



SAINT MARRY UNIVERSITY
SCHOOL OF GRADUATE STUDIES

DETERMINANTS OF FINANCIAL SUSTAINABILITY
OF MFIs IN ETHIOPIA

By

ABIYU BERHANU

JUNE, 2016

Addis Ababa

**Determinants of Financial Sustainability of Microfinance
Institutions in Ethiopia**

**A Thesis submitted to Saint Marry University in partial
fulfillment of the requirements for the Degree of Masters of
Science in Accounting and Finance**

By: AbiyuBerhanu

Advisor: AlemHagos (PhD)

June, 2016

STATEMENT OF DECLARATION

I, AbiyuBerhanu declare that this thesis entitled “Determinants of Financial Sustainability of Microfinance Institutions in Ethiopian” is outcome of my own effort and study and that all sources of materials used for the study have been duly acknowledged. I have produced it independently except for the guidance and suggestion of the thesis Advisor.

To the best of my knowledge, this study has not been submitted for any degree in this University or any other University. It is offered for the partial fulfillment of the degree of Masters of Science in Accounting and Finance.

AbiyuBerhanu: _____

Date: June, 2016

SAINT MARRY UNIVERSITY

SCHOOL OF GRADUATE STUDIES

This is to certify that the thesis prepared by AbiyuBerhanu, entitled: Determinants of Financial sustainability of MFIs in Ethiopia and submitted in partial fulfillment of the requirements for the degree of Master of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Approved by:

Internal examiner: Dr. ZinegnawAbiy. Signature_____ Date_____

External examiner: Dr. Habtamu Birhanu. Signature _____Date_____

Advisor: Dr. AlemHagos. Signature_____Date_____

Table of Contents

Acknowledgements.....	i
List of Tables.....	ii
List of figures.....	iii
List of Annexes.....	iv
List of Acronyms.....	v
Abstract.....	vi
Chapter One	1
1. Introduction.....	1
1.1 Background of the study	1
1.2 Statement of the problem	3
1.3 Objectives of the study	6
1.3.1 General objective of the study	6
1.3.2 Specific objectives	6
1.4 Hypothesis.....	6
1.5 Significance of the study.....	7
1.6 Scope and Limitation of the study	8
1.7 Structure of the study	9
Chapter Two	10
2. Literature Review	10
2.1 Definition of Microfinance.....	10
2.2 Overview of microfinance	11
2.3 The Development of Microfinance Institutions	13
2.4 Microfinance Institutions and their development in Ethiopia	16
2.4.1. Legal Framework for MFIs	18
2.4.2. The Commercial Code of Ethiopia.....	18
2.4.3. Governance and framework of MFI ownership	19
2.5 Performance of MFIs.....	21
2.6 Perspectives in Performance Measures	22
2.6.2 The Welfarist School	23
2.7 Financial resources of MFIs	24
2.7.1 Savings and deposits	24
2.7.2 Individual philanthropic sources and social investors	24
2.8. Financial Performance of MFIs	25
2.9 Sustainability of MFIs	26
2.10. Determinants of sustainability: Theoretical reviews	27

2.10.1 Source of funding (Financing structure)	27
2.10.1.1 Grants as an element of MFIs' funding sources.....	28
2.10.1.2 Leverage (Debt to Equity ratio).....	29
2.10.1.3 Deposit mobilization (Deposit to loan ratio)	31
2.10.1.4 Capital to Asset Ratio.....	31
2.10.2 Firm characteristics: scale of operation (gross loan portfolio)	32
2.10.3 Macroeconomic factors.....	33
2.11 Empirical evidences on drivers of sustainability of MFIs	33
2.11.1 Breadth of outreach.....	34
2.11.2 Grants and deposit mobilization	35
2.11.3 Cost per borrower.....	37
2.11.4 Debt to Equity ratio	38
2.11.5 Return on Asset (ROA).....	40
2.11.6 Loan portfolio.....	40
2.11.7 operating expense ratio (PAR)	41
2.11.8 Inflation rates	42
2.12 Empirical studies and research gap in Ethiopia	43
2.13 Conceptual Framework of MFIs sustainability	46
Chapter Three	48
3. Methodology and Model specification	48
3.1 Methodology	48
3.1.1 Data type, Source and data collection techniques	48
3.1.2 Target Population.....	48
3.1.3 Sample size and sampling design	49
3.1.4 Panel Unit Root Test	49
3.2 Model Specification	50
3.3 Data analysis	55
Chapter four	56
4. Descriptive and econometric analysis.....	56
4.1 Descriptive Analysis.....	56
4.2 Econometric Analysis.....	60
4.2.1 Unit root test	60
4.2.2 Panel Model Estimation Result	61
4.2.3 Post Model Diagnostic Test.....	64
Chaptr five	68
5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	68
5.1. Summary of finding.....	68
5.2 Conclusion	69
5.3 Recommendations	70
5.4. Further Research Directions	71
References	72

Acknowledgements

First and foremost, I would like to acknowledge the one and true God for blessing me with the ability and guidance to succeed in every aspect. My deepest thanks go to my advisor Dr. AlemHagos for his constructive comments, valuable suggestions and good guidance to the topics and direction of this study.

My sincere gratitude goes to the staffs of Association of Ethiopian Microfinance Institution and staffs of NBE for their sincere help in guiding and providing me the necessary available material and data to carry out this research paper to accomplish in this way. I also would like to thank the examiners Dr. Zinegnaw Abiy and Dr. Habtamu Birhanu, for their constructive comment during presenting the study

Many thanks go to my co-staffs and friends for their encouragement and moral support while I was doing the paper.

Last but not least, I would like to extend my heartfelt gratitude and special thanks to my dear wife Frehiwot Girma for her unreserved moral support and understanding during my study period.

List of Tables

Table 3.1: Description of independent variables for FSS	54
Table 4.1: Descriptive Statistics Results.....	57
Table 4.2: Levin, Lin and chu test (LLC) Unit Root Test.....	61
Table 4.3: Model Estimation Result (Random, Pooled and Fixed) Models.....	62
Table 4.4: Serial Correlation Test Result.....	65
Table 4.5: Test cross-section fixed effects	66
Table 4.6: Pearson Correlation Coefficient Result	67

List of figures

Figure 2.1 Conceptual framework of the study.....	47
Figure 4.1 Financial self-sufficiency of MFIs in Ethiopia.....	60
Figure 4.2 Normality test result.....	65

List of Annexes

Annex 1: Unit root test (E-views Output).....	79
Annex 2: Estimation Result (E-views Output).....	81
1. Fixed Effect Model	81
2. Random Effect	82
3. Pooled Regression.....	83

List of Acronyms/Abbreviation

ACCION	American for Community Cooperation in other Nations
ACSI	Amhara Credit and Saving Institution
AdCSI	Addis Credit and Saving Institution
AEMFI	Association of Ethiopian Microfinance Institutions
BOR	Breadth of outreach
CGAP	Consultative Group to Assist the Poor
CPB	Cost per Borrower
DECSI	Dedebit Credit and Saving Institution
DER	Debt to Equity Ratio
DLR	Deposit to loan ratio
FINCA	Foundation for International Community Assistance
FSS	Financial Self Sufficiency
GDP	Growth Domestic Product
GLP	Gross Loan Portfolio
MFI	Microfinance institutions
MIX	Microfinance Information Exchange
MDG	Millennium Development and Growth
MoFED	Ministry Of Finance and Economic Development
NAB	Number of active borrowers
NBE	The National Bank Of Ethiopia
NGO	Non-Governmental Organizations
PRSP	Poverty reduction strategy paper
OCSSCO	Oromia Credit and Saving Share Company
OER	Operating Expense ratio
OSS	Operational self-sufficiency
PAR	Portfolio at Risk
PEACE	Poverty Eradication and Community Empowerment
ROA	Return on Asset
ROE	Return on Equity
SFPI	Specialized Financial and Promotional Institution

Abstract

Microfinance is a type of banking service that is provided to unemployed or low-income individuals or groups who have no alternative source to gain financial support. Ultimately, the goal of microfinance is to give low income peoples an opportunity to become self-sufficient for their entrepreneurship development. It is observed that microfinance organizations have had various degrees of sustainability of which financial sustainability is the major one. It is tried to identify by different researchers regarding the determinant factors that affect financial sustainability of MFIs. However, there are insufficient studies conducted on this area in Ethiopia. Therefore this study was conducted to find out the factors which affect the financial sustainability of MFIs in Ethiopia. The study is based on quantitative research approach with longitudinal research design using panel data fixed regression as the main data analysis technique and it is based on a 10 years secondary data obtained from the annual bulletin of AEMFI and mix-market database for 15 selected MFIs in Ethiopia. The sample size has been judged based on the availability and quality of data and the resulting estimates. The study found that MFIs in Ethiopia are not financially self-sufficient and identified breadth of outreach and deposit to loan ration affect the financial self-sufficiency and sustainability of MFIs in Ethiopia significantly on the other hand, inflation and operating expense ratio are significant and negative relationship with financial self-sufficiency of MFIs in Ethiopia. Thus, the study recommend, that Ethiopian MFIs should increase their breadth of outreach and deposit to loan so as to maintain sustainable financial performance and take due attention on operating expense ratio that significant negative effect up on financial sustainability. On the other hand, the government should adjust regulatory frameworks to permit the microfinance institutions to offer lending services to a wide range of poor people and give sustainable training and capacity building program to the MFIs.

Key words: MFIs, sustainability, FSS, self-sufficiency

Chapter One

1. Introduction

1.1 Background of the study

One of the main objectives of financial institutions is mobilizing resources (in particular domestic saving) and channeling them to the would-be investors. This intermediation role of financial institutions takes different forms in different economic systems. Microfinance has become an important tool for poverty reduction in many parts of the world. Microfinance institutions (MFIs) target the poor through innovative approaches which include group lending, progressive lending, regular repayment schedules, and collateral substitutes (Kimando, et.al., 2012). While many factors contribute to poverty, its most obvious manifestation is insufficient household income. Both the extent of income-generating opportunities and ability to respond to such opportunities are determined to a great degree by access to affordable financial services. Increasing the access of poor households to microfinance is therefore being actively pursued worldwide

Microfinance is the supply of loans, savings, money transfers, insurance, and other financial services to those low-income and poor self-serving people. Microfinance institutions which encompass a wide range of financial service providers that vary in legal structure, mission, and methodology offer these financial services to clients who do not have access to typical banks or other formal financial service providers. Melkamu (2012), explained in his desertation that, Microfinance institutions play a significant role in alleviating poverty in a country where the society has no or limited access to financial service provisions. Because of these and other important missions, they have attracted the attentions of different institutions especially donors which have missions to end poverty in the world. Donors and institutions want to evaluate the performance of an MFI whether they reach the poor society and are working towards achieving the mission for which they are established for. The MFIs need to be both operationally and financially sustainable in order to continue serving the

society. Among the available measures, financial self-sufficiency and operational self-sufficiency are the predominant profitability and sustainability measurement variables. This has been needed because mostly microfinance institutions rely on the funds which are obtained from donors (Melkamu, 2012).

In Ethiopia, the poverty reduction strategy is set as the operational framework to translate the global MDGs targets in to national action (MoFED 2002). Micro finance service intervention in Ethiopia have also be considered as one of the policy instrument of the government and nongovernment organizations (NGOs) to enable rural and urban poor increase output and productivity, induce technology adoption, improve input and productivity, induce technology adoption, improve input supply, increase income, reduce poverty and attain food security. The sustainability of MFIs 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 element of the new development strategy of Ethiopia (Wolday 2000 as cited by Alemayehu, 2008).

The Ethiopian microfinance sector is characterized by its rapid growth, an aggressive drive to achieve scale, a broad geographic coverage, a dominance of government assisted MFIs, an emphasis on rural households, the promotion of both credit and savings products, a strong focus on sustainability and by the fact that the sector is Ethiopian owned and driven (Ebisa et al 2013). The industry has a strong focus on loans to the very poor, as indicated by the relatively small loans when compared to neighboring countries. Sector outreach is impressive and the financial performance of the sector is considered good, although the operational margins and profitability are low. MFIs have also mobilized a significant amount of savings, thereby improving financial as well as operational sustainability (MFT, 2011).

Sustainability refers to the ability to continue any given activity into the future within the likely existing resources of an organization, as part of its ongoing budgetary and management processes (Kimando, et al., 2012). Accordingly MFIs must struggle to have good financial and operational performance so that they can play a major role in the poverty reduction while achieving their primary objectives. Therefore, the objective of the study was to investigate what actually determines financial sustainability of MFIs in Ethiopia.

1.2 Statement of the problem

Microfinance has become an important tool for poverty reduction in many parts of the world. The services of micro finance institution (MFIS) have become a proven tool against poverty in mostly developing countries of the world especially, Bangladesh, India, Indonesia and South African sub-continents. Mazlan et al. (2014)

It has also noted that microfinance programs do substantially better than control households in Bangladesh (Morduch, Jonathan, 1999). Microfinance institutions (MFIs) target the poor through innovative approaches which include group lending, progressive lending, regular repayment schedules, and collateral substitutes (Mazlan et al., 2014). While achieving on this poverty reduction goal, MFIs should also be financially sustainable. Scholars identified that an efficient MFI management should become financial self-sufficiency which means they are able to cover all administrative costs, loan losses, and financing costs from operating income.

The microfinance programs in various countries are playing significant role in changing the lives of the very poor people by smoothing their consumption. Empirical evidence establishes that less than 15 percent of the population in developing countries has access to the mainstream financial services (Tilahun, 2013). The microfinance sector, apart from being a critical component of the financial system, is also regarded as a poverty reduction strategy for developing countries (Kyereboah-coleman, 2007).

One of the major problem MFIs facing is how to attain sustainability both financially and operationally. Today many key players in the industry use sustainability as one core criteria to evaluate the financial and operational performance of MFIs besides the outreach and impact measures. Thus, the issue of sustainability of MFIs has attracted the attention of many researchers and academicians to focus on finding the determinants of sustainability of MFIs (Yaron, 1992). In addition to the financial factors the sustainability of MFIs is highly affected by national and international financial regulations, political stability, geographical coverage, reach of the microfinance institutions and other non-financial factors (Kimando, et al. 2012). Many studies have been conducted to determine factors affecting financial sustainability and cost efficiency of MFIs using the scale and category of MFIs in different countries (Cull et al., 2007) and (Christen et al., 1995). These and other scholars argument on the driving factors of sustainability of MFIs is in relation to the MFIs financing structure (such as: size, capital to asset ratio, debt to equity ratio, deposit to loan ratio, gross loan portfolio to total asset and others), institutional characteristics or scale of MFIs (such as Experience/age of MFI, number of personnel and many others), their outreach capacity indicators (like: Number of active borrowers, gross loan portfolio, and the like) and macroeconomic variables (such as rate of inflation and real GDP growth rate).

The studies conducted in the areas of microfinance institutions in Ethiopia are limited and mainly focused on the performance of the MFIs. Financial sustainability is a high standard measure of sustainability and brings long term perspectives for MFI operations. Meyer, (2012). Whereas there is few in number studies are conducted in financial sustainability of Ethiopian MFIs with limited explanatory determinant factors. The researcher also believe that those studies which is focused on sustainability of Ethiopian MFIs did not give such an emphasis on the factors considered to be determinants of financial sustainability and fail to consider

the effects of macro economic factors and some important explanatory variables. For instance, Kinde (2012) tried to identify factors affecting financial sustainability of MFIs in Ethiopia, but the study did not show clearly and kept silent about the direction of significant dependent and independent variables. Yenesew (2014), Yirsaw (2008), and Asnakew (2012) have also tried to sort out the driving factors of performance and sustainability of MFIs in Ethiopia but the studies failed to explore a comprehensive and detail analysis of financing structure, firm characteristics and macroeconomic variables as determining factors for the sustainability of MFIs in Ethiopia.

Therefore, determining factors of financial sustainability of Microfinance Institutions in Ethiopia has roots in the existing literature but it needs further research and exploration especially in Ethiopian case because the empirical literature shows the problem is done with limited explanatory determinant factors and focused on the performance of the MFIs with descriptive statistics. Thus, to fill this gap this study has tried to identify the major variables namely Breadth of outreach, Debt to equity ratio (DER), operating expense ratio (OER) deposit to loan ratio (DLR) capital to asset ratio (CLR) cost per borrower (CPB) gross loan portfolio and inflation as put a comprehensive and detail analysis on the determinants of financial sustainability of MFIs in Ethiopia.

