ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

THE DETERMINANTS OF MICRO ENTERPRISE LOAN REPAYMENT IN ADDIS ABABA: A CASE STUDY OF GULELE SUB-CITY

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"The Determinants of Micro enterprise Loan Repayment In Addis Ababa: A Case Study of Gulele Sub-City."

By

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LIST OF ACRONYMS

MFIS =	Micro Finance Institutions
NGO =	Non Government Organizations
NBE =	National Bank of Ethiopia
SACCOS =	Saving and Credit Cooperatives
EBDSN =	Ethiopian Business Development Service Network
ILO =	International Labour Office
LPM =	Linear Probability Model
CDF =	Cumulative Distribution Function
GLKOGMBFG =	Group Leader know Other member before Forming the Group
DAGM =	Distance Among Group Members
PSTWGM =	Presence of Social ties with in Group Member
GMKOGMBFG =	Group Member know other Group Member before forming the Group
VCO=	Visit made by Credit Officer
VEM=	Visit made by Each Member
VGL =	Visit made by Group Leader
MSE =	Micro and Small Enterprise

ABSTRACT

The purpose of the study is to look into the determinants of microenterprise loan repayment in Addis Ababa particularly to Gulele sub-city.

Loan repayment has paramount importance for most developing countries, because lack of financial resources is usually regarded as a major obstacle to the development of such countries.

In addition good repayment performance is an important measure for the success of microfinance institution and microenterprises.

Hence, it is advisable to credit scheme initiatives to make more attention to investigate factors that influence loan repayment performance which enables the programs to reach millions of the poor.

The objective of the study is to investigate the determinants of microenterprise loan repayment in Addis Ababa with respect to Gulele Sub-city.

The study is based on descriptive statistical analysis and identification of the determinants of microenterprise loan repayment in beneficiaries by using binomial probit model. The data used in descriptive statistical analysis is primary data collected from a structured questionnaire from a sample of 220 borrowers who benefited from Gulele sib-city credit and saving office.

The estimated binomial probit model indicates that, loan amount, household income, age of borrower, sex of borrowers and role of group leader are negatively related to loan repayment performance. On the contrary, suitability of installment period, supervisory visit, number of activities provide source of income, expectation of another loan, house hold income, availability of other source of income, social ties, frequency of loan, living distance among group members and high school and above high school level of education are positively related to loan repayment performance.

Hence, factors that enhance and hinder loan repayment performance should be considered by Gulele sub-city credit and saving office in designing a more effective loan repayment mechanism for its borrowers.

CHAPTER ONE

1. INTRODUCTION

Ethiopia has an estimated population of 72 million. About half of the population is living below the poverty line. These people lack the financial capacity to meet the minimum living standard . Besides, they suffer from different kinds of deprivation, such as isolation and powerlessness etc.

In the early 1990s, Ethiopia has adopted a market-lead strategy that focused on the deregulation of the economy, trade liberalization and reduction of government involvement in Economic management. However, the market-lead strategy is said to affect the poor more than any other groups. .

In addition, the credit crunch afflicting small entrepreneurs in a particular sector has been exasperated by recent reforms in the financial sector, including interest rate deregulation and abrogation of preferential credit allocation to specific sectors, as well as the distress conditions of many financial institutions.

Their resource base has also been eroded by harsh economic conditions including the ravaging influence of inflation; and this situation has made the need for credit higher than ever. The increasing tendency of many small holders to rely on informal finance will be unsustainable unless there is considerable improvement in the existing level of loan repayment performance.

Hence, poverty alleviation is major issues in the country and most of the Microfinance Institutions (MFIS) have poverty alleviation as one of their main objectives. So, understanding the factors influencing MFIS development. the challenges they face as well as their sustainability with the aim to find solutions is thus crucial.

In short, Identifying the crucial factors in stemming the tide of growing arrears is therefore a crucial issue to be addressed.

The ultimate goal of this thesis is to assess the impact of factors which determine micro enterprise's loan repayment in Gulele sub-City.

1.1 Background of the Study

It has been estimated that there are about 500 million economically active poor people in the world operating microenterprise and small business (Women's world banking, 1995). Most of them do not have access to adequate financial service. To meet this substantial demand for financial services by low- income micro entrepreneurs, microfinance practitioners and donors alike must adopt long term perspective (Joanna Ledger wood, 1999).

The traditional development finance model during the first three decades following the Second World War was based on the assumption that transforming capital from the industrial countries to developing countries would serve the purpose of effective development policy.

The financing of large infrastructure and industrial project thus got acclamation from every direction (Mengestu B., 1997).

In line with this, in an attempt to handle the foreign funds, state owned development banks were established. However, the institution of the financial system of most developing countries was immature at that time. Unfortunately, the development assistance did not include the task of boosting the financial system either. As a result, "The expectation the large scale projects would act as a catalyst for the general economic development proved to be unrealistic" (Schmidt and Zeitinger, quoted in Mengistu B. 1997).

The result of many of these interventions through providing cheap credit leads to worsening the economic condition of the poor countries involved. The poorer competitors of the more wealthy that benefited from the cheap credit and the development banks that could not stand up the losses the cheap credit caused them had also to face the inevitable collapse.

There are arguments that an inadequate supply of credit can affect production in many developing countries. Alleviation of poverty and promotion of economic development can therefore be facilitated through providing credit to the poor. If the poor people or microenterprise

and small business do not get loan from formal sector, they tend to be at the mercy of specialized agencies and NGO's to satisfy their credit need.

Hence, microfinance is assuming increasing importance in many parts of the world in response to the needs of less privileged entrepreneurs with limited capital base. Operators of small scale enterprise and cottage industries do not often have easy access to formal credit. And in view of limited loanable funds and high transaction cost they are not usually favored by lenders as they ration out the available funds (Olomola, 2000).

Therefore, lack of financial resources is usually regarded as a major problem to the development of many developing countries. To contain this problem, efforts are made by government committed to development to allow development projects promoted both the public and private sector to have access to credit (Mengistu B. 1999).

Credit has long been recognized as one of the important tools that supports the success of the business venture. This success inturn, is believed to contribute towards economic development. However, the existence of facilities alone does not necessarily result in supporting economic development. It should be accompanied by the existence of factors conducive to the effective utilization of credit funds. For instance loan has to be repaid in order to make financial institution in general and micro institution in particular sustainable. Inturn, this resulted in making loanable fund available to those who want them for productive purposes on a continuous bases is to be met (Mengistu B, 1997).

So, it is important to examine factors which have greater impact on loan repayment rate.

As a result of the new approach to provide credit to the poor, credit cooperatives and lending groups began to emerge to fill the gap left out by formal lending systems.

Relying on the theoretical literature on micro credit we expect joint liability especially through peer selection, peer monitoring, and peer pressure to be associated with a better repayment performance (Marie Godquin, 2004).

Transaction costs can be transformed to borrowers from lender because "It is generally assumed that groups can perform some screening and enforcement functions and that the community has superior information on its members" (Reinke, 1996).

Experience has, however, shown that group based credit system has had different outcomes in different countries. For instance, in countries such as Egypt, India, Kenya and Venezuela, credit co-operatives and group based lending have posed problems of repayment, where as in countries such as Bangladesh, Cameroon, Malaysia, and Republic of Korea success has been scored because of better incentive , control and monitoring system (Khandker, et.al.. 1995).

In general, instead of its failure in some developing countries, group based lending, now a days, is popular in many countries. Hence, designers of group lending programs hope that the group will offer to help a member with financial difficulties. If the groups are selected carefully, common wisdom suggests that including members who trust and respect one another increases the likely hood of group solidarity.

One of the ways that designers of group lending programs hope to enhance the use of positive group dynamics, such as group solidarity, is by forming groups with higher degree of group member homogeneity. In group lending, homogeneity is desirable, if group members have similar cash flows that demand similar loan characteristics and if group members have a strong sense of trust and mutual obligation.

However, homogeneity may have adverse effects on repayment, since similar economic activities can result in covariant risk, increasing the likelihood of wide spread of default.
(Paxton, Graham and Threan; 2000).

Hence, in Asia Dr. Mohammed Yunus of Bangladesh led the way to a pilot group lending scheme for landless people. This latter, become the Grameen Bank, which now serves more than 2.4 million clients (94% of them women) and is a model for many countries (Joanna Ledger Wood, 1999).

At present, the Grameen Bank replication are found in over 40 countries spanning from such developing countries as Malaysia, Burkina Faso, Srilanka, Philippenes, and Honduras to developed countries such as Canada France (in paris) and USA in Chicago and Arkansas) to mention but a few (Shams, 1992 as cited by Mengistu B, 1997).

1.1.1 Microenterprise Financing in Ethiopia

In Ethiopia, the commercial banking system could not address the financial needs of the poor households for the very fact that they are not their ultimate large target clients.

On top of that, the transaction costs and risks involved in serving poor households are perceived to be too high.

In addition, even if there are few private banks that are interested in providing financial services to poor households, they have not yet developed a suitable credit methodology for micro lending activities. Moreover, they do not have trained personnel for such purposes.

Non government organizations (NGOs), with a strong welfare and relief orientation towards the poor population, entered into the micro credit sector to provide credit services to poor rural households and urban micro entrepreneurs under programs supported by donors and international NGOs.

However, the outreach of the NGOs schemes was limited in that it only reached a very small proportion of rural households. On account of the non suitability of commercial banks and non sustainability of NGO's credit schemes, the government of Ethiopia established a legal frame work for the establishment and operation of micro finance Institution (MFIs) to provide financial service to poor households.

Since proclamation number 40/1996 for licensing and supervision of MFIS came into effect in July 1996, 21 MFIS have been registered and licensed by the National Bank of Ethiopia (NBE). The majority of the regions now have their own MFIS. Concerning their performance, the study conducted by International fund for agricultural development (IFAD) in the year 2001 indicated that the industry, with a net work of 500 branches has recorded remarkable growth: a loan portifolio of about USD 33.5 million, net saving of about USD 16 million out reach to nearly 500,000 rural household and over 40% of client are women. Some of them are region based MFIS, with a specific objective of enhancing the living conditions of poor households in their respective regions by providing credit to microenterprise.

Concerning their governance, MFIS in Ethiopia are required to have Board of Directors elected by the general assembly of shareholders. All MFIS are required to regularly report on their operational and financial situations as well as provide external audit reports to the NBE. There is also a legal provision for establishment of savings and credit co-operative, (SACCOS) to pursue financial intermediation to their members (Ethiopia chamber of commerce and Ethiopian Business development service Network (EBDSN), 2004).

A study by Mulat and Welday (2000, as cited by Retta G, 2000) describes small enterprise or informal sectors as a sector characterized by:

1. easy of entry;
2. reliance on indigenous resources;
3. Family ownership of enterprises;
4. Small scale operation;
5. Labor extensive and adaptive Technology;
6. Skill acquired outside the formal school system; and
7. Un regulated and competitive market

These are important for creating employment at a very low investment costs and generate significant portion of household income, especially among the very poor.

1.1.2 The Micro-Credit Scheme of Gulele Sub City Credit and Saving Office

Gulele Sub city credit and saving office is one of the branches of Addis Credit and saving Institute. Addis Credit and saving institute S.c is established by the National bank of Ethiopia according to proclamation No. 40/1996. It has branches in all the sub-cities of Addis Ababa City administration. It is a region –based micro finance institution established to serve people residing in the city of Addis Ababa.

The total number of branches opened so far is ten and the total number of clients served so far is about 30,000 (all urban) .

When we look at its Gender sensitivity, male's clients are 18%, while female clients are 82% (Ethiopian Chamber of commerce and Ethiopian Business development service Network, 2004).

Addis Credit and Saving Institution has the following objectives:

a) To organize youth into voluntarily associations;
b) To identify potential income generating projects for the unemployed;
c) To provide training for the unemployed youth on business start ups and in the development of individual or groups business plans;
d) To establish saving and investment schemes; and
e) To provide credit to the youth and unemployed people without collateral , using funds from the city government (ILO, 2000 as cited by Tadesse, 2000).

In line with the above objectives the Gulele Sub-city credit and saving office has the following loan eligible criteria:

The applicant or Borrowers

1. Must be permanent residence in the Gulele Sub city;
2. Should engage in micro and small enterprise activities;
3. Unemployed youth and women with strong commitment and potential for self employment;
4. Must have willingness and full commitment to engage income generating activities;

5. Must have willingness to be organized into credit Groups and take loan through group collateral;
6. Should be above 18 years of age (Working age);
7. Individual who are known in their locality to be disciplined, honest and free from notorious deed, and bad habits: and
8. If the applicants have ever taken credit from any organization or individual before, they should settle their debt at maturity and must be free from any debt at the time of application;

According to the above criterion the credit delivery model is given by:

The scheme has been designed to focus on:

- for team organized ;
- for individual creditors;
- for creditor who organized under association

With respect to the above, target clients for loan are:

1. Micro and small enterprise owners and unemployed youth;
2. Legally registered co-operatives:
3. Community based organization such as "iddire" the iddire selects the poorest among its member;
4. New Business start –ups such as graduates of high school, college or even university graduates shall receive the service provided that they can engage them selves in income generating activities and want to take the loan on the bases of group collateral such borrowers shall be recruited or selected by the credit and saving committee of their respective local administration (Kebele); and
5. New business start-ups such as high school dropout college graduate, and similar groups, The unemployed and new business start-ups can also access the service provided that they have the necessary entrepreneurial commitment.

