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DETERMINANTS OF RURAL HOUSEHOLDS LOAN REPAYMENT PERFORMANCE, IN OROMIA NATIONAL REGIONAL STATE: THE CASE OF DODOTA WODEDA

SOLOLOMON ALEMU
ASST. PROFESSOR
DEPARTMENT OF ECONOMICS
ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY
ADAMA

ADDISU BAJIRA
INSTRUCTOR
DODOTA PREPARATORY SCHOOL
ARSI ZONE OROMIA REGIONAL STATE

ABSTRACT

A study was conducted to identify factors affecting loan repayment performance of Rural Householders in Dodota Woreda (District), Oromia Region of Ethiopia. It has tried to assess the extent to which rural credit service provided by MFIs functions and how default and non-default rates are associated with socio-economic characteristics of rural households in the study area. Necessary data were collected from both primary and secondary sources. The cross sectional primary data was collected from selected rural households and experts of the financial institute operating in the study area. Stratified sampling technique was employed to select rural household clients of two MFIs, OCSSC (Oromia Credit and Saving Share Company) Microfinance and KSCUCS.s (Keleta Saving and Credit Union) operating in the study area. Descriptive analysis result shows that the loan default rate in the study area is very high. Around 39% of the clients of the selected MFIs have defaulted on their loan either technically or financially. The Logistic regression analysis revealed the fact that the borrowers (rural households) age, sex, number of oxen owned, land holding size, access to extension service, loan supervision, and training before loan were found to be positively and significantly affecting rural households' decision to fully and timely repay their loan. However, household size and the level of interest rate are the major factors which are responsible for the increase in the default rate of households in the study area. Surprisingly, households fertilizer use, off farm income, irrigation use, and amount of money spent on nonproductive (festival) purpose were found to have no significant impact on the rural households' loan repayment performance.

KEYWORDS

Dodota Woreda, Rural households, Micro financing, Loan repayment, Logit model.

INTRODUCTION

In Ethiopia, agriculture is a dominant economic activity. The livelihood of the population in rural areas is mainly based on agriculture – typically mixed farming. The agricultural sector accounts for nearly 44% of the GDP and provides employment for 85% of the population (MoFED¹, 2010). The sector is characterized by small and subsistent farming.

In spite of its vast agricultural potential, Ethiopia has been trapped in the state of food insecurity and poverty. The country has been chronically dependent on food aid, and it is currently one of the largest recipients of food aid in Africa (Teklay and Solomon, 2013). In an effort to improve the precarious food situation in Ethiopia, expanding the use of new and improved technologies are crucial issues that has to be considered both by policy makers and development partners.

In Ethiopia among other things, lack of finance is one of the major problem impending production, productivity and income of rural and urban population. Since access to institutional credit is very limited, majority of the poor obtained financial service through informal money lenders, from their families and other informal sources

Access to financial services to small farmers is regarded as one possible strategy to gradually transform the subsistent farmers into commercial. Agricultural credit is a critical input required by the small farmers to establish and expand their farms and hence increasing their agricultural production and their farm income. Agricultural credit also enables the poor farmers to fully utilize their farm resources and take advantage of the potential profitable investment opportunities in their immediate environment (Zeller and Sharma, 1998). Thus, here comes the importance and significance of the availability of microfinance institutes to bridge the gap between owned and required capital to finance basic farm operations and technologies that would increase production and productivity of the rural community.

In Ethiopia, the importance of agricultural credit in the development of the sector has been underlined strongly by different authors including Bekele 1995; who have concluded that credit helps to bring about the required productivity and food self-sufficiency through the adoption of new and improved technologies. Moreover, Tekaly and Solomon (2013) concluded that rural households without credit access are more exposed to state of being food insecure than the households with relative credit access.

Realizing the importance of access to financial services to the development of rural community, effort has been made by different development partners and government to provide financial services through Micro-financing schemes. The Ethiopian government issued its first microfinance legislation in 1996 (proclamation 40/96) with the aim of providing microfinance service to poor by deposit taking microfinance institutions. As of June 2007, there were about 27 microfinance institutions registered under National Bank of Ethiopia. (AEMFI², 2008). These MFIs are operating throughout the country.

However, in Ethiopia like other sub-Saharan African countries, loan default is a bottleneck that impairs the effective implementation and expansion of financial services of Micro-finance institutions. Loan default is also discouraging the financial institutions from refinancing the defaulting members, which put the defaulters once again into vicious circle of low productivity. Farmers who hadn't repaid their last loan could not apply for credit in the next year. As a result they can not acquire all seasonal inputs necessary to run their agricultural activities.

In Oromia Regional State specifically in Dodota Woredas, Oromia Credit and Saving Share Company (OCSSC) and Keleta Saving and Credit Union (KSCU) provide credit for rural householders since 2006. However, the loan repayment performance of the beneficiaries was found to be low, with an average loan recovery rate of 94.1% and 84.8% respectively for last five years (OCSSC, 2012 and KSCU, 2012). If such situation continues, the institutions themselves may default and terminate their financial service provision to the needy rural households.

