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Determinants of Access to Finance of Smallholder Farmers: A study on Members of Agricultural Cooperatives in Southwest Oromia Region, Ethiopia

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Abstract
Access to finance plays significant role in enhancing agricultural productivity. However, studies showed that access to finance itself is affected by several factors though there is no consistency on the factors. This study is aimed at identifying determinant of access to finance taking evidence from least developed country, Ethiopia. To achieve this objective, 400 sample agricultural cooperative members were selected using multistage sampling and logistic regression was used in the analysis. The study found that participation in extension package, simplicity in lending procedures, Christianity in religion, large number of working family size and large land size positively affect access to cooperative credit. The study further found that short distance from MFIs, simplicity in lending procedures; higher educational level, large working family size, and possession of non farm income positively affect access to MFIs' credit. Concerning access to informal credit, educational level, working family size and land size were found to be significant factors. One interesting finding in this study is the effect of religion on access to finance. Smallholder farmers who practice Christianity tend to have high probability of accessing formal credit from cooperatives and MFIs. Muslim smallholder farmers less likely in take credit from formal sources since Islamic religious customs do not allow pre-arranged interest rates but rely instead on profit and loss sharing principles. When we come to informal sources of finance, religion is not found to be significant factor which implies that cooperatives and MFIs in the region should improve their credit provision system that accommodate the Muslim community as well.

Keywords: Access to finance, Formal sources, Informal sources, Smallholder farmers

1. INTRODUCTION

Ethiopia is the second populated country in Africa, the ninth in the world and its economy is mainly based on agriculture. However, the majorities of agricultural activities in the country are undertaken by smallholder farmers. In line with this, Gebre-Selassie and Bekel (2013) estimated that Smallholder farmers produce 94 percent of the food crops and 98 percent of the coffee in the country. Only six percent of food crops and 2 percent of the coffee are produced by mechanized private and government commercial farms. These statistics implies that emphasis should be given to smallholder farming in order to strengthen the effort towards agricultural growth and consequently to the overall economic growth of the country. This further requires identifying and solving the challenges surrounding smallholder farming.

Access to finance plays significant role in the process of enhancing agricultural productivity. Finance is a broad concept representing the provision of fund to meet operating and investment costs of any economic activity. Especially, agricultural finance specializes in financing agricultural sector, which goes beyond provision of credit. Agricultural credit is the most specialized division, which provides credit service only to agricultural firms (Komicha, 2007). Further; there are two groups of financial sources for smallholder farmers. Formal financial sources include Microfinance institutions, cooperatives, credit unions, capital lease companies and the informal sources include those sources that are not regulated by government body such as traditional saving (Iqub), loan from family, credit from local merchants and government employees etc. The two forms of credit fulfil different functions in which Informal credit is used usually for consumption-smoothing purposes, while formal credit is sought and used mostly for agricultural production purposes and investment in non-farm income generating activities (Zewdie, 2015).

A number of factors explain why certain borrowers prefer to use formal credit. The type of financial institutions and its policy will often determine access to credit. When the 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. Specifically, in developing countries including ours 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 (Yehuala, 2008).

Access to formal credit can also be affected by household characteristics. As stated by Hussien (2007), the probability of choosing the formal credit sector was positively affected by gender, educational level, household labour and farm size. He further explained that education, credit information and extension workers visit are more likely to increase the information base and decision making abilities of the farm households including the ability to compare pros and cons of choosing appropriate credit and production technology.

In another study based on the data from a sample survey of 699 randomly selected peasant farmers in Bolivia, Miller and Ladman (1983), applied discriminate analysis to identify a set of socio-economic, physical and psychological factors that influence credit use among small farmers with a view to differentiate between potential borrowers and non borrowers. The results of the study indicated that borrowers were characterized by higher resource base, farm size, higher level of education, large number of cattle, higher household incomes, higher level of market integration, greater use of improved technology, larger operating costs and investments, higher risk ability, etc. Potential borrowers were characterized by further distance from markets, low level of market integration, higher transaction costs, less number of cattle, etc. Furthermore, non-potential borrowers were characterized

by lack of interest to expand production, lower level of education, limited use of improved technology, shortage of labour and proximity to market.

Assefa (1989) empirically tested a set of socio-economic and other important factors influencing agricultural credit use among small farmers aimed at differentiating borrowers from non-borrowers. Using discriminate analysis, he found that large farm size, high investment, adoption of improved technology were significant variables in distinguishing borrowers from non-borrowers.