When we come to the credit delivery model it looks like as follow:-

a) The Gulele sub-city and kebele microenterprise offices promote the formation of micro enterprise co-operatives with in the sub- city. Accordingly groups are formed in such manner that a group consists of a minimum ten like minded members who know one

another, are either neighbors or live in the same kebele. However, relative, are not allowed to join the same group;

b) The Gulele sub-city and kebeles micro enterprise office are responsible for screening, organizing and licensing micro enterprise co-operatives. They are also supposed to give training to the co-operative members on credit utilization and related matter before loan dispersment is made;

c) The Organizing offices prepare business plan for each borrowers in co-operative they organized so that the size of the financial requirement of a borrower is determined properly. Following this, loan request is lodged with Gulele sub-city credit and saving office by co – operatives submitting all relevant documents that signify the proper assessment has been made and the remaining job is only effecting loan disbursement;

d) Making sure documents are in order the microfinance institutions disburse loans to the co-operative members through the executive members of the co- operatives;

e) Every borrower is supposed to deposit 10% of the loan as compulsory saving;

f) Group members assume joint liability for loans they receive;

Based on the above model, until June 2006, the Gulele sub–city credit and saving office, through its 10 kebeles, dispersed about a total of Birr 5,984,657 million to 77 microenterprises (unpublished report of Gulele sub – city credit and saving office, 2006).

There are, totally 8 types of activities where all borrowers are engaged, These include waving, food processing, construction, car washing, wood and metal work, agriculture, sweater and leather manufacturing and oil production.

Out of the dispersed credit to borrowers, that is 574,723 Birr, was recovered on the bases of loan contract. This recovery rate was not satisfactory for the sub–city in relation to its credit scheme. Different opinions are raised by some researchers about interest rates. However, one consensus is that "Positive interest rate" gives borrowers an incentive to be efficient (Von Pischke, 1991) .

This seems in line with the position of Dale W. Adams who also refutes the argument for low interest rate (applied to rural finance) under the ground that cheap credit will, for instance, result

in losses and channeling of more resource (Von – pischke ,1991). However, the sub –city provide credit to a borrower at the official interest rate. Hence, there has been no room for cheap credit to undermine the financial position of the lender.

Therefore, most microfinance institutions, whether they are dependent on donation or equity investment, aim at providing financial service for economically active poor. A business carried out by the poor has dual characteristics which may seen contradictory but mutually interconnected. On the one hand, financial service that are targeting poverty alleviation and enhancing the productivity of the poor should be able to manage to ensure institutional sustainability. On the other hand, the ultimate objective of almost all MFIS is to ensure poverty alleviation and enhancing productivity endeavor, and client sustainability. Hence, it is advisable for such credit schemes to pay attention to such issues through adequate studies (Alemut, in microficance development in Ethiopia, 2002).

1.2 Statement of the Problem

Lack of access to external finance is generally seen as one of the main reasons why many people in developing countries remain poor. Usually, the poor have no access to loans from the formal banking system. This is because they cannot put up acceptable collateral and cost of the for banks for screening and monitoring the activities of the poor, and enforcing their contracts, is too high.

Recently, however, the poor in developing nations have increasingly gained access to small loans with the help of micro finance programs. During the past ten years, these programs have been introduced in many developing countries.According to (Lepenu and Zeller, 2001) in a survey of a sample of such programs, 16 percent of who have made use of so called group lending to provide credit to the poor they served more than two third of all borrowers from the micro finance programs included the survey. Providing affordable credit to the poor and improving institutions that deliver such credit has long been an important objective of World Bank operations. Recent experience with micro credit programs shows that with proper incentives and monitoring, loan defaults can be kept to a minimum and affordable credit can be delivered to the poor and to women, though they lack physical collateral. An earlier study based on a household and community survey in Bangladesh in 1991-1992 found that micro credit programs have a

substantial effect in reducing poverty; and credit given to women has a substantially larger effect than credit given to men(World Bank Research program, Abstract of current study, 2000).

Many are now of the opinion that allowing the poor to have command over resource, through credit, can contribute towards poverty alleviation. "The best way to do something about poverty is to let the people do their own thing. Nobody will have more motivation to change his situation than sufferer himself" (Gibbons, 1992 as cited by Mengistu B, 1997).

In short, when we allocate credit to the poor we have to make sure that borrowers will use it in productive activities. It is known that Microfinance institutions (MFIS) are responsible for managing other people's money. If they are unable to set the right goals, monitors it progress, motivate their staff, they will not be sustainable. Hence, MFIS can only sustain as long as it remains institutionally and financially viable and as much as the borrower it caters are worth its assistance. However, in order to ensure institutional sustainability every MFIS should, as much as possible, work to minimize the challenge to its sustainability. This can be possible through giving more emphasize for factors which have impact on loan repayment. The most important and widely used method for credit delivery is group lending structure of joint liability that stimulate screening, monitoring and enforcement of contracts among borrowers. So, the lender no longer has to invest in screening, monitoring and enforcement activities. That is, group lending structure is equivalent to social collateral. As a result of this MFIS can efficiently play their role of financial intermediary. Hence, credit will be reached to the poor .

Each MFIS – tries to maximize its repayment performance, whether or not it is profit oriented or not. High repayment rate is largely associated with the benefit of both the MFI and the borrower. It enables the MFI to cut the interest rate it charges to the borrowers, thus reducing the financial cost of credit and allowing more borrower to have access to it. Improving repayment rate might also help reduce the dependency on subsidies of the MFI which would improve sustainability (Marie Godquine, 2004). It is also argued that, high repayment rate reflects the adequacy of cross subvention across borrowers. Repayment performance is a key variable for donors and international funding agencies on which many MFI depend on for their access to funds till (Marie Godquine, 2004).

Furthermore, default problems destroy lending capacity as the flow of repayment declines, transforming lenders into welfare agencies, instead of viable financial institutions. It incorrectly penalized credit worthy borrowers whenever the financial technology is not sophisticated enough to separate high-risk applicants from low-risk borrowers. Loan default may also deny new applicants access to credit as the banks cash flows management problem augment in direct proportion to the increasing default problem, loan default specially (Hunte,1996). This implies that unless microfinance institution follow efficient screening, monitoring, and enforcement mechanism so as to achieve high rate of loan repayment, lending strategies and loan collection will be meaningless. Meanwhile, experience has shown that many rural financial institutions sustained heavy losses because of poor loan collection in a stable economy such as India. Moreover because of inadequate indexation in high inflation economies like Brazil and Mexico many became a burdon on government budget (Yaron ,1994 as cited by Mengistu B, 1997). Subsidizing could not make these institutions financially sustainable as they are not forever "Subsidization per se is clearly not a problem , and it is also probably unavoidable, but subsidization which does not aim over the medium term to help institutions grow , enhance their productivities, and lower their costs is not an appropriate tool of development Policy". (Schmidt and zeitinger, 1996). Hence, loan recovery has to be dependable for the micro enterprise financial institution to have a sustainable financial position, the absence of which will easily defeat the objective of allevating poverty through credit provision (MengistuB, 1997).

Addressing the question of the relative performance of group loans compared to individual loans and using data form Zimbabwe, Barton (1986) stated that group loans' performance is better than individual loans' in years of good harvest and worse in drought years when peers are expected to default. Paxton (1996) analyses, with a mean and covariance structural model, the determinants of successful group loan repayment of 140 credit groups in Burkina Faso. She draws attention to a negative "domino effect" that qutweigh the positive effect of group lending. Zeller (1998) uses information on 146 credit grouping Madagascar and provides evidence in favor of group lending. In his article, Zeller shows that the group generate insurance which leads to a better repayment performance (Marie Godquine, 2004).

Contrary to the conclusions of the previous three articles on the positive impact of group dynamics, Diagne, Chimombo Simtowe, and Mataya (2000), working on data from Malawi, found that peer monitoring , peer pressure and joint liability had little or negative impact on loan repayment performance and that peer selection was found to be limited. And Reinke (1996) has come up with a finding that group based lending would not be successful in the context of South Africa. He states that the presence of high geographical mobility, low attachment to specific neighborhoods and peer groups consisting of competitors can frustrate solidarity groups in South Africa. That is why he recommends an individual credit system for a better loan recover performance in South Africa.

Most of the studies on the determinants of repayment rate also introduce control variables on the characteristics of the area and of borrowers. Khandker., etal(1995) raise the question of whether default is random, influenced by erratic behavior or systematically influenced by area characteristics that determine local production conditions or branch level efficiency (Marie Godquine, 2004). Hence, this needs an empirical investigation so that the findings can be used by micro financing institutions to manipulate their credit programs for the better.

Since the over all repayment performance of micro enterprise run by group of borrowers financed by the Gulele Sub-City credit and saving office seems unsatisfactory, the need to study the factors affecting the repayment behavior of the borrowers is very clear. By doing so, it is possible to improve repayment rates of micro enterprise which results in reducing the dependency on subsidies of the MFI which inturn improves sustainability.

The overall significant of this study is to throw light on the factors affecting microenterprise loan repayment behavior in Addis Ababa particularly in Gulele Sub –City.

1.3 Objective of the Study

The objective of the study is to investigate factors affecting microenterprise loan repayment performance of Gulele sub-city credit scheme in Addis Ababa.

1.4. Hypothesis of the study

In this study, it is hypothesized that microenterprise loan repayment rate either positively or negatively depends on factors discussed below:

1. Age of Borrowers: this variable may has positive, negative or may not has impact on loan repayment. Zeller (1998) state that traditional prejudices against younger borrowers should not influence the determination of repayment ability
2. Number of Activities that provide source of income for the household (including other than those for which loan has been taken): This variable is supposed to have positive impact on loan repayment
3. Social ties inside the group this variable is related to distance between group members, the degree of knowing each other, whether or not member living on the same or neighboring kebele and the like. Hence, it is supposed to have positive impact on loan repayment performance
4. Average living distance between the group members is a factor that may be negatively or positively related to loan repayment
5. Role of group leader is another factor that may affect loan repayment performance and it may have a positive effect on loan repayment.
6. Loan size: It may have either positive or negative impact on loan repayment. Loan sizes increase the probability of delinquency. The observed negative effect of these loan characteristics can be attributed to fungibilty and covariant risks. If loans are not totally diverted to the particular productive activities for which they have been granted, the expected benefits may not be fully realized and the likelihood of delinquency may arise. Although this is a possibility, as far as the effect of loan size is concerned, the emerging results shows that the problem is not a serious one: judging by the low level of increase in the probability of delinquency associated with loan size. (Olomola, 2000). Hence it is expected to have a positive sign.
7. Supervision and advisory visits: This variable may have positive or negative effect on loan repayment. Unless the number of visits is translated in to effective monitoring including proper targeting of visiting time it has a negative impact on loan repayment. If there are enforcement problems such as borrowers unwillingness to repay, the repayment rate may also be low not with standing the frequency of visit (Olomola , 2000). In this study it is expected to bring a positive impact.

8. Household income: This variable is expected to have a positive impact on loan repayment. This is due to the fact that increased household income means more capacity to repay loan.
9. Education level of borrower: This variable is expected to have a positive or negative effect on loan repayment.
10. Sex of borrowers: There is usually a belief among many microenteprise financiers that women are better loan payers, thinking that they are more entrepreneurial, as result of assuming more responsibilities in the domestic affairs of a house hold (Vigano, 1993). It also may have a negative impact on loan repayment. So it is better to test it.
11. Availability of other sources of credit (Other than iqub traditional rotating saving association). In line with this variable it is supposed to have a positive impact on loan repayment
12. Expectation for another loan: Since borrowers need to get further loan the effect of this variable on loan repayment is expected to have a positive effect on loan repayment.
13. Suitability of monthly installment repayment period: Since installment period of repayment should be effective monthly in this credit programe, It is expected that borrowers who find the repayment period suitable may perform better. Thus, it may be positively related to loan repayment.
14. Frequency of loan is another factor that may affect loan repayment performance and it is expected to have a positive effect on loan repayment.

1.5 Significance of the Study

We have seen that micro credit to the poor is a major strategy for poverty alleviation. Micro finance Institutions have paramount importance for the majority of the poor who have business idea but have no access to financial resource. Hence, providing credit to those poor, who have no access to formal banking credit, would lead to viability of their enterprise and hence poverty reduction.

To do this, the sustainability of micro finance Institution is very essential. Therefore, the study of determinants of micro enterprise loan repayment has to get emphasise. Giving emphasise to the determinants of loan repayment results in providing affordable credit to the poor and micro enterprise which lead to poverty alleviation and economic development.

