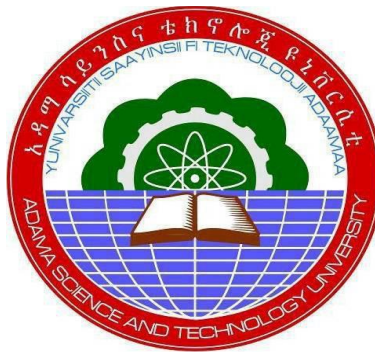


DETERMINANTS OF CREDIT RISK IN MICRO FINANCE INSTITUTIONS
(A CASE STUDY OF SELECTED ETHIOPIAN MICRO FINANCE INSTITUTIONS)
A Thesis submitted to Partial fulfillment of the Requirement for the Award of
Master Science in Accounting and Finance

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Declaration

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

Declared by:

Signature:_____

Date: December, 2015

Certification

This is to certify that the thesis prepared by Kimem Tilahun title of “**Determinants of credit risk in Ethiopian Micro finance Institution**”. And submitted in partial fulfillment of the requirement for degree Master of Science in Accounting and Finance complies with the regulation of the university and meets the accepted standards with respect to originality and quality.

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Abstracts

Microfinance institutions (MFIs) as the financial institution they are exposed to various financial risks given the ever dynamic and challenging business environment, the performance of most microfinance programs, has not been encouraging. Many have been plagued with problems as high default rates, inability to reach sufficient numbers of borrowers, and a seemingly unending dependence on subsidies.

Therefore this study attempt to study determinants of credit risk of Ethiopian micro finance institution by using both firm specific and macroeconomic variable over the period 2005 to 2014 years. In order to achieve this objective, the study uses mixed research approach. Panel data covering ten year period from 2005 – 2014 are analyzed for thirteen microfinance institution Also in-depth interview was conducted with four chief industry regulators. The study analyses a range of determinants of nonperforming loan microfinance profitability, microfinance size, capital adequacy, loan growth, lending rate, operating inefficiency and inflation. The Fixed effects technique has been applied to find out the most significant variables from considered firm specific and macro economics variable. The regression results show that, loan growth, capital adequacy size of micro finance institution and microfinance profitability has significant effects on non performing loan of microfinance institution. On the other hand, leading rate, operating inefficiency and inflation don't have statically significant effects on Ethiopian microfinance non performing loan. So, stakeholders should give consideration loan growth, capital adequacy ratio, microfinance profitability and volume of asset in controlling the level of nonperforming loan in Ethiopian microfinance Institution.

Key words: Credit risk, Nonperforming loans and MFIs

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CHAPTER ONE

INTRODUCTION

This chapter introduces the general overview of the study. It includes background of the study, statement of the problem, research objectives, literature driven hypothesis, significance of the study, scope of the study, limitation of the study, and organization of the paper.

1.1 Back Ground of the Study

Microfinance refers to the delivery of financial services such as credit, savings, insurance, etc to clients who are without access to the services of formal sector financial institutions on sustainable basis (Parker 2000). Often characterized by targeting the poor (especially the poor women); promoting small businesses; building capacity of the poor; extending small loans without collaterals; combining credit with savings; and charging commercial interest rates (Dejene, 1998). They emerged as a growing industry to provide financial services to very poor people. Most of the time microfinance institutions have been seen as non for profit organizations. However, the long term viability of any business model depends as much as on the financial viability as on its ability to deliver its settled objectives. It can be seen that without sound financial performance the sustainability of these microfinance institutions is not possible. Microfinance institutions should be economically viable and sustainable in the long run (Schreiner 2009).

In Ethiopia, improving access to financial services is taken as an important development tool, because it helps in creating employment for unemployed and increase their income and consumption of the excluded population, which would in the final analysis reduce poverty. National Bank of Ethiopia by the end of 2013/14 reported, the number of MFIs operating in the country reached 31. Their overall performance was encouraging as their total capital and total asset increased by 24.6 and 38.6 percent and reached Birr 5.6 billion and Birr 24.5 billion, respectively. MFIs need to be financially strong and need to build their own capital by going out of subsidy.

The movement out of the heavily donor-dependent sector of subsidized operations into one in which microfinance institutions are financially self-sufficient and sustained and are a part of the regular (or formal) financial system, which is called commercialization of MFIs. The need for

commercialization, other than the increase in outreach, is prompted by strive for building viable and sustainable institutions.

The sustainability of micro finance institutions that reach a large number of rural and urban poor who are not served by the conventional financial institutions has been a prime component of the new development strategy of Ethiopia (Wolday2000).

Risk is an integral part of financial services. Risks are significant if the probability of occurrence or the severity of the potential impact is high. Financial institutions should neither avoid nor ignore risks; but they should learn how to manage them. The benefits of effective risk management include identifying positive opportunities as well as avoiding negative threats (Deutsche 2000).

Strong financial sector is a backbone for the overall economical development of once country. Effective risk management is a crucial for financial sectors. In present day's all micro finance are exposing to risks like credit risk, liquidity risk, operational risk, market risk, and interest rate risk, along with other risks, which may possibly affect the survival and successes of micro finance (Ali, Akhtar and Sadaqat,2011 and Al-Tamimi and Al- Mazrooei,2007).

According to Fiedler (1971), Credit risk is the probability that a loan will not be repaid according to the terms of the contract. Hence it is better to know the factors that determine the credit risks in order to manage credits in Ethiopian Micro Finance Institution.

More precisely Risk management is the human activity which integrates recognition of risk, risk assessment, developing strategies to manage it and mitigation of risk using managerial resources. Whereas Credit risk is the risk of loss due to a debtor's nonpayment of a loan or other line of credit (either the principal or interest (coupon) or both) (Campel, et. al.1993) Whether default is random and influenced by erratic behavior or whether it is influenced by certain factors in a specific situation, therefore, needs an empirical investigation to understand determinants of credit risk that the findings can be used by micro financing institutions to manipulate their credit programs for the better (Khandker et al. 1995).

There are different studies that have been conducted on the global level related to this title such as research done by Dieckmann (2007), Balkenhol (2007) , (Scott, 2003), Santomero, A. M. (1997), Sharma, M (2005), Rose Ajiambo, 2007, Rainer, H. and Paul, W. (2007), Micco, A. and

Panizza, U. (2004), Mehmed Ganić (2014) , Vogiazas, S. D. and E. Nikolaidou (2011) Varian, H(1990).Some of these researches are done on banking sector whereas the remaining done on MFs.

In Africa also there are studies conducted on the same title. For instances ,Omino (2005), Zribi, N. and Y. Boujelbene (2011), Richard, E., Chijoriga, M., Kaijage, E., Peterson, C., &Bohman, H. (2008), Reinke, J (1996), Kombo, D.K., & Tromp, D.L.A. (2009), Joseph John Magali(2013).

Wolday Amha (2000), Tilahun Aemiro and Dugasa Rafisa Olana(2014), Samuel Amera (2011), Dejene Aredo (2003), Gebeyehu(2002) are some researchers conduct their study on related title but most of them are done on banking sector only .Very few of them are conducted on MFIs. Even study conducted on Ethiopian MFIs adders incidences of credit default by surveying of borrowers opinions and the papers were not address determinants of credit risk by using firm specific and macroeconomic variable. Therefore with best of researchers' knowledge no study is investigated yet determinants of credit risk on Ethiopian MFIs. This is research area that needs in-depth study as the incidence of credit default is high in the industry. Consequently this study aim to understand determinants of credit risk on Ethiopian micro finance institution by considering firm specific and macroeconomic variable by using with data of 2005- 2014 years this will equip all stakeholders with better understanding on determinates of credit risk on MFIs in Ethiopia.

1.2 Statement of the Problem

Credit risk is one of significant risks of MFIs that determine their activities. Through effective understanding of credit risk determinants MFIs can support the viability and sustainability of their own objective. (Balkenhol 2007). Credit risk is a risk of borrower default, which happens when the counterpart fails to pay on time. There can be many reasons for default.

According to Alemayehu 2008, prime component of the new development Strategy of Ethiopia is depend on the establishment of sustainable MFI that reach a large number of rural and urban poor who are not served by the conventional financial institutions. The objective of almost all of the MFIs in Ethiopia is poverty alleviation. To achieve this objective MFIs should be financially sustainable. Study by Dieckmann (2007) has shown that MFIs are undergoing an actual transformation from the traditional donor-driven non-governmental organizations (NGO)

framework towards a greater degree of capital market involvement. There are many assumptions as to why this transformation is happening; one of them being that it is difficult to count on donations, subsidies and grants by development agencies or private donors. In 1995, the donor community arrived at a consensus that all MFIs should in principle become profitable after seven to ten years of start-up support. (Balkenhol 2007).

Omino (2005) puts emphasis on sound development of microfinance institutions as vital ingredients for investments, employment and to encourage the economic growth. As a result of their flexibility and the way they operate, they are exposed to various risks which include financial risks, operational risks and strategic risks. And as competition increases and the sector mature, MFIs are faced with numerous risks as highlighted above and the sector must mitigate the risks in order to sustain the business and remain relevant in the long run (Omino, 2005). Since the business environment is becoming challenging, without any doubt a (MFI) is bound to be exposed to various risks. The problem is that Micro Finance Institutions that don't adapt and/or institutionalize financial risk management strategies are likely to witness poor growth patterns compared with those that adapt financial risk management strategies.

Credit risk is the risk that a borrower will be unable to make payment of interest or principal in a timely manner (Scott, 2003). Whereas financial risk is defined as the unexpected variability or volatility of returns which includes credit risks, liquidity risks and market risks (Finance dictionary, 2009). The lender in the formal financial system is at a disadvantage of information on the borrower's behavior. Fortunately, group based micro financing system that involves peer pressure and joint liability has evolved to counter the problems of a conventional bank.

These problems hinder micro finance to perform as expected from them. Many have been plagued with such problems as high default rates, inability to reach sufficient numbers of borrowers, and a seemingly unending dependence on subsidies. Few of them have lived up to their original objective of including the excluded (Bhatt 1997).

For such MFIs to be successful, they should be sustainable both financially as well as institutionally. On top of sustainability, one has to include developmental effects like income on the target group as core measure of success. For agencies that are involved in the development or in assisting the development of a microcredit institution, it is recommended that profitability and

sustainability should be the final goals, and therefore, the only indicators of success (Rudkins 1994).

The recent instabilities in the financial sector related to subprime mortgage lending crisis in U.S provides an example of the dangers in providing an increasing array of higher-risk loans to higher-risk borrowers (Ibtissem 2013). The rapidly growing supply of funds for micro-loans, the increasing competition in microcredit markets, the increasing over-indebtedness among micro-entrepreneurs and the current financial crisis increase the credit risk and therefore lead to a growing need to estimate the risk of failure of microfinance borrowers.

Prior study on micro finance industry address issue of credit default, its incidence and assess the contributing factor of non repayments of loan according to its term and agreements Okurut (2009),Marrez(2010),Nawai(2013),Magali(2013),Poudel(2013),Garr(2013),) those study primary focus on assessing borrower's ability and behaviors for non repayment of loan . In Ethiopia few unpublished master thesis available those are Gebeyehu(2002), Other unpublished master thesis which was conducted by Samuel (2011) on Credit Default Risk and its determinants of Microfinance Industry in Ethiopia and he found that the MFIs default rate increased over the review period and averaged 27.1 per cent as well. Few studies conducted on banking sectors specifically address the issue of determinant credit risk (Garr(2013), Tehulu (2014)) Consequently, a design feature that works well in one industry may not work in another. As Bird (2005) noted this may be referred to as the No-One-Size-Fits-All (NOSFA) principle, i.e. the best policy and administrative design for each country/industry has to be determined carefully in light of the conditions and objectives of that country/industry.

Therefore, as exploring the determinants of credit risk is an issue of substantial importance for regulatory authorities concerned with financial stability and for microfinance management this study Seek to see determinant of credit risk on Ethiopian MFIs. To the best of researcher's knowledge, no studies have been conducted to investigate the company specific and macroeconomic determinants of credit risk in the micro finance industry in Ethiopia. This research intends to fill a left research gap as the first in-depth study to examine the company specific and macroeconomic determinants of credit risk by taking evidence from Ethiopian Micro Finance Industry.

1.3 Objectives of the study

1.3.1. General Objective

The main objective of this study is to examine determinants of credit risk in Ethiopian micro finance institution.

1.3.2. Specific Objectives

- To determine the relation between size of micro finance and their own credit.
- To examine the impact of capital adequacy on credit risk of MFIs.
- To investigate the relationship between loan growth and credit risk.
- To determine the impact of operating inefficiency on credit risk of MFIs.
- To investigate the relationship between lending rate and credit risk in MFIs.
- To investigate the impact of inflation on credit risk of MFIs.
- To examine the relationship between return on asset and credit risk.

1.4. Literature driven hypotheses

Based on different empirical literature the following determinant of credit risk will be presented. This study have seen in two categories, namely firm specific determinant of credit risk (Capital adequacy, loan Growth, lending rate, size of microfinance and Operating Inefficiency) and macroeconomic determinants meaning those that are beyond the control of management (inflation and consumer price index).

Dependent Variable

Nonperforming loan (NPL): NPL are a type of credits which microfinance perceive as possible losses of funds due to loan default and an indicator of credit risk Chandra Sarat(2003). NPL is a dependent variable and it is chosen because it is a measurement of credit risk and indicates how MFIs evaluate their credit risk because it defines the proportion of loan losses amount in relation to Total Loan amount (Hosna et al, 2009). Many MFIs experienced failure and global financial markets faced systemic crisis. The experience of crisis increases further concerns on financial system stability and the need for better control and supervision on lending activities and institutions.

Independent variables

Size of micro finance (SMF) -The empirical evidence relating to the impact of size on credit risk appears to be mixed. For instance, some studies report a negative association between credit risk and size (Saunders et al. (1990), Chen et al. (1998), Cebenoyan et al. (1999) and Megginson (2005), Salas and Saurina, (2002,Hu et al (2006)). According to these studies, the inverse relationship means that large institution have better risk management strategies that usually translate into more superior loan portfolios vis-a-vis their smaller counterparts. There are also studies which provide evidence of a positive association between non performing loans (NPLs) and size (Rajan and Dhal, 2003). Theoretical arguments suggest a negative relationship between these two variables. Such a relationship is justified by the most natural argument that is diversification by size. Indeed, larger institution is expected to have lower risks because they have the capability of holding more diversifiable portfolios. Some prior research (Ali, Akhtar and sadaqat (2011), Ahmed, Akhtar and Usman (2011), Ahmad and Ariff (2007), and Das and Ghosh(2007)) suggests but not conclude that they have positive relationship. Therefore, it is expected that there is negative relationship between credit risk and Size of microfinance.

H₀: There is no significant relationship between Size and Credit risk.

H₁: There is a significant relationship between Size and Credit risk.

Capital adequacy (CA) -The literature on regulatory capital and bank credit risk shows an inverse relationship. For example, Husain and Hassan (2004), in the context of 11 developing countries have shown a negative relationship between capital ratio and portfolio risk. Nor and Mohamed (2007) have presented a comparative study of all factors contributing to the credit risks of commercial banks in a multi-country setting: Australia, France, Japan and the U.S. represent developed economy banking systems while emerging ones are represented by India, Korea, Malaysia, Mexico and Thailand. They have found that the regulatory capital is an important factor influencing the credit risk of any banking system that offers a range of services. Since micro finance institution small not exception from this argument. This study also highlights that the credit risk in emerging economy is higher than that in developed economies and that risk is formed by a larger number of institution specific factors in emerging economies compared to their counterparts in developed economies. In the context of emerging countries, Goldlewski (2004) have found that the regulation of capital and risk are negatively related. In

facts Profitability reflects how banks are run given the environment in which banks operate. In fact, profitability should mirror the quality of microfinance's management and the shareholders' behavior, the microfinance's competitive strategies, efficiency and risk management capabilities. Thus, it can be expected to have negative relationship with credit risk

H₀: There is no significant relationship between capital adequacy ratios and micro finance credit risk.

H₁: There is a significant relationship between capital adequacy ratios and micro finance credit risk.

