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Factors Affecting Credit Constraint and Rural Households' Access to Formal Credit in Ethiopia: The Case of Sebeta City Administration

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Abstract

This study has aimed to identify factors affecting credit constraint and rural households' access to credit in Sebeta City Administration. A total of 190 households, 24% of them female headed households, were included in the study. Logistic regression was applied in order to identify factors affecting credit constraint and rural households' access to credit. The study result revealed that only 15% of households included in the survey had access to formal credit service even though 60% of them indicated that they needed the service. Many of them did not apply for credit for two major reasons, small loan size offered by the institutions and lack of awareness about the process and procedures of the organizations. Regarding access to credit, the result of the survey indicates that four continuous variables, age, aging, family size and number of livestock in tropical livestock unit significantly affected access to credit. Similarly, four categorical variables, namely Extension package, Sex of the household head, Ownership of irrigable land and Group membership significantly affected rural household's access to formal credit. However, education level, income and land size didn't have significant impact on credit access. Number of livestock owned negatively influenced access to credit while family size and aging have positive impact on access to formal credit. Furthermore, the result of the study revealed that male headed households were more likely to access credit compared to female headed households. Finally, ownership of irrigable land, and group membership positively affected access to formal credit service while access to extension service had negative effect on access to formal credit.

With respect to Credit Constraint, the study result indicates that 57.3% of the households included in the study were credit constrained households. From the continuous variables, age of the household and number of livestock owned have significant impact in determining credit constrained households while number of dependent children, education, family size and land size seemed to be insignificant in determining credit constraint. From the dummy variables, Sex of households had impact on credit constraint while group membership is insignificant in identifying credit constraint. Aging and number of livestock owned negatively affected credit constraint. As people

become older, they accumulate enough wealth which can serve as collateral to access credit. Livestock ownership had negative impact on credit constraint since livestock can be easily converted to cash; people with larger number of livestock may prefer to sell their animals to meet their financial needs instead of accessing credit from financial institutions.

The finding of the study also indicates that most of the explanatory variables expected to affect access to credit were found to be in line with theoretical and empirical findings of other studies. It also shaded light on the need to revisit the loan size currently provided by financial institution and importance of awareness creation activities to promote farmers understanding about credit and saving.

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1. Introduction

1.1 Background

Ethiopia is one of the poorest nations in Sub-Saharan African countries. In 2014, the per capita income of the nation was $ 530; according to Human Development Index (HDI), it is ranked 173rd from 187 countries (UNDP, 2015). Agriculture remained the backbone of the country's economy; it directly supports 85% of the population, 43% of the GDP and over 70% of export value (Ibid). Increasing agricultural productivity level is considered to be the most vital requirement for sustaining economic growth in Ethiopia. The country's capacity to address poverty, food insecurity and various other socio-economic problems is highly dependent on the performance of this sector.

According to MoFED (2003), growth in agriculture implies higher incomes of the agricultural population and hence increased consumption. Thus, domestic demand for industrial goods and services particularly trade will expand, providing the industrial and trade sectors an impetus for growth. The expanded domestic market will lay a firm foundation for accelerating growth of the non-agricultural sectors.

The importance of rural credit services can be best understood by their potential contribution to the development of the agricultural sector. Credit is

necessary for small-scale farmers to increase their agricultural productivity and farm income. Modernizing agriculture requires significant amount of credit to finance use of purchased inputs such as fertilizer, improved seeds, insecticides, additional labor and so on.

Gurley and Shaw (1967) have stressed the role of credit market imperfections as an obstacle to rapid economic growth. The message from strand of literature revealed that financial deepening in the form of smoothly functioning insurance and credit markets is a prerequisite for economic development.

Despite the importance of credit for rural households to increase production and productivity of agriculture sector, their access to institutional credit is limited due to various factors. The banking sector does not satisfy the growing demand for credit and many borrowers turn to the informal sector to meet their needs. It has been estimated that only 5% of farmers in Africa and about 15% in Asia have had access to formal credit (Swain, 2001).

