

Determinants of Loan Repayment: Evidence from Group Owned Micro and Small Enterprises, Tigray, Northern Ethiopia

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Abstract

The study aims to investigate factors affecting loan repayment performance of the group owned MSEs taking borrower characteristics in to consideration. The primary data was collected by distributing semi-structured questionnaire and interviewing 62 group owned MSEs located in Mekelle city, Tigray Regional state of Ethiopia financed by DECSI by using census method, of which 13 group owned MSEs were found to be defaulters and the remaining, 49 MSEs were non-defaulters. An econometrics model (Binary Logistic Regression) was used to analyze the effect of the literature driven variables have on loan repayment (dependent variable). The binary logistic regression result shows among the variables hypothesized to affect loan repayment, initiation and sector have statistically significant effect on loan repayment. Whereas like group composition and group size have statistically insignificant effect on loan repayment. Therefore, to improve the loan repayment performance of the group owned MSEs and increase the potential contribution of MSEs to the economic growth of the country, all concerned stakeholders must to play their role.

Keywords: Determinant, Loan Repayment, Group Owned, Micro and Small Enterprises, Binary Logistic Regression Logistic, Tigray, Ethiopia.

1. Introduction

Well-functioning and organized financial markets are pre-requisites for sustainable development. But such markets are often lacking in developing countries (Guush, 2004). The poor are usually excluded from credit facilities because of many reasons. These include insufficient collateral to support their loans, high transaction costs, unstable income, lower literacy and high monitoring costs (Mead & Liedholm, 1998). In the past many governments devoted resources to supplying cheap credit to farmers. In most cases, the result was rather disappointing. The failure was partly due to failures to set up and implement prudent and innovative institutional approaches suited to local situations and contexts (Guush, 2004). Moreover, bureaucratic lending procedures, stringent collateral requirements, and high transaction costs made the problem worse (Jemal, 2003).

This time, Microfinance Institutions (MFIs) are growing as an innovative means of widening access to financial services in developing countries. In most poor countries, the objective has been two fold: reducing the risk of income shocks to help reduce poverty and raising asset accumulation to encourage private activity (Armendáriz & Gollier, 2000). Additionally, micro and small enterprises (MSEs) have been recognized as a major source of employment and income in many countries of the third World (Mead & Liedholm, 1998). The World Bank claims that between one third and three quarters of total employment in most developing countries comes from informal sector (Norhaziah & Mohdnor, 2010).

One of the methodologies of the microfinance institutions in extending finance to the needy is group lending. Since the 1970s, group lending programs have been promoted in many developing countries. The idea behind group lending is that the group obtains a loan under joint liability, so each member is made responsible for repayment of loans of his or her peers (Zeller, 1996). The threat of losing access to future credit incites members to perform various functions, including screening of loan applicants, monitoring the individual borrower's efforts, fortunes, shocks, and enforcing repayment of their peers' loans (Zeller, 1996). Lenders use the threat of banning the entire group from future loans if one or more of the group members fail to repay induces borrowers to behave to the interest of the MFI by self-selecting each other and coerces them to monitor each other's projects (Guush, 2004).

Group based institutions have been able to perform so well while others failed. The success of MFIs is because, in group based programs, the function of screening, monitoring, and enforcement of repayment are to a large extent transferred from the bank to borrowers. The main argument is that, compared to the physically distant banks, group members can obtain at low cost, information regarding the reputation, indebtedness and wealth of the loan applicant and about his or her effort to ensure the repayment of the loan. Thus, group members are found to be able to access complex and sensitive information. Further, more group members can potentially employ sanctions or seize the physical collateral of the defaulter. And also group members appear to be in a better position to access the reason for default and to offer insurance services to members experiencing shocks beyond their control (Manohar & Zeller, 1997).