1.3 Objectives of the study

1.3.1 General objective of the study

The general objective of this study is to identify the determining factors of financial sustainability of Microfinance Institutions in Ethiopia

1.3.2 Specific objectives

- Assessing performance of the financial sustainability of MFIs in Ethiopia
- To empirically examine determinants of financial sustainability
- To empirically test whether Breadth of outreach, DLR, GLP & CTA have significant positive relationship with FSS of MFIs
- To empirically test whether ,DER, CPB, OER, and Inflation have significant negative relationship with FSS of MFIs

1.4 Hypothesis

In order to achieve the objectives of the study, a number of hypotheses were tested regarding the determinants of financial sustainability of Ethiopia MFIs relying on different empirical research and theoretical review. Accordingly, there are eight hypotheses which are included:

H1: There is a positive significant relationship between breadth of outreach and financial self-sufficiency of Ethiopian MFIs

H2: There is a negative significant relationship between debt to equity ratio of microfinance institutions and Financial Self-Sufficiency of Ethiopian MFIs

H3: There is a negative significant relationship between inflation rate and financial self-sufficiency of MFIs in Ethiopia

H4: Capital to asset ratio of a microfinance institution is significantly and positively related to financial self-sufficiency of MFIs in Ethiopia

H5: There is a positive significant relationship between deposit to loan ratio of microfinance institutions and financial self-sufficiency of MFIs in Ethiopia

H6: Operational expense ratio has significant negative effect on financial self-sufficiency of MFIs in Ethiopia

H7: Gross loan portfolio has a significant positive relationship with financial self-sufficiency of MFIs in Ethiopia

H8: Cost per borrower is significantly and negatively related to financial self-sufficiency of MFIs in Ethiopia

1.5 Significance of the study

In meeting the financial needs of poor peoples, farmers, household and micro entrepreneurial, microfinance institutions play a significant role. Usually the financial resource flows out from the micro finance institutions help to improve living standard, educational level, health and financial position of the poor segment of the society and reduce poverty. Hence micro finance helps in contributing a lot towards the overall development of the economy. To achieve this stated mission continually MFIs themselves have to be financially sustainable. Therefore, this study would help the decision makers of MFIs to identify the determining factors for their financial sustainability in general and in specific and give due attention for the factors.

Majority of Ethiopian population is poor and hence depend on MFIs as source of capital and general finance. Since the study seeks to establish factors of sustainability of MFIs, it would provide invaluable information to them indirectly, so that it would eventually help the MFIs to manage the factors that significantly influence their sustainability.

The financial sustainability of micro finance in line with the objectives that is to improve the living standard of the poor and promote the mass mobilization in the nation's wealth creation as well as initiate other capable Ethiopians to participate in playing their role in the different sectors of the economy. On the other hand, the micro-financing effort is currently backed by foreign donor countries and international agencies. So the effective coverage rate and service provision is expected

to generate more assistance in the short-run while sustainable financial resource must be secured internally in the long-run. Besides, the government and pertinent offices have their own responsibilities.

In line with the above facts, it is hoped that the results of this study will: -

- Provide relevant information to decision makers (investors, donors, creditors, clients, or government) regarding the financial sustainability of MFIs
- Give information to the management of the institutions and others stakeholders regarding the potential factors that determines financial sustainability
- It might also help those policy makers to support, encourage, and promote MFIs especially the national bank of Ethiopia as a regulatory organ.

Furthermore, the result of the study is hoped to serve as a base for further research on same or related topics.

1.6 Scope and Limitation of the study

This study is conducted to identify the determinant factors which affect the financial sustainability of micro finance institution in Ethiopia. When doing so the researcher is restricting himself in some selected MFIs financial data as to compile the necessary information that help to make the research meaningful. Because it is very difficult to address all the branches, the scope of this study is limited to some selected MIFs audited financial data. The study has mainly considered and uses secondary quantitative data as to test the financial determinants of sustainability of MFIs in Ethiopia, However, it is more appropriate and would be stronger, if it was supported by additional qualitative factors that affect the sustainability of the microfinance institutions. According to various sources, the microfinance institution and microfinance service does not have a long history in Ethiopia, and hence the

researcher limits the scope only to the available secondary data of the selected fifteen Micro finance institutions in Ethiopia. Moreover, unavailability of the recent, for instance the last two year compiled data in the AEMFI, has also considered as research limitation.

1.7 Structure of the study

This research has five chapters. The first chapter is an introduction which includes background of the study, statement of the problem, objective of the study, delimitation. The second chapter discussed on review of related literature including conceptual framework for the analysis. Under this section relevant published and unpublished literatures, journals and other researcher's work that are previously done on similar areas were thoroughly discussed in a manner to achieve the objective of the study and help the data analysis, and the methodology that was used to collect and analyze data has been presented in chapter three. The analysis of data and major findings is included in Chapter four. Concluding remarks and recommendations are outlined in chapter five. At the end of the paper, references and appendices are attached.

Chapter Two

2. Literature Review

Under this chapter the theoretical and empirical evidences focusing on the overview and determinants of financial sustainability of microfinance institution are presented. Accordingly, the first section, describes overall theoretical overview of micro finance and its concepts. The second section presents review of empirical studies on the internal and external determinants of MFIs financial sustainability.

2.1 Definition of Microfinance

Different authors and organizations have defined Microfinance institutions in different ways. However the concept or the meaning of the definitions is usually the same in which microfinance refers 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 service.

Consultative Group to Assist the poor (CGAP,2012) defined "microfinance" the Provision of formal financial services to poor and low-income people, as well as others Systematically not benefited from the financial system. As noted, "Microfinance" it is not only providing a range of credit products (for consumption, smoothing for business purposes, to fund social obligations, for emergencies, etc.) Only, but also savings, money transfers, and insurance.

The other researcher defined about MFIs is that, it offers financial services to poor people. The aim of Access to financial services for poor people is help to alleviate risks, build their assets, improve their income, and furthermore contribute to development of the focal community (Cull et al, 2009).

The popularly known institution which is Microfinance information exchange (MIX) defined the microfinance institutions as a variety of financial services that target low income clients, particularly women. Since the clients of microfinance institutions have lower incomes or poor and often have limited

access to other financial services, microfinance products tend to be for smaller monetary amounts than traditional financial services. These services not only provide micro credit service for those have lower incomes but also include loans, savings, insurance, and remittances. Micro-loans are given for a variety of purposes, frequently for micro-enterprise development. The diversity of products and services offered shows the reality that the financial needs of individuals, households and enterprises can change significantly over time, especially for those who live in poverty, which is not benefited from the formal bank. Because of these varied needs, and because of the industry's focus on the poor, microfinance institutions often use non-traditional methodologies, such as group lending or other forms of collateral not employed by the formal financial sector especially by bank MIX (Micro finance information exchange).

According to Robinson, (2001) definition: Microfinance refers to small-scale financial services-primarily credit and savings-given to people who involved in farm or fish or herd; who work in small enterprises or microenterprises where goods are produced, recycled, repaired, or sold; who provide services; who work for wages or commissions; who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and to other individuals and groups at the local levels of developing countries, both rural and urban (Robinson, 2001p.9).

Ethiopian Proclamation No. 626/2009 defines micro financing business as "the provision of financial services like accepting savings, extend credit, drawing and accepting drafts payable, providing money transfer services and others specified in the Article 3(2) of the proclamation.

2.2 Overview of microfinance

The emergence of the global microfinance has a history of about three decades, yet has gone through stages of historical development. The microfinance industry is said to be in revolution: the service that was initiated in small scale and small village of South East Asia “Chintanga”, Bangladesh now turned to be international agenda and

an issue addressing one of the main problems i.e. poverty in developing countries of the world (Arega, 2007).

The field of microfinance institutions (MFIs) is still a fairly recent topic in economic research. The most important finding in the last two decades in the world of finance did not come from the world of the rich or the relatively well-off. More important than the hedge fund or the liquid-yield option note was the finding that the poor can save, can borrow (can indeed decide on loans to fellow poor), and will certainly repay loans. This is the world of microfinance (R Srinivasan and M S Sriram, 2013). Lack of access to credit is generally seen as one of the main reasons why many people in developing economies remain poor. Usually, the poor have no access to loans from the banking system, because they cannot put up acceptable collateral and/or because the costs for banks of screening and monitoring the activities of the poor, and of enforcing their contracts, are too high to make lending to this group profitably. Since the late 1970s, however, the poor in developing economies have increasingly gained access to small loans with the help of so-called microfinance programs (Niels Hermes & Robert Lensink, 2007).

The way of explaining microfinance varied with time, region and among scholars. For example, explanation of microfinance as provided by Robinson, (1998) is, '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'. However, many of writers in the field defined microfinance as the provision of financial services to low-income people. It refers to a movement that envisions a world where low-income households have permanent access to high-quality and

affordable financial services to finance income-producing activities, build assets, stabilize consumption and protect against risks.

The microfinance sector differs mainly from other financial sectors in that microfinance addresses clients who are less financially rewarding or are not in conventional banks' interest. MFIs serve poor populations which cannot post any collateral or other financial securities with microfinance services, such as small-sized loans, often \$100 or even less, so called micro credits (Reno-Weber, 2008). As mentioned by Robinson M., (2001) and as cited by Yoshi Fukasawa, et al.,(2011), the success of MFIs is based on their two main goals: the group-lending concept and teaching self-help to the poor.

The term microfinance is of recent origin and is commonly used in addressing issues related to poverty alleviation, financial support to micro-entrepreneurs, gender development etc. There is, however, no statutory definition of micro finance. The taskforce on supportive policy and Regulatory Framework for Microfinance has defined microfinance as "Provision of thrift, credit and other financial services and products of very small amounts to the poor in rural, semi-urban or urban areas for enabling them to raise their income levels and improve living standards". The term "Micro" literally means "small". But the task force has not defined any amount. At the meantime, the narrower definitions try to equate microfinance with microcredit, following early practice of NGO credit schemes. Microcredit is the provision of small loans to poor households and small business operators with or without guarantee (Degefe Duressa Obo, 2009).

2.3 The Development of Microfinance Institutions

The history of informal financial institutions, especially private money lending, can be traced to ancient Egypt and the Middle East. The Old Testament documents restriction on lending for interest among the Jews and describes morality issues related to collateral from the poor. (e.g. in the books of Deuteronomy, 23:20; 24:10-13, and Ezekiel, 18:8, 12,13,18) Thus, money lending to the poor with or without

collateral must have been widely practiced, not only for commerce, but also for private consumption, since the provisions in these books of laws at the time were attempts to regulate the practice along religious and moral values, rather than to prohibit them (Degefe, 2009).

Although microfinance has existed for centuries in various forms, the development of distinct MFIs came into prominence in the 1980s after the emergence of the Grameen Bank, which developed strategies and lending techniques that influenced microfinance organizations all over the world (Vicki Bogan, et al., 2007). Hence the idea to establish microfinance institutions traces back to Muhammad Yunus, who developed it as a way to eradicate poverty in his home country Bangladesh. Accordingly, the first Microfinance operation started approximately 33 years ago in South Asia. In 1983, he founded Grameen Bank, the first institution which realized this concept and started to operate in the microfinance business in the proper sense (The Norwegian Nobel Committee, 2006). According to Kannan, et al., (2013), however, the history of microfinance has been traced back as far as the middle of the 1800s, when the theorist Lysander Spooner was writing about the benefits of small credits to entrepreneurs and farmers as a way of getting people out of poverty, when he founded the cooperative lending banks to support farmers in rural areas.

Major adaptations of what we call today “microfinance” began to appear in the early 1900s in parts of rural Latin America (Global Envision, 2006). While the goal of such rural finance interventions was usually defined in terms of modernizing the agricultural sector, they usually had two specific objectives: increased commercialization of the rural sector, by mobilizing “idle” savings and increasing investment through credit, and reducing oppressive feudal relations that were enforced through indebtedness. Accordingly during this period many of these institutions transformed themselves into formal financial institutions in order to access and lend client savings, to enhance their outreach (<http://www.cgap.org>).

Armendáriz de Aghion, et al.,(2004) indicated that, the modern expression of the term “micro financing” has roots in the 1970s when organizations, such as Grameen Bank of Bangladesh with the microfinance pioneer Muhammad Yunus, were starting and shaping the modern industry of micro financing. Through Grameen Bank, the modern microfinance pioneer, Yunus, was able to offer access to very small amounts of capital with no collateral requirements and at a very low interest rate, which was almost unheard of when the loan is provided to the poor. In the meantime, experimental programs in Bangladesh, Brazil and a few other countries extended tiny loans to groups of poor women to invest in micro-businesses. This type of microenterprise credit was based on solidarity group lending in which every member of a group guaranteed the repayment of all members (Global Envision, 2006). These "microenterprise lending" programs had an almost exclusive focus on credit for income generating activities, in some cases accompanied by forced savings schemes, targeting very poor (often women) borrowers. Since the mid-1990s, as Global Envision, (2006) underscored, the term "microcredit" began to be replaced by a new term “microfinance” that emerged to include not only credit, but also savings, insurance, payments, remittances and other financial services. There are number of institutions, such as donor agencies, international NGOs and research institutions, which have played an important role in developing microfinance programs and institutions by supporting microfinance initiatives financially.

As noted by no. 40 of CGAP, and cited by Hashemi, et al., (2005),microfinance institutions in sub Saharan Africa (SSA) and the developing world have over the years attracted and received billions of US dollars (valued at over US\$4 billion annually worldwide) in subsidies and concessionary funds. CGAP, (2010) research reveals that the stock of foreign capital investment in the microfinance sector has more than tripled in the years since 2004, much of it drawn by the sectors’ seemingly strong growth and reputation for doing good. MFIs in low income countries seem to rely a lot

on subsidies and other forms of discounted financial support (Hudon, M and Traca, D., 2008).

2.4 Microfinance Institutions and their development in Ethiopia

Initially, micro-credit in Ethiopia has started as a government and non-government organizations motivated plan. Following the 1984/85 severe drought and famine, many NGOs started to offer micro credit along with their relief activities although this was on a limited scale and not in a sustained manner (Alemayehu, 2008)

According to the report (Micro-finance Development Review, 2000), the first micro-finance service was introduced as an experiment in 1994 when the relief society of Tigray attempted to rehabilitate drought and war affected people through rural credit scheme

Non-governmental credit schemes and informal sources of finance such as Rotating Saving and Credit Associations, known as Iquub and Iddir, and money lenders have existed in Ethiopia for many years (Aredo D., 1993). After economic liberalization in 1994, poverty and food insecurity led the government to adopt microfinance as a prime component of its new economic development agenda. The government, supported by international development community (bilateral donors, international NGOs, multilateral projects), promoted microfinance in the context of the poor performance of traditional banks in supplying suitable financial products for small farmers. As in many developing countries, the banks had focused on granting medium-and long-term credits to more solvent clients.

A key component of Ethiopia's development strategy is the establishment of sustainable microfinance institutions serving large numbers of poor people. While non-governmental organization (NGO) credit schemes and informal sources of finance have existed in Ethiopia for many years, the government instituted a legal and policy

framework for MFIs in 1996 through Proclamation 40/1996 (GebrehiwotAgeba, 2002) as cited by (SIDA, 2007). Since then, 36 MFIs have registered and licensed with the National Bank of Ethiopia and operate under the backing of this Proclamation(NBE, 2015)

Although the development of microfinance institutions in Ethiopia started very recently, the industry has shown a remarkable growth in terms of outreach particularly in number of clients, 3.8 million borrowers, depositors 3.4 million(MIXMARKET, 2015). According to MoFED, (2002), Ethiopia is one of the 70 countries that developed a poverty reduction strategy paper (PRSP). This PRSP is becoming the operational framework to translate the global MDG targets into national actions. This document is serving as a practical building block to address the country's challenges. As per the UN declarations, by the year 2015, the poverty situation of the country should decrease by half from its level in 1999. In the PRSP document, institutions and the political economy of society are considered key in influencing economic growth and its impact on poverty. It also indicates that reform of the legal system, enforcing contracts, ensuring property rights, reducing conflicts (internal/external), and improving the efficiency of the bureaucracy can generate a growth pattern that ensures faster reduction of poverty and the achievement of the Millennium Development Goals in the country (MoFED, 2002). In the document, microfinance is indicated among the specific means that is given greater emphasis and is expected to play essential role for reducing poverty in rural areas of the country where the bulk of its populace dwell. Thus, most of the microfinance services providing institutes have articulated creating a small and easily accessible loan to the poor as their primary objective with the expectation of fostering pro-poor-growth. Hence, dealing with the sustainability of MFIs in Ethiopia is of a paramount importance to bring the MDG objectives feasible in relation to the emphasis given to the MFIs sector.

2.4.1. Legal Framework for MFIs

The legal framework governing microfinance Institutions (MFIs) in Ethiopia comprises the Commercial Code of Ethiopia, proclamations issued by Government of Ethiopia (GOE) (Proclamation No. 40/1996, and Proclamation No. 147/1998) and directives issued by the National Bank of Ethiopia. Microfinance institutions are required to incorporate as share companies in accordance with the provisions of Article 304 of the Commercial Code of Ethiopia. The applicable Articles of Proclamation No. 84/1994 dealing with the licensing and supervision of banking business and the Commercial Code of Ethiopia also provide the needed legal framework for incorporation and operation of MFI as well as their regulation and supervision by the National Bank of Ethiopia.

2.4.2. The Commercial Code of Ethiopia

The Commercial Code of Ethiopia clearly defines the manner of incorporation, governance and operation of all commercial companies and provides the criteria for formation, governance and winding up of such companies. The duties and responsibility of the shareholders, directors and the Chief Executives are also explicitly stated. The Commercial Code also provided that the elected board of directors is the decisive governing body of a share company next to the general assembly of shareholders, and accordingly is expected to safeguard the financial and business interests of the shareholders. The Commercial Code also defines share and the rights and duties of shareholders (Itana et. al., 2003).

