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Determinants of Small Farmers' Agricultural Credit Repayment: A Case of East Gojjam Zone, Amhara National Regional State, Ethiopia

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ABSTRACT

This study was conducted to identify determinants of small farmers agricultural credit repayment in East Gojjam Zone; Ethiopia. Primary data from 390 households were collected through a questionnaire survey in 2016/17 by using multi-stage random sampling technique. A Binary Logistic model was used to identify determinants of credit use decision. A total of 19 explanatory variables were included in the analysis. The estimation of the binary logit model reveled that, among the hypothesized explanatory variables included in the model, twelve (12) variables were found to be Significantly influence the probability of loan repayment of small farmers' in the study area; Among these, amount of on farm income, amount of off farm income, family size , years of credit Experience, saving amount, training on credit, supervision by lending institution, and perception on repayment period were found important and significant factors that enhance/increase the probability of loan repayment. While variables such as age of household head, annual expenditure, distance of market and amount of loan were found significant factors that weaken/decrease the probability of loan repayment. It is, therefore the study recommends that lending institutions should have to focus on supervision and training of clients to avoid mis-use of loans, family planning, promoting off farm activities to rural areas to diversify income sources, educate small farmers to reduce the social ceremonial expenditures and enhancing the establishment of rural saving and credit cooperatives to improve the saving habits of small farmers are the concern areas that would help to improve loan repayment performance.

Introduction

Credit is a crucial factor in agricultural production and in many cases may be a limiting factor in small farmers' agriculture. Agriculture in Ethiopia can be characterized by the small farmers. CSA (2014/15) agricultural survey report revealed that more than 95% of the total grain production comes from private peasant holders/small farmers. In Ethiopia, the importance of agricultural credit in the development of the sector has been underlined strongly by various authors (Sisay, 2008; Gebrehiwot, 2006; Tsegaye, 2006; Wolday, 2003). All these authors had concluded that credit helps to bring about the required productivity and food self sufficiency through the adoption of new technologies.

However, failure by farmers to repay their loans in time or to repay them at all is a serious problem facing both agricultural credit institutions and small farmers. Increasing defaults in the repayment of loans may lead to very serious implications. For instance, it discourages the financial institutions to refinance the defaulting members, which put the defaulters once again into vicious circle of poverty.

According the annual report of East Gojjam zone department of agriculture (2016/17) about 49.1 million ETB loans which was given from the period 2010 to 2015, has not been repaid until June 2016. This creates a greater pressure on the regional government recurrent budget so that the bank deducts the unpaid amount from the regional government account according to its agreement. However, factors contributing to the poor loan repayment performance /default of small farmers are not yet studied in the study area and investigation of the various aspects of loan defaults is utmost importance both for policy makers and the lending institutions (Kelly, 2005). Therefore, this study is designed to identify determinants of formal credit source of agricultural credit repayment. The findings of this study are significant in terms of adding knowledge and information about the determinants of

agricultural loan repayment of individual borrowers in the study area.

Hypothesis

Based on theories and review of empirical studies the expected sign, code, type and unit of measurements of independent variables included in the binary logit model were summarized in the following table 1.

Table 1. Definitions, units of measurement and expected sign of variables included in the Binary Logit model

Variable	Variable code	Type of variable	Unit of measurement	Expected sign
Repayment performance	REPAYPER	Dummy	1, if a house hold is non defaulter and 0 defaulter	
Age of a house hold	AGE	Continuous	measured in years	-
Sex	SEX	Dummy	1 if the household head is male and 0 for female	+
Family size	FAMSIZ	Continuous	Measured in number	+
Education level	EDUCLVL	Dummy	1 if the household head is literate and 0 otherwise	+
Total Cultivated land	CULTLAND	Continuous	measured in hectare (Ha)	+
Total livestock unit	TLU	Continuous	Measured in tropical livestock unit (TLU)	+
On farm income	ONFARINC	Continuous	Measured in ETB	+
Off-farm income	OFFARINC	Continuous	Measured in ETB	+
Annual Expenditure	EXPEND	Continuous	Measured in ETB	-
monthly Frequency of extension contact	FREXTCON	Continuous	Measured in Number	+
Distance from market center	DISMRK	Continuous	Measured in minutes	-
Amount of loan	AMLOAN	Continuous	Measured in ETB	-
Experience in credit	EXPCRDT	Continuous	Measured in Years	+
Saving	SAVAMT	Continuous	Measured in ETB	+
Training on credit	TRAOCRDT	Dummy	1 if a household took training on credit and 0 otherwise	+
Supervision	SUPERVI	Dummy	1 if a household Supervised by the lending institution after the loan is granted and 0 otherwise	+
perception on repayment period	REPYPERD	Dummy	1 if the respondent think that repayment period is convenient and 0 otherwise	+
Loan diversion	LOANDIVE	Dummy	1 if a household diverted loan and 0 otherwise	-
Credit from informal source	CRDTINFOR	Dummy	1 if a household borrowed money from informal source and 0 otherwise	-