Hussien (2007), in his study also found out that the use of extension package, in effect, requires adequate labour supply, thus a positive effect of household labour on the choice of formal credit for the farm input. The choice of the formal sector increases with the number of productive members of the farm households. It was also indicated that the low level of education of the farm households may have contributed for limited use of formal credit by farm households. Men tend to borrow more from the formal and semiformal sources than women do. That is being a female reduces the likelihood of borrowing from the formal and semiformal credit sectors where it increases the probability of borrowing from the informal credit sources.

The authors have undertaken a research sponsored by Jimma university on the topic "Financial and Marketing Challenges of Smallholder Farmers: A Study on Members of Agricultural Cooperatives in Southwest Oromia" in the academic year 2016/17. The objective was to identify the bottlenecks surrounding smallholder farmers in the study area and provide appropriate suggestions for solving them. This article is part of the above mentioned study specifically aimed at identifying determinants of access to finance of smallholder farmers taking evidence from least developing country Ethiopia. The evidence for the study is taken from smallholder farmers in three zones in southwest Oromia sub-region. To achieve the purpose, the remaining part of this paper is structured as follows. Section two explains the research problem, section three reviews related literatures. Section four presents the research design and methodology adopted in the study. Section five presents the result, analysis and discussion and finally section six concludes the paper.

2. RESEARCH OBJECTIVES

Access to finance is the most critical factor for the use of improved agricultural inputs and modern agricultural technologies. Access to financial services is critical to provide funds for farm investments, improve post harvest practices, smooth household cash flow, enable better access to markets and promote better management of risks. Access to finance can also play an important role in climate adaptation and increase the resilience of agriculture to climate change, thus contributing to long term food security.

But access to finance to purchase inputs like improved seeds and fertilizer, invest in machinery, and pay for transport to sell outputs is a challenge that smallholder farmers face every harvest season. This is because access to formal and informal rural credit is determined by several factors. The problem is, though several studies have been conducted to identify the main determinant factors for use of either formal or informal rural financial sources, no common agreement has been reached till today. For instance Hossain (1988) argue that most of the conditions imposed by formal credit institutions like collateral requirements should not actually stand in the way of smallholders and the poor in obtaining credit. On the other hand, Getaneh (2005) argued that requirements to access formal financial sources effectively ration out some groups of farm households which are the poorest of the poor.

On the other hand, conclusive research evidence on the critical factors that determine access to formal and informal financial sources for smallholder farmers plays vital role in an effort to support smallholder agriculture. It will help formulating policy guideline on how to approach the problem of access to finance. This has motivated the researchers to conduct research on this topic. Therefore, the main objective of this study is to identify factors that determine access to finance of small holder farmers in southwest Ethiopia. Specifically, the study is aimed to:

1. Identify factor that significantly determine access to Microfinance Institution's credit
2. Identify factors that significantly determine access to Cooperative credit
3. Identify factors that significantly determine access to Informal credit sources

3. LITERATURE REVIEW

Generally, there have been different determinants of credit constraints presented differently by several authors as discussed above. The variation in the determinants of credit constraints across different studies mainly arise from the equivalent variations in their objectives or the contents of the dataset they used. Every author decides what variable to include and what not primarily depending up on the dataset they are working with. In general factors that determine access to finance can be categorized in to household level demographic variables and institutional variables. The effect of these different categories of factors are reviewed from different literatures and presented as follows.

a. Age of the Household Head

Those farmers having a higher age due to life experience will have much better association with cooperatives and other formal credit institutions, and have more access to use credit from the formal or informal sources. Older farmers have more social network or social capital and thus have more access to credit market. Younger farmer on the other hand are highly in need for credit but less successful in their loan applications because of their lack of experience. Although young and energetic individuals are ambitions to earn higher income and expand investment, they are not successful in securing credit from formal financial institutions (Girma & Abebaw, 2015). But these arguments don't last long as the household head becomes too old; lenders usually level old age individuals as risky borrowers. The ability to repay the loan might decrease because the individual might be too weak to work to generate the needed income to pay back the credit (Zewdie, 2015). In this study, it was hypothesized that older smallholder farmers have more access to credit than their younger counterparts.

b. Gender of the Household Head

Gender of the household head has been believed to be one of the leading determinants of credit rationing in the literature. Male headed households are less vulnerable than female headed households for credit rationing. This is because male headed households have the chance to participate in different meetings and have more exposure to information and have more access to use formal credit (Zewdie, 2015). In a study conducted in Kenya, male farmers accessed agricultural credit more than their female counterparts at 78.72 percent and 21.28 percent respectively. This is because, most of the decisions on accessing agricultural credit are mainly made by male. The implication is that male headed households had more access to agricultural credit than their female counterparts due to the fact that land ownership is dominated by male. This is attributed to collateral security which is a requirement by financial institutions and is traditionally owned by male farmers. Indeed, this makes the gender variable an important determinant in accessing agricultural credit, where the female headed households are credit constrained (Kosgey, 2013).Women are more constrained to access credit than men because they lack control over economic resources. Yehuala (2008) stated that there are two major factors which restrict women's access to formal credit more than men's. These are related to women's lack of control over economic resources and the nature of their economic activity.