Hence, improving institution that deliver credit to the poor has long been an important objective of World Bank operations. Recent experience with micro credit program shows that with proper incentive and monitoring, loan default can be kept to a minimum, and affordable credit can be delivered to the poor and women, even if they luck physical collateral.

Therefore, by examining determinants of microenterprise loan repayment, it is possible to reduce loan default rate that resulted in a sustainable microfinance institution. This makes loanable fund available to microenterprise that play an important role in creation of job opportunity and hence lead to poverty alleviation and Economic development. So, this study will make some contribution for concerned policy makers and interested researcher in this area. In addition to this, it is important to government and microfinance institution to set effective micro- credit schemes, which makes loan default rate minimum and create sustainable microfinance institution.

1.6 Scope of the study

The study consider only micro enterprises run by a group of borrowers who are the customer of Gulele sub-city and have already passed12 months of installment maturity date. The study does not include borrowers who are the customers of other financial institutions or NGO's and micro enterprise run by individual borrowers. Hence, the study's main focus is the determinants of microenterprise loan repayment in Gulele sub city. It will not make comparison of factors of the determinants of microenterprise loan repayment between different credit schemes that provide credit to microenterprise formed by a group of individuals.

CHAPTER TWO

2. Review of Related Literature

2.1 Empirical Literature

Theoretical models generally confirm that joint liability leads to higher repayment performance due to more and effective screening, monitoring and enforcement among group members. Most empirical studies on this issue support this view. Several authors have empirically investigated the prediction of high repayment performance of Grameen Bank and Bancosol. They focused on analyzing the determinant of micro enterprise loan repayment performance. All in all, concerning loan repayment performance there is no well developed theory in the field. Hence, the study mostly utilizes empirical exercise.

Accordingly, a number of factors that systematically influence loan repayment have been raised. In line with this, looking at the major one's can serve the purpose of grasping what the literature offers on empirical work done so far.

Education is one of the factors that can affect loan repayment performance. Matin (1997) found that education has a positive impact on repayment performance (Marie Godquin, 2004). Access to basic literacy service might have access to more profitable projects or might be able to generate more cash out of project. On the other hand, secondary education decreases the probability of repayment. The negative impact of secondary education on repayment performance tends to confirm the view point of Olomola (1999) regarding the behavior of educated individuals in terms of repayment of informal loans. According to him educated individuals have better chance of securing white color jobs and they are very mobile. The tendency to move from place to place in search of better job opportunities implies that they are unlikely to have reputation with in the community that can make them attractive to lender and social groups that are coming together for saving and credit purpose (Olomola, 2000).

There are other findings that support this argument. Njoku and Obasi (1991) in their Nigerian case study, and Yaqub (1995), in his Bangladesh case study, indicated that education is negatively related with loan repayment. On the other hand, authors like Jama and Kulundu

(1992), Kashuliza (1993), and Njoku and Obasi (1991) reported findings that show the insignificance of education to affect loan repayment (Mengistu B, 1997).

Household income is another factor that is believed to influence micro enterprise loan repayment positively or negatively. Matin (1997) on his study of repayment performance of Grammen Bank borrowers in uniziped state found that the area of operated land, which could be proxies, for wealth of borrower, had a positive impact on repayment. The value of the productive asset of the household, the dummy for self-employment in agriculture and the number of landed relatives were used to control variables for wealth of the household and wealth of its social network. These variables showed a positive and significant impact on the on time repayment performance. This trend can be explained by a given ability richer households or house hold with richer relative to cope with shocks. It is also likely that households with more productive assets have access to projects with higher return or safe projects. In addition to this, the works of Jama and Kulundu (1992) on Kenya, and that of Kashuliza (1993) on Tanzania, indicate positive relation between farm income and loan repayment. Adeyemo (1984 as cited by Mengistu B, 1997), on the other hand, has somewhat different position about the impact of farm income on loan repayment. According to his study, on Nigerian case, income at higher level has a negative relation with loan repayment.

A number of sources of income is another factor that affect micro enterprise loan repayment. As to Jama and Kulundu (1993), number of source of income was found to have positive impact on loan repayment. In addition to this, Olomola (2000) on his study of determinants of small holder loan repayment performance evidence from the Nigerain microfinance stated that for improved repayment performance, there is a need for clear diversity in sure of income among group members.

Loan diversion to another purpose is another factor that is considered to have a significant impact on micro enterprise loan repayment. According to Ololmola (2000), if an individual has to engage in multiple diversity in the productive venture which have to be undertaken, there will be improved repayment performance. On the other hand, Jama and kulundu (1992) study made for

Kenyan small holder farmer credit repayment performance showed that there was a negative relationship between loan diversion and loan repayment.

According to his study, loan diversion was taken as an endogenous variable whose predicted value was used in the determination of loan repayment performance. In addition to this, factors like late on loan issue and inappropriate supervision have impact on loan diversion. Similarly, a study conducted by Vigano (1993), found out that loan issued in small amount what is requested resulted in loan diversion.

Social ties inside the group are also another factor which has impact on loan repayment performance. Zeller (1998) looks at the repayment performance of six group- based lending program in Madagascar based on detailed information from 146 groups. Zeller used measure of social ties between group members and finds evidences that groups with stronger ties show higher repayment rates. This supports the assumption that group members with stronger ties have more information about each other and are therefore better able to screen, monitor and enforce. However, social ties among group members are not always associated with a better repayment performance (Marie Godquin, 2004).

Written formal rule is another factor which has a positive impact on loan repayment. Wenner (1995) provides one of the first empirical studies on the determinants of repayment of groups. He uses the data of 25 groups from, a group based program in Costarica. His analysis indicates that repayment performance of groups improves when they have written (formal) rules stating how members should behave. This variable implicitly measures screening, monitoring and enforcement activities that take place within the group. Zeller (1998) also come out with the same conclusion.

Homogeneity of the group (ethnicity, occupation, income etc). A study done by Paxton, Graham and Thraen (2000) Provide the data of 140 groups from a group based lending program in Burkina Faso. They found out that the homogeneity of group in terms of their ethnicity, occupation, income, etc has got a negative impact on repayment performances. This may indicate that if members are more homogenous, they will have lower incentives to screen, monitor and

enforce each other and/or may start to collude against the program. Hence, group homogeneity is frequently used as a methodological guideline for group formation in many microfinance programs. Therefore, further research must be done to understand what type of impact, if any, group homogeneity could bring on the repayment performance of the borrower.

Training is another factor that has a positive impact on micro enterprise loan repayment. Paxton, Graham and Thraen (2000) found out that group that have received better training before they started the program have a better repayment performance.

Group leader's role is a factor that has impact on loan repayment. It is positively related to repayment performance which may be seen as evidence for the fact that the group leader plays a prominent role in screening, monitoring and enforcement with in the group (Paxton, Graham and Thraen, 2000).

Distance between group members and cultural similarities are another factor that have impact on loan repayment performance. Karlan (2004) used data of over 1.700 individual member of a group based lending program in Peru and finds that distance between group members has a negative impact on the repayment performance of a group.

This result was also reported by Wydick (1999). In addition to this Karlan shows that cultural similarity has got a positive impact on loan repayment performance based on the assumption that cultural similarity increases the probability that members know each other and therefore be better able to screen, monitor and enforce each other. This result seems in contrast with that of Paxton, et.al (2000) who pointed out a negative relationship between measure of cultural similarity and repayment, explain this result interms of collusion against the program.

Visit (Supervision) is a factor that has a positive or negative impact on loan repayment. Regarding this Olomola (2000), in his study on determinants of small holder loan repayment performance, evidence from the Nigerian micro finance state that if an increase in the number of visit is transformed into effective monitoring including proper targeting of visiting time, it may

have a positive impact on loan repayment performance. Otherwise borrowers may be in an unfavorable repayment status, despite increasing visit.

Another factor that has impact on micro enterprise loan repayment performance is borrowers' attitude towards loan repayment. Willingness to pay rather than ability to pay play important role in micro enterprise loan repayment performance. Jama and kulundu (1992) and Kashuliza (1993) carried out empirical study. They came up with results suggesting that there will be negative impact, if borrowers attitude towards loan repayment is negative.

Loan size (amount) is another factor that can affect loan repayment performance. Sharma, Zeller (1997) and Marie Godquine, (2004) showed that loan size has negative sign and is significant in affecting loan repayment. This negative sign is theoretically explained by the fact that the loan size increase the gains associated with extant and expost moral hazard. The negative sign of loan size of the loan could also be linked to borrowers' inability to repay a large amount over a given period (usually one year). It could be that, for a given duration large loans do not meet the borrowing needs and are not suited to the local economy. This statement is largely related to the positive and significant sign of duration of the loan throughout the specification. In addition, studying the case of Burkina Faso, loan size is positively related to loan repayment, if the borrowers are established bank customers.

Olomola (2000) in his study of determinants of small holder loan repayment performance, evidence from the Nigerian microfinance system, found out that loan size increases the probability of delinquency. It implies that loan size is negatively related to loan repayment.

Household size is another factor that may or may not have impact on microenterprise loan repayment. According to Zeller (1998) large family size should not influence the determination of loan repayment ability. But Njoku and Obasi (1991), on their study in Nigeria, found out that household size is positively related to loan repayment performance. Kashuliza (1993) in Tanzania and Njoku and Obasi (1991) in Nigeria both found out that household size is inversely related to loan repayment.

Age is another factor that may have impact on loan repayment performance. Zeller (1998) questioning the impact of the characteristics of borrowers, showed that traditional prejudices against women, young borrowers or large families should not influence the determination of repayment ability. This means the age may not have impact on loan repayment performance.

Interest paid on loan is a factor that has impact on loan repayment performance. Promise of continuing access to bank credit at interest rate well below equilibrium can provide borrowers with strong incentive to repay loans promptly. However, as the AID spring review thoroughly document, low interest rate on bank agriculture loans are as wide spread as repayment problem in developing countries (Robert C.Vogele, 1981). Higher rate of inflation imply lower, real interest rate which, other things being equal, make it more profitable to delay repayment (Robert C. Vogel, 1981)

Business experience is another factor that should be considered in studying factors affecting loan repayment. It is usually considered to be positively related to loan repayment. Olomola (2000) support this idea. On the other hand, according to Njoku and Obasi (1991), in Nigeria, and Yaqub (1995) in Bangladesh, borrower's experience has no relevance in loan repayment. The membership period was positively associated with default; and also the age of the group is found to have a negative impact on repayment. This raises the need to develop new incentives for experienced borrowers to avoid decreasing repayment performance and negative domino effect as the clientele of MFI becomes more mature (Marie Godquine, 2004).

Value of assets of borrowers is another factor that has impact on loan repayment performances. Matin (1997) found that the area of potential land, which could be proxies for wealth of borrowers, had a positive impact on loan repayment performance (Marie Godquine 2004). The value of production asset of the household, the dummy for self employment in agriculture, and the number of landed relatives, were used to control variable for wealth of the household and wealth of its social network. It showed a positive and significant impact on the on time repayment performance. This trend can be explained by a given ability of richer house hold or household with richer relatives to cope with shocks. It is also likely that the household with more productive assets have access to projects with higher return or safe project (Marie, Godguine,

2004). On the contrary, Yaqub (1995) and Hunte (1996) with a Guyanese case study, come up with a negative sign.

Credit experience or repeated borrower is another variable that may have positive or negative impact on loan repayment performance. Borrowing experience increases the default probability. Although this finding is counter intuitive, it is possible to have experienced borrowers who default during a particular loan cycle despite the fact that their previous repayment records have been satisfactory to the lender. Such experienced borrowers may have genuine problems, and they may expect some support from the lender. This may include loan re-scheduling or re-financing based on their previous interaction with the lender (Olomola, 2000).

Hunte (1996), in his study of credit experience in loan repayment showed a positive impact on loan repayment performance. When a borrower is an established customer, both party may prefer voluntary liquidation. This action reduces the cost of the bank and provides the borrower with a chance to continue a relationship with the lender (William C. Hunter, 1984). This indicates that there is a positive relationship between credit experience and loan repayment.

Access to other credit sources is also one factor that has impact on microenterprise loan repayment performance. Marie Godquine (2004) like that of Paxton, Graham and Thraen (2000) show that the presence of other credit source has a positive, significant coefficient. This supports the hypothesis that having other contract is an indication of credit worthiness rather than having obligation spread too thin.

However, Sharma and Zeller (1997) indicated that group members should have more incentive to screen, monitor and enforce if they have no alternative credit sources. In line with this Matin (1998) uses data from 246 borrowers from the Grameen Bank, Bangladish. In his study he finds that members who have other credit sources have a higher probability of showing repayment problem. This outcome indicates that since these borrowers have other credit opportunities, they have less interest having future access to loan, from the program, which may reduce their screening, monitoring and enforcement activities.