Prudential financial regulation according to Chaves and Gonzaliz - Vega (1994) has three major objectives (i) ensure the solvency and financial soundness of all intermediates; in order to project the stability of the country's payment system (ii) provide consumer (for example depositor) protection against undue risks that may arise from failure, fraud, or opportunities behavior on the part of the suppliers of financial services and (iii) promote the efficient performance of institutions and markets and the proper working of competitive market forces (Wolday 2000).

Until very recently, the formation and governance of MFIs in Ethiopia were governed by the Licensing and Supervision of MFIs Proclamation (Proclamation No. 40/1996). This law is now repealed and replaced by the Micro Financing Business Proclamation (Proclamation No. 626/2009, herein after the MFI Proclamation). In addition, there are quite a few directives issued by the NBE that are still applicable. The Proclamation in force makes reference to the Commercial Code of Ethiopia when it requires MFIs to be established in the form of a share company. When it comes to governance, we find provisions in all the above legal instruments.

2.4.3. Governance and framework of MFI ownership

In Ethiopia, MFIs are to be established in the form of share companies as defined under article 304 of the Commercial Code (CC). The Code defines a share company as “a company whose capital is fixed in advance and divided into share and whose liabilities are met only by the assets of the company.” The NBE registers and licenses MFIs upon the latter fulfilling the requirements set by the MFI Proclamation and directives.

A share company may not be established by fewer than five shareholders (Article 307 CC). An initial capital of ETB 200,000 is required to form an MFI. Like in the other financial services sub-sectors, capital/share of MFIs must be fully owned by Ethiopian nationals and registered under the laws of and having their head office in Ethiopia (Article 2(3) Proclamation No. 626/2009). Foreigners must not own an MFI, fully or partially. Any foreign national or organization fully or partially owned by foreign nationals may not be allowed to establish an MFI. Open branches or subsidiaries of a foreign micro-financing institution in Ethiopia or acquire the shares of an Ethiopian MFI (Article 25 of Proclamation No. 626/2009). This rule is a confirmation of what is seen in the investment regulation (Investment Regulation 84-2004).

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

top of that, the transaction costs and risks involved in serving poor households are perceived to be too high. In addition, even if there are few private banks that are interested in providing financial services to poor households, they have not developed yet a suitable credit methodology for micro lending activities and they do not have trained personnel for that (EBDSN, 2004).

The first micro-finance service was introduced as an experiment in 1994 when the relief society of Tigray attempted to rehabilitate drought and war affected people through rural credit scheme (Micro-finance Development Review, 2000).

Governance refers to a system of check and balance whereby a board of directors is established to oversee the management of the MFIs. The board of directors is responsible for reviewing, confirming and approving and plans and performance of the senior management, ensuring that the vision of the MFI is maintained or fulfilled (CGAP, 2000).

Discussions on corporate governance have largely centered around large firms and in most cases in advanced economies. Stephen and Backhaus (2003) have highlighted that the problem of corporate governance is that of ensuring that enterprises operate in the interest of their owners and not the interests of managers and this emanates from the concept of separation of ownership and control. We focus on corporate governance because we believe the measures of corporate governance employed each have the ability to substantially influence the ability of investors to pressurize management to efficiently use resources available to microfinance institutions (MFIs). It is believed that, good governance generates investor goodwill and confidence. Thus corporate governance has been identified to have a significant impact on the performance of firms. For instance, Dittmar and Mahrt-Smith (2007) show that good corporate governance is able to double the value cash holdings of firms as compared to poorly governed firms. They again show that the market value of excess cash for well-governed firms is about one half times of the market value of excess cash of poorly governed firms. More interestingly it is shown that well governed firms have

their cash resources better “fenced” in and that firms with poor corporate governance structures dissipate excess cash more quickly Dittmar and Mahrt-Smith (2007). In other studies, Pinkowitz et al. (2006) in their study on governance, cash and dividends show that good corporate governance enhances the value of cash holdings. Thus, it is clear that poorly governed institutions are less efficient in their performance. The value and contribution of the current study to the evolving literature on governance is not directly looking at cash holdings, but to show how good governance is essential for outreach and profitability of MFIs.

According to Ledgerwood, J. (1999), Microfinance has evolved as an economic development approach, intended to benefit low-income women and men. The term may also refer to the provision of financial services to low-income clients, including the self-employed. Financial services generally include savings and credit; however, some micro-finance organizations also do provide insurance and payment services. In a nutshell, the term microfinance could be defined as not simply banking; rather it involves making financial resources available to the productive poor. It must be pointed out that for microfinance to perform a creditable function as a poverty reduction and development tool, governance is of critical importance.

2.5 Performance of MFIs

Performance of an institution or a company shall be measured not only from the objectives of the organizations angle, but also from the industry average. The goal of MFIs is to reduce or eradicate poverty by giving access to the poor financial resource and by creating awareness for resource utilization. In the early days when MFI started, they were financed by donor funds that have a poverty eradication goal. As explained by Melkamu Woldeyes, (2012), hence the performance of the MFI was measured on how much MFI reach to the poor (outreach) and impact (how far the lives of those who get financial services are changing as compared to those who don't get these services).

However, those days, the performance of microfinance institutions was being measured by different parameters. For instance Richard Rosenberg (CGAP) has indicated Core performance indicators of microfinance institutions written for staffs who design or monitor projects that fund microfinance institutions (MFIs). He offers basic tools to measure performance of microfinance institutions in a few core areas: Breadth of Outreach: number of clients being served, Depths of Outreach: poverty level of the clients, Collection performance: performance of an MFI in collecting its loans, Financial sustainability: profitability to maintain and expand services without continued injections of subsidized donor funds, Efficiency; performance in controlling the administrative costs. These are general measures in which the performance should be considered.

2.6 Perspectives in Performance Measures

The various perspective on which the MFI performance is to be measured has created two contrasting but having the same goals school of thought about the MFI industry: the Welfarist approach and the Institutionist approach.

2.6.1 The Institutionist

According to the Institutionist school thought financial deepening is the main aim of microfinance. That is, the setting up of a separate system of “sustainable” financial intermediation for the poor who are either neglected or are underserved by the formal financial system. The activists of this school of thought give emphasis to more on the achievement of financial self-sufficiency, breadth of outreach (numbers of clients), depth of outreach (levels of poverty reached) and positive client impact. The interest of the approach is that the institutions abstain from all kinds of subsidies as they insist on financial self-sufficiency (Nelson, 2011).

The institutionists focus and believe that in order to effectively fight the problem of poverty, it is necessary to build a microfinance industry as a system in which able to reach a large number of people. In order to reach a large number of people a huge amount of financial resources should be contributed from

MFIs themselves instead of donors provide is necessary. The institutionists start from the basic and obvious assumption that donors cannot subsidize enough MFIs to let them provide financial services to all of the potential microfinance clients. They also believe that the only way to overcome this constraint is to attract Private sources of capital and this in turn requires MFIs to be sustainable and profitable (Elia, M. 2006). According to this point sustainable financial institutions that provide financial services to the poor are necessary if the main goal is a substantial poverty reduction. The emphasis not on depth of outreach (level of poverty of clients) rather must be put on breadth of outreach (number of clients reached). If the system is not able to increase the number of clients reached, it would fail the target of poverty reduction. Furthermore, institutionists believe and focus that if the approach of building sustainable MFIs is used the poorest will also benefit from it, while the other way around of targeting the poorest with highly subsidized programs will have a low overall impact due to the limited and unstable donor funding. The institutionist position has clearly obtained success within the microfinance community (Elia, M. 2006)

2.6.2 The Welfarist School

Self-employment of the poorer of the economically active poor, especially women is their main objective. Their interest depends in the “family” and they give more emphasis on the depth of outreach (the levels of poverty reached). They are more concerned with the use of financial services to minimize the effects of acute poverty among individual participants as well as communities. The focus of this school of thought is on the unexpected improvement in the well-being of participants. Though there are significant lines of differences between the two schools of thought, they have some similarities as well. In as much as the two approaches seek to solve the problem of financial needs of the poor, microfinance activities should aim at achieving the objectives of the two approaches (Nelson, 2011).

The welfarist approach focuses on depth (number of clients reached) rather than breadth of outreach (poverty level of clients) and accept subsidies on an ongoing basis. Welfarists accept subsidies as they believe and focus that if sustainability is considered as a necessary requirement, the accomplishment of the social mission of microfinance is at risk. The center of attention is now the clients that are served rather than the institution or developing self-sustained industry and also the welfarist accept the subsidies or required subsidies on ongoing basis and this school not just focuses on financial self-sufficiency as a necessary tool (Elia, M. 2006).

2.7 Financial resources of MFIs

2.7.1 Savings and deposits

Internationally micro saving products, also known as retail deposits, offered by MFIs serve as a low cost source of funding and are a common practice in countries like the Philippines, Uganda, Pakistan, Peru and Kenya ('Funding Sources for Microfinance Institutions .'). Most governments only allow microfinance banks to offer micro saving products and prohibit other MFIs from raising deposits. The potential pitfall of these deposit products is that MFIs may fail to provide instantaneous liquidity.

2.7.2 Individual philanthropic sources and social investors

Non-profit investors, such as individuals interested purely in the social impact of microfinance, often lend their own money to MFIs through peer-to-peer online platforms, internationally the most famous of which are Kiva and MicroPlace('Funding Sources for Microfinance Institutions.'). Similarly, high net worth individuals who are interested in philanthropy often give away great sums of money to MFIs, in acts known as 'venture philanthropy'. Social investors are individuals or institutions (high net worth, foundations, endowments, and retirement plans) which choose to apply non-financial characteristics to their investment

decision making. These non-financial characteristics are often related to the investors' value system or social mission, and may include concern for environmental protection, social and economic development of the poor, education and health, as priorities. For example, in India Rang De, an MFI raises money from social investors. Commercial institutions also participate in such social investment. For example, Citibank provides charitable contributions to three local MFIs in Haiti to help

2.8. Financial Performance of MFIs

MFIs earn financial revenue from loans and other financial services in the form of interest fees, penalties, and commissions. Financial revenue also includes income from other financial assets, such as investment income. An MFI's financial activities also generate various expenses, from general operating expenses and the cost of borrowing to provisioning for the potential loss from defaulted loans. Profitable institutions earn a positive net income (i.e., operating income exceeds total expenses). For the purpose of this review and to account for the institutional scale of operations, financial revenue and expense indicators as well as returns are compared against the institution's assets (MIX, 2005, 9).

Effective financial management requires periodic analysis of financial performance. Performance indicators collect and restate financial data to provide useful information about the financial performance of an MFI. By calculating performance indicators, donors, practitioners, and consultants can determine the efficiency, viability, and outreach of MFI operations.

The achievements of MFIs are examined through the lenses of standard industry performance metrics over a series of variables: Outreach (breadth and depth), financial structure, financial performance, efficiency and productivity, and portfolio quality (Lafourcade, et.al, 2005, 6).

Several levels of sustainability can be applied to microfinance. In general, the first stage, operational sustainability, is referred to when a microfinance institution covers

its administrative costs and loan loss expenses from its client revenues. A second level of sustainability, referred to as financial sustainability, is attained when an institution which is operationally sustainable is able to cover the cost of funds, including inflation. By borrowing from a commercial bank, the equity of the MFI is leveraged, and the institution is able to pay the additional cost of commercial borrowing from its income stream. Financially sustainable institutions can become licensed financial institutions. The implications of getting such license are considerable, since MFIs which have reached this stage can raise resources from their national financial market and are likely to have access to rediscount lines from central banks, in amounts that are five to ten times their equity (UNCDF, 1999, 12).

Zeeler and Meyer (2002, 4) indicated, "Measuring financial sustainability requires that MFIs maintain good financial accounts and follow recognized accounting practices that provide full transparency for income, expenses, loan recovery, and potential losses."

2.9 Sustainability of MFIs

According to Letenah, (2009) sustainability is defined as the ability of a MFI to cover its operating and other costs from generated revenue and provide for profit. It is an indicator which shows how the MFI can run independent(free) of subsidies. This change in emphasis has created a different perspective on the analysis of performance of the MFIs.

In micro-finance, sustainability can be considered at several levels of institutional, group, and individual and can relate to organizational, managerial, and financial aspects (Rao, 2001) as cited by (Kimando, et al., 2012). However, the issue of financial sustainability of microfinance institutions has attracted more attention in mainstream analysis for its contribution to poverty reduction. Sustainability is loosely defined as the ability of a MFI to cover its operating and other costs from generated revenue and provide for profit. It is an indicator which shows how the MFI can run free of subsidies (Melkamu Woldeyes, 2012). This change in emphasis has

created a different perspective on the analysis of performance of the MFIs. Today many key players in the industry use sustainability as one core criteria to evaluate the performance of MFI besides the outreach other impact measures described earlier.

In the early days when MFIs established, their finance was from donation or grants from those donors who have set their goal as eradication or reduction of poverty. Diverse literatures noted that sustainability is one of the areas that need to be assessed to enhance the full functioning of microfinance institutions. This brought the need for MFIs to be measured on how much MFI reach to the poor and how far the lives of those who get financial services are changing as compared to those whodon't get these services. But as the MF industry grows in size, the need for increased financing coupled with unpredictability of donor funds trigger the issue of building a sustainable MFIs that stand on their own leg.

2.10. Determinants of sustainability: Theoretical reviews

2.10.1 Source of funding (Financing structure)

Financing structure is a financial tool that helps to govern how firms choose their funding structure. Most MFIs in the world started off as NGOs and had built substantial supply side competencies which makes funding structure had no relevance. However, with development and commercialization, MFIs are spanned off to become fully independent, the *enigma* of funding structure that will ensure sustainability becomes relevant. During any time of financial or banking crisis, when bailout aid is available, questions of capital structure become more salient. What is the best mix of grant, debt and equity funding which will ensure solvency and self-sufficiency? The question of optimal capital structure for MFIs, particularly ones with access to grant funding, is an open and substantial question (Bogan, et al., 2007).

2.10.1.1 Grants as an element of MFIs' funding sources

Bogan (2009) noted that existing research places the evolution of MFI funding sources within the context of an institutional life cycle theory of MFI development. According to this framework of analysis, most MFIs start out as NGOs with a social vision, funding operations with grants and concessional loans from donors and international financial institutions that effectively serve as the primary sources of risk capital for the microfinance sector. In recent years, there has been increasing internal and external pressure for the MFIs to decrease dependence on subsidized or grant funding. For example, ACCION International, an organization designed to support MFIs, helps MFIs obtain equity financing, debt financing, and other commercial funding instruments. By enabling MFIs to link directly with investors and commercial banks, ACCION strives to help them become independent of donor funds. Over the past decade ACCION has been highly influential in encouraging donors to subsidize start-up costs only and pushing for MFIs to have a commercial focus (Armend´ariz de Aghion, B., &Morduch, J., 2004). Since donor funds are limited in amount, reliance on this source of funding limits the ability of MFIs to expand to meet rising demand for services. There is also a question as to whether reliance on donor funds allows MFIs to avoid pressures to operate efficiently. Commercially-funded MFIs respond to the profit incentive, working to increase revenues and decrease expenses so that they can have revenues sufficient to cover all operating expenses.

MFIs with access to donor funds may not respond to these pressures to operate efficiently or may deliberately choose outreach over efficiency by serving poor or rural clients with higher delivery costs (Armend´ariz de Aghion, B., &Morduch, J., 2005).As explained by, Bogan, et al(2007), despite keen interest in possible links between funding sources and operational sustainability and studies of relative profitability of individual institutions, there have been no systematic studies that provide robust evidence of how variations in funding or institutional structure affect the sustainability for a larger group of MFIs.

2.10.1.2 Leverage (Debt to Equity ratio)

Debt to equity ratio is the simplest measure firm leverage and believed as the drivers of MFIs sustainability and efficiency. Although maintaining best mix of debt and equity is still the subject of intense debate among scholars, three popular theories are emerged to define the appropriate mix of equity and debt so as to enhance firms' return and efficiency. In 1958 Modigliani and Miller published a seminal work in capital structure where they concluded to the broadly known theory of "capital structure irrelevance" where the capital structure is irrelevant to firm performance in perfect capital markets. This view is further supported by Berk&DeMarzo (2007) when they argued that the law of one price implied that leverage would not affect the total value of the firm. Instead, it only changes the allocation of cash flows between debt and equity, without changing the total cash flows of the firm. The Modigliani and Miller theorem holds true under the assumption of a perfect capital market, which means: individuals and firms trade at the same, no taxes exist and no transaction costs exist. However this scenario are unlikely to happen in real world particularly in the MFI sector under which all these assumption cannot be hold true and less straight-forward. The basic MM principles are applicable to MFIs, but only after accounting for the fundamental differences in how MFIs and corporations operate (Cohen, 2003).

The manner in which revenues are generated and the nature of regulation for an MFI are markedly different from that of a corporate firm. Consequently, the theoretical notion of an optimal capital structure for MFIs' to become solvent and sustainable is not very well-defined. The issue of grant money adds another layer of complication to the capital structure question for MFIs. Does grant money create moral hazard or incentive issues with respect to MFI towards sustainability? Thus, within the context of the MFIs capital structure discussion, one is required to consider issues similar to the grant versus concessional loan debate in the foreign aid literature (Bogan, 2009).