Therefore, it was hypothesized that female smallholder farmers are more constrained to access credit than their male counterparts.

c. **Literacy Level**

Education infuses to smallholder famers the ability to present positive financial information and strong business plans and the ability to maintain a better relationship with financial institutions. Farm households who can read and write are expected to be more capable of exploring relevant information as well as more receptive of advice from extension services. Farmers who can read and write are expected to have more exposure to the external environment and accumulate knowledge. They have the ability to analyze costs and benefits (Girma & Abebaw, 2015).Formal and semiformal sources require more papers to fill. It is assumed that the probability for a person who is not educated to take loan from formal and semi-formal is low and are most of the time ignored by these institutions. It is again assumed that households with a good educational level are more likely to choose more formal or semi-formal financing practices than less educated ones. Tang et al. (2010) indicated education as one of the most important variables that affect households demand for credit. Their findings indicated that additional year of education by the household head would increase the probability of borrowing by another 2.5 percent. According to their study, while education increased households 'probability to borrow from formal credit markets, it decreased or did not affect the informal credit demand at all. For this study, Literacy Level measured in terms of level of education attained by the head off the household is hypothesised to positively and significantly affect access to finance of smallholder farmers.

d. Family Labour

This refers to the total number of family members of the household who have the potential to work on the farm which was measured in man equivalent. The larger the number of family labour, the more the labour force available for production purpose. The more the labour force available, the lower is the demand for hired labour, this means no or low cost for hired labour. If demand for hired labour decreases due to availability of family labour the need for credit decreases (Zeller et al., 1997). Therefore, family labour was hypothesized to have significantly negative impact on access to formal credit in this study.

e. Farm Size

Farm size is the total land size cultivated which is the sum of owned cultivated land, rented-in land and land secured through crop sharing arrangements by the household. The larger the cultivated land size, the more the labour required that demands additional capital that might be obtained through credit. Farm size was used to estimate the expected income of the borrower and also used as a proxy for the scale of operation of the borrowers being classified into the different groups. Large farm sizes were expected to lead in accessing agricultural credit as compared to small farms. The bigger the farm size, the more likely it is that grain farmer would obtain loans. Larger farm size affects the amount of the loan needed through a greater need for variable farm inputs, hence increasing the need for credit (FAO, 2003). A study in Kenya also indicated that farmers who own land privately accessed agricultural credit more than those who do not have (Kosgey, 2013). In this study, it is hypothesised that land size whether it is owned or rented positively and significantly affect access to formal credit.

f. Total Livestock owned

This refers to the total number of animals possessed by the household measured in tropical livestock unit (TLU). A household livestock size in TLU is calculated by multiplying the number of each type of animal by an appropriate conversion factor and then summing together. Total Tropical Livestock Unit (TTLU) which is used as a measure of the household livestock endowment and was calculated using the following conversion factors for the livestock: 1.0, 0.7, 0.1, and 0.01 for cattle, horse/mule/donkey,

goat/sheep and poultry, respectively. Livestock is considered as another asset which is liquid and a security against crop failure. Girma and Abebaw (2015) found that as the total number of animals in the household increases, the household would be less likely to go for credit. This can be attributed to increase wealth and income base of farm households which makes more money available in the households that minimizes demand for credit. Hence this variable was assumed to have significantly negative influence on the desire for formal credit.

g. Religion

In their survey in 2017 micro and small enterprises in Ethiopia, Lakew and Birbirsa found that Islamic religion negatively affects micro credit participation. The main reason could be the compliance with Islamic religious customs, which do not allow pre-arranged interest rates, but rely instead on profit and loss sharing principles. The needs of the poor in Islamic communities are not different from the poor in other societies. They need financial services. However, the survey by Khan (2008) conducted in Jordan, Algeria and Syria further revealed that 20-40 percent of the respondents cited religious reasons for not accessing conventional micro loans and more than 60 percent of the low income survey respondents in the West Bank and Gaza claim a preference for Islamic products over conventional products that involve interest. Religious dummy has been used in the study to catch the distinction between Muslim headed household and Christians. In Ethiopia, most microfinance Institutions didn't work in line with the principles of Islamic banking. And in this study, it is assumed that Muslim headed households are more vulnerable to credit rationing than Christian smallholder farmers.

h. Other Nonfarm Income

Another independent variable is the non farming activities smallholder farmers are engaged in. This variable measures whether smallholder farmers have other occupations apart from farming. Farmers having other sources than agriculture are highly trusted by financial institutions. For instance, financial institutions consider farmers with a business orientation as having an advantage since they are able to plough back the returns faster than those who have no business orientation (Girma & Abebaw, 2015)..In this study, the impact of nonfarm activity on access to finance is assumed to be significant and positive.

