Determinants of Operational and Financial Self-Sufficiency: An Empirical Evidence of Ethiopian Microfinance Institutions

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This is to certify that the thesis prepared by Melkamu Tamene, entitled: Determinants of Operational and Financial Self-Sufficiency: An Empirical Evidence of Ethiopian Microfinance Institutions and submitted in partial fulfilment of the requirements for the degree of Degree of Master of Business Administration in Finance complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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Abstract

An enduring problem facing MFI is how to attain financial and operational sustainability. Several studies have been conducted to determine the factors affecting the financial and operational sustainability of MFIs. However, there are insufficient studies conducted on this area in Ethiopia. Therefore, this study was conducted to fill the gap. This study is based on quantitative research approach using panel data regression as the main data analysis technique. The study was based on a six years" secondary data obtained from the mix-market database for twelve selected MFI 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. Whereas cost per borrower, number of active borrowers and yield on gross loan portfolio affect their financial sustainability. The Study also found that MFIs in Ethiopia are operationally self-sufficient while they are not financially self sufficient. This study recommends microfinance institutions to consider more numbers of borrowers, find ways of serving the borrowers at the lowest possible cost, be able to utilize their short term assets to generate more cash and financial revenues, they should increase the loan size, and finally it has been recommended that they should increase the value of their total assets.

Dedication

This Work is dedicated to my Father, Tamene Woldeyes.

TO GOD IS THE GLORY!

Acknowledgment

First of all, I thank the almighty God for giving me the encouragement and patience to complete my work. This time would not have been easy for me without the help of Jesus.

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To my father Tamene W., my mom Asnakech A., all my Brothers and Sister, I say Thank you for your unconditional love, support and encouragement you gave me throughout this period. This work would not have been possible without your support and contributions. I love you guys. I also wish to thank my friends (Teka F., Selamsew Y., Habtamu N., Tolera A., and Salem S.) for their Good words of encouragement and friendship. God Bless You Guys.

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List of Acronyms

ACCION	Americans for Community Cooperation in Other Nations
AdCSI	Addis Credit and Saving Institution
AEMFI	Association of Ethiopian Microfinance Institutions
ALBPB	Average Loan Balance per Borrower
AROA	Adjusted Return on Asset
ASCI	Amhara Saving and Credit Institution
BG	Busa Gonofa
CGAP	Consultative Group to Assist the Poor
CLRM	Classical Linear Regression Model
CPB	Cost per Borrower
DER	Debt to Equity Ratio
DECSI	Dedebit Credit and Saving Institution
DW	Durbin Watson
FINCA	Foundation for International Community Assistance
FSS	Financial Self-Sufficiency
LR	Liquidity Ratio
M-CRIL	Micro-Credit Rating International Limited
MF	Microfinance
MFI	Microfinance Institution
MIX	Microfinance Information Exchange
NAB	Number of Active Borrower
NBE	National bank of Ethiopia

NGO	Non-Governmental Organization
NLP	Net Loan Portfolio
NPL	Non-Performing Loan
OCSSCO	Oromia Credit and Saving Share Company
OER	Operating expense Ratio
OLS	Ordinary Least Square
OMFI	Omo Microfinance Institutions
OSS	Operational Self-Sufficiency
PAR	Portfolio at Risk
PEACE	Poverty Eradication and Community Empowerment
PPI	Progress out of Poverty Index
PPR	Personnel Productivity Ratio
ROA	Return on Asset
ROE	Return on Equity
SDI	Subsidy Dependence Index
SFPI	Specialized Financial and Promotional Institution
SMFI	Sidam Micro finance institution
SNNP	Southern Nation and Nationalities people
SPA	Social performance assessment
SSA	Sub-Saharan Africa
UNDP	United Nation Development Program
USAID	United States Agency for International Development

CHAPTER ONE

INTRODUCTION

1.1.Background of the Study

Ethiopia is one of the poorest and most underdeveloped countries of the world. With more than 80 million inhabitants, it has one of the largest populations in SSA. The Ethiopian economy is largely based on agriculture, productivity is generally very low. Because of this the numbers of poor in the country are very high.

Ethiopia‟s formal financial sector is still underdeveloped and these institutions do not reach the urban poor, and even less the poor in rural areas. Commercial banks consider them as un-bankable due to their lack of collateral and information asymmetries, so it is the microfinance institutions that provide them with small and short term loans.

Microfinance is the provision of financial service to the poor people with very small business or business projects (Marzys, 2006). Only a small fraction of the world population has access to financial instruments, essentially because commercial banks consider the poor people as un-bankable due to their lack of collateral and information asymmetries.

Microfinance is the supply of loans, savings, money transfers, insurance, and other financial services to these low-income and un-bankable 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 mainstream banks or other formal financial service providers.

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 weather they reach the poor society and are working towards achieving the mission for which they are established for.

These institutions, to continue serving the poor societies, their profitability and sustainability should be measured, because they need to be operationally and financially sustainable. Among the available measures, operational self-sufficiency and financial self-sufficiency are the predominant profitability and sustainability measurement variables. This has been needed because mostly they rely on the funds which are obtained from donors. The problem is not about relaying on them, but it is about what if the donation is terminated at some point in time.

There are a number of studies in the MF industry in international level because it has got the attention of academicians and practitioners as an innovative method of fighting poverty. But it is limited in our country Ethiopia. The studies mostly concentrate on three key areas.

The first one is impact assessment; whether the provision of financial service has improved the lives of the poor in terms of economic, social and political indicators of poverty. The second most important area is whether these financial service providers reach the poorest of the poor who is in need of financial services. The other third most important area that got the attention in the MF industry is the issue of financial sustainability of MFIs. Historically MF has started operation with donor funds and

now the industry has almost aged around 30 years. There is an intense debate on whether MFIs should continue to be donor supported or get relived from donation and stand on their own leg. There is school of thought called welfarists which says MF should be sustainable with donor funds and the other school of thought called institutionalist that says MF should generate enough revenue to cover their own costs as donors funds are unpredictable (Basu and Woller, 2004). Hence the issue of building a sustainable MF industry that can operate without a donor funds is of an empirical enquiry.

MFIs must struggle to have good financial and operational performance so that they can play a major role in the poverty reduction so that achieve their primary objectives. Therefore, this study focused on the factors affecting and determining the financial and operational sustainability of microfinance institutions in Ethiopia. The assessment of financial and operational performance of the selected micro-financial institutions in Ethiopia have also been tried to be scrutinized under this study using performance indicators. Therefore, this study has tried to assess the determining factors of operational and financial sustainability.

1.2.Statement of the Problem

This study focuses on determining the factors affecting the operational and financial sustainability of microfinance institutions in Ethiopia. Microfinance"s goal is to eradicate poverty. In the early days when MFI started, they were financed by donor funds that have a poverty eradication goal. 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). 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 i.e. MFIs shall start covering their own cost of operation from their program revenues to alleviate poverty. Therefore, given this, the improved financing is seen as crucial in alleviating poverty by being sustainable.

A major problem facing MFIs is how to attain sustainability (operational and financial) (Shcreiner, 2000; Woller, 2000; Christian et al, 1995). 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. This problem has attracted the attention of many researchers and as a result many strategies have been put to ensure that MFIs are sustainable (Shcreiner, 2000; Yaron, 1992).

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?

Along this line 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.

Several studies have been conducted to determine the factors affecting operational and financial sustainability of MFIs in different countries. However, the level of

significance of these factors in affecting the operational and 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 Shcreiner 2002; Christian et al, 1995).

The factors affecting the operational and financial sustainability of MFIs in Ethiopia are not clearly known, or else, the applicability of the findings of other studies for Ethiopia is not indicated when most of the institutions are government and NGO supported. Therefore, this study is aimed to narrow the knowledge gap about the significant determining factors of sustainability of Ethiopian microfinance institutions.

1.3.Objectives of the Study

1.3.1. General Objective

The main objective of this study was to determine factors affecting operational and financial sustainability of microfinance institutions in Ethiopia.

1.3.2. Specific Objectives

In trying to determining the factors affecting the operational and financial sustainability of microfinance institutions, this study has specifically tried to address the following specific objectives:

- To assess the operational and financial sustainability of the microfinance institutions;

- To see the effect of the outreach, efficiency, and productivity of microfinance institutions on operational and financial sustainability measured by the indicators;
- To determine the determinants of operational and financial sustainability on the sustainability of microfinance institutions in Ethiopia; and finally

1.4.Research Hypotheses

The research hypotheses for the study are:

H1: There is a significant positive relationship on the yield on gross loan portfolio of microfinance institutions with operational self-sufficiency and financial self-sufficiency.

H2: There is a positive significant relationship between Size of microfinance institutions and operational self-sufficiency.

H3: There is a positive significant relationship between personnel productivity ratio and operational self-sufficiency.

H4: There is a negative significant relationship between debt to equity ratio of microfinance institutions and operational self-sufficiency.

H5: Cost per borrower is negatively related to operational self-sufficiency and financial self-sufficiency.

H6: There is a significant positive relationship between average loan balance per borrower and operational self-sufficiency.

H7: Age of a microfinance institution is significantly and positively related to operational self-sufficiency and financial self-sufficiency.

H8: There is a significant positive relationship between liquidity ratio and financial self-sufficiency.

H9: There is significant positive relationship between number of active borrowers and financial self-sufficiency.

H10: There is a negative significant relationship between operating expense ratio and financial self-sufficiency.

1.5.Conceptual Frame Work

Microfinance in the past thirty years has emerged as a development strategy indicative of reducing poverty from a wider scope of building financial, human, physical and social capital. All in one strategy, architects of microfinance, mainly practitioners, development partners and government assert its capability.

As microfinance firms are viewed predominantly as instruments of social economic change, their performance has been often measured by non-financial parameters. The concept of social performance has seemed to overshadow the state of financial health and sustainability of these enterprises. However, the accepted criteria in a number of studies to study the performance of any MFI have been the twain of Financial Performance and Outreach (Chaves and Gonzales-Vega 1996, Christen et al 1995, Ledgerwood 1999, Yaron, 1992, Yaron 1994, Yaron et al, 1998, as cited in Arsyad, 2005). However, there exist various social performance assessment tools and institutionalized rating processes but assessment of financial performance has yet to gain ground. Some of the more popular tools include MFC Social Audit, ACCION SOCIAL, USAID SPA Audit, M-CRIL, Microfinanza Rating, Micro Rate (SPA), CGAP-Grameen-Ford Progress out of Poverty Index (PPI) etc (Sen, 2008). These tools often focus on outreach indicators, which are considered as proxies for impact of MFI on development (Yaron el al 1997).

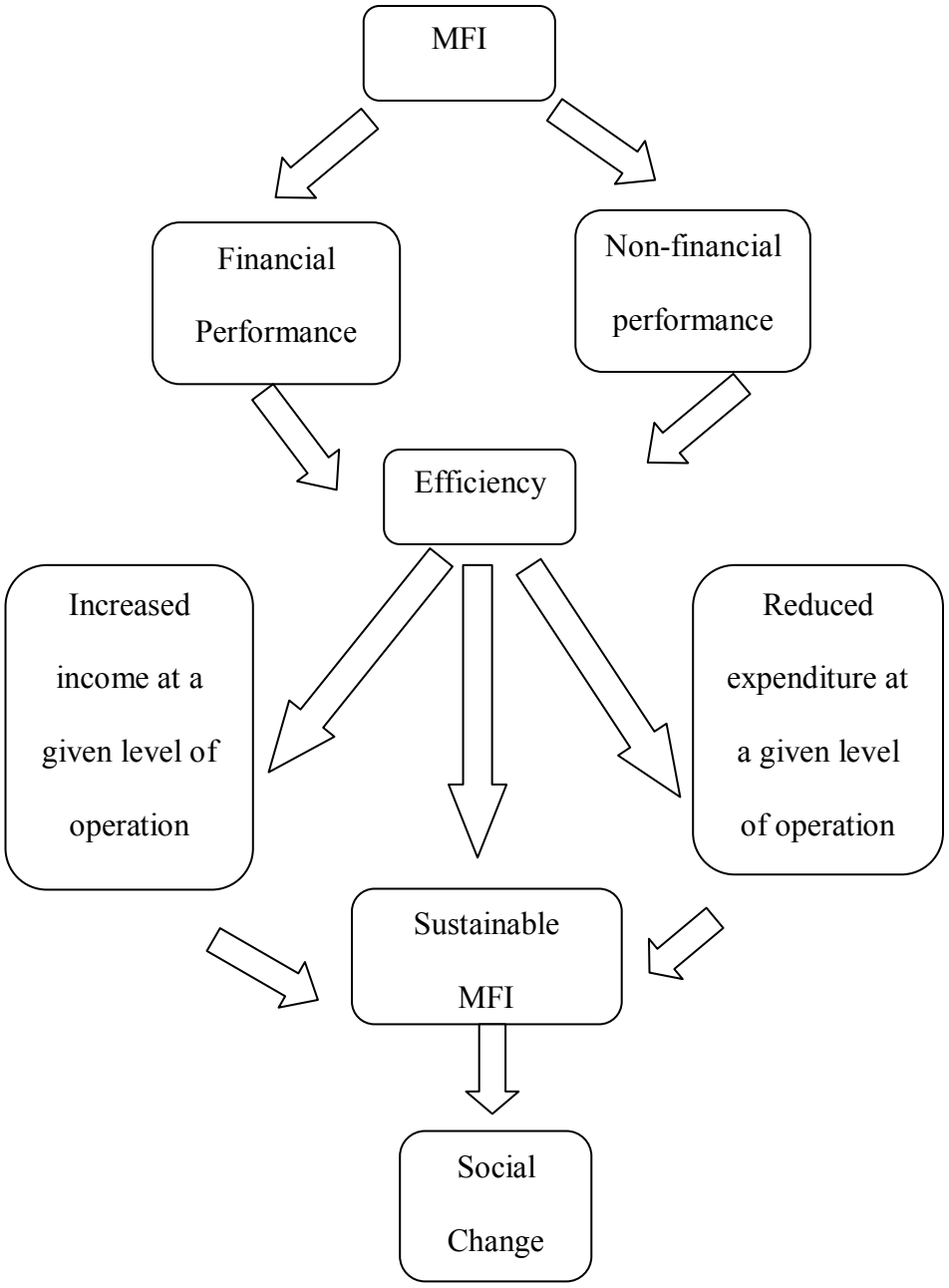
The financial performance assessment is devoid of such a multitude of options and methodologies despite critical importance of financial sustainability. Though an ambition for sustainable institutions has been often articulated, there was also opinion that most microfinance institutions working in this field have been unsustainable (Copisarow, 2000). Research studies have shown that this is predominantly connected to the perception of micro borrowers" risk and creditworthiness, and the diseconomies of scale in making small loans (Quach, 2005). Microfinance has been attractive to lending agencies because of demonstrated sustainability and low cost of operations.

Initially it was expected that the MFIs would be able to wean themselves off donor subsidies and achieve self-sufficiency as their rate of recovery of loans was excellent, but Morduch (1999) contends that the well publicized high rate of recovery in the micro-credit industry has somehow failed to automatically transform the donor-dependent MFIs into independent self-sustaining organizations. Morduch (2000) is also sceptical of the optimistic belief harboured in the industry that sound banking practice including financial sustainability will also ensure depth of outreach and alleviation of poverty.