Research Methodology

Sampling design and data collection

The study was conducted in east Gojjam zone, Amhara National Regional State which is located in the northern part of Ethiopia and has a total area of 14.71 thousand sq. Km, with an altitude ranging from 800 to 4070 m.a.s.l. The study area is highly populated area with a small average landholding size of farming households. The projected population of the Zone for the year 2015/16 was estimated to be 2,539,490 of which 48.9% were males. It constitutes about 12.22 % of the total population of the region. The rural population size constitutes 85.25% (BOFED, 2016). The societal dependency ratio was 77.07 percent; this simply shows that in the zone for every person, there is an addition of another 0.77 person to bear the socio economic burden.

Data were collected from 390 sample household heads in 2016/17 through conducting formal survey based on structured questionnaire that was prepared. Multistage sampling technique was used to draw the sample respondents of the study. In the first stage, out of 16 rural districts 10 districts which had relatively high amount of un- repaid loan were selected purposively. Secondly, of the selected 10 districts 3 districts were selected randomly. Third, considering the number of kebeles in each district 2 kebeles[1] from *Enebsiesarmider*, one kebele from *shebel berenta* and one kebele from *Gozamen* a total of 4 kebeles were selected using simple random sampling technique. Finally, from information's obtained from Development agents, Amhara credit and saving institution (ACSI) and Cooperatives the sampling frame of households who took credit and list of non-defaulters and defaulters for each kebele was prepared. Finally, Probability proportional to size random sampling technique was used to draw individual sample households from each kebeles.

Analytical methods

Both descriptive statistics and econometric model were employed to study the relationship between the dependent and explanatory variables. Descriptive statistics such as mean, standard deviation and percentage were used to see the socio economic difference between the two groups (non- defaulters and defaulters). The inadequacy of the linear probability model suggests that a non-linear specification may be more appropriate and the candidate for this will be an S-shaped curve bounded in the interval of 0 and 1(Amemiya, 1981;

[1] The Lowest Administrative Level of Government

Maddala, 1983). Hosmer &Lemshew (1989) pointed out that a logistic regression has got advantage over others in the analysis of dichotomous outcome variables. These are 1) from a mechanical point of view, it is an extremely flexible and easily used function, and 2) it lends itself to a meaningful interpretation. The logit model is simpler in estimation than the probit model. Therefore, a binary logistic regression model was used to identify the determinants of small farmers' agricultural loan repayment. Following Hosmer & Lemshew (1989), the logistic distribution function for identification of the participant and non-participant household heads can be defined as:

The probability of being non- defaulter is given by:

Prob (Y_i=1) =P_i =

$$\frac{1}{1+e^{-z_i}} \quad \text{.....1}$$

The probability of being default is:-

Prob (Y_i=0)

$$=1-Pi = \frac{1}{1+e^{z_i}} \quad \text{.....2}$$

Thus,

Prob (Y_i=1) =P_i =

$$\frac{1}{1+e^{-z_i}} \quad \text{.....3}$$

Where:

P_i is the probability of being non defaulter for the i^{th} farmer and Z_i is a function of n explanatory variables (X_i), and expressed as:

$$Z_i = \beta_o + \beta_1X_1 + \beta_2X_2 + \text{-----+ } \beta_mX_m \quad \text{.....4}$$

Where β_o is the intercept and β_i are the slope parameters in the model. The slope tells how the log-odds in favor of being non defaulter change as independent variables change.

Since the conditional distribution of the outcome variable follows a binomial distribution with a probability given by the conditional mean Pi, interpretation of the coefficient will be understandable if the logistic model can be rewritten in terms of the odds and log of the odds, (Gujarati, 1995). The odds to be used can be defined as the ratio of the probability that a farmer will non-defaulter (P_i) to the probability that he/she will defaulter (1-P_i).