***i.* Participation in Extension Package**

Information acts as a basis for decision to smallholder farmers on whether to apply for a loan or not, and what needs to be fulfilled for a loan to be granted. Therefore, any information asymmetry hinders the smallholder farmers' access to bank credit. Thus, it was hypothesized that, smallholder farmers with inadequate information about the sources of finance are likely to be more constrained. Access to information is measured in terms of the connection of the smallholder farmer with relevant source of information including extension agents, cooperative leaders, Local administration, and microfinance officers that the respondent made. Farmers who have a frequent contact with extension agents are expected to have more information that will influence farm household's demand for credit from the formal sources. If a household participates in extension package program, then it is expected to have credit for the purchase of farm inputs or technologies. The Rwandan study by Ali, Deininger and Duponchel (2014) reported that better access to information via news or from relatives holding political office have a significant negative impact on credit rationing. They asserted that better access to information and political office affiliation minimizes the probability of ending credit constrained (Zewdie, 2015). Specifically, Girma and Abebaw (2015) argue that frequent visit of farmers by Development agents or extension officers to discuss on agricultural marketing issues and provide the necessary supports to farmers have good chance in accessing credit.

j. Physical Distance of Farmers from Lending Institutions

Farmers near lending institutions have a location advantage and can contact the lender easily and have more access to information than those who live at more distant locations. Therefore, location advantage was expected to increase access to use credit from the formal institutions. Geographical distance, expressed in terms of time directly affects transaction costs for all the market participants and financial progress might bring a reduction of such high transaction costs. According to Yehuala (2008), farmers near the lending institutions have a location advantage and can contact the lender easily and have more access to information than those who live at more distant locations. Few financial institutions managed to establish local branches in rural areas where the majority of smallholder farmers reside. According to Hussien (2007), farm households are discouraged to borrow from credit sector if it is located farther. This is because transportation cost increase with lender borrower distance which raises the effective cost of borrowing at otherwise relatively lower interest rate in the sector. Therefore, for this study, it was hypothesised that the further the smallholder farmer from formal financial institution, the less the chance to get credit.

k. Lending Procedures

Lending procedures is among the independent variables tested as a determinant of smallholder farmers' access to credit. Usually these procedures are complex and time consuming for applicants. To get formal loans farmers are expected to pass through different processes, which is time-taking, cumbersome and sometimes difficult to understand. Rather they prefer to take from the informal credit institutions for the sake of ease even if it charges higher interest rates. Yehuala (2008) found that farmers prefer to borrow from informal credit institutions as they are time effective although they charge higher interest rates on loans in comparison to banks. Schmidt and Kropp (1987) also reported that in most cases the access problem, especially among formal financial institutions, is one created by the institutions mainly through their lending policies. This is manifested in the form of complicated application procedures and restrictions. For instance, smallholder farmers are expected to form a group (that can serve as collateral) to take credit from the formal credit sources. But farmers perceived that group lending is difficult to access credit from these sources. Therefore, in this study, it was hypothesised that long lending procedure negatively and significantly affects access to formal credit.

4. RESEARCH METHODOLOGY

This study is designed to identify factors that significantly affect access to finance of smallholder farmers. Thus, an explanatory method is viewed as an appropriate research design for the study. A multi stages sampling procedure were adopted to select 400 sample respondents for the study. First, eight administrative districts which have sufficient number of cooperatives were purposely selected from three zones in west Oromia. The districts selected were four from Jimma zone, two from Buno Bedele Zone and two from Illu Aba Bora Zone. Second, two primary agricultural cooperatives from each districts were randomly selected and finally 25 smallholder farmers were randomly taken from each agricultural cooperatives for structured interview.

Data for this study were collected from primary sources during 2016/17. Interview questionnaire was designed and used taking into account the limited level of education of the respondents. The Interview questionnaire includes information on access to finance, household & farm characteristics such as age, gender, education, family composition and farm size, household income, loans and credit provisions. The questionnaire was prepared considering all the variables to be analyzed and using questionnaires of similar researches conducted in other parts of the country. As it was stated earlier, the main objective of this study is to find out the determinant factors of access to finance. To achieve, this objective, the following analytical framework was developed and used in the study.