Loan growth (LG)-Credit growth sometimes called loan growth implies credit expansions by lenders. Excessive rapid loan growth, as well as sharp declines in micro finance capital levels are useful pointers to the deterioration in the financial health of institution and can be employed as early warning indicators of future problem loans (Das and Ghosh, 2007). Previous literature shows growth in loan is a cause for credit risk. A strong loan growth translates into significantly higher credit losses with a lag of 2-4 years (Hess, Grims and Holmes, 2009). There for it's expected that negative or positive relationship with credit risk.

H₀: loan growth is not significantly affects credit risk in Ethiopian micro finance institution.

H₁: loan growth is significantly affects credit risk in Ethiopian micro finance institution.

Lending Rate/Interest Rate

Lending rates are one of the primary economic determinants of NPLs. It is the cost of borrowed funds. Interest rate spread is a measure of profitability between the cost of short term borrowing and the return on long term lending. Interest rate spread affect performing assets in microfinance as it increases the cost of loans charged on the borrowers (Joseph, 2011). Interest rate is the price a borrower pays for the use of money they borrowed from the lenders. Interest can be thought of as rent of money.

Thus, lending rate is a rate of return usually remains in admittance of monetary regulators (NBE) to manipulate the pursuance of monetary objectives. In case, maximum and minimum lending rate is set by NBE. There is empirical evidence showing a positive and negative association

between lending rate and NPLs. For instance: Saba *et al.* (2012) found negative association between lending rate and

NPLs whereas Farhan *et al.* (2012) and Ranjan and Chandra (2003) found as there is a positive relationship with NPLs and lending rate since an increase in interest rate curtails the paying capacity of the borrowers. Thus, lending rate is expected to have positive association with NPLs in this study.

H₀: Lending rate has no relationship with credit risk of Ethiopia Microfinance Institution

H₁: Lending rate has relationship with credit risk of Ethiopian Microfinance Institution.

Operating inefficiency (OI)-Regarding operating efficiency, Ali, Akhtar and Sadaqat (2011) found a negative but insignificant relationship with credit risk of Pakistan commercial banks. Inefficient managers will not cope successfully with the process of granting and monitoring loans that will lower the banks' credit quality and bring about a growth in problem loans (Salas and Saurina, 2002). Inefficient banks hold riskier portfolio (Lis, Pages and Saurina, 2000). As studied by Berger and De Young (1997), poor management in the financial institutions results in bad quality loans, and therefore, escalates the level of non-performing loans. They argue that bad management of the banking firms will result in banks inefficiency and affects the process of granting loans.

The banks' management might not thoroughly evaluate their customers' credit application due to their poor evaluation skills. Therefore, financial institution inefficiencies might lead to higher non-performing loans. So it is expected with positive or negative sign and hypothesized as follows.

H₀: Operating inefficiency of micro finance institution will not significantly affect credit risk.

H₁: Operating inefficiency of micro finance institution will significantly affect credit risk.

Inflation-Inflation is one of macroeconomic factor which affects the efficiency of financial sector. Inflation depreciates the value of money which reduces the rate of return in general. High inflation rates are generally associated with a high loan interest rate. Thus, high interest rate increases cost of borrowing, which leads to an increase in the obligation of borrowers resulting in an increase in the credit risk. In the banking area, Athanasoglou, Brissimis *et al.* (2008) suggest that the impact of inflation on the microfinance profitability depends on whether the operating expenses increases at a faster rate than inflation. Since inflation reduces the future value of

money, it pays people (both potential borrowers and lenders) to try to forecast inflation over the relevant time period. This forecast is called anticipated inflation (Kessel and Alchian 1962). When financial institution accurately forecast inflation, the management can appropriately adjust the interest rate in order to increase their revenues faster than the cost which mitigates the negative impact of inflation. Thiagarajan, Auuapan et al. (2011) examined the relationship between current inflation and one year lag inflation with credit risk and found positive relationship between current inflation and credit risk and no any relationship between one year inflation lag and credit risk in case of public sector banks but the result showed that there is no any relationship between inflation and credit risk in case of private sector banks.

Similarly, Gunsell (2008) and Rinaldi and Sanchis-Arellano (2006) examined the influence of inflation to credit risk in North Cyprus and Euro Zone country respectively and found positive relationship. In the opposite direction, (Shu 2002), Zribi and Boujelbene (2011) and Vogiazas and Nikolaidou (2011) in case of Honkong, Tunsian and Romanian banking sector, found negative relation between inflation and credit risk. However some other study by Aver (2008), Bofondi and Ropele (2011) and (Castro 2012) in case of Solvenian, and Italian financial sectors, didn't find any influence of inflation to credit risk. It is measured on continuously by a compounded rate basis (differences in the natural logarithms) or as an annual percentage increase. Inflation, to one degree or another, is a fact of life. Consumers, businesses and investors are impacted by any upward trend in prices. Since absence of literature on micro finance sectors considering as limitation we try to see the effects of inflation on micro finance credit risk by advancing the following hypothesis with expectation of positive sign.

H_0 : H_1 : Inflation rate has no significant impact on credit risk on Ethiopian micro Finance institution.

H_1 : Inflation rate has a significant impact on credit risk on Ethiopian micro Finance institution.

Return on Asset: The return on Assets (ROA) is a ratio that measures company earnings before interest & taxes (EBIT) against its total net assets. Return on asset (ROA) and return on equity (ROE) can be used to view the performance in terms of profitability. The ratio is considered an

indicator of how efficient a company is using its assets to generate before contractual obligation must be paid. It is calculated as: $ROA = EBIT / \text{Total Assets}$. Return on assets gives an indication of the capital intensity of the banking industry, which will depend on the industry; banks that require large initial investment will generally have lower return on asset (Haslem, 1968). So the researcher expects negative relationship of ROA and credit risk.

H_0 : ROA has no relation with credit risk of Ethiopian microfinance.

H_1 : ROA has relation with credit risk of Ethiopian microfinance.

1.5. Significance of the Study.

The determinants of credit risk is clearly of enormous issue since these institutions objective concerns about ignored community which increase the number of poorest in once country. The results of this research will have implications and importance to various stakeholders as follows:

- Identification these factors was expected to generate useful information that help for effective credit targeting, enhanced outreach service to large class of customers, and sustainable operation of the institution to bring the desired poverty reduction impacts.
- The study will benefit scholars and academicians who wish to undertake further studies and increase the body of knowledge on the effect firm specific and macroeconomic variables on credit risk of MFI in Ethiopia particularly and in developing economy at large.
- It will increase knowledge on the relationship between firm specific and macroeconomic variables with credit risk determinant in Ethiopia.
- It also suggests areas where gap in literature exist and where further research studies are required so that scholars in the field of finance and economics can do further studies in them.

1.6. Scope of the study

The scope of this study was limited to examine the determinants of credit risk in Ethiopian micro finance institution over the period 2005 to 2014 years only. The rationale behind this is to get

sufficient number of observation without compromising number of microfinance institution included in the study. To this end, this study was limited to firm specific and macroeconomic determinant of credit risk (loan growth, size, capital Adequacy, micro finance profitability, Operational inefficiency, lending rate and Inflation). The study area of this research is delimited to Ethiopian Micro Finance Industry (Addis credit and Saving Institution (ACSI), Amara Developments credit saving institution (ADCSI), Buusaa Gonofaa (BG), Dedit credit saving institution (DECSI), Oromia credit saving share company (OCSSCO), Omo saving and credit (OMO), Vision Fund Ethiopia (VFE), African village financial services (AVFS), Wasasa Microfinance Institution (WASASA), Eshet Microfinance Institution (Eshet), Meklit Micro Finance Institution (MEKLIT), PEACE micro finance institution (PEACE), Specialized Financial promotion Institution (SFPI) .

1.7 Limitation of the study

As with any other study, this study has also its own limitations. In this Study the considered sample micro finance institution were on bases of purposive sample method, based on the age and availability of data. This may introduce bias inherent with non-probability sampling method. However, this is because there are thirteen micro finance institutions that have complete data for the study period to make balanced panel data set. Therefore, thus micro finance was selected purposively. Other major's limitations that hamper the study was unavailability of active secondary market which forced the researcher to measure the dependent variable i.e. measures of NPL as well as the proxies of the independent variables in terms of book values.

1.8. Organization of the paper

The thesis is organized into five chapters. Chapter one presents research introduction, statement of the problem, objective of the study, scope and limitation, and significance of the study. Following on this, chapter two of the study deals with review of theoretical and empirical literatures on determinants of credit risk. Chapter three presents the research methodology. Then, chapter four covered results and analysis of the study and finally, chapter five present conclusions summary and possible recommendations.

CHAPTER TWO

LITERATURE REVIEW

Microfinance gives access to financial and non-financial services to low-income people, who wish to access money for starting or developing an income generation activity. The individual loans and savings of the poor clients are small. Microfinance came into being from the appreciation that micro-entrepreneurs and some poorer clients can be bankable that is, they can repay, both the principal and interest, on time and also make savings, provided financial services are tailored to suit their needs. Microfinance as a discipline has created financial products and services that together have enabled low income people to become clients of a banking intermediary.

This chapter presents the theoretical and empirical literature review over the credit risk determinates and relevance of microfinance institution theme.

2.1. Definition and goals of microfinance Institutions

The definition of Microfinance institutions proposed by some authors and organizations are seemingly different from one another. However the essence of the definition is usually the same, in which microfinance refer to the provision of financial services primarily savings and credit to the poor and low income households that don't have access to commercial banks (Arsyad 2005). Microfinance refers to small-scale financial services for both credits and deposits that are provided to people who farm or fish or herd; operate small or microenterprises where goods are produced, recycled, repaired, or traded; provide services; work for wages or commissions; gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools and to other individuals and local groups in developing countries, in both rural and urban areas (Robinson M. 1998).

The goals of microfinance institution as development organizations is to service the financial needs of un-served or underserved markets as a means of meeting development objectives such as to create employment, reduce poverty, help existing business grow or diversify their activities, empower women or other disadvantaged population groups (poor people or low income people) and encourage the development of new business. In short, microfinance institutions have been

expected to reduce poverty, which is considered as the most important development objective (Arsyad 2005).

2.1.1 The Necessitate for Microfinance Institutions

The formal financial institutions played little role in financing development efforts in the rural areas. This is because they are clustered in urban areas, concentrate on funding large enterprises and are inaccessible to the rural poor especially in terms of distance. In addition, the rural poor can't fulfill banking requirement to get credits. The requirements for collateral and intrinsic banking procedures are in most cases very difficult for the poor to deal with. The volume of loan demanded by small farmers is not appealing to banks. Such loans are difficult to manage and their processing not financially feasible (Sharma 2005).

Dejene (2003) argues on the economic importance of the informal institutions in Ethiopia that the poor are often marginalized in the formal credit markets. This can be explained partly in terms of: a lack of collateral, which makes lending to the poor a risky venture, Transaction cost of lending to and borrowing by the poor is often high; and utility loss from repayment is higher for the poor as compared to the rich.

On the other hand, credit from informal sources is inadequate and moreover the interest rate charged is exorbitantly exploitative. Fidler and Webster (1996) note that although informal credit markets operate widely in rural areas, moneylenders typically charge very high interest rates, inhibiting the rural poor from investing in productive income generating activities.

2.1.2 The development of Microfinance Institutions in Ethiopia

Development of microfinance in Ethiopia should be viewed as an identification of considerable levels of unrealized demand and potential market growth for financial services and a shift by the NGO sector and government from relief assistance to sustainable development which intersects at the point of institutionalization of microfinance provision (Fiona 1999 as cited by AEMFI 2000).

The establishment of sustainable microfinance institutions that reach a large number of rural and urban poor who are not served by the conventional financial institutions, such as the Commercial Banks, has been a prime component of the new development strategy of Ethiopia(AEMFI 2000).

Proclamation No. 84/94 allows private domestic investors to participate in banking and insurance activities, which were previously monopolized by the government. However, the issuance of this proclamation alone did not totally solve the financial problem of the economically active poor people in rural and urban areas. Another Proclamation, No. 40/96 was issued to solve the problem of the delivery of financial services to the poor. Following the issuance of this proclamation the microfinance industry of Ethiopia showed a remarkable growth in terms of outreach and sustainability. Furthermore, the National Bank of Ethiopia issued a new directive on May 2002 to improve the regulation limits on loan size (Br. 5000), repayment period (one year), and lending methodology (social collateral) (Seifu (2002) as cited by AEMFI (2000)).

According to Seifu (2002), the microfinance business in Ethiopia Formally started in 1994-95. Seifu further discusses that, the licensing and supervision of Institution proclamation of the government encouraged the Spread of Institutions (MFIs) in both rural and Urban areas as it authorized them among other things, to legally accept deposits from the general public (hence diversify sources of funds), to draw and accept drafts, and to manage funds for the Micro financing business.

Know there are about 30 microfinance institutions formally established and operating the in country. Their outreach performance measured in terms number of active borrowers and gross loan portfolio reached more than 2.4 million and birr 6 billion. Actually they cover only 20% of the demand of the economically active poor.

2.1.3 The Regulatory Framework for the Microfinance Industry in Ethiopia

The delivery of efficient and effective microfinance services to the poor required conducive macroeconomic policies and the establishment and enforcement of legal and regulatory frameworks of a country. An effective financial system provides the foundation for a successful poverty alleviation program (AEMFI 2000).

Prudential financial regulation refers to general principles, or legal rules that aim to contribute to stable and efficient performance of financial institutions and markets and ensure the safety and soundness of the system (Chaves and Gonzalez –Vega 1994 as cited by AEMFI 2000).

Kassa (2010) suggests that the purpose of National Bank of Ethiopia Establishment Proclamation no. 591/2008 is to maintain stable rate of price and exchange, and to foster a healthy financial system in the country. The microfinance institutions are a part of the formal financial system that are regulated and supervised by national bank of Ethiopia. However, regulations in the microfinance industry do not only mean government regulations; it also involves self-regulations and code of conducts introduced by networks or associations.

Regulatory frameworks governing the microfinance industry should ensure that the MFI has a sound portfolio performance; low delinquency or default rate; high diversification to reduce the risk of specializing in the delivery of one loan product; ensure the safety of deposits through equity capital; ensure lower levels of liquidity risk; provide regular and high quality financial information and reduce the risk arising from dependence on subsidy and influence of donor (AEMFI 2000).

There are numerous policies, laws and directives which affect the development of microfinance industry in Ethiopia. The most relevant and recent policies affecting the industry include:

- ✓ The Monetary and Banking Proclamation No. 83/1994 empowered the National Bank of Ethiopia (NBE) to license, supervise and regulate financial institutions such as banks, insurance companies, microfinance institutions and savings and credit cooperatives.
- ✓ The Licensing and Supervision of Banking Business Proclamation No. 84/1994 allowed for the first time the establishment of private financial institutions, thus breaking the state monopoly.
- ✓ Proclamation No. 40/1996 which aims to provide for the licensing and supervision of the business of micro financing clearly indicates the requirements for licensing microfinance institutions by empowering the National Bank of Ethiopia to license and supervise them.

The National Bank of Ethiopia has also issued 12 directives, which have been consistent with Proclamation No. 40/1996. These included setting a loan ceiling of 5,000 Birr and loan duration of one year. The interest rate has been waived and MFIs are now free to set their own interest rates ceiling.

The current regulatory framework requires microfinance institutions to be formed as share companies owned only by Ethiopian nationals. Foreign nationals are not allowed to invest in the

financial sector, including in microfinance business. Most of the shareholders of the MFIs are regional governments, associations, individuals and NGO's (Kassa 2010).

2.2. Theoretical Review:

In this section theory relating Traditional Bank's Difficulty in Lending to the Poor: An Economic-Theoretical Explanation Portfolio theory, Arbitrage Pricing Theory (APT) Information is presented.