It is important to note, however, that group lending may not ensure high repayment rates at all times. Repayment problems become the main obstacle for the MFIs to continue providing microcredit services

(Norhaziah & Mohdnoor, 2010). When loans are received on the basis of joint liability, the risk of loan default by a particular member is shared by his/her peers. It may also be that borrower's assessment of his or her peer's likelihood of defaulting triggers the borrower's own decision to default. And also groups beyond a certain size may experience increased difficulty of communication and coordination so that both information and monitoring advantage of the group are dilute (Manohar & Zeller, 1997). And also, the lenders cannot observe the behaviors of their clients whether they are honest and dishonest. The lenders only observe the outcome of the loans either the clients repay or not (Norhaziah & Mohdnoor, 2010). Hence, loan repayment problem is one of the major issues of MFIs that concerns many stakeholders were the high loan default rate is the primary cause for the failure of MFIs. This research therefore, aims to investigate the factors affecting loan repayment of the group owned micro and small enterprises (MSEs) financed by Dedebit Credit and Saving Institution (DECSI) located in Mekelle city, Tigray regional state of Ethiopia.

2. Literature Review

Bruce and Kofi, (1999) conducted a research on the determinants of loan default and delinquency in rural credit programs in Ghana using a logit regression. The study reveals that, a person who is married is less likely to default than one who is separated or divorced. A male is more likely to default than a female. Holding everything else constant, the larger the loan, the less likely a person is to default. Borrowers with an elementary or secondary education are more likely to default compared to those with no formal schooling.

According to Ajayi (1992), the factors which influence loan default in mortgage finance institution with particular reference to the Federal Mortgage Bank of Nigeria using multiple regression analysis based on 128 samples showed that default has largely been positively influenced by cost of construction, monthly repayment, loan to value ratio, market value of property, age of borrower and the annual income of borrower. The expected rental income from property, however, had a negative influence on default.

A study made by Njoku and Odii (1999) on the determinants of loan repayment in Nigeria by employing multiple regression model based on 300 sample beneficiaries indicated that poor loan repayment performance was as result of late release of loan funds, cumbersome loan application and disbursement procedures and emphasis on political considerations in loan approvals. In addition, loan diversion to non-agricultural enterprises as well as low enterprise returns resulting from low adoption rate of improved agricultural technologies contributed to poor loan repayment performance of small holders. Loan volume, years of farming experience, farming as major occupation, years of formal education, household size, loan period, farm size, farm output, value of assets and interest paid on loan were all highly significant determinants of loan default. The coefficients of loan volume, years of formal education, household size and interest paid on loan are positive while the coefficients for years of farming experience, loan period, farm size, farming as major occupation, farm output, and value of assets are negative.

According to (Kashuliza, 1993), he used a linear regression model to analyze determinants of loan repayment in smallholder agriculture in the southern highlands of Tanzania. His study showed that education, attitude towards repayment, farm income and off-farm income positively affect loan repayment with farm income being significant, while age, household expenditure and household size have negative influence on loan repayment performance with household expenditure being significant.

A study by Ade (1999) on the determinants of small holder loan repayment performance evidence from Nigerian micro-finance system found out that the proportion of borrowers with secondary education, number of times borrowers were visited by loan officials and the loan size were the major factors that cause the loan default by the borrower.

A study made by Roslan and Mohd (2009) on the determinants of microcredit repayment in Malaysia the case of Agro bank by taking a sample of 630 and employing probit and logit models indicated that the factors that influence loan repayment are gender of the borrower, type of business activity, amount of loan and training. According to their result the probability of loan default is higher for males, if the borrower is engaged in the production activity, if the amount of loan is higher and if the borrower did not take any training.

Vigano (1993) in his study about the case of development bank of Burkina Faso employed a credit-scoring model. He found out that being women, married, aged, more business experience, value of assets, timeliness of loan release, small periodical repayments, project diversification and being a pre-existing depositor are positively related to loan repayment performance. On the other hand, loan in kind, smaller loan than required, long waiting period from application to loan release and availability of other source of credit were found to have negative relation with loan repayment performance.

