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Determinants of Group Loan Repayment Performance of MSE's Manufacturing Sector: A Case Study in Dedebit Credit and Saving Institution (DECSI), Ethiopia

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Abstract
This study was conducted with the objective of identifying and analyzing the factors that influence group loan repayment performance of the beneficiaries of DECSI operating in the manufacturing sector as group owned MSEs. Primary data was collected from 34 selected group leaders of the group owned MSEs borrowers by using structured questionnaire and depth-interview. A binary logit regression model was used to analyze the group related factors, lender related factors, and socio-economic related factor that influence group loan repayment. Out of the nine explanatory variables, the six explanatory variables, i.e., group composition, group initiation, peer pressure, suitability of repayment period, loan size and external shocks have statistically significant effect on loan repayment of the group borrowers; whereas the three explanatory variables, i.e., internal rule and regulation, loan supervision, and training have statistically insignificant effect on loan repayment of the group borrowers. Therefore, to improve the loan repayment performance of the group borrowers, DECSI, among others, should consider homogeneity, self-initiation, existence of peer pressure among members, extent of loan size with business plan of group borrowers at the very beginning, and should focus on the repayment challenges which are stated by the borrowers (market linkage and loan supervision), and take corrective actions. Finally, further research on similar area is suggested by considering factors that need solution such as experience of group borrowers in the sector, group size, and lack of land; besides similar study may be conducted in other sectors of the MSEs (i.e., construction, urban agriculture, and service and trade) in order to have a holistic understanding of about the determinants of group loan repayment performance.
Keywords: Chi-square, DECSI, Determinant Factors, Group Loan, Logit, Manufacturing Sector, Mekelle, Microfinance, MSEs.

1. INTRODUCTION

The purpose of this study was to identify factors that determine group loan repayment performance in DECSI microfinance institution. Specifically, the study was addressing groups that are engaging in manufacturing sector found in Mekelle city. It was attempting to analyze the common assumption that group lending leads to good repayment rates by examining what countervailing processes may affect group loan repayment.

Microfinance is often defined as financial services for poor and low-income clients offered by different types of service providers. In practice, the term is often used more narrowly to refer to loans and other services from providers that identify themselves as "microfinance institutions" (MFIs). It has grown in prominence since Muhammad Yunus started the Grameen Bank Project in 1976. The Grameen bank of Bangladesh, which was founded by Mohammad Yunus was one of the first microfinance institutions (MFIs). Mohammad Yunus came upon a group of villagers that were unable to pay off their debt to a money collector. These methods include group lending and liability, pre-loan savings requirements, gradually increasing loan sizes, and an implicit guarantee of ready access to future loans if present loans are repaid fully and promptly. It is an important strategy to alleviating poverty in developing countries (Cabraal, Russell, & Singh, 2006, as cited by Fikirte, 2011).

Microfinance institutions are primarily expected to provide various a permanent access to appropriate financial services such as credit, savings, micro-insurance, remittances, leasing to low-income clients including consumers and the self employed, who traditionally lack access to banking and related services. It is rather an important tool for the eradication of poverty (Jegatheesan, Ganesh, & Kumar, 2011).

In addition to financial services, some MFIs provide social intermediation services such as the formation of

groups, development of self confidence and the training of members in that group on financial literacy and management. The target group of MFIs are self employed low income entrepreneurs who are; traders, seamstresses, street vendors, small farmers, hairdressers, rickshaw drivers, artisans blacksmith etc (Robinson, 2003).

One of the most characteristics of microfinance institution is extending loan to the poor and low income people through group without asking for collateral, but it serve as collateral. Therefore, in microfinance institutions (MFIs) group lending is a lending to groups of members of a community who have come together with the goal of reinforcing their creditworthiness. It allows a group of individuals - often called a solidarity group - to provide collateral or loan guarantee through a group repayment pledge (Ralph, 2011).

It is since the 1970s that, group-lending programs have been promoted in many developing countries. Most schemes make members jointly liable for the repayment of loans and give subsequent credit only if all members of the group have fully repaid. The joint liability but possibly more so, 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, and shocks; and enforcing repayment of their peers' loans (Zeller, 1998).

According to Ghatak and Guinnane (1999), joint liability leads to an enhanced repayment performance through lessening the four major problems facing formal credit institutions in lending to the poor. These problems are: (a) to ascertain what kind of a risk the potential borrower is (the problem of adverse selection), (b) to make sure they will utilize the loan once made, properly, so that they will be able to repay it (the problem of moral hazard), (c) to find out how their project really did in case they declares their inability to repay (auditing or monitoring) and (d) to find methods to force the borrower to repay the loan if she is reluctant to do so (the enforcement problem).

Even though joint-liability lending have been proposed that various aspects of microcredit's informational and enforcement in loan repayment advantages over other forms of lending, Norhaziah and Mohdnoor (2013) argued that examining repayment performance is important because, if borrowers do not repay, then there may not be sufficient funds to ensure that the liquidity position of the MFI is maintained. When there is a loss in the MFI liquidity due to high levels of non-repayment, the cyclical flow of funds between the MFI and the borrowers will be interrupted. The result of this is a reduction in the efficiency of the MFIs operation. To attain financial viability, MFI must reach operational self-sufficiency first and in order to attain operational self-sufficiency, the MFI must ensure that the operational cost can cover non-financial expenses. This can be achieved by low delinquency where the MFI must maintain a low delinquency rate to ensure operational self-sufficiency.

To sum up, this study was identifying and examining the determinants of group loan repayment in DECSI microfinance institution. Specifically, the study has covered groups of borrowers who took loan from DECSI microfinance institution to work together in manufacturing activities in Mekelle city, Tigray, Ethiopia from 2009-2013 operation years. Also, the study has focused on the extent to which group related factors (i.e., demographic characteristics of members and group-specific factors), socio-economic factors, and lender related factors that may influence group loan repayment performance.

2. EMPIRICAL LITERATURE REVIEW

Loan repayment performance is affected by a number of socio-demographic of group members, group specific factors and lender/institutional factors. While some of the factors positively influence the loan repayment, the other factors negatively affect the repayment rate. Regarding to the group loan repayment performance of borrowers, several studies have been conducted in many countries by different researchers and summarized below.

2.2.1 EMPIRICAL STUDIES IN OTHER COUNTRIES

A study undertaken by Bassem (2008), on main factors vulnerable to affect the repayment performance of group lending in Tunisia reveal that the repayment is influenced positively by the internal rule of conduct, the same business, the knowledge of the other members of the group before his formation, the peer pressure, the self-selection, the sex, the education, and the non financial services and tie with the loan officer. However, the homogeneity, and the marital status are among the main factors acting negatively on the repayment performance of credit groups.

A study on group size and social ties in microfinance institutions conducted by Abbinki, Irlenbusch, and Renner (2006) indicated that microfinance programs provided poor people with small loans given to jointly liable self-selected groups. Follow-up loans provided incentives to repay. In this study they experimentally investigated the influence of those features on strategic defaults. Each group member invested in an individual risky project, whose outcome was known only to the individual investors. Subjects decide whether to contribute to group repayment or not. Only those with successful projects could contribute. The experiment ended if too few repay. This investigated group size and social ties effected and observed robust high repayment rates.

A study conducted by Wenner (1995) on group credit as a means to improve information transfer and loan repayment performance in Costa Rica found that members of groups engaged in formal screening with an internal code of regulations had a low probability for delinquency, indicating that screening indeed resulted in an informational efficiency gain, a result

which is supported by Zeller (1998).