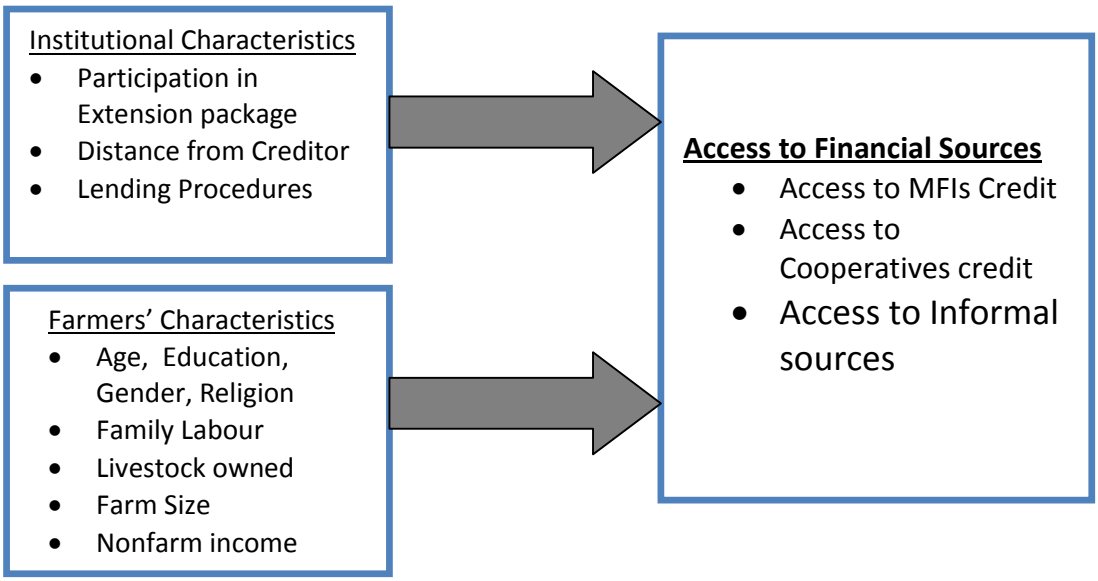

Figure 1: Analytical Framework for the Study

The following table 1 presents the variables used and their measurement to achieve objectives of the study.

Table 1: Variables and Their Measurement for the Study

	Variables	Symbol	Measurement
1.	Farmer's Education	EDU	Grade level attained by household head
2.	Farmer's Age	AGE	Age of the household head
3.	Gender of the Head of Household	GEN	1 = Male, 0= Female
4.	Family Labour	FLBR	Number of labour aged Family members
5.	Ownership of Livestock	LSTK	Tropical livestock Unit (TLU)
6.	Farm Size	FSIZE	Total Farm size in Hectare
7.	Religion	RLGN	1 = Christian, 0 = Muslim
8.	Extension Package	EPKG	0 = Don't Participate in Extension package 1 = Participate in Extension package
9.	Distance from MFIs	DSMF	Distance in kilometre from MFIs
10.	Distance from Cooperative	DSCO	Distance in kilometre from Cooperatives
11.	Lending Procedures	LPDR	1 = Simple lending procedures 0 = Complex lending Procedure
12.	Nonfarm Income	NFICM	1 = Have additional nonfarm income 0 = No additional nonfarm income
13.	Access to Informal Credit	AIC	0 = No credit from Informal sources 1 = Get credit from Informal sources
14.	Access to MFIs Credit	AMFC	0 = No credit from MFIs 1 = Get credit from MFIs
15.	Access to Coop Credit	ACOC	0 = No credit from Cooperatives 1 = Get credit from Cooperatives

As can be seen in table 1 above access to credit from formal and informal sources have binary outcome. There are several methods to analyze data involving binary outcomes. However, for this particular study, logit model was selected. Hosmer and Lemeshew (1989) pointed out that the logistic distribution has got advantage over the others in the analysis of dichotomous outcome variable in that it is extremely flexible and easily used model from mathematical point of view and results in a meaningful interpretation. Hence, the logistic model is selected for this study. The general functional relationship between the dependent variable and the 11 independent variables can be given as follows.