There is no consensus among scholars also as to what determine households' access to credit and factors affecting credit constraint. For example, some researchers such as Zeller et al (2002) argued that gender appeared to have no impact on credit access while others argued that women are especially discriminated against formal financial markets. Furthermore, since such kind of study has not been conducted in the study area, this paper is helpful in bridging the knowledge gap and can positively contribute to the on-going debate on factors that affect rural household's access to credit service.

2. Research Methodology

2.1 Description of the Study Area

Sebeta City Administration is one of the towns found in Oromia National Regional State, Finfine rounding Oromia Special Zone, at a distance of 25km to the South west of Addis Ababa to the direction of Jimma main road. Sebeta has given the status of Zone and it is also serving as the capital of Sebeta Hawas Woreda. The town is divided in to nine Kebeles (the lowest political administrative Units). It covers a total area of about 9800 hectares. The study area is located between $8^0 53'50''N$ and $8^0 55'59''N$ latitude, and $38^0 36'36E$ to $38^0 40'E$ longitude.

It has an altitude of 2,356 meters above sea level. According to 2007 CSA census, the population of Sebeta town was 49,331 where male and female account for 24,356 and 24, 975, respectively. But, based on the 2013 Sebeta Administration Report, number of population is projected to be 120,427 (male 62,134 and female 59,293)

Figure 1: Map of Sebeta City Administration
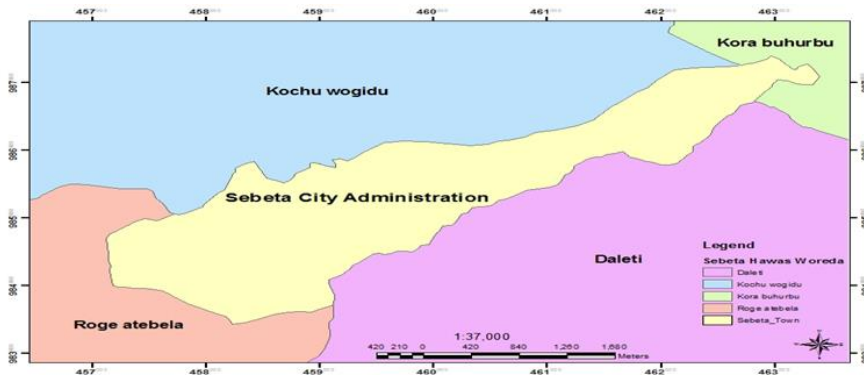
Source: Shape File Adopted from CSA 2007

2.2 Research Design

This research adopted a descriptive survey design. Descriptive research helps to study characteristics of the study subject, estimate proportion of population that have particular characteristic and to discover association/correlation among different variables. Therefore, descriptive survey was deemed the best strategy to fulfil the objectives of the study.

2.3 Sampling Technique

A multistage sampling technique was used to select 190 respondents from the City Administration. Firstly, purposive sampling was used to choose two Kebeles from the Woreda because they are the only rural Kebeles under the City Administration and farmers in this area depend on agriculture to sustain life. In order to include representative women in the study, stratified random sampling was used. First, the households were stratified into male and female headed. Then, systematic random sampling was used to select sample households from each stratum.

2.4 Data Collection

With respect to primary data collection, structured and semi structured questionnaire were used to collect required information from the selected households and key informants. In addition, secondary data were consulted to strengthen the finding of the study.

2.5 Analytical Method

The stated objectives were achieved using one empirical model to estimate the desired variables. In the first objective, only descriptive method was used to analyze the data. In the second and third objective, both descriptive and logistic regression was used in the analysis of categorical and continuous variables.

2.5.1 Model Specification

Empirical Model Specification

"Access '' refers to actual receiving of credit facility from formal financial institution. The response in this case is dichotomous (binary choice variable); includes a ''yes'' or '' no'' type.