Therefore, this paper attempted to identify major factors affecting the loan repayment of rural householders in Dodota Woreda in Oromia Regional State of Ethiopia.

¹ MoFED : Ministry of Finance and Economic Development of Ethiopia

² AEMFI : Association of Ethiopia Microfinance Institution. Website- www.aemfiethiopia.org (2008), Addis Ababa Ethiopia.

OBJECTIVES OF THE STUDY

The overall objective of this study is to analyze the loan repayment performance of rural householders of Dodota Woreda. Specifically the paper will try to;

- identify socio-economic factors affecting loan repayment and
- identify institutional factors affecting loan repayment

SIGNIFICANCE OF THE STUDY

This study contributes to the existing body of knowledge in the rural community particularly in Dodota Woreda about major factors responsible for rural households' poor loan repayment performance. The study also provides a piece of information which help local governmental and nongovernmental financial institutions, policy makers, policy implementers, to channel their efforts to minimize the loan default rate by designing successful credit programs in the study area and in similar Woredas having similar socio-economic characteristics in Arus Zone. Moreover, the study would provide micro level information for those who would like to conduct detailed and comprehensive studies on rural credit.

RESEARCH METHODOLOGY

STUDY AREA

The study area called Dodota Woreda³ is found in the East Arsi Zone of Oromia Regional State, south East of Addis Ababa at a distance of 125 km and to the North of Assela. The capital city of the zone, at a distance of 50 km. Dodota is one of the 26 Woredas of Arsi zone. The historical name of the Woreda is derived from trees name mostly found in the rift valley named as "Dodota". However before 2004 the Woreda named as Dodota Sire. But due to the decentralization policy of government, Sire as a Woreda separated from it. Currently Dodota has 14 kebeles⁴ of which 12 are kebeles and 2 urban administrations in Dera town. The Woreda is located between 8°10'N to 8°30'N Latitude and 39°10'E to 39°30'E Longitude. Relatively, Dodota is found North of Hetosaa, North-west of Lode Hetossa, West of Sire, East of Zuway Dugda Woreda and South of East Shewa Zone, With the total area of 445.6 Km².

According to Agricultural Development Office (2011) the study area (Dodota Woreda) is dominated by kolla⁵ climate, with altitude ranging from 500m-1300 masl. The annual average rainfall ranges between 500 mm-900mm notably in the main rainy season of summer (June to August), with temperature range between 15°C-27°C. From total area of Woreda, about 49.3% and 16.10% are used for crop production and construction and residential purpose. The soils in the Woreda are characterized as fertile sandy to clay soils which is more productive with irrigation but there are shortage of rain & water in the area. Due to its rift valley location and desertification, the Woreda has low network of river systems. The Woreda has high potential for both traditional and modern irrigation system mostly from Awash River for production of sugar cane, fruits, and vegetables.

According to the 2007 population census, population of the Woreda was reported to be 72680 of which 36576 were males and 36104 were females. 68% of the population live in the rural areas and gain their livelihood from agricultural sector. The overall population density of the Woreda was '163 p/km²' and agricultural density was 114p/km². In the Woreda, the average family size in the rural areas was 7.2 persons per household.

The study area is characterized by production of annual food crops and livestock rising. The major annual crops grown in the Woreda are cereals, Pulses and Oil Seeds. From cereal crops Wheat, Barley, Maize and Teff, are the most widely grown once. In addition, the Woreda is known in producing some cash crops like sugar cane, tomato, onion and different fruit by the use of irrigation.

Livestock production takes different forms such as providing traction power for land preparation; threshing and transportation as well as using manure to fertilize the soil for crop production and the livestock products are used as a source of food for the family. Similarly, crop production can contribute to livestock production by supplying feed in the form of residuals and stacks. Animal dung is also an important source of energy for households and can be used as a source of income for the farmer's in the vicinity of the towns. Livestock like, Cattle 43%, Sheep 25%, Goats 25%, Donkeys 6%, Horses 1%, Mules 0.85%, and Camels 0.15% are the major livestock population found in the Woreda. Oxen is the only source of traction power in the area, are owned by most of the farmers. In general, farmers give priority to have oxen ownership relative to ownership of other forms of livestock. As a result, the number of oxen per farmer is second to that of poultry, whose production and management system is simple and later change to beef farming after the end of cultivation of land.

Regarding the financial service access, there are different types of financial service in the Woreda. Microfinance institutes are mostly used for transfer of money and saving of money for the farmers rather than borrowing. The Operation of Mekilit Microfinance is limited only to two urban kebeles in Dera town.

The Oromia Credit and Saving Share Company (OCSSC) and Keleta Saving and Credit Union (KSCU) are the major microfinance institutions which are operating both in urban and rural kebeles of the Dodota Woreda.

The OCSSC started its operation in Dodota Woreda in 2006 for the purpose of providing financial services to poor people with the initial client number of 440 poor households and loan with the amount of 651640 Birr. In year 2011 this micro finance provided loan to 1326 rural and 1681 urban clients with the loan size of 4344965.96 Birr and 5256435 Birr respectively.