Therefore, there has been a recent paradigm shift in the micro-credit industry, from subsidized credit delivery programs to financially self-sufficient institutions providing commercial microfinance. Robinson (2001) addresses this gradual transformation in the micro-credit industry where, MFIs achieve social outreach and financial sustainability without requiring any subsidies. As a result, all MFIs and the micro-credit industry in general are faced with the reality that policy makers, donors and investors are increasingly emphasizing their financial performance by eliminating

their reliance on subsidies. Therefore in order to eradicate poverty, microfinance institutions should be sustainable. On the other hand again, to achieve sustainability, they should identify those factors contributing to their sustainability.

Figure1. Conceptual framework of the study



Source: Developed by self design and partly adopted from Nymsgoro (2010)

1.6.Delimitations and Limitations of the Study

1.6.1. Delimitation/Scope of the Study

Any discussion about the performance of microfinance in alleviating global poverty should measure both financial success of the organization along with the success in reaching the poorest of the poor and improving the lives of the borrowers, and hopefully, through a multiplier effect, the lives of many others in the community. However, due to certain limitations like constraints of time and higher cost of gathering primary data from the users, for instance to measure the impact of microfinance institutions on the lives of the poor, this study only focuses on determining the factors affecting the financial and operational sustainability of Ethiopian MFI. It excludes the outreach and its impact on the lives of the poor, and also comparison of the financial performance with the global peers and within themselves from investigation.

1.6.2. Limitations of the Study.

The major problem that the researcher has faced during the process was actually lack of complete information. As indicated in the other sections, this research was purely dependent on the secondary data which is obtained from the mix-market database. However, all microfinance institutions did not make reports to this website. From the total of 30 MFIs in the country, only 22 make reports on annual basis. From these 22, however, it is only 12 of them that have a complete data for the years under consideration (2005-2010). But on the other aspects, the researcher believes that there is no problem with regard to the designs and methodologies applied to achieve the objectives of the study.

1.7.Significance of the Study

This research has been conducted to determine the determinant factors that affect the operational and financial self-sufficiency of microfinance institutions in Ethiopia. Therefore, one of the most important things that MFIs obtain from the result of this particular study is that they will clearly know and understand the factors affecting their operational and financial sustainability. If there is a clearer understanding by MFI in the factors that affects their operational and financial sustainability, they will give greater attentions to these factors and strive to manage them properly in order to make themselves operationally and financially self-sufficient.

This research is also aimed to assist microfinance practitioners in measuring the financial and operational performances of MFIs and consequently to give some insights into how a MFIs‟ financial and operational performances could be improved by showing gap.

The other significance of this study is, indicated in the other section, to support further investigation on the area. Since, there are no sufficient studies conducted on this area, this research will also help other researchers in two ways. For one thing, it will provide a good literature for the study which may be conducted on the same area. And for the other thing, to show directions in which other researchers should follow to make further investigation on the sustainability of MFI.

1.8.Structure of the Paper.

This paper is organized in to five chapters. The first chapter presents, the back ground of the study, statement of the problem, objectives of the study, significance of the study, delimitation and limitation of the study. The second chapter deals with the

details of related and important literatures used in the study. The third chapter will deal with the methodology in general. It presents the data collection mechanism, data analysis tool, operational definition for the variables used in this study and the expected effects of the explanatory variables on the sustainability. The analysis, findings and discussions are kept in the fourth chapter. It presents all the findings of the study with their implications. Lastly but not least, the final chapter will attempt to generalize the findings and make certain recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1.Introduction

The literature part is grouped into eight sections. The first section will deal with the Introduction; the second section is about the general overview of microfinance institutions. Then, the third section discuses about MF in Ethiopia, the performance measure of microfinance and perspectives of performance measure will be considered under the fourth and Fifth sections. Under section six and seven, sustainability in general and in the case of Ethiopian microfinance institutions has been mentioned and lastly, the empirical evidence with regard to the determinants of microfinance sustainability has been discussed in detail under section eight of the literature part.

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 and Robert Lensink, 2007).

2.2.General Overview

2.2.1. What is Microfinance?

Different authors and organizations have defined Microfinance institutions in different ways. However the essence of the definitions are usually the same in which

microfinance refer to the provision of financial services; primarily savings and credit to the poor and low income households that don"t have access to commercial banks.

Arsyad (2005) and Legerwood (1999, p1) defines it as the provision of financial services (generally saving and credit) to low income clients. Robinson (2001) defines it as small scale financial services primarily credit and saving provided to people who farm or fish or herd; who operate small enterprises or micro-enterprises where goods are produced, recycled, repaired or sold; who provide services; who work for wage and commission; who gain income from renting out small amount of land, vehicles, draft animals, or machinery tools; and other individual and groups at the local level of developing countries both rural and urban area.

But for this case the definition given by the MIX (Microfinance information exchange) is more appealing than the rest provided in the above paragraph. The MIX defines 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 and often have limited access to other financial services, microfinance products tend to be for smaller monetary amounts than traditional financial services. These services 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 reflects the fact that the financial needs of individuals, households, and enterprises can change significantly over time, especially for those who live in poverty. 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.

MIX recognizes many general definitions of microfinance, but for analysis purposes, employs a functional definition: Microfinance services – as opposed to financial services in general – are retail financial services that are relatively small in relation to the income of a typical individual. Specifically, the average outstanding balance of microfinance products is no greater than 25% of the average income per person (GNI per capital).

2.2.2. The Microfinance Landscape

Microfinance programs provide credit to the poor, either through joint liability group lending or through individual-based lending. The joint liability lending approach uses groups of Borrowers to which loans are made (e.g. the Grameen Bank of Bangladesh and BancoSol of Bolivia) while the individual based lending involves direct relationship between the program and the individuals (traditional methodology). Currently, according to N. Hermes and R. Lensink (2007), the majority of microfinance borrowers have access to loans through group lending programs. These lending types are described here under.

Individual-based lenders are institutions that use standard bilateral lending contracts between a lender and a single borrower. Liability for repaying the loan rests with the individual borrower only, although in some cases another individual might serve as a guarantor.

Solidarity group lenders are institutions that employ contracts based on joint liability implemented with solidarity groups (in the spirit of contracts used initially at the Grameen Bank in Bangladesh and at BancoSol in Bolivia). Loans are made to individuals but the group, which has between 3 and 10 members depending on the

institution and location, shoulders responsibility for a loan if a member cannot repay. In general with joint liability lending the group of borrowers is made responsible for the repayment of the loan, i.e. all group members are jointly liable. Thus, if one group member does not repay his/her loan, others may have to contribute so as to ensure repayment.

Village banks are where each branch forms a single, large group and is given a degree of self-governance (this kind of arrangement was pioneered by FINCA and is now employed by organizations like Pro Mujer and Freedom from Hunger).

2.2.3. Objectives and Roles of MFI

Micro finance is regarded as an effective tool for poverty alleviation. The Asian Development Bank (Finance for the poor: Micro Finance Development Strategy, 2000) has recognized micro finance as a powerful tool to reduce poverty, promote economic growth, support human development and improve the status of women.

Most of the poor people live in rural areas and have little opportunity. Therefore, Microfinance could help poor people who have no collateral, but a willingness to work and a desire to do some business activities from which he/she will acquire employment as well as income. What is more, the economic environment provides great business opportunities.

Microfinance institutions around the world have been quite creative in developing products and services that avoid barriers that have traditionally kept women from accessing formal financial services such as collateral requirements, male or salaried guarantor requirements, documentation requirements, cultural barriers, limited mobility, and literacy. Nevertheless, in a number of countries and areas few or no

institutions offer financial services under terms and conditions that are favourable to women. Together, the type of products offered, their conditions of access, and the distribution of an institution‟s portfolio among different products and services affect women‟s access to financial services. They also suggest that much more can be done to serve poor women in certain cultural and economic contexts. Therefore, the major objective and role of microfinance institutions is to alleviate poverty by providing financial services to the poor people, especially for women.

2.3.Review of Microfinance in Ethiopia

Microfinance is a diverse and growing industry around the world. As the industry matures the importance of common standards by which MFIs can be measured increases (UNDP). The micro-credit sector in Ethiopia has been strictly regulated since 1996. Following an assessment of revolving funds managed in the framework of NGO development projects, a piece of law was promulgated with the aim of professionalizing the sector by reducing imprudent lending practices, lenient financial discipline and distortions due to unrealistic interest rates.

Formal micro-finance in Ethiopia started in 1994/5. In particular, the Licensing and Supervision of Microfinance Institution Proclamation of the government during 1996 encouraged the spread of Microfinance Institutions in both rural and urban areas as it authorized them among other things, to legally accept deposits from the general public (hence diversify sources of funds), to draw and accept drafts, and to manage funds for the micro financing business.

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. Since the issuance of Proclamation 40/1996, which provides the establishment of microfinance institutions, sixteen microfinance institutions (MFIs) have been legally registered by the National Bank of Ethiopia (NBE) and started delivering services by the time. However currently, there are 30 licensed MFIs in the country. According to the data obtained from the MIX database on the year 2010, from the total of 30 MFI in the country, 22 of them are reaching about 2,358,717 credit clients and some saving clients. Considering the potential demand, particularly in rural areas, this only satisfies an insignificant proportion.

According to the Micro start Project document of UNDP, (1999), the economically active poor in Ethiopia who can potentially access financial services are about 6 million. Out of this, about 8.3% of the active poor have gained access to the licensed microfinance institutions. Despite the obvious disadvantages of the microfinance industry in Ethiopia such as poor communication and infrastructure, weak legal systems, banking sector and technical capacity when compared with other Sub-Saharan countries, the sector has been growing at a significant rate.

The sector experienced a spectacular development as shown by the figures published by the AEMFI on its web page: on the 30th of June 2006, there were 26 microfinance institutions registered in 8 regions of the Ethiopian federal state. Altogether, these institutions reach about 1,450,000 customers. However the data from the MIX market for the year 2010 shows 22 MFI are reaching about 2,358,717 customers which are almost double of the 2006s‟ figure. As Ethiopia has more than 80 million inhabitants of which 30% are considered as economically active, the penetration rate of the sector is 7%. The main MFIs in the country are all linked to regional governments and represent 83% of this figure. In terms of volume, by the end of 2010; the Net Loan

portfolio (NLP) represented more than 5,850 million birr, with an amount of 2,796.9 million birr collected in savings according to the data obtained from the National Bank of Ethiopia (NBE). The sector is divided in three main types of organizations. Firstly, the large MFIs that are linked to the regional governments (Oromia, Amhara, Tigray and SNNP) and benefit from their support and they represent the most important players. Secondly, the mediums and thirdly, the fully private MFIs which are smaller in size and have often been created by NGOs implementing development projects. All of them belong to the AEMFI, a national professional association of MFIs. Since 2005, the federal government has been more flexible concerning the maximum amount of loans granted to a single borrower. A ceiling of 500 Euros had been initially fixed for „normal" loans and 20% of the aggregate disbursement may exceed this ceiling. The idea was to ensure that most of the customers indeed came from the poorest sectors of the population. This amount should now be raised in order to better meet the funding needs of small and medium enterprises and urban companies.

Current figures (2010) obtained from NBE"s database indicates that the total loan by the 30 microfinance institutions represents 5,850 million Birr; Active borrowers: 2,358,717; Deposit: 2,796.9 million Birr.

2.4.Performance Measures of Microfinance

Performance of an institution shall be measured not only from the objectives of the organization angel, but also from the industry average. Microfinance"s goal is to eradicate poverty. In the early days when MFI started, they were financed by donor funds that have a poverty eradication goal. 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).

But these times the performance of microfinance institutions is being measured by different measures. 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 are in which the performance should be considered and these can be further elaborated in detail based on Ledgerwood (1999) ways of measuring the performance of MFI. These are:

Portfolio Quality indicators

Portfolio quality ratios provide information on the percentage of non-earning assets, which in turn decrease the revenue and liquidity position of MFIs. Some of the measures used include the repayment rates, arrears rate, Portfolio at risk, delinquent borrowers, loan loss reserve ratio, and loan loss ratio.

Productivity and Efficiency Ratios

Productivity and efficiency ratios provide information about the rate at which the MFI generate revenue to cover their expense. Productivity refers to the volume of business that is generated for a given resource or asset (input). Common measures of

productivity include the number of active loans per credit officer, and average portfolio outstanding per credit officer. On the other hand efficiency refers to the cost per unit of output. Common efficiency ratios includes operating cost ratio, salaries and benefits to average portfolio outstanding, average credit officer salary as a multiple of per capita GDP, cost per unit of currency lent, and cost per loan made.

Financial Viability Indicators

Financial viability refers to the ability of the MFI to cover its costs with earned revenue. A financially viable MFI will not rely on donor funding to subsidize its operation. Common indicators here include financial spread, Operational Self Sustainability (OSS), Financial Self Sustainability (FSS) and Subsidy dependence index.

Profitability Indicators

These indicators measure the MFI net income in relation to the structure of its balance sheet. Common measures include Return on Equity, Return on Assets, and Return on Business.

Leverage and Capital Adequacy Ratios

Leverage refers to the extent to which a MFI borrows money relative to its amount of equity. In other words, it answers the question of how many additional dollars can be mobilized from commercial sources for every dollar worth of funds owned by the MFI. The most widely used measure of leverage is the debt equity ratio. Capital adequacy refers to the amount of capital a MFI have relative to its assets. Capital adequacy means there is a sufficient level of capital required to absorb potential losses

while providing financial sustainability. The measure used for capital adequacy is the ratio of capital to risk weighted assets.

Scale and Depth of Outreach Indicators

These are non financial indicators of performance. Scale of outreach indicate the scale of the MFI activities as measured by the number of clients served with different type of instruments such as saving and credit. Depth of outreach measures the type of clients served and their poverty level. The proxy for depth of outreach used in various studies such as (Robert Cull et al, 2008; Hartarska, 2004; Mersland and Storm, 2007; Smith, 2006) is average loan size per GNI per capita, the percentage of women borrowers and percentage of rural clients.

However, 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 i.e. MFIs shall start covering their own cost of operation from their program revenues. Therefore, it is the sustainability aspects that this study has considered (the OSS and FSS).

2.5.Perspectives in Performance Measures

The different perspective on which the MF performance is to be measured has created two opposing but having the same goals school of thought about the MF industry: the Institutionist approach and the Welfarists" approach.

The movement has come to be divided by two broad approaches, or opposing camps, regarding the best way to help the poor through access to financial services. Jonathan Morduch (1998) refers to this division as the microfinance schism. The irony is that

while the worldviews of each camp are not inherently incompatible, and in fact there are numerous microfinance institutions that appear to embrace them both, there nonetheless, exists a large rift between the two camps that makes communication between them difficult. Here under the ideologies of the two schools of thought are discussed.

Welfarist

Welfarists argue that MFIs can achieve sustainability without achieving financial sustainability. They contend that donations serve as a form of equity and as such donors can be viewed as social investors. As per the idea of Basu and Woller (2004), unlike private investors who purchase equity in publicly traded firm, social investors don‟t expect to earn monetary returns. Instead these donor investors realize a social intrinsic return.

Basu and Woller (2004), believes that Welfarists tend to emphasize poverty alleviation, place relatively greater weight on depth of outreach relative to breadth of outreach and gauge institutional success according to social metrics. This is not to say that neither breadth of outreach nor financial metrics matter. Welfarists feel these issues are important, but they are less willing than Institutionist to sacrifice depth of outreach to achieve them.