On the other hand the pecking order theory of capital structure is emerged as one of the most influential theories of corporate finance. The pecking order theory is popularized by Myers and Majluf (1984) when they argued that equity is a less preferred means to raise capital because when managers issue new equity, investors believe that managers think that the firm is overvalued and managers are taking advantage of this over-valuation. As a result, investors will place a lower value to the new equity issuance.

The order of preferences reflects the relative costs of the various financing options. In reference to this theory Mayer (2001) noted that the pecking order theory explains why the bulk of external financing comes from debt. It also explains why more profitable firms borrow less: not because their target debt ratio is low but because profitable firms have more internal financing available. Less profitable firms require external financing, and consequently accumulate debt. However in reference to pecking order theory many MFIs in Africa may represent an interesting scenario since retained earnings are zero and perhaps following the pecking order MFIs may opt for debt since quite a number of them have no access to capital market. If evidence found that is consistent with the pecking order theory then our results should highlight a negative relationship between leverage and MFI sustainability (James, 2003).

The monotonic increase of debt for higher tax shield increases bankruptcy cost especially when profitability of the firm is low and fluctuating. This leads to 'trade off' theory of capital structure that postulates an optimum debt level or target level, where the marginal increase of present value of tax saving is just offset by the same amount of bankruptcy cost. The tradeoff theory says that the firm will borrow up to the point where the marginal value of tax shields on additional debt is just offset by the increase in the present value of possible cost of financial distress.

According to Myers(2001) financial distress refers to the costs of bankruptcy or reorganization, and also to the agency costs that arise when the firm's creditworthiness is in doubt. Although difficult to determine the exact debt target

level objectively in microfinance, because of MFIs industrial organization, trade off theory explains that there is a limit to debt financing and the target debt may vary from MFI to MFI depending on profitability, among a host of other factors. Consistently, profitable MFIs with lot of tangible asset that can be offered as collateral for debt may have a higher target debt ratio. Simply put high proportion of fixed interest capital to equity would imply that the MFI is highly indebted and therefore risks becoming insolvent increases. On the other hand highly leveraged MFIs may perform better by enjoying scale economies, enhancing their ability to boost profitability (James , 2003).

2.10.1.3 Deposit mobilization (Deposit to loan ratio)

Sustainability of MFIs depends on their saving mobilizing capacity. Deposit to loan ratio is an important indicator for MFIs that mobilize deposits. Deposit to loan ratio measures that portion of the MFIs' portfolio funded by deposits. The higher the ratio the greater is the MFIs' capability to fund it loan portfolio from its deposits and enhances commercialization of microfinance operation. Thus higher ratio brings down the cost of funds and helps MFIs to rely on internal funding. Deposit mobilization has now becoming more important in Ethiopia as commercial banks seem to be reluctant to fund MFIs' portfolio through their debt. Some commercial banks lent to MFIs, with strong third party guarantee (AEMFI, 2014).

2.10.1.4 Capital to Asset Ratio

The capital to assets ratio is a simple measure of the solvency for the financial institution. It is used to assess an MFI's ability to meet its obligations and absorb unexpected losses. For the regulated MFIs, there is a minimum solvency requirement stipulated by the regulator. The requirement of minimum capital to assets ratio depends on an MFI's assessment of its expected losses and its financial strength to absorb such losses. Expected losses should be covered through provisioning under the MFI's accounting policies. The capital to asset ratio measures the amount of

capital required to cover additional unexpected losses and ensure that the MFI is well capitalized for potential shocks. Some lenders or investors may stipulate minimum capital to assets ratio for which they invest MFIs.

According to the Consultative Group to Assist the Poor (CGAP), MFI should be subject to even higher capital maintains a ratio than banks in the light of risks and vulnerability of MFI loan portfolio. They further advise MFIs to maintain a ratio up to 20 percent with subsequent performance-based relaxation to 12-15 percent. Ethiopian MFIs maintained an average capital to asset ratio of 36 percent. This is relatively higher, thanks to the contribution of donor-equity to MFIs and the policy of the government which exempts MFIs with social objectives (which are not distributing dividend to shareholders from paying profit tax).

2.10.2 Firm characteristics: scale of operation (gross loan portfolio)

Vingo (2012), stated that, in commercial microfinance, scale of operation refers to the scale of financial products and services provided to the poor by MFIs. The quality and the level of financial products and services are likely to be adapted to meet the demands of the poor which ensures that the right financial products and services are provided to the right people. According to Microbanking Bulletin No.19 (2009), the criteria for defining MFIs' scale of operation are based on their gross loan size. Accordingly MFIs having gross loan portfolio of greater than \$8 million can be considered into large scale MFIs, medium MFIs do have gross loan size of \$2million to \$ 8million and small scale MFIs do have gross loan size less than \$2 million. Gross Loan portfolio can be used as a proxy to measure the scale of an MFI and it has positively related to sustainability (Vingo, 2012). According to him an increase in outstanding loans (scale of operation) tends to help MFIs achieve higher self-sufficiency. However, he noted that due to diseconomies of scale, large scale operation could lead to an increase in the unit cost and there is also a limit of scale due to bounded rationality.

2.10.3 Macroeconomic factors

Understanding the linkages between overall country's macroeconomic level and MFIs sustainability can make MFI evaluation more accurate and, further, can help to locate microfinance in the broader picture of economic development. Furthermore, understanding the macroeconomic impact on MFIs may also help a growing number of investment funds that target their financial resource toward MFIs, sometimes with the dual goal of earning returns for investors and achieving social impact.

Evidences arise for strong relationship between MFI performance and the broader economy. Christian, et al. (2009) has explained that, MFIs are more likely to cover costs when growth is stronger; and MFIs in financially deeper economies have lower default and operating costs, and charge lower interest rates. There is also evidence suggestive of substitutability or rivalry. For example, more manufacturing and higher workforce participation is associated with slower growth in MFI outreach (IBID).

The suggestion of most of the previous empirical studies is that macroeconomic variables are based primarily upon an economic tradition, emphasizing the importance of external market factors in determining firm's success. These typically include inflation, GDP growth rate, GDP per capita, GNI per capital, population, unemployment rate and interest rate differentials. For example Vingo (2012) indicated that the common approach has been to study the impact of macroeconomic factors by investigating the impact of GDP growth and inflation on performance. The inflation indicator refers to a rise in the general level of prices of goods and services in an economy over a period of time. Overall, the country context appears to be an important determinant of MFI performance (Christian Ahlin, et al., 2009).

2.11 Empirical evidences on drivers of sustainability of MFIs

Common financial viability indicators used in past studies are Financial Self-Sufficiency (FSS), Operational Self-Sufficiency (OSS), and even the profitability ratios such as Return on Asset (ROA), Return on Equity (ROE) (Ayele, 2014). A financially viable MFI will not rely on donor funding to subsidize its operation. Common indicators here include financial spread, Operational Self-sufficiency (OSS), and

Financial Self-sufficiency (FSS) (Melkamu Woldeyes, 2012). Various researches noted that, unless FSS ratio of 100% is reached, the long-term provision of credit services is undermined by the impact of inflation and the continued necessity to rely on donor funds.

As cited by Woldeyes (2012) in the works of Research in the field of sustainability has flourished since when more attention has been given to the long term aspect of microfinance which can widespread around developing countries only if lending to the poor is proven to be sustainable. Following the theoretical reviews, the sections below provides the empirical results on the determinants of financial sustainability revealed from various studies. As stated in the previous section of this paper the proxy for measuring sustainability is the financial self-sufficiency (FSS) ratios with their various explanatory variables of financing, firm characteristics, outreach indicators and macroeconomic factors of Ethiopian MFIs as suggested and applied by various studies in various jurisdictions.

2.11.1 Breadth of outreach

The breadth of outreach refers to the number of poor served by a microfinance institution (Hishigsurem, 2004). Various studies have used the number of borrower as a measure of microfinance breadth of outreach. Regarding breadth of outreach, LOGOTRI (2006) found that larger number of borrowers is the biggest sustainability factor, on the contrary, Nyamsogoro (2010) on Tanzanian microfinance institutions reports negative and significant relationship between breadth of outreach and financial sustainability indicating that increase in number of borrower itself does not improve financial sustainability of microfinance institutions. The reason could be increased inefficiency as a result of increased number of borrowers. However, Hartarska (2005) reports that number of borrowers had no significant impact on financial sustainability. The empirical evidence regarding the relationship between size and MFIs' sustainability shows a

positive association. Studies by Nyamsogoro (2010), Bogan (2008), Mersland and Storm (2007) and Cull et al (2008) show that size is positively and significantly related to financial performance reflecting the cost advantages associated with size (economies of scale).

The study made by Alain et al (2007) confirms the fact that increasing the number of borrowers per MFI would lower the average operating cost and would raise total operating costs less than proportionately with the number of borrowers. This is a clear indication for an increasing the number of borrowers per field officer would raise the sustainability indicators in FSS and.

Alain et al (2007), also indicated on their finding that increasing the number of borrowers per field officer seems to be the most promising way to reduce costs, especially in group-based delivery models.

This would not hurt repayment despite a likely lightening of the monitoring. If scale economies can be found, it is thus primarily by extending the number of borrowers, not by abandoning the depth of the coverage, i.e. not by abandoning the focus on the poor. Therefore, the number of active borrowers influences the operational and financial sustainability of microfinance institutions positively according to this finding. Another result of work by Mersland et al (2007), on the impact of the number of active borrowers indicates there is a notion that implies the existence of positive relationship between the active number of borrowers and the sustainability of microfinance institutions, even though the relationship is not clearly indicated by them.

2.11.2 Grants and deposit mobilization

Many studies undertaken around the world underscored the importance of financing structure or funding sources on sustainability. Studies undertaken by Sekabira (2013) hypothesized that grants and debts erode sustainability whereas share capital

and assets improve it and found the same result as predicted. He argued that government policy must limit MFIs access to grants and debts.

The study recommended that terrible financial need by small holders must only be solved through direct aid to the needy such as food stamps, universal education, health care and others. The same author concluded that banking policy must premier share capital accumulation by MFIs and their close monitor by central banks. However, the author argued that if terms and conditions under which grants are disseminated change to optimal level, grants may have a positive influence on MFI sustainability, though changing grant's terms may seriously jeopardize short term objectives and intended purposes of grants. While Bogan (2009) and Magali (2012) found the same result that grants erode sustainability.

On the other hand Ravicz, et al(1998)claimed that microfinance initiatives can reduce, and even eliminate the need for subsidies if they achieve a significant volume of business so that they can be sustainable. Bogan (2009) claimed that the negative effect of grants were a particularly meaningful result given that it is consistent with a growing view that MFIs should rely less on grants, soft loans and other types of donor funds. However, many understood that, the negative impact of subsidies was more recognized when many MFIs faced liquidity problems during the financial crises. As rising financial costs and the fluctuations of exchange rates affects MFIs who rely on external finance, many of the MFIs have started to fund at least part of their lending activity by using local savings .This was indeed supported by CédricLützenkirchen (2012) when it found that many institutions were able to achieve high growth rates by retaining profits and by attracting additional funds from commercial sources rather than subsidies.The Deutsche Bank claimed that over time, an increasing share of institutions no longer depended on donations to expand their business, although many MFIs still benefit from them. This has indeed led to the importance of savings on MFI sustainability.

In appreciating the impact of savings on sustainability, Morduch and Haley (2002) also argued that savings help MFIs to achieve independence from donors and investors, which is particularly important in periods of liquidity. Vingo (2012) gave reference to Gozalez and Meyer (2009); Wright and Elser et al., (1999) to understand that deposits are more than half of the total assets reported by financial institutions that have deposit mobilizations because depositors enjoy certain benefits, such as access to loans constraints. This makes savings a relatively low cost of funds and hence increasing sustainability. This view is also appreciated by Vingo (2012) when he argued that deposits are a relatively stable and low-cost source of funds. He concluded that profitable and regulated microfinance institutions which take on considerably more commercial funds are shown to have higher sustainability which in turn emphasizes the negative impact of subsidies on sustainability.

Therefore, based on these empirical evidences and theoretical reviews, with few empirical exceptions, many of the reviews point to the fact that while subsidies erode sustainability, mobilizing deposits to support loans enhance sustainability

2.11.3 Cost per borrower

The cost per borrower is defined as the operating expenses divided by an MFI's average number of borrowers. The result of the study made by Yoshi et al (2011), the lower cost per borrower implies that an MFI is more efficient to reduce the borrowing cost. Therefore, MFIs with a lower ratio have a higher OSS, and negatively related to the FSS and OSS of a given MFI, leading to a negative sign for the coefficient.

The finding by Nyamsogoro (2010), indicates that there is a negative coefficient but statistically insignificant relationship between cost per borrowers and financial sustainability of microfinance institutions in Tanzania. The insignificant effect of the staff cost per borrower on the financial sustainability is contrary to the findings by

Woller and Schreiner (2002) they shows that salary levels significantly determines financial sustainability of microfinance institutions. This was also strengthened by the finding of Cull et al (2008) that staff cost per borrowers has a significant effect on the financial sustainability of microfinance institutions.

Based on these and Nyamsogoro (2010) on his finding concluded that the higher staff pay, all things remain constant, could lead them to more leisure than in doing more work for the MFIs“ main business especial where facilitation for field visit is very low. This can also help to explain why possibly the administrative expenses are positively related with financial sustainability. Furthermore, the results of the study made by Cull et al (2009) and Nyamsogoro (2010) show that a greater cost per unit of loan had significantly negative financial performance of MFIs in India, Ethiopia and Tanzania respectively. However, Kipesha & Zhang (2013) noted that reduction of cost per borrower enabled cooperatives MFIs in East Africa to attain the financial sustainability.

2.11.4 Debt to Equity ratio

Debt to equity ratio is calculated by dividing total liabilities by total equity. Total liabilities include all the MFI owes to others, including deposits, borrowings, accounts payable and other liabilities. Whereas total equity is total asset less total liability. It is the simplest and best known measure of capital adequacy because it measures the overall leverages of the institutions (AEMFI, 2014).

According to the performance analysis report of AEMFI (2014) the average value of debt to equity ratio of Ethiopian MFIs stood at 204% during the study periods. Moreover, it pointed out, traditionally MFIs’ ability to borrow from commercial lenders has been somehow limited. Based on the mix marketwebsite dated July 25, 2015, the average score of debt to equity ratio attained by MFIs of Central Africa, Eastern Africa, western Africa and the entire continent of Africa 4, 3.14, 2.15 and 2.41 Given the average debt to equity ratio scored by these sub African regions, Ethiopian MFIs appeared to score normal result of debt to equity ratio, but still managed to score

above the recommended threshold of 150% (AEMFI, 2012). However the maximum debt to equity ratio score of Ethiopian MFIs (11.15) appeared to look very high. Those MFIs scoring maximum DER should be vigilant because theories suggest that higher DER bound to exert pressure on profit margin (sustainability and efficiency).

Studies have been conducted to explain whether the capital structure determines the sustainability of microfinance institutions. Kyereboah (2007), for example, found that highly leveraged microfinance institutions have higher ability to deal with moral hazards and adverse selection than their counterparts with lower leveraged ratio. This states that high leverage and profitability are positively correlated. Bogan et al (2007) conducted a study to ascertain whether capital structure affects the financial sustainability of an MFI. They found that microfinance institutions capital structure were associated with their financial sustainability. The study by Nyamsogoro (2010) indicates that there is a positive correlation coefficient between the capital structure and financial sustainability of microfinance institutions. The more an MFI is equity financed compared to other sources of finance, the more the improvements in its sustainability in other words, although how the capital has been structured affects the financial sustainability (Bogan et al, 2007) having different source of capital does not improve the financial sustainability of microfinance institutions.

The results of a study by Hartarska and Nadolnyak (2007) show that financial performance is affected by the capital ratio, less leveraged MFIs have better operational self-sufficiency (OSS), perhaps, suggesting a link between donors' willingness to provide equity to MFIs that do well and prefer to extend loans to those MFIs that slack off. Thus, the result conforms to the notions that MFIs with bigger endowments would be more efficient because they do not need to adjust their mission in order to get additional capital. The research result by Dissanayake (2012) states that, there is strong significant negative correlation in Debt/Equity Ratio (capital structure) to Operational Self Sufficiency Ratio. This indicates that, change in

Debt/Equity Ratio (capital structure) is negatively contributing towards changes in to Operational Self Sufficiency Ratio significantly. In conclusion the researched postulate Debt/Equity is a statistically significant predictor variable in determining operational self-sufficiency and the correlation value between the variables indicates that, the change in the capital structure, negatively contribute towards changes in the operational self-sufficiency significantly.