Delayed loan issuing or Disbursement lag: The finding in respect of this issue implies that loan processing has a role to play in determining whether repayment performance will be favorable or not. The disbursement lag is intended to capture the effect of activities between the period of submission of loan application and the period of collection of loan. Loan processing activities are successfull to some extent, judging by the significance of loan dispersement lag in reducing default probability among borrowers (Olomola, 2000). According to Hunte (1996), delayer loan issuing resulted in a fell in loan repayment. He also identifies such activities, as rice and sugar production and fishing as having a positive relation with loan repayment.

Sex is also one factor that may or may not have impact on loan repayment performance. In line with this, female borrowers did not prove to have a significant better repayment performance. Even thought the coefficient is positive, it is not significant. Using the same data set, Pitt and Khandker (1998) found that female borrowers have a better impact on poverty reduction than male borrowers. This might be a greater argument infavor of female borrowers. The fact that on average women have alower default probabilities, could be partly explained by their lower average loan size (Marie Godquine ,2004). Besides, Hunte (1996) came with that female have got negative impact on loan repayment while Yaqub's(1995) finding showed that women are better than their male counter parts in Bangladesh in repaying loan.

Grace period is also another factor that has impact on the microenterprise loan repayment performance. Regarding this issue, Hunte (1996) got a negative result. Accordingly, extended grace period resulted in diminished loan repayment. However, a recent study by Caporioand Demirgiic Kunt (1998) on the loan of long term finance shows that there is an association between long-term finance and higher productivity. This implies that higher productivity may mean higher profit and hence, good loan repayment. In other words, since long grace period is relatively associated with long-term finance, it can be conclude that grace period is positively affect loan repayment (Mengistu, B., 1999).

It is also worthwhile to make note Njoko and Obasi (1991) who stresses the importance of profitability of an enterprise in loan repayment. Contrary to this, Vigano (1993) states that "There is almost no relationship between the specific project profitability and regular loan repayment.

This confirm the widespread opinion that fungibility of money and the unity of the enterprise (Delli Amore (1965), (Von piscke and Admas, 1980)] make it misleading and dangerous to put too much attention on the specific project to be financed instead of evaluating the firms global performance (Vigano 1993 as cited by Mengistu B., 1997).

Finally, in addition to the above variables, loan maturity (installment period), and ratio of total debt to total asset are also believed to have impact on loan repayment. Accordingly, Vigano (1993) says that both have a negative relation with repayment. Regarding loan maturity, small periodical repayments are good. Based on the above review, we conclude that empirical studies have provided that there are factors affecting microenterprise, loan repayment. Hence, it is possible to improve loan repayment performance of microenterprise by focusing on these factors which are believed to have paramount importance for the sustainability of microfinance institutions.

2.2 Literature on Ethiopia

Studies on determinants of microenteprise loan repayment are very limited in Ethiopia. However, Mengistu (1997), Berhanu (1999), Mengistu (1999), and Retta (2000) have come out with studies on determinants of loan repayment performance.

Accordingly, record keeping is one of the factors that affects loan division rate. Mengistu (1997) in his study on determinants of Microenteprise Loan Repayment and efficacy of screening mechanism in Awàsa, and Berhanu (1999) on his study on project office for the creation of small scale Business opportunities (POCSSBO) in Addis Ababa arrived at a conclusion that record keeping is inversely related to loan diversion rate. This implies that record keeping has a positive relation to loan repayment. The same result also obtained by Retta (2000) in his study on women and microfiance: The case of women fuel wood carriers in Addis Ababa.

Timely loan granting is also another factor that affects loan diversion rate. Mengistu (1997) and Berhanu (1999) on their study came with the idea that timely loan granting is negatively related to loan diversion and positively related to loan repayment.

Monthly household income is a factor that affects loan diversion rate. Mengistu (1997) showes that monthly household income is negatively related to loan diversion rate, and to also encourages loan repayment.

Household size is a factor that has impact on loan diversion rate. Mengistu (1997) came with the result that household size is positively related to loan diversion rate, and it discourages loan repayment.

Number of dependent outside the household is also a factor that has impact on loan diversion rate. With regard to this Mengistu (1997) came up with a positive relationship to loan diversion in the case of Awasa, while negative relationship in the case of BahrDar. This implies that it has either positive or negative impact on loan repayment performance.

Loan Size, number of dependents within the Household and consumption expenditure of beneficiaries are factors which affect loan diversion rate. In line with these factors, Berhanu (1999), in his study show that these factors have positive impact on loan diversion. He also stated that education is negatively related to the proportion of loan funds diverted. This indicates that education is positively related to loan repayment, while loan size, number of dependents with in household and expenditure have a negative impact on loan repayment.

Age of borrowers is another factor that has impact on repayment. Concerning this factor Mengistu (1997) and Berhanu (1999) came with that there is positive relationship between loan repayment performance and age of borrowers.

Loan size and loan division rate are factors which have impact on loan repayment. Accordingly a study conducted by Mengistu (1997) and Berhanu (1999) suggested that there is an inverse relationship between these factors and loan repayment.

Sex, number of workers employed, education, and suitability of weekly repayment period are additional factors which affect loan repayment. Mengistu (1997) in his study showed that there is positive relationship between these factors and loan repayment. Concerning suitability of the

repayment period, Berhanu (1999) came with the same result. Retta (2000) pointed out that education is negatively related to loan repayment, while suitability of loan repayment period is positively related to loan repayment.

Expectation for another (future) loan is also another factor which has impact on loan repayment. Mengistu (1997) on his study showed that this factor is positively related to loan repayment.

Supervision visit is also a factor that affects loan repayment rate. Berhanu (1999), Mengistu (1997) and Retta (2000) showed that supervision is positively related to loan repayment.

Availability of other sources of credit is a factor that has impact on loan repayment. Mengistu (1997) came with that availability of other sources of credit is negatively related to loan repayment, and other factors, such as age and sex are insignificant in affecting repayment behavior of borrowers in the case of Bahir Dar.

Income from source other than the business financed by the loan and frequency of the loan are also factors that affect loan repayment. Retta (2000) in his study indicated that there is positive relationship between these factors and loan repayment rate. The natural logarithms of income and loan size are insignificant but have their expected sign. In his study, fitted values of loan diversion rate and age are insignificantly related to loan repayment.

Income from business financed by the loan and other sources of income are factors which affect loan repayment. Berhanu (1999) in his study found out that both factors are unexpectedly negative sign with full loan repayment performance.

CHAPTER THREE

3. Data and Methodology

3.1 Data Type and Sources

In terms of geographical scope, the study covers gulele sub-city. Data for the study is obtained through a sample survery of borrowers' groups, that is micro enterprises.

The data used in this study is mainly primary and cross–sectional in type. Secondary data and relevant documents of Gulele sub-city micro enterprise office which is responsible for organizing micro enterprise and micro finance credit and saving office employed in few of the cases. The data is collected in accordance with the accepted practice in the field of study from micro enterprise and panel covering 12 months repayment period (installment period) of year 2006 for each observation. Here, it should be noted that one repayment period corers a month period. That is, loans for which maturity date has already passed before the time of data collection are utilized for the analysis of determinants of loan repayment rate.

Guele Sub-city is selected based on the fact that it is a branch where many microenterprise are operational as compared to the rest of the sub-cities in Addis Ababa. Therefore, it has so many clients who already have obtained loans in groups. And also it is the branch with the most arrears, and thus the interpretation of group dynamics becomes more interesting.

3.2 Data Collection

There are about 10 kebele branches in the Guele Sub-city credit and saving micro finance office. Each branch/ Center has its own credit field officer or facilitator.

A survey is conducted by employing a structured questionnaire, administered by trained enumerators between August and September 2006. The sample size was determine taking the resource and time constraints in to consideration. The survey is designed to assess the determinants of micro enterprise loan repayment performance and loan diversion rate.

The following procedure is used for data collection. So as to collect data, the sampling procedure is important. Hence, the sampling procedure is discussed as follows:- In selecting the sample of the study, a list of beneficiaries of the loans disbursed by Gulele Sub-City credit and saving office is obtained from the office. This serves as the sampling frame. There after, the target population that are beneficiaries of Gulele sub-city credit and saving office who are members of microenterprise run by group borrowers with in the sub-city are identified and randomly selected microenterprise from each kebele. And then a sample size is randomly determined from this target population through a rule of thumb method. All of these micro enterprises were based in the Kebele.

The total number of the target population as collected from documents of Gulele Sub-City credit and saving office are about 77 micro enterprise amounting to 1312 members and 44 micro enterprise amounting to 732 members randomly selected. Then the sample size is determined to be 220 (i.e 30% of 732) beneficiaries so as to minimize sample error. Out of the total sample beneficiaries 31 (14%) are female, while 189 (86%) are male.

After selecting the sample size using the rule of thumb method for each branches /centers (i.e Kebele) the group leader and two or more other members are selected randomly from the sample of each branches/ centers. In the survey we asked questions about the socio-economic characteristics of the group members, as well as repayment performance of individual group members. In addition, we included questions on the group formation process, the existence of social ties and etc.,

Here we have two types of questions. The first type of questions are asked for both group leader and the other members of each micro enterprise. The second type is specifically asked to the group leader. We included separate questions for the group leader since we observed that the group leader has a quite important role to play as a representative of the group to the program organization. This set up of questionnaire provides us with a unique data set in which we have information on characteristic and group behavior related to screening, monitoring and enforcement at the individual level. In particular, it allows us to investigate behavior of the group

leaders versus that of other group members, and the impact of this behavior on repayment performance of the groups.

3.3 Methodology

The methodology employed in this study is discussed below. The methodological approach used in this study mainly focuses on descriptive analysis concerned with the description of general characteristics sampled beneficiaries and regression analysis dealing with the identification of factors that determine the probability of determinants of microenterprise loan repayment.

In the descriptive analysis, statistical measures like average/mean, percentages and standard deviation are employed to the trends major variable. In regression analysis the probit model is used to model the relationship between the probability of micro enterprise loan repayment and other variables influencing it. Concerning loan repayment performance, there is no well-developed theory in the field. Hence, the study is mostly concentrated on empirical exercise. Thus, factors affecting microenterprise loan repayment rate are studied using various techniques. Therefore, the study makes use of empirical evidences, and approaches from related studies in the country and other countries. Accordingly, to study the determinants of micro enterprise loan repayment rate in Addis Ababa a case study of Gulele Sub-city credit and saving office needs an appropriate estimating model.

Hence, to achieve the best estimate, it is very important to employ the appropriate model for conducting estimation process. Loan repayment performance is a dependent variable and it is a dichotomous which takes the value of "1" If loan is fully repaid on time; otherwise "0". Therefore, the model that can be employed in such situations are: the linear probability model, the logit model the probit model, and the tobit (censored) regression model.

The linear probability model is used to denote the occurrence or non occurrence of an event. This model has the following four major shortcomings (Gujarati, "1995, Maddla 1992).
The model in the usual regression frame work is given as:

$$Y_i = Bx_i + U_i \quad \ldots\ldots \quad (1)$$

Where x = a vector of explanatory variables

B = a set of parameter

Y= a dichotomous dependent variable which will have the value "1" if the event occurs and "0" if other wise.

U_i= an error term

The models that express the dichotomous dependent variable Yi as a linear function of the explanatory variables X_i, are known as linear probability models (LPM) with $E(U_i) = 0$. The conditional expectation $E(y_i/x_i)$ is equal to Bx_i. This has to be interpreted in this case as the probability that the event will occur given xi. Since Y takes the value 1 or zero, the error term in the above equation can take only two values: (1-Bxi) and (-Bxi).

This implies that the error term is not normally distributed since U_i follows the binomial distribution rather than normal distribution. Hence, this is the first major problem associated with linear probability model (LPM).

Also with the interpretation we have given in the above equation and the requirement that $E(U_i) = 0$ the respective probabilities of these events are Bxi and (1-Bxi). Thus, we have:

U_i	$f(U_i)$
1- Bxi	Bxi
- Bxi	(1-Bxi)

Hence,

$$\text{Var}(U_i) = Bx_i(1 - Bx_i)^2 + (1-Bx_i)(-Bx_i)^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

$$= Bx_i(1 - Bx_i)$$

$$= E(y_i)(1-E(Y_i)$$

The variance U_i is var $(U_i) = Bx_i(1 - Bx_i)$ which is hetroscedastic because it depend on conditional expectation of Y, which of course depends on the values taken by x. Hence U_i depends on x and is not homoscedastic. Therefore, this is the second problem or shortcoming of linear probability model (LPM). (Maddla, 1992).

The third major problem of LPM is non fulfillment of $0 \leq E(Y_i/x_i) \leq 1$. Since $E(Y_i/x)$ in the linear probability models measures the conditional probability of the event Y occurring given x, it must necessarily lies between 0 and 1.