In general, Welfarists emphasize depth of outreach. They are quite explicit in their focus on immediately improving the well-being of participants. They are less interested in banking persons than in using financial services as a means to alleviate directly the worst effects of deep poverty among participants and communities, even if some of these services require subsidies. Their objective tends to be self-

employment of the poorer of the economically active poor, especially women, whose control of modest increases of income and savings is assumed to empower them to improve the conditions of life for themselves and their children. The centre of attention is the "family." The most prominent examples of Welfarists institutions are the Grameen Bank in Bangladesh and its replicates elsewhere, and FINCA-style village banking programs in Latin America and, more recently, in Africa and Asia.

Institutionist

On the contrary, Institutionist argue that unless we build sustainable MFI that are capable of running independent of subsidies, the promise of MFI of eradicating world poverty will not be met. They argue that sustainable MFI helps to expand outreach and reach more poor people.

Hence even if the two schools of thought seem contradictory, they are actually not. Their goal is eradicating poverty. Their difference lies on how to go about it (the approaches to alleviate poverty). Welfarists say we have to target the very poor and profitability shall be secondary. They prefer to charge subsidized and low interest rates by relying on donor funds. On the other way round, institutionist argues that donor funds are unreliable and MFI must by themselves generate enough revenues to reach more poor people in the future. They favour marginally poor customer. They charge higher interest rates and focus on efficiency of MFIs to generate profit and reach more poor.

The debate between the two schools of thought is endless and today many players in the MF industry use both the Welfarists and Institutionist perspective to assess the performance of MFIs. For many years the MFI industry was operating with subsidy

from donors and governments but there is now a pressure on these organizations to be financial sustainable. However, it seems that serving the poor and being financially self-sufficient seems contradictory. Various arguments are forwarded: the poor can‟t pay high interest rate, if the poor consume it has no collateral, there is big transaction cost in serving the poor. But these assumptions are falsified in the last 20 years and the poor is seen as capable of paying high interest as ROI of small projects are larger than large projects, the poor don‟t consume the money rather use it for financing his/her business, transaction cost barriers are mitigated by the creation of group lending, absence of physical collateral is mitigated by social capital. Hence contrary to the expectations the MFI industry has shown significant repayment rate although high repayment rates can‟t be translated into financial sustainability.

However, there seem many unresolved problems. Many MFI can‟t reach a significant portion of the world poor; they can‟t be free from subsidies. Mixed results are read on the impact of the micro-credit on lives of the poor. Can we serve the poor but still financially self-sufficient? Is the MFI model correct? If so what are hindering them to achieve the targets set? What optimal solution is available for the MFI in reaching the poor and being financially self-sufficient?

2.6.Sustainability

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. This change in emphasis has created a different perspective on the analysis of performance of the MFIs. Today many key plays in the industry use sustainability as one core criteria to evaluate the performance of MFI besides the outreach and impact measures described earlier.

CGAP‟s definition of sustainability traditionally addressed microfinance institutions‟ ability to stand on their own feet financially after a period of operations. To become financially sustainable requires an institution to cover all its costs (administration costs, cost of default, cost of funding, and reserves for expansion).

Hanns Martin Hagen (2002), has tried to define sustainability in the way that a rural financial institution is sustainable if it is willing and able to provide self-reliantly and permanently financial services to the rural poor without external assistance or after assistance by donors or government has ended. Pollinger, Outhwaite, and Cordero-Guzmán (2007) defined sustainability as the ability to cover annual budgets including grants, donations, and other fundraising.

In fact, they suggest that MFI generally operate in one of three different modes: survival, sustainability, or self-sufficiency. In survival mode, organizations barely cover their monthly expenses and many programs have faced a lingering decay as capital that was lent out in earlier years did not return as expected to cover future operations. Many of these organizations and programs eventually begin the process of dissolution and explain the high organization and program mortality in the sector. Most organizations seem to operate between survival and sustainability or the ability of organizations to cover their annual budget through donations and other grants in addition to earned income from their lending operations. In their definition, self-sufficiency refers to organizations that can survive and add to their asset base wholly on the basis of income derived from their lending and related operations.

The quest for sustainability and eventual self-sufficiency is widely regarded as a best practice in the microfinance industry. Vinelli (2002) offers five supporting arguments that explain why. First, sustainability helps ensure organization survival and the

continuing provision of a financial service that is desired by many micro business owners. Further, defaults may increase if borrowers believe that a lender is not permanent or if they believe the lender will not punish them. Second, MFIs that price their products at market levels will be able to attract the target population of non-bankable (but potentially viable) borrowers who do not have access to cheaper products. Third, traditional lenders may be deterred from competing with organizations that enjoy large subsidies. Fourth, sustainability facilitates the ability to raise capital from a variety of sources. And, lastly, a focus on self-sufficiency could prompt MFIs to control costs.

Self-sufficiency is seen as an appropriate mechanism for achieving the long-term viability of the microfinance sector. First, available resources and subsidies are too small to provide microfinance to all who might benefit from it. Second, a focus on self-sufficiency can lead to decreased costs through increased efficiency. Third, leverage is more easily attained by organizations that generate the means to repay debt. Finally, reliance on subsidies might alter a firm‟s incentive structure in ways that could increase the likelihood of a negative event.

The majority of MFIs do not cover their costs and it appears that cost-based pricing is a lever that MFIs are not fully utilizing Pollinger, Outhwaite, and Cordero-Guzmán (2007). There are various possible explanations for this according to them:

a. Certain funding institutions provide capital to MFIs with restrictions on the interest rates and fees that can be charged.
b. Lending by traditional institutions such as banks may create downward pressure on prices. If such pressure exists, it appears to affect only the near-bankable segment of the microfinance market.

c. There may be some price sensitivity on the part of borrowers,
d. MFIs may not fully appreciate the true operational costs underlying their lending products.

Organizations receiving subsidies may not get incentives to understand their true costs and maximize their efficiency of credit delivery. MFIs must be conscious of the possibility that pricing products below market levels may lead to the misdirection of funds to more credit-worthy borrowers who would otherwise seek bank financing and, in doing so, perpetuates some degree of credit market misallocation.

In microfinance, sustainability can be considered at several levels; institutional, group and individual and can relate to organizational, managerial, and financial aspects (Sa-Dhan, 2003). However, the issue of financial sustainability of microfinance institutions has attracted more attention in mainstream analysis at the expense of the sustainability of the client/borrower. According to Sharma and Nepal (1997), a microfinance institution attains sustainability when its operating income from loans is sufficient to cover all the operating costs. They argue that sustainability of microfinance institution includes both financial viability and institutional sustainability (self-sufficiency) of the lending institution.

The micro-credit summit campaign, on the other hand refers to a microfinance institution as institutional (operational) and financially Self-Sufficient if it is able to cover all actual operating expenses from income generated from its financial services operations, after adjustment for inflation and subsidies. Shah (1999) criticized the financial definition of sustainability saying that it is too narrow. He argued that the concept of sustainability must include, amongst other criteria: obtaining funds at market rate and mobilization of local resources. Thus, he proposes sustainability

measures that include among others: repayment rate, operating cost ratio, market interest rates and portfolio quality.

Microfinance institutions must be financially self-sustainable if they are to provide long term reliable services to users. Most literature refers to the viability or financial sustainability of microfinance institutions as their ability to cover costs from earned revenue. Three levels of viability are identified: Subsidy dependency, Operational self-sufficiency and financially self-sufficiency.

Rosenberg (2009) provided a guide to measuring indicators of MFI sustainability. He identified 5 broad indicators of MFI performance and sustainability: sustainability is measured by the return on asset (ROA), return on equity (ROE), Adjusted Return on Asset (AROA), Financial Self-Sufficiency (FSS), Operational Self-Sufficiency (OSS) and Subsidy Dependency Indicator (SDI). However, sustainability in this study is measured by operational and financial self-sufficiency. Therefore, it is only the two of them that will be discussed here under.

Operational self-sufficiency (OSS) requires MFIs to meet all administrative costs and loan losses from operating income. It is computed by dividing operating income by operating expenses. It is suggested, based on international experience, that successful MFIs should be able to achieve operational self-sufficiency within three to seven years. OSS is computed as the ratio of operating income to the sum of administrative expenses, loan losses and interest expenses. A firm is operationally sustainable if its OSS is 100% or more.

Financial Self-Sufficiency (FSS) is a subsidy-adjusted indicator often used by donor-funded microfinance NGOs. It measures the extent to which an MFI‟s business

revenue; mainly interest received covers the MFI"s adjusted costs. If the FSS is below 100%, then the MFI has not yet achieved financial break-even. It is measure by dividing business revenue excluding grants for operating expenses. One of the greatest challenges facing non-profit organizations in developing countries is that of obtaining critical funds to carry out the necessary activities to fulfil their mission. These challenges exist at the local or national, and the international level.

Achieving institutional financial sustainability is a goal that all non-profit organizations strive for. Theoretically, this financial sustainability will enable us to cover our administrative costs and to prioritize our activities so as to accomplish our missions, without undergoing interminable negotiations with donors who may or may not agree with our vision or with our cost percentages.

Nonetheless, the percentage of organizations that achieve financial sustainability remains very low. This is due not to a lack of creativity or commitment, but rather to the fact that many organizations continue to have a donor dependent vision. For microfinance institutions to be sustainable, this particular study covers the determining factor of sustainability in Ethiopia.

2.7.Determinants of Sustainability

In the following section we will discuss on the research result on the variables that determines the sustainability (operational and financial) of microfinance institutions which are conducted by different researchers all around the world. Different studies by different authors, specifically on the determinants of financial sustainability, found different results on the determinants that affect the financial and operational self-sufficiency of microfinance institutions. This literature is reviewed for the purpose of

developing empirical evidence for the independent variable that the researcher think may affect the operational and financial sustainability of microfinance institutions in Ethiopia.

2.7.1. Yield (Yield on Gross Loan portfolio)

Portfolio yield is a percentage that shows the average gross returns as a proportion of the portfolio outstanding. Generally speaking, Portfolio Yield is the initial indicator of an institution's ability to generate revenue with which to cover its financial and operating expenses. It measures how much the Microfinance Institution (MFI) actually received in interest payments from its clients during the period. It also provides an insight into portfolio quality. If the MFIs use cash accounting here, the Portfolio Yield will not include the accrued (interest and fee) income that delinquent loans should have generated, but did not. For Portfolio Yield to be meaningful, it must be understood in the context of the prevailing interest rate environment the MFI operates in.

The yield on gross loan portfolio (yield) indicates the efficiency of microfinance institutions in generating cash revenue from their outstanding portfolio. It measures all interest and fees charged on loans outstanding over a period (the measure of average interest rates on loans to customers).

In order to remain sustainable, Nadiya (2011) suggested MFI managers shall set the interest rates of the MFIs, such that it covers its total cost; comprising of cost of funds, transaction cost and default costs. Therefore, the sustainability of microfinance depends on how much interest income they earn from their operation.

The research finding by Cull (2005) indicates that the coefficient for real gross portfolio yield (the measure of average interest rates on loans to customers) is positive and significant across all three profitability indicators (financial self-sufficiency, operational sustainability, and return on assets), indicating that individual-based lenders tend to be more profitable when their average interest rates are higher. However, the same result indicates that the result does not hold true for village banks or solidarity group lenders. The yield coefficients for both types of lenders are insignificant (except for village banks in the ROA specifications) and negative. When summed, the coefficients for yield and the village bank yield interaction are not significantly different from zero. Thus, for village banks there is not a significant relationship between yields and profitability. The same pattern also holds for solidarity group lenders while the evidence indicates a strong positive association between interest rates and financial performance only for individual-based lenders.

The finding by Nyamsogoro (2010) indicates that there is a significant positive relationship between the yield on gross loan portfolio and financial sustainability. This provides evidence that the efficiency of microfinance institutions in generating cash revenue will positively affect their financial sustainability. The econometric result on the relationships of both interest rate and the amount outstanding (measured by the average loan outstanding) indicates that both interest rate and outstanding loans are significantly affecting the financial sustainability. According to this study both variables are positively and statistically significant at 1 percent significance level.

A study by Rombrugghe, Tenikue and Sureda (2007) as sited for the purpose of this study indicates; the yield affects the financial self-sufficiency (FSS) of a microfinance institution. It has indicated that the relation between yield and FSS is immediate and

positive through interest and fee revenues. On their research of determinants of financial self-sufficiency, Woller and Schreiner, have indicated that the real portfolio yield were robustly statistically significant in affecting the financial self-sufficiency of microfinance institutions.

Rombrugghe et al (2007) concluded that interest rates charged to borrowers affect the financial performance of microfinance institutions‟ overall sustainability (Financial self-sufficiency or Operational self-sufficiency) this is also supported by the study of Conning (1999) that the financial sustainability is associated with higher interest rate However, the result of a study by Cull (2005) shows that raising interest rate is associated with improved financial performance for individual-based lenders only.

Adongo and stork (2005) on their findings on Namibia‟s microfinance institutions, found that for the period captured by the dataset all the selected microfinance institutions in the report were financially unsustainable. The reason is, according to the study, they were not charging interest rates that were high enough to cover all financial and non-financial costs, and risks of their operations. From this we can conclude that, even though it is not supported statistically, interest rate is a major determinant for the financial self-sufficiency of microfinance institutions.

2.7.2. Portfolio at Risk (PAR)

The portfolio at risk (PAR) measures indicates how an MFI is efficient in making collections. The higher the PAR indicates low repayment rates, as indication of inefficient microfinance institution. The higher the PAR, the more inefficient the microfinance will be and, therefore, the less financially sustainable.

As per the econometric result by Nyamsogoro (2010) indicates, there is a negative relationship between PAR and financial sustainability of microfinance institutions. This shows that the less efficient the microfinance institution is (higher PAR) the less will be its financial sustainability. Therefore the statistics for the variables indicates that there is insignificant relationship between the two variables.

2.7.3. Liquidity Ratio (Current ratio)

Liquidity ratios are a set of ratios or figures that measure a company‟s ability to pay off its short-term debt obligations. This is done by measuring a company‟s liquid assets (including those that might easily be converted into cash) against its short-term liabilities. There are a number of different liquidity ratios, which each measure slightly different types of assets when calculating the ratio. More conservative measures will exclude assets that need to be converted into cash. The greater the coverage of liquid assets to short-term liabilities, the more likely it is that a business will be able to pay debts as they become due while still funding ongoing operations. On the other hand, a company with a low liquidity ratio might have difficulty meeting obligations while funding vital ongoing business operations. There are three fundamental liquidity ratios that can provide insight into short-term liquidity: current, quick, and cash ratios. This work considers the current ratio which is measured as the proportion of assets available to cover current liabilities, (Current assets divided by Current liabilities).

The current ratio should be at least between 1.5 and 2, although some investors would argue that the figure should be above 2, particularly if a high proportion of assets are stock. A ratio of less than 1 (that is, where the current liabilities exceed the current assets) could mean that you are unable to meet debts as they fall due, in which case

you are insolvent. A high current ratio could indicate that too much money is tied up in current assets.

As per the finding by Nyamsogoro (2010) the coefficient for liquidity ratio variable is positive and statistically significant at 5 percent significance level. This indicates that, the microfinance liquidity level affects their financial sustainability, and that holding all factors constant, the higher the liquidity, the more financial sustainable MFI will be.