A study on key factors of joint-liability loan contracts by Alexander and Denitsa (2004) reported that joint liability induces a group formation of low risk borrowers. Furthermore, the incentive system leads to peer-measures between the borrowers, helping the lender to address the moral hazard and enforcement problem. They also demonstrate that the mechanism realizes high repayment rates, if the loan officers fulfill their complementary duties in the screening and enforcement process.

Another study was conducted by Onyeagocha, Chidebelu, Okorji, Ada-Henri, Osuji and Korie (2012) on an examination of determinants of loan repayment of microfinance institutions in southeast states of Nigeria reveal that out of nine explanatory variables, five variables were found to be significant for the probability of being defaulter; that is group size, shocks, training duration, loan size and credit officers experience were significantly influencing loan repayment performance of MFIs. However, the remaining four explanatory variables namely, gender, age, interest rate and methodology had no significant effect on the loan repayment performance.

Roslan and Mohd (2009) undertook a study on the determinants of loan repayment among microcredit borrowers in Malaysia by dividing determinants into three categories- characteristics of borrowers, characteristics of the project or business and the characteristics of the loan. Their result indicated that the probability for loan repayment default was influenced by the gender of the borrower, type of business activity, amount of loan, repayment period and training.

Determinants of repayment performance of credit groups in Madagascar were analyzed by Zeller (1996). He found that groups with higher level of social cohesion have a better repayment rate. Moreover, the programs that provide saving service to their members have a significantly higher repayment rate.

Julia (1996) studied the determinants of successful group loan repayment in Burkina Faso. This study revealed that probability of loan repayment is influenced by effective use of group dynamics (*ex ante* and *ex post* peer pressure and group solidarity) as well as other factors such as appropriate training and leadership; homogeneous groups with sufficient training and reliable leaders had the highest probability of repaying their loans; negative externalities like the "domino effect" occur when one or more members of a credit group default due to the default of other members; negative influence on repayment occurs when the credit terms and conditions are no longer appropriate for each member as credit cycles continue, creating an inherent "matching problem" as group lending is repeated over time; and as loan sizes increase due to the dynamic incentives, preferred loan terms and volumes will differ with the consequence that borrowers with smaller loan volumes will reject joint-liability for borrowers with higher loan volumes in the same group if the latter run into repayment difficulties.

An investigation on the key factors that influence loan repayment performance among group clients of microcredit institutions (MFIs) in Tanzania have been carried out by Francis and Abel (2009). According to their findings, experience, training time, and sanctions have positive and significant effects on loan repayment performance among group clients of MFIs. However, transaction costs and group size have negative and significant effects on loan repayment performance.

An investigation by Alessandra, Luke, and Bruce (2005) on the effect of social capital on group loan repayment found direct relationship between default and homogeneity, which is the increment in the homogeneity of the group members, would lead to the higher repayment.

As per empirical analysis on determinants of repayment performance in credit groups by Zeller (1998) implementation of internal rules and regulations by the group members would lead to the better repayment performance that is decrement in the cost of operations of the lender and decrement in the default rate.

To sum up, as mentioned above, various studies were conducted in various countries (outside Ethiopia) on the determinants of group loan repayment performance. Most of these studies have identified major factors influencing group loan repayment performance and categorized them as group borrower specific factors (i.e., peer monitoring, peer pressure, self-selection, homogeneity, group size, internal rule of regulation), lender specific factors (i.e., loan size, training, experiences of credit officers) and socio-economic specific factor (i.e., external shocks) that affect principally the loan repayment rate of group borrowers.

2.2.3.EMPIRICAL STUDIES IN ETHIOPIA

An empirical analysis on factors that influence the loan repayment performance of the beneficiaries of Addis Credit and Saving Institution (ACSI) was made by Fikirte (2011). Accordingly, the study revealed that out of twelve explanatory variables, eight variables were found to be significant for the probability of being defaulter, that is age and five business types (baltina & petty market, kiosk & shop, services providing, weaving & tailoring, and urban agriculture) were important in influencing loan repayment performance of the borrower. In addition, sex and business experience of the respondents were found to be significant determinants of loan repayment rate. However, the remaining four explanatory variables namely, education level, family size, business experience and dependency ratio had no significant effect on the probability of being defaulter.

An empirical study was conducted by Amare (2005) on the determinants of loan repayment performance of smallholder farmers in North Gondar, Ethiopia. A total of 15 explanatory variables were considered in the econometric model. Out of these, seven variables were found to significantly influence the repayment performance.

These were land holding size of the family, agro-ecology of the area, total livestock holding, number of years of experience, number of contacts, sources of credit and income from off-farm activities. The remaining eight variables (family size, distance between main road and household residence, purpose of borrowing, loan amount, age of borrower, education level, gender of the household head, and expenditure for social festivals) were found to have insignificant effect on loan repayment performance of smallholder.

Another study was conducted by Abraham (2002) on an examination of determinants of repayment status of borrowers and criteria of credit rationing with reference to private borrowers around Zeway area who are financed by the DBE. The result revealed that having other source of income, education, work experience in related economic activity before the loan and engaging on economic activities other than agriculture are enhancing loan recovery performance while loan diversion, being male borrower and giving extended loan repayment period are undermining factors of loan recovery performance.

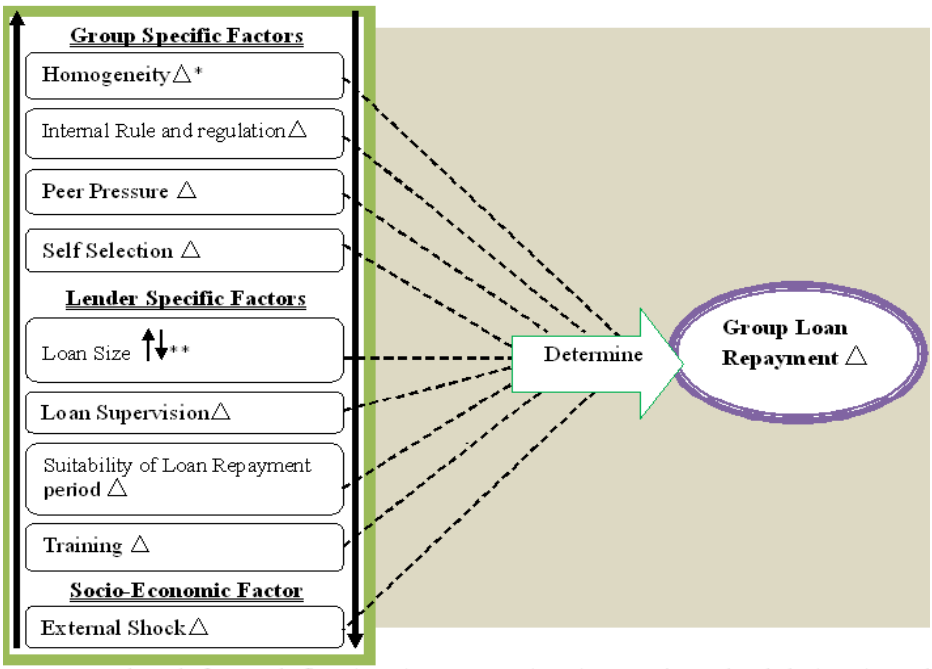
An investigation on the microfinance repayment performance of Oromia Credit and Saving Institution (OCSI) in Kuyu has been carried out by Abafita (2003). According to his finding; sex, loan size and number of dependants are negatively related to loan repayment and age was found to be positive. Income from activities financed by loan, repayment period suitability and loan supervision are positively and significantly related to loan repayment performance. Moreover, loan diversion is significant and negatively related to loan repayment rate.