Although this is true a priori, there is no guarantee that $\hat{y}i$, the estimators of $E(Y_i/x_i)$, will necessarily fulfill this restriction, and this is the real problem with the OLS Estimation of the LPM. That is $E(Y_i/x_i)$ could be negative which is less than 0 and large number which is greater than 1. (Gujarati, 1995)

The forth problem is that the LPM forces the probability changes to be a linear function of x. which is meant the marginal or incremental effect of x remains constant through out. That is, the derivative with respect to a given explanatory variables is constant for LPM, while it is calculated at different levels of explanatory variable for logit. Tobit and probit models so as to know the range of variation for the resulting changes in the probabilities (Gujarati, 1995).

In short, due to the above mentioned problems, LPM cannot be used in this study, instead the probit model is employed for loan repayment rate.

3.3.1 The Probit Model

As we have noted, to explain the behaviors of dichotomous dependent variable, we used a suitable chosen Cumulative distribution function (CDF). The estimating model that emerges from normal CDF is popularly known as the probit model, Sometimes it is also known as the normit model. We presented the probit model based on utility theory, or rational choice perspective on behavior.

To motivate the probit model we assume that the decision of the ith borrower to repay or not depends on an unobservable utility index I_i that is determined by an explanatory variable (s), say income x_i in such a way that the larger the value of the index I_i, the greater the probability of the borrower to pay the loan.

We express the index as

$$I_i = B_1 + B_2 x_i \quad \ldots \quad (3)$$

where x_i is the income of the ith borrower.

As before, let Y = 1, if a borrower pays his loan for greater than or equal to five months and Y = 0 If borrower pays his loan for less than five months. To relate this non observable utility index with the decision of repaying loan, borrowers have been grouped into two categories, based on the rate of repayments they achieved. Accordingly, we have category of borrowers with repayment rate of more than or equal to five months and those with repayment rate of less than five months. The major reason for this grouping is to separate borrowers with repayment problem from those who have good repayment performance. On the basis of this borrowers with repayment rate of greater than or equal to five months are considered as borrowers with no repayment problem, while those with repayment rate less than five months are considered as borrowers with repayment problem.

Note, it is reasonable to assume that for each borrower there is a critical or thereshold level of the index, call it I_i^*, such that if I_i exceeds I^*_i, the borrower will pay his loan, other wise he/she will not. The threshold I^*_i, Like I_i, is not observable, but if we assume that it is normally distributed with the same mean and variance, it is possible to estimate not only the paramerter of index given in equation (3) but also to get some information about the unobservable index itself. This is shown as follows:

Given the assumption of Normality, the probability that I_i^* is less than or equal to I_i can be computed from the standardized normal CDF as:

$$Pi = Pr\ (Y = 1) = Pr\ (I^*_i \leq Ii) = F\ (Ii) = 1/(2\Pi)^{1/2} \int_{-\infty}^{B_1 + B_2 xi} e^{-t^2/2}\, dt \quad \ldots \quad (4)$$

$$= 1/(2\Pi)^{1/2} \int_{-\infty}^{B_1 + B_2 xi} e^{-t^2/2}\, dt$$

where t is a standardized normal variable, i.e $t \sim N(0,1)$

Since p_i represents the probability that an event will occur, here the probability of paying loan is measured by the area of standard normal curve from $-\infty$ to I_i as shown in fig 1 presented in annex 1.

Now, to obtain information on I_i, the utility index, as well as B1 and B2 we take the inverse of equation number 4 to obtain:

$$I_i = F^{-1}(Ii) = F^{-1}(pi)$$

$$= B_1 + B_2 x_i \quad \ldots \quad (5)$$

where F^{-1} is the inverse of the normal CDF.

What all this means can be made clear from fig (1) presented in Annex 1. In panel (a) of this figure we obtain (from ordinate) the (cumulative) probability of repaying loan given $Ii^* \leq Ii$; where as in panel (b) we obtain (from the abscissa) the value of Ii given the value of Pi which is simply the inverse of the former. In the language of probit analysis the unobservable utility index Ii is simply known as normal equivalent deviate (n.e.d) or simply normit. Since the n.e.d or Ii will be negative whenever Pi < O.5, in practice the number 5 is added to the n.e.d and the result is called a probit Inshort:

$$\text{probit} = \text{n.e.d} + 5 \quad \ldots \quad (6)$$

$$= I_i + 5$$

Now, to estimate B_1 and B_2, we write equation 3 as

$$I_i = B_1 + B_2 x_i + U_i \quad \ldots \quad (7)$$

where U_i is the stochastic disturbance term.

3.4 Specification of the model

In section 3.3 that the linear probability model has four major problems. Hence, the probit model is employed in this study in modeling the relationship between the probability of micro enterprise loan repayment rate and other variables influencing it. The main reason for using these models for the dichotomous dependent variables case is due to the inefficiency of the ordinary least square (OLS) method.

All in all, the estimates of B in LPM are inefficient LPM is also logically weak in that it assumes $P_i = E(Y_i = 1/x_i)$ increases linearly with xi, implying that the marginal effect of X remains constant across all sample values. Therefore, there is a need for appropriate probability model, such as probit and tobit model which show that as the explanatory increases, the probability that the dependent variable will occur (i.e Yi =1) remain with in the (0,1) interval.

On the basis of the above discussion and the description of the explanatory variables given in the preceding section, the following model is used:

$$LRR_i = \alpha_1 + B_1 LA + B_2 SRP + B_3 NSV + B_4 HI + B_5 NAPSIFH + B_6 AB + B_7 ELB + B_8 SB + B_9 AOSI + B_{10} EFAL + B_{11} ST + B_{12}^{LDBG} + B_{13} RG + B_{14} FL + U_i \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where LRR = Loan Repayment rate, LRR=1 if loan is paid for greater than or equal to five months

LRR = 0 if loan is paid for less than five months

LA = Loan amount
SRP = Suitability of loan Repayment period
NSV = Number of supervision visits
HI= House hold income
NAPSIFH = Number of activities that provide source of income for the household
AB = Age of borrower
ELB = Education level of the Borrower
SB = Sex of borrower
AOSI = Availability other Source of Income
EFAL = Expectation for Another Loan
ST = Social Ties
FL= Frequency of Loan
LDBG = Living Distance between Group member
RGL = Role of Group Leader
U_i = Error Term and
$B_1, B_2, \ldots . B_{14}$ = Parameters
α_1 = Intercept

The variable education is qualitative in nature. As a result, it is necessary to consider the mutually exclusive level of education separately. These are: less than high school (grade 0-8), high school (grade 9-12) and above high school (above grade 12). Accordingly, two dummies can be introduced so as to take care of the three level of education.

Assuming that the three dummies for the level of education affect the intercept that is in this assignment of dummies for education the less than high school level education category is treated arbitrary as the base category of the education.

Hence, the intercept α_1 reflects the intercept for this category, not the slope in the regression of the probability of loan repayment, on the other explanatory variables. So the following model is employed.

$$LRRi = \alpha_1 + \alpha_2 D_2 + \alpha_3 D_3 + B_1 LA + B_2 SRP + B_3 NSV + B_4 HI + B_5 NAPSIFH + B_6 AB + B_7 ELB + B_8 SB + B_9 AOSI + B_{10} EFAL + B_{11} ST + B_{12} LDBG + B_{13} RG + B_{14} FL U_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

where D2 = 1 if a borrower has high school level of education, O other wise

D3=1 if a borrower has above high school level of education; O otherwise. Other variables are as described in equation (1) above

It is necessary to impose the restriction that the error terms are uncorrelated, which means, there is no serial correlation among the error terms; i.e Cov (U_i, U_j) =0 , i ≠j so as to proceed the regression.

The maximum likelihood estimation technique is employed to estimate the model. To simplify, this equation (2) can be written as follows:

$$LRRi = \alpha_1 + \alpha_2 D_2 + \alpha_3 D_3 + B_i x_i + U_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

where xi = LA, SRP, NSV, HI, NAPSIFH, AB, ELB, SB, AOSI, EFAL, ST, LDBG, FL and RG

$B_i = B_1, B_2, B_3 \ldots\ldots B_{14}$ and the other

Variables are as described in equation (2) above E (LRR_i/ xi) , that is the conditional expectation of LRR given x_i can be interpreted as conditional probability that the event will occur given x_i, that is , P(LRRi = 1/x_i) Hence, E (LRRi/xi) gives the probability of a borrower to repay loan fully.

Assuming E (U_i) = 0, so as to get unbiased estimators, one obtains

$$E(LRRi/xi) = \alpha_1 + \alpha_2 D_2 + \alpha_3 D_3 + B_i x_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

Let P_i be the probability that LRRi = 1 (i.e: a borrower repay loan fully) and 1-pi be the probability that LRRi= 0 (i.e; a borrower did not repay loan), Therefore, the variable LRR_i has the following probability distribution:

LRRi	Probability
1	Pi
0	1-pi
Total	1

$P_i = E(LRR_i = 1/x_i)$ where, $LRR_i = 1$ means borrowers repay loan fully

By definition of mathematical expectation one can get the following result:

$E = (LRRi/xi) = 0\ (1\text{-}pi) + 1\ (Pi) = pi$ . . . . . .(5)

Comparing Equation (4) with equation (5), one can equate:

$E(LRRi/xi) = \alpha_1+\alpha_2D_2+ \alpha_3D_3+B_2Xi = Pi$ . . . . . (6)

This shows that the conditional expectation of model (2) can be interpreted as the conditional probability of LRR_i given x_i. The probability pi must lie between O and 1. One can have the restriction:-

$O \leq E\ (LRRi/Xi) \leq 1$ . . . . . (7)

It means the conditional probability must lie within the interval (01).

But now consider the following representation of borrowers repay loan fully

$$P_i = E(LRR_i = 1/x_i) = P_i = Pr\ (LRR = 1) = Pr\ (I_i^* \leq I_i) = F\ (Ii)$$

$$Pi = E(LRR_i=1/xi) = Pi = Pr\ (LRR = 1) = pr\ (I_i^* \leq Ii) = F(Ii) = 1/(2\prod)^{1/2} \int_{-\infty}^{B_1 + B_2xi} e^{-t^2/2}\ dt \quad \ldots .(8)$$

where t is a standard normal variable, i.e $t \sim (0,1)$. To Simplify this, equation (8) can be rewritten as follows:

$$= 1/(2\prod)^{1/2} \int_{-\infty}^{I_i} e^{-t2/2}\ dt \quad \ldots (9)$$

where $Ii = B_1+B_2\ xi$

Since Pi represents the probability that an event will occur, here the probability of borrower repay loan for greater than or equal to five months. It is measured by the area of standard Normal curve from ∞ to Ii (as shown in figure 1 presented in annex1)

Now to obtain information on Ii, the utility index, as well as B_1 and B_2 we take the inverse of equation (8) to obtain:

$$Ii = F^{-1}(Ii) = F^{-1}(pi)$$
$$= B_1 + B_2 x_i \quad \ldots\ldots (10)$$

where F^{-1} is the inverse of the normal CDF. What all this means can be made clear from the figure which is presented in annex 1.

Once we have the estimated Ii estimating B_1 and B_2 is relatively straight forward matter as we show shortly.

In passing note that in language of probit analysis the unobservable utility index Ii is simply known as Normal equivalent Deviate (n.e.d) or simply normit. Since the n.e.d or Ii will be negative whenever $Pi < 0.5$, in practice the number five is added to the n.e.d and the result is called a probit.

In short:

$$\text{Probit} = n.e.d + 5 \quad \ldots\ldots (11)$$
$$= Ii + 5$$

To estimate B_1 and B_2 we write equation (10) as follows:

$$I_i = B_1 + B_2 xi + U_i \quad \ldots\ldots (12)$$

where ui is the stochastic disterbance term .This shows that the unobservable utility index Ii is linear both in the explanatory variables (x) and the parameters (B). Here note that the linearity assumption of OLS does not require the explanatory variable (x) to be necessarily linear. Hence, one can have x^2, x^3 etc; as regressors in the model for the purpose of estimating the parameters. It is linearity in the parameters that is crucial (see Gujarati, 1995)

CHAPTER FOUR

4. Descriptive and Empirical Analysis

4.1 Descriptive Analysis

This chapter is devoted to the analysis of the results of the survey data. The survey result shows that about 86% of the sample beneficiaries are male, while 14% are female.

Most micro finance institutions provide loan to beneficiaries for income generating purpose but not for consumption.

The result from this survey indicates that 31.2% of the sample beneficiaries took the loan to engage in activities of waving and 57.6% of the sample beneficiaries took the loan to engage in activities of Precastbeam, Gravel, Hollow concrete Block and wood and metal work production

Although they took loans for diverse activities, most of the beneficiaries are concentrated in the same activities. In general, a single borrower can engage in two or more activities at the same time.

Table 4.1

Distribution of Respondents by Planned Activities

Types of activities	Frequency	Percentage
Precast Beam production	37	15.6
Gravel production	18	7.5
Hollow concrete Block production	47	19.8
Wood and metal work production	35	14.7
Animal breading	5	2.1
Weaving	74	31.2
Dry food preparing and selling	13	5.4
Oil manufacturing	3	1.2
Car washing	4	1.6
Sweater and Leather manufacturing	1	0.42

Some of the beneficiaries, who have taken loans for their respective intended purposes mentioned in Table 4.1, may not dispose the whole amount of the loan to the same purpose. The study indicates that only 10 beneficiaries, which accounts 5% of the sampled beneficiaries, have diverted the loan to other purposes.