2.2.1. Traditional Bank's Difficulty in Lending to the Poor: An Economic-Theoretical Explanation

In order to supply cheaper credit, many commercial banks have attempted to offer financial services to the poor in rural areas by implementing large-scale subsidized credit programs between the 1950s and 1970s. Their objective is to provide a subsidized credit at below-market interest rate to small agricultural producers, enabling them promoting investment in agricultural, thereby increasing food production and, subsequently, stimulating overall economic growth (Yaron and Benjamin, 2002). However, usually these attempts have been failed, giving rise to abuses and corruption, and inevitably leading to a collapse. Morduch (1999) cites the work by Adams, Graham and von Pischke who claims that subsidized credit was a keystone for many developing countries in the 1950's as a poverty reduction effort but all these attempts were is appointments with repayment rates less than 50 percent.

Different barriers prevent traditional banking system from serving poor rural household. The theoretical framework that attempt to explain why this is the case can be found in the collateral debt. When Yunus (1994 a) asked traditional bank about the causes of financial exclusion of poor people, the bank explained that: Banks need collateral. The poor cannot offer collateral. Moreover, the poor are not to be trusted. They are not credit worthy. Banking is a business. It cannot indulge in charity for the poor' (Yunus, 1994a, p.5). Collateral is commonly used as a mechanism reducing both the screening and the enforcement problems. The existence of screening function of collateral is supported by empirical study by Machauer and Weber (1998) and by empirical evidence and experiments reported by Capra *et al.* (2001). Collateral debt can be viewed as a mechanism to reveal the information concealed ex ante from the lender. It can be

used also as a credit enhancement or credit risk transfer mechanism from the lender to the borrower. If the borrower cannot (involuntary default) or would not (strategic default) pay back the loan, collateral would be the compensation. However, poor and self-employed people have little or no physical and livelihood assets or stable source of income that can be secured by a bank as collateral.

The high transaction costs associated with the small loans is also a main barriers preventing traditional banking system from serving poor rural households. Actually, the process of lending a loan entails many bureaucratic procedures, which lead to extra transaction costs. This transaction costs have a large fixed-cost component regardless of the size of the loan. Thus, the costs for the bank to lend multitude loans of small amount of money to a multitude of borrowers are much higher compared to lower transaction costs for offering larger loans to fewer borrowers.

Generally, poor borrowers are more likely to apply for loans of small sizes, and thus the lender's transaction costs increase. Giné *et al.* (2010) mentioned that moral hazard and adverse selection, coupled with small transaction sizes, together restrict the possibilities for banks to lend profitably to poor customers.

This failure of traditional commercial banking and the exclusion of poor borrowers raise the question on how poor people can improve their situation. According to Hulme and Mosley (1996), credit activities have faced severe difficulties where three of them must be overcome (i) how to ensure that large numbers of poor borrowers can access loans; (ii) how to provide a mechanism for screening out bad borrowers, both in terms of character and in terms of projects in the absence of written records and business plans; and (iii) how to give borrowers who cannot offer collateral an incentive to repay or, failing this, compel them to repay in time.

2.2.2. Portfolio Theory

Since the 1980s, companies have successfully applied modern portfolio theory to market risk. Many companies are now using value at risk models to manage their interest rate and market risk exposures. Unfortunately, however, even though credit risk remains the largest risk facing most companies, the practice of applying modern portfolio theory to credit risk has lagged (Margrabe, 2007)

Companies recognize how credit concentrations can adversely impact financial performance. As a result, a number of institutions are actively pursuing quantitative approach to credit risk measurement. This industry is also making significant progress toward developing tools that measure credit risk in portfolio context. They are also using credit derivatives to transfer risk efficiently while preserving customer relationships. Portfolio quality ratios and productivity indicators have been adapted (Kairu 2009). The combination of these developments has vastly accelerated progress in managing credit risk in a portfolio context.

Traditionally, organizations have taken an asset-by-asset approach to credit risk management. While each company's method varies, in general this approach involves periodically evaluating the quality of credit exposures, applying a credit risk rating, and aggregating the results of this analysis to identify a portfolio's expected losses. The foundation of the asset-by-asset approach is a sound credit review and internal credit risk rating system. This system enables management to identify changes in individual credits, or portfolio trends in a timely manner. Based on the changes identified, credit identification, credit review, and credit risk rating system management can make necessary modifications to portfolio strategies or increase the supervision of credits in a timely manner. While the asset-by-asset approach is a critical component to managing credit risk, it does not provide a complete view of portfolio credit risk, where the term risk refers to the possibility that actual losses exceed expected losses. Therefore, to gain greater insight into credit risk, companies increasingly look to complement the asset-by-asset approach with a quantitative portfolio review using a credit model (Mason and Roger, 1998). Companies increasingly attempt to address the inability of the asset-by-asset approach to measure unexpected losses sufficiently by pursuing a portfolio approach. One weakness with the asset-by-asset approach is that it has difficulty identifying and measuring concentration. Concentration risk refers to additional portfolio risk resulting from increased exposure to credit extension, or to a group of correlated creditors (Richardson, 2002).

2.2.3 Arbitrage Pricing Theory (APT)

A more interesting alternative was the Arbitrage Pricing Theory (APT) of Ross (1976). Stephen Ross's APT approach moved away from the risk vs. return logic of the CAPM, and exploited the notion of pricing by arbitrage to its fullest possible extent. As Ross himself has noted, arbitrage-

theoretic reasoning is not unique to his particular theory but is in fact the underlying logic and methodology of virtually all of finance theory. This theory subscribes to the fact that an estimate of the benefits of diversification would require that practitioners calculate the covariance of returns between every pair of assets. In their Capital Asset Pricing Model (CAPM), Morris (2001) solved this practical difficulty by demonstrating that one could achieve the same result merely by calculating the covariance of every asset with respect to a general market index. With the necessary calculating power reduced to computing these far fewer terms (betas), optimal portfolio selection became computationally feasible.

2.2.4 Information Theory

Derban, Binner and Mullineux (2005) recommended that borrowers should be screened especially by banking institutions in form of credit assessment. Collection of reliable information from prospective borrowers becomes critical in accomplishing effective screening as indicated by symmetric information theory.

Qualitative and quantitative techniques can be used in assessing the borrowers although one major challenge of using qualitative models is their subjective nature. However according to Derban, Binner and Mullineux (2005), borrowers attributes assessed through qualitative models can be assigned numbers with the sum of the values compared to a threshold. This technique minimizes processing costs, reduces subjective judgments and possible biases. The rating systems will be important if it indicates changes in expected level of credit loan loss. Brown Bridge (1998, pp.173-89) concluded that quantitative models make it possible to numerically establish which factors are important in explaining default risk, evaluating the relative degree of importance of the factors, improving the pricing of default risk, screening out bad loan applicants and calculating any reserve needed to meet expected future loan losses.

2.3 Empirical Literature Reviews:

Under this section related empirical literature on determinates of credit risk was reviewed and because of the absence of empirical work on micro finance institution on direct related topic we will try to reviews other related topics to the theme both from banking and sectors and micro finance institution from different emerging economic and hence the details as follows.

Tehulu(2014) did study to examined the bank specific determinants of credit risk in Ethiopia commercial banks. The quantitative research approach was adopted for the study. A balanced panel data of 10 commercial banks both state-owned and private owned for the period 2007 through 2011 has been analyzed using random effects GLS regression. The regression results revealed that credit growth and bank size have negative and statistically significant impact on credit risk. Whereas, operating inefficiency and ownership have positive and statistically significant impact on credit risk. Finally, the results indicate that profitability, capital adequacy and bank liquidity have negative but statistically insignificant relationship with credit risk.

Ganić (2014) conduct study to examine the influence of bank specific determinants on realization of credit risk in the portfolio of commercial banks in Bosnia and Herzegovina (B&H). This study comprises a sample of seventeen out of twenty eight planned banks that are analyzed over the period of 2002 to 2012. The effect of variations in the determinants of bank credit risk exposure is based on using a multivariate panel regression model. Our empirical results suggest that a significant relationship exists between credit risk and the following variables:[Inefficiency (IE), profitability (ROE), Credit growth (CG) and Deposit rate (DR) while variables Solvency (SR), Loans to deposit ratio (LTD), Market power (MP), profitability (ROA) and Reserve ratio (RR)] are not statistically significant in terms of credit risk.

Hitchcock (2014) did study to examine fluctuations in microfinance loan performance over the business cycle. Specifically, he addresses how MFI loan delinquency rates change with variation in yearly GDP growth. Furthermore, tries to see also the correlation between non-performing loans and GDP according to MFI status as a none or for-profit organization. And he found that MFI loan performance reacts procyclically to the business cycle, although the effect is not as strong as experience by other types of lending institutions. In addition, for-profit MFI loan performance is estimated to be more sensitive to the business cycle than non-profit MFIs.

Magali(2013) Conduct study to assess factors affecting loans' default risks or loans repayment performance for the Savings and Credits Cooperative Societies (SACCOS) in Tanzania. He used qualitative, descriptive and multivariate regressions analysis to assess factors affecting credit default risks for 431 borrowers from 37 SACCOS in Morogoro, Dodoma and Kilimanjaro regions. The study reveals that loan size and years of schooling of borrowers contributed

positively to the loan default. However, the study finds that other independent variables such as loan activity, marital status, age, family size, interest, loan duration, value of collateral and borrowers' experiences unfit the regression model. Other factors such as political interference, lack of entrepreneurship and investment analysis skills, embezzlement practiced by leaders and SACCOS' staff, drought, diseases, deaths and other calamities, non performance of the business, inadequate loans follow-up and lack of loan activities' insurances cover were mentioned to affect the loans default. The study noticed that absence of proper credit risks management techniques resulted into huge amount of overdue loans. This study recommends that politics should not be entertained in the SACCOS activities and SACCOS should make sure that they abide by their regulations. Also SACCOS' management and members should be trained on investment and business analysis, at the same time the loans limit should be considered. We strongly recommend that insurance cover on the crop, livestock and other products should be introduced for SACCOS operating in rural areas while the government should continue to monitor and supervise the rural SACCOS in Tanzania.

Poudel (2013) investigate the macroeconomic determinants of credit risk in the Nepalese banking sector by means of time series modeling. It is motivated by the hypothesis that macroeconomic environment such as business cycle, inflation, money supply, market interest rate and foreign exchange fluctuation influence the banks' credit risk which is proxies by Non-performing Loan (NPLs). Using annual series that span from 2001-2011, this paper cover both the booming period and the recent financial crisis. The findings of paper conclude that macroeconomic variables inflation and foreign exchange fluctuation has influenced on credit risk of banks in Nepal. The results have several implications for policymakers, regulators and managers as the study covers the recent crisis period and also fill the gap in research as the best knowledge the first in-depth study in the determinants of credit risk in context of Nepal.

Garr(2013) did study to examines bank-specific, industry-specific and macroeconomic factors that influence credit risk (CR) in commercial banks in Ghana using unbalanced panel data set from 33 commercial banks covering the 21-year period 1990 to 2010. The study employed annual time series data from 1990 to 2010. The paper is the first of its kind in Ghana, a developing country with emphasis on macroeconomic tools relied on by the central bank for

creating a stable macroeconomic environment. Results suggest that credit risk in Ghana is significantly influenced by management efficiency, Government borrowing and the financial sector development. Government borrowing and financial sector development have a negative relationship with credit risk while management inefficiency.

Nawai 2013 analyzes the repayment performance in microfinance programs in Malaysia that apply individual lending approach. The research framework of this study is built by four factors namely individual/borrower factors, firm/business factors, loan factors and institutional/lender factors as independent variables and repayment performance either paid on time, delinquent and default as dependent variables. The study used mixed methodology, combining between quantitative and qualitative data through questionnaire survey, in depth interviews, publishes and unpublished reports. The data of this study is gathered from 401 respondents in Peninsular Malaysia through multistage random sampling. The data is analyzed by descriptive analysis and multinomial logit model. Meanwhile, for qualitative data, a total of 21 respondents (7 respondents who paid on time, 7 respondents who delinquent and 7 respondents who default) were selected randomly and structured interviews with 6 MFI's State Managers. The results show that in terms of borrower characteristics, only micro entrepreneur's religious education level is statistically significant in the relationship between delinquent and good borrowers and between default and good borrowers. Whereas, in firm/business characteristics, the result shows that distance, business formality and total sales are statistically significant. The finding shows that total loan received, loan type and repayment schedule are the loan characteristics that affect micro entrepreneur's loan repayment. In terms of institutional/lender characteristics, the finding shows that loan monitoring is statistically significant in the relationship between delinquent and good borrowers.

Castro(2012) Did study and employed dynamic panel data approaches to five countries over the period 1997q1-2011q3, he conclude that the banking credit risk is significantly affected by the macroeconomic environment: the credit risk increases when GDP growth and the share price indices decrease and rises when the unemployment rate, interest rate, and credit growth increase; it is also positively affected by an appreciation of the real exchange rate; moreover, we observe a

substantial increase in the credit risk during the recent financial crisis period. Several robustness tests with different estimators have also confirmed these results.

Samuel (2011) conduct study on Credit Default Risk and its determinants of Microfinance Industry in Ethiopia by using primary data collected through structured questionnaire and referred secondary sources of data. As a result, the collected data and information were compiled and analyzed for possible indications of problem areas. So, the outcomes revealed that the MFIs default rate increased over the review period and averaged 27.1 per cent as well. The core factors of default were found to be poor business performance, in terms of low profitability or business losses. Besides, credit diversion to unprofitable uses, domestic problems, numerous dependents, and tenancy problems were other factors that caused credit default. Further, the inference results of the descriptive statistics and the probit model show that education, income, loan supervision, suitability of repayment period and availability of other credit sources are important and significant factors that enhance the credit repayment performance, while credit diversion and credit/loan size are found to significantly increase credit default. There were serious problems observed in the screening mechanism the institutions employed, i.e. borrowers who are good payers like literate were rationed more, while those who contribute to the default problem like male and who apply for larger loan amounts were rationed less. So, the lending institutions are particularly recommended to improve these problems observed in its rationing mechanism. Moreover, the processes should be worked out to identify borrower capacity and any obligations that may interfere with repayment. Finally, the selected MFIs should intensify recovery of outstanding balances from defaulters through increased borrower follow-up.

Marrez(2010) analyze the credit risk of a microfinance institution based on the loan portfolio of a leading Maghrebian MFI, both in terms of number of clients served and of portfolio size. This allows us to work with a proprietary data set of 1,144,770 contracts issued between 1997 and 2007. Using a resembling technique, we estimate the probability density function of losses and value-at-risk measures for a portfolio of loans granted to female and male microfinance clients. Results show similarities and differences in credit risk between male and female clients with implications in terms of capital requirements.

Okurut (2009) investigated the key factors that influence loan repayment performance among group clients of microcredit institutions in Tanzania. This was motivated by the fact that sustainability of MFIs is critical for poverty reduction among the poor through sustainable access to credit. Sustainability of microcredit institutions is greatly influenced by the loan repayment performance of their clients. High repayment rates enable MFIs to recover interest income and minimize loan losses which enhance profits. In turn, these profits enhance the capital base which enables microcredit institutions to increase their outreach and reduce their dependence on donors. The study was based on a sample of 150 respondents from Kariakoo Division, Dar es Salaam, Tanzania. The logit model regression results suggest that experience, training time, and sanctions have positive and significant effects on loan repayment performance among group clients of MFIs. However transaction costs and group size have negative and significant effects on loan repayment performance. The policy options to improve loan repayment performance among group clients of MFIs in Tanzania include: encouraging long term relationship with groups (i.e. client retention), adequate training of groups, establishing lasting social sanctions within the groups and by the microcredit institutions, cutting down transaction costs incurred by groups and encouraging more coordination amongst MFIs through the creation of a credit reference bureau.

Abafita(2003) conducted study with the aim of analyzing the factors that influence microfinance loan repayment, evaluating the loan rationing mechanism and also assessing the impact of the program on the livelihood of borrowers, using primary data collected through structured questionnaire. The estimation results of the descriptive statistics and the probit model show that education, income, loan supervision, suitability of repayment period, availability of other credit sources and livestock are important and significant factors that enhance the loan repayment performance, while loan diversion and loan size are found to significantly increase loan default. In addition female borrowers were found better in terms of loan repayment. According to these findings the institution is recommended to see into these factors with care and design a better lending strategy focusing on effective supervision, training and approval of appropriate loan size so as to minimize the loan default problem observed. Moreover, it should pay attention to expanding of its services so that more poor women join the program and benefit from it there by contributing to the improvement of the repayment performance.