Generally, numbers of studies were conducted in Ethiopia on determinants of loan repayment performance of group based and individual based credit. The results of different studies reviewed above revealed the significant factors that probably affect loan repayment as age, sex, business types, business experience, land holding size, total livestock holding, loan size, repayment period suitability, loan supervision and loan diversion.

2.3 CONCEPTUAL FRAMEWORK

As it has been reviewed from previous empirical studies in the above sections, factors that affecting group loan repayment performance are divided into group-specific factors (i.e. homogeneity, internal rule of regulation, self-selection and peer pressure), lender/institution related factors (i.e. loan size, suitability of repayment period, loan supervision and training), and factors related to overall socio-economic which include external shocks that involve different types of family emergencies, sickness, output market loss, major social events, etc. Thus, this study has constructed the following conceptual framework (**Figure 2.1**) based on the empirical findings. Nine socio-economic factors, group specific factors and lender specific factors were identified from the empirical studies.

Figure 2.1: Conceptual Framework of Group Loan Repayment



Source: Adapted from Abafita (2003), Bassem (2008), Francis and Abel (2009), and Onyeagocha et al. (2012).

Note: ** Denote increase and decrease in quantitative variable
△* Denotes changes in qualitative variables

As it has been shown in the above **Figure 2.1**, group loan repayment is affected by different factors which may lead group borrowers to default loan or repay it fully. These are socio-demography, group-specific and lender or institution factors. The socio-demographic factor is the nature of homogeneity among group members in gender,

age, education and marital status, which is expected to affect loan repayment positively as it is changed from heterogeneity to homogeneity in socio-demography among members. The group related factors are also those factors that enforce the repayment of group loan to change as they change; and the lender/institution factors are those factors that are related with lender/microfinance institution which are expected to affect group repayment status.

3. STATEMENT OF THE PROBLEM

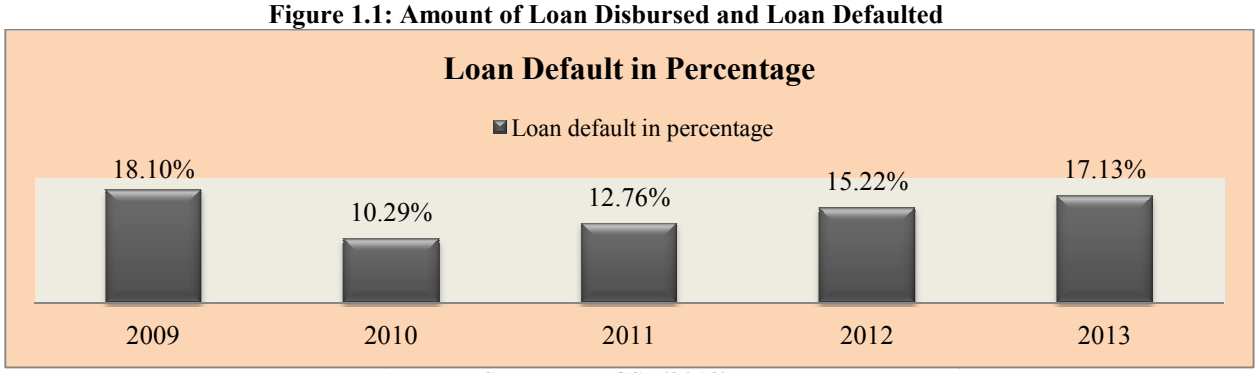
Based on a preliminary data collected, default rate of last five years on average reach around 14.7% on the selected groups in the manufacturing sector. In view of that the past five years (2009-2013) summary of group loan repayment performance (default rate) at semen branch DECSI microfinance institution is presented in Table 1.1 and Figure 1.1 below.

Table 1.1: Summary of loan repayment performance in DECSI for the successive past 5years

Year	2009	2010	2011	2012	2013
Disbursed	750,000Birr	753,500Birr	408,950Birr	7,188,473Birr	408,972Birr
Loan Collected	736438.55Brr	675,917.42Brr	356,767.98Birr	6,094,387.50Birr	338,915.20Brr
Loan Defaulted	13,561.45Birr	77,582.58Birr	52,182.02Birr	1,094,085.50Birr	70,056.80Birr
Default rate	18.10%	10.29%	12.76%	15.22%	17.13%

Source: DECSI (2013)

Figure 1.1: Amount of Loan Disbursed and Loan Defaulted



Source: DECSI (2013)

As the above Table 1.1 and Figure 1.1 indicates even if it seems like decreasing in year 2010 operation from that of year 2009 (i.e., 18.10% to 10.29%), the default rate of group borrowers of semen branch DECSI microfinance institution is increasing consequently for the subsequent three years (2011-2013). It reveals that group borrowers are not paying well their loan successfully from time to time that can badly affect financial sustainability of DECSI microfinance institution.

This is the reason why identifying and analyzing factors that determine group loan repayment performance in DECSI microfinance institution was attempted; specifically those borrowers who operate together in manufacturing sector in Mekelle city. Besides, according to the manager of Semein branch of DECSI microfinance institution, the default rate that the institution is incurring now in group lending has its own significant contribution to the cumulative default rate of DECSI. This leads to increase in the overall annual default rate that is higher than the rate that the National Bank of Ethiopia (NBE) set for all financial institutions, i.e., <5 percent (or >95 percent expected to be collected).

Therefore, whether repayment of group loan is influenced by certain factors in a specific situation or influenced by group member themselves needs an empirical investigation so that the findings can be used by microfinance institution to manipulate its credit programs for the better.

4. OBJECTIVES OF THE STUDY

The objective of the study was to identify and examine the factors that determine group loan repayment performance of Dedebit Credit and Saving Institution (DECSI) microfinance in Mekelle city.

5. RESEARCH METHODOLOGY

5.3 RESEARCH APPROACH

Research design is a plan and procedure for research that span the decisions from broad assumptions to detailed methods of data collection and analysis. It is a design and specific methods (data collection, analysis and interpretation) that should be used to study a specific topic considering the nature of the study and the research problem, the researcher's personal experience, and the audiences for the study (John, 2009). Accordingly, in this section research approach, description of the data type, data sources, methods of data collection, sampling design,

sample size and methods of data analysis and interpretation are presented.

Given the objectives and nature of this study, the study has used a mixed approach. The study applied explanatory type of research that determines the relationship between the dependent and independent variables by using cross sectional data collected from the sample respondents from April 23 to May 14, 2014.

5.3.1 TARGET POPULATION

The target populations of this study were group borrowers in the manufacturing sectors and loan officer(s) of Semen branch DECSI microfinance institution residing in Mekelle city.

5.3.2 DATA TYPE AND SOURCES

This study has used primary data **(**both qualitative and quantitative types**)** collected from MSEs group leaders and DESCI's loan officer.

5.3.3 DATA COLLECTION INSTRUMENTS

This study has used structured questionnaire and depth interview, respectively, in order to collect primary data from group leaders and loan officer of DECSI.

