monthly interest rate and a loan with 20% annual interest rate, which loan would offer better value?; (ii) If the same bicycle is on sale in two different shops at 200,000 UGX and one shop offered a discount of 30,000 UGX and the other shop offered a 10% discount: which one is the better bargain?; and (iii) You want to borrow Shs. 500.000/= from a moneylender (M1). He says that you can get it but you must pay him 600.000 in a month. Another Money lender (M2) says you have to pay 500.000 back plus 15% interest in a month. Which one do you take?

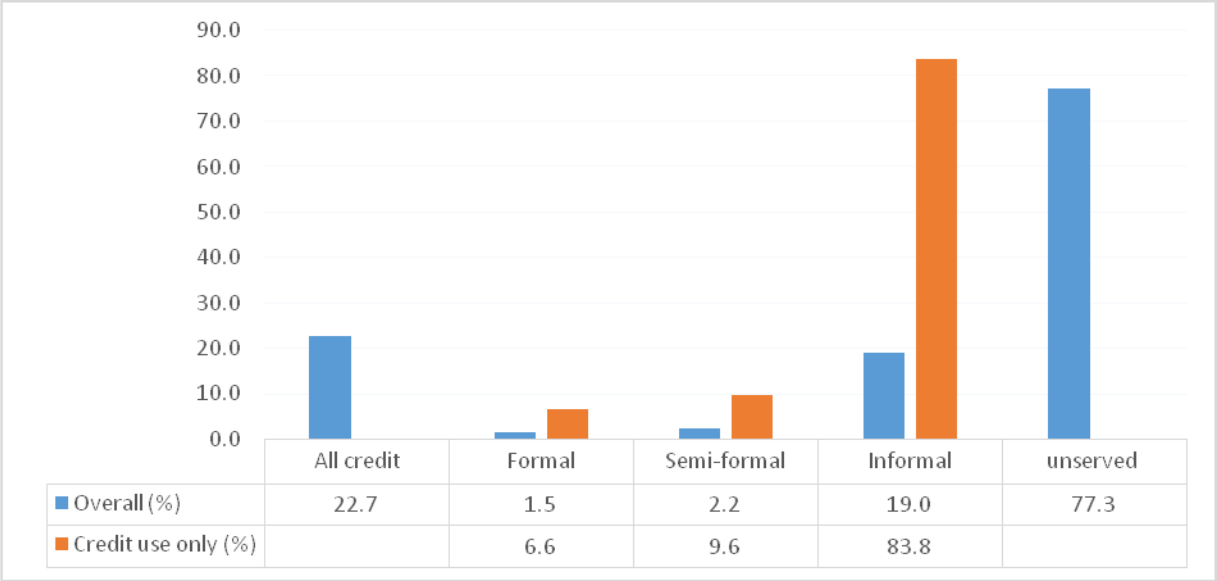
July 2013. FinScope surveys have been carried out in 18 African countries including Uganda. The main objective of these surveys is to determine the levels of access to and use of financial products and services by the adult population. The 2013 FinScope III survey for Uganda follows two previous surveys— FinScope I and II surveys carried out in 2006 and 2009 respectively. The survey captured information on various aspects including saving and investment; credit and borrowing; remittances and money transfer; financial literacy and insurance (EPRC, 2013). Additionally, the survey covered information on socio-economic and demographic characteristics of survey participants including questions on household source of earnings. The survey covered 3,401 households randomly selected using a two stage stratified random sampling design. For purposes of this current study, we focused on households whose main source of earnings was farming.Therefore, out of the 3,401 households covered to during the survey, 1,192 households were farming households, representing 35% of total households.

RESEARCH FINDINGS

Descriptive analysis

Figure 1 below illustrates the overall credit usage among the farming households. It is evident that the proportion ofhouseholds that used credit at national level is 22.7%.Out of this number, 3.7% of households use formal institutions (formal bank and non-bank formal) while 19% use the informal institutions. The analysis further show that of 271 farming households who accessed credit, 83.8% accessed credit through informal sources, 9.6% through semi-informal sources and 6.6% through formal financial institutions. These results are consistent with other studies in Uganda using Uganda Agriculture Census data (2008/09) and 2005/06 and 2009/10 panel data that the majority farming households use credit from informal sources (Munyambonera et al., 2012). In instances, where the majority of farming households access credit through informal sources, government and other stakeholders have to be worried because credit access through informal sources is not sustainable. Not only being risky, informal sources have limited source of funding and may not satisfy the growing demand for farmers.