Regarding the loan rationing, borrowers who are literate, loan diverters, support more dependents and earn more income, were disfavored; while those who are older, male, apply for larger loan amounts, own livestock of higher value, perceive supervision as adequate and the repayment period as suitable were favored. There were some serious problems observed in the rationing mechanism the institution employed, i.e., borrowers who are good payers (like those who are literate) were rationed more while those who contribute to the default problem (like those who are male and who apply for larger loan amounts) were rationed less. The institution is particularly recommended to improve these problems observed in its rationing mechanism. The credit scheme was also found to have positive impact in improving the income, education, health and nutritional status of the borrowers as evidenced by the Wilcoxon test that compares the situations before and after participation in the credit scheme.

Gebeyehu(2002) did study In an attempt to analyze the determinants of loan repayment status of borrowers and to identify the criteria employed to ration credit two equations-loan repayment and rationing equations were estimated using survey data. The estimation result employing tobit model reveals that having other source of income, education, work experience in related economic activity before the loan and engaging on economic activities other than agriculture are enhancing while loan diversion, being male borrower and giving extended loan repayment period are undermining factors of the loan recovery performance of projects. With regards to the loan rationing mechanism, it is found that borrowers who secured high value of collateral and those with relatively longer repayment period were favored although they tend to be more risky while those with higher equity share and extensive experience in related activity were disfavored. This leads to the conclusion that the bank's rationing mechanism didn't much with the repayment behavior of borrower. The result leads to the suggestion that, the bank's rationing technology should be revised in such a way that Small Scale Entrepreneurs who have the managerial and entrepreneurship capacity but don't have sufficient credit access due to stringent collateral requirement could make use of the financial resource of the country and thereby contribute towards the envisaged development target as well as the bank to get out of the loan default problem.

Ajayi (1992) employed correlation and multiple regression analysis in his study about factors affecting default in residential mortgages of the Federal Mortgage bank of Nigeria. His results revealed that cost of construction, monthly repayment, credit to value ratio, market value of property, age of borrower and annual income of borrower enhance credit defaults, while expected rental income from property reduces credit default. In addition, Njoku and Odii (1991) studied determinants of credit/loan repayment under the Social Emergency Loan Scheme in Nigeria. Their study showed that late release of loans, complicated loan processing procedures, credit diversion to non-agricultural enterprise low enterprise returns resulting from low adoption rate of improved agricultural technologies and emphasis on political considerations in loan approvals contributed to poor credit repayment performance of small holders. Loan volume, years of formal education, household size and interest paid on loan were found to positively and significantly affect that by Arene (1992). The study evaluated the credit delivery system of Supervised Agricultural credit repayment; while years of farming experience, loan period, and farm size, farming as major occupation, farm output and value of assets were found to negatively and significantly affect credit/loan repayment. The extra imperative study is Credit Schemes among smallholder maize farmers in Nigeria employing multiple regression analysis. The analysis indicated that loan size, farm size, income, age, number of years of farming experience, level of formal education and adoption of innovation are significantly and positively related to repayment rate. Distance between home and source of loan, household size and credit needs were found to be negatively related to repayment rate.

2.4. Conceptual Frame Work of the Paper

The conceptual framework is the schematic diagram which shows the variables includes in the study. It is system of concepts assumption, expectation belief and theories that support and inform research. It explains either graphically or in narrative form the main things to be studies, the key factors concepts or variable, and the presumed relationship between them (miles and humberman 1994) therefore the research design the relationship between independent and dependants' variable as follows

Independent variables

Dependant

Variable

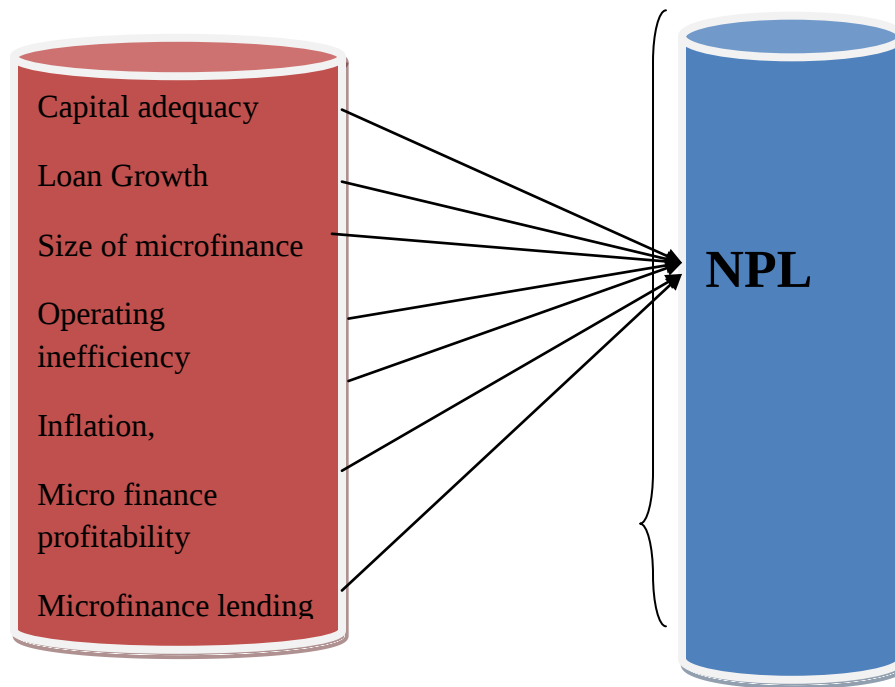


Fig.2.1. Conceptual frame work of the paper

2.5. Summary of Empirical literature and Research Gap:

Most of the study conducted on area of micro finance focus on identifying loan repayment performance. For example Magali (2013) did a study to assess factors affecting loans' default risks or loans repayment performance for the Savings and Credits Cooperative Societies (SACCOS) in Tanzania., Okurut (2009) investigated the key factors that influence loan repayment performance among group clients of microcredit institutions (MFIs) in Tanzania. Abafita (2003) conducted studies with the aim of analyzing the factors that influence microfinance loan repayment, evaluating the loan rationing mechanism and also assessing the impact of the program on the livelihood of borrowers, Gebeyehu(2002) did study In an attempt to analyze the determinants of loan repayment status of borrowers in Ethiopian micro finance

institution ,regarding to credit risk determinants some related study also focus to Credit Default Risk and its determinants of Microfinance(Amera (2011), Marrez(2010)) literature On micro finance industry keep silent to show determinants credit risk specially focusing on firm specific and macroeconomic variable being untouched area that need to be study. Globally determinants of credit risk on banking sectors is well studied (Tehulu (2014) Ethiopia , Ganić (2014), Bosnia and Herzegovina Poudel (2013) Nepalese Garr(2013) Ghana Castro(2012) Castro(2012) panel data approaches to five countries ,Zribi(2011) on Tunisia) Consequently, a design feature that works well in one country/industry may not work in another. As Bird (2005) noted this may be referred to as the No-One-Size-Fits-All (the NOSFA) principle, i.e., the best policy and administrative design for each country/industry has to be determined carefully in light of the conditions and objectives of that country/industry. Despite its remarkable achievements, there remained several weaknesses in microfinance that need to be improved to ensure its continuous development and successful implementation. A critical aspect of microfinance that needs to be focused on is the risks management aspect. Microfinance is entrapped by various types of risks, such as credit risk (Goetz et al. 1995), disaster risks (Karlan 2005), currencies risk, and interest rate risk and commercialization risk. Studies conducted so far on Ethiopia micro finance institution were not specifically address determinants of the credit risk on microfinance institution as the issue need great attention and yet has severe negative repercussions on the success of microfinance. Stakeholder should be equipped with clear understanding on company specific and macro factors influencing of credit risk of micro finance institution in Ethiopian

As issue of micro finance is a policy agenda and vital importance for economic development of the countries understanding determinants of credit risk curial the topic need clear empirical investigation. Generally all those studies conducted in Ethiopia are almost focus on loan repayment performance and its determinants and completely ignored the determinant of credit risk on micro finance institution. So this paper fills up the void in literature by including both firm specific factors and macro economic factors(Capital adequacy, Loan Growth, microfinance profitability , Size of microfinance, Operating Inefficiency, Inflation, micro finance lending rate).

CHAPTER THREE

RESEARCH METHODOLOGY

The purpose of this chapter is to discuss the research methodology along with the detailed methods used in the study. And it is divided into five sub sections. The first section states the research design used in the study followed by data type and source, sample design, data analysis technique and finally model and variable measurement.

3.1 Research Design

The research design is a plan and structure of investigation so conceived as to obtain answers to research questions (Crewell, 1994). It expressed the structure of research problem, the framework, the organization, or the configuration of the relationships among variables of the study- and the plan of investigation used to obtain empirical evidence on those relationships (Adams and Schvaneveldt, 1991). The study employed an exploratory research design. Exploratory research design deals with unknown problem, descriptive in which there is an awareness of the problem or explanatory, where the problem is clearly defined (Ahmed 2011).

3.2 Data type and sources

Decision regarding the selection of research instrument, the nature of collected data and the analysis of collection are based on the research method used in a study. Selection of appropriate research methods is very important because it decides the quality of study findings. This study used quantitative data type. Quantitative data type Involve counting and measuring of events and performing the statistical analysis of a body of numerical data. This data type is from Secondary data source which was collected from annual financial report of ten consecutive years since 2005-2014 from national bank of Ethiopia.

3.3 Sampling design

The population of the study was all MFIs registered by NBE. Currently, as per NBE (20013/14) annual report, 31 Microfinance institutions are operating in Ethiopia. However to undertake this study the researcher select thirteen MFIs using purposive sampling method, this is because availability of data this just to have balanced panel data set. Therefore, those microfinance institutions which were established after 2005 and started to provide financial statement in the

succeeding fiscal year were not included in this study because this study incorporated only MFIs that have financial statements for the year, 2005, and onwards. Therefore, only thirteen microfinance were used; Addis credit and Saving Institution (ACSI), Specialized Financial promotion Institution (SFPI), Amara Developments credit saving institution (ADCSI), Buusaa Gonofaa (BG), Dedebit credit saving institution (DECSI), Oromia credit saving share company (OCSSCO), Omo saving and credit (OMO), Vision Fund Ethiopia (VFE), African village financial services (AVFS), Wasasa Microfinance Institution (WASASA), Eshet Microfinance Institution (Eshet), Meklit Micro Finance Institution (MEKLIT) and peace micro finance institution (PEACE).

3.4. Data Analysis Method

Data analysis consists of examining, categorizing, tabulating, or recombining the evidence, to address the initial proposition of a study (Yin, 1989). To test the factors that affect credit risk of micro finance institution Ordinary Least Square (OLS) was conducted using EVIEWS 7 econometric software package. According to (Hayashi, 2000), OLS is a method for estimating the unknown parameters in a linear regression model by minimizing the sum of squared vertical distances between the observed responses in the data set, and the responses predicted by the linear approximation thus providing minimum variance mean unbiased estimation. To analyses determinants of credit risk, Descriptive, correlation and multiple panel linear regression data analysis method was employed. The descriptive statistics is used to describe the important features of the variables using mean, maximum, minimum and standard deviations. The correlation analysis was used to identify the relationship between the independent and dependent variables using Pearson correlation analysis. The correlation analysis shows only the degree of association between variables and does not permit the researcher to make causal inferences regarding the relationship between variables (Marczyk et al. 2005). Therefore, multiple panel linear regression analysis were tested the hypothesis.

3.5 Variable Measurement

3.5.1 Dependant variable

The exact definition varies from study to study, and there is no defined formula for NPL. Typically NPL are measured as ratio of the sum of loans in arrears plus loans in default over the loan portfolio. In other words, it is usually the percent of the gross loan portfolio that has missed a payment or has defaulted. Given the general definition of NPL above, there are two primary values that constitute NPL loans in arrears and loans in default. Classifying late loans is relatively straightforward and unambiguous. If a borrower has missed a payment for a predetermined amount of time, that loan is said to be in arrears. For example, 90-day portfolio-at-risk (PAR90) is the value of the loans that are at least 90 days overdue. There is, however, some variation in the categorization of arrears across empirical work that renders direct comparison between studies problematic. Banking institutions may be required to report portfolio-at-risk for different time intervals according to their regulatory agencies. For example, banks in one country may be required to report PAR60 while banks in another country are required to report PAR270. The empirical estimation methodologies presented here draw from the literature on non-performing loans at traditional banks in order to determine if the same set of NPL determinants apply equally to MFIs this method was by Hitchcock (2014) .In this study the dependent variables used was: 30-day portfolio at risk (PAR30) are used as is the most sensitive measure of non-performing loans. The proxy of independent variable were MFIS(size of microfinance), CAR(capital adequacy),LG (loan growth), OPINF(operational inefficiency), ROA (Microfinance profitability) ,LR (lending rate) and , and INF (Inflation) I

3.5.2. Independent variables

To achieve the objective of the study presented in chapter one seven hypotheses concerning the determinants of credit risk on the Ethiopian micro finance industry were tested.

Size of Micro Finance

According to empirical studies, the inverse relationship means that large institution have better risk management strategies that usually translate into more superior loan portfolios vis-a-vis their smaller counterparts. There are also studies which provide evidence of a positive association between none performing loans (NPLs) and size (Rajan and Dhal, 2003). In this study the size variable is constructed by computing the relative market share of the asset of each micro finance.

Theoretical arguments suggest a negative relationship between these two variables. Such a relationship is justified by the most natural argument that is diversification by size. Indeed, larger institutions are expected to have lower risks because they have the capability of holding more diversifiable portfolios. Natural logarithm of total assets have been used as a proxy for measuring institution size in most prior research (Ali, et,al (2011), Ahmed, Akhtar and Usman (2011), Ahmad and Ariff (2007) and Das and Ghosh (2007)). Based on the above empirical literature the following hypotheses were advanced.

Ho: There is no significant relationship between Size and credit risk.

Capital Adequacy

This is also an independent variable and is chosen because it is the core measure of a MFIs financial strength from a regulator's point of view. It consists of the types of financial capital considered the most reliable and liquid. MFIs with good Capital Adequacy Ratio have good performance (Haslem, 1968).The literature on regulatory capital and bank credit risk shows an inverse relationship. Since microfinance institution small bank not exception from this argument. This study also highlights that the credit risk in emerging economy is higher than that in developed economies and that risk is formed by a larger number of institution specific factors in emerging economies compared to their counterparts in developed economies. In the context of emerging countries, Goldlewski (2004) have found that the regulation of capital and risk are negatively related. In facts Profitability reflects how banks are run given the environment in which banks operate. In fact, profitability should mirror the quality of microfinance's management and the shareholders' behavior, the microfinance's competitive strategies, efficiency and risk management capabilities. Thus, based o the above arguments the following null hypothesis were advanced.

Ho: There is no significant relationship between capital adequacy ratios and micro finance credit risk.

Loan growth

Credit growth sometimes called loan growth implies credit expansions by lenders. Excessive rapid loan growth, as well as sharp declines in micro finance capital levels are useful pointers to the deterioration in the financial health of institution and can be employed as early warning indicators of future problem loans (Das and Ghosh, 2007). Previous literature shows growth in

loan is a cause for credit risk. A strong loan growth translates into significantly higher credit losses with a lag of 2-4 years (Hess et'al 2009). Therefore based on the above literature the following hypothesis was tested.

Ho: Loan growth is not significantly affects credit risk in Ethiopian micro finance institution.

Operating inefficiency

Regarding operating efficiency, Sadaqat et'al (2011) found a negative but insignificant relationship with credit risk of Pakistan commercial banks. Inefficient managers will not cope successfully with the process of granting and monitoring loans that will lower the banks' credit quality and bring about a growth in problem loans (Salas and Saurina, 2002). Inefficient banks hold riskier portfolio (Lis, Pages and Saurina, 2000). As studied by Berger and De Young (1997), poor management in the banking institutions results in bad quality loans, and therefore, escalates the level of non-performing loans. They argue that bad management of the banking firms will result in banks inefficiency and affects the process of granting loans. The banks' management might not thoroughly evaluate their customers' credit application due to their poor evaluation skills. Therefore, financial institution inefficiencies might lead to higher non-performing loans. Therefore based on the above hypothesis the following null hypotheses were hypothesized.