5.3.4 SAMPLING DESIGN

This study has applied purposive sampling design to select the group leader respondents. It is because group leader is the one who looks after members of the group and he/she is assumed to know the required information. Besides, the study was census based by taking all groups currently on operation, because the number of groups are not large (i.e., they are 34 group leaders) and possibly manageable to take all groups in the selected sector (i.e., the manufacturing sector).

5.3.5 SAMPLE SIZE

This study has been conducted in DECSI microfinance branch in Mekelle city. Hence, according to the report of branch and sub-branch DECSI (2013), the total numbers of group borrowers organized as a cooperative in the manufacturing sector and currently on operation were 34. Hence, the study has covered only those 34 groups that were functioning in the manufacturing activities and financed by DECSI from 2009 to 2013.

5.3.6 METHOD OF DATA ANALYSIS AND PRESENTATION

This study has applied the econometric analysis which is logistic regression model (binary) to test the relationships among variables. All necessary tests regarding the specification tests have been checked and the overall fitness of the model (overall level of significance of the model) was also verified by using the value of Pearson Chi-square test. The details are presented in **Table 3.3** below.

DEFINITION OF VARIABLES

Once the analytical procedure and its requirements are known, it is necessary to identify the potential explanatory and dependent variables, and describe their measurements. Different variables are expected to affect group loan repayment (the dependent variable). The major variables influencing the group's loan repayment and the direction of their effect are presented and explained below.

DEPENDENT VARIABLE: GROUP LOAN REPAYMENT (Y_i)

Y_i(s) is the binary variable that represents group loan repayment performance. Group loan repayment is defined as the act of paying back money previously borrowed from microfinance institution by all group members. It has a value of 1 if group is non-defaulter otherwise 0, if default.

INDEPENDENT VARIABLES

Independent variables are variables that are expected and have more explanatory power on the dependent variable, i.e., groups' loan repayment. The independent variables that have been empirically identified and used in this study are: internal rule of conduct, peer pressure, homogeneities among member, self selection, external shock, loan size, suitability of repayment period, training, and loan supervision.

Table 3.2: Authors, code, measurement, expected sign and operational definitions of independent variables

Authors	Independent Variables	Codes	Operational definitions	Measurement	Expected Sign
Bassem (2008); Manfred (1996); Zeller (1998)	Internal rule	IRC	It indicates that whether the group has internal rule of conduct to monitor members. It is expected that groups that have clear internal rules of conduct have a significantly higher loan repayment.	Dummy variable (1= if it has rule, 0= if it hasn't).	Positive
Bassem (2008); Ahlin and Townsend (2005); Wydick (1999)	Peer pressure	PP	It refers to the will to exercise pressure on defaulters' group members.	Dummy variable (1= if make pressure to incite repayment, 0= if not).	Positive

Bassem (2008); Julia (1996); Umara and Iqbal (2013)	Homogeneities among group member	HOM	It implies the homogeneity among group member and it is measured by average age range, sex, marital status, education level. The higher the homogeneity among members the higher loan repayment	Dummy variable (1= if members are homogenous in composition, 0= if not)	Positive
Bassem (2008); Charlotte and Lodewijk (2003); Manfred (1996); Sharma and Zeller (1997); Umara and Iqbal (2013); Zeller (1998)	Self selection	SS	It indicates whether members are organized by their own interest through selecting members or by another body.	Dummy variable (1= if organized by their own, 0= if not by their own).	Positive
Abafita (2003); Onyeagocha et al. (2012); Umara and Iqbal (2013)	Loan size	LS	If the loan size was higher and enough for the intended project, the chance of repayment is increased.	Dummy variable (1= if loan granted is enough for the intended investment, 0= if not enough for intended purpose)	Positive
Abafita (2003)	Suitability of repayment period	SRP	It is expected that member borrowers who find the repayment period suitable, perform better. Hence we expect a positive sign for this variable.	Dummy variable (1= if repayment time is suitable and otherwise 0).	Positive
Francis and Abel (2009); Julia (1996)	Training	PLT	It indicate that pre and after loan training for group members by DECSI microfinance institution.	Dummy variable (1= if there is adequate training for members, 0 otherwise).	Positive
Abafita (2003)	Loan supervision	LSP	It refers to continuous follow up and supervision visit by loan officer to evaluate the loan utilization and repayment. It is expected to have positive relationship with loan repayment.	Dummy variable (1= if there is timely supervision, 0= if not).	Positive
Manfred (1996); Onyeagocha et al. (2012); Sharma and Zeller (1997)	External shock	EXS	It refers to the sickness, market loss, family problem, etc of group members.	Dummy variable (1=if the default reason is because of external shock, 0= if it is not because of external shock).	Negative

Source: Own Empirical Review (2014)

Note: The above table is depicted on variable based order.

5.4 LITERATURE DRIVEN HYPOTHESIS

The hypotheses are driven after an extensive empirical literature review and the factors that are considered in this study are those factors which were considered in the previous studies. These factors are categorized in to group-specific factors, lender related factors, and overall socio-economic factors by following the classification in the empirical studies (Norhaziah & Mohdnoor, 2010; Olomola, 1998; Roslan & Mohd, 2009; Zeller, 1996; 1998). The expected effects of these factors on the group loan repayment performance are hypothesized in the following section.

5.4.1 GROUP-SPECIFIC FACTORS

When loan is not repaid, it may be due to the character of the borrowers, borrowers' unwillingness and /or

inability to repay**.** Homogeneity among group members, self-selection, internal rule of conduct, and peer pressure are considered in this study as group-specific factors that affect group loan repayment. The effects of these factors are presented below.

Hypothesis 1: ***Groups that are homogeneous are predicted to have a higher probability of loan repayment as compared to groups that are heterogeneous.***

Hypothesis 2: ***Groups that implement internal rule and regulation are predicted to have a higher probability of loan repayment as compared to groups that didn't implement internal rule and regulation.***

Hypothesis 3: ***Groups formed with self selection are predicted to perform better in terms of loan repayment as compared to the groups formed by other than member's self- selection (by an outside agent).***

Hypothesis 4: ***The higher peer pressure exercised by group members on the defaulting member, the higher the group performs good loan repayment.***

5.2.2 LENDER/ INSTITUTION RELATED FACTORS

Loan defaults arise not only from problems with the borrower but also because of the problems with the lender (microfinance institution). Many studies have found that lender characteristics play an important role in determining loan repayment of the group. These factors can be loan size, suitability of repayment period, loan supervision, and training (Abafita, 2003; Francis & Abel, 2009; Julia, 1996; Onyeagocha et al., 2012; Roslan & Mohd, 2009; Umara & Iqbal, 2013). Thus, in this study, the following four lender related variables are considered.

Hypothesis 5: ***The larger the loan size, the higher the probability of loan repayment by the group borrowers.***

Hypothesis 6: ***As suitable loan repayment period is set for borrowers, the probability of loan repayment increases.***

Hypothesis 7: As loan supervision is made regarding loan utilization, the probability of loan repayment by the groups is higher.

Hypothesis 8: ***As training is available by DECSI MFI, the higher the probability of loan repayment by the groups.***

5.2.3 FACTORS RELATING TO OVERALL SOCIO-ECONOMIC CHARACTERISTICS

Although there are different socio-economic factors that can affect group loan repayment, this study took the critical socio-economic factor that affects group loan repayment, i.e., external shock.