Figure 1: Percentage distribution of credit access by farming households



	All credit	Formal	Semi-formal	Informal	unserved
Overall (%)	22.7	1.5	2.2	19.0	77.3
Credit use only (%)		6.6	9.6	83.8	

Table 1 presents the summary statistics of the variables used in the analysis. The summary statistics are disaggregated by credit strands of the farming households. The last column of Table 1 presents the chi-square test and one way ANOVAresults on the degree of differences across the different credit strands. The one way ANOVA test was used to test for difference across credit strands for continuous variables while the chi-square test was used for categorical variables. The results show that among continuous household variables, years of education and distance from nearest commercial revealed significant statistical difference across the four credit strands. The chi-square test results on the other hand indicate that households significantly differ across the four credit strands in relation to financial literacy, employment status, residence, ownership of land title and income levels.

Table 1: Household level summary statistics

Variable	Formal credit access (%)	Semiformal credit access (%)	Informal credit access (%)	Unserved (%)
Years of education of household head	17.3	13.5	12.9	12.5
Age of household head	38.1	40.5	43.5	12.5
Distance to nearest commercial bank	25.7	18.1	19.3	44.7
Financial literacy household head				
Illiterate	33.3	61.7	49.3	64.8
Literate	66.7	38.5	50.7	35.2
Gender of household head				
Male headed	83.3	61.5	68.7	71.6
Female headed	16.7	38.5	31.3	28.5
Marital status of household head				
Married	72.2	69.2	71.8	65.6
Unmarried	27.8	30.8	28.2	34.4
Employment status of household				
Self employed	50.0	80.8	78.9	77.2
Salaried employment	38.9	11.5	7.5	5.2
Unemployed	11.1	7.7	13.7	17.6
Residence				
Rural	66.7	84.6	89.0	86.8
Urban	33.3	15.4	11.0	13.3
Own land title				
Yes	33.3	15.4	9.7	11.4
No	66.7	84.6	90.3	88.6
Income level				
Less than 500,000	61.1	61.5	68.7	78.5

500,001-1,000,000	16.7	26.9	22.5	15.9
100,001-5,000,000	16.7	11.5	6.6	5.0
Above 5,000,000	5.6	0.0	2.2	0.65

*Note: ** and * indicate 10 and 5 percent significance levels respectively.*

Econometric Analysis

Analysis of the potential factors influencing credit access of farming households using the multinomial logit model is presented in Table 2. Given that the estimated coefficients in multinomial models cannot be used in drawing inference except for the signs, the study generated relative risk ratios. The analysis is based on the four main access strands namely; formal, semi-formal, informal, and those excluded. The exclusion from credit was used as base category.

The results in Table 2 below show that financial literacy dummy is statistically significant in explaining relative risk ration of accessing formal credit and informal credit. For instance, the results show that the relative risk ratio of accessing formal credit by farming households more than triple the corresponding relative risk ratio of those who are financially illiterate. These findings demonstrate that the probability of a financially illiterate farmer remaining financially excluded both formally and informally is significantly high. These findings are consistent with studies in the East African region as reported by Wachira and Kihiu, 2012 that most illiterate farmers do not access credit both from informal and formal financial providers. In respect with informal credit, the results show that the relative risk ratio of accessing/using informal credit rather than those excluded from credit is 74% higher for financially literate farming households than financial illiterate farming households. However, we did not find significant effect of financial literacy in relation to access to semi-formal credit, although relative probability is positive. This perhaps may reflect the fact that most clients who access services from SACCOS and Microfinance institutions have prior financial knowledge given the fact that these institutions mainly offer services to their members. Therefore, the level of financial literacy may not matter so much in influencing people's credit access.