Chirwa (1997) estimated the probability of agricultural credit repayment utilizing data from five Agricultural Development Divisions in Malawi using a probit model. The result are based on 1237 sample farmers showed that the availability of resources from crop sales and income transfers, the size of the club, the degree of diversification and the quality of information determined the probability of repayment. In contrast, other factors such as amount of loan, sex of household head, and size of household were not statistically

significant. Crop sales, income transfers, degree of diversification and quality of information are positively related with the probability of repayment.

3. Research Method

To examine the factors affecting the loan repayment of group owned MSEs, this study draws on empirical evidence from the 2012 survey covering 62 purposively selected MSEs from Mekelle city Tigray regional state of Ethiopia. A semi-structured questionnaire and personal interview were used to collect first hand data. The data collected in this way was classified, summarized and presented using text and table, and analyzed using the descriptive statistical tools like percentages, ratios, mean and standard deviation. In addition, the econometric analysis tool that is binary choice logistic regression model was used to test the literature driven hypothesis and to draw conclusions.

3.1 The Model

In this study MSEs are assumed to be either defaulting or non-defaulting. Hence the binary choice logistic regression model that assumes dichotomous dependent variable which takes either 1 or 0 value depending on y^* is used. Let $Y_i=1$, if the borrower repaid the full amount of the loan within the given maturity period.

$Y_i=0$, if the borrower did not repaid the full amount of the loan within the given maturity period.

But $Y_i=1$, if y^* is >0

$Y_i=0$, if y^* is ≤ 0

Where y^* is a latent variable. It is unobserved variable which can affect the loan repayment by the borrower. Hence it cannot be measured.

The probability that a borrower will repay the loan is given by:

$$P_i (Y_i=1) = \frac{1}{1 + e^{-z_i}} \quad \text{or} \quad \frac{e^{z_i}}{1 + e^{z_i}} \quad \text{----- Equation 1}$$

If the probability of repaying the loan is given by equation 1, then the probability of non-repayment of the loan is:

$$P_i (Y_i=0) = 1 - P_i = \frac{1}{1 + e^{z_i}}$$

Therefore, we can write

$$\frac{1 - P_i}{P_i} = \frac{1 + e^{z_i}}{1 + e^{-z_i}} = e^{z_i} \quad \text{----- Equation 2}$$

Now, $\frac{P_i}{1 - P_i}$ is simply the odd ratio- the ratio of the probability that the borrower repays the loan to the probability that the borrower does not repay the loan within the given maturity period. Mathematically, the model is specified as follows:-

$$LR_i = \frac{P_i}{1 - P_i} = \beta_0 + \beta_1 SO + \beta_2 GS + \beta_3 IN + \beta_4 GC + e_i$$

Where: $\frac{P_i}{1 - P_i}$ = Natural logarithm of the odd ratio (logistic model), which is the marginal effect.

LR= Loan repayment (Dependent variable)

SO= Sector of operation

GS= Group size

IN= Initiation

GC= Group composition

3.2 Specifying dependent and independent variables

In this study loan repayment, which is dependent variable, is a dichotomous, taking two values that is “1” if the borrower repaid in full and “0” if the borrower did not repaid in full. The independent variables that are critically examined in this study are:-

Sector versus loan repayment

MSEs that engage in the service sector as compared to other sectors like construction, manufacturing, and agriculture face a lower loan default or a better loan repayment. This is because, service sector is less exposed to risk and uncertainty relative to other sectors of the economy (Roslan & Mohd, 2009).

Hypothesis 1: MSEs that are engaged in the service sector have a higher probability of loan repayment as compared MSEs engaged in other sectors.

Group size versus loan repayment

The larger the group size, the more imperfect are the flows of information likely to be between members. Hence, problems arising out of asymmetric information make monitoring and enforcing costly and less effective. Therefore, loan repayment by the group is expected to decrease with group size increasing (Arene, 1992; Bhatt & Tang, 2001; Manohar & zeller, 1997).

Hypothesis 2: The smaller the group size, the higher the probability of loan repayment by the MSEs.