Hypothesis 9: ***External shock is predicted to have a significant and negative impact on group loan repayment rate.***

5.3 MODEL SPECIFICATION

In order to investigate the factors that determine group loan repayment, the binary logistic regression model was used to examine the relation of each factor with group loan repayment. This model is often used to approximate the mathematical relationships between explanatory variables and dichotomous dependent variable.

The binary logistic regression model is selected due to the nature of the dependent variable. If the dependent variable is categorical variable with only two categories (default & non-default valued as 1 & 0, respectively), binary logistic regression is appropriate. The logit and the probit model yield similar parameter estimates, but the cumulative logistic regression model is preferred because of its comparative mathematical simplicity and more meaningful interpretation of odds ratio (Gujarati, 2004). Thus, the model was specified as follows:

$$Y_i = \beta_0 + \beta_1 IR + \beta_2 PP + \beta_3 HOM + \beta_4 SS + \beta_5 SRP + \beta_6 LS + \beta_7 LSP + \beta_8 TR - \beta_9 EXS \ldots\ldots\ldots\ldots (1)$$

Where;

Y_i = repayment performance of loan (1 if the loan was fully repaid within the specified period of the loan contract, otherwise 0)

β_0 = Constant (intercept)

ε_i= disturbance error

$\beta_1, \beta_2 \ldots \beta_9$ = slope coefficients of independent variables (the unknown parameters that reflecting the impact of change in independent variables).

IR = Internal Rule of Conduct; ***PP***= Peer Pressure; ***HOM*** = Homogeneity (Composition of group); ***SS***= Self-Selection

SRP= Suitable Repayment Period

LS = Loan Size; ***TR***= Training; ***LSP*** = Loan Supervision; ***EXS***= External Shock

MODEL SPECIFICATION TEST

Before applying the binary logistic regression model, a measure of model fit for binary logistic regression model, which is the Hosmer-Lemeshow test of goodness of fit was used to see how well the model fits the data. Hosmer- and Lemeshow's goodness of fit test shows how much predicted values match closely the observed

values. This test states that the more closely the observed frequencies and predicted frequencies matched, the better the fitness of the model. This test is more appropriate test for binary logistic model (Hosmer & Lemesho, 1980). To test/check goodness fit of the model "*lfit*" has been conducted. There are no fixed points as to judge the model as a best or bad predictor yet it is generally agreed that a model with its overall predictive power of three percent or more is good (Anders, Ari, & Magnus, 2006). As indicated in **Table 3.3** below, the result of the test indicates the p-value (0.1578) is greater than 0.05. Therefore, the null hypothesis (i.e., Ho: The model fits the data well) is accepted.

To detect the data problem for heteroskedasticity, multicollinearity, specification bias and normality tests (i.e., hettest, VIF test and OV test), respectively, were conducted.

Multicollinearity problem is the existence of a "perfect," or exact, linear relationship among some or all independent and explanatory variables of a regression model (Gujarati, 2004). Multi-collinearity diagnostics test was done to check the presence of high collinearity among and between the dependent and each independent variable. In order to test the existence of multicollinearity problem, the Pearson correlation matrix was utilized ('pwcorr'). As a general rule multicollinearity is a problem when the correlation result is above 0.80 and below -0.80 (Stock & Watson, 2007) but, as it is shown in the following Table 3.3 the value is under 0.6837 and over -0.6402. Moreover, Variance Inflating Factor (VIF) was used to check for multi-colinearity problem among and between explanatory variables. Chattereje, Hadi, and Price (2000) set the general rule for multicollinearity to be a severe problem, if the mean value of VIF exceeds 10 and falls bellow one (i.e., 1< mean VIF<10). However, to solve multicollinearity problem, it is advised to drop one of the independent variable that has perfect linear relationship with another explanatory variables. Thus, as indicated in the following **Table 3.3**, VIF result shows that there is no perfect collinearity among and between explanatory variables because the VIF value is below 2.30, only multi-collinearity can be a problem if and only if VIF value exceeds 10.

The other assumption of the CLRM is the disturbance term Ui appearing in the regression function is homoskedastic. That is they have the same variance (E (Ui^2) = s^2 where i= 1, 2, …n. Test of heteroskedasticity says the null hypothesis that the variance of the residuals is homogeneous. If p-value is very small, i.e., Pr < 0.05 (at 95% confidence), the null hypothesis will be rejected and accept the alternative hypothesis that the variance is not homogenous (Gujarati, 2004). The "*hettest*" was used to check whether there is heteroskedasticity problem or not. As Breusch-Pagan/Cook-Weisberg test shows in the following **Table 3.3**, the null hypothesis (i.e., Ho: Constant variance) was rejected because the test result showed P-value of 0.1422 (14.22 percent), which is greater than the significance level (1 percent, 5 percent, and 10 percent). Thus, the result indicated that there is equal variance among the error terms. Therefore, there was no serious problem of Heteroscedasticity in the process of model specification and the model was well fitted.

Furthermore, the Ramsey RESET test, "*ovtest*" has been used to check whether the model has omitted variables or not. It tests the null hypothesis that Ho: model has no relevant omitted variables. As a decision rule according to Ramsey RESET test, a model specification is fit or no omitted variables and ready for analysis if P-value stated in P>F greater than the chosen level of significances, i.e., 1 percent, 5 percent and 10 percent. Accordingly, in this study as shown in **Table 3.3** below, the result indicated that the model had no relevant omitted variables since the test failed to reject the hypothesis, i.e., Prob.>F of 0.1168 is found greater than any of the significance levels of the specified model of the study. Additionally, the robust regression is carried out and used to avoid the aforementioned problem in the data. The various goodness-of-fit measures validate that the model fits the data well. Therefore, the value of Pearson Chi-square test shows that the overall goodness-of-fit of the model fit the data at less than 1 percent significance level**.**

In general, the logit regression model was tested for its fitness by using lfit, hettest, ovtest, pwcorr and VIF, and thus, found fit for analyzing the factors that influence loan repayment performance of group borrowers operating in the manufacturing sector of the MSEs.

Table 3.3: Summary of Model Specification Test Results

Tests	Test Names	Null Hypothesis	Ch^2/F-value	Prob>ch^2/F-value
lfit	*Hosmer-Lemeshow*	Model fits data	11.85	0.1578
hettest	*Breusch-Pagan/cook-Weisberg*	Constant variance	2.15	0.1422
ovtest	*Ramsey RESET*	No omitted variables	7.79	0.1168
vif	Minimum= 1.06	Maximum=2.29	Mean=1.68	
pwcorr	Minimum= -0.6402	Maximum=0.6837		

Source: Own Survey (2014)

6. RESULTS AND DISCUSSIONS

For the purpose of examining the determinants of group loan repayment performance, group owned MSEs operating in the manufacturing sector which has been financed by Dedebit Credit and Saving Institution (DECSI)

from 2009- 2013 were taken as a target population for this study. Their total number was 34. Hence, this study has used census method to study the factors affecting loan repayment of this sector. Questionnaire was distributed for all group leaders of those currently functioning group owned MSE's. All the distributed questionnaires were completed and returned (100 percent response rate). In addition, depth interview was carried out with randomly selected five group leaders and DECSI's loan officer.

6.1 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

In this section, the group leaders' demographic characteristics are presented with particular reference to age, gender, education level and marital status in Table 4.1 below.