2.7.4. Number of Active Borrowers

Crombrugghe et al (2007), on their study 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 OSS. In the Indian context, according to these researchers, serving one more borrower costs nothing to the MFIs in the sample, but that offering larger loans to the MFIs borrowers could eventually raise costs more than profits.

They have 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 „width" of the coverage (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 by Mersland and Storm (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. However, this has not been clearly indicated on the research finding by these researchers.

However, the econometric result by Nyamsogoro (2010) indicated that the number of borrowers per staff was negatively related to financial sustainability of microfinance institutions. This indicated that an increase in the number of borrowers per staff affected negatively the financial sustainability of microfinance institutions in Tanzania. That is microfinance staff for rural MFI in Tanzania are not efficient, as a result they fail to manage the borrowers when their number grows causing the microfinance institutions to suffer poor repayment rates, and therefore, become less financially sustainable.

Therefore, based on these literatures it can be hypothesised that the number of active borrowers in an MFI has a positive and significant influence on both the operational and financial self-sufficiency of microfinance institutions.

2.7.5. Cost per Borrowers

The finding by G. Daniel 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) and Christen et al (1995) which shows that salary levels significantly determines financial sustainability of microfinance institutions. The finding by Cull et al also strengthen the significance effect of staff cost per borrowers on the financial sustainability of microfinance institutions. Based on these G. Daniel 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.

2.7.6. Operating Expense Ratio

The operating expense ratio is the ratio of total operating cost to outstanding loan portfolio. The lower the ratio, all things being equal, will imply efficiency. According to the finding of G. Daniel Nyamsogorom (2010) the operating expenses ratio strongly affects the financial sustainability of microfinance institutions. The econometric result of this finding shows that the coefficient for the variable is negative and statistically significant at 1 percent significance level. 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, financially sustainable.

On his research of the determinants of operational self-sufficiency of microfinance institutions in Sri Lanka, Dissanayake (2012) 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. The

finding of the research concludes that the Operating Expense ratio is a statistically significant predictor variable in determining operational self sufficiency of the Sri Lankan microfinance institutions.

2.7.7. Average Disbursed Loan Size (Depth of outreach)

The average loan size (defined as the average gross loan portfolio divided by the number of active borrowers) is a proxy for depth of outreach. Smaller loans are generally taken to indicate greater depth of outreach. This variable measures the efficiency of microfinance institutions in selling loans.

Adongo and Stork (2006) found that profitability is related to selling bigger loans. The finding by Nyamsogoro (2010) indicates that the coefficient for the average loan size is positive and statistically significant. The finding concludes that microfinance profitability is associated with higher loan size. The finding also added that the amount of outstanding loan improves financial sustainability more that the interest rate. The findings by Gonzalez (2007) and Gregoire and Tuya (2006) concluded that larger loans are associated with higher cost efficiency and, therefore, profitability.

However, the above two findings contradict with that of Cull et al (2007) for which the finding indicates that institutions that makes smaller loans are not less profitable on average compared to those making bigger loans. Not only this, but also in his 2005 study he concluded the same indicating the average loan size variable are not strongly linked to the financial performance indicators. Even institutions that make smaller loans are not less profitable on average as compared to those making higher loans.

The study by Nadiya (2011) on the relationship of the average loan size and Operational self-sufficiency indicates a negative relationship between the two but

statistically significant. This variable is considered to see if Indian MFIs are improving their sustainability levels by increasing their loan size, however, the negative relationship shows that poorer the clientele better the sustainability.

The finding by Rombrugghe et al (2007) shows the size of loans or average loan per borrower affects financial self-sufficiency (FSS) of microfinance institutions. Woller and Schreiner found that depth of outreach is inversely associated with financial self-sufficiency. Perhaps the most notable finding was that depth of outreach, as peroxide by the average loan to GNP per capita, is inversely associated with financial self-sufficiency. This finding demonstrates that among poverty lenders, deep outreach and financial self-sufficiency can be complementary, assuming the adoption of appropriate policies.

2.7.8. Size of an MFI

Another factor that can affect the financial performance of an MFI is its size. The size of an MFI is measured by the value of its assets (Mersland and storm, 2009; Hermes et al, 2008; Mersland and storm, 2008; Bogan et al, 2007; Hartarska, 2005). According to Cull et al (2007) the size of an MFI is significantly positively linked to its financial performance. He also concluded the same in his research of 2005, that an institution‟s size is significantly positively linked to financial performance across all three indicators, meaning that financial self-sufficiency (FSS), operational self-sufficiency (OSS).

While Hartarska (2005) found that the size of an MFI did not significantly affect its financial sustainability, recent studies by Mersland and storm (2009) and Bogan et al (2007) have reported that the size of an MFI is associated with its financial

sustainability. Furthermore, the size of microfinance could also imply that large microfinance institutions have large capital and, therefore, can reach a relatively bigger number of clients than small microfinance institutions. A study by Kyereboah-Coleman and Osie (2008) supports this. In their study on outreach and profitability of microfinance institutions in Ghana Kyereboah et al (2008) found that the size of an MFI had a significant positive impact on profitability.

Nyamsogoro (2010) found that the size of an MFI significantly affects its financial sustainability in opposed to the study conducted by Hartarska et al (2005). But it is in line with that of Mersland and storm (2009); Bogan et al (2007); Cull et al (2007); and Robinson (2001).

Rombrugghe et al (2007) confirm this by adding beyond the size of the loans, the size of the MFI itself may matter the size of the MFIs can be measured by the total value of the portfolio or its average value over a year, or by the number of borrowers or of members. Economies of scale can occur through the size of the portfolio or through the number of active customers or both. If they occur mainly at the portfolio level, this will be captured by the size of the loans.

With regard to operational sustainability, Hartarska and Nadolnyak (2007) examine operational-self-sufficiency and find positive significant impacts from the size of the MFI. This study investigates the effect of the size of an MFI on its financial sustainability (FSS) and operational sustainability (OSS).

2.7.9. Debt To Equity Ratio

The composition of the various source of capital to an MFI is known as capital structure (Bodie et al 2009; Brealey eta al 2006; Martin et al 1991; Puxty et al 1990).

That is, the different source of capital makes a capital structure of an MFI. This can be debt/equity (leverage).

There are different sources of capital from which an MFI may tap. According to Bogan et al (2007); Fehr and Hishigsuren (2006); Kyereboah et al (2007); Farrinton and Abraham (2002); and Woller and Schriener (2002), these includes loans, savings, deposits, and shares. Woller and schriener (2002) Perceived savings to be a more stable source of long-term than donation and, that its demand exceeds that of loan.

Studies have been conducted to explain whether the capital structure determines the sustainability of microfinance institutions. Kyereboah Coleman (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. With this finding in mind, this study seeks to analyze the relationship between capital structure and financial sustainability of microfinance institutions in Ethiopia.

2.7.10. Age of an MFI

Sustainability could also relate to the age of MFI. The age refers to the period that an MFI has been in operation since its initial inception. Studies indicate that the MFIs‟ age relates to the financial sustainability (Cull et al, 2007; Gonzalez, 2007). Based on MBB data, Robinson, (2001) found that experienced microfinance institutions (those with age above six years) were 102 percent financially self-sufficient. Those which

were in 3 to 6 years of age were 86 percent financially self-sufficient, while it was 69 percent for those in operation for less than 3 years of age. The finding by Robinson, (2001) implies that the age of microfinance can affect its financial self-sufficiency level.

Moreover, Bogan et al (2007) and Cull et al (2007) also found that the age of a microfinance institution is related to its financial sustainability. Cull et al (2005) strengthen the same idea by indicting that an institution‟s age significantly and positively linked to financial performance across all three indicators (FSS, OSS, and AROA).

The finding by Nyamsogoro (2010) indicates that there is no significant relationship between MFIs‟ age and financial sustainability. And therefore, it concludes that, MFIs‟ age does not improve its financial sustainability.

With regard to the relationship between age of MFI and Operational sustainability, findings by Nadiya (2011) shows that it is not significant in explaining the changes in OSS. This study will look at whether there is a relationship between the age of a microfinance and financial sustainability in Ethiopia.

2.8.Empirical Evidence on Sustainability of Ethiopian MFIs

In our country Ethiopia, there are very few researches conducted on the area of sustainability of microfinance institutions. Even, as described in the other sections of this paper, these researches, which are very few in number are not sufficiently measured the performance of MFI in the country, because they are very weak in terms of statistical measures. However, the results of some of them are indicated here under for the purpose of this particular study.

A research conduct on the Outreach and Financial Performance of Microfinance Institutions in Africa by the MIX market taking 163 MFI in Africa had indicated that MFIs in East Africa are the most profitable as compared to other regions of the continent. The study has indicted that from this region the largest portion is cover by the largest MFIs of Ethiopia. MFIs in West Africa also generate positive returns, whereas MFIs in the Central Africa, Southern Africa, and Indian Ocean regions generate negative returns.

With regard to efficiency, East African MFIs are highly efficient in absolute terms because they spend only 58 USD per borrower. In contrast, MFIs in the Indian Ocean region spend the most, at more than 240 USD (83 percent of GNI per capital) to maintain each loan client more than half the average loan amount of 468 USD (161 percent of GNI per capita). In general, the finding of the study underline that Ethiopian microfinance (ASCI and DESCI) are performing well in terms of the outreach and profitability as compared to the other microfinance institution, especially the western Africans.

According to a research conducted by Alemayehu (2008) on the performance of Ethiopian MFI, the average operational self-sufficiency for small MFI is 99.5% whereas average financial self-sufficiency still below the threshold level (81%). The average Operational self-sufficiency and financial self-sufficiency for medium MFIs is 149% and 125% respectively. large microfinance institutions scored 206 % in operational and 129.5% in financial self-sufficiency .In general the study concluded that small MFIs were not in a position to generate sufficient revenue to cover operating costs and at the same time their ability to operate and expand without subsidies is difficult for these institutions. Large and Medium MFIs did well in terms

of operational and financial self-sufficiency because in both ratios they achieved beyond the threshold level (100%).

The findings of the study by Alemayehu indicates that out of 6 MFI, 4 registered positive ROA whereas the remaining 2 MFIs were not good in managing their assets to optimize profit. 3 out of 6 MFIs secured a positive return on equity and were good in using retained earnings and donor money to become sustainable. But the remaining 3 MFIs had a negative return. So the paper concludes that Microfinance institutions in Ethiopia were doing well in the year 2006 from profitability and sustainability point of view. They have achieved a positive return both on equity and on assets and passed the break-even point in operational and financial self-sufficiency.

On the other hand another study by Letenah Ejigu (2009) on performance analysis of sample of Ethiopian MFI indicates that Ethiopian MFIs in general are poor performers on depth of outreach. They are not reaching the poorest of the poor. They are also poor in terms of the ratio of GLP to assets, allocating a lower proportion of their total assets in to loans. They are also not using their debt capacity properly. The large and small MFIs are allocating more loan loss provision expense than the industry average and the related PAR is high for these MFIs.

All the MFIs are good at breath of outreach, cost management, efficiency and productivity. They also charge low interest rates. The finding also indicates that the profitability and sustainability of the MFI depend on their size. From a simple correlation analysis it is found that there is a trade-off between serving the poor and being operationally self-sufficient. MFI‟s age correlates positively with efficiency, productivity, the use debt financing (commercialization) and OSS. It is also found that the use of debt financing makes firms more efficient and productive.

As per the study conducted by Befikadu (2007) it is found that MFIs are operationally sustainable measured by return on asset and return on equity and the industry's profit performance is improving over time. Similarly, using dependency ratio and Non-performing Loan (NPLs) to loan outstanding ratio proxies the study also finds that MFIs are financially sustainable. Finally, it finds no evidence of trade-off between outreach and financial sustainability.

A case study by Mubarek (2006) on sustainability of microfinance institutions in Ethiopia which has taken Addis credit and saving institution (AdCSI), Omo Microfinance Institutions (OMFI) and Sidam Micro finance institution (SMFI) indicates that the two of them (AdCSI and OMFI) have achieved operational sustainability of 103 percent and 106 percent in the year 2004 respectively, which is almost equal to average for Ethiopian MFIs, 104 percent and below average for African MFIs, 111.1 percent. The revenue they generated from operations fully covers their operating costs. However, all sample MFIs under study are not achieving the level of financial sustainability.

The study by Hilesillasie (2001) on Financial Sustainability of Micro Financing Institutions, which is a case study on „Specialized Financial and Promotional Institution" (SFPI) and „Poverty Eradication and Community Empowerment (PEACE) Micro finance Institution" indicated that the institutions achieved extensive outreach. They gave financial services to the urban and rural poor. Saving mobilization was significant. The number of savers as well as the value of savings had increased. The repayment rate was very high (98% SFPI and 99.6% PEACE). Majority of the clients were women. Both institutions were subsidy dependent. The lending interest income and fees they generated did not cover the administrative expenses. However, the trend

of their financial performance demonstrated that there was a good and steady progress towards reaching operational self-sufficiency.

The productivity and efficiency indicators showed that cost per unit of money lent and cost per loan decreased significantly. The result of operations illustrated that with the increase of outreach, operational self-sufficiency increased, though not at equal rates. Return on total assets improved proportionately. Operating cost decreased significantly. The financial and ratio analysis showed that financial viability helped to scale up outreach which in turn helped to improve financial viability. In other words, there was positive interrelationship between outreach and financial sustainability.

Both institutions had qualified and committed management team and supportive board. The loan approval process was centralized in SFPI due to the misappropriations by loan officers. Similarly, the locations of PEACE‟s operational areas did not justify continuing the centralized loan approval process, because the practice was very expensive, both in terms of cost and time. The branches were decentralized with certain limit of money.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1.Research Design

This chapter presents research design and methodologies used in the study. It starts with a description the research design used and followed by research methodologies. Lastly, it presents the econometric analysis approaches used for the regression.

This research is a quantitative in its nature in which the research design used is the longitudinal design. The type of longitudinal design that has been used, in this research, is the panel one. The advantages of using longitudinal research design are threefold; first it reveals individual level changes, second, establishes time order of variables, and third it can show how relationship emerges between variables. Therefore to ensure the evidence obtained enable the researcher to answer the initial questions, the type of data needed has been used for six consecutive years (2005-2010).

3.2.Research Methodology

Multiple regression models have been used to assess the significant determinants of microfinance institutions‟ sustainability in Ethiopian. To measure the self-sufficiency of microfinance institutions in Ethiopia, Operational Self-Sufficiency and Financial Self-Sufficiency ratios were applied as the dependent variables. To measure the predictor variables of operational self-sufficiency, seven measures are used as independent variables which were extracted from different studies. Namely, Age, Average Loan Balance per Borrower, Cost per Borrower, Debt to Equity Ratio, Personal Productivity Ratio, size (measured by total asset) and the yield on gross loan

portfolio. On the other hand, to measure the determinants of financial self-sufficiency, six measures were used as independent variables. These are Age, Cost per Borrower, Liquidity Ratio, Number of Active Borrowers, Operating Expense ratio, and the yield on gross loan portfolio.

3.2.1. Target Population

The target population for this particular study are all the microfinance institutions currently operating in the country. According to the statistics from the NBE, there are 30 microfinance institutions which are providing a microfinance service to the poor society in Ethiopia on the current period.