As shown in table 4.2 below, 89 (40.45%) of the sample beneficiaries are between the age of 18-27. On the other extreme, 4 (1.8%) of the sample beneficiaries are between the age of 48-52. This implies that most of the sample beneficiaries are youths between the age of 18-27.

Table 4.2

Distribution of Respondents by Age Group

Age – group	Frequency	Percentage
18-22	34	15.45
23-27	55	25.00
28-32	53	24.04
33-37	35	16.00
38-42	15	6.81
43-47	11	5.00
48-52	4	1.8
53-70	13	5.9
Total	220	100

As far as loan size is concerned, the majority of sampled borrowers are in the loan size group of 1000-4000 Birr and the average is Birr 5126. In table 4.3 it is shown that 131 (59.54%) of the sample beneficiaries have taken credit ranging from 1000-4000 Birr. On the other end 5(2.27%) of the sample beneficiaries on loan group 8001-10,000 Birr are about 3.81% of the loan group of 1000-4000 birr as indicated in table 4.3. This portrays that most of the sample beneficiaries have taken small amount of loan.

Table 4.3

Distribution of Respondents by Loan Size

Loan Size (in Birr)	Frequency	Percentage
1000-4000	131	59.54
4001-6000	15	6.82
6001-8000	24	10.92
8001-10,000	5	2.27
10,001-12,000	16	7.27
12001-14,647	29	13.18
Total	**220**	**100**

In addition to this as reported in the sample borrowers, the total amount of loan requested by the sample beneficiaries is 4,934,766 Birr while the total amount loan dispersed to these beneficiaries is 2,581,789 Birr. That means, 52% of the loan requested by sampled beneficiaries was issued to the borrowers.

Concerning household income, 157 (71.36%) of the sample beneficiaries are in the income group of 101-300 Birr, where as 12(5.45%) of the sample beneficiaries are in the income group of above 500 Birr. This shows that credit is given to almost to poor beneficiaries, as depicted in the following table.

Table 4.4

Distribution of Respondents by Level of Income

Level of income (in Birr)	Frequency	Percentage
Below 100	42	19.09
101-200	55	25
201-300	60	27.27
301-500	51	23.19
Above 500	12	5.45
Total	**220**	**100**

With regard to education, 78 (35.45%) of the sample beneficiaries are in the education category of Grade 1-8. On the other hand, 5 (2.27%) of the sample beneficiaries are illiterate (cannot read and write), while 45 (20.45%) are vocational school graduates 55 (25%) and 37 (16.82%) of the sample beneficiaries are in the category of Grade 9-12 and above grade 12 respectively. Table 4.5 shows the frequency distribution of beneficiaries by education level where it is categorized as the highest level of schooling completed and the illiterates group. Here, it should be noted that the category is formed arbitrarily and the illiterates are include just for comparison purpose

Table 4.5

Distribution of Respondents by Level of Education Completed

Category	Frequency	Percentage
Illiterate	5	2.27
Grade 1-8	78	35.45
Grade 9-12	55	25
Above grade 12	37	16.82
TVET /Vocational School/	45	20.45
Total	**220**	**100**

With respect to frequency distribution of loan taking of the sample beneficiaries, 170 (77.27%) are those who took loan only onese, while 50. (22.73%) are those who took loan twice. Regarding the presence of social ties of group leader with other members of the group with in the sample beneficiaries, 37 (84.09%) of them reported that they have social ties. 7 (15.91%) of them reported that they do not have social ties. On the other hand, 29 (65.91%) of the sample beneficiaries responded that the living distance among other member of the group is near, while 15 (34.09%) responded that the distance is far.

In addition to this as to whether the group leader knew other member of the group or not, 36 (81.82%) of the sample beneficiaries knew other group member before forming the group; while 8 (18.18%) of them responded that they do not know other member before forming the group.

Table 4.6

Distribution of Group Leaders Response by Social Ties, knowing Other Members before Forming the Group and Living Distance Among Group Member.

Variables	Responses of Group Leaders			
	No/far	Percentage	Yes/near	Percentage
GLKOGMBFG	8	18.18	36	81.82
DAGM	15	34.09	29	65.91
PSTWGM	7	15.91	37	84.09

With respect to the presence of social ties among group members in the sample beneficiaries, 169 (76.82%) of them reported that they have social ties, where as 51(23.18%) responded that they do not have social ties. On the other hand, 62 (28.18%) of the sample beneficiaries reported that the distance among each other is far, while 158 (71.82%) responded that the distance is near.

Besides, whether or not each member knew each other before the formation of the group, 172 (78.18%) of the beneficiaries responded that they knew each other before the formation of the group, while 48 (21.82%) responded that they do not know each other before the formation of the group. Frequency distribution of each member by social ties is depicted by the following table.

Table 4.7

Frequency Distribution of Each Member by Social Ties, Group Member knowing Other Members before Forming the Group and Living Distance Among Group Members.

Variables	Responses of Each Group Member			
	No/far	Percentage	Yes/near	Percentage
GMKOGMBFG	48	21.82	172	78.18
DAGM	62	28.18	158	71.82
PSTWGM	51	23.18	169	76.82

Concerning supervisory visiting 142 (64.65%) of the sample beneficiaries responded that there is supervision visit by a credit office, 190 (86.24%) of them responded that there is supervisory visit by each other 39 (88.64%) responded that there is supervisory visit by the group leaders, while 78 (35.45%) responded that there is no supervisory visit by a credit officer, 30 (13.76%) responded that there is no supervisory visit among each member of the group and 5 (11.36%) responded that there is no supervisory visit by the group leader. Frequency distribution of beneficiaries by supervisory visiting is given in table 4.8.

Table 4.8

Frequency Distribution of Beneficiaries by Supervisory Visiting

Variables	Responses of Beneficiaries			
	No	Percentage	Yes	Percentage
VCO	78	35.45	142	64.65
VEM	30	13.76	190	86.24
VGL	5	11.36	39	88.64

With regard to feeling responsibility to other members, knowing group leader before forming the group and having written formal rule 204 (92.73%) ,179 (81.36%) and 220 (100%) of the sample beneficiaries reported yes respectively, where as 16 (7.27%), 41 (18.64%) and all of the sampled beneficiaries responded no respectively.

Concerning the existence of social ties, homogeneity, in terms of ethnicity, occupation and culture, the belief that the group leader plays prominent role in screening, monitoring and enforcement, and loan to be repaid, 178 (80.91%), 216 (98.18%), 200 (90.91%) and 212 (96.36%) of the sample beneficiaries responded positively while 42 (19.09%), 4 (1.82%), 20 (9.09%) and 8 (3.64%) of the sample borrowers responded negatively.

Concerning such questions as:

is the loan enough for the intended purpose?

is the loan repaid on the basis of loan contract's for the expectation of another loan?

Is the monthly repayment period appropriate? and

Is the loan issued on time?

48 (21.82%) , 109(49.55%), 82 (37.27%) and 135 (61.36%) of the respondents answered positively,

On the other hand, 172 (78.18%) 111 (50.45%), 138 (62.73%) and 85 (38.64%) of the sample borrowers reported that loan is not enough for the intended plan, they paid loan on the basis of contract, not at the expectation of another loan, monthly repayment period is not suitable and loan is not issued on time respectively.

As far as borrowers are provided with training before the credit and the existence of source of credit other than the Gulele sub-city credit and/or equb concerned, 109 (49.55%), and 10 (4.55%) of the sample borrowers responded yes respectively, while 111(50.45%) and 210 (95.45%) of the sample borrowers responded saying no respectively. Look at table no 4.9 presented below.

Frequency distribution of responses regarding different variables is depicted in the following table.

Table 4.9

Frequency Distribution of Responses Regarding different Variables

Variable	Response of Beneficiaries			
	No	Percentage	Yes	Percentage
Knowing group member before forming the group	53	24.09	167	75.91
Feeling responsible to other member in the case of failure to repay the loan	16	7.27	204	92.73
Knowing group leader before forming of the group	41	18.64	179	81.36
Having written formal rules	-	-	220	100
Having social ties	42	19.09	178	80.91
Existence of homogeneity /ethnicity, Occupation and culture/	4	1.82	216	98.18
Believing that group leader plays prominent role in screening, monitoring and enforcement	20	9.09	200	90.91
Believing that loan to be repaid	8	3.64	212	96.36
Was the loan you received enough for your plan	172	78.18	48	21.82
Was it expectation of another loan you paid the loan	111	50.45	109	49.55
Was monthly repayment suitable	138	62.73	82	37.27
Did you receive the loan on time	85	38.64	135	61.36
Did you get training on the group credit before receiving the loan	111	50.45	109	49.55
Did you have source of credit other than the Gulele sub city credit and/or equb	210	95.45	10	4.55

Table 4.10

Distribution of Respondents by Major Operation Problem

Major operational problem	Frequency	Percentage
Inadequate skill	6	2.73
Lack of working capital	165	75
Shortage of input supply	144	65.45
Inadequate working premises	35	15.91
Lack of market place for your product	77	35
Management and understanding problem	2	1
Lack of market	24	10.91
Low price	6	2.73

Regarding operational problems, 165 (75%) of the respondents point out the lack of working capital, 144 (65.45%) shortage of input supplies, 77 (35%) lack of market place for their product, 35(15.91) inadequate working premises, and 24 (10.91%) shortage of market. These are fundamental problems that hinder many micro enterprise operators from paying their loan on time which resulted in unsustainability of micro finance institution which inturn has negative impact on poverty reduction.

4.2 Estimation of the Probit Model and Empirical Analysis of the Result

In this section an attempt is made to explain the analysis of empirical result and interpretation of the parameters which are obtained by estimating the complete model by using probit analysis.

Initially, we try to use all the variables, for which we have information in our empirical investigation. However after carefully analyzing the data, we decided that it is better to drop some of the variables due to low variability. Hence, in empirical analysis on which we report in this study we only use a sub- set of the variable for which we have the information.

The modle includes 15 independent variables. Concerning the identification of the determinants of the probability of loan repayment performance, the probit model is estimated using STATA for summarizing and analyzing the data.

It is clear that the existence of hetroscedasticity and specification errors result in serious problems in estimation of dichotomous variable models.

Hence, more attention is given to the problem of hetrosecdasticity and specification errors. Accordingly the existence of Hetroscedasticity is tested.

The result shows that there is hetroscdasticity problem. It is evident that the presence of hetroscdasticity would result in inefficient estimator. To resolve this problem the model is corrected for hetroscedastic.

Table 4.2.1

Statistic Summary of Variables

Variable	Mean	Std.Dev	Minimum	Maximum
LRR	0.27	0.44	0	1
LA	5126.48	4341.542	1000	14647
SRP	0.37	0.485	0	1
NSV	9.04	21.649	0	264
HMI	2.69	1.204	0	5
NAPSIFH	1.38	0.776	1	5
A.B	31.52	10.374	0	70
SB	0.86	0.349	0	1
AOSI	0.05	0.209	0	1
EFAL	0. 5	0.51	0	2
ST	0.81	0.394	0	1
LDBG	0.28	0.451	0	1
RGL	0.91	0.288	0	1
FL	1.22	0.417	1	2
D_2	0.25	0.434	0	1
D_3	0.3727	0.48463	0	1

The summary of statistics is given in table 4.2-1 above. Looking at some of the means of the major variables suitability of monthly repayment period, availability of other source of income, having social ties and expectation of other loan are respectively reported yes by 37%, 5% , 81%, and 50 % of respondents on average.

With regard to living distance among group members on average 28% of the respondent's reported the distance is far.

The average amount of loan size, number of supervision and number of activities that provide source of income for the house hold and frequency of loan are Birr 5126,9,1.4,and 1.2 respectively.

With respect to education on average 25% of the respondents have high school level of education and 37.3% of the respondents have above high school level of education.

Concerning the role of group leaders, on average, 91 % of the respondents reported that group leaders have a prominent role in loan repayment performance.

The mean on time loan repayment performance is only 27%. This is a very slow loan repayment rate required for a good financial performance, must be greater than 90 %.

Variables such as loan diversion rate, availability of rules and regulation and homogeneity of group members excluded in the regression model for they have constant value across the borrowers.