Table 2: Multinomial Logit Regression Results

Credit access	**Formal access**		**semi-informal**		**Informal**	
	RRR	**p-value**	**RRR**	**p-value**	**RRR**	**p-value**
Financial literacy	3.435	0.027*	1.005	0.990	1.742	0.000*
Years of education	1.164	0.012*	1.029	0.572	1.009	0.633
Own land title	5.872	0.003*	1.474	0.491	0.816	0.430
Married	0.778	0.714	1.448	0.473	1.480	0.050**
Male headed household	0.812	0.794	0.346	0.037*	0.573	0.006*
Age	1.189	0.218	1.198	0.090**	1.059	0.042*
Age squared	0.998	0.218	0.998	0.069**	0.999	0.032*
Employment status (Base: unemployed)						
Self-employed	0.893	0.893	2.269	0.276	1.418	0.114
Salaried employment	5.945	0.059**	3.955	0.153	1.800	0.101
Rural residence (base category : urban)	0.328	0.057**	1.084	0.886	1.309	0.261
Distance to nearest bank	1.027	0.043*	0.986	0.344	0.993	0.162
Perceived lending behavior	1.410	0.060**	1.173	0.373	1.071	0.368
Income levels (Base category: Less than 500,000						
500,001-1,000,000	1.408	0.627	2.28 7	0.083* *	1.55 7	0.021*
100,001-5,000,000	3.515	0.082* *	2.62 5	0.157	1.40 6	0.290
Above 5,000, 0000	10.86 6	0.052* *	0.00 0	0.985	4.04 4	0.029*

Note: Base category is credit exclusion; * significant at 5%; and ** significant at 1%. The RRR is defined as Relative Rate Ratio and defines the relative probability.

Education was found to have a significant positive influence on relative risk ratio of accessing formal credit compared to credit exclusion. This implies that educated farming

households are more likely to access formal credit. Empirical evidence has demonstrated that education affects cognitive ability which in turn increases financial market participation, (Cole and Shastry, 2009). Nonetheless, financial literacy has demonstrated that the level of education of the farmer compliments his/ her ability to access, comprehend information and ability to complete loan application forms properly (Dzadze*et al.,* 2012).

Availability of collateral security has been found to have significant impact on credit access and land title is a key collateral security required by most institutions results show that relative risk ratio of accessing formal credit rather than credit exclusion for household who owns land title is higher than corresponding relative risk ratio for households without a land title. There is no doubt that land titling is necessary prerequisite for accessing formal credit. We did not find significant influence of land titling. In country, where most farmers' land lack formal documentation of rights, programs that provide farmers with titles will ultimately lead to expansion of formal credit access.

Marital status of household head is only statistically significant in influencing informal credit access. The relative risk ratio of accessing informal credit rather than credit exclusion is higher for married farming households than unmarried farming households. This finding is consistent with findings from Kenya (Wachira and Kihiu, 2012) which demonstrated that marital status was insignificant in explainingaccess to formal and semi-formal financial services. The study found out that formal and semi-formal institutions do not factor in marital status when designing their financial services and that most Informal service providers prefer lending to married persons, because of increased level of trust as one moves from one stageof life to another.

Male head households are significantly less likely to access semi-formal and informal services compared to female headed households in accessing financial services from semi-formal and informal stands respectively. This finding is not consistent with traditional belief that male headed families are more risky taking than female head families. The reason why female headed households are more likely to access semi-formal and informal credit is perhaps due to the fact most semi- formal and informal provider have schemes designed for women. Indeed, in Uganda women are considered vulnerable and sometimes

credit worthy and therefore more likely to get credit from semi-formal and informal services. Wachira and Kihiu (2012) have argued that women have higher chances of accessing informal services in Kenya because of many programs that target women.

Age of the farmer was found to be significant and positively related to household decision to access semi-formal and informal credit. This implies that relative risk ratio of accessing semi-formal and informal credit increases with age. For instance, the results indicate that the relative risk ratio of accessing semi-formal and informal credit rather than credit exclusion higher for older farmers. However, age squared is significant and negative for semi-formal and informal credit access, indicating a diminishing impact of age on credit access as people get older. The return to age diminishes as people grow and their demand for credit falls. This finding is consistent with many studies in Uganda and Africa (see Wachira and Kihiu, 2012; Simon, 2013, Hananu*et al.,* 2015, Mpuga, 2008 and Heikkilä, 2009).