2.11.5 Return on Asset (ROA)

Return on Asset indicates of how profitable a company is relative to its total assets. It is calculated by dividing net income after taxes and excluding any grants and donation by period average assets. It gives us an idea as to how efficient management is in using its assets to generate earnings. According to Wolday(2013), return on asset is the most common measure of profitability in banks and other commercial institutions. Rosenberg (2009) also stated that return on asset reflects that organizations' ability to deploy its asset profitably. Return on asset measures how well the institution uses all its assets and it is also an overall measure of profitability reflecting both the profit margin and the efficiency of the institutions (Ledgerwood, 1999). Many scholars indicated that is an intuition is best in use of its assets to earn profit, and efficient it is said to be financially viable and financially sustainable. Mohd et al (2014), have made a study on the determinants of performance and financial self-sustainability of Microfinance Institutions (MFIs) in Bangladesh. The study showed that ROA has a positive effect on Operational self-sufficiency and financial self-sufficiency of MFIs.

2.11.6 Loan portfolio

The findings of Magali(2013), shows that sustainability increases as the average loan size increases, indicating that, it is the large size of loans which makes the rural SACCOS sustainable or vice versa. It implies that the large size of loans lowers the operation costs for the rural SACCOS and hence increases the profitability. This

result was also confirmed Nyamsogoro (2010) and Quayes (2012) who revealed that large size of loan improves the sustainability of MFI and SACCOS. Similarly, Hermes et al (2008) found out that MFIs that have lower average loan balances were also less efficient. However, Zerai and Rani (2013) found that the correlation between the average loan size and OSS for Indian MFIs was found to be weak. Additionally, Nyamsogoro (2010) noted that disbursing high volume of loans increases the default risks.

2.11.7 Operating expense ratio (PAR)

The operating expense ratio is defined and described as the ratio of total operating cost to outstanding loan portfolio and thus calculated by dividing all expenses related to the operation of the MFIs (including all the administrative and salary expenses, depreciation and board fees) by the period average gross portfolio, interest and provision expenses (Wolday, 2013). According to the research finding of Nyamsogoro (2010), the lower the ratio, all things being constant, will imply efficiency and the ratio strongly affects the financial sustainability of microfinance institutions. This indicates that, the more MFIs are efficient in reducing operating costs at a given level of outstanding loan portfolio, the more profitable they become and, therefore, maintain financial and operational self-sufficiency and ensure financially sustainable. Furthermore the findings of Mohd et al.(2014) made on the MFIs of Bangladesh, advocates that the operating expense ratio has negative effect on the financial self-sufficiency and operational self-sufficiency of MFIs and hence the sustainability. Dissanayake (2012), research on the determinants of operational self-sufficiency of microfinance institutions in Sri Lanka, stated that there is strong significant negative correlation in Operating Expense Ratio to Operational Self Sufficiency Ratio. This indicates that, change in Operating Expense Ratio, is negatively contributing towards changes in Operational Self Sufficiency Ratio significantly.

2.11.8 Inflation rates

Most of previous empirical studies focused on those macroeconomic variables are based primarily upon an economic tradition, emphasizing the importance of external market factors in determining a firm's success (Hansen & Wernerfelt,1989);Bogan (2009) and Vingo (2012). Bogan (2009) informed that the common approach is to study the impact of macroeconomic factors by investigating the impact of GDP growth and inflation on performance.

According to a study by from developing countries investigation of average loan size per GNI per capita indicated that macroeconomic variables are significant contributors of performance. In their empirical study Gwas & Ngambi (2014) also tested the influence of macroeconomic indicators -GDP growth and inflation on the sustainability of MFIs. Although statistically not significant, their result showed a negative impact of inflation and a positive impact of GDP growth on the sustainability of MFIs. According to them a positive result of GDP indicated that improving macroeconomic performance raises overall income level and business performance which ultimately improves clients repayment ability and hence sustainability of MFIs. They noted that the negative impact of inflation on sustainability indicated that repayment levels are usually weak and low in the presence of higher inflation rates. The study made by Ahlin & Lin (2006); Bogan (2009) on the relationship of macroeconomic variables and efficiency, asserted that macroeconomic variables could have an effect on MFI efficiency. Furthermore, Nawaz(2010) indicted that MFIs operating in high income per capita countries do incur higher costs per borrower because of the lower outreach. Vingo (2012) too revealed that cost per borrower tends to increase with the increasing income of households, since the financial products and services of the MFIs may not be appropriate for their financial demands. Therefore, the poor tend to move to commercial banks after being lifted out poverty causing MFIs to left with lower demand of loans. In spite of these, this study believed that high economic growth can help MFIs to benefit from improved repayment rate

and can mobilize large volume of savings due to improved household income so that they can reduce the cost acquiring debts and meet the demands of larger loans which ultimately results in reduce cost per borrower.

2.12 Empirical studies and research gap in Ethiopia

The Ethiopian microfinance sector is characterized by its rapid growth, an aggressive drive to achieve scale, a broad geographic coverage, a dominance of government backed Microfinance Institutions (MFIs), an emphasis on rural households, the promotion of both credit and savings products, a strong focus on sustainability and by the fact that the sector is Ethiopian owned and driven (Ebisa et al. 2013). Therefore, most large and medium MFI in Ethiopia are attached and supported by the regional government as well as national and international NGOs. The question is what is the future of these MFIs when the donations and supports are over? Regarding this concept and issue, Randhawa and Gallardo (2003) posit that it does not seem likely that most MFIs will be able to sustain their operations without continued donor support for funding and technical assistance.

This leaves the future of the microfinance institutions in uncertainty. Thus an important question here is what should be done to make these MFIs sustainable and hence ensure sustainable provision of microfinance services and sustainable poverty reduction through outreach. The first step in doing this is to understand the factors affecting their operational and financial sustainability (Melkamu Woldeyes, 2012).

Several studies have been conducted to determine the factors affecting financial and operational sustainability of MFIs in different countries. However, the level of significance of these factors in affecting the financial sustainability of MFIs varies with studies and countries. While some of the determinants are found to be significant in one country or economy or MFI, they may not be significant for others (Cull et al, 2007; Woller and Shreiner 2002; Christian et al, 1995).

Empirical studies have been conducted in Ethiopia in relation to the microfinance industry, although, the topics, scopes, comprehensiveness and depth are vary. Some mentioned in regard sustainability of MFIs for instance, Melkamu (2012) on determining factors for operational and financial self-sufficiency of Ethiopian MFIs, he considered Yield, size, personnel productivity ratio, debt to equity ratio, cost per borrower, average loan per borrower and age of MFI as explanatory variables for the OSS. Yield, cost per borrower, liquidity ratio, number of active borrowers, operational expense ratio and age as the determining factors for FSS of MFIs in Ethiopia. The study found that average loan balance per borrower, size of a MFI, cost per borrowers and yield on gross loan portfolio affects the operational sustainability of Ethiopian MFIs significantly and cost per borrower, number of active borrowers and yield on gross loan portfolio affect their financial sustainability. Tilahun (2013) in addition, has done his research on the determinants of Financial Sustainability of Microfinance Institutions in East Africa, by including the Ethiopia, and he included Loan portfolio, size and management efficiency as significant determining factors for financial sustainability of East African MFIs including Ethiopia. This study clearly fails to include more determining factors for financial sustainability of MFIs in Ethiopia. Whereas, the study by Sileshi (2015) which considered 13 microfinance institutions is more detail and employ several explanatory variables except fail to consider some variables like, breadth of outreach, capital to asset ratio and macroeconomic factor (inflation) those affect financial sustainability significantly.

Furthermore, a study made by other more empirical studies by Kereta in (2007), Asnakew (2012), Yirsaw (2008,) and Yenesew (2014) have been done in various periods on different research topics of MFIs in Ethiopia. Even though, few exceptions exist, most of these studies focused on MFI profitability, outreach and sustainability with limited explanatory variables and by excluding the effect of macroeconomic variables on Ethiopian MFIs sustainability.

Other study conducted by Kereta (2007) concerning on the industry's outreach and financial performance using descriptive analysis, graphs and percentage growth rates identified that MFIs are operationally sustainable as measured by ROA and ROE and the industry's profit performance is improving overtime. The use of these proxies (ROA and ROE) by Kereta (2007) and others for sustainability measurement were contrary to earlier studies made on MFIs sustainability such as, Mohd (2014);Gibson (2012); Bogan (2009); Kimando et al.(2012); Rahman & Mazlan(2014) and other scholars who used financial self-sufficiency , and operational self-sufficiency ratios which are described as adjusted revenues as a percent of adjusted expenses and the ratio of financial revenue as financial expense, impairment expenses and all other operating expenses respectively better explains financial sustainabilityof MFIs than ROE and ROA due to their long term perspective in measurement of sustainability.

Yenesew (2014) studied determinants of financial performance on selected micro finance institutions in Ethiopia and tried to incorporate different variables from different perspective which is wider analysis of the MFIs performance than the earlier ones. But, the research mainly focused on profitability rather than sustainability by taking ROA as a dependent variable which is contrary to proxies used by many researchers as mentioned above. Melkamu (2012) has excellent analysis of MFIs by using proxy of financial and operational sustainability, however he entirely focused on internal factors such as loan size and number of active borrowers leaving crucial variables in the case of Ethiopia such the influence as of some components of MFIs' funding sources (subsidies) and the number of borrowers and the impact of macroeconomic variables such as GDP and inflation.

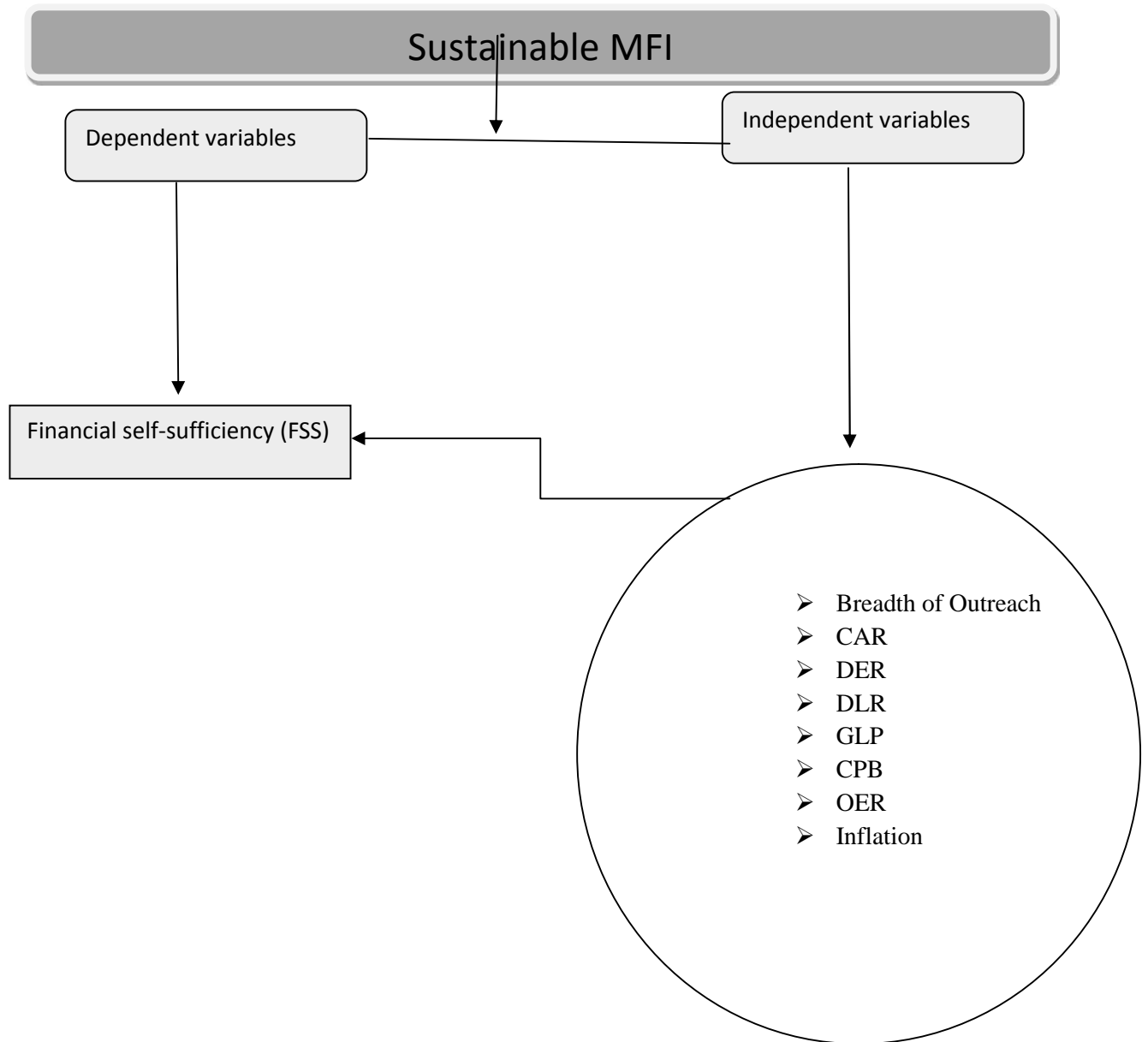
Therefore, to the best knowledge of the researcher, even though tremendous has been undertaken on the sustainability, efficiency, performance development and other topics in relation to of MFIs in Ethiopia, there is no comprehensive and detail study on the determinant financial factors for the sustainability of Ethiopian MFIs, by using

proxies' financial self-sufficiency. As described by various parts of this research and explained by many researchers, the researcher uses FSS to measure the sustainability of Ethiopian MFIs, and used Breadth of outreach, debt to equity ratio(DER), cost per borrow (CPB), capital to asset ratio (CAR), inflation (INF), operating expense ratio(OER), deposit to loan ratio (DLR), and gross loan portfolio GLP as independent explanatory variable for FSS. Therefore, this study is aimed to narrow the knowledge gap about the significant financial determinant factors of sustainability of Ethiopian microfinance institutions by considering FSS as a proxy and by taking more explanatory financial variables and macroeconomic variable like inflation.

2.13 Conceptual Framework of MFIs sustainability

The Ethiopian microfinance sector is characterized by its rapid growth, an aggressive drive to achieve scale, a broad geographic coverage, a dominance of government backed Microfinance Institutions (MFIs), an emphasis on rural households, the promotion of both credit and savings products, a strong focus on sustainability and by the fact that the sector is Ethiopian owned and driven (Ebisa, 2013). Further to this, government has put its eye to microfinance institutions in its GTP to achieve the sustainable development goal. Therefore, given the broad role and objectives of MFIs, they have to serve, the target group successfully with continuity, with better efficiency and capacity, the MFIs themselves should exist sustainably. Therefore, the following conceptual framework will help the MFIs to understand on the financial determining areas for their sustainability.

Figure 2.1 Conceptual framework



Source: developed by the researcher

Chapter Three

3. Methodology and Model specification

This particular chapter of the study starts with the description of research type, approach (design), and followed by describing the target population, sample size and sampling technique, source of data and methods of collection. Finally definition of variables, model specification and data analytical tools will be presented.

3.1 Methodology

3.1.1 Data type, Source and data collection techniques

To assess the determinants for the financial sustainability of microfinance institutions in Ethiopia, the researcher has gathered and used a secondary data from various sources. Accordingly the secondary data specific to MFIs has been taken from annual reports of the Association of Ethiopian Micro Finance Institutions (AEMFI) and complemented with data extracted from the Mix market website. Whereas, the data related to the macroeconomic factors were collected from the National Bank of Ethiopia (NBE), Ministry of Finance and Development (MoFED), MixMarket and the website of World Bank. To enhance the quality of econometric estimates and to preserve consistency, only the most available MFIs' audited data are collected from the fiscal years 2004 to 2013 (but issued from 2004 to 2014 respectively) which are available in the annual reports of AEMFI and effectively constituted 10 years data.

3.1.2 Target Population

According to the Association of Ethiopian Micro Finance Institutions (AEMFI) bulletin report, there were 33 microfinance institutions operating in the country by the end of year 2013. Thus, the target population considered by the researcher is all the 33 microfinance institutions which were providing the microfinance service to the target group by the end of year 2013.

3.1.3 Sample size and sampling design

The researcher considered 15 microfinance institutions out of the total population of MFIs. Hence, included in the study is the 15 MFIs 10 year’s data which were audited for the year 2004 to year 2013 and published in the AEMFI annual report from year 2004 to year 2015. Therefore, this provides a total 150 (15MFIs *10years) observation, which is indeed well enough to do a fixed effect regression in which a minimum of 95 observation is recommended by many researchers.

Accordingly, the below listed microfinance institutions are selected for the study

- AdCSI Addis Credit and Saving Institution
- ACSI Amhara Credit and Saving Institution
- DECSI Dedebit Credit and Saving Institution
- OCSSCO Oromia Credit and Saving Share Company
- PEACE Poverty Eradication and Community Empowerment
- SFPI Specialized Financial and Promotional Institution
- Wisdom ,AVFS, Meklit, OMO, Gasha, Wasasa, Sidama, Eshet and BussaaGonofa

3.1.4 Panel Unit Root Test

Testing for unit root in panel data is now common practice among empirical researcher after Levin and Lin (1993) established the foundation for panel unit root tests. Recently different literature has proposed a number of tests for unit roots in panel data. Among those, Levin,Lin and Chu test (LLC) and Im, Pesaran and Shin (IPS) are the most common one. For this study, the paper has chosen (LLC) because the number of cross section is greater than the time period. (LLC) begins by specifying a separate ADF regression for each cross-section as follows:

$$\Delta y_{it} = \dots_i y_{it-1} + \sum_{L=1}^{\dots_i} \alpha_{iL} \Delta y_{it-1} + \gamma_{mi} d_{mt} + v_{it} \dots \dots \dots (1)$$

Where d_{mt} is a deterministic component and γ_{mi} is the corresponding vector of coefficient y process has a unit root for individual I, while $\alpha_{iL} < 0$ means that the

processes is stationary around the deterministic parts. The null hypothesis is that each individual time series contains a unit root against the alternative that each time series is stationary.