However, whether the households were constrained or not the data were derived from their response to the following questions. Do you need credit? Why didn't you access formal credit? Was the amount of credit received enough? Those households that replied '' I don't need credit'' were included in unconstrained group. If the answer was yes, follow up question was asked to know whether they were credit constrained or not. Those households that received credit but replied the amount was insufficient were considered as credit constrained households. Furthermore, those who didn't apply for credit due to small loan size, lack of awareness about the conditions and procedures, and those households' whose application was rejected due to unclear reasons were also included in constrained group. However, those household who replied, '' I have enough money'', "loan received was enough" and "afraid of risk" were considered as unconstrained groups. As a result, the final choice in the case of credit constraint was also binary '' Yes'' if constrained and '' No" otherwise.

According to Brooks (2008), both the logit and Probit are non-linear models and are estimated using maximum likelihood (ML) method. They are the most widely used model when the dependent variable happens to be

dichotomous (Gujarati``, 2004). Probit has a normal distribution while logit has a logistic (slightly flatter tails) distribution. The choice of probit versus logit regression depends, therefore, largely on the distribution assumption one makes. The logit regression model in practice has been used by many researchers because of its comparative mathematical simplicity. The logistic regression is powerful, convenient and flexible and is often chosen if the dependent variable is of categorical nature or it is not normally distributed. Some of the study variables were categorical and therefore this study applied binary logit model to identify the factors that influence access to credit.

Logistic Probability Model is Econometrically Specified as

$$P(Xi) = \frac{e^{\alpha+BX}}{1+e^{\alpha+BX}} = \frac{1}{1+e^{-Z}} = e^{Z} \qquad Where\ Z = \alpha + Bx$$

- Where, Pi is the probability that an individual access credit given Xi
- Xi represents the ith explanatory variable, a vector of household socioeconomic, demographic, institutional and communication characteristics and
- e denotes the base of natural logarithms,
- α and β are parameters to be estimated

Central to the use of logistic regression is the logit transformation of P given by Z, that is, to get linearity, we take the natural logarithms of odds ratio equation. The logistic transformation is given by:-

$$Z = \ln\left(\frac{Pi}{1-Pi}\right) = \alpha + \beta 1 X1 + \beta 2 X2 + \cdots. + BnXn + Ui$$

- Where Zi is the indicator of smallholder farming household access to credit or not,
- Ui is the error term.

2.5.2 Variables and Expected Signs

Table 1: Variables Expected to Affect Access to Credit and Expected Sign

List of variables	Description	Expected sign	Remark
Age	Age of the household head in years (continuous)	-ve or +ve	Based on previous studies
Aging	Age square of household head (continuous)	+ve	Previous studies
Education	Education level of a household head (years)	+ve	Based on previous studies
EXTS	Extension service by farmer (0= No, 1 = yes)	+ve	Based on previous studies
FSIZE	Family size of the household	+ve	Based on previous studies
GRPM	Group Membership (0=No, 1= Yes)	+ve	Based on previous studies
LANDSIZE	Total land size in Hectare	+ve	Based on previous studies
Income	Value of Total produce and income generated from off farm activities.	+ve	
IRL	Have irrigable land (0 = No, 1= Yes)	+ve	Own observation
SEXHH	Gender of head of household (Dummy 1= Male, 0= female)	+ve	Based on previous studies
TLU	Number of total livestock measured in tropical livestock unit	-ve	As they can be cash sources for buying inputs.
DCHILD	Number of dependent children under 15	-ve	Based on previous studies

From the personal observation of the researcher, cultivation of irrigable land is labor intensive and inputs need for such purpose is more expensive compared to rain fed agriculture. As a result, household need additional finance in order to cover all the necessary expenses which increases demand for credit.

3. Results and Discussions

3.1 Characteristics of Sample Households

This section presents demographic, institutional and socioeconomic characteristics of households included in the survey such as age, sex, number

of dependent children, education level of household head, size of land holding in hectare, livestock size, participation in extension package, and ownership of irrigable land, income from farm and off farm income generation activities.

A total of 190 households were included in this study, women headed households accounted for 24% of individuals interviewed. The average age of household in the study area is 46.21. Average family size of households included in the study is 4.87 and average number of dependent children per household is 1.63. Average family size of the respondents is slightly below the mean family size for the country.

Land is the most important asset in the Woreda. Mean landholding of the respondents is 2.28 hectare which is twice as large as national average for the country. Another important asset of rural households is livestock; it is measured in terms of number of tropical livestock unit. The mean livestock size of the households is 8.9.