Table 4.1: Demographic Characterises of Respondents

Category	Number	Percent
Gender		
Male	29	85.29
Female	5	14.71
Total	34	100
Education level		
Primary	2	5.88
Secondary	3	8.82
TVET/Diploma	17	50.00
Degree	12	35.29
Total	34	100
Age		
18-25	2	5.90
26-35	21	61.75
36-45	11	32.35
Total	34	100
Marital status		
Single	15	44.12
Married	18	52.94
Divorced	1	2.94
Total	34	100

Source: Own Survey (2014)

As indicated in Table 4.1 above, among the 34 respondents;

- 5(14.71 percent) of group borrowers were led by females and 29(85.29 percent) of group borrowers were led by males.
- Majority (50 percent) of the group leaders have attended diploma (TVET) followed by first degree holder group leaders (35.29 percent). The remaining group leaders, 8.82 percent had secondary, and 5.88 percent had primary education.
- Group leaders in the age category of 18-25; 26-35 and 36-45 accounts 5.90 percent, 61.75 percent and 32.35 percent, respectively.
- 44.12 percent, 52.94 percent and 2.94 percent were single, married and divorced, respectively.

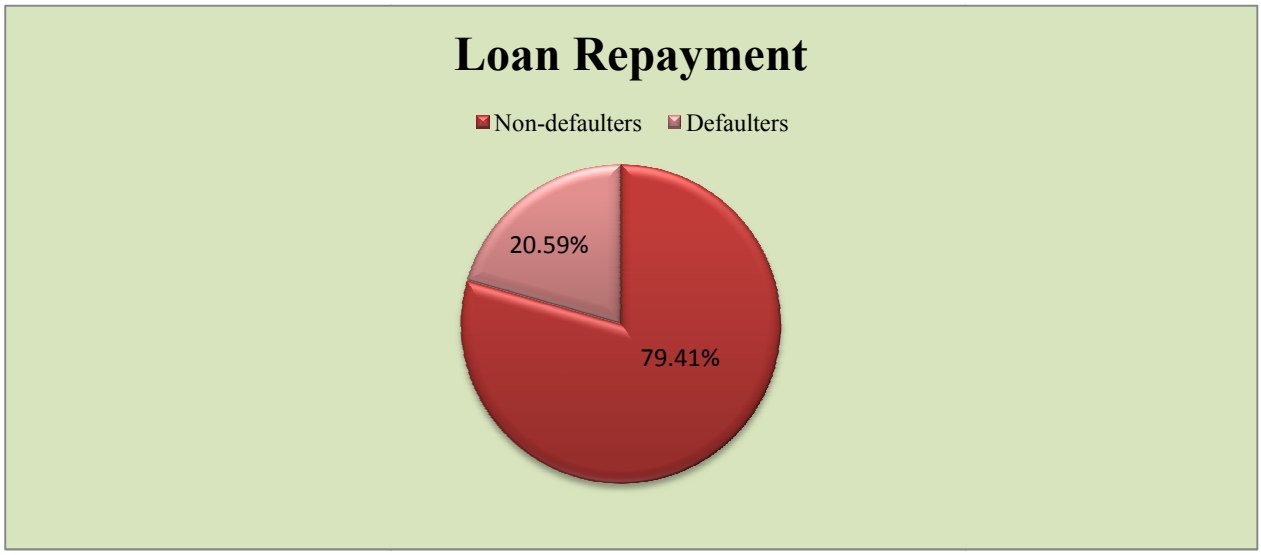
6.3 RESULTS, ANALYSIS AND DISCUSSION

6.2.1 STATUS OF GROUP LOAN REPAYMENT

To know the loan repayment status, group borrowers were asked whether they have paid back fully or not paid successfully in the form of "Yes" or "No" response question. Such an objective response and direct measurement of the binary dependent variable (i.e., group loan repayment equal to "1" if groups were non-defaulters and "0" otherwise) was used to determine the factors that affect group loan repayment performance in similar studies of Bassem (2008), Julia (1996), Manfred (1996), and Zhang and Yoichi (2008). Therefore, both group borrowers paid successfully and those did not paid fully were taken into analysis for the identified common explanatory variables.

Out of the total respondents 79.41 percent (27 groups) were able to repay the loan within the given maturity period, and hence they are creditworthy. Whereas the remaining 20.59 percent (7) respondents have defaulted on their loan and this implies that the borrowers are not creditworthy. In addition, loan officer was asked/ interviewed if the institution has any feedback from group borrowers as "What do you think is the reason borrowers fail to pay their loans?" Then the officer replied that borrowers often reason out market problem, mainly output market, and some borrowers also claim repayment schedule relating to amount and grace period. The following Figure 4.1 shows the status of loan repayment by the group borrowers.

Figure 4.1: Status of Loan Repayment by the Group Borrowers



Source: Own Survey (2014)

It was well discussed in literature that less loan default rate is critical for financial sustainability of MFIs (Norhaziah & Mohdnoor, 2013). Concerning this matter, annual reports of DECSI indicates that the loan default rate for DECSI is increasing from time to time, especially in the group lending (DECSI, 2013). This result also found 20.59 percent default. Therefore, this high loan default rate might endanger the financial sustainability of DECSI.

Reason for Engaging in Group Loan: one of the major reasons, as stated by respondents, to engage in group credit was they had no collateral security that DECSI requires as guarantee for the money loaned. Table 4.2 below reveals that out of the total group borrowers (34), about 47.06 percent responded lack of collateral security; required by DECSI (35.29 percent), and easy to get loan in group was their main reason for engaging in group loan.

Table 4.2: Summary of Reasons for Engaging in Group Loan

Group Borrowers	Reason of Engaging in Group Loan		
	Easy to get loan in group	It is required by DECSI MFI	Lack of collateral security
Response (n=34)	6	12	16
Percent of response	17.65	35.29	47.06

Source: Own Survey (2014)

6.2.2 LOGISTIC REGRESSION RESULT, ANALYSIS AND DISCUSSION

Group loan repayment has been affected by numerous variables that were tested in many of the previous empirical evidences. Similarly, in this study, the selection and incorporation of the explanatory variables was guided by the conceptual framework discussed in the literature review (**Figure 2.1**). Due consideration was given in including variables that are possibly determine group loan repayment performance and tested in this study. The binary logistic regression was used to identify the determinant factors and to estimate their potential effect of each explanatory variable on the loan repayment rate of group borrowers. The explanatory variables include group-specific, lender-specific and socio-economic characteristics/factors. Primary data was collected from 34 groups owned MSEs functioning in manufacturing sector.

Before applying the binary logistic regression model, the *Hosmer-Lemeshow* test of goodness of fit was used to see the overall fitness of the model. Similarly, before estimating the model, various detection and diagnostics tests were done to check for the related econometric problems such as multicollinearity, heteroskedasticity, model specification bias, and normality of the data as discussed in chapter three. The results of these tests indicated that the model is fitted, no severe multicollinearity, and the normality of data set (**Table 3.3**)

Table 4.8 below presents the binary logistic regression results, i.e., shows the odd ratios (probability of loan non-default/probability of loan default), the p-value, and the marginal effect of explanatory variables included in the model.