Table 4.2.2
Maximum Likelchood Estimates of the Binomial Probit Model for loan Repayment performance

Variable	Coefficient	Z-value	P-Value
LA	-0.0000443	-1.46	0.144
SRP	0.1543377	0.68	0.495
NSV	0.0028138	0.85	0.397
SB	-0.3500908	-0.55	0.582
HI	-0.0743204	-0.750	0.451
NAPSIFH	0.2697087	2.02	0.044
AB	-0.0404505	-2.83	0.005
AOSI	0.727215	1.58	0.114
EFAL	0.6226482	2.67	0.007
ST	0.419216	1.54	0.123
LDBG	0.9035304	3.67	0.00
RGL	-1.138153	-2.91	0.004
FL	1.544342	5.43	0.00
D2	0.1421499	0.42	0.674
D3	0.131001	0.37	0.709
Constant	-1.500662	-1.88	0.061
Loglikelihood			-88.844032
Restricted log likelihood			-127.91725
Lrchi2 (15)			69.32
Pseudo R^2			0.3055
Number of Observations			220

The estimated model fits the data well. The computed likelihood Ratio (LR) statistic, which is distributed chi-squared with 15 degree of freedom LR= -2 [-127.91725 – (-88.844032)] is equal to 78.146436. But the critical value of chi-squared with 1 degree of freedom at 5% level of significance is 24.996. From this the hypothesis of homoscedasticity can be rejected at 5% level of significance. The likelihood Ratio (LR) has a chi-square distribution with 15 degree of freedom, is statistically significant at 5% level of significance.

No specification error is observed in the data set but hetroscedasticity problem is detected and correction is made for hetroscedasticity the result of which is presented in Table 4.2.2 above.

Suitability of repayment period, number of supervision, availability of other source of income, social ties and high school and above high school level of education are positively related to loan repayment rate. However, the coefficient of these variables are found to be statistically insignificant.

Number of activities that provide source of income for the household and expectation for another loan are positively relate to loan repayment rate at less than 5% and 1% level of significance respectively. In addition both are significant in affecting loan repayment rate.

Distance among group member and frequency of loan are positively related to loan repayment rate at less than 1% level of significant and both are significant in affecting loan repayment rate.

Loan amount, sex of borrowers and household income are negatively related to loan repayment rate. But all are statistically insignificant.

Age of borrowers and role of group leader are found to be negatively related to loan repayment rate at 1% level of significance and both variables are significant in affecting loan repayment rate.

When we compare the major findings in this study with similar studies in Ethiopia: Retta (2000), in his study on women and microfinance the case of women fuel wood carriers in Addis Ababa, found that frequency of loan has positive impact on loan repayment rate. In addition, the same result is obtained in this study. But mengistu (1997), in his study on the determinants of microenterprise loan repayment and efficacy of screening mechanism in urban Ethiopia: The case study of Bahir Dar and Awasa Town; and Berhanu (1999), in his study of microfinance credit and poverty alleviation in Ethiopia: The case of project office for the creation of small scale business opportunities in Addis Ababa did not consider frequency of loan as a variable affecting loan repayment performance.

Like Berhanu (1999), Mengistu (1997), and Retta (2000) also reported that loan size are inversely reated to loan repayment rate. The same result is also obtained in my study.

In this study other source of income has positive sign and similar result was also found by Retta (2000). But negative sign was obtained by Berhanu (1999).

Almost similar result are obtained for variables such as supervision and suitability of repayment period.

Mengistu (1997) has found education level and suitability of repayment period to be positively related to loan repayment performance for Awasa, while the former variable has a negative sign for Retta (2000). But both variable have positive impact in this study.

Variables like social ties, distance among group members and role of group leader are not considered as a variable affecting loan repayment rate by Mengistu (1997), Berhanu (1999) and Retta (2000). While the former two have positive impact on loan repayment performance, and the later has negative impact in this study. However, living distance among group member and role of group leader are highly significant in affecting loan repayment rate.

4.2.1 The marginal effect of the independent variables

As depicted in table 4.2.3 below, the marginal impact of loan amount and number of supervision visit on loan repayment performance is not significantly different from zero. Suitability of repayment period, number of activities that provide source of income to the household, availability of other source of income, socialties, expectation for another loan, living distance among group member, frequency of loan, and secondary and above secondary school level of education increase loan repayment performance by 4.3, 7.3, 2.5, 10.1, 16.9, 28.12, 42.01, 3.9 and 3.6 percent respectively.

Table 4.2.3

Partial Derivatives of maximum likelihood estimates of the probit model

Variables	Df/dx	P>Z
LA	-0.0000121	0.144
SRP*	0.0426956	0.495
NSV	0.0007655	0.397
HI	-0.0202187	0.0451
NAPSIEH	0.0733737	0.044
AB	-0.0110045	0.005
SB*	-0.08158	0.582
AOSI *	0.2463182	0.114
EFAL	0.1693903	0.007
ST *	0.1009745	0.123
DBG*	0.2812405	0.00
RGL*	-0.3995095	0.004
FL	0.4201352	0.00
D2*	0.0398579	0.674
D3*	0.0361505	0.709

Note (*) df/dx is for discrete change of dummy variables from 0 to 1

In contrast to this, age of borrowers, sex of borrowers, role of group leaders and household income decrease loan repayment performance by 1.1, 8.2, 40 and 2.02 percent respectively.

CHAPTER FIVE

Conclusion and policy Implications

5.1 Conclusion

In Ethiopia it is (now) widely recognized that the promotion of the micro and small enterprise (MSE) sector is a viable and dynamic strategy for achieving national goals, including employment creation, poverty alleviation and balanced development between sectors and sub-sectors.

To do this, microfinances programs are now a key element in the country. Hence, Addis credit and saving s.c microfinancing program is legally registered by the national bank of Ethiopia . It has 10 branches in Addis Ababa.

The main objective of the credit and saving s.c is to provide micro credit to the unemployed poor in the city.

The study has analyzed the impact of borrowers and lenders characteristics on loan repayment performance.

So as microfinancing activity to continue in a sustainable way, improving the living or economic conditions of the borrowers and reducing poverty, it is important to have a better loan repayment performance.

Therefore, examining factors that affect loan repayment performance has crucial importance to the sustainability of microfinance institutions.

In short, this study has analyzed the impacts of borrowers' and lenders' characteristics on loan repayment performance in Addis Ababa with respect to Gulele sub- city credit and saving micro finance office.

The survey result shows that 75% of the sample beneficiaries state that they have the lack of working capital; 65.45% shortage of input supplies; 35% lack of market place; 15.91% inadequate working premises; and 10.91% shortage of market as the major problems

Concerning these problems Gulele sub- city microfinance offices must be thought over once again in order to maximize the contribution of the microfinance office towards helping poverty alleviation programs.

In earlier discussions the empirical analysis in section 4.2 showed that there are some factors which significantly affect loan repayment performance. Number of activities that provide source of income for the household is positively related to loan repayment performance. This indicates that loan repayment performance increases with the number of activities that provide source of income for the borrower.

Frequency of loan has positive relation with loan repayment performance. This implies that borrowers who took loan frequently have got experience in their business activity and strengthen their ties with the staff and their fellow group members, which inturn facilitates the repayment of loan. Moreover, expectation for another loan is positively related to loan repayment performance. This shows that beneficiaries who intend get loan in the future prefer to pay their loan on time.

Distance among group members also is positively related to loan repayment performance. This indicates that loan repayment performance increases with living distance among groups members.

Role of group leaders is negatively related to loan repayment performance. This implies that the role of group leader is inversely related to loan repayment performance. In addition age of borrowers is negatively related to loan repayment performance. That is, loan repayment performance decreases as the age of borrowers increase.

In general, suitability of repayment period, number of supervision, availability of other source of income, socialties, high school and above high school level of education, number of activities that provide source of income for the household and expectation for another loan, distance among group member and frequency of loan are found to be important in enhancing the probability of loan repayment performance, where as loan amount, sex of borrowers, household income, age of borrowers and role of group leader hinder loan repayment performance.

Such a strategic identification of factors influencing the probability of loan repayment performance with their negative and positive effect has paramount importance in designing and implementing improved microfinancing progrmmes, particularly in Gulele Sub-City and thoughout the country in the future

5.2 Policy Implications

The result from this study provides indications as to what is needed to strengthen microfinance institutions in the country. It also has implications for the articulation of effective urban finance policy and successful performance of urban finance institutions. It is obvious that Gulele sub-city credit and saving office is exclusively established to alleviate poverty. Moreover, it tries to enhance economic development through providing short term and medium term credit facilities to the poor.

The contribution of the Gulele sub-city credit and saving office to such an end can hence, become very important if its loan provision is directed towards feasible and viable small scale enterprises which have significant contribution in poverty reduction.

However, some of the findings imply that the Gulele Sub-City credit and saving office could not succeed in meeting its objectives, if repayment behavior of borrowers is not carried out properly.

Hence, it is paramount to have a mechanism through which a systematic understanding of the repayment behavior of the borrower is established.

With regard to the determinants of loan repayment performance, number of activities that provide source of income for the household, expectation for another loan, living distance among group member as well as frequency of loan are factors that need focuse. The Gulele Sub-city credit and saving office is required to promote these factors in designing a strategy for effective loan repayment performance.

That is, the existence of a clear diversity insure of income, borrowers attitude expectation for another loan, living distance among group member with effective monitoring mechanism and frequency of loan are areas that must be given special attention by the sub-city microfinance institution in its leanding policy.

As far as group leaders are concerned, they play an intermediary role between the staff and the group. In addition, they chair group meeting, collect the installed payment, from group members and transfer it to the credit officer, visit group members regularly, discuss business and/or group related problems and call for extera group meetings if repayment problem occurs.

Since, the group leader plays a prominent role in the function of the group. There should be a means of incentive either from the Gulele sub-city credit and saving office or from the group it self. In such a way, it becomes possible to have effective supervisory visits by the group leader and hence, good repayment performance will be achieved.

In addition others factors have been mentioned which are responsible for the inability of borrowers to repay their loan on time. These are operational problems such as inadequate skill, lack of working capital, shortage of input supplies, inadequate working premises, lack of market place for the product and etc. These problems need to be resolved through appropriate policy actions by all of Gulele Sub-City microfinance office and government in the country.

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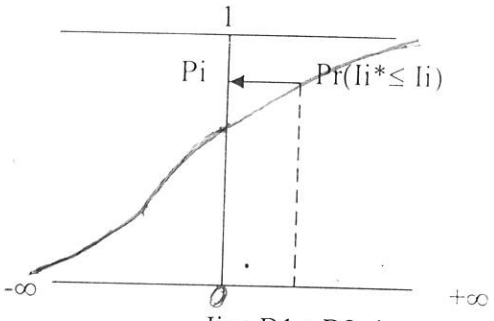
Annex 1

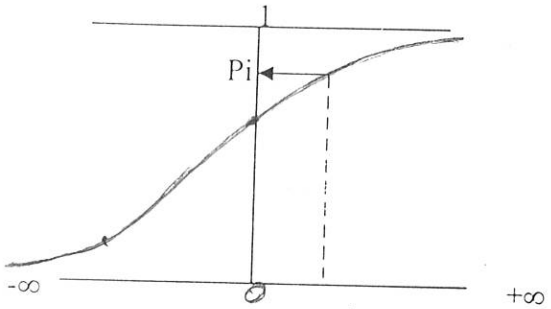
The probit Model Figure

Pi = F(Ii)



(a)

Pi = F(Ii)



(b)

Probit model (a) Given Ii, read Pi from the ordinate

(b) Given Pi read Ii from the abscissa

Source Gujarati (1988)

Since Pi represents the probability that an event will occur, here the probability of paying loan, it is measured by the area of the standard normal curve from -∞ to Ii as shown in figure (a) Now to obtain information on Ii, the utility index, as well as P1 and B_2, we take the inverse of

$$Pi = Pr(Y=1) = Pr(Ii^* \leq Ii) = F(Ii) = 1/(2\Pi)^{1/2} \int_{-\infty}^{Ii} e^{-t^2/2}\, dt$$

$$= 1/(2\Pi)^{1/2} \int_{-\infty}^{B1+B_{2Xi}} e^{-t^2/2}\, dt$$

Where t is a standardized normal variable, i.e., t ~ N(0,1)

To obtain:-

$$Ii = F^{-1}(Ii) = F^{-1}(Pi)$$

$$= B_1 + B_{2Xi}$$

Where F^{-1} is the inverse of the normal CDF. What all this means can be made clear from the above figure.

In panel (a) we obtain (from the ordinate) the (cumulative) probability of paying loan given Ii* ≤ Ii , where as in panen (b)we obtain (from the abscissa) the value of Ii given the value of Pi, which is simply the inverse of the former.

Annex 2

SURVEY QUESTIONNAIRE

To the respondent.

The out come of this questionnaire is meant to support a research report to be presented for a university degree. The answers given by a respondent are confidential and will not be disclosed to any party for purposes other than strictly research. The research outcome that may be possible through this questionnaire believed to contribute to the objective of helping the urban poor in Ethiopia through providing credit more effectively.

Questionnaire for studying the determinates of micro enterprise loan repayment in urban Ethiopia with special reference to Gulele Sub-city of Addis Ababa.