Access to Credit = f (EDU, AGE, GEN, FLBR, LSTK, FSIZE, RLGN, EXPKG, DSTNC, LPRCDR, NFINCM)

Logit model is selected for this study because, the dependent variable "Access to Credit" is discreet in nature and have two value. The general logit model can be given as follows (Gujirati, 2003).

$$Z_i = \beta_0 + \sum_{j=1}^{n} \beta_i x_i + U_i$$

Where $Z_i$is the dependent variable with a value "0" when firm i have no access to credit and "1" when firm i have access to credit, $x_i$is a vector of explanatory variables and U_i is the discrepancy term. Using the 11 independent variables and the general logit model above, the following regression equation is used to empirically identify the determinant factors.

$$L_i = \beta_0 + \beta_1 EDU + \beta_2 AGE + \beta_3 GEN + \beta_4 FLBR + \beta_5 LSTK + \beta_6 FSIZE + \beta_7 RLGN + \beta_8 EXPKG + \beta_9 NFINCM + \beta_{10} DSTNC + \beta_{11} LPRCDR + u_i$$

Where:
L_i = log of the odds ratio of having access to credit to not having access to credit
β_0 = *the intercept of the regression equation*
β_i = *the coefficients of each independent variables*
u_i = the error term

5. RESULT AND DISCUSSION

Binary logistic regression was used to identify the determinant factors that affect access to the different financial sources. Binary Logistic regression does not make many of the key assumptions of multiple linear regression and general linear models that are based on ordinary least square algorithms particularly regarding linearity, normality and homoscedasticity (Tabachnick & Fidell, 2007; Pallet, 2005). However, some other assumptions still apply which includes large sample size and multicollinearity. Therefore, these two assumptions were checked before the binary logistic regression is run.

Different authors tend to give different guidelines concerning the number of samples required for multiple regressions. Stevens (1996) recommended that for social science research, about 15 subjects per independent variable are required for a reliable result. That means, for 11 independent variables used in this study; the minimum required sample size should be 165 (15 x11). The 400 responses used in this study are well above the minimum required under this formula and satisfies sample size requirement for this specific regression model.

Another assumption is absence of multicollinearity which refers to the relationship among the independent variables. Since multiple regressions don't like multicollinearity, checking of this assumption is important before starting the analysis (Pallet, 2005). In order to check existence of

multicollinearity among the 11 independent variables, correlation coefficients among the variables were calculated and presented in a matrix as shown in table 2 below.

Table 2: Correlation Matrix Among the Variables forin the Study

	EPKG	DSMF	DSCO	LPDR	AGE	EDU	GEN	RLGN	FLBR	FSIZ	LSTK	NFIC
EPKG	1											
DSMF	-.213**	1										
DSCO	-.002	.054	1									
LPDR	.019	-.131*	.046	1								
AGE	-.101	.254**	-.074	-.088	1							
EDU	-.076	.110*	-.068	-.181**	-.163**	1						
GEN	.034	-.059	-.104	-.021	.104*	.116*	1					
RLGN	-.008	-.121*	.138**	-.400**	.054	.226**	.068	1				
FLBR	.129*	.061	-.038	-.044	.478**	-.107*	.133*	.090	1			
FSIZ	.066	.219**	-.101	.081	.187**	-.044	.007	-.100	.316**	1		
LSTK	.167**	.073	-.001	-.084	.125*	-.030	.003	.096	.400**	.560**	1	
NFIC	-.118*	-.072	.150**	.083	-.210**	.001	-.143**	-.008	-.254**	.034	-.044	1

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed

Source: Survey Data

According to Pallet (2005), multicollinearity exists when the independent variables are highly correlated (r = 0.9 and above). As it is shown in the correlation matrix presented in table 2, all the correlation coefficients among the variables are less than 0.9 which implies multicollonearity is not a problem and all the independent variables can be inserted in to the regression model together.

Once the assumptions were tested as shown above, binary logistic regression analysis was run to identify which of the independent variables significantly determine access to credit from Cooperatives, MFIs and Informal credit sources.

First, determinants of access to credit from cooperatives were identified in table 3 below. The Omnibus Tests of Model Coefficients gives an overall indication of how well the model performs, over and above the results obtained when none of the predictors are entered into the model. This is referred to as a 'goodness of fit' test. For this set of results, we want a highly significant value. When the 11 predictor variables are considered all together, Omnibus Tests of Model Coefficients showed that, they significantly predict whether or not a firm can access credit from cooperative at $\chi 2 = 82.860$, *df= 11, N=344, P* =.000. The effect of the specific factors on access to cooperative credit is presented in table 3 below.