Table 4.3: Logistic Regression Estimation Result

Variables	Odd ratios	p>|z|	Marginal effects (dy/dx)
Group-Specific Factors			
Composition (homogeneity)	8.442986	0.059***	0.2226957
Internal rule and regulation	0.3988835	0.178	-0.0475766
Initiation (self-selection)	16.95498	0.005*	0.3228618
Peer pressure	9.846844	0.035**	0.2067954
Lender-Specific Factors			
Loan size	0.1757597	0.027**	-0.0782067
Suitability of repayment period	18.34454	0.005*	0.3036484
Loan Supervision	0.2123275	0.117	-0.1000537
Training	1.556051	0.707	0.0252288
Socio-Economic Factor			
External shock	0.1201008	0.061***	-0.201596
Statistics:			
Number of observations = 34		Prob > chi^2 = 0.0000	
Wald $chi^2(9)$ = 38.78		Pseudo R^2 = 0.6816	

Source: Own Survey (2014)

*, **, *** indicate level of significance at 1 percent, 5 percent and 10 percent, respectively.

6.3INTERPRETATION OF ESTIMATION RESULT (MODEL OUTPUT) AND HYPOTHESIS TESTING

The interpretation of estimation results (i.e., logistic regression output) of the explanatory variables are presented bellow followed by tests of research hypotheses.

As Table 4.3 above shows the most influential explanatory variables from group specific factors in determining group loan repayment performance are group composition, group initiation and peer pressure found significant as they have an estimated odds ratio of 8.44 (P-value of 0.059); 16.95 (P-value of 0.005), and 9.85 (P-value of 0.035), respectively; from lender specific factors suitability of loan repayment period and loan size are found significant in influencing dependant variable (loan repayment) with an odds ratio of 18.34 (P-value of 0.005) and 0.176 (P-value of 0.027), respectively. Furthermore, from socio-economic factor external shock is found significant in determining group loan repayment performance with an odds ratio of 0.12 (P-value of 0.061).

H_1: Groups that are homogeneous are predicted to have a higher probability of loan repayment as compared to groups that are heterogeneous.

The first group specific variable found significant in this study is group composition. In line with expectation, holding other factors constant, homogeneous group composition has more likelihood of loan repayment. Consistent to the expectation, the result shows that the odd ratio of 8.44. This indicates that the probability of group loan repayment is 8.44 times higher for homogeneous group borrowers than heterogeneous group borrowers. The marginal effect of this variable is 0.223 indicating that the probability of group loan repayment for homogeneous group increases by 22.30 percent as compared to heterogeneous group. Considering this a number of justifications have been given as to why homogeneous group borrowers pay their loan in time higher than heterogeneous group. In this study, group borrowers are graduate students from universities and colleges found in the same age range, education level and gender. This may help them to understand each other on an issues including successful repayment of their loan in time. Therefore, the first research hypothesis which says "*groups that are homogeneous are predicted to have a higher probability of loan repayment as compared to groups that are heterogeneous"* is accepted at 10 percent level of significance.

Thus, it can be concluded that the probability of group loan repayment increases as group borrowers become homogeneous because groups with homogeneous members showed the highest percentage of loan repayment as compared to groups with heterogeneous members.

H_2: Groups formed with self selection are predicted to perform better in terms of loan repayment as compared to the groups formed by other than member's self-selection (by an outside agent).

Group Initiation (Self Selection) is another group specific variable which is found significant at 1percent. It refers to the way in which group members formed to engage in his or her current business activity. It is hypothesized that screening and selecting of creditworthy borrowers is more effective with groups that are formed by the members themselves than the groups that depend on the intervention from an outside agent to be formed. Their loan default is lower for groups that are formed on their own.

In line with this expectation, the variable initiation has a positive relation with loan repayment and is statistically significant at 1percent level of significance. The possible reason as to why the groups initiated by the members themselves have performed better in repaying the loan is that the group members can obtain at low cost information regarding the reputation, indebtedness and effort of a group member to ensure the repayment of the

loan. The group members might be able to access complex and sensitive information about the group member.

The odd ratio of 16.95 for group initiation (self-selection) indicates that the probability of loan repayment increases by 16.95 times higher for group borrowers who are initiated by the members themselves than group borrowers who are initiated by an outside agent or promoter. Similarly, the marginal effect of 0.3229 shows, other things remain constant, the probability of loan repayment increases by 32.29 percent for those groups who are initiated by the members themselves as compared to those groups who are initiated by an outside agent or promoter. Hence, the hypothesis *"groups formed with self selection are predicted to perform better in terms of loan repayment as compared to the groups formed by other than member's self-selection (by an outside agent)"* is accepted at 1 percent significance level.

From this result, it can be concluded that the probability of group loan repayment performance increases as far as group formation is based on member's self-selection because group members can easily identify the creditworthy group member.

H_3: The higher peer pressure exercised by group members on the defaulting member, the higher the group performs good loan repayment.

Peer pressure has a positive relation with loan repayment and is statistically significant at 5 percent level of significance. The odd ratio shows that the probability of loan repayment is 9.85 times higher for the group which makes peer pressure in incitement of repayment than groups which do not employ the technique. The marginal effect of 0.207 implies, holding other variables constant, the probability of repaying the loan increases by 20.70 percent for those group borrowers who exercise peer pressure on defaulting members as compared to those borrowers who do not employ peer pressure on defaulting members to enforce loan repayment.

As a result, the hypothesis which states "*the higher peer pressure exercised by group members on the defaulting member, the higher the group performs good loan repayment*" is accepted at 5 percent significance level. Therefore, it is possible to say that existence of peer pressure among group members proves to be positive and meaningfully contribute to improve the group loan repayment performance.

H_5: As suitable loan repayment period is set for borrowers, the probability of loan repayment increases.

From the lender specific factors, suitability of loan repayment period found significant at 1 percent level. It refers to the time period during which the entire loan must be repaid. It was predicted that suitable loan repayment period is positively correlated with group loan repayment because it was assumed that if borrowers find the repayment period suitable, they can utilize the loan proceeds effectively for the intended purpose than those who regard the period of repayment unsuitable.

The odd ratio of 18.34 for suitability of loan repayment period indicates the probability of loan repayment increases by 18.34 times higher for group borrower found suitable loan repayment period as compared to group borrowers who did not found suitable repayment period. Similarly, the marginal effect of 0.304 shows that, keeping other factors constant, the probability of group loan repayment increases by 30.40 percent for group borrowers that found suitable loan repayment period as compared to those who didn't found suitable repayment period. Therefore, the research hypothesis which says "*as suitable loan repayment period is set for borrowers, the probability of loan repayment increases*" is accepted at 1 percent level of significance.

Thus, it is possible to conclude that those groups (MSEs) who seek suitable repayment period were found to be good performers in loan repayment as compared to those MSEs who do not found suitable repayment period.

H_6: The larger the loan size, the higher the probability of loan repayment by the group borrowers.

The other lender specific variable found significant at 5 percent is loan size. The result indicates that the loan size has a negative effect on the probability of group loan repayment. Similarly, the odd ratio shows that the probability loan repayment decreases by 0.1758 times higher for group borrower that perceived the loan amount is enough as compared to group borrowers who did not satisfied with the loan amount that borrowed, other thing kept constant. The marginal effect of this variable is -0.0782 indicating that the probability of group loan repayment for group borrower that perceived the loan amount is enough decreases by 7.82 percent as compared to group borrowers who did not satisfied with the loan amount that borrowed. Here the perspective to this variable might be due to the larger the loan, the higher is the borrower's cost of delaying payment. A larger loan is more difficult to repay if allowed to accumulate especially where there are compounding interest and sanctions. This factor puts pressure on the borrower to reduce late payments and serious default. In addition, this may be due to the fact that, the higher the loan size provided to the borrowers, the higher to invest in long term investment that need longer time to give back benefits to the owners. Therefore, this may enforce group borrowers to seek longer grace period to make the first repayment and lower amount of loan repayment per period when repayment starts and gradually increases with the income level. Hence, the research hypothesis which says *"the larger the loan size, the higher the probability of loan repayment by the group borrowers"* is rejected at 5 percent level of significance. Therefore, the alternative hypothesis (the lower loan size, the higher the probability of loan repayment by the group borrowers) may be accepted.