With respect to education which was measured in terms of year of schooling, mean year of schooling for the respondents is 3.78 which seem to be very low.

Regarding purpose for which the credit was used 46% of respondents used it for trade, 22.5% of them used it for livestock fattening, 24% of them for the purchase of agricultural inputs, 6.8% for expansion of irrigation channel and 3.4% of them used it for land rental.

Table 3: Summary of Sample Household Characteristics

	N	Minimum	Maximum	Mean	Std. Deviation
Age of head of household	190	22	76	46.21	11.634
Number of dependent children below 15 years	190	0	6	1.63	1.260
Education level of household head	190	0	12	3.78	4.073
Family size of the household	190	1	10	4.87	1.874
Total size of land owned in hectare	190	0.00	7.00	2.2817	1.10074
Loan size	190	2000.00	5200.00	3851.7	889.01
Total livestock owned in Total livestock unit	190	0.00	39.00	8.9632	7.54467
Total value of income from farm & off farm	190	8000.00	224000.00	57942.1053	46338.46398
Valid N (listwise)	190				

3.2 Number of Households with Credit Access

This section looks at the level of formal credit access by sample households included in the study. As shown in Figure 1, result of the survey indicates that only 15% of the respondents in the study area had accessed to formal credit. However, as depicted in table 6, 60% of the respondents indicated that they are interested to take loan from formal financial institutions.

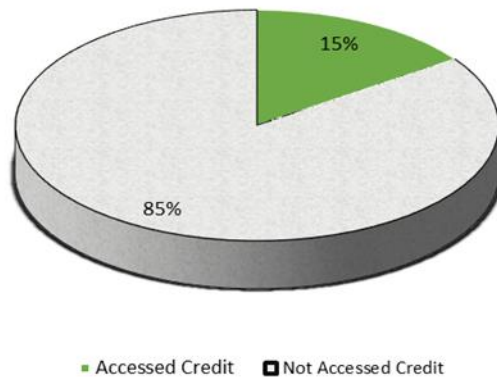Figure 2: Level of Credit Access by Sample Households

■ Accessed Credit   ☐ Not Accessed Credit

Table 4: Demand for Credit

Demand for credit	Frequency	Percent
No	76	40
Yes	114	60
Total	190	100

3.3 Factors Affecting Rural Households' Access to Credit

This section deals with the effect of continuous and discrete variables on access to credit. 7 continuous variables and 4 categorical variables were hypothesized to have effect on rural households' access to formal credit in Methodology section of this document. "Continuous Variable" quantitative variables that can be easily measured while " categorical, discrete or dummy variable'' refers to the variables that are qualitative in nature and can only assume nominal values such variables usually indicate the presence or absence of a "quality" or an attribute.

3.3.1 Descriptive Statics

With respect to gender, 65.5% of those who managed to access formal credit were male and 34.5 % were female. Similarly, 77.6% of those who failed to get access to formal credit were male and 22.4% were female.

Among the farming households who managed to get access to formal credit, 86.2% accessed extension service while 13.8% were not exposed to extension service. On the other hand, from households who failed to access formal credit, 54.7% of them used extension package while 45% did not use extension package.

Table 5: Summary of the Attributes of Smallholder Farmers Access to Credit (for categorical variables)

Variable	Households Accessed Credit (Yes = 1)			Households Not Accessed Credit (No = 0)			P- value
	Obs.	Freq.	Percent	Obs.	Freq.	Percent	
Gender Male Female							0 .1
	29	19	65.5	161	125	77.6	
	29	10	34.5	161	36	22.4	
Participation in extension package Yes No				161			0 .000
	29	25	86.2	161	88	54.7	
	29	4	13.8	161	73	45.3	
Group Membership Yes No				161			0 .097
	29	29	100.0	161	74	46.0	
	29	0	0.0	161	86	53.4	
Own irrigable land Yes (= 1) No (=0)				161			0 .035
	29	11	37.9	161	75	46.6	
	29	18	62.1	161	86	53.4	

3.3.2 Logistic Regression Analysis

This part presents the findings of the factors influencing smallholder farmers' access to formal credit in the study area using logistic regression analysis. The regression emphasis is on analysing both the categorical and continuous variables together and not one at a time.