Sub-city----------

Kebele----------

House No----------

Enumerator ----------

Date----------

Section 1: Personal Information of the borrower

1.1. Name----------

1.2. Age----------

1.3. Marital Status----------

Answer 1. If Single

2. If married

3. If Divorced

4. If Widowed

1.4. Sex----------

Answer 1. If male

2. If female

1.5. Educational level of borrower

Answer 0. If illiterate (can not read and write)

1. If grade 1-8

2. If grade 9-12

3. If above grade 12

4. If TVET/Vocational school/

1.6. house hold size (number of dependent in the household of borrower) list household member by age and sex

	No	Age	Sex
1.6.1. With in the household	1	-	-
	2	-	-
1.6.2. outside the household	1	-	-
	2	-	-

Section 2. Co-operative (Group) formation Information

2.1. Name of the micro enterprise co-operative to which the borrower belonged last time ----------

2.2. How many members did the co-operative have?----------

2.3. Did you know all of your group members of your group members before forming the group?

Answer 1. If yes

0. If No

2.4. Did you feel responsible to other members of your group?----------

Answer 1. If yes

0. If no

2.5. Dis you have a feeling .that you might be used in the case of failure to repay the loan?--------

Answer 1. If yes

0. If no

2.6. Did you know your group leader before the information of the group? (pass it if you are group leader)----------

Answer 1. If yes

0. If no

2.7. For how many years did the group leader live in your living area?----------

2.8. Did the enterprise have written formal rules statement how member of the group behave?

Answer 1. If yes

0. If no

2.9. Is there a social tie between enterprises member?

Answer 1. If yes

0. If no

2.10. If your answer to question 2.9 yes----------

Answer 1. If you have the same Idir

2. if you have the Equb

3. If you have the same religion

4. If other specify it

2.11. Is the average distance between your enterprise and other similar enterprise far or near?

Answer 1. If far

0. If near

2.12. Is there homogeneity of member in the enterprise with respect to ethnicity.

Occupation, income and culture?----------

Answer 1. If yes

0. if no

2.13. If your to question 2.12 yes----------

Answer 1. If similarity in culture

2. If similarity in ethnicity

3. If similarity in occupation

4. If similarity in income

2.14. Is the living distance between you and other member of your enterprise far or near?

Answer 1. If far (----------meter)

0. if near (----------meter)

2.15. Do you believe your group leader plays a prominent role in screening, monitoring and enforcement with in the group?----------

Answer 1. If yes

0. If no

2.16. How do you select your group leader?----------

Answer 1. If the group leader know all member of the group before the formation of the group

2. If the group leader live for a long period of time on the kebele (Administration region)

3. If the group leader is educated (write his education status)

4. If the group leader has more experienced in the enterprise activities

2.17. Did you visit (supervise) other member of your group

Answer 1. If yes

0. If no

Section 3. Issues Concerning Loan and Loan Repayment

3.1. How much did you receive from the Gulele Sub-City Credit and saving SC office in loan ?----------

3.2. What was the repayment period/time?----------

3.3. What was the amount of reach loan repayments installment? Birr----------

3.4. Do you think it was large, small of enough? Answer 1. If large

2. Small

3. enough

3.5. In how many months was the total loan wanted to be fully repaid?----------

3.6. How much interest did you pay on the loan till know?----------

3.7. Did you have a belief that the loan was something that had to be repaid the Gulele Sub-city credit and saving offices?----------

Answer 1. If yes

0. If no

3.8. How many times did you take loan from Gulele sub-city credit and saving office by a member of micro enterprise co-operative?----------

3.9. Was the loan you receive enough for your planning purposes?----------

Answer 1. If yes

0. If no

3.10. What was the amount had requested? Birr----------

3.11. Was it in expectation of getting another loan that you were repaying the loan as per contract?----------

Answer 1. If yes

0. If no

3.12. How many months were you given to adjust yourself to using the loan before Starting the loan repayment?----------

3.13. Was the monthly repayment period suitable?----------

Answer 1. If yes

0. If no

3.14. If your answer to question 3.12 is no a repayment period of how many months did you think was suitable?----------

3.15. Did you receive the loan on time?----------

Answer 1. If yes

0. If no

3.16. Did you use the loan (or part of the loan) for other purpose than you (at first) Planned ?----------

Answer 1. If yes

0. If no

3.17. If you use the loan partially or fully for other purpose, how much did you spend on these other purpose? Birr----------

Section 4 price and information about usefulness of credit

4.1. Did you get any benefit because of using Gulele sub-city credit and saving office loan during the period you last took loan?----------

4.2. Was the price for your product stable?----------

Answer 0. If constant

1. If decreasing
2. If increasing

4.3. What was the trend in the price for your product?----------

Answer 0. If constant

1. If decreasing
2. If increasing

4.4. Did the loan help you in overcoming your problems?----------

Answer 1. If yes

2. If no

4.5. Did you use record keeping methods and/or bank accounts?----------

Answer 1. If yes

2. If no

Section 5. Supervision and advisory visit

5.1. Do you briefly state the major operational problem you encountered since your participation in the credit scheme? (more than one answer could be possible)

1. In adequate skill
2. Luck of working capital
3. Shortage of input supply
4. In adequate working
5. Luck of market for your product
6. Production of similar (homogenous) product by many of
7. Other (specify)

5.2. How many times did people from Gulele sub-city micro enterprise office that organize your cooperatives or from the Gulele sub-city credit and saving office come to visit (advise) or supervise your loan utilization?----------

5.3. Did you go to Gulele sub-city micro enterprise office or Gulel sub-city credit and saving office about any of your problem?----------

Answer 1. If yes

0. If no

5.4. If your answer to question 5.2 is yes how many times did you go?

5.5. If you went to Gulele sub-city credit and saving office or Gulele sub-city micro-Enterprise office were you helped? ----------

Answer 1. If yes

0. If no

5.6. If your answer to question 5.5. is No. and if you had a problem you could not solve with Gulele sub-city credit and saving office and Gulele sub-city micro enterprise office whom else did you approach.

5.7. Did you get training on the group credit before receiving the loan?----------

Answer 1. If yes

0. If no

Section 6. Income and wealth Information

6.1. What is the monthly income of your household?----------

6.2. Do you have you own house?----------

Answer 1. If you own house

0. If you rented

6.3. How many rooms does the house you live in have?----------

6.4. What is the house live in.made of?----------

Answer 1. If stone/hollow block/brick

0. If mud

6.5. Do you have a toilet?----------

Answer 1. If yes

0. If no

6.6. Do you have own tap water facility?----------

Answer 1. If yes

0. If no

6.7. What is the estimated value of your asset (including asset for purpose other than you Business)?----------

6.8. How many times do you go or take your children to a doctor or a clinic per year?-----

6.9. How much do you think were your medical expenses per year? Birr----------

Section 7 Employment and Production Information

7.1. In how many activities were you engaged while using the loan?----------

7.2. What was the major type of activities you were engaged in?----------

Answer 1. If local drinking preparation

2. If food processing
3. If wood work/metal work
4. If textile/garment making/tailoring/tannery
5. If shoe repair
6. If agricultural activities
7. If other

7.3. How many years of experience do you have in major activities business for which you took the loan?----------

7.4. What type of labor did you employ?----------

Answer 1. If yourself only

2. If yourself and members of your family

3. If your self and hired labor

4. If yourself, family member and hired labor

7.5. How many workers did the enterprise employ including yourself, family member and hired labor?----------

7.6. What did you mostly use in your production?----------

Answer 1. If machine mostly

0. If hand tool mostly

7.7. What was the ownership of the tools of machines you were using?----------

Answer 1. If your property

2. If hired

3. If both hired and your property

7.8. What was the ownership of your work shade?----------

Answer 1. If your property

0. If rented

7.9. If your work shade was rented who was the owner?----------

Answer 1. If kebele

2. If private individual

7.10. If rented how much was the monthly rent?----------

Section 8 other source of credit

8.1. Did you have source of credit other than the Gulele sub-city credit and/or equb (it could be for loan repayment during emergency or for you business or for any other purpose)?

Answer 1.If yes

0. If no

8.2. If your answer to question 8.1 is yes please specify your other source of credit?-------

8.3. Were you a member on equb(IQUB) during the loan period?----------

Answer 1. If yes

0. If no

Thank you

QUESTIONNAIRE FOR GROUP LEADER ONLY

1. Did you know your group member before forming the group?----------

   Answer 1. If yes

   0. If no

2. For how many year did you live together with other member of the group?------

3. Did you regularly visit your group members?----------

   Answer 1. If yes

   0. If no

4. Was the average living distance between you and your group members far or near?-----

5. Did you get any benefit from being group leader?----------

   Answer 1. If yes

   0. If no

6. If your answer for question No.5 yes. Specify the benefit that you got----------

7. How much was your monthly installment payment (% of income)?----------

8. Do you briefly state the major function you have performed since you become group leader?

   1. Chair group meetings
   2. Collect the install payments from group member
   3. Transfer the collected install payment to credit offer
   4. Visit group members regularly and /or group related problems
   5. Call for extra group meeting.

Annex 3 Correlation Martrix for variables Includes in the final regression

	LRR	LA	SRP	NSV	SB	HI	NAPSIAH	AB	AOSI	EFAL	ST	LDBG	RGL	FL	D_2	D_3
LRR	1															
LA	0.1188	1														
SRP	-0.0422	0.0739	1													
NSV	0.04	-0.0787	0.0461	1												
SB	-0.0628	-0.0679	0.0511	-0.0512	1											
HI	0.0129	0.1487	0.0682	0.0479	-0.0301	1										
NAPSIAH	0.2713	0.1907	-0.0159	0.1429	-0.0017	0.1972	1									
AB	-0.2328	-0.1907	-0.0707	-0.0519	-0.1083	-0.1415	-0.1769	1								
AOSI	0.1634	0.1108	0.1026	-0.0303	-0.424	-0.0702	0.0051	-0.049	1							
EFAL	0.0504	-0.0938	-0.0185	0.0733	0.0477	-0.1227	-0.0231	-0.003	0.0429	1						
ST	0.033	0.0194	0.0874	0.1281	0.0326	0.008	0.0155	0.0435	0.0505	-0.1136	1					
LDBG	0.2594	0.2736	-0.0441	0.087	-0.0677	0.1215	0.3565	-0.0951	0.0773	-0.0794	-0.1842	1				
RGL	-0.0584	0.2121	0.01496	0.1038	0.0614	-0.0036	-0.0278	0.1719	0.069	0	0.128	-0.0575	1			
FL	0.3664	0.2919	-0.1415	-0.1754	-0.0456	0.0852	0.0746	-0.1843	0.093	-0.2254	0.121	0.0046	0.1313	1		
D_2	0.077	0.0919	0.0977	0.0113	0.0561	-0.0066	0.0542	-0.162	0.0756	-0.1753	0.0401	0.1283	0.073	0.0694	1	
D_3	0.1487	0.4275	-0.1276	0.1121	-0.1497	0.2228	0.2755	-0.2424	-0.0328	0.0554	-0.0322	0.2067	0.1457	0.1748	-0.445	1

Annex 3 Correlation Martrix for variables Includes in the final regression

	LRR	LA	SRP	NSV	SB	HI	NAPSIAH	AB	AOSI	EFAL	ST	LDBG	RGL	FL	D_2	D_3
LRR	1															
LA	0.1188	1														
SRP	-0.0422	0.0739	1													
NSV	0.04	-0.0787	0.0461	1												
SB	-0.0628	-0.0679	0.0511	-0.0512	1											
HI	0.0129	0.1487	0.0682	0.0479	-0.0301	1										
NAPSIAH	0.2713	0.1907	-0.0159	0.1429	-0.0017	0.1972	1									
AB	-0.2328	-0.1907	-0.0707	-0.0519	-0.1083	-0.1415	-0.1769	1								
AOSI	0.1634	0.1108	0.1026	-0.0303	-0.424	-0.0702	0.0051	-0.049	1							
EFAL	0.0504	-0.0938	-0.0185	0.0733	0.0477	-0.1227	-0.0231	-0.003	0.0429	1						
ST	0.033	0.0194	0.0874	0.1281	0.0326	0.008	0.0155	0.0435	0.0505	-0.1136	1					
LDBG	0.2594	0.2736	-0.0441	0.087	-0.0677	0.1215	0.3565	-0.0951	0.0773	-0.0794	-0.1842	1				
RGL	-0.0584	0.2121	0.01496	0.1038	0.0614	-0.0036	-0.0278	0.1719	0.069	0	0.128	-0.0575	1			
FL	0.3664	0.2919	-0.1415	-0.1754	-0.0456	0.0852	0.0746	-0.1843	0.093	-0.2254	0.121	0.0046	0.1313	1		
D_2	0.077	0.0919	0.0977	0.0113	0.0561	-0.0066	0.0542	-0.162	0.0756	-0.1753	0.0401	0.1283	0.073	0.0694	1	
D_3	0.1487	0.4275	-0.1276	0.1121	-0.1497	0.2228	0.2755	-0.2424	-0.0328	0.0554	-0.0322	0.2067	0.1457	0.1748	-0.445	1

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university. All sources of materials used for the thesis have been dully acknowledged.

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