Therefore,

$$\frac{P_i}{1-P_i} = \frac{1+e^{z_i}}{1+e^{-z_i}} = e^{z_i} \quad \text{..... .5}$$

And

$$\frac{P_i}{1-P_i} = \frac{1+e^{z_i}}{1+e^{-z_i}} = e^{\beta_0+(\sum_{i=1}^{n}\beta_iX_i)}$$

.....6

Taking the natural logarithm of the odds ratio of equation (6) will result in what is known as the logit model as indicated below:

$$\ln\left[\frac{P_i}{1-P_i}\right] = \ln\left[e^{\beta_0+(\sum_{i=1}^{n}\beta_iX_i)}\right] = Z_i$$

.....7

If the disturbance term U_i is taken into account the logit model becomes

$$Z_i = \beta_o + \sum_{i=1}^{n}\beta_iX_i + \cup_i \quad \text{.....8}$$

Where β_o is the intercept and β_i are the slope parameters in the model. The slope tells how the log-odds in favor of being non defaulter change as independent variables change.

Results and Discussion

Descriptive Analysis

In order to investigate the presence of group mean difference with respect to the hypothesized social, economic, and institutional factors uni-variate tests were used. Student's t-test and Chi-square statistics were used to identify the potential continuous and dummy variables differentiating non-defaulters from defaulters respectively. Non-defaulter and defaulter households significantly different in eight of the twelve hypothesized continuous variables (Table 2). The average age of the sample household heads was found to be about 45 years ranging from 24 to 86 years and 42 percent of respondents have an age of greater than 45 years. The mean age of non-defaulter was found to be less than that of defaulter and the t-test result showed that insignificant mean difference (table 2). The family size of the sample households ranges from 1 to 11 persons, with a mean of 4.78 persons and about 59 percent of respondents have a family size of 3 to 5 persons. The average family size of non-defaulters and defaulters was found to be 4.87 and 4.69 persons. Statistically insignificant mean difference was observed between the groups in the mean family size.

The average size of cultivated land by sample respondents during the survey year 2016/17 was found to be 1.25 ha (hectare) ranging from 0.25 to 4 ha. Non-defaulters cultivate on average larger area of land than defaulters (table 2). So that, the mean cultivated area difference between the two groups was statistically significant at 5 % probability level. The average size of livestock in TLU was found to be 3.58, 3.75 and 3.41 for total sample households, non-defaulters and defaulters, respectively, ranging from 0 to 14.22 TLU. About 22% of total sample respondents had more than 5 TLU sizes of livestock holding. The mean livestock holdings difference between the two groups was statistically significant at 10% significant level. The implication is that non-defaulters have more access to financial capital by selling their livestock to recover their loan.

The average total income earned by sample respondents during the study year was found 20650 ETB[2] with standard deviation of 7752. Non- defaulters and defaulters were also earned an average total income of 22007and 19280 ETB with a standard deviation of 8733 and 6349; respectively. The two groups also have a statistical significant mean difference in annual on farm and off farm income. Correspondingly, the average amount of expenditure of total respondents during the study year was found 19006 ETB. Non- defaulters and defaulters were also spent an average amount of 18896 and 19058 ETB, respectively. There was a slight difference in the mean annual expenditure between the two groups. However, the result of t-test showed that statistically insignificant mean difference between the two groups.

Access to extension service is very important element of institutional support needed by farmers to enhance the use of information. The survey result indicated that about 94 percent of the sample respondents had extension contact. However, frequency of extension contact was different among respondents. The mean monthly extension contact frequency of sample respondents was found to be 1.68. Likewise, non-defaulters and defaulters have 1.72 and 1.64 mean monthly extension contact frequency, respectively. The mean monthly extension contact frequency of non defaulters is a slightly

[2] ETB= Ethiopian BIRR, one ETB is equivalent to 27.35 dollar currently)

greater than defaulters. However, the mean difference was statistically insignificant. Respondents also reported that on average they travelled 49.5 minutes to get market center. Likewise, non-defaulters and defaulters travelled 45.2 and 53.8 minutes to get the market center, respectively. The mean minutes travelled to get institutions for the defaulters is higher than that of non- defaulters. The t- test result shows a statistical significant mean difference between the two groups.