Table 3: Determinants of Access to Cooperative Credit

Factors	B	S.E.	Wald	df	Sig.	Exp(B)
EPKG	2.935	1.183	6.158	1	.013	18.820
DSCO	.108	.076	2.018	1	.155	1.114
LPDR	.946	.387	5.964	1	.015	2.574
AGE	.015	.014	1.104	1	.293	1.015
EDU	.068	.047	2.101	1	.147	1.070
GEN	1.022	1.116	.838	1	.360	2.779
RLGN	1.993	.359	30.853	1	.000	7.336
FLBR	.179	.079	5.145	1	.023	1.196
FSIZ	-.040	.014	8.613	1	.003	.960
LSTK	-.028	.053	.274	1	.601	.973
NFIC	-.109	.323	.114	1	.735	.896
Constant	-6.956	1.853	14.086	1	.000	.001

Source: Survey Data

From table 3, it can be seen that participation in extension package, complexity of loan procedure, Religion, working family size, total farm size of the small holder farmer significantly determine access to cooperative credit at $p < 0.05$.

As indicated in the regression result, participation in extension package enhances access to credit from cooperatives. Farmers who have frequent contact with extension agents are expected to have more information that will influence farm household's demand for credit from the formal sources specifically cooperatives. If a household participates in extension package, then it is expected to have credit for the purchase of farm inputs or technologies from cooperatives. This finding is in line with the finding of the Rwandan study by Ali, Deininger and Duponchel (2014) and Ethiopian study by Girma and Abebaw (2015).

Lending procedures is among the independent variables tested as a determinant of smallholder farmers' access to credit. As seen in the regression result, ease of lending procedure enhances access to credit from cooperatives where as complex loan procedure hinder access to credit. This finding is similar with Yehuala (2008) and Schmidt & Kropp (1987) studies who found that when the lending procedure get complex farmer tend to choose informal sources.

Religion is another factor that affects access to formal credit from cooperatives. Especially, Islamic religion negatively affects micro credit participation. The main reason could be the compliance with Islamic religious customs, which do not allow pre-arranged interest rates, but rely instead on profit and loss sharing principles. Islamic law teaches that paying and receiving credit on interest is forbidden. This finding is similar with finding by Khan (2008) conducted in Jordan, Algeria and Syria which revealed that 20-40 percent of the respondents cited religious reasons for not accessing formal credit.

This study also found that as the number of working family member increase, the probability of access to credit from Cooperative increases. This contradicts with the initial assumptions that the more the labour force available in the family, the lower is the demand for hired labour, which means no or low cost for hired labour. If demand for hired labour decreases due to availability of family labour, the need for credit decreases. This result can be a subject for further investigation in the future.

The last significant variable in the regression output is size of farm land. The analysis found that as size of farm land increase, the probability of access to credit from cooperatives decrease. This contradicts with the initial assumption that larger farm size affects the amount of loan needed through a greater need for variable farm inputs, hence increasing the need for credit.

Other variables including Distance from the cooperative, Age, Education, Gender, Livestock owned, Non farm income are not found to determine access to cooperative credit significantly in this study. These results contradict with the finding by Girma and Abebaw (2015), Yehuala (2008) and Hussien (2007) and should be subject for further investigation.

In addition to access to cooperative credit, the following table 4 identifies factors that determine access to credit from MFIs. The omnibus test of the model coefficient shows that when the 11 predictor variables are considered all together, they significantly predict whether or not a firm can access credit from MFIs at $\chi 2 = 104.087$, *df= 11,N=344,P =*.000.The effect of the specific factors on access to MFI credit is presented in table 4 below.

Table 4: Determinants of Access to MFI's Credit

	B	S.E.	Wald	df	Sig.	Exp(B)
EPKG	-.035	.818	.002	1	.966	.966
DSMF	-.063	.032	3.953	1	.047	.939
LPDR	4.204	.817	26.504	1	.000	66.952
AGE	.001	.016	.003	1	.958	1.001
EDU	-.119	.050	5.598	1	.018	.888
GEN	-.426	.778	.300	1	.584	.653
RLGN	1.531	.405	14.304	1	.000	4.621
FLBR	-.232	.088	6.931	1	.008	.793
FSIZ	-.027	.014	3.893	1	.048	.974
LSTK	.079	.060	1.748	1	.186	1.083
NFIC	.997	.320	9.686	1	.002	2.710
Constant	-2.865	1.542	3.450	1	.063	.057

Source: Survey Data

From table 4, it can be seen that distance from MFIs, Complexity of Loan procedure, Education Level, Religion, number of working family members, Farm land size, Non farm Income significantly determine access to credit from MFIs at $p < 0.05$.The effect of loan procedure, working family size and farm land size on access to credit from MFIs is similar with that of access to cooperative credit discussed above.

In this regression analysis, distance from MFIs was found to be significantly affecting access to credit from MFIs. This might be because; farmers near MFIs have a location advantage and can contact the lender easily and have more access to information than those who live at distant locations. This result is similar with the finding by Yehuala (2008) and Hussien (2007) who found the location of smallholder farmers affected access to credit from MFIs.