Initiation versus loan repayment

It is hypothesized that screening is more effective with groups that are formed on their own than with those groups that depend on the intervention from an outside agent, indicating that delinquency or default rates are

lower for groups that are formed on their own (Manohar & Zeller, 1997). In contrast with this, it is of no significance whether the group was formed at the initiative of the extension officer or not (Zeller, 1996). But, in this study, if the group is formed on its own it is positively related to loan repayment by the group.

Hypothesis 3: MSEs formed by the members themselves have a higher probability of loan repayment as compared to the MSEs formed by an outside agent.

Group composition versus loan repayment

Group homogeneity is defined as group members share some similar characteristics such as religion, age, and educational status. The researcher expects that group homogeneity to have a positive impact on loan repayment. This is because; the costs of monitoring decreases if the group is homogenous and there is also unconditional help among group members as homogeneity increases social cohesiveness (Zeller, 1996).

Hypothesis 4: MSEs that are homogenous have a higher probability of the loan repayment as compared to MSEs that are heterogeneous.

4. Results and Discussion

Sector vs. Loan Repayment

Table 4.3 reveals that groups engaged in the agriculture sector have zero average loan repayment as compared to other sectors in the economy. The reason is that, groups engaged in the agriculture sector are more exposed to risk and uncertainty as compared other sectors. In comparison, manufacturing sector has a better loan repayment, which is on average 87.5% as compared to construction sector with average loan repayment rate of 76.2%. Service sector has showed better loan repayment rate of 88.9% as compared to construction and manufacturing sectors. As per the result obtained from the model (see table 1), sectors of construction and manufacturing have a positive relation with loan repayment and statistically significant at 1% level of significance. By taking the service sector as reference, the construction sector has a marginal value of -0.848 which implies the probability of loan repayment decreases by 8.48 % for those borrowers who are engaged in the construction sector as compared to those borrowers who are engaged in the service sector. The same is true for the manufacturing sector, the marginal effect for the manufacturing sector is -0.993 which indicates that the probability of loan repayment decreases by 9.93% for those borrowers who are engaged in the manufacturing sector. This finding is similar with the result obtained on the descriptive analysis and with the findings of Roslan and Mohd (2009). Therefore the hypothesis “*MSEs that are engaged in the service sector have a higher probability of loan repayment as compared MSEs engaged in other sectors*” is accepted.

Group Size vs. Loan Repayment

From chart 4.1 it can be observed that more default is witnessed in groups with group size ranging from 10 to 15 members as compared to groups with members greater than 15 persons per group. This implies that, there is no problem of loan repayment even if group size increases. The possible reason for this could be as obtained from the study, all the contacted groups have internal rules and regulations to guide the activity of group members. Hence, there is no communication gap and no information asymmetry making monitoring effective and less costly. Furthermore, larger groups have more opportunities to exploit scale effects through joint procurement of inputs and marketing of outputs, thus increasing their negotiation power to obtain more favorable prices. Also, larger groups have a greater scope for diversification of risks. Similarly, the same result was obtained from the econometric analysis (see table 1). Hence, it implies that group size have no effect on loan repayment performance. This result contradicts with the findings of Arene (1992), Bhatt and Tang (2001), and Manohar and Zeller (1997).

Initiation vs. Loan Repayment

From table 4.4 it is possible to understand that groups formed by the members themselves have witnessed a better loan repayment with an average loan recovery rate of 88.5% as compared to groups formed by an outside agent that registered an average loan repayment rate of 30%. Therefore, from this result it can be concluded that screening and selecting of creditworthy group member is more effective with groups that are formed by the members themselves indicating a lower rate of loan default for these groups. Similar result was obtained from the econometric analysis, which is, the marginal effect of -0.388 shows (see table 1), other things remain constant, the probability of loan repayment decreases by 38.8% for those groups who are initiated by an outside agent or promoter as compared to those groups who are initiated by the members themselves. The result is consistent with the result obtained on the descriptive analysis and with the findings of Manohar and Zeller (1997). But it contradicts with the findings of Zeller (1996). Hence the hypothesis “*MSEs formed by the members themselves have a higher probability of loan repayment as compared to the MSEs formed by an outside agent*” is accepted.