In respect with employment status, the results in Table 2 show that salaried employment had significant effect on access to formal credit demand. For example, the results show that relative risk ratio of accessing formal credit rather than credit exclusion is higher compared to relative risk ratio of unemployed household. This is expected because many formal financial institutions in Uganda have specific credit programs for salaried workers.

Several studies have documented that rural based farmers are resource constrained and therefore disadvantaged than their urban counterparts in accessing formal credit (Hananu et al, 2015, Kasirye, 2007). Our study results also reveal that relative risk ratio of accessing formal credit for rural farming households is negative and statistically significant. For instance, the relative probability of accessing formal credit rather than credit exclusion is lower for rural farmers than urban farmers.

Availability evidence has demonstrated that distance from or nearness to a bank continues to pose a major challenge on access to formal financial services. Findings revealed that relative risk ratio of accessing formal credit rather than credit exclusion is higher for households nearer to commercial banks than households who are further in the distance

from a commercial bank. The lower relative risk ratio for semi-formal and informal credit strands, although not significant are consistent with findings that the probability of accessing financial services from formal and formal strands reduces as distance from nearest commercial bank reduces. The relative risk ratio for semi-formal and informal, although not significant has the positive expected signs. This may imply that rural household's relative risk ratios to access semi-formal and informal are positive particularly because such institutions have their presence in rural areas than formal institutions. To ascertain this fact, we estimated two other multinomial models, one replacing distance to the nearest commercial bank with distance to nearest semi-formal institution and the other with distance to nearest informal institutions. The results show that distance to nearest semi-formal financial institutions significantly reduces the relative risk ratio of accessing informal credit while distance to nearest informal credit financial institutions also significantly reduces the credit demand from semi-formal institutions. The model estimation shows that distance to nearest financial institution; whether formal, semi or informal financial institution, influence the demand for credit from these institutions.

In this study we computed composite index that measures the perception of the farmers about lending behavior of formal financial institutions. Our results show that access to formal credit is significantly affected the household perception of the lending behavior of financial institutions. The relative risk ratio of accessing formal credit rather than credit exclusion is higher for households who had positive perception about lending behavior of formal institutions.

Income level of the household significantly affects the demand for formal credit. The results in Table 2 show that households with higher income levels have a higher relative risk ratio of accessing formal credit. For semi-formal credit, the results show relative risk ratio of accessing semi-formal credit rather than credit exclusion for an average household who earn between 500,001 and 1,000,000 is more than double the corresponding relative probability of households who earn less than 500,000. However, the results show that households who earn on average less than million shillings and those in higher income bracket (Ugx5 million and above) are more likely to borrow from informal sources. These

findings show that higher income levels are associated with access to formal credit whereas average income earners are more inclined to semi and informal sources of credit. However, it also noted that farmers in higher income bracket are also attracted to informal credit.

CONCLUSIONS AND POLICY RECOMMENDATIONS

The study findings revealed that access to credit is still very low particularly formal credit. This stance is very worrying because in situations where farmers'access to formal is limited, farmers will be encouraged to seek informal services which are risky and expensive. The results of analyses further revealed that financial literacy, years of education, ownership of land title, location (rural/urban), perception about lending behavior of the bank, distance to the nearest bank and income level are important factors influencing the demand for formal credit. Gender, age and income level were found to have significant influence on probability of using semi-formal services and while financial literacy, gender, age and income were found to have significant influence on demand for informal credit. These results are very important if we want to include over 70% of the farming households who are excluded from credit access and over 90% who are excluded from formal credit services.

The fact that the majority of farming households do not have accesses to formal credit, it is recommended support interventions that mobilize savings and maximize the availability of credit to the farming population in rural areas of Uganda is necessary. Efforts and interventions are required to enable the formal banks to offer loans to potentially productive activities farmers. The study findings also indicate that interventions geared at increasing rural empowerment, accessibility, credit awareness and financial literacy have the potential to influence credit access among farmers.

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