Ho: Operating inefficiency of micro finance institution will not significantly affect credit risk.

Lending Rate/Interest Rate

Lending rates are one of the primary economic determinants of NPLs. It is the cost of borrowed funds. Interest rate spread is a measure of profitability between the cost of short term borrowing and the return on long term lending. Interest rate spread affect performing assets in banks as it increases the cost of loans charged on the borrowers (Joseph, 2011). Interest rate is the price a borrower pays for the use of money they borrowed from the lenders. Interest can be thought of as rent of money.

Thus, lending rate is a rate of return usually remains in admittance of monetary regulators (NBE) to manipulate the pursuance of monetary objectives. In case, maximum and minimum lending rate is set by NBE.

There is empirical evidence showing a positive and negative association between lending rate and NPLs. For instance: Saba *et al.* (2012) found negative association between lending rate and NPLs whereas Farhan *et al.* (2012) and Ranjan and Chandra (2003) found as there is a positive relationship with NPLs and lending rate since an increase in interest rate curtails the paying capacity of the borrowers. Thus, lending rate is expected to have positive association with NPLs in this study. Accordingly, this study considers average lending rate (average of Minimum and Maximum Lending Rate) as proxy of lending rate as being commonly used by micro finance institution for pricing loans. Accordingly the study hypothesis that

Ho: Lending rate has no relationship with credit risk of Ethiopia Microfinance Institution

Return on Asset (ROA)

Represents efficiency in asset utilization and shows how much net income is generated out of assets. It indicates the ability of micro finance management to generate profits by utilizing the available assets of the company. Thus, if the ratio of ROA is high, it indicates that it is better performance in order to generate profit. Strong micro finance profitability measured in terms of ROA might result from high lending rate, fees and commission that lead microfinance growth in size and profitability. Thus, ROA gives an idea as to how efficient management is at using its assets to generate earnings.

Different researchers found different results regarding the relationship between ROA and NPLs. For instance: Ahmed and Bashir (2013) and Makri *et al.* (2014) were examined positive significant relationships between ROA and NPLs. However, Boudriga *et al* (2009) and Selma and Jouini (2013) found negative association between NPLs and ROA by supporting the arguments that states deterioration of profitability ratio measured in terms of ROA leads to riskier activities of microfinance and then raise the level of NPLs. They justified that since ROA represents efficiency in asset utilization, poor utilization of assets leads higher NPLs for the MFIs. Thus, this ratio is expected to have negative relationships with NPLs in this study. It is measured by the ratio of net profit to total asset as follows. Accordingly, the study hypothesis the following null hypothesis.

Ho: Micro finance profitability measured by ROA has no negative relationship with credit risk.

Inflation

Inflation is one of macroeconomic factor which affects the efficiency of financial sector. Inflation depreciates the value of money which reduces the rate of return in general. High inflation rates are generally associated with a high loan interest rate. Thus, high interest rate increases cost of borrowing, which leads to an increase in the obligation of borrowers resulting in an increase in the credit risk. In the banking area, Brissimis et al. (2008) suggest that the impact of inflation on the bank profitability depends on whether the operating expenses increases at a faster rate than inflation. Since inflation reduces the future value of money, it pays people (both potential borrowers and lenders) to try to forecast inflation over the relevant time period. This forecast is called anticipated inflation (Kessel and Alchian 1962). When micro finances accurately forecast inflation, the management of the bank can appropriately adjust the interest rate in order to increase their revenues faster than the cost which mitigates the negative impact of inflation. Auuapan et al. (2011) examined the relationship between current inflation and one year lag inflation with credit risk and found positive relationship between current inflation and credit risk and no any relationship between one year inflation lag and credit risk in case of public sector banks but the result showed that there is no any relationship between inflation and credit risk in case of private sector banks. Similarly, Gunsell (2008) and Rinaldi and Sanchis-Arellano (2006) examined the influence of inflation to credit risk in North Cyprus and Euro Zone country respectively and found positive relationship. In the opposite direction, (Shu 2002), Zribi and Boujelbene (2011) and Vogiazas and Nikolaidou (2011) in case of Honkong, Tunsian and Romanian banking sector, found negative relation between inflation and credit risk. However some other study by Aver (2008), Bofondi and Ropele (2011) and (Castro 2012) in case of Solvenian, Italian, and GIPSI financial system, didn't find any influence of inflation to credit risk. It is measured on a continuously by compounded rate basis (differences in the natural logarithms) or as an annual percentage increase as reported in the Consumer Price Index (CPI). Inflation, to one degree or another, is a fact of life. Consumers, businesses and investors are impacted by any upward trend in prices. **Since absence of literature on micro finance sectors considering as limitation we try to see the effects of inflation on micro finance credit risk by advancing the following null hypothesis.**

Ho: There is no relationship with Inflation rate and credit risk on Ethiopian micro Finance institution

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3.6. Specifications of Research Model.

To estimate the determinants of credit risk in Ethiopian MFIs the following general empirical research model has been used;

$$Y_{it} = \alpha + \sum \beta X_{it} + \varepsilon_{it}$$

Where:

The subscript i representing the cross-sectional dimension
 t denote the time-series dimension.

The left-hand variable Y_{it} represents the dependent variable in the model, which is the credit risk (NPL).

X_{it} Contains the set of independent variables in the estimation model was considered over time t and specific to the individual cross-sectional unit i .

If α is taken to be the same across units, then OLS provides a consistent and efficient estimate of α and β .

Therefore, the model for this study, was based on the one used by Poudel (2013), with some modification to explain determinants' of credit risk on Ethiopian MFIs as shown below.

$$NPL_{it} = \alpha + \beta_1 (MFIS_{i,t}) + \beta_2 (CAR_{i,t}) + \beta_3 (LG_{i,t}) + \beta_4 (OPINF_{i,t}) + \beta_5 (LR_{i,t}) + \beta_6 (ROA_{i,t}) + \beta_7 (INF_{i,t}) + \varepsilon_{i,t}$$

WHERE:

MFIS: Microfinance size

CAR: Capital adequacy

LG: Loan growth

OPINF: Operating Inefficiency

LR: Lending Rate

ROA: Return on Asset

INF: Inflation

CHAPTER FOUR

RESULTS AND DISCUSSIONS

This chapter presents the results and analysis of the findings of the different methods used. The chapter is organized to have three sections. Section 4.1 presents test for five Classical Linear Regression Model Assumptions for classical linear regression model. Following this Section 4.2 presents the results of structured record reviews and in depth interview. Then the results obtained under these different methods are jointly analyzed in the discussion section presented in section

4.1. Descriptive Statistics

Descriptive statistics is used to describe the sample data of each variable in the study with a single value that represents the center of the data, the biggest and smallest data values. It is also used to determine how spread out the data is from the mean.

Table 4.1 bellow provides a summary of the descriptive statistics of the dependent and independent variables for thirteen MFIs for a period of ten years from year 2005-2014 with a total of 130 observations. The table includes the mean, median, standard deviation, number of observations, minimum and maximum for the independent and dependent variables of the model. This was generated to give overall description about data used in the model and served as data screening tool to spot unreasonable figure.

The dependent variable for this study is Nonperforming loans ratio. It is measured by Nonperforming loans divided by total loan ranges from 0.00- 99 percent. It has mean value of 0.04(4 percent) showing the high deviation (0.09) or 9 percents when it can compared with regulatory requirements of NPLs ratio should be at maximum of 5 percents. This result further indicates that MFIs in Ethiopia incurred 0.04 of NPLs on the average from its total loan

portfolio. As general from table 4.1 bellow nonperforming loan is shown as serious problem as the ratio is above the regulatory requirements of 5 percents.

As shown in chapter three, return on asset which gives an idea how efficient management is at using its assets to generate earnings was measured as profit after tax divided by total asset.

The average value of return on asset for the sample MFIs in Ethiopia is negative 9 percent (mean value 0.09) with a maximum and minimum value of 3 percents and -9.4 percent respectively. At the same time, the standard deviation is 0.96 from the average value. This result indicates that most performing among the sampled MFIs earned 3 cents of profit after tax for a single birr invested in the assets of the firm. On the other hand, less efficient MFIs during study period from the sampled microfinance incurs loss of 9.3 cents for each birr invested in the assets of the firm.

Summary of Descriptive Statics table 4.1

	Mean	Maximum	Minimum	Std. Dev.	Observations
NPL	0.04	0.99	0.00	0.09	130
OPINF	0.16	0.58	0.01	0.11	130
ROA	-0.09	3.00	-9.30	0.96	130
SIZE	16.46	22.86	7.40	3.59	130
LR	0.26	1.35	-0.14	0.29	130
LG	0.50	9.60	-0.91	1.17	130
INF	0.17	0.36	0.03	0.11	130
CAR	0.39	0.90	0.00	0.16	130

CAR also measured by total equity divided by total assets presents a minimum of 0 and maximum of 0.9 with a mean value and standard deviation of 0.39 and 0.16 respectively. This indicates that CAR for the sample MFIs in Ethiopia during study period was above the minimum requirement, which is 12.on the average base.

Furthermore, INF demonstrates a minimum of 0.03 and maximum of 0.36 with a mean value 0.17 showing 0.11 deviations from its mean. On other hand, loan growth ranges from minimum values of -0.91 to a maximum of 9.6 and during study period loan growth deviate from its mean (0.26) by 1.17 for sampled microfinance institutions over study period.

Further during study period lending rate of sampled micro finance institution average mean values of 0.26 and it deviates from mean values by 0.29 where as maximum and minimum lending rate were 1.35 and -0.14 respectively.

Furthermore operational inefficiency measured by dividing total Operating Expense to total Assets of selected microfinance institution were mean values of 0.16 and its deviation from the mean values were 0.11 and maximum and minimum value where 0.58 and 0.01 respectively .

Further the above table indicates size of sampled microfinance institution which is measured by log of total asset of the MFIs have a maximum and minimum values of 22.86 and 7.40 respectively where as it deviates from its mean value (16.46) by 3.59.

4.2. Correlation Analysis of the Study Variables

Correlation analysis is a statistical tool which is used to measure the strength or degree of linear association between two variables. The correlation coefficient, which always lays between -1 and +1, was used to measure the strength and magnitude or degree of linear association between two series. A correlation coefficient of +1 shows a strong and positive linear relationship between two variables. On the contrary, a correlation coefficient of -1 indicates a strong and negative linear association between two series (Brooks, 2008). A correlation coefficient of zero shows that there is little or no linear relationship between two variables. The coefficient can be either negative or positive.

This section of the study presents the results and discussions of the correlation analysis. To identify the relationship among the determinants of credit of selected MFIs in Ethiopian correlation coefficients were used. The correlation coefficients show the extent and direction of

the linear relationship between dependant variable and considered explanatory variable of the selected MFIs in Ethiopian.

Below in table 4.2 the correlation matrix which shows the relationship of the nonperforming loan with micro finance profitability(ROA), capital adequacy ratio(CAR), inflection (INF) loan growth(LG) lending rate(LR) , operational inefficiency(OPINF) and size of microfinance(SIZE)

This table also shows the linear relationships between each independent variables used in this study.

Table 4.2: Correlation Matrix of Dependent and Independent Variables

Variables	NPL	OPINF	LG	CAR	ROA	SIZE	LR	INF
NPL	1.000000							
OPINF	0.110930	1.000000						
LG	0.471886	0.061142	1.000000					
CAR	-0.043677	0.079257	0.090732	1.000000				
ROA	0.013113	0.083037	0.013192	0.069035	1.000000			
SIZE	-0.198333	-0.434101	0.000780	0.093084	0.02264	1.000000		
LR	-0.014868	0.206202	0.115215	0.169747	0.07841	0.102915	1.000000	
INF	-0.02782	-0.083728	0.121170	0.078512	0.21405	0.12013	0.12457	1.000000

Source: Eviews correlation result based on the data obtained from selected MFIs.

The correlation coefficient matrix table above shows that three of variables such as operating inefficacy, loan growth and return on asset were positively correlated with NPL. And the remaining variables such as capital adequacy ratio, size, liquidity ratio and inflation were negatively correlated to NPL. The result of correlation analysis is discussed in detail as follows:

The coefficient of correlation between NPL and operating inefficiency was 0.110930. It shows that there is positive relationship between them and also it means that when 100% increase in operating inefficiency increase non performing loan by 0.110930. The coefficient of correlation

between NPL and loan growth is 0.471886. This figure reveals that there is positive relationship between NPL and loan growth over the last ten years. It further indicates that when loan growth is increased by 100% NPL will be increase by 0.471886. The coefficient of correlation between NPL and capital adequacy ratio was -0.043677. This shows that weak and negative relationship between capital adequacy ratio and NPL. NPL is decreased by 43.67% when capital adequacy ratio is increased by 100%. The coefficient of correlation between NPL and ROA was 0.013113. The figure shows that there is positive relation between NPL and ROA and NPL is increase by 1.31% ROA is increased by 100%. Beside that the regression results shows that size of selected of selected micro finance is significantly negative related to NPL by -0.198333. The figure indicates that an increase of size of the firms by 100% will result in a decrease of NPL by 19.83%. The coefficient of correlation between NPL and lending rate was -0.014868. The parameter value shows that 100% increase in liquidity ratio decrease NPL by 14.68%. In addition to that the coefficient of correlation between NPL and inflation was -0.02782. The results shows that 100% increase in inflation decrease NPL by 2.78%.

Operating inefficiency variable was positively correlated to LG, CAR, ROA and LR with correlation Coefficient of 0.061142, 0.079257, 0.083037 and 0.206202 respectively. On the contrary, it was negatively correlated with size and inflation by having correlation coefficient of -0.434101 and -0.083728 respectively. Loan growth was positively correlated with CAR, ROA, size, LR, and inflation with correlation coefficient of 0.090732, 0.013192, 0.000780, 0.115215 and 0.121170 respectively.

CAR variable was positively correlated to ROA, size, LR, and inflation with correlation coefficient of 0.0693035, 0.093084, 0.169747 and 0.078512 respectively. ROA was positively correlated with size, LR and inflation with correlation coefficient of 0.02264, 0.07847 and 0.21405 respectively. Size was positively correlated with LR and inflation with a correlation coefficient of 0.102915 and 0.12013. Liquidity ratio was positively correlated with inflation with a correlation coefficient of 0.12457.

4.3. Classical Linear Regression Model Assumptions

This section presents the test for the assumptions of classical linear regression model (CLRM) namely the error have zero mean, heteroskedasticity, autocorrelation, normality and multicollinearity. The five basic assumptions relating to the linear regression model (CLRM) were made in this study. The assumptions were as follows: the mean of the error term for all X is (independent variables) are zero $\{E(u_t) = 0 \text{ for all } u_t\}$, the assumption of homoscedasticity (no heteroscedasticity) which assumes that the variance of the error is constant $\{\text{var}(u_t) = \sigma^2 < \infty \text{ for all } u_t\}$, assumption of non autocorrelation assumes that covariance between the error terms over time (or cross-sectional, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another $\{\text{cov}(u_i, u_j) = 0 \text{ for } i \neq j\}$, the assumption of normality says the disturbances are normally distributed $\{u_t \sim N(0, \sigma^2)\}$ and the assumption of multicollinearity. Test of these assumption were required to show the fulfillment of desirable properties of estimation technique and to ascertain the validity of hypotheses test results on the coefficient estimates. The diagnostic tests were made by the researcher before running the regression model, which says the return on asset was a function of independent variable such as nonperforming loan, loan loss provision, loan and advance, capital adequacy, liquidity ratio, number of branch, inflation and GDP, to ensure that the data fits the basic assumption of classical linear regression model.

Test for Average Value the Error Term is Zero ($E(u_t) = 0$)

The test for the mean of the error term is zero is the first diagnostic test conducted in the study. According to Brooks (2008) the existence of constant term in the regression equation will prevent the violation of the assumption the average value of errors is zero. Because the equation or multiple regression model developed in this study included the constant term the assumption of the mean value the error term is zero was not violated.