The average amount that sample household heads borrowed was found 6194 ETB ranging from 292 to 20459 ETB. Non-defaulters borrowed on average an amount of 5357 ETB where as defaulters borrowed on average an amount of 7040 ETB. The mean loan size difference between the two groups was statistically significant at less than 1% significant level. The average years of credit experience for the total sample household heads, non-defaulters and defaulters were also found 4.3, 4.85 and 3.78 years, respectively. The credit experience ranges from 1 to 10 years.

About 64 % of the household heads have a credit experience of greater than 3 years. The mean number of years of experience of the non-defaulter is greater than that of defaulter (Table 2). Statistically significance mean difference was observed between the two groups. Respondents were also saved on average 485 ETB during the survey year. Non-defaulters were saved more amount than defaulters. The t- test also shows that the mean saved amount difference between the two groups was statistically significant at less than 1% significant level.

Table 2. Mean and t-test values of continuous variables differentiating users from non-users (n=390);

Variable	Non- Defaulters (n=196)	Defaulters (n=194)	Total Sample (n=390)	t-value
AGE	44.18	45.04	44.6	-0.714
FAMSIZ	4.87	4.69	4.78	1.035
CULTLAND (Ha)	1.3	1.19	1.25	2.023**
TLU	3.75	3.41	3.58	1.699*
ONFARINC(‘000ETB)	19.3	16.8	18.07	3.057**
OFFFARINC ((‘000ETB)	0.68	0.34	0.51	2.121**
EXPEND (‘000ETB)	18.8	19.50	19.2	-0.544
FREXTCON	1.72	1.64	1.68	0.863
DISMRK (IN minutes)	45.2	53.8	49.5	-3.583***
AMLOAN (‘000ETB)	5.4	7.04	6.19	-4.38***
EXPCRDT	4.35	3.78	4.3	6.589***
SAVAMT (‘000ETB)	0.64	0.32	0.48	3.094***

, **,* indicates Significant at 10%,5% and 1% probability level respectively. Source: Survey result*

Non- defaulter and defaulter households not only differ in quantitative variables but also in terms of qualitative variables. It is, therefore, desirable to use a method of testing the differences between Non- defaulters and defaulters with respect to qualitative variables.

Hence, the chi-square test was used to test the presence and absence of difference between the two categories of households (Table 3). The survey result also indicated that among the total sample household heads, 83.6% were male and 16.4% of them were female (table 3). The chi-square test for sex distribution between the two groups was found statistically significant at 5% probability level. Concerning the educational level of sample household heads, about 60% of the total respondents are illiterates, while the rest have various educational levels ranging from the ability to read and write up to 10th grade. The result of $\chi 2$-test shows that statistical insignificant difference for distribution of illiterate and literate household heads of the two groups.

Table 3. Dummy Variables Differentiating Users from Non-Users (N=390)

Variable	Score	Non- Defaulters (n=196)	Defaulters (n=194)	Total Sample (n=390)	$\chi 2$
SEX	0	41	23	64	5.838***
	1	155	171	326	
EDUCLVL	0	117	116	233	0.000
	1	79	78	157	
TRAONCRT	0	70	139	209	50.62***
	1	126	55	181	
SUPERVI	0	71	164	235	95.02***
	1	125	30	155	
RPYTPERD	0	32	84	116	33.98***
	1	164	110	274	
LOANDIVE	0	186	177	363	2.212
	1	10	17	27	
CRDTINFOR	0	186	180	366	0.755
	1	10	14	24	

,,*** indicates Significant at 10%,5% and 1% probability level respectively. Source: Survey result*

Out of total respondents 46.4 % of them were reported that they have been taken training on credit ranging from one to seven days during the past five years. Similarly, 64.3 % of non-defaulters and 28.4% of defaulters replied that they have been taken training on credit.

The difference between the two groups with respect distribution of respondents on training on credit is statistically significant. It implies that borrowers who have been trained is more likely to settle their loan timely than who have not been trained. A statistical significance difference was also observed between the two groups in terms of supervision by the lending institution (table 3). It shows that borrowers who have been supervised by the lending institution is more likely to settle their loan timely than who have not been supervised.

Regarding the convenience of the repayment period 70.3 % of respondents replied that the repayment time is convenient. Similarly, 83.7% of non-defaulters and 56.7% of defaulters also replied that the repayment period is convenient. Statistical significance difference was observed between the two groups of borrower's in their view on the convenience of the repayment period. Moreover, Only 6.9% of the total respondents replied that they were used some portion of the loan for non-intended purposes. The proportion of diverters for Defaulter group is greater than that of non-defaulters. This shows that loan diversion has a negative effect on repayment performance. However, Statistical significance difference was not observed between the two groups of borrowers with respect to loan diversion.