3.2.2. Sampling Techniques and Sample Size

A sample of a subject is taken from the total population to make inference about the population because it is time consuming and expensive to collect data about every individual institutions in the population. However, where the selected sample can reliably represent the population, the sample can still be used to make inferences about the population (Collis and Hossey, 2003)

This study has used a sample of 12 MFIs, from the total population of 30 MFIs in the country. Out of these 12 selected MFIs, 3 are those supported by and attached to the regional governments. These are Amhara Credit and Saving Institution (ACSI), Dedebit Credit and Saving Institution (DECSI), and Oromia Credit and Saving Share Company (OCSSCO). The other 9 selected, BussaGonofa (BG), Eshet, Gasha, Harbu, Metemamen, PEACE, SFPI, Wasasa and Wisdom are private and NGO affiliated MFIs. For these MFIs, a six year data (2005-2010) has been taken except for Harbu

microfinance institution. The reason is Harbu started operation and reporting financial data to the mix-market starting from 2006.

The criteria for choosing among the MFIs were based on the availability and quality of data for the time period of 6 years (2005-2010). Form the total of 30 MFI in Ethiopia; around 22 MFIs makes financial reports to the mix-market. However, these data for the 22 MFIs were incomplete and almost half of them did not report the full report starting from 2005. Based on this, 12 MFIs that have a complete data from 2005 onwards have been selected. Therefore, based on the sample size and the time coverage, the sample consists of 72 observations. The data were provided by the "Mix Market" web site which is known as the Microfinance Information Exchange (MIX), which is a non-for profit organization.

The samples taken are believed to be representative to all microfinance institutions in Ethiopia given their size and age. It has been tried to include MFIs in the study from all categories of size (large, medium and small) and age (old, medium and young). Based on this, ACSI, DECSI and OCSSCO represent the largest and oldest microfinance institutions, Eshet, Harbu and Gasha represent the smallest and youngest microfinance institutions while the rest Bussaa Gonnofa, Metemamen, Wisdom, Wasasa, PEACE, and SFPI represent the medium institutions.

3.2.3. The Data And Means Of Collection

The study pays the greater emphasis on assessing the significant determinants of operational and financial self-sufficiency in Ethiopian microfinance institutions. The study anticipates basing on secondary data by means of annual reports of the respective MFIs. The data are financial ratios and some outreach indicators. This

research is, therefore, purely based on secondary data obtained from the mix-market database for six years. This has been taken, as indicated in the above section, for 12 selected microfinance institutions from the mix-market data base.

3.2.4. Operational Definition

This section explains the variables used as dependent and independent (explanatory) variables in this study. The definitions/measurements used for these variables are described and summarized under the following table.

3.2.4.1.Dependent Variables

The dependent variables in this section are the sustainability of microfinance institutions which is measured by the operational self-sufficiency and financial self-sufficiency. The operational self-sufficiency is computed as the ratio of unadjusted operating income to operating expenses (the ratio of operating income to the sum of administrative expenses, loan losses and interest expenses). On the other hand financial self-sufficiency is measured as the ratio of adjusted financial revenue to adjusted operating expenses. This is summarized in the following table for clarity.

Table 3.1: Variable Description (Dependent Variables)

Variables Name	Measurement (Formula)
Operational Self-Sufficiency (OSS)	Financial revenue/ (Financial expense+ Impairment losses + Operating expenses)
Financial Self-Sufficiency	Adjusted Financial revenue/ (Financial expense+ Loan

(FSS)	loss provision + Operating expenses + Expense adjustment)

3.2.4.2.Independent Variables

The independent variables used to determine the factors affecting operational sustainability are ***the yield on gross loan portfolio; size of an MFI, personnel productivity ratio, debt to equity ratio, cost per borrower, average loan balance per borrower and age of microfinance institutions.*** The independent variables for financial self-sufficiency used for this study includes ***yield on gross loan portfolio, cost per borrower, liquidity ratio, number of active borrowers, operating expense ratio and age of microfinance institutions.*** The following table presents the description of the independent variables or explanatory variables used in this study for both the OSS and FSS dependent variables. Some of the variables are presented in their log form for regression purpose.

Table 3.2: Variable Description (Independent variable)

S.N	Variable Standard Name	Description	Variable name in regression model	Variable Description as used in regression model	Expected effect
1	Yield on Gross loan Portfolio (Nominal)	Adjusted financial revenue from Loan Portfolio/Adj. average GLP	YIELD	Financial Revenue as a percentage of GLP	+
2	Size of MFI	Total Asset of MFI		Natural Logarithm of	

			SIZE	the Total Asset	+
3	Personnel Productivity Ratio	The expense incurred for personnel per the loan portfolio	PPR	Personnel expense ratio to loan portfolio	+
4	Debt to Equity Ratio	Adj. Total Liabilities/Adj. Total Equity	DER	Debt as a percentage of Equity	–
5	Cost Per Borrower	Adj. Operating Expense/Adj. Av. No. of Active Borrowers	lnCPB	Natural logarithm of the cost per borrower	–
6	Average Loan Balance per Borrowers	Adj. GLP/Adj. Number of Active Borrowers	lnALBPB	Natural logarithm of the average loan size	+
7	Age of MFIs	Age of MFIs since their establishment	AGE	Number of operation years	+
8	Liquidity Ratio	The ratio of current asset to current liabilities	LR	Percentage of cash and trade investments to deposits and liabilities	+
9	Number of Active Borrowers	Number of active borrowers with loans outstanding	lnNAB	Natural logarithm of the number of active borrowers	+
10	Operating Expense Ratio	The ratio of operating expense to the gross loan portfolio	OER	Operating expense ratio	–

Therefore, the yield on gross loan portfolio, size of microfinance institutions, personnel productivity ratio, average loan balance per borrower, age of an MFI,

liquidity ratio and number of active borrowers are expected to have positive significant impact on sustainability. Debt to equity ratio, cost per borrower and operating expense ratio, on the other hand, are expected to have negative significant impact on sustainability of microfinance institutions in Ethiopia.

3.2.5. Model Specification

This section covers the operational panel data regression model used in the study. The model used for this study to determine the factors affecting the operational sustainability of microfinance institutions in Ethiopia is explained as follows. The model is adopted from different studies conducted on the same area.

$$\mathbf{OSS}_{it} = \alpha_i + \beta_1\mathbf{YIELD}_{it} + \beta_2\mathbf{SIZE}_{it} + \beta_3\mathbf{PPR}_{it} + \beta_4\mathbf{DER}_{it} + \beta_5\mathbf{lnCPB}_{it} + \beta_6\mathbf{lnALBPB}_{it} + \beta_7\mathbf{AGE}_{it} + \varepsilon_{it}$$

Where: OSS_{it} is the operational self-sufficiency ratio of microfinance *i* at time *t* (which is the dependent variable); α_i is a constant term; β measures the partial effect of independent or explanatory variables in period *t* for the unit *i* (MFI); X_{it} are the explanatory variables as described in the above table; and ε_{it} is the error term. The variables, both dependent and independent, are for cross-section unit *i* at time *t,* where *i* = MFI (1 to n), and *t* = 1to 6.

The operational panel data for the regression to determine the factors determining the financial self-sufficiency of microfinance institutions is presented as follows.

$$\mathbf{FSS}_{it} = \alpha_i + \beta_1\mathbf{YIELD}_{it} + \beta_2\mathbf{lnCPB}_{it} + \beta_3\mathbf{LR}_{it} + \beta_4\mathbf{lnNAB}_{it} + \beta_5\mathbf{OER}_{it} + \beta_6\mathbf{AGE}_{it} + \varepsilon_{it}$$

Where: FSS_{it} is the financial self-sufficiency ratio of microfinance *i* at time *t* (which is the dependent variable); α_i is a constant term; β measures the partial effect of independent or explanatory variables in period *t* for the unit *i* (MFI); X_{it} are the explanatory variables; and ε_{it} is the error term. The variables, both dependent and independent, are for cross-section unit *i* at time *t,* where *i* = MFI (1 to n), and *t* = 1to 6.

3.3. Data Analysis

Data analysis is the way in which the collected data has been analyzed to achieve the stated objectives. Therefore, under this section the methods and tools used to analyze the data will be discussed in detail.

First the data needed for the research has been taken from the mix-market data base. These are the ratio value for different variable including the dependent and independent variables used in the study. This data which has been downloaded, has been kept in an excel sheet. The data needed were ratios for the variable. However, some of the variables are not kept in ratios (does not have ratio value). Therefore, to measure the changes in variables over time, the researcher has transformed these variables into their natural logarithm. This means that the variables are expressed as relative changes measured by logarithmic differences.

The next step was to see whether the candidate variables to be used in the regression process to determine operational and financial self-sufficiency, are most important or not. This has been done using a procedure known as a ***stepwise regression in*** Eviews package. Stepwise regression is an automatic variable selection procedure which chooses the jointly most „important" (variously defined) explanatory variables from a

set of candidate variables (Brooks, 2008). There are a number of different stepwise regression procedures, but in this study the uni-directional forwards method has been used. This starts with no variables in the regression (or only those variables that are always required by the researcher to be in the regression) and then it selects first the variable with the lowest *p*-value (largest *t*-ratio) if it were included, then the variable with the second lowest *p*-value conditional upon the first variable already being included, and so on. The procedure continues until the next lowest *p*-value relative to those already included variables is larger than some specified threshold value, then the selection stops, with no more variables being incorporated into the model. Therefore, variables with p-values of 0.5 and less have been selected for further consideration in the regression to determine the factors that affect the sustainability of microfinance institutions in Ethiopia. Before this procedure has been used, the candidate independent variables were 9 and 10 for OSS and FSS respectively. Based on the above procedures, 7 and 6 variables are selected by the step wise procedure respectively for each dependent variable.

Next the short listed variables are used in the regression analysis to determine which factors affect the operational and financial self-sufficiency of microfinance institutions in Ethiopia. The variables selected by the stepwise procedure were imported to Eviews version 6 to conduct the estimation. The estimation was first made using the pooled regression approach. But the random effect model has been chosen. The reason is according to Brooks (2008), the random effects model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a fixed effect model is more plausible when the entities in the sample effectively constitute the entire population. Since this

study has taken samples form the population, the researcher has decided the random effect model to be the appropriate model for this study.

Next the regression estimation has been made using the random effect model and the results have been tested for almost all of the assumptions of linear classical regression model. The estimation was not against the assumptions and the researcher had no reason not to go forward for the interpretation. The model has been tested for Heteroscedasticity, Multicollinearity, Autocorrelation (serial correlation) and test of normality. Therefore, the regression model meets all the assumption.

CHAPTER FOUR

DATA PRESENTATION AND DISCUSSIONS

This chapter presents the findings of the study in two sections. Under the first section, the descriptive statistics of both the dependent and independent variables will be discussed separately. The second section will present the econometric result in which the explanatory variables are checked whether they determine the sustainability of MFIs.

4.1.Descriptive Result

This part will presents the result based on the descriptive statistics of both the dependent and independent variables which are described under the following

sections. This is done for the years under consideration (2005-2010). The descriptive statistics result is done separately for the dependent and independent variables.

4.1.1. Dependent Variables

Sustainability can be defined as a program‟s capacity to remain financially viable in the absence of domestic subsidies or foreign support Woolcock (1999). Conversely, Michael Tucker affirmed that, sustainability includes generating sufficient profit to cover expenses while eliminating all subsidies. The two kinds of sustainability (operational self-sustainability and financial self-sustainability) that can be observed in assessing MFIs performances, according to Mayer (2002), have been used as dependent variables in this study.

Operational self-sufficiency (OSS) requires MFIs to meet all administrative costs and loan losses from operating income which is measured by dividing operating income by operating expenses. On the other hand, financial self-sufficiency (FSS) is a ratio which measures the sustainability of an MFI in terms of the financial capacity. It is a ratio of the adjusted financial revenue to the financial and operational expense as well as the loan loss provision and expense adjustments. The value of one and above for both variables (OSS and FSS) indicates that the microfinance institutions are operationally and financially self-sufficient and the value below this point indicates they are not sustainable. The following table indicates the descriptive statistics for the dependent variables: operational self-sufficiency (OSS) and financial self-sufficiency (FSS).

Table 4.1.: Descriptive Statistics for the dependent variables

Variable	Obs.	Mean	Std. Dev.	Max.	Min.
OSS	66	1.32197	0.43754	2.26	0.35
FSS	60	0.97367	0.3705	2.04	0.4

Source: Extracted from Eviews result

As indicated on the above paragraph, the operational self-sufficiency (OSS) indicates the sufficiency of operating income to cover operational costs like salaries, suppliers, loan losses, and other administrative costs. Therefore, based on the above table the mean of operational sustainability is 1.317 (131.7%) indicating sustainability. This shows that, on average the operational sustainability of MFI in under consideration is 1.3. This is beyond the threshold for sustainability. Thus, we can infer from this that Ethiopian microfinance institutions are operationally sustainable. An operational self-sufficiency of 1 (100%) is the first stage that an institution should reach in its way to long term financial viability (Berne, 2005). According to Berne, if an MFI does not reach that, eventually its equity will be reduced by losses or must be compensated by grants. But this is not the case as per this figure for mean. The standard deviation for this variable is 0.44 (44%), indicating that the variation in the operational sustainability of microfinance institutions under consideration is 44%. Therefore, as the variation or dispersion of the sustainability indicates, all of the microfinance institutions under consideration are somewhat close to average. Based on this we can infer the result for the population that the operational self-sufficiency of Ethiopian microfinance industry on average is 1.3 which is beyond the requirement.

When the breakeven value of 1 has been reached for operational sustainability, the focus needs to be shifted to the question of financial self-sufficiency because the financial self-sufficiency ratio corresponds to the operational self-sufficiency ratio,

adjusted by the interest subsidy from concessional loans and in-kind subsidies according to Berne (2005). Therefore, when we consider the mean of financial self-sufficiency variable, it seems that these microfinance institutions are not financially sustainable as they have reached the operational sustainability.

As per the descriptive statistics for FSS indicated on table 4.1 above, the mean of the financial sustainability is 0.973 (97.3%) which indicates that MFIs in the sample are not Financial self-sufficient. This is benchmarking the standard which says an MFI is sustainable if the value (ratio) of its financial sustainability is 1 (100%) and above. But the average for this variable is below the standard, therefore, not financially sustainable. The standard deviation for this variable is 0.37. This indicates that there is 37% variation in the financial sustainability of microfinance institutions under consideration. This signifies that the sustainability of MFIs in Ethiopia is close to the average. Since the value of the standard deviation is small, implying every one in the sample is close to the average, therefore, we can infer the result for the population. Based on this, Ethiopian microfinance institutions are not financially self-sufficient. Unless financial self-sufficiency is arrived at, the long term provision of financial services is undermined by the continued necessity to rely on donor funds. Usually, financial self-sufficiency should also cover the cost of capital: the loss in the real value of equity due to inflation.

4.1.2. Independent Variables

Under this section the descriptive statistics of the explanatory variables are presented. All the explanatory variables, expected to have an impact on the operational self-sufficiency, have 66 numbers of observations in total while those designed for FSS

have 60 observations. The proxy for the size of microfinance institutions is the total asset which was then transformed in to its natural logarithm form.