Another microfinance institute called OCSSC (Oromia Credit and Saving Share Company) is operating on the basis of group lending. Small and self-formed groups of borrowers, who took on collective responsibility for repayment of loans, were selected on the basis of several criteria, of which business plan and poverty status were the more important ones. To get loan rural households (farmers) of the Woreda are organized in to groups, with the members of 40-60 peoples in each group. Based on OCSSC records, the borrowing interest rate in 2011/12 was 13% per year on average. Borrowers were expected to make regular deposits and repayments. OCSSC reported that, the average loan default rate for OCSSC in 2007 was 3%, but in 2011 it was 7%.

Before the formation of KSCUC farmers of Dodota Woreda were organized under Self-help to get support and acquire credit from the institution for long period. Later Self-help was shifted to form farmer's cooperative union (now Called Keleta saving and credit union cooperatives) at 2006 with the member of 695 and loan amounts of 856743.6 Birr to improve the livelihood of farmers in the Woreda. In 2011 these cooperatives union provided loan to 2450 rural households (farmers) and 654 nonfarm clients with the loan amount of 7315700.56 Birr and 2943342.86 Birr respectively. To get loan farmers have to save first about 25% of the loan and organized in to groups. KSCUC reported that, the total borrowing interest rate is 15% of which 13% will be paid to KSCUC and 2% for each groups in which the borrower belongs. The average loan default rate for KSCUC in 2007 was 10%, but in 2011 it has increased to 17%. These imply that the average default rates are increasing over time. If it continues like these, the institution cannot be effective and may not sustain in its operation. Therefore, it is reasonable to identify the major factors affecting the loan repayment performance of rural householders of Dodota Woreda.

SOURCES AND METHOD OF DATA COLLECTION

For the purpose of assessing factors affecting loan repayment performance of rural households both primary and secondary data were collected from different sources. The cross sectional primary data were collected from 191 randomly selected households and experts of the financial institute operating in the study area. Structured questionnaires were used to collect primary data from selected households in the study area. Personal interview was also conducted to collect relevant information from respondents who are working as expert in the selected microfinance institutes (MFIs) of the financial institutes. To ensure the validity of the instrument, the questionnaire was pre tested.

³ Woreda is the second tier after 'zone' in administrative structure of Federal regions and it is composed of a number of kebeles (the smallest administration structure next to woreda)

⁴ kebele is the smallest administrative unit of Ethiopia similar to a neighborhood or a localized and delimited group of people

⁵ Kolla is a climatic condition characterized by above 22°C temperature and annual rainfall less than 1400 mm, below 1500 meter above sea level (m. a.s.l) of elevation,

To supplement the primary data, secondary data were collected from published and unpublished sources of seasonal and annual reports of the Woreda , zonal and regional offices of the Agriculture and Rural Development (ARD), and Financial Institute Office (FIO) where generation of information about the general back ground of the Woreda was made. The total sample size was determined using the following relationship given by Watson (2001).

$$n = \frac{p(1-p)}{Z^2 \cdot \frac{e^2}{N}}$$

Where n represents the optimal sample size, Z is the abscissa of the normal curve that cuts off an area at the tails, e is the desired level of precision, and p is the estimated proportion of an attribute present in the population. Hence, in this paper, the researcher took the proportion of households who have repaid their loan successfully (P= 0.61). The desired a confidence level of 95%.

METHOD OF DATA ANALYSIS

To meet the objectives of the study, both descriptive and econometric analysis were employed. The collected data was analyzed using different Statistical Packages.

MODEL SPECIFICATION

To examine factors influencing the loan repayment performance of rural households, binary logistic regression model was used. The dependent variable is binary or dichotomous and has only two groups: Defaulters and non-defaulters, whereas, the explanatory variables could be continuous, categorical or dummy. In estimating binary choice models the Linear Probability Models (LPM) are the possible alternative models that can be used for a binary response variable (Gujarati, 2004). Some of the problems of applying the Ordinary Least Squares when the response variable is dichotomous are: [1] Non-normality of the disturbances [μ_i], although OLS does not require the disturbances [μ_i] to be normally distributed, we assumed them to be so distributed for the purpose of statistical inference. [2] Heteroscedasticity variance of the disturbances terms: the classical assumption of homoscedastic can no longer be maintained in LPM. As statistical theory shows, for a Bernoulli distribution the theoretical mean and variance are, respectively, P and P(1 - P), where P is the probability of success (i.e. in our case the non-default probability of rural household) showing that the variance is a function of the mean. [3] Possibility of E(Yi/X) might lie outside of Logical band; that is, the range of 0 to 1. Hence, there is no guarantee that \hat{Y}_i , the estimators of E(Yi | Xi), will necessarily fulfill this restriction, and this is the real problem with the OLS estimation of the LPM. [4] Even the fundamental problem with the LPM is that it is not logically a very attractive model because it assumes that $P_i = E(Y = 1/X)$ increases linearly with X; that is, the marginal or incremental effect of X remains constant throughout (Ibd) In this study the dependent variable is a binary choice, either the householders is defaulters (Y=1) or none(Y=0). It is believed that a set of factors represented as vector X affects the probability of being in either of the two groups.

$$prob (Y = 1 / X) = F (X, \beta)$$

$$prob (Y = 0 / X) = 1 - F (X, \beta)$$

The set of parameters β reflects the impact of changes in X on the probability. In this case what interests us is the marginal effect of explanatory variables on the probability of being default.