Econometrics Analysis

Determinants of small farmer's agricultural credit repayment performance

Under this section the important socio-economic and institutional factors, which were hypothesized to affect small farmers' agricultural credit repayment performance were analyzed. Binary Logit-model was used to identify determinants of small farmer's agricultural credit repayment. The variables were considered for further analysis after verifying that multicollinearity is not a problem using a technique of variance inflation factor (VIF) for continuous variables and the degree of association between each dummy/discrete variable.

The result of the binary logistic regression model from STATA 14 robust indicated that out of 19 independent variables included in the model 12 variables were found to be significantly influence the loan repayment performance of respondents in the study area (table 4). The coefficients of other seven variables were not statistically significant at the conventional probability levels implying that they were less important in effecting on small farmers' loan repayment.

Among the significantly influenced variables, family size (FAMSIZ), Education level of the household head (EDUCLVL), area of cultivated land (CULTLAND), livestock holding (TLU), amount of on farm income (ONFARINC), amount of off farm income (OFFFARINC), frequency of extension contact (FREXTCON), saving amount (SAVAMT), years of credit Experience(EXPCRDT), training on credit (TRONCRT), supervision by lending institution (SUPRVI), and perception on repayment period (RPTYPERD) were found to affect the agricultural loan repayment positively. Whereas variables such as age of household head (AHH), Sex (SEX), Annual Expenditure (EXPEND), Distance of market from residence (DISMRK), amount of loan (AMLOAN), loan divert (LOANDIVE) and credit from informal source (CRDTINFOR) were influence the loan repayment negatively.

The sign of included variables in model showed a similar result as the expected result of the researcher hypothesis except Sex variable which has a negative sign. The negative sign indicates that female borrowers are better payers of loan than their male counterparts, although it is not significant. This result is consistent with the findings of Berhanu (1999), Abreham (2002), Jemal (2003) and Amare (2005).

The result of the study shows that AGE of household head has a negative significant influence on loan repayment of a borrower at 10% level of significance. It means that as age increases, the probability of loan repayment (non defaulter) declines. This is due to the fact that each additional unit increase in age after some point would thus add less to household income leading to low credit repayment performance.

The result coincides with the findings of Berhanu (1999) and Ezihf et.al (2014) which reported negative relationship of age and loan repayment.;while contrary to Amare (2005) and Wongnaal & Awunyo-Vitor (2013) which were found a positive relationship of age and loan repayment.

The odds ratio for Age (0.97) indicates that under constant assumption means keeping the influences of other factors constant the weighted log odds ratio in favor of non-defaulting decrease by 0.97 units as the age increase by one year. The family size has a positive and significant influence on repayment performance at less than 1% level of significance. This is possibly due to one of their family member being engaged in source of other income activities which might help them earn additional income and give a chance to repay on time. The result is also fits with studies conducted by Arene (1992), Bhatt & Tang (2002), Abebe (2011) and Firafis (2015).

The results of the logit model indicated that on farm income has a significant influence at less than 1% probability level and positively affect small farmers' repayment performance. It means that a borrower who has more income has good loan repayment performance than low income groups. The weighted log odds ratio in favor of non-defaulting, ceteris paribus, increased by a factor of 1.0004 as the farm revenue increases by one ETB.

This result is in agreement with the findings of Ephraim (1997), Jemal (2003) and Abebe (2011). Off farm income also has a positive significant influence on the loan repayment performance of small farmers (probability of non-defaulter). This is due to the fact that; off-farm activities are additional sources of income for small farmers and the cash generated from these activities could back up the farmers' income to settle their debt timely even during bad harvesting seasons and when repayment period coincides with low agricultural prices. The result is fit with the findings of Ephraim (1997), Abreham (2002). Amare (2005), Maru & Robert (2010), Afolabi (2010), Abebe (2011) and Million et.al (2012).