Table 4.2.: Descriptive Statistics for the independent variables

Variable	Obs.	Mean	Std. Dev.	Max.	Min.
AGE	66	8.69697	2.58379	13	2
ALBPB	66	2.07182	0.1996	2.57	1.57
CPB	66	1.07394	0.24327	1.47	0.34
DER	66	2.24227	3.5562	29.56	0.01
PPR	66	0.07591	0.05012	0.308	0.016
SIZE	66	6.78955	0.78446	8.29	5.52
YIELD	66	0.19667	0.06376	0.37	0.04
LR	60	2.8228	10.3625	58.05	0.09
NAB	60	4.64317	0.65944	5.85	3.4
OER	60	0.09463	0.05914	0.27	0.01

Source: Researchers own extraction from the Eview"s result

Based on the above descriptive result, the following statistical inference has been reached for the independent variables of the study.

Age shows the time frame (duration) in which the microfinance institutions have been providing services. It denotes the number of years since the inception of the MFI. The mean value for this variable shows that MFIs in Ethiopia have served for 8.6 years (8 years and 7months in real term) on average. This indicates MFIs in Ethiopia are young in terms of the duration of time in which they stayed in operation. Some MFIs have reached the age of 15 while some few are 4 years old at the end of the current year.

The **average loan balance per borrower** indicates the efficiency of MFIs in selling the loans. Loans are the main product of most microfinance institutions. Thus, all things being equal, the more loans are sold, the better for profitability and operational sustainability. The descriptive statistics for this variable shows that the mean average loan balance per borrower for MFIs in Ethiopia is 2.071818 in its natural logarithm value. In real terms, the value for the mean is $134.64, indicating the microfinance industry in Ethiopia provides, on average, 135 USD for a borrower. The standard deviation from the mean is 63.17. The maximum amount of the average loan balance per borrower is $374 while the minimum is $37 that can be given for a single borrower. However, according to a study by the Lafourcade, Isern, Mwangi, and Brown (2005), an average loan balance for African countries was 307 USD even on 2005. Compared to this figure, after all these years, the average Ethiopian MFI"s average loan balance per borrower is 135 USD. Based on this, MFIs in Ethiopia offer the smallest average loan balances of all African regions, in absolute terms when compared to this figure.

The **cost per borrower** shows the efficiency of MFIs in servicing the finance to the borrowers at the lowest possible cost. The lower this value, the more it implies that the institutions are efficient in serving the borrowers. The mean of this variable for the selected microfinance institutions stands at 1.073939 and the minimum and maximum value for the variable is also 0.34 and 1.47 respectively. When these values are described in the real terms, they will become $14.47 for the mean and $30 and $4 respectively for the maximum and minimum cost per borrower incurred by the industry. This indicates that MFIs in Ethiopia are incurring on average 14.47 USD to serve a single borrower. Some of the inefficient MFIs incurred 30 USD while the efficient MFIs are incurring 4 USD per borrowers. Based on this we can say that they

are efficient/inefficient comparing with the bench mark for the variable. However, an average figure for cost per borrower in African countries was 72 USD (Lafourcade et al, 2005). For Ethiopian MFI, when compared to this average it is the smallest. This indicates that Ethiopian MFIs are efficient in terms of the cost per borrower relative to its African peers. The same study (Lafourcade et al, 2005) indicates that MFIs in the East African countries are the most efficient in terms of the cost per borrower compared to the other African regions.

Debt to Equity ratio (leverage) is the ratio of the debt financing to equity financing. The higher this value, the more it implies that the institutions are leveraged than financed through equity capital. As per the mean value of this variable (2.242273) indicates, MFIs in Ethiopia are leveraged on average than financed through equity capital. On the other hand the minimum leverage (debt to equity) is 0.01 indicating few MFI are financed more through equity capital than debt. However, the maximum value for this variable is 29.56 which indicate that debt financing is more considered instead of having proportional financing structure, therefore highly leveraged.

Personnel productivity ratio measures the amount of quality services delivered by microfinance staff to their clients and it quantifies the employees‟ efforts to deliver a MFIs output. The mean of the personnel productivity ratio in this particular study is 0.076 and the maximum and minimum values in the industry for the variable are 0.308 and 0.016 respectively. The lower this value means the higher the productivity of personnel. Therefore, from these figures what we understand is that, the industry incurs personnel costs of 7.6 cents for each dollar in the loan portfolio. Some efficient microfinance institutions incur only 1.6 cents while few inefficient ones incurred 30 cents for each dollar in the gross loan portfolio. Therefore, by increasing productivity,

a MFI can lower per unit costs, improve efficiency, and ultimately enhance self - sufficiency; in fact, staff productivity is the primary indicator to measure the productivity, Geetha Nagaranjan (2001). A MFI‟s entire staff is a relevant unit of production, so the best measure of productivity collectively accounts for the efforts of front and back offices.

Size which is measured by the total asset of the institutions, measures whether they are large enough to be operationally as well as financially sustainable and cover their operational costs or not. The mean value of the variable is 6.789545 in its natural logarithm value, whereas the minimum and maximum values are 5.52 and 8.29 respectively. These values are in their log form and when they are transformed into their real values they will become $31,892,504, $197,847,300 and $332,099 for the mean, maximum and minimum values respectively. The standard deviation from the mean is $56,791,764. Based on this, therefore, the average total asset of the microfinance industry is around 32 million USD. When this value is compared to a calculated average USD of African Microfinance, which has been taken from a study by Lafourcade et al (2005), value (8,052,676) it is much better.

The **yield** on gross loan portfolio indicates the ability of an MFI to utilize the short term assets to generate cash financial revenue. It indicates the efficiency with which an MFI has utilized its resources generating cash revenue. The higher the ratio, the better it indicates microfinance efficiency. The mean descriptive statistics for this variable shows that MFI in Ethiopia generates 0.196667. This means that they generate on average 19.66 cents cash for each single dollar in the outstanding loan portfolio. The minimum and maximum yield on the gross loan portfolio for this study is 0.04 and 0.37 respectively. This means some of the inefficient MFI generates only

0.4 cents for each single dollar on the gross loan portfolio while the efficient MFI generates up to 37.00 cents. Anyhow weather it is large enough or not, all MFIs in Ethiopia are generating cash revenues from their gross loan portfolio.

Liquidity ratio measures the efficiency with which an MFI matches its assets and liabilities (CGAP, 2003). It is a ratio of an MFI‟s current assets to current liabilities. This ratio indicates the dollar value of current assets available to meet each one dollar short-term obligation (Brealey, 2006). Therefore, based on this, the microfinance industry in Ethiopia has the capacity to meet the short term liabilities from its short term assets. As the mean value for liquidity ratio indicates, the dollar value of current assets available to meet each one dollar short term obligation is $ 2.8. As a rule of thumb a liquidity ratio of 1.5 to 2 is acceptable. Therefore, the mean for this ratio is above the threshold. However some inefficient microfinance institutions have $0.09 available to meet the short term obligations while efficient MFI have $58. When we look at the industry average, the figure is sufficient.

Number of active borrowers is a measure of breadth of outreach, which means the number of poor served by a microfinance institution (Woller and Schreiner, 2002). It is generally assumed that the larger the number of borrowers the better the outreach and thus, it leads an MFI to become more sustainable. The mean statistics for this variable is 134,452. This indicates on average a microfinance institution in Ethiopia is reaching 134,452 numbers of borrowers (in other words poor). The maximum numbers of borrowers reached so far by a microfinance institution in the industry is 710,576 borrowers and the minimum is 3,457. 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. Not only this, but also when this number is compared to the income level of the society, it still needs attention to reach more poor in the country.

Operating expense ratio, according to CGAP (2003), is the most commonly used measure of microfinance efficiency. It measures how an MFI‟s management has been efficient in reducing operating costs at a given level of operation. The lower the operating expense ratio will indicate efficiency in microfinance institutions‟ cost reduction strategy. An MFI is operating at lower cost, which means, all things being equal, efficient. The operating expense ratio for the Ethiopian microfinance industry shows 0.095 in its mean. This indicates that on average they are incurring 9.5 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 27 cents for each dollar on their gross loan portfolio.

4.2.Data Analyses, Results and Discussions

This section presents the empirical findings from the econometric result for the factors affecting the operational and financial sustainability of microfinance institutions in Ethiopia.

The model for OSS and FSS, based on the result, has been tested for the assumptions of the classical linear regression model (CLRM) before interpreting the result. According to the test results, the model satisfies all the assumptions for the CLRM which is discussed here under. These tests are indicated under the following sections.

4.2.1. Regression Diagnostic Tests

Multicollinearity Test

An implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another (Brooks, 2008). If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another. If the explanatory variables were orthogonal to one another, adding or removing a variable from a regression equation would not cause the values of the coefficients on the other variables to change.

According to Brooks, 2008, in any practical context, the correlation between explanatory variables will be non-zero, although this will generally be relatively being in the sense that a small degree of association between explanatory variables will almost always occur but will not cause too much loss of precision. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as *multicollinearity*. The most simple, operational definition of unacceptable co-linearity makes no pretense to theoretical validity. An admittedly arbitrary rule of thumb is established to constrain simple correlations between explanatory variables to be smaller than 0.8 to 0.9. (Donald E.Farrar and Robert R. Gluaber, 2005). This assumption has been tested for the variables considered in the study as the independent variables. Therefore, the null hypothesis is articulated as there is no very high correlation between the independent variables. This is summarized with the alternative hypothesis as follows.

Ho: No Multicollinearity

Ha: Multicollinearity

In this particular case, the largest observed positive correlation in for the independent variables of Operational Self-Sufficiency is 0.68 between average loan balance per

borrower and size of microfinance institutions and between cost per borrower and the yield on gross loan portfolio of microfinance institutions which is 0.66 and thus, this is sufficiently small as compared to the tolerable correlation sated for this particular study which is 0.8.

According to correlation result for all the explanatory variables of Financial Self-Sufficiency, the largest correlation is observed between cost per borrower and operating expense ratio, which has a coefficient value of 0.74 and between cost per borrower and the yield on gross loan portfolio which is 0.65. These values are below the standard set used for this particular study which is a correlation coefficient of 0.8. Based on this, it can be reasonably ignored. Therefore, we fail to reject the null hypothesis of no multicollinearity between the independent variables under both cases (models). The result of the Multicollinearity test for all the explanatory variables are indicated under appendix 2-a for OSS and 2-b for FSS.

Hetroscedasticity Test

It has been assumed that the variance of the errors is constant, σ^2; this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be *heteroscedastic*. Consequence of proceeding with the existence of hetroscedasticity is that, the OLS estimators will still give unbiased (and also consistent) coefficient estimates, but they are no longer blue that is, they no longer have the minimum variance among the class of unbiased estimators. Therefore, for the assumption to hold and to get efficient estimator, this test has been made for both OSS and FSS models using the White test for heteroscedasticity and their results are indicated under the table that follows. It is hypothesized that there is no

heteroscedasticity in which the null and alternative hypothesis are summarized here under for both models.

Ho: no Heteroscedasticity (Homoscedastic)

Ha: Hetroscedastic

According to Brooks, 2008 the three different types of tests for heteroscedasticity using the white‟s test are the F-stat, X^2 („LM‟) and scaled explained SS. If the P-values of these test statistics are considerably in excess of 0.05, then they give the same conclusion that there is no evidence for the presence of hetroscedasticity. However if the P-values for these tests are less than 0.05, suggests in this case, that there is evidence of heteroscedasticity. In this case, all the three version of the test statistics for both models give the same conclusion that there is no heteroscedasticity, since their P-values are in excess of 0.05. It is clear evident that the errors are homoscedastic. Therefore, based on this statistics we fail to reject the null hypothesis that is indicated as there is no Heteroscedasticity for both models. This can be concluded that the variance of the errors is constant in both cases. The test result can be referred from the appendixes (3-a and 3-b).

Test of Autocorrelation (Serial Correlation)

The notion of autocorrelation defines that there is no serial correlation or autocorrelation among the disturbances *u i* entering the population regression function (Gujarati D.N, 2008). The covariance between the error terms over time (or cross-sectional, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it

would be stated that they are „auto-correlated" or that they are „serially correlated". A test for this assumption is therefore required which is tested by the DW test in this study. The DW test is a test for first order autocorrelation (a test for a relationship between an error and its immediately previous value). Therefore to conduct the DW test, the hypothesis is stated as follows.

Ho: No Autocorrelation ($\rho = 0$)

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

As a rule of thumb if the DW test approaches 2, then it is an indication for no autocorrelation. But if the value of the test is 0, then it is an indication for the existence of perfect positive autocorrelation. On the other hand if the value of the DW test equals 4, that means there is perfect negative autocorrelation (Brooks, 2008).

In this case for the OSS model, the DW test stands at 1.93 and 2.14 for FSS model. This indicates that both models do not correspond with autocorrelation since their values are not far from 2. The values of the DW test are a few points away from the point that indicates no autocorrelation, therefore, it can be concluded that there is no or little evidence of a relationship between successive residuals and based on this, in both cases, and we fail to reject the null hypothesis of no autocorrelation. The result is indicated under appendix 4.

Normality

The assumption of normality requires the disturbance to be normally distributed around the mean. This test has been conducted using the Jarque-Bera test. The *p*-value of the normality test should be bigger than 0.05 to not to reject the null

hypothesis of normality at the 5% significance level (Brooks, 2008). The null and alternative hypothesis for the test has been indicated here under.

Ho: Normally Distributed Errors

Ha: Non-Normal Distribution Errors

A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3 (Brooks, 2008). However, the coefficient of the kurtosis in this study is 4 for OSS model and 2.7 for FSs model which is above and below 3 for OSS and FSS models respectively. But the p-value for the Jarque-Bera (JB) test of OSS and FSS models are 0.1376 (13.76%) and 0.846507 (84.65%) respectively. This indicates that the p-value for the Jarque-Bera test for both models is greater than 0.05 which indicates that the errors are normally distributed. Based on the statistical result, we fail to reject the null hypothesis of normality at the 5% significance level. The histogram and the respective p-values for each model is indicated on appendix 2-a; and 2-b.

4.2.2. Multiple Correlation Analysis

Multiple correlation analysis is used in situations involving two or more independent variables and their degree of association with the dependent variable (Leonard J, 2004). Therefore, in order to look at the degree of association between OSS and its explanatory variables as well as FSS and the explanatory variables, multiple correlation analysis has been done and described here under.

Table 4.3.: The relationship between OSS and its determinants

	OSS	AGE	ALBPB	CPB	DER	PPR	SIZE	YIELD

OSS	1							
AGE	0.37967	1						
ALBPB	0.53097	0.52313	1					
CPB	-0.4876	-0.2756	-0.1172	1				
DER	0.19048	0.30703	0.24851	-0.2257	1			
PPR	-0.6653	-0.5008	-0.689	0.57781	-0.2774	1		
SIZE	0.73472	0.57991	0.68965	-0.5646	0.36303	-0.6879	1	
YIELD	0.19288	-0.291	-0.4096	0.66022	-0.2281	0.53875	-0.5135	1

Source: Researchers own extraction from the Eview‟s result

According to the above correlation result, it can be stated that there is a negative correlation in cost per borrower and personnel productivity ratio to Operational Self-Sufficiency Ratio. This indicates that a change in cost per borrower and personnel productivity ratio are negatively contributing towards changes in Operational Self-Sufficiency Ratio disregard of their strength.

Likewise, there is positive correlation in age of MFIs, average loan balance per borrower, debt to equity ratio, size of MFIs and yield on gross loan portfolio to Operational Self Sufficiency Ratio. This implies that changes in the predictors; (average loan balance per borrower, debt to equity ratio, size of MFIs and yield on gross loan portfolio) is positively contributing towards the change in Operational Self-sufficiency Ratio.