Both Probit and Logit model which are Linear Probability Models (LPM) are commonly well -established approaches in the analysis of binary choices (Gujarati, 2004). Whether to use Logit or Probit is a matter of computational convenience. Probit and Logit models are different due to the specification of the distribution of the error terms as Logit model assumes that the underlying distribution of the error terms is logistic while Probit assumes the distribution to be normal. But both are almost converges to each other with increase in sample size. The Logit model has been widely used in many fields, including Economics. Hosmer and Lemeshew (1989) pointed out that a Logit model has got advantage over others in the analysis of dichotomous outcome variable in that it is extremely flexible and is easily used model from mathematical point of view and results in a meaningful interpretation.

Thus, owing its advantage this study used binary Logit model. The model enable us the determination of those factors affecting loan repayment performance of rural householders in the study area. In the study rural households are classified as defaulter and non - defaulter based on their ability to repay their debt. Accordingly, the cumulative logistic probability model is specified as follows:

Following Gujarati (2004), the Logit model, for binary choice, variable Y_i takes value 1 ($Y_i = 1$) if the household is default, $Y_i = 0$ ($Y_i = 0$) otherwise. The

Probability of being default is a function of Z_i . Where $Z_i = \alpha + \beta_i X_i$

Following the same author the logistic model could be written in terms of the odds ratio and log of odds ratio, which enable one to understand the interpretation of the coefficients. In this study, the odds ratio is the ratio of the probability that a household would default (P_i) to the probability that a household would be non-defaulter ($1-P_i$).

$$(1 - P_i) = \frac{1}{1 + e^{Z_i}}$$

$$\left(\frac{P_i}{1 - P_i}\right) = \frac{1 + e^{Z_i}}{1 + e^{-Z_i}} = e^{Z_i}$$

Therefore,

$$\left(\frac{P_i}{1 - P_i}\right) = \frac{1 + e^{Z_i}}{1 + e^{-Z_i}} = e^{(\alpha + \sum \beta_i X_i)}$$

Taking the natural logarithm of equation (4)

$$Y_i = \ln\left(\frac{P_i}{1 - P_i}\right) = \alpha + \sum_{i=1}^k \beta_i X_i$$

$$Y_i = \alpha + \sum_{i=1}^k \beta_i X_i + \mu_i$$

Where: K=the number of explanatory variables; Xi= vector of independent socio-demographic, socio-economic and institutional variables of households and μ =the error term of the model. For continuous variables, the marginal effect is the probability change in response to an increase in the value of the independent variable by one evaluated at the mean value

VARIABLES AND THEIR ASSUMPTIONS

Dependent Variable: The dependent variable of this study is loan repayment of the rural household. It is a binary or dichotomous variable representing the payment status of households.

Independent Variables: It is hypothesized that households' loan repayment decision (status) at any time is influenced by the combination of various factors. This includes both dummy and continuous variables such as: household characteristics, socioeconomic characteristics and institutional characteristics in which the borrowers operate. The variables expected to affect the loan repayment performance are summarized in table 1.

TABLE 1: DEFINITION OF THE INDEPENDENT VARIABLES INCLUDED IN THE MODEL AND THEIR EXPECTED SIGN

Variable	Description	Type	Unit of measurement	Expected sign
Sex	Sex of the borrower	Dummy	1 if the borrower was male and 0 otherwise.	+/-
Age	Age of the borrower	Continuous	Age in number of years	+
Family size	Household size of the borrower	Continuous	Number of the family members	-
Education	Educational Level of the borrower	Continuous	The level of formal education	+
Land Size	Land Holding size of the borrower	Continuous	Total land owned per household in hectare	+
Oxen	Ownership of Oxen	Continuous	Total number of Oxen owned per the borrower.	+
Loan size	Amount of loan	Continuous	Amount borrowed by the borrower.	-
Interest rate	Interest rate	Continuous	Amount of interest rate paid by household for the borrowing	-
Off-farm Income	Off farm income of borrower	Continuous	Amount of additional income that the borrower gets outside of farming activities	+
Irrigation	Whether the borrower use irrigation or not	Dummy	1 if the household has access to irrigation , 0 otherwise	+
Access to Ext.	Access to Extension services	Dummy	1 if the household has access to agricultural extension, 0 otherwise	+
Training	Training before loan	Dummy	1 if the household has got training before loan , 0 otherwise	+
Supervision	Loan supervision	Dummy	1 if the household has been supervised, 0 otherwise	+
Loan Diversion	Loan diversion is a money spent on festival or other nonproductive use	Continuous	Amount of money spent on festival	-