LLC suggest a three step procedure to implement their test:

Step 1: perform a separate ADF regression for each cross section

Step 2: Estimate the ratio of long run to short run standard deviation

Step 3: compute the panel test statistics

3.2 Model Specification

This study seeks to analysis determinants of financial sustainability of MFIs Ethiopian, by taking financial self-sufficiency as a proxy during the period 2004-2013 by using panel data. In this section, the paper specifies the model based on two blocks of variables: first block include sector specific variable and second block include macro variable: Debt to Equity ratio (DER), operational expense ratio (OER), cost per borrower (CPB), Capital to Asset, deposit to asset ratio (DLR), and gross loan portfolio (GLP), are selected as sector specific variables while Inflation (INF) has been selected as macro variable. Therefore, this paper specifies with expected sign and estimates the following model:

$$Y_{it} = f(BOR_{it}^+, DER_{it}^-, OER_{it}^-, CPB_{it}^-, DLR_{it}^+, CAR_{it}^+, GLP_{it}^+, INF_t^-)$$

Where Y_{it} = financial self-sufficiency MFI i at time t.

LBURit is breadth of outreach of an MFI i at time t,

DERit is the debt to equity ratio of an MFI i at time t,

OERit is the operating expense ratio of an MFI I at time t,

CPBit is cost per borrower of an MFI i at time t,

CARit is the capital to asset ratio an MFI i at time t,

INFit is the rate of inflation of Ethiopia assigned to an MFI i at time t, and

DLRit is the deposits to loan ratio of an MFI i at time t,

GLPit is the gross loan portfolio of an MFI i at time t,

Therefore to estimate the above equation, this study employed the following panel estimation method:

1. Pooled Regression Estimation Model

This estimation method assumes that observations are serially uncorrelated across cross-sections and time; the errors are homoscedastic and also same intercept and slope for all coefficients. In addition it emphasizes on the joint estimation of coefficients- ignores panel structure of the data.

The model specifies as follows:

$$y = \partial + x'S + \hat{\epsilon} \dots\dots\dots(2)$$

But how realistic is it to ignore the panel structure of the data?

2. Random Effect Model

The general form of the panel data regression represented as follows:

$$y_{it} = \partial + x_{it}'S + \hat{\epsilon}_{it} \dots\dots\dots(3)$$

$$\hat{\epsilon}_{it} = \tilde{\epsilon}_i + v_t \dots\dots\dots(4)$$

Where y= dependent variable, X = regressors, i= indicate the cross section (individual microfinance), t=time period, v_t =cross section invariant shock- time effect and $\tilde{\epsilon}_i$ = time invariant shock- individual effect. Therefore based on the equation three, the random effect assumes that:

- ❖ Differences in the v_i are randomly distributed between units
- ❖ Values of v_i are uncorrelated with the other regressors

3. Fixed Effect Model

Again based on the equation three, the fixed effect assumes that:

- ❖ The constant/intercept in each equation is a separate parameter
- ❖ Values of v_i are potentially correlated with the other regressors

Thus before estimation here the study defines and hypostasized the dependent and independent variables:

A. Dependent variable

Financial self-sufficiency is measured as the ratio of adjusted financial revenue to adjusted operating expenses, which are summarized with the following measurements (formula) (AEMFI, 2015). The paper used financial self-sufficiency as a proxy for financial sustainability

$$\text{Financial self-sufficiency} = \frac{\text{Adjusted financial revenue}}{(\text{Financial expense} + \text{Loan loss provision} + \text{Operating expenses} + \text{Expense adjustment})}$$

B. Explanatory variables

Breadth of outreach: refers to the number of poor served by a microfinance institution (Hishigsurem, 2004). The study expect positive significant relationship between breadth of outreach and financial self-sufficiency of Ethiopian MFIs

Deposit to loan ratio: This study expect positive significant relationship between deposit to loan ratio of microfinance institutions and financial self-sufficiency of MFIs in Ethiopia

Capital to asset ratio: capital to asset ratio of a microfinance institution is significantly and positively related to financial self-sufficiency of MFIs in Ethiopia.

Cost per borrower: is defined as the operating expenses divided by an MFI's average number of borrowers. The paper expects Cost per borrower is significantly and negatively related to financial self-sufficiency of MFIs in Ethiopia;

Debt to Equity: is calculated by dividing total liabilities by total equity. Total liabilities include all the MFI owes to others, including deposits, borrowings, accounts payable and other liabilities. Whereas total equity is total asset less total liability. It is the simplest and best known measure of capital adequacy because it measures the

overall leverages of the institutions (AEMFI, 2014). This paper expects negative significant relationship between debt to equity ratio of microfinance institutions and Financial Self-Sufficiency of Ethiopian MFIs;

Gross Loan portfolio:-Gross loan portfolio which is measured by gross loan portfolio, adjusted for standardize write-offs has a significant positive relationship with financial self-sufficiency of MFIs in Ethiopia.

Operating expense ratio (OER):-The operating expense ratio is defined and described as the ratio of total operating cost to outstanding loan portfolio and thus calculated by dividing all expenses related to the operation of the MFIs (including all the administrative and salary expenses, depreciation and board fees)by the period average gross portfolio, interest and provision expenses (Wolday, 2013). The paper expects change in Operating Expense Ratio is negatively contributing towards changes in Operational Self Sufficiency Ratio significantly.

An inflation rate:-is a sustained increase in the general price level of goods and services in an economy over a period of time. When the price level rises, each unit of currency buys fewer goods and services. This paper expects negative significant relationship between inflation rate and financial self-sufficiency of MFIs in Ethiopia.

The following table summarizes the standard name, description of the independent variables or explanatory variables, the variable name in regression model, variable description to be used in the regression model and the researcher expected effect of the independent variables for FSS dependent variables used in the research. Some of the variables will be presented in their natural log form for regression purpose.

Table 3.1 Description of independent variables for FSS

S.N	Variable Standard Name	Description	Variable name in regression	Variable Description as used in regression model	Expected effect
1	Breadth of outreach	Number of active borrower	BOR	Number of active borrower	+
2	Debt to Equity Ratio	Adj. Total Liabilities/Adj. Total Equity	DER	Debt as a percentage of Equity	-
3	Cost Per Borrower	Adj. Operating Expense/Adj. Av. No. of Active Borrowers	CPB	Natural logarithm of the cost per borrower	-
4	Capital to asset ratio	Capital to asset	CAR	Capital to asset ratio	+
5	Operating Expense Ratio	The ratio of operating expense to the gross loan portfolio	OER	Operating expense ratio	-
6	Gross loan portfolio	Gross loan portfolio of MFI	LnGLP	Natural logarithm of the gross loan portfolio	+
7	Inflation Rate	The inflation rate of the country	INF	The inflation rate as a percentage	-
8	Deposit to loan ratio	All deposits divided by outstanding loan	DLR	The ratio of deposit to outstanding loan	+

Source: adapted from different theoretical reviews and empirical evidences

3.3 Data analysis

The panel data collected from the AEMFI annual bulletins, and various websites are managed in the form of ratios, percentages and natural logarithmic forms. These panel data has been regressed and interpreted by using multiple regression method and descriptive statistic. To enhance the strength of the models, to minimize the cross section effects of the intercepts the study will employ a fixed effect regression technique. According to Brooks (2008) the simplest types of fixed effects models allow the intercept in the regression model to differ cross-sectionally. The fixed-effects model controls for all time-invariant differences between the individuals, so the estimated coefficients of the fixed-effects models cannot be biased because of omitted time-invariant characteristics.

The study also checked whether the proposed empirical models are free from the assumptions of autocorrelation, multicollinearity, and normality. A violation of key assumption of OLS regression occurs if any one of those assumptions turns out to be present. Redundant fixed effect test is also made to ensure that a fixed effect regression technique is appropriate. Eviews8 software has the ability to help researchers to analyze their research data easily and efficiently. Therefore, as recommended by Brooks (2008) the researcher used Eviews8 software to analyze and interpret the given panel data.

Chapter four

4. Descriptive and econometric analysis

4.1 Descriptive Analysis on Explanatory variable

Before doing the econometric model analysis it is important to see the variables behavior and other characteristics by applying a descriptive statistics such as measure of central tendency variation and symmetry. Accordingly, the below figures reveals the descriptive statistics results of mean, maximum, minimum, standard deviation, skewness and kurtosis for all variables included in the study.

As table 1 depicts that on average the financial self-sufficiency (FSS) for selected microfinance institutions is 0.95 while, the maximum, minimum, standard deviation, skewness and kurtosis are 1.76, 0.29, 0.29, 0.29 and 2.89, respectively. Since the average value of financial self-sufficiency is less than 1 which is 0.95, Microfinance Institutions in Ethiopia are not financially self-sufficient. Meanwhile, the standard deviation value is less the mean value and also its skewness and kurtosis show there is no significant variation among the selected Microfinance Institutions over the selected period regarding to the financial self-sufficiency.

Table 4.1: Descriptive Statistics Results

Variables	LBUR	INF	GLP	OER	DLR	DER	CPB	CAR	FSS
Mean	10.75	17.05	18.11	0.09	0.25	2.16	183.61	0.38	0.95
Maximum	13.68	55.24	22.18	0.28	0.76	11.15	935.60	0.89	1.76
Minimum	8.27	2.38	14.56	0.00	0.00	0.13	36.00	0.09	0.29
Std. Dev.	1.46	16.19	1.79	0.05	0.17	1.73	155.70	0.15	0.29
Skewness	0.45	1.34	0.43	0.84	0.49	2.67	2.64	0.54	0.29
Kurtosis	2.06	3.58	2.24	3.62	2.55	12.33	11.31	3.09	2.89

Source: Author's Eviews descriptive statistics output for variables, 2015.

On the other hand, for the variables, breadth of outreach (BOR), inflation(INF), gross loan portfolio (GLP), operating expense ratio (OER), deposit to loan ratio (DLR) , debt to equity ratio (DER), cost per borrower(CPB), capital to asset ratio (CAR), the mean values are 10.75, 17.05, 18.11, 0.09, 0.25, 2.16, 183.61, 0.38, respectively, whereas, the standard deviation are 1.46, 16.19, 1.79, 0.05, 0.17, 1.73, 155.7 and 0.15, respectively. As the result indicates that, the standard deviation for each variable is less than their respective mean values. This reveals that, there is no significant variation on those variables across Microfinance Institutions (table 4.1).

4.1.1. Breadth of Outreached: -The mean statistics for this variable is 134,660. This indicates on average a microfinance institution in Ethiopia is reaching 134,660 numbers of borrowers. When we see the maximum numbers, it reached 880,506 borrowers and the minimum is 3,939. However, when we see the industry average that an MFI is reaching, it is still very low as compared to the number of population in the country. Thus, it still needs attention to reach more poor in the country.

4.1.2. Inflation: - The mean value of inflation was 17.05% and it is much higher than the average of the entire African continent which was 9% in Mix Market's report (2014). The maximum score 55.54 in 2008 were create negative effect on financial sustainability of MFIs in Ethiopia.

4.1.3. Gross loan portfolio: -As a measurement of MFI's scale of operation, the mean scores of gross loan in the industry reveal 18.11 which is higher than the mean score of African country which is around (4.5) on the report of MixMarket(2011). Thus Ethiopian MFIs on average can be categorized in to large scale MFIs.

4.1.4. Operating expense ratio: -The operating expense ratio for the Ethiopian microfinance industry shows 0.09 in its mean. This indicates that on average they are incurring 9 cents in operating expense for each dollar in the gross loan portfolio. Some highly efficient institutions incur operating expense of 1 cent for each dollar in the gross loan portfolio. On the other hand, inefficient institutions in the industry incur an operating expense of 26 cents for each dollar on their gross loan portfolio.

4.1.5. Deposit to loan ratio: - It assume that the higher the ratio, the greater is the MFIs' capability to fund its loan portfolio from deposits. The mean value of Ethiopian MFIs showed that 0.25 which implies 25% loan portfolio has been financed by deposits. Whereas, 75 % of the loan portfolio is financed by other means such as borrowing, soft loans and grants. Comparison of this ratio with other jurisdiction indicated that MFIs in Central Africa, Eastern Africa, Southern Africa , Western Africa and the entire continent of Africa have mean score of DLR 154.8%, 48.6%, 30.5%, 59.5% and 154.8% respectively indicating that MFIs in these regions

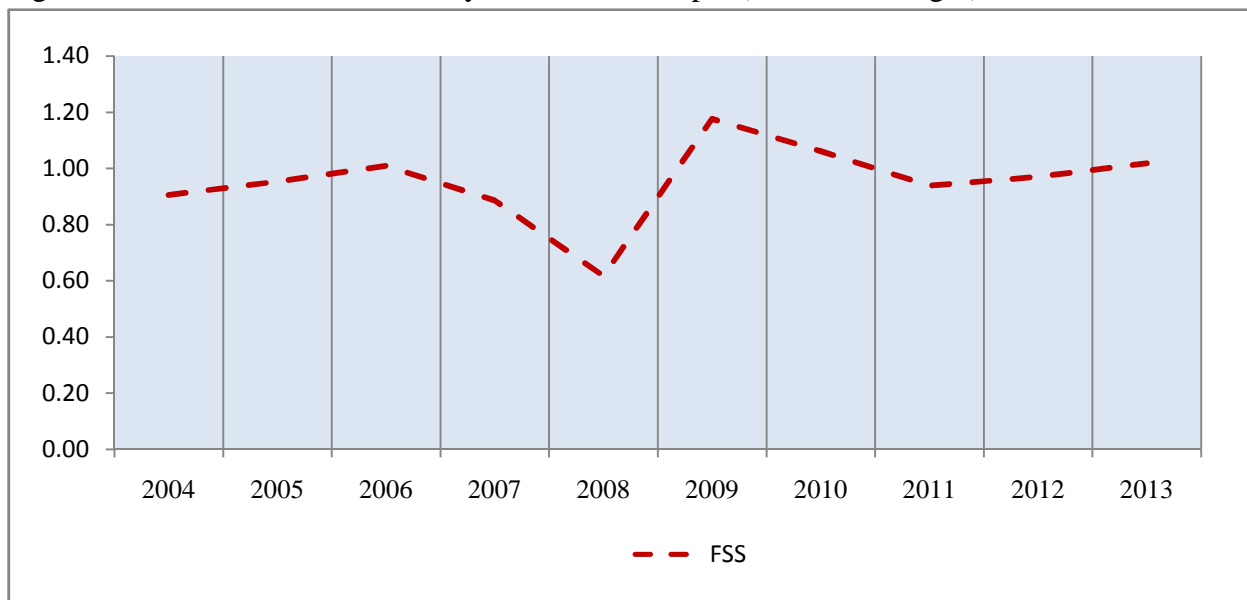
have mobilized higher commercial sources (savings) to finance their loan than MFIs in Ethiopia.

4.1.6. Debt to equity ratio: - As debt to equity measure the overall leverage of the institution, the Ethiopian MFIs are in normal status comparing with other African country but still needs to score the recommended threshold that is 1.50 from the mean value of 1.93 which in the study period.

4.1.7. Cost per borrower: -It is the most popular measure of MFIs efficiency and is calculated by dividing all expenses related to the operation of MFIs (including all administrative and salary expenses, depreciation and board fess) by average number of active borrowers. As the result of descriptive statistics, Ethiopian MFIs mean score is 183.41. It imply that averagely MFIs incurred birr 183.41 for a single borrower. According to the data of MixMarket (2011) revealed that the average cost per borrower for MFIs in Central Africa, Eastern Africa, Southern Africa, Western Africa and the whole Africa were found to be \$15, \$149, \$182, \$103 and \$137 respectively. In this regard, Ethiopian MFIs considered as more efficient in maintaining a single borrower consideration with the dollar value.

4.1.8. Capital to asset ratio: - It is used to assets an MFI's ability to meet its obligations and absorb unexpected losses. For the regulated MFIs, there is a minimum solvency requirement stipulated by the regulator. The requirement of minimum capital to assets ratio depends on an MFI's assessment of its expected losses and its financial strength to absorb such losses. During the study period, the Ethiopia MFIs scored a mean value of 38% which is much greater than the advised thresh hold limit that is up to 20%.

Figure 4.1: Financial self-sufficiency of MFs in Ethiopia (Annual Average¹)



Source: Author's Eviews descriptive statistics output for variables, 2015

As the figure shows that, the financial self-sufficiency has showed some volatility over the given periods. In 2008, the value of financial self-sufficiency witnessed the lowest ratio which is around 0.62 or 62 percent. In this period, there was a world financial crisis as well as high inflation rate (55.2%) in Ethiopia, although the financial crises didn't affect significantly. This may be the one reason that the financial self-sufficiency of MFs declined in Ethiopia. However, after this period it shows a great improvement and seems stable (figure 4.1).