Table 4.4.: The relationship between FSS and its determinants

	FSS	**AGE**	**CPB**	**LR**	**NAB**	**OER**	**YIELD**

FSS	1						
AGE	0.3574	1					
CPB	-0.5148	-0.2725	1				
LR	-0.2248	-0.2094	-0.2012	1			
NAB	0.55165	0.5715	-0.5392	-0.2145	1		
OER	-0.5382	-0.4472	0.76456	0.16914	-0.5892	1	
YIELD	0.15636	-0.3566	0.65248	-0.1791	-0.4859	0.58657	1

Source: Researchers own extraction from the Eview‟s result

By taking a glance at the above table of correlation of the independent variables to the financial sustainability (FSS), it can be concluded that there is a negative correlation in cost per borrower, liquidity ratio, and operating expense ratio to financial self-sufficiency of MFIs in Ethiopia. This is an indication for the change in cost per borrower, liquidity ratio and operating expense ratio negatively affects the changes in Financial Self-Sufficiency Ratio.

On the other hand age of an MFI, number of active borrowers, and the yields on gross loan portfolio are positively correlated to financial self-sufficiency ratio of an MFI. This implies the change in these explanatory variables positively contributes towards the change in Financial Self-sufficiency Ratio disrespect of the relative strength.

4.2.3. Multiple Regression Analysis

This section measures the Goodness of fit of the regression line by applying the multiple coefficients of determination (R^2) and presents the regression result. The coefficient of determination (R^2), measures the proportion of the total variation in the

dependent variable „Y‟ explained by the explanatory variables (the „Xs‟) jointly (Gujarati D. N, 2008).

a. Regression Result of OSS

Table 4.5.: Econometric Results for the Determinants of OSS

Variables	Coefficient	Std. Err.	Probability
AGE	-0.021156	0.014949	0.1624
ALBPB	0.70936	0.339461	0.0410**
CPB	-0.918785	0.269129	0.0012***
DER	-0.00598	0.008727	0.4959
PPR	-1.680898	1.157015	0.1517
SIZE	0.26164	0.083901	0.0028***
YIELD	4.009664	0.78234	0.0000***
R-squared	0.640677		
Ad. R-squared	0.597310		
F-statistic	14.77352		
Prob. (F-stat.)	0.000000		
DW stat	1.932625		

***** Significant at 1%; ** Significant at 5%**

Source: researchers own extraction from the Eview‟s result

The researcher has assumed that the predictor variables‟ coefficients are simultaneously different from zero and this is tested for under the next paragraph. The R^2 value stands at 0.64 (64%), implying that 64 percent of fitness can be observed in the sample regression line. Furthermore, it measures 64 percent of the total variation in the Operational Self-Sufficiency Ratio, is explained by independent variables

(Average Loan Balance per Borrower, cost per borrower, size measured by the total asset and yield) jointly. Therefore, these four variables explain 64% of the variance of operational self-sufficiency.

The reported F-statistics in the regression output and its P-value is 14.77 (F-Statistics) and 0.00000 (the P-value). Based on this the researcher concluded that all the significant explanatory variables are jointly significant in explaining the operational self-sufficiency of microfinance institutions in Ethiopia. Therefore, the null hypotheses which were articulated as the predictor variables coefficients are simultaneously equal to 0 are rejected. Thus, the concluding remark here is that the predictor variables are significant in influencing the changes in the OSS. The rule of thumb for the rejection of the null hypothesis is that, if the P-value of the F-statistics is less than 0.05 (5%). Therefore the p-value here is 0.00000.

The regression result of the analysis indicates that average loan balance per borrower, size of microfinance institutions and the yield on gross loan portfolio positively affects the operational sustainability of Microfinance institutions in Ethiopia significantly. These variables affect the operational sustainability significantly at 5%, 1% and 1% significance level respectively. The increase in loan per borrower, an increase in the total asset (a proxy for the size of an MFI) and the yield on the gross loan portfolio increases the operational sustainability of microfinance institutions in Ethiopia. For this particular study, cost per borrower is found to be strongly and negatively affects the operational self-sufficiency of microfinance institutions. This variable is significant at 1% significance level.

On the other hand, the coefficients of age of microfinance institutions, debt to equity ratio and personnel productivity ratio are negative but insignificant. These variables

are not significant in determining the operational self-sufficiency of Ethiopian microfinance institutions. Let us see the details and implication of these variables one by one under the following sections.

Average Loan Balance per Borrower

As the regression result for the average loan balance per borrower indicates, it is strongly significant in affecting the operational self-sufficiency of an MFI in Ethiopia positively at 5% significance level. This variable is measured by dividing the gross loan portfolio by the number of borrowers. The value for this variable will be increased if the gross loan portfolio is increased, other thing being constant. If the gross loan portfolio is increased instead of increasing the number of borrowers, it increases the efficiency of MFIs in making collection in two terms. The first thing is that the PAR will be reduced; if the outstanding loans are on the hand of few numbers of borrowers, for the MFI, there is nothing to worry about since it is on the hand of critically selected borrower. But this must be interpreted with a great caution because if the microfinance institution is to select among the borrowers, they may opt for the marginal poor and the poorest of the poor may be neglected here, and therefore a mission drift will occur. Second, if the borrowers are relatively few in number, the collection effort made by the MFI will be reduced which will greatly affects the cost spend per borrower and increases personnel productivity. Thirdly, the cost will be minimal for an MFI when it process and manage large loans with the lower number of borrowers. This study has made analysis on the impact of cost per borrower on the sustainability of Ethiopian MFI and the result is indicated under the next paragraph which negatively affects the sustainability. To conclude, therefore, as the result indicates, an increase in the average loan balance increases the operational self-

sufficiency of MFI in Ethiopia by reducing the PAR and the cost per borrower. Therefore, we reject the null hypothesis which was articulated as there is no significant relationship between the average loan balance per borrower and operational self-sufficiency of microfinance institutions. Thus, the finding supports the alternative hypothesis that the average loan balance per borrower affects operational self-sufficiency positively and significantly.

The finding of this study is supported by the findings of Adongo and Stork (2006), Nyamsogoro (2010), Gonzalez (2007) and Gregoire&Tuya (2006). The findings by these researchers conclude that microfinance profitability is associated with higher loan size. However, this finding is against the finding of a study made by Cull et al (2007) which indicated that institutions that make smaller loans are not less profitable on average as compared to those making bigger loans. And the same result has been found for his 2005 study indicating average loan size is not strongly linked to the sustainability of microfinance institutions. The study made by Nadiya M (2011), is also against the finding of this study, indicating operational self-sufficiency is negatively and significantly related to average loan size per borrower.

Size of Microfinance Institutions

Based on the regression result, it is found that the total asset (which is a proxy measure for the Size of an MFI), is positively and significantly affects the operational sustainability. This is strongly significant at 1% significance level. This indicates that a change in the size (total asset) causes a change in operational sustainability positively. This means, an increase in the size of an MFI will lead to an increase in the operational sustainability of MFIs in Ethiopia. The finding of this study is in line with that of cull et al (2005) and (2007). He concluded that an MFI‟s size is significantly

and positively linked to operational self-sufficiency. Therefore, we reject the null hypothesis which was articulated as there is no significant relationship between the size of microfinance institutions and their operational self-sufficiency. Thus, the finding supports the alternative hypothesis that the size of a microfinance institution affects its operational self-sufficiency positively and significantly. Further this finding is supported by the findings of Mersland and storm (2009), Bogan et al (2007), Kyereboah-Coleman and Osie (2008). It is also supported by the finding of Hartarska and Nadolnyak (2007) which examined operational self-sufficiency and find positive significant impacts from the size of the MFI.

The Yield on Gross Loan Portfolio

Yield on gross loan portfolio is positively and strongly significant in affecting the operational sustainability of the microfinance institutions in Ethiopia at 1% significance level. As per the result an increase on the yield on gross loan portfolio for the institutions increases their operational sustainability. The same holds when the yield decreases. The yield on gross loan portfolio indicates the ability of an MFI to utilize the short term assets to generate cash financial revenues. Therefore, the more an MFI utilizes its short term assets, the grater it generates higher financial revenues, which on the other way round cause higher sustainability. This can be further elaborated as, since the higher the ratio the better the operational sustainability of an MFI is, the MFI should utilize its resource to the maximum possible level so as to increase the financial revenue in the form of interests, fees, penalties and commissions from the gross loan portfolio. Therefore, we reject the null hypothesis which was articulated as there is no significant relationship between the yield on gross loan portfolio and operational self-sufficiency of microfinance institutions. Thus, the

finding supports the alternative hypothesis that the yield on gross loan portfolio affects operational self-sufficiency positively and significantly. The finding of this study is in line with that of Nyamsogoro (2010), Rombrugghe, Tenikue and Sureda (2007) that concluded the yield on the gross loan portfolio positively affect the operational self-sufficiency of microfinance institutions.

Cost per Borrower

The cost per borrower that an MFI incurs, negatively affects the operational self-sufficiency of Ethiopian microfinance institutions at 1% significance level. The result from the analysis indicates that the increase in cost per borrower reduces the operational sustainability of microfinance institutions. The cost per borrower measures the MFI effectiveness in cost reduction given the number of borrowers they are serving. This implies the role of cost reduction in improving the operational sustainability. Therefore, we reject the null hypothesis which was articulated as there is no significant relationship between cost per borrower and operational self-sufficiency of microfinance institutions. Thus, the finding supports the alternative hypothesis that the cost per borrower affects operational self-sufficiency negatively and significantly. This finding is in line with that of Dissanayake (2012) which has found a strong negative relationship between cost per borrower ratio and operational self-sufficiency ratio.

Age

The Age of microfinance institutions refers to the period that an MFI has been in operation since its initial inception. Previously, the variable was expected to determine operational-self-sufficiency positively. But, according to this finding, the

variable is turned-out to be negative and insignificant even at 10% significance level. The finding on the impact of age of microfinance on operational self-sufficiency by Cull et al (2007), Bogan et al (2007), and Robinson (2001) contradicts with this particular finding. Based on the regression result we fail to reject the null hypothesis which has indicated the non-existence of a significant relationship between the age of microfinance institutions and operational self-sufficiency. However, the finding of the insignificance of age in determining the operational self-sufficiency of Ethiopian MFI is in line with the finding by Nadiya (2011) and Nyamsogoro (2010), that it is not significant in explaining the change in operational self-sufficiency.

Debt to Equity Ratio

Debt to equity ratio (Leverage) is insignificant negative predictor variable in determining operational self-sufficiency. This finding contradicts the finding on debt to equity ratio by Dissanayake (2012), that leveraged MFI are more sustainable. The result by Hartarska and Nadolnyak (2007) is also indicated that less leveraged MFIs have better operational self-sufficiency (OSS). These two results are also against each other. This study found debt to equity variable to be insignificant negative predictor for operational self-sufficiency, but Dissanayake found it negative but significant while Hatarska and Nadolnyak found it strong positive significance for the variable. Therefore, based on the regression result from the study, we fail to reject the null hypothesis which was formulated to show the absence of a significant relationship between debt to equity ratio and operational self-sufficiency of Ethiopian microfinance institutions.

Personnel Productivity Ratio

Personnel productivity ratio is another insignificant predictor variable in determining the operational self-sufficiency even at 10 % significance level. However, the correlation value indicates it have a negative value since it is measured by the ratio of personnel expense to loan portfolio. Based on the analysis, therefore, we fail to reject the null hypothesis which was articulated as there is no significant relationship between personnel productivity ratio and operational self-sufficiency ratio of microfinance institutions in Ethiopia.

To compare which variable contributes relatively more to the other for the operational sustainability among the significant predictor variables, their beta coefficient has been compared. The comparison here is based on the beta coefficient which measures the relative strength of various predictors within the model (UCLA, 2007). Based on this, the beta coefficient for the significant variables; ALBPB, CPB, Size and Yield are 0.709360, -0.918785, 0.261640, and 4.009664 respectively. Thus, this indicates that relatively, the yield on gross loan portfolio improves operational sustainability more than the average loan balance per borrower and size of microfinance institutions. On the other hand it is only the cost per borrower which negatively affects the operational sustainability significantly, so no comparison has been made for it. To put the relative strength of the beta coefficient regardless of their relationship with the dependent variable, it is found that the yield on gross loan portfolio is on the first place, cost per borrower on the second, average loan balance per borrowers on the third place and lastly size of the institution.

b. Regression Result for FSS

This section measures the Goodness of fit of the regression line by applying the multiple coefficient of determination (R^2) and it also presents the regression result.

This measures the proportion of the total variation in the dependent variable „Y" explained by the explanatory variables (the „Xs") jointly (Gujarati D. N, 2008). The researcher assumes that the predictor variables" coefficients are simultaneously different from 0. And this has beeb tested using the F-statistics and its P-value under the next section.

Table 4.6.: Econometric Results For the Determinants of FSS

Variables	Coefficient	Std. Err.	Probability
AGE	0.01452	0.017503	0.4105
CPB	-0.778329	0.275214	0.0066***
LR	-0.005147	0.004245	0.2307
NAB	0.172796	0.077342	0.0297**
OER	-0.863754	1.120835	0.4443
YIELD	2.509728	0.779298	0.0022***
R-squared	0.514104		
Ad. R-squared	0.459097		
F-statistic	9.346154		
Prob. (F-stat.)	0.000001		
DW stat	2.147255		

***** Significant at 1%; ** Significant at 5%**

Source: Researchers own extraction from the Eview"s result

Based on the regression result, the R^2 value is 0.514 (51.4%) which implies that 51% of fitness can be observed in the sample regression line. This can be further explained as, 51% of the total variation in the financial sustainability is explained by the

independent variables (cost per borrower, number of active borrowers and the yield on gross loan portfolio) jointly.

However, the study founds age of an MFI, liquidity ratio, and operating expense ratio to be insignificant in determining the financial self-sufficiency of an MFI in Ethiopia. These variables are not significant even at 10% significance level. The reported F-statistics in the regression output and its P-value is 9.35(F-Statistics) and 0.000001 (the P-value). Based on this the researcher concluded that all the significant independent predictor variables are jointly significant in explaining the financial self-sufficiency of microfinance institutions in Ethiopia. Therefore, the null hypotheses which were articulated as the predictor variables coefficients are simultaneously equal to 0 are rejected. Thus, the concluding remark here is that the predictor variables are significant in influencing the change in the OSS. This is based on the rule of thumb that if the p-value is less than 0.05 (5%), the null hypothesis would be rejected. Therefore, just looking at the R^2 and the F-stat we can conclude that the model fits. These variables are described in detail under the following sections.

Cost per Borrower

Cost per borrower**,** which measures the MFI effectiveness in cost reduction given the number of borrowers they are serving, negatively affects the financial self-sufficiency of microfinance institutions in Ethiopia. This variable is highly significant at 1% significance level based on the regression result. An increase in the cost per borrower reduces the financial self-sufficiency of the institutions. Therefore the lower the figure, the better MFI is financially sustainable. From this we can understand that the reduction of cost per borrower will significantly makes an institution to be more sustainable. Therefore, we reject the null hypothesis which was articulated as there is

no significant relationship between the cost per borrower and financial self-sufficiency of microfinance institutions. Thus, the finding supports the alternative hypothesis that the cost per borrower affects financial self-sufficiency negatively and significantly. This finding is supported by a finding by Woller and Schreiner (2002), Christen et al (1995) Cull et al (2007) and Dissanayake (2012). However, in a study by Nyamsogoro (2010) the finding reports that, the cost per borrower had a negative correlation but statistically insignificant impact on financial self-sufficiency.