Group Composition vs. Loan Repayment

The survey result shows that 53(85.48%) of the respondents believe that there is homogeneity among group members. While the remaining 9(14.52%) of the respondents believe that there is heterogeneity among the group members. From table 4.5 it can be observed the average loan repayment for homogenous group is 79.2% and

77.8% for heterogeneous groups. Similar result was obtained from the logistic regression (table1) and therefore, group compositions have no effect on the loan repayment performance of the borrowers. This result contradicts with the findings of Zeller (1996).

5. Conclusion

To articulate about loan repayment, out of 62 groups 49(79.03%) groups are found to be non-defaulters whereas the remaining 13(20.97%) are defaulters.

In identification of the most important explanatory variables that affect loan repayment by the group owned MSEs is conducted using binary logistic regression model. The model reveals that among four explanatory variables which were hypothesized to influence loan repayment by borrowers, 2 variables were found to be statistically significant. These variables are: initiation and sector. The remaining two variables were found to be statistically insignificant in affecting loan repayment performance of the group owned MSE. The two variables are group size and group composition.

When triangulating the findings of this research with findings of different researchers described the same result was also obtained with Roslan and Mohd (2009) with regard to sector. That is, service sector is positively related and have significant effect on loan repayment by the MSEs as compared to construction and manufacturing sectors. The possible reasons why service sector has performed better than construction and manufacturing sectors is that, service sector may be less exposed to risk and uncertainty than construction and manufacturing sectors and also construction and manufacturing sectors face frequent fluctuation in price of input materials and also unsustainable supply of input materials and this could affect loan repayment by the MSEs operating in construction and manufacturing sectors. Groups operating in construction and manufacturing sectors have witnessed lower loan repayment performance as compared to groups engaged in service sector. These two sectors (construction and manufacturing) have lower loan repayment due to shortage of market for their production output and frequent increase in price of input materials these two sectors use. Therefore, especial attention is needed by the concerned stakeholders (DECSI, BTI, and Regional MSEs development agency) in providing these two sectors with market linkage to sell their output and there should also be continuous supply of input materials for these two sectors use in their production until these two sectors build capacity to operate on their own. Especial attention is needed for two these sectors because these two sectors can play decisive role in reducing unemployment level in the city since these two sectors are labor intensive

With regard to variable initiation, groups that are formed on their own were found to be better loan repayment payers as compared to groups that are formed by an outside agent. This might be because of, for groups that are formed by the members themselves selecting and screening of creditworthy group member is more effective since group members can access complex and sensitive information about the group member. Hence, group members can easily identify the creditworthiness of group member. This result concurs with the findings of Manohar and Zeller (1997) but it contradicts with the result of Zeller (1996).

As discussed above 23 groups or MSEs were found to be defaulters. These 23 group owned MSEs have disappeared without repaying loan. Most of these groups were engaged in construction sector. As per discussion held with one loan officer of DECSI, one reason for low loan repayment by MSEs is the wrong credit perception of borrowers. That is borrowers consider loan as donation and opted-not-to pay back. Therefore, this shows the environment is contaminated and DECSI should create awareness among clients before disbursing loan to clients that the loan has to be repaid so that DECSI can have sustainable and viable operation and this enables DECSI to reach millions of poor people in the region thereby eradicating poverty from the region. By strengthening its IT systems, DECSI can easily facilitate the supply of up-to-date loan repayment statements and enable early detection of potential slow loanees and defaulters. This will facilitate appropriate action including, follow-up, counseling or serving demand notices.

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Annex:

Table 4.1 Summary result of logit model on factors affecting loan repayment

Variables	Odds Ratio	Robust Std. Err.	Z	P> z	[95% Conf. Interval]	dy/dx
Group composition	6.69465	8.171198	1.56	0.119	.612052 - 73.22636	.003853
Initiation	0.000463	.0017075	-2.08	0.037**	3.3607 - .6374646	-.3876986
Group size	3.3912	6.2811	-1.43	0.154	5.9928 - 19205.88	-.0236417
With reference to service sector						
Construction	7.2607	9.8107	-10.46	0.000***	5.1408 - .0000103	-.8483283
Manufacturing	4.6108	5.1308	-15.18	0.000***	5.2109 - 4.0807	-.9930386

Source: STATA output from survey data (2012).