RESULT AND DISCUSSION

DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS OF HOUSEHOLD

The households' profile and their demographic and socio-economic characteristics are summarized in table 2. It was hypothesized that household size will have a negative influence on the households (borrowers) loan repayment performance. As the number of household size increases the family need for basics good and services will increase proportionally and this may induce the borrowers to divert part or all of the borrowed money towards fulfilling their basic needs or the need of their family members instead of using the money for more productive use. This may reduce the households (borrowers) loan repayment performance. As expected the household size of the borrowers who have defaulted on their loan is higher than those borrowers who have successfully repaid their loan and this difference is statistically significant at 1% of significance level (table 2)

TABLE 2: HOUSEHOLDS' SOCIO-ECONOMIC CHARACTERISTICS AND THEIR LOAN REPAYMENT STATUS (continuous variables)

Continuous Variables	Non-defaulter (N=117)		Defaulter (N=74)		p- value (chi2)
	Mean	SD	Mean	SD	
Family size	5.6	2.3	7.7	1.8	9.037**
Age of the HH	41.2	10.9	37.8	8.5	0.019***
Land size in ha	2.3	1.1	1.8	0.89	0.015**
Livestock holding (TLU)	5.6	0.9	3.21	1.5	0.431
Oxen Ownership in Number	2.0	0.9	1.3	0.58	0.000***

Source: Own Survey Data, 2013

Note: ***, ** and * Significant at 1%, 5% and 10% significance level

There is ongoing debate among scholars about the relationship between age of borrower households and their loan repayment status. Some argue that as the age of the borrower increases, she/he become more knowledgeable and experienced in managing her/his scarce resources. In other words, as the age of the household increases her or his experience about farm resource and risk management increases. As a result the loan repayment performance improves with the age of the borrower. In contrary to this, some scholars argue that even though as age increases experience and wealth may accumulate. However, due to natural physical limit, individuals' ability to undertake farm activities and more physical labor will decrease. This may reduce the households' ability to generate more income and repay their debt. Thus, according to this group, household age and their loan repayment performance expected to be inversely related. However, table 2 revealed that as age of borrowers increase their loan repayment performance seems increasing. The average age of non-defaulters' is higher (43.2) than that of defaulters which is an average of 37.8 years. The statistical test confirmed that there is statistically significance difference between the mean ages of the two groups

Land is a key asset for rural households specifically for farmers to sustain and make their livening. Land is also the major sources of income for the household in the study area. If there is large arable land owned by a household, they might get enough amount of agricultural produce which will be enough to support the whole family members. Thus, it was hypothesized that households who own more arable land are less likely to default on their loan. The mean farm size of non-defaulters and default households is 2.3ha and 1.8ha, respectively. The overall mean farm size of the sample households is about 2.1ha. The difference in farm size between the two groups is statistically significant at 5% significance level. It means that, the households with smaller land size are most likely default on their loan than those having relatively larger farm size.

Another farm input that may affect the level of farm income is the number of oxen owned by rural households. Farmers with large number of oxen expected to enjoy higher level of crop production and hence improved level of farm income. This in turn expected to improve the loan repayment performance. The average number of oxen owned by the non-defaulters is relatively higher (two oxen) than the defaulters who own only a single ox. This difference in the oxen ownership is statistically significant at 1% significance level.

Table 3 presents the socio-economic characteristics of households in terms of categorical variable. The sex profile of respondents shows that majority (58.6%) of the clients of the Microfinance Institutions (MFIs) are female clients. It seems that the larger proportion (62.2%) of defaulters is also female clients as compared to their male counterparts which represent 37.8% of the total defaulters. However, the chi-square test does not prove any statistically significant difference between male and female clients in their loan repayment performance.

Education level of households in the study area was also assessed to see how it will affect the loan repayment performance of households and is described in table 4.3. It can be concluded that most of the clients of the MFIs in the study area are illiterate. Literate households represent only about 27% of the households. Education is an important factor that enables households to properly utilize the borrowed fund and hence improving their repayment performance. From the total borrowers who have defaulted on their debt, 81% of them are illiterate as compared to 19 % who are literate and can at least read and write. From this it can be argued that those households who are literate have better loan performance than their counter part illiterate households. The difference in the loan performance between the two groups is also statistically significant at 1% significance level.