4.2 Econometric Analysis

4.2.1 Unit root test

In this research paper as discussed in the methodology part, Levin, Lin and chu test of unit roots is used to determine the order of integration of the variables as a result of number of cross section is greater than time period. Table 4. 2 reports the Levin,

¹ Annual average of financial self-sufficiency refers to the sum of financial self-sufficiency of MFs' in each year divided by total number of MFS (15).

Lin and chu test for the variable at level with trend and intercept (see the full result in annex 1).

Table 4.2: Levin, Lin and chu test(LLC) Unit Root Test

Variables	At level	
	With Trend and intercept	Prob
FSS	-9.335*	0.000
INF	-9.311*	0.000
DLR	-5.721*	0.000
OER	-3.859*	0.000
BOR	-2.929*	0.001

Note: * indicate that the variables are stationary at 1%.

Levin, Lin and chu test of unit roots indicates all the variables in level are stationary i.e. they are I (0). Therefore the paper applies pooled regression, fixed effect and Radom effect model which are the fitted model for stationary variable at level.

4.2.2 Panel Model Estimation Result

In this section the paper has discussed the regression result obtained from the three models which are pooled regression; fixed effect and random effect model Estimation method (see the result in annex 2). The table below fixed effect model has higher Adjusted R² than the other two models and also all the variables are significant and have expected sign. In addition redundant fixed effects test depicts that, the fixed effects are necessary for this study the results of the test are presented in the table 4. 2. Moreover, the fixed effect model controls all the time-invariant difference between the cross-sections. Thus due to the above reason this paper only discuss the estimated coefficient of Fixed Effect models.

Table 4.3: Model Estimation Result (Random, Pooled and Fixed) Models

Variables	Random effect model			Pooled regression			Fixed effect model		
	Coefficient	t-Statistic	Prob	Coefficient	t-Statistic	Prob	Coefficient	t-Statistic	Prob
FSS (dependent variable)									
INF	-0.007	-6.552	0.000	-0.0067	-6.028	0.000	-0.006	-7.639	0.000
OER	-1.729	-4.051	0.000	-1.899	-5.637	0.000	-1.162	-3.033	0.003
DLR	0.426	3.723	0.000	0.382	3.407	0.000	0.360	3.065	0.003
BOR	-	-	-	-	-	-	0.103	2.966	0.004
C	1.397	9.414	0.000	1.599	12.133	0.000	-0.009	-0.028	0.978
Coefficient diagnostic									
R ²	0.380			0.442			0.710		
Adjusted R ²	0.358			0.422			0.670		
F-test	17.664			22.801			17.827		
Prob(F)	0.000			0.000			0.000		

Note: CPB, Capital to Asset, gross loan portfolio GLP and DER have not been included in the last estimation model because of their insignificance and unexpected sign.

The empirical result of fixed effect model in Table 4.3 shows that all explanatory variables were statistically significant at 5% critical point. The coefficient of determination or adjusted R² shows that explanatory variables explained approximately 67% of the variation financial self sufficiency of the microfinance. The

F statistic (17.827) reveals that the explanatory variables are jointly significant in explaining changes in financial self-sufficiency.

Table 4.3 also shows that the elasticity coefficient and sign of each explanatory variable. The elastic coefficient for inflation is -0.006 which means a ten unit change in inflation leads to 0.06 unit decrease in financial self-sufficiency. This implies that increase in inflation reduce repayment levels this leads to deterioration of financial self sufficiency of MFI's which is consistent result with Gwas&Ngambi (2014) finding.

Operating expense ratio has a statistically significant and negative relationship with financial self-sufficiency. The response of financial self-sufficiency to operating expense ratio is very elastic, which is a 10 unit increase in operating expense leads to an 1.62 unit decrease in financial self-sufficiency. This indicates that, the more MFIs are efficient in reducing operating costs at a given level of outstanding loan portfolio, the more profitable they become and, therefore, maintain financial self-sufficiency and ensure financially sustainable.

In addition the paper found that with elasticity coefficients of 0.360 deposits to loan ratio has a statistically significant and positive relationship with financial self-sufficiency. This implies that a 10 unit increase in deposits to loan ratio leads to 3.6 unit increase in financial self-sufficiency the reason behind this is improvement of deposit mobilizations increase access of loans. This makes savings a relatively low cost of funds and hence increasing sustainability enhancement and profitability of financial sector development.

Finally the paper found that increase in number of poor served by a microfinance institution has a significant and positive relationship with financial self-sufficiency. The results show that a 10 unit increase in number of customers leads to 10 unit increase in financial self-sufficiency through the cost advantages associated with size (economies of scale).

4.2.3 Post Model Diagnostic Test

The econometric estimation technique that is used by this study is fixed effect model. In this section the paper has tested some regression assumption and it check the violation of these assumptions. The method used to test these assumptions in this paper is described as follows:

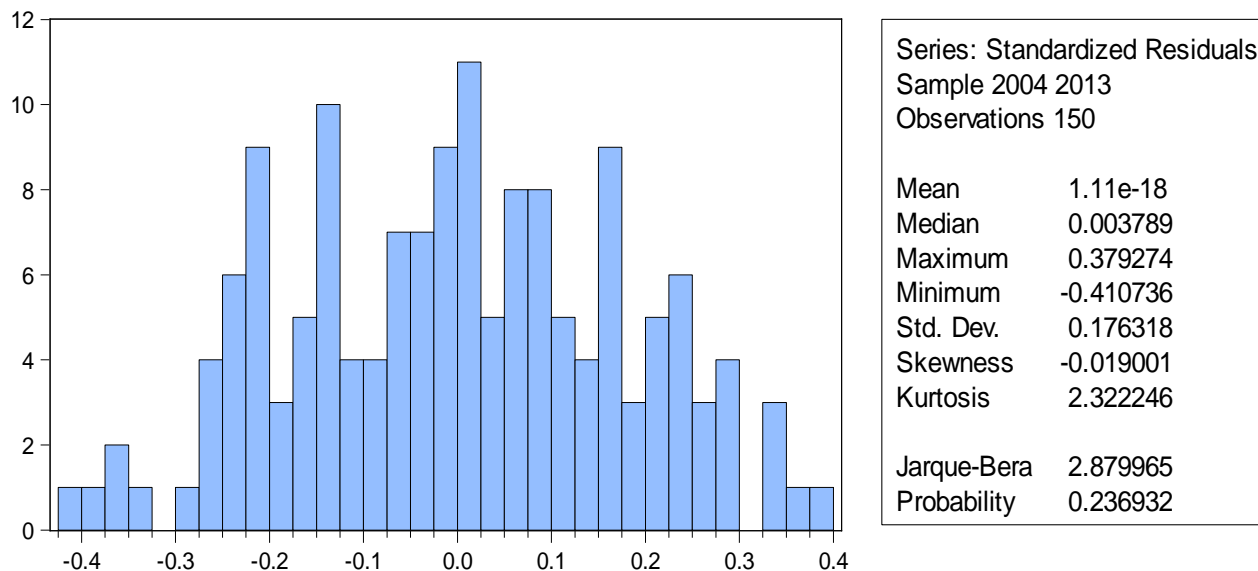
A. Normality test

Null hypothesis (H_0): The residuals are normally distributed Vs

Alternative hypothesis (H_1): The residuals are not normally distributed

Below the figure indicates that a Bera-Jarque normality test has been used for normality test. The kurtosis value is around 2.32 which almost related to 3. The p-value given at the bottom of the normality test screen should be bigger than 0.05. Hence, the p-value shows 0.23 which is greater than 0.05 failed to reject the null hypothesis of normality presence at the 5% level (Brooks, 2008).

Figure 4.2: Normality test result of fixed effect model



B. Serial Correlation Test

In this section this paper has Durbin Watson test along to test the serial correlation of the model. Therefore to conduct the DW test, the hypothesis is stated as follows:

Null hypothesis (Ho): No Autocorrelation ($\rho = 0$) Vs

H1: Autocorrelation ($\rho \neq 0$)

Table 4.4: Serial Correlation Test Result

<i>Fixed effect model</i>	
Durbin-Watson stat	1.804634

Therefore from the above table 4.4, it can be concluded that there is no or little evidence of a relationship between successive residuals and based on this, in the above cases we fail to reject the null hypothesis of no autocorrelation because DW test approaches 2.

C. Redundant Fixed Effects Tests

To determine whether the fixed effects are necessary or not, this study run a redundant fixed effects test as it is recommended by brooks (2008). The results of the test are presented in the following table.

Table 5: Redundant Fixed Effects Test Result

Redundant Fixed Effects Tests

Equation: EQ01

Table 4.5 Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	7.405983	(14,131)	0.0000

The above table depict that the p-values associated with the test statistics are almost zero to, indicating that it is better to employ the fixed effect model than a simple pooled regression model.

D. Multicollinearity Test

Multicollinearity (collinearity) is a phenomenon in which two or more predictor (independent) variables in a regression model are highly correlated. The multicollinearity test results in table 4. 6 indicate that there is a weak correlation between independent variables which are below 0.7. This suggests that, there is no multicollinearity between the independent or explanatory variables

Table 4. 6: Pearson Correlation Coefficient Result

Covariance Analysis: Ordinary

Date: 06/20/16 Time: 16:21

Sample: 2004 2013

Included observations: 150

Correlation	DLR	INF	OER	LBUR
DLR	1.000000			
INF	-0.109178	1.000000		
OER	-0.150325	-0.044882	1.000000	
LBUR	0.511779	0.094735	-0.638533	1.000000

CHAPTER FIVE

5. SUMMARY of FINDING, CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary of finding

This study was examines determinants of financial sustainability of MFIs in Ethiopia. Both descriptive and econometrics analysis has been used to asses determinants of financial sustainability of MFIs in Ethiopia.

The descriptive analysis reveals that there is no significant variation on those variables across Microfinance Institutions because the standard deviation for each variable is less than their respective mean values. In addition the descriptive analysis found that financial self-sufficiency has showed some volatility over the given periods. In 2008, the value of financial self-sufficiency witnessed the lowest ratio which is around 0.62 or 62 percent. In this period, there was a world financial crisis as well as high inflation rate (55.2%) in Ethiopia. This may be the one reason that the financial self-sufficiency of MFs declined in Ethiopia. However, after this period it shows a great improvement and seems stable.

In addition to the descriptive analysis this paper has used econometrics analysis using panel data. The result of fixed effect model shows that all explanatory variables (such as inflation, Operating expense ratio, deposits to loan ratio and number of customers) were statistically significant with expected sign at 5% critical point. The coefficient of determination or adjusted R² shows that explanatory variables explained approximately 67% of the variation financial self sufficiency of the microfinance. The F statistic (17.827) reveals that the explanatory variables are jointly significant in explaining changes in financial self-sufficiency.

To confirm the statistical validity of fixed effect model specification, the paper has tested serial correlation, normality, multicolliniarity and redundant fixed effect test then the paper found that the model has passed the entire diagnostic test.

5.2 Conclusion

The aim of this study was to quantify determinants of financial sustainability of MFIs in Ethiopia by using eight independent explanatory variable such as Breadth of outreach, Debt to equity ratio, Capital to asset ratio, Deposit to loan, Inflation, Cost per borrower, operational expense ratio and Gross loan portfolio, and the dependent variable (predictor) financial self-sufficiency, considering 10 years data of 15 Ethiopian microfinance institution over the period 2004 to 2013.

Based on the descriptive statistic result, the Ethiopian MFIs scored an average Financial Self-Sufficiency (FSS) ratio of 95%. It reveals that Ethiopian MFIs are not financially self-sufficient (sustainable). As it is described in the literature part and the international requirement that a micro finance institution presumed to be financial self-sufficient, it should score above 100%. Unless, it is difficult to MFIs in order to cover all costs and their obligations without ongoing donation, concessional loan or government subsidy. Various researches noted that, unless FSS ratio of 100% is reached, the long-term provision of credit services is undermined by the impact of inflation and the continued necessity to rely on donor funds.

As it is also described in the analysis part, the financial self-sufficiency of MFIs in Ethiopia has showed some volatility over the given periods. In 2008, the value of financial self-sufficiency witnessed the lowest ratio which is around 0.62 or 62 percent. In this period, there was a world financial crisis as well as high inflation rate (55.2%) in Ethiopia. This may be the one reason that the financial self-sufficiency of MFs declined in Ethiopia. However, after this period it shows a great improvement and seems stable. But still lower Comparing of Ethiopian MFIs' FSS with other countries indicated that MFIs operating in Eastern African and southern African regions.

The coefficient of determination or adjusted R^2 shows that explanatory variables explained approximately 67% of the variation financial self sufficiency of the

microfinance. The F statistic (17.827) reveals that the explanatory variables are jointly significant in explaining changes in financial self-sufficiency.

5.3 Recommendations

Based on the descriptive and econometrics analysis this study has been forward the below listed recommendation and suggestions.

As the study finding of financial self-sufficiency regression model that deposit to loan ratio shows positive coefficient suggesting that as the ratio increases, the financial self-sufficiency increase. In this regard MFIs in Ethiopia should maintain high level of deposit to loan ratio in order to improve their financial self –sufficiency and it make them capable to provide loan with their internal fund.

The operating expenses ratio in this study appeared as important determinant. The lower ratio implies more efficiency and vice versa, but the regression result shows a negative sign means as the ratio gets down, the financial self-sufficiency will rise (Table 3, pp.62). With this regard, the study recommends that the institution should take into attention to reduce operating expenses and see its effects on financial sustainability and the researcher still recommends that MFIs should be cost conscious in handling and processing a loan, as this is an important parameter to measure efficiency of an MFI. It is also more advisable to increase the breadth of outreach as it is a major determinant factor to financial sustainability of Ethiopian micro finance institutions and it would of course lower the average operating cost.

This study result shows that, there are MFIs showing a DER ratio as high as 11.5. Those MFIs scoring maximum DER (highly leveraged MFIs) should be cautious because theories suggest that higher DER bound to exert pressure on profit margin (sustainability and efficiency) during bad economic situations. Therefore, they have to review their mix of capital structure seriously, this can be achieved by using deposit as a main source of finance, while increasing the scale of operation (gross loan portfolio) instead of using debt financing as a principal loan source.

The researcher on the other side recommends the government to play a central role in creating an encouraging environment for enabling MFIs to ensure their long-term sustainability; by maintaining the macroeconomic stability through appropriate monetary and fiscal policies, by giving a vital role to the micro finance institutions to play during formulating poverty reduction strategies, and explicitly recognize them, by adjust regulatory frameworks to permit the microfinance institutions to offer lending services to a wide range of poor people as premature or restrictive regulations can stifle innovation, and finally by improving supervisory capacity beyond simply licensing them. In addition, Government and donors should avail funds with the understanding that MFI projects require substantial subsidies when they are first introduced. If these projects are not subsidized in their early years, they will be forced to charge high interest rates that clients could not pay.

5.4. Further Research Directions

This study is limited to only quantitative aspect; it doesn't include the qualitative factors for the determinants of MFIs sustainability in Ethiopia. Therefore, the researcher recommends future researchers to do comprehensive study by considering other influencing factors (like: Political factors, Geographical factors, and others) for the sustainability of Ethiopian MFIs.