Table 4. Maximum likelihood estimates of binary logit model on determinants of loan repayment

Explanatory variable	Estimated Coefficient	Odds ratio	Robust Std. Err	z	P>z
Constant	-0.9337	0.3930	0.4538	-0.81	0.419
AGE	-0.0278	0.9724	0.0148	-1.83 *	0.067
SEX	-0.6876	0.5027	0.2857	-1.21	0.226
FAMSIZ	0.3352	1.3983	0.1744	2.69***	0.007
EDUCLVL	0.2611	1.2983	0.4642	0.73	0.465
CULTLAND	0.2889	1.3350	0.6207	0.62	0.534
TLU	0.0733	0.9293	0.0834	0.82	0.414
ONFARINC	0.0004	1.0004	0.0001	5.42***	0.000
OFFFARINC	0.0005	1.0005	0.0001	3.39 ***	0.001
EXPEND	-0.0004	0.9996	0.0001	-4.42 ***	0.000
FREXTCON	0.0717	1.0744	0.1953	0.39	0.693
DISMRK	-0.0195	0.9806	0.0062	-3.06 ***	0.002
AMLOAN	-0.0003	0.9997	0.0001	-5.12 ***	0.000
EXPCRDT	0.3381	1.4023	0.1698	2.79 ***	0.005
SAVAMT	0.0004	1.0004	0.0002	2.32 **	0.020
TRAONCRT	1.0436	2.8395	1.0578	2.80***	0.005
SUPERVI	3.4619	31.8782	16.4889	6.69 ***	0.000
RPYTPERD	1.9154	6.7897	2.7894	4.66 ***	0.000
LOANDIVE	-0.3596	0.6979	0.5932	-0.42	0.672
CRDTINFOR	-0.8100	0.4448	0.3601	-1.00	0.317
2 Log Likelihood …….-123.77			Pseudo R2 = 0.54		
Wald Chi-Square (19)……...104.47***			Number of obs. = 390		

,,*** indicates Significant at 10%,5% and 1% probability level respectively. Source: STATA output from the field survey data.*

As expected the amount of annual expenditure has a negative significant influence on loan repayment. The possible explanation is that the expenditure for consumption, celebration such as weddings, funerals, engagements, circumcisions etc increases beyond what the borrowers could afford capacity to repay the loan on time diminished which leads to be a defaulter. The result has similarities with the findings of Miller (1977), Singh et al., (1985), Zeller & Sharma (1996), Belay (1998), Belay (2002), Million et.al (2012) and Zelalem et.al, (2013). In the same way, amount of loan borrowed also has negative and significant influence on the chance (probability) to be a non- defaulter. This shows that as loan amount increases, the probability of loan repayment (non defaulter) declines. This is because in the event of production failure, the borrower will find it more difficult to meet repayment obligations out of his/her personal funds. The result is similar with the findings of Jemal (2003) and Pishbahar et.al (2015).who has been reported the negative effect of loan size on repayment performance

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Distance from the market which was used as a proxy for market access, has a significant negative impact on loan repayment performance. It implies that Borrowers nearby the market center have a location advantage to get daily market price and can sell their farm produce at good price, which enables them to settle their loan timely. Years of Experience in credit is significant at 1% probability level and related positively with the small farmers loan repayment performance. Borrowers who have more experience can easily settle the loan on time than who have less experience. This implies that experienced farmers in credit have developed their credit utilization and management skills that helped them to pay loans timely. In addition, as a result of their participation in credit for number of years, these farmers might be the beneficiary of the use of improved agricultural technologies that would increase their income generating capacity in turn helps to repay the loan timely. Amare (2005), Wongnaal & Awunyo-Vitor (2013), Ali et.al (2013), Akerele, et.al (2014) and Firafis (2015) were also reported the same result. .

The model estimates also confirmed that amount of saving of a household influences loan repayment positively and significantly. As expected saving enables farmers to easily fulfill the contract entered when prices of agricultural products are not conducive. The more the amount of savings, the greater the capacity to repay as opposed to low/non amount of savings (Abebe, 2011). Training on credit and supervision by the lending institutions have also a positive significant influence on small farmers' repayment performance. Training and supervision helps to borrowers' to easily understand the rule and regulation of the lending institutions and also develop skill how to use loan and make business. This finding is in complete agreement with the study made by Jemal, (2003), Wongnaa1 & Awunyo-Vitor (2013), and Coker & Audu, (2015). Moreover, the perception of convenience of repayment period also affects loan repayment positively and significantly. The perception (thinking) of borrowers on repayment period influences the decision to repay the loan on time as most loans are repaid immediately after harvest. So that if a borrower perceived that the price of the produce increases to the future he prefers to be late to pay the loan , which leads to be a defaulter and willing to incur additional interest costs by delaying crop sales as price rise later in the year.