TABLE 3: HOUSEHOLD LOAN REPAYMENT STATUS AND HOUSEHOLD CHARACTERISTICS (Categorical variables)

Categorical Variables		Non-defaulter		Defaulter		χ^2	P-value
		Frequency	Percent	Frequency	Percent		
Sex	Female	66	56.4	46	62.2	0.0225	0.881
	Male	51	43.6	28	37.8		
Educational Status	Literate	38	32.5	14	19	7.8818***	0.005
	Illiterate	79	67.5	60	81		
Fertilizer Utilization	Yes	104	88.9	55	74.3	1.3548	0.244
	No	13	11.1	19	25.7		
Access to Extension service	Yes	82	70	38	51.4	1.32	0.251
	No	35	30	36	48.6		
Use of Irrigation	Yes	14	12	8	10.8	0.900	0.764
	No	103	88	66	89.2		
Loan Supervision	Yes	98	83.8	55	74.3	2.1592**	0.043
	No	19	16.2	19	25.7		
Training before loan	Yes	44	37.6	18	24.3	1.0981	0.2709
	No	73	62.4	56	75.7		

Source: Own Survey Data 2013

Note: ***, and ** represents significant at 1% and 5% significance level

Fertilizer use supposed to increase farm income through its effect on farm productivity. This in turn expected to increase the probability loan repayment. About 83.25% of the households in the surveyed area have applied fertilizer in their farms in previous production season. Surprisingly, most of the households (74.3%) who have defaulted on their loan are those who applied fertilizer to their fields as a farm input. However, the chi-square test revealed the fact that there is no association between the fertilizer use and the households' loan performance. This implies that fertilizer utilization in the study area could not help to discriminate households in to non-default and default groups. This might be due to the fact that the price of fertilizer is expensive for rural poor households which may result in reducing the rate applied in their fields. In appropriate rate of fertilizer application may not bring significant improvement in the crop yield. Similar finding was obtained by Teklay and Solomon (2013), who have observed during survey that commonly fertilizer is sold in the local market just like salt or other grains did. Meaning, farmers who have received⁶ fertilizer took it to the local market and sale it so as to smooth their daily consumption. This might affect the rate of application and time of application of fertilizer which in turn reduces the farm return from fertilizer.

Loan supervision by the loan officer is an important activity that has to be implemented on regular basis to minimize the problem of moral hazard and thereby ensuring the productive use of the loan by the rural households. As it can be seen above in table 3, most of the respondents (80%) were officially supervised on their loan utilization and their repayments schedule. It seems that there is an association between loan repayment performance and loan supervision in the study area. This association is statistically significant at 5% level of significance indicating that those households who are periodically supervised are most likely perform better than those who are not supervised at all.

LOAN REPAYMENT PERFORMANCE

The respondents' loan repayment performance as of the date of data collection - April 2013 is presented in table 4. The loan repayment performance is a categorical variable. Most of the householders were not fully repaid their loans timely. During this study out of the total 191 interviewed householders' 117 (61.3 %) respondents' have fully repaid their loan on time, and the remaining 74 which makes 38.7% of the respondents have defaulted on their loan.

TABLE 4: LOAN REPAYMENT PERFORMANCE OF RURAL HOUSEHOLDS

Repayment status	Frequency	Percent	Cumulative (%)
No-default	117	61.3	61.3
Default	74	38.7	100
Total	191	100	

Source: Compute based on selected MFIs.

During the survey among defaulters, 46 which is 62 % of them were complete defaulters while 38 % of them are technical defaulters who paid total interest rate and between 30-50% of the principal. This figure is very high by any standard and need to be addressed if the MFIs have to continue in their provision of financial services to the needy rural households in the study area (Dodota Woreda). Table 5 presents loan default rate by MFIs.

TABLE 5: DISTRIBUTION OF DEFAULTERS BY MFIs

Borrowing rate of interest	OCSSC		KSCUC	
	Frequency	Percent	Frequency	Percent
Default	17	25.8	57	45.6
No-default	49	74.2	68	54.4
Total	66	100	125	100

Source: Survey data (2013)

As it can be observed in the above table (table 5), the loan default rate between the two MFIs, OCSSC and KSCUC is quite different. The OCSSC loan collection performance is better than its counterpart KSCUC. About 74.2% of OCSSC clients have fully repaid their loan as compared to KSCUC which has collected the loan from only 25.8% of its clients. From this it can be argued that among the MFIs operating in the study area OCSSC loan collection performance is much better. The possible reason for the difference in the loan recollection performance of the two MFIs can be due to difference in the lending interest rate. The average interest rate charge by OCSSC is 13% which is less by 2% than the amount charged by KSCUC (15%).

DETERMINANTS OF RURAL HOUSEHOLD LOAN REPAYMENT PERFORMANCE- LOGIT ESTIMATE

So far the paper has tried to characterize rural households based on different demographic and socio-economic factors. However, in this section attempts have been shifted towards explaining the main demographic and socio-economic determinants of rural household's loan repayment performance which is beyond the scope of descriptive analysis and other indices.

Pair wise correlation matrix was employed to test for the existence of the problem of multicollinearity. Accordingly, it is found that there is no serious multicollinearity problem among the explanatory variables. To avoid the effect of heteroscedasticity robust logistic regression was employed as it handles the effect of heteroscedasticity.

⁶ In effort to bust agricultural productivity and encourage farmers to apply fertilizer, the local government will distributed fertilizer to the farmers on credit bases.