The second factor that was found to be significantly affecting access to credit from MFIs is Lending procedure. This implies complex lending procedure discourage access to MFIs' credit, In addition to the empirical finding above, interview with officials of cooperative agency further indicates that group lending is the most common method of providing rural credit to the poor who could not bring material collateral. However, poor farmers especially the very poor farmers find group lending inconvenient to access credit from MFI since they are frequently rejected from the group by others.

Educational level of the smallholder farmer was also found to affect access to MFIs credit. This might be because farmers who can read and write are expected to have more exposure to the external environment and accumulated knowledge. They have the ability to analyze costs and benefits of each alternative. Higher levels of education imply better technical knowledge, know-how and farming skills, more information on credit markets and facilities and familiarity with bureaucratic procedures. This result is similar with Girma and Abebaw (2017) and Tang et al. (2010) who found education as one of the most important variables that affect households demand for credit.

Number of working family members was found to negatively affect access to credit from MFIs. This is in line with the initial assumptions that the more family labour force available, the lower is the demand for hired labour, this means no or low cost for hired labour. If demand for hired labour decreases due to availability of family labour, the need for credit decreases.

The last variable that significantly determines access to finance from MFIs is other non farm income. The analysis indicated that farmers having other sources of income have high probability of getting credit from MFIs. This might be because farmers having other sources than agriculture are highly trusted by financial institutions. The remaining variables including participation in extension package, Age, Gender, Livestock owned were not found to determine access to credit from MFIs. This contradicts with the findings by Zewdie (2015), Girma and Abebaw (2015) and Kosgey (2013) and subject for further investigation.

The descriptive study found that 46 percent of smallholder farmers take credit from informal creditors at least sometimes. This implies that informal lending is still important source of finance to the rural and urban population. These sources in their order of importance include; local traders, friends and relatives, local government empoyees and Iqubs. The following table 5 identify factors that determine access to credit from these informal sources. In this case, institutional related independent variables including participation in extension package, distance and complexity of loan procedure are not included since the sources of finance are informal. The Omnibus Tests of Model Coefficients for this regression shows that when the eight predictor variables are considered all together, they significantly predict whether or not a firm can access credit from MFIs at $\chi 2 = 30.077$, *df= 8, N=360, P =*.000.The effect of the specific factors on access to MFI credit is presented in table 5 below.

Table 5: Determinants of Access to Credit from Informal Sources

	B	S.E.	Wald	Df	Sig.	Exp(B)
AGE	.016	.012	1.761	1	.184	1.016
EDU	-.065	.039	2.821	1	.093	.937
GEN	-.262	.677	.149	1	.699	.770
RLGN	-.079	.274	.084	1	.773	.924
FLBR	-.169	.069	6.037	1	.014	.844
FSIZ	-.034	.011	9.372	1	.002	.967
LSTK	.063	.043	2.157	1	.142	1.065
NFIC	.599	.260	5.298	1	.021	1.821
Constant	.603	.809	.556	1	.456	1.828

Source: Survey Data

From table5, it can be seen that Educational level, Number of working family members, Farm land size, Non farm Income significantly determine access to credit from informal sources at $p < 0.01$. Other variables including Age, Gender, Religion, Livestock owned are not found to determine access to credit from informal sources.

One interesting finding in this study is the effect of religion on access to finance. In the previous two regression models, smallholder farmer who practice Christianity tend to have high probability of accessing formal credit from cooperatives and MFIs. Muslim smallholder farmers have less probability to take credit from formal sources since Islamic religious customs do not allow pre-arranged interest rates but rely instead on profit and loss sharing principles. When we come to informal sources of finance, religion is not found to be significant which implies that only other factors determine access to informal finance than religion.

6. CONCLUSION AND RECOMMENDATION

Though cooperatives and microfinance institutions are established to provide credit, small holder farmers are not using them properly. The study found that participation in extension package, simplicity in lending procedures, Christianity in religion, large number of working family size and large land size positively affect access to cooperative credit. The study further found that short distance from MFIs, simple lending procedures; higher educational level, large working family size, and

possession of other non farm income positively affect access to MFIs' credit. Concerning access to informal credit, educational level, working family size and land size were found to be significant factors. One interesting finding in this study is the effect of religion on access to finance. Smallholder farmers who practice Christianity tend to have high probability of accessing formal credit from cooperatives and MFIs. Muslim smallholder farmers have less probability to take credit from formal sources since Islamic religious customs do not allow pre-arranged interest rates but rely instead on profit and loss sharing principles. When we come to informal sources of finance, religion is not found to be significant which implies that cooperatives and MFIs in the region should improve their credit provision system to accommodate the Muslim community.

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