Test for No Heteroscedasticity (Homoscedasticity) $\{\text{var}$

The researcher has tested the assumption no heteroscedasticity which assumes that the variance of the error term is the same for all observations. As it is shown in from table 4.3, the F statistic

and Chi-Square versions of the test statistic give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values are considerably in excess of 0.05 (Gujarat, 2004). $(ut) = \sigma^2 < \infty$

Table 4.3 Heteroskedasticity Test: White

F-statistic	8.642491	Prob. F(35,94)	0.0659
Obs*R-squared	74.82751	Prob. Chi-Square(35)	0.5721
Scaled explained SS	1921.128	Prob. Chi-Square(35)	0.6705

Source: Data of sampled MFIs and own computation

The third version of the test statistic, Scaled explained SS which as the name suggests is based on a normalized version of the explained sum of squares from the auxiliary regression, also suggested the same conclusion that there is no evidence for the presence of heteroscedasticity since the p-value was greater than 0.05. Thus the conclusion of the test is no heteroscedasticity problem in the data.

Test for Assumption of No Autocorrelation $\{cov(ui,uj) = 0 \text{ for } i \neq j\}$

This is an assumption that the errors are linearly independent of one another (uncorrelated with one another). According to Gujarati (2004) the assumption of no autocorrelation between the disturbances assumes that given any two X values, X_i and X_j ($i \neq j$), the correlation between any two u_i and u_j ($i \neq j$), is zero. According to Chris Brooks (2008) it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlated ‘or that they are serially correlated’. If the errors are correlated with one another, it would be stated that they are autocorrelated. This assumption was tested by Durbin Watson (DW) test of autocorrelation. Durbin--Watson (DW) is a test for first order autocorrelation -- i.e. it tests for a relationship between an error and its immediate previous value. One way to motivate the test and to interpret the test statistic would be in the context of a regression of the time t error on its previous value

$$u_t = \rho u_{t-1} + v_t$$

Where $v_t \sim N(0, \sigma^2 v)$ and ρ is the coefficient of autocorrelation. The DW test statistic has as its

null and alternative hypotheses. Under the null hypothesis, the errors at time $t - 1$ and t are independent of one another (the errors at time $t - 1$ and t are uncorrelated), and the alternative hypothesis says the errors at time $t - 1$ and t are independent (the errors at time $t - 1$ and t are serially correlated).

Therefore

$H_0 : \rho = 0$ (no autocorrelation)

$H_1 : \rho \neq 0$ (autocorrelation)

DW has 2 critical values: an upper critical value (dU) and a lower critical value (dL), and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor rejected. The DW test statistic value in the regression result was 1.69. There are 130 yearly observations in the regression Accordingly DW test statistic was clearly between the lower limit and upper limits and thus the null hypothesis of not rejected because the result fall in inconclusive region. Durbin-Watson test value for the autocorrelation of residual which is 1.69 which is very close to 2; therefore without going any analysis it can be easily judged that there is no problem of autocorrelation.

**Reject H_0
positive**

**do not reject
no evidence of
autocorrelation**

**Reject H_0
Negative**

Auto

autocorrelation

Autocorrelation

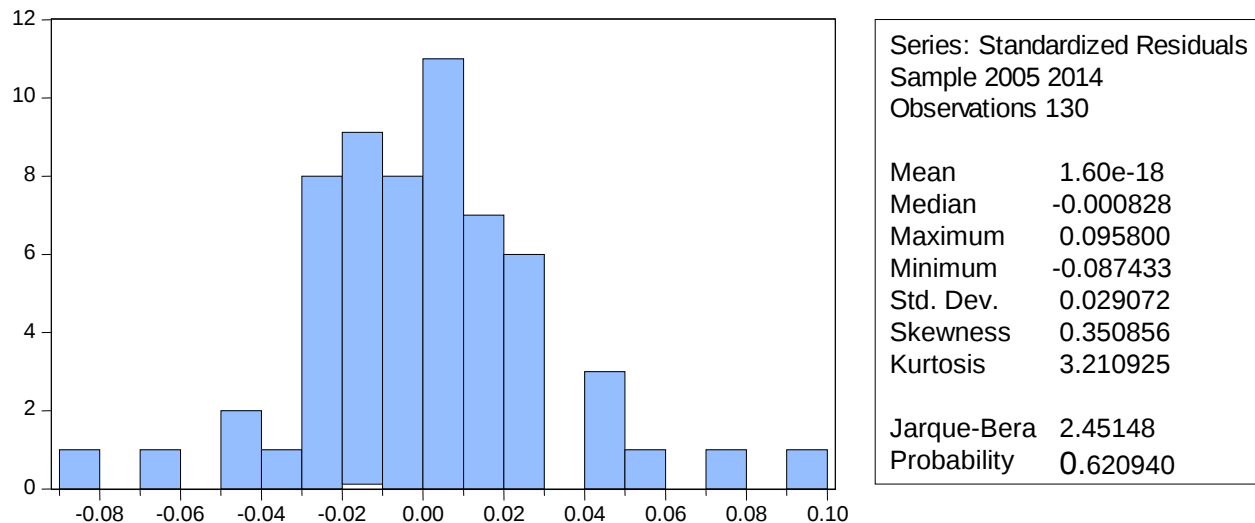
		inconclusive		inconclusive		
0	DL	DU	2	4-DU	4-DL	4

Test of Normality Assumption $\{u_t \sim N(0, \sigma^2)\}$

The fourth diagnostic test for CLRM assumption of normality assumption was tested by this study. The assumption says that disturbances are normally distributed. According to Chris

Brooks (2008), one of the most commonly applied tests for normality is the BeraJarque test. BeraJarque uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments the mean and the variance. The standardized third and fourth moments of a distribution are known as its skewness and kurtosis. Skewness measures the extent to which a distribution is not symmetric about its mean value and a normal distribution is symmetric about its mean, while a skewed distribution will not be. Kurtosis measures how fat the tails of the distribution are. A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3. This assumption is required in order to conduct hypothesis testing, particularly if the sample size is small. For sample sizes that are sufficiently large, violation of the normality assumption is virtually inconsequential (David Kreiberg, 2009). If the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would not be significant

Figur 4.1 normality



This means that the p-value should be bigger than 0.05 to not reject the null of normality at the 5% level. The normality test for this study as shows in figure 4.2 the kurtosis is close to 3 ,and the Jargue-Bera statistic has a p-value of 0.620940 which is above 0.05 indicate that the data were consistent with a normal distribution assumption.

Test for Absence of Multicollinearity Assumption

The last CLRM assumption tested in this study was the absence of multi co linearity assumption. According to Chris Brooks (2008) the absence of multi co linearity assumption says that the explanatory variables are not correlated with one another. If there is no relationship between the

explanatory variables, they would be said to be orthogonal to one another. If the explanatory variables were orthogonal to one another, adding or removing a variable from a regression equation would not cause the values of the coefficients on the other variables to change. A small degree of association between explanatory variables will almost always occur but will not cause too much loss of precision. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as multi collinearity. Perfect multi co linearity occurs when there is an exact relationship between two or more variables. In this case, it is not possible to estimate all of the coefficients in the model. Perfect multi co linearity will usually be observed only when the same explanatory variable is in advertently used two times in a regression. This assumption requires that none of the explanatory variables in the model be correlated with any other explanatory variable or with any linear combination of those explanatory variables. This assumption is very important and necessary for estimation. If the explanatory variables in the model are perfectly linearly correlated (i.e., if the correlation coefficient = 1), the parameters of the model become indeterminate and the method of OLS breaks down (Mukras, M.S,1993). However, if each of the explanatory variables is linearly independent of all the others or any linear combination of all of the variables, no estimation difficulty will arise as the variables are orthogonal to each other.

Hair et al. (2006) argued that correlation coefficient below 0.9 may not cause serious multi collinearity problem. According to Cooper and Schendler (2009) the correlation coefficient between independent variable up to 0.8 may not cause series multicollinearity problem therefore, coefficient of correlation less than 0.8 is acceptable. According to Hair et al (2006), the correlation coefficient between independent variable should not exceed 0.9 which means coefficient of correlation less than 0.9 is acceptable. Therefore in this study the correlation matrix for seven of the independent variable is shown below in table 4.4.

Table 4.4. Correlation Matrix between independent variables

variables	INF	CAR	LG	LR	OPINF	ROA	SIZE
INF	1.00						
CAR	0.03	1.00					
LG	-0.22	-0.18	1.00				
	0.01	0.22	-0.25	1.00			

LR							
OPINF	0.14	0.13	-0.24	0.21	1.00		
ROA	0.11	-0.14	-0.23	0.43	0.57	1.00	
SIZE	-0.03	-0.19	0.00	-0.10	-0.52	0.01	1.00

- The results of correlation matrix shows that the maximum coefficient of correlation between two independent variables in this study was 0.57 which is between operating inefficiency and return on asset. This coefficient of correlation does not violate the acceptable level stated by Hair et al (2006), Cooper and Schendler (2009). Therefore, there is no multicollinerity among the independent variables in the study.

4.4. Results of Regression Analysis

This section covers the empirical regression model used in this study and the results of the regression analysis. The panel data is used to run the regressions to examine the determinants credit risk on Ethiopian selected microfinance institution. In doing this, the empirical models were developed in chapter three to guide the analyses are provided as follows:

$$NPL_{it} = \alpha + \beta_1 (MFIS_{i,t}) + \beta_2 (CAR_{i,t}) + \beta_3 (LG_{i,t}) + \beta_4 (OPINF_{i,t}) + \beta_5 (LR_{i,t}) + \beta_6 (ROA_{i,t}) + \beta_7 (INF_{i,t}) + \varepsilon_{i,t}$$

WHERE:

α = an intercept

NLP: Non performing loan

MFIS: Microfinance size

CAR: Capital adequacy

LG: Loan growth

OPINF: Operating Inefficiency

LR: lending rate

ROA: Return on Asset

INF: Inflation.

ε . Error term

There are broadly two classes of panel estimator approaches that can be employed in panel data financial research: fixed effects models (FEM) and random effects models (REM) (Brooks 2008). If this two approaches end up with nearly the same results, there are situations that they will deviate widely. The fixed effects and the random effects models both have potential advantages - as well as disadvantages – to consider when selecting an approach. The fixed effects model will produce unbiased estimates of parameters, but those estimates can be subject to high sample-to-sample variability (Tom S. Clark and Drew A. Linzer, 2014). The random effects model will, except in rare circumstances, introduce bias in estimates of parameters, but can greatly constrain the variance of those estimates. For this study the researcher used the fixed

effects model since the number of regressors is greater than the number of cross sections and the results presented as follow. Table 4.6 below reports regression results between the dependent variable and explanatory variables. The R-squared value measures how well the regression model explains the actual variations in the dependent variable (Brooks, 2008). The adjusted R^2 value in table 4.6 below indicates that 69% of the total variability of credit risk of selected micro finance institution was explained by the variables in the model. The regression F-statistic (3.79) and the p-value of zero attached to the test statistic reveal that the null hypothesis that all of the coefficients are jointly zero should be rejected. Thus, it implies that the independent variables in the model were able to explain variations in the dependent variable

Table 4.6 Regression Result

Dependent Variable: NPL

Method: Panel Least Squares

Date: 13/10/15 Time: 15:11

Sample: 2005 2014

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.891953	1.274525	1.484439	0.1406
INF	0.582644	1.454357	0.400620	0.6895
LG	0.787225	0.137569	5.722381	0.0000
OPINF	-0.171588	1.912709	-0.089710	0.9287
SIZE	-0.122396	0.060552	-2.021330	**0.0457
				***0.003
CAR	-0.092463	0.030105	-3.071352	0.0005
				***0.006
ROA	0.181433	0.064118	2.829671	0.0000
LR	-0.376359	0.597530	-0.629859	0.5301
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.595781	Mean dependent		0.29510

	var	8
Adjusted R-squared	0.691416	2.04894
	S.D. dependent var	7
		4.06868
S.E. of regression	1.724751	Akaike info criterion
		1
		4.50984
Sum squared resid	327.2244	Schwarz criterion
		0
		Hannan-Quinn
		4.24793
Log likelihood	-244.4643	crit.
		9
		1.69656
F-statistic	3.792269	Durbin-Watson stat
		8
Prob(F-statistic)	0.000000	

*** and ** denotes significance at 1% and 5% levels respectively

After running the regression the following results shown

$$\text{NPL} = 1.89153 + 0.582644\text{INF} + 0.787225\text{LG} - 0.171588\text{OPINF} - 0.122396\text{SIZE} - 0.092463\text{CAR} + 0.181433\text{ROA} - 0.376359\text{LR}$$

The results of the above model as follows, the constant variable indicated that if the micro finance fails to manage their credit risk properly their NPL increase 1.89153 annually.

The regression results show that, inflation, loan growth, and return on asset had positive coefficients. , operating inefficiency, size, capital adequacy and lending rate had negative coefficient. The coefficient of INF is 0.582644. The magnitude of inflation had a coefficient of 0.582644 which shows that INFL and NPL had positive relation with each other and 100% increase inflation cause an increase of 58.26% of NPL even if this relation is not significant. Loan growth had a coefficient of 0.787225 and the current study found a positive and statistically insignificant impact on NPL. The researcher supposes that this might be because when micro fiancé provide credit to their customer the possibility of collecting their loan on time cause their loan performing loan to increase. The result suggests that 100% increase in LG of micro finance increase NPL by 78.72%. The magnitude of operating inefficiency coefficient has negative effect on non performing loan even though the relation is not significant. The coefficient of OPINF is - 0.171588 which shows that 100% increase in OPINF decrease NPL by 17.16%. Size which had a coefficient of -0.122396 indicate that 100% increase in size cause 12.24% decrease in NPL. The coefficient of size is negative and highly significant at 5% level of significance. Capital adequacy ratio has a statistically significant negative impact on non performing loan of selected

micro finance in Ethiopia. Thus, the increase in capital adequacy ratio of selected micro finance by 100% point causes a decrease of 9.25% point of nonperforming loan of micro finance. CAR is significant at 1% level of significance. ROA has a statistically significant positive impact on NPL of selected micro finance. Consequently, the increase in the ROA of selected micro fiancé by 100% point causes an increase of 18.14% point of NPL of this micro fiancé. ROA is significant at 1% level of significance. The last explanatory variable is lending rate which expressed (in logarithms) of selected micro finance have no statistically significant impacts on their non performing loan. Lending rate which had a coefficient of -0.376359 which indicate 100% increase in LR cause 37.64% decrease in NPL. The R-squared from the estimation result indicate that the model explains 59.58 of the variation in the NPL of selected micro fiancé operating in the country. The F-statistic with its probability is usually used to test the global significance of the model. In this case, it indicates that coefficients included in the estimation are jointly significant. The F-statistic is a test of the null hypothesis that explanatory variables in the model are not jointly significant. Null hypothesis of F-statistic (the overall test of significance) which says the Adjusted R-squared is equal to zero was rejected at 1% significance level. In this case the Probability (F-statistic) with 0.00000 values indicates that strong statistical significance which enhanced the reliability and validity of the model. The Durbin-Watson statistics of 1.69 in its part indicate that the estimated model is free from the problem of serial correlation in the residuals.

4.5. Testing of Hypothesis

The following section provides the results for each explanatory and control variables and their importance in determine the profitability of micro finance in Ethiopia through testing hypothesis.

Hypothesis 1:

H_0 : There is no significant relationship between Size and Credit risk.

H_1 : There is a significant relationship between Size and Credit risk.

The results of fixed effects model in table 4.5 indicates that size has -0.122396 beta coefficients, which shows that if size is increased by 100%, NPL will be decrease 12.24% by controlling other factors constant. Since the beta coefficient of size has a negative sign, size has a negative impact

on credit risk of micro finance measured in terms of NPL. Size is statically significant at 5% significant level because the p-value of size is 0.0457. Therefore, the null hypothesis was rejected in the study because size has a negative significant impact on non performing loan of micro fiancé in Ethiopia. The finding is consistence with Abbas et al., (2014), Abiola (2014), (Tefera, 2011) . The finding is inconsistence with Boahene,dasah and Agyei, (2012), Tsehay,(2014)

Hypothesis 2:

H₀: There is no significant relationship between capital adequacy ratios and micro finance credit risk.