In addition, various goodness of fit tests validate that the model fits the data well. The LR chi-square test robustly rejects the null hypothesis that all slope coefficients are simultaneously equal to zero. This implies that the model correctly predicted the observations. The Hosmer-Lemeshow⁷ test of goodness of fit also fails to reject the null hypothesis that the model fits the data well. Hence, the Hosmer and Lemeshow test statistic shows a significant association between the observed and the model's prediction of a household's loan performance status. The count R² for the binary Logit model is found to be 90.00 percent implying that the Logistic model correctly predicted 90 % of the total sample households. Thus, it can be concluded that the binary Logit model under consideration fits the data very well and fairly.

After ensuring the validity of basic assumptions and the explanatory power of the model, it is fitted to the binary Logit model which is depicted in table 6. In the estimation result of Logit model the response variable-rural household loan repayment status regressed on different demographic and socio-economic correlates which are expected to have due influence on households' loan repayment performance in the study area.

In this binary Logit model, fourteen explanatory variables are included of which eight variables are found to be significant determinant factors of rural household loan repayment performance in the study area. These include, age, sex, household size number of oxen owned, land holding size, access to extension service, loan supervision, interest rate and training before loan. The remaining six explanatory variables were found to have no significant influence on loan repayment performance of the rural households in Dodota Woreda.

TABLE 6: LOGIT REGRESSION RESULT FOR FACTORS AFFECTING RESPONDENT'S LOAN REPAYMENT PERFORMANCE

Finished Repayment	Coef.	Robust Std. Err.	P -value	Marginal Effect (dy/dx)
Age	.0866844***	.0266094	0.001	0.016971
Sex	.8348492*	.4670688	0.074	-0.16345
Education	.3852951	.4664572	0.409	0.075433
HH Size	-.5304126***	.1158594	0.000	-0.10384
Land size	.6095041**	.2957256	0.039	0.119328
Fertilizer use	-.0003767	.0080806	0.963	-7.4E-05
Access to Ext	.3807655**	.1669607	0.023	0.07455
Oxen	.6820004**	.3396219	0.045	0.133521
Off-farm Income	-.1151236	.6318846	0.855	-0.02254
Loan Size	-.0001386	.0004181	0.740	-2.7E-05
Loan Supervision	.8015279	.5566085	0.107	0.156922
Training	.7141108**	.4997868	0.051	0.13981
Interest Rate	-.99.06652***	27.44141	0.000	-19.398
Money spent	.0008125	.0030354	0.789	0.0002
Logistic regression Log likelihood = -74.089439		Number of obs = 190 LR chi2(15) = 103.97 Prob > chi2 = 0.0000 Count R2 = 90.00		

Source: STATA output based on survey data

Where, ***, **, * represent level of significance at 1%, 5% and 10% respectively

Age of Household: The estimated parameter for age of the rural household head has a positive and statistically significant impact at one percent level of significance on the rural households' loan repayment performance. This implies that as age of households (borrowers) increase the probability of loan repayment will increase as well and vice versa. The marginal effect which is 0.0169, implying that as the age of the borrower increases by one more year the probability of loan repayment in full and in time increases by 1.6 percent assuming other things are remain unchanged. This finding is consistent with the findings of Okorie (2004) in Nigeria who has reported that age is positively and significantly affects loan repayment performance. However, the finding is inconsistent with the findings of Kashuliza (1993) in Tanzania who has identified that age of the borrower to inversely affect the loan repayment performance in his study area.

Sex of Household: The study has tried to see to what extent being male or female affects the loan repayment of clients in the study area. Sex of the respondent was found to positively and significantly affect the probability of full repayment of loan at ten percent level of significance. Meaning that male borrowers seems to have low probability of default than the female borrowers in Dodota Woreda (study area). Possible explanations for females poor loan repayment performance may be that female borrowers most likely to divert the borrowed fund to household consumption than their male counterparts as they shoulder more responsibility in managing their households expenditure.

Household Size: Household size has been identified to have a significant and negative effect on farmer's loan repayment performance in the study area. This is consistent with the findings of Oladeebo (2008) in Nigeria and Kashuliza (1993) in Tanzania, who all concluded that the family size of the borrowers is one of the significant factor affecting the loan repayment performance of households in their respective study area. Thus, it can be concluded that borrowers with relatively large family size are most likely default on their loan as the result is statistically significant at one percent significant level. The marginal effect shows that a unit increase in household size, will increase the probability of loan default by around 10 % in the study area, other things remain the same.

Land size: As expected, farm size was found to be positively associated with full recovery of loan and it is statistically significant at five percent level of significance. The positive coefficient implies that farmers with relatively larger holdings have higher probability to fully repay their loan. A unit increase in land holding size will increase the probability of full repayment nearly by 12%.

Access to Extension Service: Consistent with researcher's expectation, the coefficient of extension service was found to be positive and significant factor affecting the loan repayment performance of households in the study area. Rural household (borrowers) who do not have access to extension services most likely default on their loan than their counterpart borrowers who have access to extension services. This can be explained by the fact that through extension service households will get periodic training and advisory services on the use fertilizer, improved seeds and other agricultural technologies. Such services enable participants to improve their farm productivity. Increased farm productivity will ultimately increase farm income which will results in improving households repayment capacity.