Therefore, group borrowers who supposed that granted loan size is enough to conduct the intended investment poorly perform loan repayment than those group borrowers agreed granted loan size is not as much enough to

carry out investment.

H_9: External shock is predicted to have a significant and negative impact on group loan repayment rate.

Holding other factors constant, the probability of group loan repayment decreases by 0.12 times higher for group faced external shock (such as family problem, market losses, social events, etc.). Similarly, the marginal effect of (-0.202) shows the probability of group loan repayment decreases by 20.20 percent for those groups facing external shock as compared to those groups who did not encountered the shocks, all other factors kept constant. Based on this, the hypothesis that assumes "*external shock is predicted to have a significant and negative impact on group loan repayment rate*" is accepted at 10 percent level.

From this result, it can be concluded that as number of group member facing shocks increase, the probability of group loan default increases.

However, the following hypotheses are found statistically insignificant (Table 4.3):

H_4: Groups that implement internal rule and regulation are predicted to have a higher probability of the loan repayment as compared to groups that didn't implement internal rule and regulation.

H_7: As loan supervision is made regarding loan utilization, the probability of loan repayment by the groups is higher.

H_8: As training is available by DECSI MFI, the higher the probability of loan repayment by the groups.

7. CONCLUSIONS AND RECOMMENDATIONS

7.3 CONCLUSIONS

The study was carried out to identify and analyze the factors that influence group loan repayment, particularly those groups owned MSEs functioning in manufacturing sector and who are beneficiaries of DECSI microfinance, Mekelle branch. Therefore, based on the research findings, the following conclusions are drawn.

- It has been found that about 79.41 percent of group borrowers were non defaulters and about 20.59 percent of them were defaulters. It was also found that the basic reasons as to why members want engaging in group borrowing are lack of collateral security to take loan individually when they want, required by DECSI, and easy to get loan in group than on individual basis.

The logit regression model revealed that among the nine (9) explanatory variables which were hypothesized to influence group loan repayment, six (6) variables were found to be statistically significant at 1 percent, 5 percent, and 10 percent levels of significance.

- Group composition, group initiation or formation, peer pressure and suitable repayment period had positive and significant effect on group loan repayment performance, while loan size and external shock had negative and significant effects. The remaining three variables (i.e., internal rule and regulation, loan supervision and training) were found to be statistically insignificant in affecting group loan repayment performance.
- The marginal effect of group composition, group initiation and peer pressure, i.e., 0.223; 0.3229; and 0.207, respectively, indicated that the probability of group loan repayment increases by 22.30 percent; 32.29 percent; and 20.70 percent for homogeneous group; for those groups who are initiated by the members themselves; and for those group borrowers who exercise peer pressure on defaulting members as compared to their respective counterpart group borrowers, respectively, keeping other thing constant.
- The marginal effect of suitable repayment period, i.e., 0.304 indicated that, keeping other factors constant, the probability of group loan repayment increases by 30.40 percent for group borrowers that found suitable loan repayment period as compared to those who didn't found suitable repayment period. Whereas loan size found negative and statistically significant influence with the marginal effect of -0.0782 indicating that the probability of group loan repayment for group borrower that perceived the loan amount is enough decreases by 7.82 percent as compared to group borrowers who did not satisfied with the loan amount that borrowed.
- The marginal effect of external sock, i.e., -0.202 indicated that, holding other factors constant, the probability of group loan repayment decreases by 20.20 percent for those groups facing external shock (such as family problem, market losses, social events, etc.) as compared to those groups who did not encountered the shocks.

7.4 RECOMMENDATIONS

Based on the above conclusions drawn, the following recommendations are forwarded:

- As per the discussion held with the loan officer of DECSI, one reason for low loan repayment by MSEs is wrong credit perception of borrowers. That is borrowers consider loan as donation and opted-not-to pay back. Therefore, DECSI should create awareness among clients before disbursing loan through giving short training about its objectives (i.e., its source of funds and convincing them the advantages why they are required to repay back the borrowed fund) that the loan has to be repaid so that DECSI can have sustainable and viable operation. This enables DECSI to reach millions of poor people in the region thereby eradicating poverty.

- DECSI should consider homogeneous group, self initiated groups, and peer pressure groups (i.e., groups with strong social ties) while screening group borrowers. This could reduce significantly loan default and DECSI is sustaining since creditworthy borrower can be selected from the very beginning.
- In order to make group borrowers run effective business, the availability of sufficient loan size is one important factor. Thus, DECSI should compare loan size with the business proposal of the client before loan disbursement and should revise the rule and regulation of the institution based on the current economic condition of the country.
- DECSI should set business and income based suitable loan repayment period (i.e., enough grace period, amount repayment per period, and repayment time) as per the type of businesses in the sector.

Most of these groups operating in the manufacturing sectors have witnessed lower loan repayment performance. This sector has lower loan repayment due to shortage of market for their output and frequent increase in price of inputs that the sector uses. Similarly, result from descriptive statistic and logit regression model revealed that as number of group member facing shocks increase, the probability of group loan default increases. Therefore, especial attention is needed by the concerned stakeholders (DECSI, Bureau of Trade and Industry, and Regional MSEs development agency) in creating market linkage to sell their output; and sustainable supply of inputs at fair price until these group owned MSEs build capacity to operate on their own. Especial attention is also needed for this sector because the sector can play decisive role in reducing unemployment level in the city since the sector is labor intensive.

Finally, although internal rules and regulations, loan supervision, and training are found statistically insignificant, their important influence on loan repayment should not be ignored. Thus, continuous follow up and supervision is important for loan repayment; help the MSEs develop an internal by laws; and training on loan management should be given to the MSEs. Also, loan officers should give the clients the necessary orientation, follow-up, and counseling services.

7.5 LIMITATION AND SUGGESTION FOR FURTHER RESEARCH

There will be many factors (such as experience of group borrowers in the sector, interest rate, group size, and lack of appropriate working place for both manufacturing and selling outputs) beside the factors that are mentioned in this study which hinder ability of borrowers (groups) to fulfill their loan repayment obligations as per the scheduled repayment periods. In an attempt to see the repayment status of group borrowers in Mekelle city, Tigray, this study has gone some steps forward.

Addressing the group leaders only for the study may affect the quality of the study because of biasness even if the assumption was that the leader is the one who looks after all members. Thus, further research may be conducted by addressing sample members of the group borrowers, than only the leader.

This study has focused only on the manufacturing sector. Thus, similar study may be conducted in the remaining/other sectors (i.e., construction, urban agriculture, and service and trade).

Finally, this study finding may not be used to generalize about the determinants of the group loan repayment because the study has focused on only the manufacturing sector and confined only to the Mekelle city. The study has only through a light on the factors that determine group loan repayment performance. Thus, comprehensive and comparative studies are recommended in order to have holistic picture on the group loan repayment performance by considering wide area and all the MSEs subsectors.

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