H₁: There is a significant relationship between capital adequacy ratios and micro finance credit risk.

Capital adequacy ratio is one of specific independent variable, which can be controlled by the management of micro fiancé body, the other dependant variable, used and hypothesized in the study. The beta coefficient of capital adequacy was -0.092463 which indicates that if the capital adequacy of micro fiancé banks increases by 100%, the micro fiancé non performing loan will decrease by 9.25% by controlling other factors constant. Again, this indicates that CAR has a negative impact on NPL of the micro fiancé in Ethiopia which is measured by NPL. The results of fixed effects model in table 4.5 indicate that capital adequacy has a negative relation with non performing loan of micro fiancé and statically significant (p-value 0.0035) at 1% level. Therefore, the researcher rejects the null hypothesis. The finding was accordance with the expected sign which is stated that there is significant negative relation between capital adequacy ratio and NPL of micro fiancé in Ethiopia. Therefore, there is statistically significant relationship between capital adequacy ratio and NPL of selected micro fiancé. The finding is consistency Afriyie and Akote (2013) and inconsistency with Abiola (2014)

Hypothesis 3:

H₀: loan growth is not significantly affects credit risk in Ethiopian micro finance institution.

H₁: loan growth is significantly affects credit risk in Ethiopian micro finance institution.

Based on the regression result, it is found that loan growth measured by Current year Loans minus Previous year Loans/previous year loan had statically significant relationship between

loan growth and non performing loan in Ethiopian microfinance institution during the study period for sampled microfinance institution. The results of the fixed effects estimate indicate in table 4.5 that loan growth has a beta coefficient of 0.787225 which shows loan growth have a positive relation with the non performing loan of micro fiancé in Ethiopia even if their relation is insignificant. The beta coefficient 0.787225 indicate that keeping the other thing constant had resulted 0.78 unit change on the Level of NPLs in the same direction with change on institution loan growth. Therefore, it is not possible to reject the null hypothesis. The study was inconsistence with Tsehay Bekele(2014) and consistency with Kargi, (2011).

Hypothesis 4:

H₀: Lending rate has no relationship with credit risk of Ethiopia Microfinance Institution

H₁: Lending rate has relationship with credit risk of Ethiopian Microfinance Institution.

The regression result of fixed effects model in table 4.5 above shows that insignificant relationship between lending rate and nonperforming loan in Ethiopian microfinance institution during the study period for sampled microfinance institution. The beta coefficient of lending rate was -0.376359 and the relation with NPL was negative. This negative sign indicates an inverse relationship between lending rate and NPLs. Thus, according to MFIs, change in lending rate had no direct impact on NPLs since change in lending rate has a limit by regulatory authorities. The main reason for this negative association between lending rate and NPLs for MFIs in Ethiopia is: First, higher lending rate curtails ability to borrow, which decreases the amount of loan and then reduce NPLs. In case, higher lending rate enable individuals with funds to start saving with the MFIs to earn on their funds but investors with the profitable projects feel unwilling to borrow and invest. Second, increasing the level of lending rate has maximum and minimum limit by itself. That means degree of increase in lending rate and amount of NPLs may not be equal. Rather, ability to repay debt depends on other factors like borrowers' source of income. Thus, the probability of committing type 1 error as indicated in p-value is very high, it is not possible to reject the null hypothesis. The finding is consistant with Ranjan and Chandra (2003) and Farhan *et al.*(2012), Louzis *et al.*(2010), Sakiru *et al.*(2011), Tomak(2012), Konfi (2012), and Daniel and Wandera(2013).

Hypothesis 5:

H₀: Operating inefficiency of micro finance institution will not significantly affect credit risk.

H₁: Operating inefficiency of micro finance institution will significantly affect credit risk.

The regression result of fixed effect model in the above table 4.5 is show that negative but insignificant relationship with non performing loan of selected MFIs over the study period. From table 4.5, the results indicate that operating inefficiency has a coefficient of -0.171588 which indicate that if operating inefficiency increase by 100% nonperforming loan decrease by 17.15% by controlling other factors constant. Since the coefficient has a negative sign, operating inefficiency has negative impact on the nonperforming loan of micro fiancé of Ethiopia. Inefficient managers will not cope successfully with the process of granting and monitoring loans that will lower the banks' credit quality and bring about a growth in problem loans (Salas and Saurina, 2002). Inefficient traditional lending institution (bank) hold riskier portfolio (Lis, Pages and Saurina, 2000). Therefore the premise of null hypothesis under this study which says Operating inefficiency of micro finance institution has no significantly affects credit risk where not rejected by this data. The finding is consistency with Felix and Claudine, Ahmad and Ariff, (2007) and inconsistency with Ahmed, Tekeda and Shawn (1998), Abiola, (2014).

Hypothesis 6:

H₀: Inflation rate has no significant impact on credit risk on Ethiopian micro Finance institution.

H₁: Inflation rate has a significant impact on credit risk on Ethiopian micro Finance institution.

The regression result of fixed effect model in the above table 4.5 is show that inflation in Ethiopia Microfinance institution doesn't have significant impacts on non performing loan in Ethiopia. Inflation was another macroeconomic (external) variable which is beyond the control of the management of selected micro fiancé. As shown from table 4.5 inflation has beta coefficient of 0.582644, which shows that an increase in the inflation at 100% will increase the credit risk by 58.26% which is measured by NPL by controlling other factors constant. The positive sign of beta coefficient of inflation variable has indicates that inflation has a positive

impact on nonperforming loan of selected micro fiancé. However, inflation is statistically not significant even at 10% significance level because the p-value of inflation was 0.6895 which is greater than 10%. Therefore, the researcher failed to reject the null hypothesis because according to the finding of the study, inflation has no impact on NPL selected micro fiancé. The finding is inconsistent with Molyneux and Thornton, (1992), Hassan and Bashir, (2003), Kosmidou, (2006), Kyriaki, (2012) and Nayeem et al., (2014)

Hypothesis 7:

H₀: ROA has no relation with credit risk of Ethiopian microfinance.

H₁: ROA has relation with credit risk of Ethiopian microfinance.

The regression result of fixed effect model in the above table 4.5 is inconsistent with the hypothesis developed by the researcher. Hence the premise of null hypothesis which says Microfinance Profitability measured by ROA has no relationship with credit risk in Ethiopia is strongly rejected at one percent level of significance. This reveals positive and statistically significant impact of ROA on the levels of NPLs and implies that for one unit change in MFIs profitability measured in terms of ROA, keeping the other thing constant had resulted 0.18 unit change on the level of NPLs in the same direction. Unlike the study made by Boudriga *et al.*(2009) and Makri *et al.*(2014) where aggregate country data was used, and Selma and Jouini(2013) where particular country data was used for traditional lending institution, the results of this study confirm the finding of Swamy(2012) and, Ahmad and Bashir(2013) where single country data was considered. Thus, results of this study examined positive significant effect of MFIs profitability measured in terms of ROA on the levels of NPLs of MFIs in Ethiopia. The main reason for this positive impact of ROA on the levels of NPLs resulted from Microfinance institution managements' inefficiency on asset utilization and also poor loan quality in Ethiopia.

Table 4.6 Summary of Hypothesis and Results

No	Hypothesis	p-value	Discussion
1	There is no significant relationship between Size and Credit risk.	0.0457	Reject H0
2	There is no significant relationship between capital adequacy ratios and micro finance credit risk.	0.0035	Reject H0
3	Loan growth is not significantly affects credit risk in Ethiopian micro finance institution.	0.000	Reject H0
4	Lending rate has no relationship with credit risk of Ethiopia Microfinance Institution	0.5301	Accept H0
5	Operating inefficiency of micro finance institution will not significantly affect credit risk.	0.9287	Accept H0
6	Inflation rate has no significant impact on credit risk on Ethiopian micro Finance institution.	0.6895	Accept H0
7	ROA has no relation with credit risk of Ethiopian microfinance.	0.0060	Reject H0

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

In the previous chapter, the results of the study were presented and discussed. This chapter deals with the conclusions and recommendations of the study based on the findings. Hence, section 5.1 presents the conclusions, section 5.2 presents the recommendations and Avenues for Future Research and Improvements provided in section 5.3.

5.1 Conclusion

The main objective of this study was to examine the determinants of nonperforming loans (NPLs) of MFIs in Ethiopia based on panel data analysis on the time period from 2005 to 2014. The data was analyzed by using Fixed Effect Model. For the purpose of analysis EVIEW 7 was used. The study used a descriptive analysis, correlation analysis and multiple regressions. In the descriptive analysis, simple descriptive statistics and correlation analysis are used to learn something meaningful about the sample data before a formal empirical investigation. As far as the econometric study is concerned, the period from 2005- 2014 is considered to quantify the extent to which the credit risk variables like INF, LG, OPINF, SIZE , CAR ,ROA and LR has affected selected micro fiancé NPL. The study selected fixed effects model to estimate the relationship between the dependent variable (NPL) and the independent variables.

The study found out Loan growth, microfinance profitability, capital adequacy ratio, microfinance size had statistically significant effect on the level of NPLs. However, the results of fixed effect regression model revealed the insignificant effect of inflation, operational inefficiency and leading rate with NPLs. The finding of the trend analysis of NPLs shows a fluctuating trend over the time of study.

On the other hand, the findings indicated Micro Finance institution profitability had positive and significant impacts on non performing loan implies that Microfinance institution managements' inefficiency on asset utilization and also poor loan quality during study period is revealed that result profitability measure of ROA had positive impacts on NPLs.

On the other hand size of micro finance institution had statically significant negatives that inverses relationships with non performing loan this implies that a high diversification of portfolio assets in large MFIs can cause a reduction in credit risk of MFIs in Ethiopia and it also shows that larger MFIs have better diversification opportunity than smaller MFIs.

Further the result confirms significant negative effect of CAR on the levels of NPLs this finding supporting the arguments that state well capitalized institution are better able to resist the levels of risk. This implies MFIs in Ethiopia are less the incentives to take riskier loan activities due to highly regulated nature of the institution in the country.

Further the result conforms as loan growth had statically significant effects on level of nonperforming loan of microfinance institution in Ethiopia which supports the idea of Microfinance Institution aggressive lending to maximize profit, can cause non performing loan.

Finally there are several factors relating to internal inefficiencies due to systems, governance, human resource issues and the related.

5.2. Recommendation

On the basis of the findings of this study, the Researcher has drawn the following recommendations.

In order to improve asset quality, specifically loans, it is strongly recommended that MFIs Management and loan officers should always give a serious attention to the health of asset quality of MFIs specifically loan performance for prevention of loans loss. In order to curtail the chance of occurrence of NPLs; it is better for the MFIs managers to give due emphasis on the asset management decision. Once assets are considered as appropriate sources of financing, these assets must be managed efficiently. Thus, it is better for the MFIs managers to efficiently utilize its current assets and loans than fixed assets in order to reduce the level of nonperforming loans.

Besides, loan officers should provide financial counseling to the borrowers on the wise use of loan and should make decision on timely fashion to meet their needs. If so, the MFIs management on asset utilization is improved and then reduces the level of NPLs MFIs in the country.

Microfinance Institutions in Ethiopia should pursue a balanced approach of profit maximization and risk management lest they engage in aggressive lending and unhealthy competition that would lead to selecting borrowers that would default.

Microfinance Institutions in Ethiopia should give due emphasis it takes to developing the competency of credit operators, information system management pertaining to credit and efficiency of the credit process. As loans would contribute to the development of an economy and its default leads to episode of huge loss on Microfinance Institutions in Ethiopia and a country; deliberate effort should be exerted in developing culture of the public towards credit and its management by individual Microfinance Institutions in Ethiopia, National Bank of Ethiopia microfinance association and others.

Prudence of policies that govern Microfinance Institutions in Ethiopia loans should continuously be ensured in light of international best practices, macroeconomic situations, level of development of Microfinance Institutions and the economy in general by NBE.

5.3. Further Research Area and Improvements

This study examined both Microfinance institution specific and macroeconomic determinants of nonperforming loans of selected MFIs in Ethiopia using selected variables. However, there are so many variables that were not included in this study. Thus, future researchers may be interested in validating the consistency of the result and provide supplementary results for this study by including other variables like GDP growth rate, , ownership, unemployment rate and the like on the same MFIs. Furthermore, the same study may be required on newly emerging MFIs.

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APPENDIX

Appendix one

Interview leading question

What is more determine occurrence of nonperforming loan in Ethiopia MFIs?

Do you believe environments factors cause occurrence of nonperforming loan?

What about management efficiency of MFIs in controlling non performance of loan?

Do you believe macro economic factors affects non performing loan in microfinance institutions?

Is there enough regulatory capacity to supervisees microfinance institution in there day to day operation?

Appendix Two

Research Model

MODEL

Dependent Variable: NPL

Method: Panel Least Squares

Date: 05/05/15 Time: 15:11

Sample: 2005 2014

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.891953	1.274525	1.484439	0.1406
CPI	0.582644	1.454357	0.400620	0.6895
LG	0.787225	0.137569	5.722381	0.0000
OPINF	-0.171588	1.912709	-0.089710	0.9287
SIZE	-0.122396	0.060552	-2.021330	0.0457
CAR	-0.092463	0.030105	-3.071352	0.0035
ROA	0.181433	0.064118	2.829671	0.0060
LR	-0.376359	0.597530	-0.629859	0.5301

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.395781	Mean dependent var	0.295108
Adjusted R-squared	0.291416	S.D. dependent var	2.048947
S.E. of regression	1.724751	Akaike info criterion	4.068681

Sum squared resid	327.2244	Schwarz criterion	4.509840
Log likelihood	-244.4643	Hannan-Quinn criter.	4.247939
F-statistic	3.792269	Durbin-Watson stat	1.696568
Prob(F-statistic)	0.000000		

Appendix Three

Husman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	33.79013	7	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CPI	0.582644	-0.804835	0.025616	0.1651
LG	0.787225	0.812891	0.000734	0.3434
OPINF	-0.171588	0.061809	0.731422	0.7849
SIZE	-0.122396	-0.118101	0.000846	0.8826
CAR	-0.092463	-0.582922	0.766839	0.1663
ROA	0.181433	0.253787	0.003432	0.2168
LR	-0.376359	-0.489508	0.031599	0.5244

Cross-section random effects test equation:

Dependent Variable: NPL

Method: Panel Least Squares

Date: 05/05/15 Time: 15:09

Sample: 2005 2014

Periods included: 10

Cross-sections included: 13

Total panel (balanced) observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.891953	1.274525	1.484439	0.1406
CPI	0.582644	1.454357	-0.400620	0.6895
LG	0.787225	0.137569	5.722381	0.0000

OPINF	-0.171588	1.912709	-0.089710	0.9287
SIZE	-0.122396	0.060552	-2.021330	0.0457
CAR	-0.092463	0.030105	-3.071352	0.0035
ROA	0.181433	0.064118	2.829671	0.0060
LR	-0.376359	0.597530	-0.629859	0.5301

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.395781	Mean dependent var	0.295108
Adjusted R-squared	0.291416	S.D. dependent var	2.048947
S.E. of regression	1.724751	Akaike info criterion	4.068681
Sum squared resid	327.2244	Schwarz criterion	4.509840
Log likelihood	-244.4643	Hannan-Quinn criter.	4.247939
F-statistic	3.792269	Durbin-Watson stat	1.696568
Prob(F-statistic)	0.000000		

Appendix Four

Heteroskedasticity Test: White

F-statistic	8.642491	Prob. F(35,94)	0.0659
Obs*R-squared	74.82751	Prob. Chi-Square(35)	0.5721
Scaled explained SS	1921.128	Prob. Chi-Square(35)	0.6705

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 05/05/15 Time: 15:44

Sample: 1 130

Included observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	83.44865	61.73189	1.351792	0.1797
CAR	-68.60079	97.50425	-0.703567	0.4834
CAR^2	-47.00077	36.65245	-1.282336	0.2029
CAR*CPI	27.70260	80.95232	0.342209	0.7330
CAR*OPINF	231.3991	122.3098	1.891909	0.0616
CAR*ROA	-14.03146	63.86852	-0.219693	0.8266
CAR*LR	-52.71616	41.38752	-1.273721	0.2059
CAR*LG	-53.53358	16.74228	-3.197508	0.0019
CAR*SIZE	-3.091689	4.365834	-0.708155	0.4806
CPI	-20.41880	130.4408	-0.156537	0.8759
CPI^2	-70.05330	154.4902	-0.453448	0.6513