Number of Oxen: It was assumed that the households' farm productivity increase as the number of oxen owned increases and hence enhances the households' loan repayment capacity. In accordance with the expectation the number of oxen owned by household found to be crucial for farmers' loan repayment performance. It is positively and significantly associated with the loan repayment performance. The marginal effect depicts that a unit increase in number of oxen owned by the borrowers, the probability of full repayment will increase by about 13% other things remain unchanged.

Training before Loan Provision: Consistent to the researcher's expectation, training before loan which is a useful instrument for credit repayment performance is positively related to credit repayment performance of rural households. The result was found to be significant at five percent level of significance. This result is also consistent with the theoretical framework and empirical findings of different researches conducted in different countries. Similar results were obtained by Olagunju (2007), and Okorie (2004), in Nigeria, and Jama and Kulundu (1992) in Kenya.

⁷ Under the Hosmer- Lemeshow goodness of fit , the null hypothesis is that the model fits data well and hence, failing to reject it means the model fits the data well

Interest Rate: Interest rate is cost of borrowing and it is expected to negatively affect the repayment ability of borrowers. As expected the interest rate that the borrowers has to pay for their borrowing had a negative and significant effect on the probability of fully loan repayment in the study area. This implies, that higher borrowing rate, most likely increase the probability of default of the rural households. The marginal effect of interest rate revealed the fact that, other things held constant a unit increase in interest rate, will increase the probability of default by nearly 14% and vice versa. The finding was also consistent with the finding of Arifujjaman (2007).

CONCLUSION

Poverty still remained a daunting challenge to developing countries that threaten their development effort. In deed it is a problem for almost all sub-Saharan African countries irrespective of their level of development and can be observed in many forms. It causes can be different. It may be due to lack of resources, lack of coping capacity, lack of basic human capabilities, lack of institutional defenses or in extreme cases it can be due to lack of all of them. In a wider sense, it may be a combination of economic, social and political deprivations. To address this problem different strategies have been implemented by developing countries. Recently Microfinance (MF) has been given due weight as one of the means to fight against poverty. MF programs include extending small loans to poor people aiming at enhancing self-employment projects that generate income to improve the living conditions of the poor and hence alleviating poverty. Ethiopia as part of the developing countries has adopted MF programs and many MFIs are providing credit services to both rural and urban poor households. In Ethiopia improving access to financial services particularly in rural areas are regarded as one of the development strategies to eradicate poverty in developing countries. However, the success and sustainability of financial service provision of credit is constrained by loan repayment performance of the potential borrowers. Identifying major factor affecting the repayment performance of borrowers is a first step towards suggesting remedial measures. It was with this spirit this study has tried to assess and analyze the loan repayment performance of rural householders of Dodota Woreda, in Oromia Regional state of Ethiopia based on data collected from 191 respondents.

The study documented that the households in the study area are characterized by a low loan repayment performance where about 61 % respondents fully repaid their loan while 39% of them defaulted on their loan. This figure is very high by any standard and is negatively affecting the operation of MFIs. Thus, it is imperative to identify the major factors contributing for such high loan default rate.

Interest rate paid by borrowers happens to be higher particularly when the borrower is poor rural households. It is negatively affecting the loan repayment performance of households and is responsible for increasing the default rate in the study area. It was observed that the MFIs lending rate is higher than the commercial banks' lending rate. One can argue that high borrowing rate is the characteristic of small loan. However, if the rural financial service provision has to sustain it is imperative to improve the loan repayment performance of potential borrowers. One way is taking measures that reduce the rate of borrowing by MFIs through improved efficiency of loan service so as to decrease the borrowing interest rate. The reduction of borrowing interest rate is further justified by the empirical finding which showed that a unit decreases in the rate of interest rate leads to a decrease a defaulting rate by almost 10%.

It was observed that the average family size of the households who have defaulted on their loan is relatively higher (around 7 family members). The empirical finding document that households with relatively large family size are the one who most likely default on their loan and this calls for concerted effort to educate the rural community on modern family planning. This is to say that family planning services need to be considered as one of the important rural development strategies to fight poverty in the rural Ethiopia in general and in Dota Woreda in particular.

The study recognized the fact that any factor that affects the farm productivity such as; farm size, agricultural extension services, ownership of oxen and other relevant farm input have a significant impact on the households income and hence on their loan repayment performance. Thus, addressing the issue of farm input and their productivity through improved agricultural extension services need to be considered as a policy measure that improve the loan repayment performance of the rural household.

Provision of financial services to the rural community could be successful in improving the livelihood of rural households if it is accompanied with training before loan provision and regular supervision to ensure the productive use of the fund by the borrowers. Thus, planning and proper implementation of these two activities need to be considered as part and parcel of the financial operation of MFIs.

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