*** Significant at 1%, **Significant at 5%, *Significant at 10%

dy/dx is a marginal effect after logistic which is discrete change of dummy variable from 0 to 1

Table 4.2 Hypothesis Decision

No	Hypotheses	p-value	Decision
1	Grace Period Vs Loan Repayment	0.000***	Reject Hypothesis
2	Initiation Vs Loan Repayment	0.037**	Accept Hypothesis
3	Repayment Period Vs Loan Repayment	0.000***	Accept Hypothesis
4	Service Sector Vs Loan Repayment	0.000***	Accept Hypothesis
5	Timeliness of Loan Release Vs Loan Repayment	0.094*	Accept Hypothesis

Source: STATA output from survey data (2012).

*** Significant at 1%, **Significant at 5%, *Significant at 10%

Table 4.3 Summary of loan repayment by Sector

Sector	No.	%	Defaulters	%	Non-Defaulters	%	Mean	S.D
Agriculture	4	6.5%	4	100%	-	-	0	0
Construction	21	33.9%	5	23.8%	16	76.2%	0.762	0.436
Manufacturing	19	30.6%	4	21.05%	10	78.9%	0.875	0.341
Service	18	29.03%	2	11.1%	16	88.9%	0.888	0.323

Source: STATA output from survey data (2012)

Table 4.4 Summary of loan repayment by initiation

Initiation	No.	%	Defaulter	%	Non-Defaulter	%	Mean	S.D
By Group	52	83.87%	6	11.54%	46	88.5%	0.885	0.322
By Promoter	10	16.13%	7	70%	3	30%	0.3	0.483

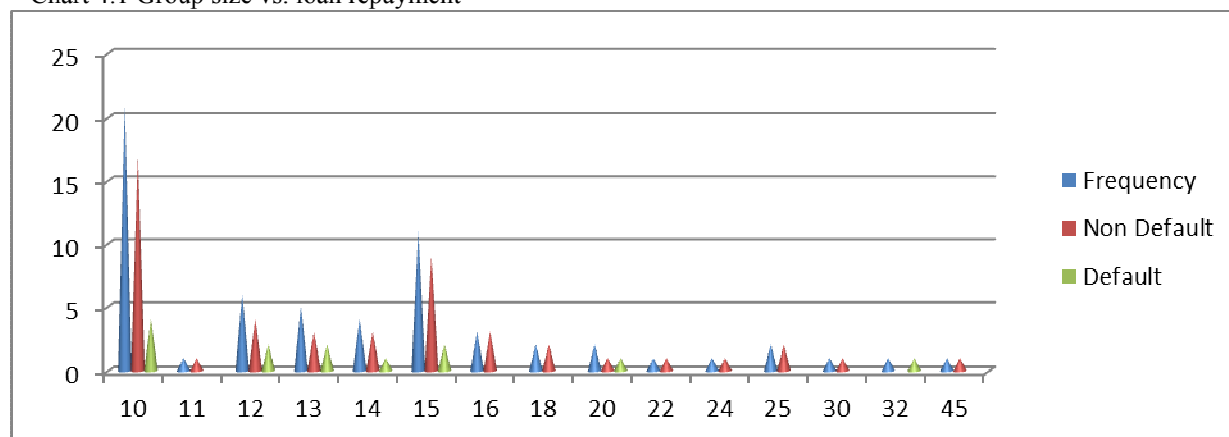
Source: STATA output from survey data (2012)

Table 4.5 Summary of loan repayment by group composition

Group Composition	Obs.	Mean	S.D
For Whole respondents	62	.8548	.3551
For heterogeneous	9	.7777	.4409
For Non-defaulters	53	.7924	.4094

Source: STATA output from survey data (2012)

Chart 4.1 Group size vs. loan repayment



Source: Survey result (2012)

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