References

- AEMFI. (2015). Association of Ethiopian Microfinance Institutions performance Analysis Report, Addis Ababa, Bulletin 13.
- AEMFI. (2014). Association of Ethiopian Microfinance Institutions performance Analysis Report, Addis Ababa, bulletin 12.
- AEMFI. (2013). Association of Ethiopian Microfinance Institutions performance Analysis Report, Addis Ababa, bulletin 11.
- AEMFI. (2012). Association of Ethiopian Microfinance Institutions performance Analysis Report, Addis Ababa, bulletin 10.
- AEMFI. (2011). Association of Ethiopian Microfinance Institutions performance Analysis Report, Addis Ababa, bulletin 9.
- AEMFI. (2010). Association of Ethiopian Microfinance Institutions performance Analysis Report, Addis Ababa, bulletin 8.
- AEMFI. (2011). Association of Ethiopian Microfinance Institutions performance Analysis Report, Addis Ababa, bulletin 7.
- AEMFI. (2010). Association of Ethiopian Microfinance Institutions performance Analysis Report, Addis Ababa, bulletin 6
- AEMFI. (2009). Association of Ethiopian Microfinance Institutions performance Analysis Report, Addis Ababa, bulletin 5.
- AEMFI. (2018). Ethiopian Microfinance Institution Performance Analysis Report. Addis Ababa. Addis Ababa: Bulletin 4..
- Ahlin, C., & Lin, J. (2006). Luck or Skill? MFI Performance in Macroeconomic Context. Vanderbilt University, Working Paper .
- Alain de Crombrughe, M. T. (2007). "performance analysis for a sample of microfinance institutions in India". *Annals of public and cooperative economics* 2008., 79:2.
- .
- Alemayehu, Y (2008), The performance of microfinance institution in Ethiopia: A case of six Microfinance institution", Addis Ababa University

- Armendáriz de Aghion, B. &. (2004). Microfinance: Where do we stand? In Charles Goodhart Edition. Financial Development and Economic Growth: Explaining the links.
- Asnakew, B. A. (2012). Financial Sustainability of Microfinance Institutions (MFIs) in Ethiopia. *European Journal of Business and Management*, Vol 4, (No.15).
- Ayele, A. T. (2014, Jly). MICROFINANCE INSTITUTIONS IN ETHIOPIA, KENYA, AND UGANDA. Loan Outreach to the Poor and the Quest for Financial Viability.
- Bogan. (2007). Capital Structure and Sustainability: An Empirical Study of Microfinance.
- Bogan V. (2009). "Microfinance Institutions: Does Capital Structure Matter",.
- CédricLützenkirchen, C., &Weistroffer, C. (2012). Microfinance in evolution: An industry between crisis and advancement: Deutsche Bank AG, September 13, 2012.
- CGAP. (2012). Sub Saharan Africa 2009: Microfinance Analysis and Benchmark report. Microfinance Information Exchange. Available at www.themix.org. [Accessed: July 2015.]
- Christian Ahlin, J. L. (2009). Where Does Microfinance Flourish? Microfinance Institution Performance in Macroeconomic Context.
- Cull R. Demirgüç-Kunt A. and Morduch J. (2008). "Does Microfinance regulation curtail profitability and outreach?" NYU Robert Wagner Graduate School of public service paper.
- Cull R., D.-K. A. (2007). Financial Performance and Outreach: A Global Analysis of Leading Micro Banks. *Economic Journal*, vol.117,, pp.107-133.
- DegefeDuressa Obo. (2009). Microfinance in Ethiopia: Elixir or Poison?
- Dittmar, A. and Mahrt-Smith, J. (2007), "Corporate governance and the value of cash holdings", *Journal of Financial Economics*, Vol. 83, pp. 599-634.
- Dissanayake. (2012). "The Determinants of Operational Self Sufficiency: An Empirical Analysis of Sri Lankan Microfinance Institutions", University of Kelaniya. .
- EbisaDeribie, G. N. (2013, January). Filling the Breach: Microfinance. *Journal of Business and Economic Management*.
- Elia, M. (2006) Microfinance: Text and Cases, Basics on micro finance cases studies from the Arab Region.
- Federal Democratic Republic of Ethiopia (1996) Federal NegaritGazeta: Proclamation No. 40/1996, Proclamation to provide for the Licensing and Supervision of the Business of Micro Financing Institutions. Addis Ababa, Ethiopia.

- GebrehiwotAgeba. (2002). Microfinance Institutions in Ethiopia: Issues of Portfolio Risk, Institutional Arrangements and Governance.
- Global Envision. (2006). The history of Microfinance: Retrieved June 26, 2015 from www.globalenvision.org/library/4/1051.
- Gonzalez, A. and Rosenberg, R. (2005), The State of Microcredit – Outreach, Profitability, and Poverty, MIX/CGAP.
- Gwas, N., & Ngambi M. (2014). Competition and Performance of Microfinance Institutions in Cameroon,. International Journal of Research in Social Sciences,, Vol.3, (No.8).
- Hansen, G. S., & Wernerfelt, B. (1989). Determinants of firm performance: The relative importance of economic and organizational factors. Strategic Management Journal, , , vol. 10 (5).
- Hartarska Valentina and Nadolnyak Denis. (2007). “Do regulated microfinance institutions achieve better sustainability and outreach? Cross-country evidence”. Applied Economics.
- Hashemi, S. F. (2005). Beyond good intentions: measuring the social performance of microfinance institution. CGAP.
- Hermes, N., Lensink, R. and Meesters, A. (2008). Outreach and Efficiency of Microfinance Institutions. In World Development (Vols. Vol. 39, ,, pp. pp. 875–881,).
- <http://www.cgap.org>, c. i. (n.d.).
- Hishigesuren, (2004), scaling up and mission drift, can microfinance institutions maintains a poverty allocation mission while scaling up?
- Hudon, M and Traca, D. (2008). On the Efficiency Effects of Subsidies in Microfinance: An Empirical Inquiry. Brussels, Belgium: Centre Emile Bernheim. Research Institute in Management Science. University of Brussels, Solvay Business School.
- Itana A., Tsehay T. and Eshetu E. (2003) Governance and Ownership Structure of MFIs in Ethiopia. AEMFI Occasional Paper No. 8: Addis Ababa, Ethiopia.
- James M.K. (2003). The effect of funding structure on the financial performance of deposit taking microfinance institutions in Kenya.
- Kannan, & P. (2013). The Microfinance in India,. International Journal of Current Research and Academic Review , pp 78-83.

- Kereta, B. B. (2007). Outreach and Financial Performance: Analysis of Microfinance Institutions in Ethiopia,.
- Kimando, N. L. (2012). Factors Influencing the Sustainability of Micro-Finance Institutions in Murang'a Municipality. *International Journal of Business and Commerce*, Vol. 1 (No. 10).
- Kinde ,B.A (2012). Factor affecting financial sustainability of MFIs in Ethiopia
- Kipsha,F.E. & Zhang, X. (2013). Sustainability, Profitability and Outreach Tradeoffs: Evidences from Microfinance Institutions in East Africa. *European Journal of Business and Management*,, Vol.5, No.8, 2013.
- Kyereboah, C. A. (2007). "The impact of capital structure on the performance of microfinance institutions". *The Journal of Risk Finance*,, 8:1, 56-71.
- Ledgerwood, J. (1999). "Microfinance Handbook: An Institutional and Financial Perspective",. *Sustainable Banking with the Poor Project* . World Bank, Washington D.C.: World Bank,.
- Lengerwood J. (1999). *Sustainable Banking with the Poor: Microfinance Handbook, The Institutional and Financial Perspective*.
- Letenah.E.(2009). "Performance analysis of sample microfinance institutions of Ethiopia",
- Magali, J. J. (2013). Are Rural Savings and Credits Cooperative Societies in Tanzania Sustainable? *International Journal of Management Sciences and Business Research*, .
- Mazlan, et al. (2014). "Determinants of financial sustainability of microfinance institution in Bangladesh",. *International Journal of Economics and Finance*
- MelkamuWoldeyes. (2012, May). *Determinants of Operational and Financial Self-Sufficiency: An Empirical Evidence of Ethiopian Microfinance Institutions*. Thesis .
- Mersland, Roy & Øystein Strøm, R. (2009). "Performance and governance in microfinance institutions,". *Journal of Banking & Finance*,, vol. 33(4).
- Mersland, Roy and Strøm, Reidar Øystein . (2007). "Performance and corporate governance in microfinance institutions".
- Meyer, R. L. (2012). *Track Record of Financial Institutions in Assisting the Poor in Asia*,. ADB Institute Research Paper, (No 49).
- MixMarket. (2014). *Sub-Saharan Africa Microfinance: Analysis and Benchmarking Report 2010*. Retrived July 20, 2015, from www.mixmarket.org/.
- MIXMARKET. (2015). www.mixmarket.org.

- MoFED. (2002). Sustainable Development and Poverty Reduction Program, Addis Ababa,.
- Mohd. Abdur Rahman & Ahmad Rizal Mazlan,. (2014). Determinants of Financial Sustainability of Microfinance Institutions in Bangladesh. *International Journal of Economics and Finance*, Vol. 6 (No.9).
- Morduch, J and B. Haley. (2002). Analysis of the Effects of Microfinance on Poverty. Working Paper No. 1014, .
- Morduch, Jonathan. (1999). 'The Microfinance Promise'.
- Nawaz, A. (2010). Issues in Subsidies and Sustainability of Microfinance: An Empirical Investigation. CEB Working Paper, Centre Emile Bernheim. Research Institute in Management Science, University of Brussels, Belgium.
- NBE. (2015). BIRITU. Addis Ababa: The National Bank of Ethiopia.
- Nelson, S. (2011) Performance Assessment of Micro Finance Institution in the Ashaiman Municipality, MSc thesis.
- Niels Hermes & Robert Lensink. (2007). "Impact of microfinance: a critical survey,".
- Nyamsogoro, G. D. (2010). "Financial sustainability of rural microfinance institutions in Tanzania": PhD thesis,.
- Pinkowitz, L., Stulz, R. and Williamson, R. (2006), "Does the contribution of corporate cash holdings and dividends to firm value depend on governance? A cross-country analysis", *Journal of Finance*, Vol. 61 No. 6, pp. 2725-2751.
- Quayes, S. (2012). Depth of outreach and financial sustainability of microfinance institutions.
- R Srinivasan and M S Sriram. (2013). Microfinance:IIMB Management Review,.
- Rahman, M. &Mazlan, A. (2014). Determinants of Financial Sustainability of Microfinance Institutions in Bangladesh. *International Journal of Economics and Finance* .
- Randhawa B. and Gallardo J. (2003). "Microfinance Regulation in Tanzania: Implications for sustainability.".
- Reno-Weber, B. (2008). Microfinance goes mainstream. *Harvard Kennedy School Review*,. Vol.8, pp.123-128.
- Robinson, M. S. (1998). 'Microfinance: the Paradigm Shift From credit Delivery to Sustainable Financial Intermediation'.

- Robinson, M. (2001). *The microfinance revolution: Sustainable finance for the poor*. .
- Rosenberg, R. (2009). *The New Moneylenders: Are the Poor Being Exploited by High Interest Rates?*, Occasional Paper 15. Washington, D.C.: CGAP.
- Sekabira, H. (2013). *Capital Structure and Its Role on Performance of Microfinance Institutions: The Ugandan Case*.
- SIDA. (2007). *Short Study on Microfinance in Ethiopia*. SIDA.
- Sileshi, M.(2015). "Determinates of financial and operational sustainability of MFIs in Ethiopia": an empirical study. Department of Accounting and Finance, Addis Ababa university,Addis ababa,Ethiopia,2015
- The Norwegian Nobel Committee. (2006). *Nobel Peace Prize 2006*. nobelpeaceprize; peaceprize.org/en-gb/laureates-2006, retrived on July 5,2015.
- TilahunAemiro. (2013). *Determinants of Financial Sustainability of Microfinance Institutions in East Africa*. *European Journal of Business and Management*, Vol.5, (No.17,).
- UNCDF (1999), *The United Nations Capital Development Fund (UNCDF) Working paper on Microfinance*.
- Vicki Bogan, W. J. (2007). "Does Capital Structure Affect the Financial Sustainability of Microfinance Institutions?"
- Vingo, T. (2012). *Capital Structure and Microfinance Performance*:Retrieved July 3, 2015, URL: <http://etheses.bham.ac.uk/4428/>.
- WoldayAmha and AntenehKifle . (2013). *Performance Analysis Report-Bulletine 9*. AEMFI.
- WoldayAmha, A. K. (2014). *Ethiopian Microfinance Institutions Performance Analysis Report*. Addis Ababa,: Association of Ethiopian Microfinance Institutions (AEMFI).
- Wolday, Amha. (2000). *Networking Microfinance Activities in Ethiopia: Challenges and Prospects*. Addis Ababa, Ethiopia: AEMFI.
- Yaron, J. (1992). "Successful rural finance institutions". World Bank discussion paper (No. 150,).
- Yenesew, A. (2014). *Determinants Of Financial Performance: A Study On Selected Micro Finance Institutions In Ethiopia*, MSc Thesis. Addis Ababa University. Addis Ababa Ethiopia.
- Yirsaw, A. (2008). *The performance of Micro Finance Institutions in Ethiopia: A case of Six Microfinance Institutions*, MSc Thesis. Addis Ababa University.

Yoshi Fukasawa, a. K. (2011). Factors Determining the Operational Self-Sufficiency Among Microfinance Institutions. *Advances in Business Research*, Vol. 2, (No. 1,), pp172-178.

Zeeler and Meyer (2002). *The triangle of microfinance: Financial Sustainability, Outreach and Impact*. International food research institute, Washington D.C.

Zerai, B. and Rani L. (2013). Is There a Tradeoff between Outreach and Sustainability of Micro finance institutions? Evidence from Indian Microfinance Institutions (MFIs),. *European Journal of Business and Management*,, Vol 4, (No.2,).

Annex 1: Unit root test (E-views Output)

Null Hypothesis: Unit root (common unit root process)

Series: FSS

Date: 06/09/16 Time: 23:14

Sample: 2004 2013

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 120

Cross-sections included: 15

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-9.33548	0.0000

** Probabilities are computed assuming asymptotic normality

Null Hypothesis: Unit root (common unit root process)

Series: DLR

Date: 06/09/16 Time: 23:15

Sample: 2004 2013

Exogenous variables: Individual effects, individual linear trends

User-specified maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total number of observations: 132

Cross-sections included: 15

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-5.72076	0.0000

** Probabilities are computed assuming asymptotic normality

Null Hypothesis: Unit root (common unit root process)
 Series: INF
 Date: 06/09/16 Time: 23:17
 Sample: 2004 2013
 Exogenous variables: Individual effects, individual linear trends
 User-specified lags: 1
 Newey-West automatic bandwidth selection and Bartlett kernel
 Total (balanced) observations: 120
 Cross-sections included: 15

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-9.31102	0.0000

** Probabilities are computed assuming asymptotic normality

Null Hypothesis: Unit root (common unit root process)
 Series: OER
 Date: 06/09/16 Time: 23:17
 Sample: 2004 2013
 Exogenous variables: Individual effects, individual linear trends
 User-specified lags: 1
 Newey-West automatic bandwidth selection and Bartlett kernel
 Total (balanced) observations: 120
 Cross-sections included: 15

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-3.02694	0.0012

** Probabilities are computed assuming asymptotic normality

Null Hypothesis: Unit root (common unit root process)
 Series: BOR
 Date: 06/09/16 Time: 23:18
 Sample: 2004 2013
 Exogenous variables: Individual effects, individual linear trends
 User-specified lags: 1
 Newey-West automatic bandwidth selection and Bartlett kernel
 Total (balanced) observations: 120
 Cross-sections included: 15

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-10.500	0.0000

** Probabilities are computed assuming asymptotic normality

Annex 2: Estimation Result (E-views Output)

1.Fixed Effect Model

Dependent Variable: FSS

Method: Panel EGLS (Cross-section weights)

Date: 06/05/16 Time: 15:04

Sample: 2004 2013

Periods included: 10

Cross-sections included: 15

Total panel (balanced) observations: 150

Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLR	0.360129	0.117489	3.065214	0.0026
INF	-0.006929	0.000907	-7.639905	0.0000
OER	-1.161775	0.383084	-3.032694	0.0029
BOR	0.102528	0.034569	2.965908	0.0036
C	-0.009855	0.356477	-0.027645	0.9780

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.710104	Mean dependent var	1.064498
Adjusted R-squared	0.670271	S.D. dependent var	0.379114
S.E. of regression	0.188042	Sum squared resid	4.632109
F-statistic	17.82699	Durbin-Watson stat	1.804634
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.625605	Mean dependent var	0.953867
Sum squared resid	4.745963	Durbin-Watson stat	1.906487

2. Random Effect

Dependent Variable: FSS

Method: Panel EGLS (Cross-section random effects)

Date: 06/06/16 Time: 16:09

Sample: 2004 2013

Periods included: 10

Cross-sections included: 15

Total panel (balanced) observations: 150

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-0.006713	0.001025	-6.551837	0.0000
OER	-1.729472	0.426957	-4.050696	0.0001
DLR	0.425925	0.114398	3.723187	0.0003
DER	-0.039279	0.019515	-2.012703	0.0460
CAR	-0.480927	0.236638	-2.032334	0.0440
C	1.397936	0.148490	9.414311	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	0.110359	0.2391
Idiosyncratic random	0.196889	0.7609

Weighted Statistics

R-squared	0.380171	Mean dependent var	0.468700
Adjusted R-squared	0.358649	S.D. dependent var	0.246084
S.E. of regression	0.197075	Sum squared resid	5.592724
F-statistic	17.66443	Durbin-Watson stat	1.713284
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.429616	Mean dependent var	0.953867
Sum squared resid	7.230393	Durbin-Watson stat	1.325229

3.Pooled Regression

Dependent Variable: FSS

Method: Panel Least Squares

Date: 06/06/16 Time: 16:09

Sample: 2004 2013

Periods included: 10

Cross-sections included: 15

Total panel (balanced) observations: 150

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-0.006888	0.001143	-6.027750	0.0000
OER	-1.899935	0.337074	-5.636561	0.0000
DLR	0.381946	0.112121	3.406567	0.0009
DER	-0.069521	0.017179	-4.046878	0.0001
CAR	-0.753630	0.202666	-3.718587	0.0003
C	1.599166	0.131803	12.13300	0.0000
R-squared	0.441876	Mean dependent var		0.953867
Adjusted R-squared	0.422497	S.D. dependent var		0.291678
S.E. of regression	0.221657	Akaike info criterion		-0.136194
Sum squared resid	7.074977	Schwarz criterion		-0.015769
Log likelihood	16.21455	Hannan-Quinn criter.		-0.087269
F-statistic	22.80145	Durbin-Watson stat		1.412018
Prob(F-statistic)	0.000000			