In the Research Methodology part of this research, 11 variables of which 4 categorical and 7 continuous variables were hypothesized to affect rural households' access to formal credit.

Overall Significance and Goodness of Fit of the Model

- **Overall significance of the model or null hypothesis**: Chi-square was used to test the existence of relationship between the dependent variable and independent variables as a whole. As indicated in Table 8, Chi-square value is 57.7 and it is statistically significant at 1% hence we reject the null hypothesis which states that there is no relationship between the dependent variable, access to credit, and the independent variables. However, some of the variables are individually insignificant in explaining rural households' access to credit.
- **Goodness of fit**: In order to assess the goodness of fit of the model, percentage correctly predicted, -2 Log likelihood and Nagelkerke R Square was used. The results obtained from the Table 8, indicates that overall the model correctly predicts 87.4% expected outcome , Nagelkerke R Square= 0.456 and - 2Log-likelihood is 104.6

Therefore, given the above points, it is possible to conclude that the model is significant in explaining determinants of rural households' access to credit in the study area even though some of the variables are not significant individually.

The result in the table 6 indicates that four of the continuous variables, age, aging, family size and Number of livestock in tropical livestock unit significantly affect access to rural credit. On the other hand, all the four categorical variables, Extension Package, Sex of the household head, Ownership of irrigable land and Group membership significantly affect rural household's access to formal credit. However, education level, income and land size do not have significant effect on credit access.

Though education level in terms of year of schooling shows positive sign, it is statistically insignificant. The finding of the study contradicts with findings of Hussein (2007) who concluded that higher level of education is associated with the ability to access and comprehend information on credit terms and conditions. The reason for insignificance of the variable might be attributed

to low level of education in the study area which is only 3.7 years of schooling.

With respect to land size, its insignificancy might be associated with the fact that the financial institutions in rural area do not take into consideration size of land while providing loan to clients. For MFIs, the loan size depends on the number of terms the client has taken loan from them and the loan size is very small compared to agricultural input price. Furthermore, farmers in Ethiopia are not allowed to take loan from financial institutions presenting their land as collateral.

Table 6: Summary of Logistic Regression Result for Access to Credit

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
AGEHH	-0.216	0.1	4.6	1	0.031**	0.806
AGING	0.002	0.001	4.3	1	0.036**	1.002
EDUHH	0.053	0.08	0.436	1	0.509	1.054
EXTENSION(2)	-1.639	0.883	3.44	1	0.064*	0.194
FSIZE	0.427	0.159	7.232	1	0.007***	1.533
GROUPMEM			6.747	2	0.034**	
INCOME	0	0	0.496	1	0.481	1
IRRIGABLE (2)	1.596	0.731	4.773	1	0.029**	4.935
LANDSIZE	0.218	0.303	0.518	1	0.472	1.244
SEXHH (1)	2.07	0.755	7.517	1	0.006***	7.923
TLU	-0.14	0.082	2.867	1	0.09*	0.87
Constant	-19.799	40193.12	0	1	1	0
Percentage Correct = 87.4						
- 2log likelihood = 104.6						
χ^2 = Chi-square = 57.7, Sign = 0.000						
Nagelkerke R Square= 0.456						

*, **, *** represents significance at 10%, 5% and 1%, respectively.

3.3.2.1 Elaboration of Significant Explanatory Variables

Aging (age square): Many scholars use age square as a good proxy variable to estimate aging. This variable has positive effect on accessing credit. The possible explanation is as the individual becomes older, they are less likely to take risky business. As a result, financial institutions favour old people. The odd ratio in favour of accessing formal credit increases by 1.002 as aging

increases by 1 unit. The result of the study is similar to the finding of Zelleret al (2002).

The Age of Household Head (AGEHH): The age of household head has negative effect on access to credit. With increase age, the household accumulates enough wealth and depends on own finance to meet their financial needs. They may not prefer to visit MFIs or SACCOs to get their services. As the age of the household increases by one year the odd ratio in favour of accessing formal credit declines by 0.806.