CPI*OPINF	-21.21871	165.1203	-0.128505	0.8980
CPI*ROA	63.97602	203.4154	0.314509	0.7538
CPI*LR	29.22364	63.52007	0.460069	0.6465
CPI*LG	86.40078	41.47212	2.083346	0.0399
CPI*SIZE	0.419114	4.380652	0.095674	0.9240
OPINF	-118.9388	110.2160	-1.079143	0.2833
OPINF^2	-26.54271	54.94446	-0.483082	0.6302
OPINF*ROA	37.96286	104.8405	0.362101	0.7181
OPINF*LR	-49.42728	55.30641	-0.893699	0.3738
OPINF*LG	-129.3338	50.76220	-2.547837	0.0125
OPINF*SIZE	4.844515	4.739801	1.022093	0.3094
ROA	61.89599	119.2744	0.518938	0.6050
ROA^2	1.322108	4.076731	0.324306	0.7464
ROA*LR	39.64752	42.04024	0.943085	0.3481
ROA*LG	25.67885	49.75440	0.516112	0.6070
ROA*SIZE	1.722586	2.186540	0.787813	0.4328
LR	-48.45827	49.58985	-0.977181	0.3310
LR^2	-3.781027	13.73178	-0.275349	0.7837
LR*LG	16.13674	13.80556	1.168858	0.2454
LR*SIZE	1.195324	2.204491	0.542222	0.5889
LG	-148.2497	29.79993	-4.974834	0.0000
LG^2	10.32164	1.241936	8.310926	0.0000
LG*SIZE	5.977498	1.407382	4.247248	0.0001
SIZE	-2.778792	5.220786	-0.532255	0.5958
SIZE^2	-0.046420	0.127084	-0.365271	0.7157
R-squared	0.575596	Mean dependent var	2.136790	
Adjusted R-squared	0.417574	S.D. dependent var	16.37889	
S.E. of regression	12.49986	Akaike info criterion	8.118918	
Sum squared resid	14687.17	Schwarz criterion	8.913005	
Log likelihood	-491.7297	Hannan-Quinn criter.	8.441582	
F-statistic	3.642491	Durbin-Watson stat	1.771744	
Prob(F-statistic)	0.000000			

Appendix Five

Raw Data

MFI	YEAR	NPL	OPINF	ROA	SIZE	LG	LR	CPI	CAR
ACSI	2005	0.11	0.02	0.04	20.20	0.43	0.02	0.06	0.24
ACSI	2006	0.01	0.01	0.04	20.55	0.54	0.02	0.11	0.00
ACSI	2007	0.05	0.02	0.04	20.97	0.48	0.03	0.16	0.27
ACSI	2008	0.02	0.08	0.08	21.57	0.52	0.02	0.25	0.10
ACSI	2009	0.04	0.10	0.06	21.57	0.07	0.03	0.36	0.26
ACSI	2010	0.03	0.08	0.07	21.60	0.08	0.49	0.03	0.28
ACSI	2011	0.04	0.09	0.07	22.20	0.68	0.67	0.18	0.37
ACSI	2012	0.01	0.08	0.08	22.43	0.21	0.48	0.34	0.34
ACSI	2013	0.01	0.10	0.09	22.49	0.18	0.36	0.14	0.32
ACSI	2014	0.01	0.09	0.07	22.86	0.23	0.52	0.08	0.32
ADCSI	2005	0.09	0.02	0.01	18.77	0.04	0.43	0.06	0.70
ADCSI	2006	0.01	0.01	-0.07	18.98	0.82	0.00	0.11	0.71
ADCSI	2007	0.00	0.01	-1.49	14.67	0.48	-0.14	.16	0.67
ADCSI	2008					-			
		0.03	0.06	0.04	19.49	0.01	0.43	0.25	0.70
ADCSI	2009	0.04	0.06	0.03	19.77	0.25	0.40	0.36	0.72
ADCSI	2010	0.04	0.06	0.05	20.09	0.51	0.73	0.03	0.65
ADCSI	2011	0.05	0.07	0.04	14.87	0.60	0.87	0.18	0.35
ADCSI	2012					-			
		0.04	0.09	0.05	14.95	0.33	0.83	0.34	0.36
ADCSI	2013	0.03	0.09	0.04	15.11	0.50	0.22	0.14	0.31
ADCSI	2014	0.03	0.08	0.04	15.27	0.64	.27	0.08	0.25
AVFP	2005	0.03	0.17	-0.08	15.89	0.96	0.61	0.06	0.62
AVFP	2006	0.04	0.14	-0.08	16.29	0.19	0.01	0.11	0.60
AVFP	2007	0.05	0.13	-0.06	16.50	0.24	0.01	0.16	0.62
AVFP	2008	0.01	0.16	0.01	16.63	0.17	0.01	0.25	0.62
AVFP	2009	0.09	0.18	0.03	16.68	0.07	0.01	0.36	0.62
AVFP	2010	0.06	0.26	-3.40	16.80	.23	0.14	0.03	0.56
AVFP	2011	0.06	0.23	0.10	7.40	0.01	0.21	.18	0.43
AVFP	2012	0.08	0.31	-0.02	9.95	0.05	0.19	0.34	0.59
AVFP	2013					-			
		0.04	0.31	-0.70	10.14	0.07	0.89	0.14	0.51
AVFP	2014	0.03	0.35	-1.70	10.16	0.16	0.39	0.08	0.47
BG	2005	0.00	0.16	-0.09	16.15	2.69	0.01	0.06	0.66
BG	2006	0.01	0.08	-0.01	16.58	0.30	0.01	0.11	0.66
BG	2007	0.13	0.06	-0.01	17.17	0.96	0.01	0.16	0.43
BG	2008	0.02	0.24	0.07	17.58	0.58	1.22	0.25	0.44
BG	2009	0.02	0.21	0.07	17.91	0.46	0.01	0.36	0.43

BG	2010	0.01	0.20	0.08	17.91	0.10	0.65	0.03	0.54
BG	2011	0.01	0.19	0.09	11.34	0.53	0.13	0.18	0.54
BG	2012	0.00	0.20	0.09	11.73	1.11	0.32	0.34	0.49
BG	2013	0.01	0.45	0.19	12.16	0.30	0.61	0.14	0.43
BG	2014	0.01	0.17	0.09	12.47	0.40	0.42	0.08	0.40
DECSI	2005	0.00	0.01	0.03	20.62	0.71	0.03	0.06	0.23
DECSI	2006	0.00	0.01	0.02	20.77	0.10	0.04	0.11	0.23
DECSI	2007	0.05	0.01	0.00	21.18	0.46	0.04	0.16	0.20
DECSI	2008	0.02	0.06	0.02	21.80	0.33	0.04	0.25	0.19
DECSI	2009	0.05	0.06	0.03	21.80	- 0.06	0.02	0.36	0.38
DECSI	2010	0.03	0.11	0.00	21.46	0.11	0.49	0.03	0.37
DECSI	2011	0.03	0.09	0.03	21.48	0.22	.59	0.18	0.35
DECSI	2012	0.04	0.10	0.03	14.95	0.09	0.47	0.34	0.36
DECSI	2013	0.11	0.14	0.02	15.11	0.18	0.40	0.14	0.31
DECSI	2014	0.04	0.09	0.03	15.27	0.17	0.30	0.08	0.25
Eshet	2005	0.00	0.05	0.03	16.71	0.58	.03	0.06	0.28
Eshet	2006	0.01	0.03	0.04	17.25	1.13	0.02	0.11	0.32
Eshet	2007	0.16	0.07	-0.08	17.47	0.40	0.12	0.16	0.28
Eshet	2008	0.26	0.51	0.02	17.57	0.06	0.03	0.25	0.26
Eshet	2009	0.24	0.24	0.01	17.65	- 0.10	0.03	0.36	0.26
Eshet	2010	0.20	0.25	0.03	10.74	8.78	0.29	0.03	0.36
Eshet	2011	0.13	0.27	-0.01	10.73	- 0.87	0.12	0.18	0.30
Eshet	2012	0.05	0.23	0.09	10.90	0.41	0.27	0.34	0.31
Eshet	2013	0.03	0.58	0.08	11.04	0.00	0.25	.14	.31
Eshet	2014	0.05	0.24	0.03	11.09	0.01	0.24	0.08	0.33
MEKLIT	2005	0.08	0.05	-0.02	16.58	1.13	1.35	0.06	0.43
MEKLIT	2006	0.12	0.03	-0.11	16.53	- 0.10	0.01	0.11	0.44
MEKLIT	2007	0.16	0.09	-0.08	16.59	0.12	1.20	0.16	0.48
MEKLIT	2008	0.26	0.13	0.02	16.71	0.10	0.03	0.25	0.24
MEKLIT	2009	0.24	0.20	0.01	16.84	0.01	0.03	0.36	0.25
MEKLIT	2010	0.17	0.37	0.02	16.72	- 0.09	0.65	0.03	0.28
MEKLIT	2011	0.07	0.23	0.08	10.09	0.22	0.22	0.18	0.31
MEKLIT	2012	0.08	0.43	0.00	10.06	0.13	0.25	0.34	0.34
MEKLIT	2013	0.05	0.25	0.00	10.25	0.14	0.35	0.14	0.36
MEKLIT	2014	0.06	0.28	-0.01	10.39	0.14	0.27	0.08	0.32
OCSSCO	2005	0.07	0.06	-0.04	15.46	1.16	0.06	0.06	0.34

OCSSCO	2006	0.03	0.04	0.08	16.77	0.72	0.02	0.11	.28
OCSSCO	2007	0.02	0.04	0.02	16.60	0.00	0.03	0.16	0.28
OCSSCO	2008	0.04	0.35	0.03	16.78	0.27	0.02	0.25	0.28
OCSSCO	2009	0.02	0.20	0.00	16.92	0.23	0.03	0.36	0.29
OCSSCO	2010	0.21	0.22	-0.02	17.02	0.03	0.32	0.03	0.78
OCSSCO	2011	0.17	0.21	0.07	10.23	0.30	.26	0.18	0.29
OCSSCO	2012					-			
		0.05	0.21	0.11	10.39	0.03	0.26	0.34	0.36
OCSSCO	2013	0.04	0.18	0.12	10.71	0.28	0.61	0.14	0.39
OCSSCO	2014	0.03	0.18	0.10	10.88	0.25	0.33	0.08	.43
OMO	2005	0.08	0.19	0.01	19.01	0.61	0.01	0.06	0.44
OMO	2006	0.02	0.16	0.40	19.61	0.97	0.01	0.11	0.30
OMO	2007	0.00	0.10	0.01	20.05	0.63	0.03	0.16	0.28
OMO	2008	0.03	0.22	0.04	20.48	.01	0.03	0.25	0.25
OMO	2009	0.07	0.27	0.03	20.62	0.46	0.03	0.36	.25
OMO	2010	0.02	0.28	0.05	21.05	0.33	0.56	0.03	0.39
OMO	2011	0.03	0.23	0.03	14.29	0.25	0.32	0.18	0.36
OMO	2012	0.02	0.24	0.08	14.61	0.00	0.22	0.34	0.37
OMO	2013	0.03	0.37	0.06	14.89	0.40	0.24	0.14	0.28
OMO	2014	0.04	0.16	0.05	15.33	0.43	0.36	0.08	0.23
PEACE	2005	0.01	0.03	-0.02	18.59	1.02	0.10	0.06	0.10
PEACE	2006	0.03	0.09	-0.01	18.76	0.48	0.09	0.11	0.12
PEACE	2007	0.02	0.02	-0.01	19.30	0.66	0.07	0.16	0.13
PEACE	2008	0.05	0.10	0.02	19.96	1.48	0.11	0.25	0.30
PEACE	2009	0.07	0.07	0.02	20.05	0.00	0.09	.36	0.21
PEACE	2010	0.07	0.11	0.02	20.27	0.16	0.25	0.03	0.47
PEACE	2011	0.16	0.11	0.02	13.54	0.23	0.29	0.18	0.45
PEACE	2012	0.11	0.12	0.04	14.09	0.40	0.64	0.34	0.32
PEACE	2013	0.06	0.13	0.04	14.44	0.45	0.36	0.14	0.31
PEACE	2014	0.04	0.10	0.03	14.81	0.52	0.25	0.08	0.22
SFPI	2005	0.04	0.07	-0.03	16.73	0.36	0.01	0.06	0.55
SFPI	2006	0.03	0.04	-2.70	17.07	0.51	0.01	0.11	0.53
SFPI	2007	0.02	0.03	-9.30	17.01	0.32	0.02	0.16	0.07
SFPI	2008	0.04	0.17	3.00	17.58	0.16	0.01	0.25	0.46
SFPI	2009	0.03	0.19	0.01	17.80	0.04	.01	0.36	0.43
SFPI	2010	0.03	0.20	0.08	17.92	0.28	0.29	0.03	0.45
SFPI	2011	0.05	0.18	0.06	11.15	0.39	0.23	0.18	0.49
SFPI	2012	0.05	0.20	0.06	11.44	0.73	0.16	0.34	0.43
SFPI	2013	0.02	0.42	0.16	11.85	0.00	0.36	0.14	0.39
SFPI	2014	0.03	0.18	0.08	12.01	0.19	0.29	0.08	0.41
VFE	2005	0.03	0.09	-0.02	17.28	1.30	0.02	0.06	0.90

VFE	2006	0.05	0.05	0.01	17.80	0.74	0.01	0.11	0.47
VFE	2007	0.03	0.06	-0.08	18.10	0.29	0.02	0.16	0.64
VFE	2008	0.03	0.23	0.00	18.48	0.38	0.01	0.25	0.44
VFE	2009	0.05	0.26	-0.02	18.49	- 0.91	0.01	0.36	0.44
VFE	2010	0.07	0.33	-0.03	18.61	- 0.29	0.11	0.03	0.47
VFE	2011	0.03	0.37	-0.04	18.75	9.60	0.86	0.18	0.56
VFE	2012	0.01	0.34	0.02	19.35	1.16	0.74	0.34	0.55
VFE	2013	0.01	0.27	0.20	19.76	1.22	0.64	0.14	0.58
VFE	2014	0.05	0.27	0.05	19.89	0.04	1.00	0.08	0.70
WASASA	2005	0.08	0.06	-0.05	16.41	0.37	0.02	0.06	0.47
WASASA	2006	0.09	0.06	-0.02	.08	1.45	0.01	0.11	0.46
WASASA	2007	0.02	0.06	0.03	17.46	0.52	0.01	0.16	0.43
WASASA	2008	0.02	0.12	0.06	17.79	0.57	0.02	0.25	0.33
WASASA	2009	0.01	0.12	0.08	18.25	0.45	0.02	0.36	0.32
WASASA	2010	0.04	0.18	0.06	18.71	0.30	0.37	0.03	0.10
WASASA	2011	0.02	0.13	0.07	11.76	0.39	0.21	0.18	0.36
WASASA	2012	0.01	0.13	0.09	12.16	0.37	0.79	0.34	0.38
WASASA	2013	0.01	0.16	0.06	12.38	0.26	0.32	0.14	0.36
WASASA	2014	0.01	0.17	0.06	12.64	.26	0.36	0.08	0.32

Appendix six

Selected MFIs name

Addis credit and Saving Institution (ACSI)

Amara Developments credit saving institution (ADCSI)

Buusaa Gonofaa(BG)

Dedebit credit saving institution (DECSI)

Oromia credit saving share company (OCSSCO)

Omo saving and credit (OMO)

Vision Fund Ethiopia (VFE)

African village financial services (AVFS)

Wasasa Microfinance Institution(WASASA)

Eshet Microfinance Institution (Eshet)

Meklit Micro Finance Institution(MEKLIT)

PEACE micro finance institution (PEACE)

Specialized Financial promotion Institution (SFPI)