The sensitivity analysis shows that the probability of non-defaulting of a typical borrower (who represents the characteristics of the majority of the borrowers) increases by 97.35%, if a borrower is supervised by lending institution. Similarly, the probability of non-defaulting of a given

borrower with a typical condition increased by 48.93%, if a borrower is trained on credit. If a borrower perceived that repayment period is not convenient the probability of non-defaulting would decreases by 75.43%. The relative importance of quantitative explanatory variables affecting loan repayment performance is also measured by their elasticity. A 10% increase in on farm income above the average increases the probability of non-defaulting by about 35.51%. An Increasing of annual expenditure by 10% above the average also decreases the probability of being non-defaulting 35.91%.

Conclusion

Credit is a crucial factor in agricultural production and in many cases may be a limiting factor in small farmers' agriculture. Agriculture in Ethiopia can be characterized by the small farmers, more than 95% of the total grain production generates from small farmers. Thus, the need for agriculture credit becomes more important to enhance the technological use of these small farmers. The importance of agricultural credit in the development of the sector has been underlined strongly by various authors. However, failure by farmers to repay their loans in time or to repay them at all is a serious problem facing both agricultural credit institutions and small farmers. Increasing defaults in the repayment of loans may lead to very serious implications. For instance, it discourages the financial institutions to refinance the defaulting members, which put the defaulters once again into vicious circle of poverty. Hence, Knowledge on the determinants of small farmer's agricultural credit repayment performance is undoubtedly important in the provision of information to device appropriate strategy for the lending institutions as well as the government. It is, therefore, the purpose of this paper is to identify the socio-economic and institutional factors which determine small farmers' agricultural loan repayment in the study area.

The results of binary logit model analysis based on a sample of 390 farmers selected from three districts namely, from *Enebsiesarmider*, *shebel berenta* and one *Gozamen* Motta, Enebsiesarmider and Enarjenawuga districts of East Gojjam zone; Amhara region; Ethiopia in 2016/17 shows that among the 19 hypothesized explanatory variables included in the model, twelve variables are found to be significantly influencing the loan repayment performance of respondents in the study area. Among the significant variables family size (FAMSIZ), Education level of the household head (EDUCLVL), area of cultivated land (CULTLAND), livestock holding (TLU), amount of on farm income (ONFARINC), amount of off farm income (OFFFARINC), frequency of extension contact (FREXTCON), saving amount (SAVAMT), years of credit Experience(EXPCRDT), training on credit (TRONCRT), supervision by lending institution (SUPRVI), and perception on repayment period (RPTYPERD) are found to affect the agricultural loan repayment positively. Whereas variables such as age of household head (AHH), Sex (SEX), Annual Expenditure (EXPEND), Distance of market from residence (DISMRK), amount of loan (AMLOAN), loan divert (LOANDIVE) and credit from informal source (CRDTINFOR) are influencing the loan repayment negatively. Based on the findings of the study the following points need to be considered in order to enhance the loan repayment performance of small farmers'. The result of the study shows that income has a significant positive influence on loan repayment. Farmers engaged in off-farm activities can able to settled their debts timely than non–engaged farmers. Therefore, rural development strategies should not only emphasis on increasing agricultural production but simultaneous attention should be given to promoting off-farm activities in the rural areas. Expenditure has also significant negative effect in the farmers' repayment performance. It is, therefore, important that more attention to be given to educate small farmers to reduce the social ceremonial expenditures such as death of family member, wedding, engagement and circumcision and develop their saving habits. Concrete effort should be made by elders, community leaders, local associations and religious organizations so as to minimize these traditional ceremonies and mitigate the associated expenditure through time. Enhancing the establishment of rural saving and credit cooperatives should also be give attention to strengthen the mobilization of saving and scale up the accessibility of credit for small farmers.

Training on credit and supervision by lending institutions are also important variables which affect the loan repayment performance of small farmers'. Thus it is recommended that lending institutions should have to focus on supervision and training of clients to avoid mis-use of loans and enhance the capacity of borrowers' in different aspects. The extension service in the area of agricultural credited and adult education should also be strengthening. As well, the econometric result also shows that, Farmers who were near to the market center has better loan repayment performance than farmers who are relatively far from market centers. Therefore, policies and strategies geared towards the enhancement of market opportunities for small farmer produces through promoting rural markets should be given adequate emphasis in order to making available market information to the farmers and integration of agricultural producers which might help the farmers to get good prices for their products which results improvement in repayment performance.

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