Number of Livestock in Tropical Livestock Unit (TLU): Livestock in the rural areas constitutes accumulation of wealth, security against emergencies, dowry, (also used as a cultural privilege). They can also be easily converted into cash when demand arises. Due to these reasons, it was hypothesized to have a negative relationship with the dependent variable, as the total number of animals in the household increases; the household will 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. The result of the logit model also revealed that the variable has a negative relationship; farmer with lesser number of animals uses formal credit than farmer with larger livestock size. The odd ratio in favour of accessing formal credit use decreases by a factor of 0.87 when the livestock number increases by one unit. The result is consistent with the prior expectation.

Access to Extension Service: -Normally, extension service is expected to motivate farmers to use improved inputs and increase demand for credit. Access to extension by smallholder farmers was significant at 6% level of significance, however, with negative effects on access to credit. This implies that the cost of fertilizer is high compared to the amount of credit given by the finance institution. As a result, farmers may prefer not to request the service. Furthermore, there is no input credit scheme in the study area and farmers are expected to pay 100% cash up front to purchase fertilizer and improved seed.

Family Size of Households: Family size is significant at 5% significance level with positive sign. Proper management of farm and off- farm income generation activities requires adequate labor supply, thus household labor affect access to credit positively. On the other hand, households with large number of children may need credit for consumption smoothing purpose. The study result shows that as the family size increase by one unit the odd ratio in

favour of accessing credit increases by 1.533.The finding of the study concurs that of Hussien (2007).

Sex of the Household Head: Gender of households affects rural households' access to credit and level of significance is 1%. The odd ratio in favour of accessing formal credit for Men is 7.9 compared to female households. Theoretical and empirical studies show that one of the disadvantaged groups from the economic point of view is women. Though microfinance institutions work to reach women, because of the existing gender differences women are still less accessed to use formal credit.

Ownership of Irrigable Land: Ownership of irrigable land is another important factor that affects rural household's access to credit in the study area and the significance level is less than 5%. The odd ratio in favour of accessing credit is 5 times higher for those who own irrigable land compared to those who do not have irrigable land. Cultivation of irrigable land demands higher inputs compared to rain fed agriculture. Hence, it increases demand for credit in order to finance additional resource required.

4. Conclusion and Recommendation

4.1 Conclusion

The finding of the study indicated that most of the explanatory variables expected to affect access to credit were found to be in line with theoretical and empirical findings of other studies. The unexpected insignificance of education level and size of land on credit access entails low level of farmers' education and land not being used as collateral. The amount of credit they receive is not associated with the size of land they own; it mainly depends on number of years they borrowed from the MFIs.

Analysis of impact of gender on access to credit indicates that men are more likely to access credit than their female counterparts in the study area. It shows that despite the various endeavours made to empower women headed households to access credit, they are still disadvantaged groups. Unlike access to credit, male headed households are more likely to be credit constrained compared to female headed households...

Generally, farmers in the study area have limited understanding about services provided by financial institutions, credit and saving. Furthermore,

the size of loan offered by financial institutions is too small compared to demand for the product.

4.2 Recommendations

The major cause for low level of credit access is small loan size which in turn is attributed to farmers' lack of collateral. Land is the most important asset farmers in Ethiopia own. However, the proclamation No. 456/2005 gives farmers only the usufruct right and farmers cannot use their land as collateral to access credit; on the other hand the same proclamation Article 8, Sub-article 4 allows investors to use their lease right as collateral to access credit from financial institutions. The government of Ethiopia need to revisit its current land administration and use proclamation in order to ensure the way farmers can get credit from financial institution using their land holding right.

The loan size given by financial institutions fail to take into consideration up to date market information about the price of agricultural inputs. It is important to conduct market assessment prior to setting loan ceiling.

Farmers also expressed lack of awareness regarding conditions and procedures of financial institutions as among the main reasons for not accessing formal credit. The financial institutions need to make frequent awareness raising campaign in order to inform farmers the services they offer. Their presence in the Sebeta town does not guarantee demand for their product.

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