Number of Active Borrowers

Number of active borrower indicates the level of the breadth of outreach; meaning that the number of poor served by a microfinance institutions (Woller and Schreiner, 2002). This study has found that the number of active borrower is among the variables that most highly and significantly affects the financial self-sufficiency of microfinance institutions. This variable is statistically significant at 5% significance level. This result indicates that an increase in the number of borrowers would lead to an increase in the financial self-sufficiency of an MFI. Thus, if all other things are held constant, larger number of borrowers would lead an MFI to become more sustainable. In general, the larger the number of borrowers the better the sustainability is. Therefore, we reject the null hypothesis which was expressed as there is no significant relationship between the number of active borrowers and financial self-sufficiency of microfinance institutions. Thus, the finding supports the alternative hypothesis that the number of active borrowers affects financial self-sufficiency positively and significantly.

The Yield on Gross Loan Portfolio

The yield on gross loan portfolio indicates the ability of an MFI to utilize the short term assets to generate cash financial revenues. Therefore, the more an MFI utilizes its short term assets, the grater it generates higher financial revenues, which on the other way round cause higher sustainability. This study also founds the same thing, that it affects financial self-sufficiency positively. This variable is highly and statistically significant at 1% significance level in affecting the financial sustainability of an MFI in Ethiopia. Since the higher the ratio the better the financial sustainability of an MFI is, the MFI should utilize its resource to the maximum possible level so as to increase the financial revenue in the form of interests, fees, penalties and commissions from the gross loan portfolio. Therefore, we reject the null hypothesis which was articulated as there is no significant relationship between the yield on gross loan portfolio and financial self-sufficiency of microfinance institutions. Thus, the finding supports the alternative hypothesis that the yield on gross loan portfolio affects financial self-sufficiency positively and significantly. The finding of this study for the yield on gross loan portfolio is in line with that of Nyamsogoro (2010), Rombrugghe, Tenikue and Sureda (2007), Woller and Schreiner (2002). All these findings support that yield affects the financial self-sufficiency (FSS) of a microfinance institution. All have indicated that the relation between yield and FSS is immediate and positive through interest and fee revenues.

Age of an MFI

The finding for Age of an MFI in this study indicates that, its correlation with financial self-sufficiency is positive but insignificant. This finding is supported by the finding of Nyamsgoro (2010), and Nadiya (2011) which has been seen for operational

sustainability. However, despite of its insignificancy, it is against the findings by Bogan et al (2007) and Cull et al (2007). Based on the regression result, therefore, we fail to reject the null hypothesis that there is no significant relationship between the age of a microfinance institution and its financial self-sufficiency level even at 10% significance level. This indicates that there is no evidence for microfinance institution‟s financial sustainability to depend on their age.

Liquidity Ratio

The regression result for Liquidity ratio in this study indicates that; it is statistically insignificant in affecting the financial sustainability negatively. Even though the correlation for the variable is negative, the impact on the dependent variable is statistically insignificant. That means we don‟t have any evidence that liquidity ratio affects the financial self-sufficiency of Ethiopian microfinance institutions significantly. Based on this we fail to reject the null hypothesis that liquidity ratio and financial self-sufficiency have no significant relationship.

Operating Expense Ratio

The regression result for operating expense ratio indicates negative correlation but insignificancy for determining the financial self-sufficiency of an MFI in Ethiopia. Based on the regression result, therefore, we fail to reject the null hypothesis that there is no significant relationship between the operating expense ratio of a microfinance institution and its financial self-sufficiency at 10% significance level. This indicates that there is no evidence for microfinance institution‟s financial sustainability to depend on their operating expense ratio.However, the finding for this

variable by another study indicated that there is strong significant negative correlation to financial self-sufficiency. Therefore this finding is against Nyamsogoro, (2010).

The comparison of beta coefficient of the explanatory variables will indicate the relative strength of the significant variables in explaining the dependent variable as explained in the previous section under the result for OSS. Thus this comparison has been made between the significant determinant variables of financial self-sufficiency. The beta coefficient of cost per borrower, number of active borrowers, and the yield on gross loan portfolio are -0.778329, 0.172796 and 2.509728 respectively. Based on this, the yield on gross loan portfolio which has 2.509728 explains financial self-sufficiency more positively relative to number of active borrowers. On the other hand, this study found that it is only the cost per borrower that affects the financial self-sufficiency negatively and significantly. To put the relative strength of the beta coefficient regardless of their relationship with the dependent variable, it is found that the yield on gross loan portfolio is on the first place, cost per borrower on the second and number of active borrowers on the third place.

To summarise, average loan balance per borrower, size of microfinance institutions, cost per borrower and the yield on gross loan portfolio affects the operational self-sufficiency of microfinance institutions significantly. On the other hand cost per borrower, number of active borrowers and the yield on gross loan portfolio are statistically significant variables in affecting the microfinance institutions in Ethiopia.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary and Conclusions

The research questions/objective formulated in this study was "What are the significant determinants of Operational self-sufficiency and financial self-sufficiency?" Here under the summary and conclusions have been made consecutively for the discussions made on the fourth chapter of this particular study.

The mean of operational sustainability of the 12 selected MFI is 131.7% indicating sustainability. This shows that, on average the operational sustainability of MFI in Ethiopia is 1.3 and therefore, we can infer from this that Ethiopian microfinance institutions are operationally sustainable. The mean of the financial sustainability is 97.3% which indicates that MFI in Ethiopia are not Financial self-sufficient. The figure for this variable is below the standard, therefore, not financially sustainable.

MFIs in Ethiopia are young in terms of the duration of time in which they stayed in operation. On average they have served the society for around 9 years. Some MFIs have reached the age of 15 while some few are 4 years old at the end of 2012.

Microfinance industry in Ethiopia provides, on average, 134 USD for a borrower. The maximum amount of the average loan balance per borrower is $374 while the minimum is $37 that can be given for a single borrower. Therefore, the loan size that Ethiopian microfinance institutions provide is small. On the other hand the cost per borrower for Ethiopian MFI is 14.47 USD on average to serve a single borrower. Some of the inefficient MFIs incurred 30 USD while the efficient MFIs are incurring only 4 USD per borrower. The personnel cost for the Ethiopian microfinance industry is 7.6 cents for each dollar in the loan portfolio. Some efficient institutions incur only 1.6 cents while few inefficient ones incurred 30 cents for each gross loan portfolio.

The operating expense of 9.5 cents is what actually the industry incurs on average for each dollar in the gross loan portfolio. Some highly efficient institutions incur 1 cent, while the inefficient institutions in the industry incur an operating expense of 27 cents for each dollar on their gross loan portfolio.

The average total asset of the microfinance industry in the country is about 31, 892,504 USD. These institutions are leveraged on average than financed through equity capital as their mean for debt to equity ratio indicates. The ratio for this variable is 2.24.

The microfinance industry in the country generates on average 19.66 cents cash for each single dollar in the outstanding loan portfolio. The minimum and maximum yield on the gross loan portfolio for this study is 0.04 and 0.37 respectively. This means some of the inefficient MFI generates only 0.4 cents for each single dollar on the gross loan portfolio while the efficient MFI generates up to 37.00 cents.

The liquidity ratio (the dollar value of current assets available to meet each one dollar short term obligation) in the industry is $ 2.8. The mean for this ratio is above the threshold. However some inefficient microfinance institutions have $0.09 available to meet the short term obligations while efficient MFI have $58.

On average a microfinance institution in Ethiopia are reaching 134,452 numbers of borrowers (in other words poor). The maximum numbers of borrowers reached so far by a microfinance institution is 710,576 borrowers and the minimum is 3,457.

In order to determine the significant determinants of OSS and FSS, the researcher hypothesized that the yield on gross loan portfolio, size of microfinance institutions, personnel productivity ratio, debt to equity ratio, cost per borrower, average loan balance per borrower and age of an MFI are statistically significant predictor variable in determining operational self-sufficiency. Similarly, the research also hypothesized that the yield on gross loan portfolio, cost per borrower, age of an MFI, liquidity ratio, number of active borrower, and operating expense ratio to be statistically significant predictor variables in determining financial self-sufficiency.

Based on this, the study found that ***average loan balance per borrower, cost per borrower, size of an MFI and the yield on gross loan portfolio*** are statistically significant variables in determining operational self-sufficiency. On the other hand the study found ***cost per borrower, number of active borrower, and the yield on gross loan portfolio*** to be statistically significant predictor variables in determining the financial self-sufficiency of Ethiopian microfinance institutions.

The researcher‟s finding on ***average loan balance per borrower and operational self-sufficiency*** is supported by Adongo and Stork (2006), Nyamsogoro (2010), Gonzalez (2007) and Gregoire&Tuya (2006). And, an opposing finding to Cull et al (2007) and Nadiya, (2011) was postulated. The result for ***size***, is also found to be supported by Mersland and storm (2009), Bogan et al, (2007), Kyereboah-Coleman and Osie (2008), Hartarska and Nadolnyak (2007). The finding on the ***yield on gross loan portfolio with operational and financial self sufficiency*** is also supported by the finding of Nyamsogoro (2010), Woller and Shcreiner (2002), and Rombrugge et al (2007). Similarly the finding on ***cost per borrower*** is supported by Woller and Shcreiner (2002), Dissanayake (2012), Christian et al (1995), and Cull et al (2007).

Moreover, correlation value of cost per borrower, together with operational self-sufficiency and financial self-sufficiency, indicates that, changes in the predictor variables negatively contribute towards changes in the operational and financial self-sufficiency significantly. On the other hand, correlation values of average loan balance per borrower, size and yield on gross loan portfolio together with the operational self-sufficiency indicate that changes in the predictor variables positively contribute towards changes in the operational self-sufficiency. Finally, correlation values of number of active borrower and yield on gross portfolio together with financial self-sufficiency indicates the change in the predictor variables positively contributes towards changes in financial self-sufficiency significantly.

The researcher has proved that the models for both dependent variables meet all the assumptions of classical linear regression model (CLRM). It has been proved that the models are not in sequence of the problem of multicollinearity (i.e. all variables act independently), hetroscedasticity, autocorrelation and non-normality.

Based on the findings, therefore, the following concluding remarks have been made by the researcher. The conclusions made are:

- ✓ Microfinance institutions in Ethiopia are operationally self-sufficient but they are not financially self-sufficient.
- ✓ MFIs in Ethiopia are young in terms of the duration of time in which they stayed in operation.
- ✓ The loan size that Ethiopian microfinance institutions provide is small relative to other MFIs in African country.

- ✓ Ethiopian microfinance institutions are highly efficient in absolute terms in terms of the cost per borrowers when compared to the African countries average.
- ✓ Microfinance sector in Ethiopia is much better than its African peer when the average total asset is compared. Relatively, therefore, in terms of the size of assets they are big enough.
- ✓ ***Average loan balance per borrower, cost per borrower, size of an MFI and the yield on gross loan portfolio*** are statistically significant predictor variables which determines the operational self-sufficiency of microfinance institutions in Ethiopia.
- ✓ Personnel productivity ratios, debt to equity ratio, age of an MFI are not statistically significant determinant variables of operational self-sufficiency of MFIs in Ethiopia.
- ✓ ***Cost per borrower, number of active borrower, and the yield on gross loan portfolio*** are statistically significant predictor variables in determining the financial self-sufficiency of Ethiopian microfinance institutions.
- ✓ Age of an MFI, liquidity ratio, and operating expense ratio are statistically insignificant predictor variables in determining financial self-sufficiency

5.2. Recommendations

Based on the findings of the study, the researcher has recommended certain points what he thought to be very critical if considered and implemented by the microfinance institutions accordingly and properly. Therefore, the following suggestions have been given.

It has been seen that MFIs in Ethiopia manage small loans. Managing small loan increases operational costs. An increase in the average loan balance increases the operational self-sufficiency of MFI in Ethiopia by reducing the PAR and the cost per borrower. Therefore, they (MFI) should increase the loan size that they lend to a borrower in order to reduce cost per borrower in proportion to the amount they lend.

It is also found that size of an MFI is significant in achieving operational sustainability; therefore, MFIs should increase their value of total assets. If the things they own are as great as possible, they will be sure to be operationally as well as financially sustainable, because operational sustainability is the first step to financial sustainability.

Financial self-sufficiency unless financial self-sufficiency is reached, the long term provision of financial services is undermined by the continued necessity to rely on donor funds. Usually, financial self-sufficiency should also cover the cost of capital: the loss in the real value of equity due to inflation. According to Berne, if an MFI does not reach that, eventually its equity will be reduced by losses or must be compensated by grants. To be financially self sufficient, therefore, microfinance institutions should increase the number of active borrowers they are serving. This is needed because to be benefited from the economies of scale. That means the cost per borrower will be reduced when the number of borrowers is increased, because the total cost will be distributed over the total number of borrowers. It is at this time that an economy of scale is achieved. Since the study found that cost per borrower to have a negative impact and number of active borrowers to have a positive impact on the financial self-sufficiency.

On the other hand, financial self-sufficiency can be achieved when microfinance institutions are able to utilize their short term asset to generate cash financial revenues so as to increase the yield on the gross loan portfolio because, the yield on gross loan portfolio indicates the ability of an MFI to utilize the short term assets to generate cash financial revenues. Therefore, the more an MFI utilizes its short term assets, the greater it generates higher financial revenues, which on the other way round cause higher sustainability. This can be further elaborated as, since the higher the ratio the better the operational sustainability of an MFI is, the MFI should utilize its resource to the maximum possible level so as to increase the financial revenue in the form of interests, fees, penalties and commissions from the gross loan portfolio. As indicated in the discussion of the finding, the yield on gross loan portfolio, is relatively strong predictor variable of operational and financial sustainability. Thus a greater emphasis should be given in raising the yield. However, this should be interpreted with a greater caution, because the researcher is not saying that, the other significant predictor variables in the study should not be given equal emphasis to the yield. But what is referred here is that the yield is contributing much as compared to the other variables. Therefore, should not be neglected or given less emphasis.

The role of cost reduction in improving the operational self-sufficiency has been indicated in this study. Therefore, a microfinance institution should strive to reduce the cost per borrower to the possible minimum level which will reduce the overall cost of operations.

As the research result indicates, an increase in the number of borrowers would lead to an increase in the financial self-sufficiency of an MFI. Thus, if all other things are held constant, larger number of borrowers would lead an MFI to become more

sustainable. In general, the larger the numbers of borrowers, the better sustainable microfinance institutions are. Thus, MFIs in Ethiopia should reach higher number of poor so that, for one thing their objectives of reaching the poor will be achieved and for the other thing, the number of borrowers will be increased and the cost spend to serve the borrowers will be reduced due to the economies of scale. 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. Not only this, but also when this number is compared to the income level of the society, it is still needs attention to reach more poor in the country. Therefore, MFIs in Ethiopia should reach more number of poor.

Moreover operational and financial self-sufficiency are significant if a particular MFI could adopt commercialized scenario of microfinance initiatives. In other words adding market based solutions to microfinance. And many researchers have acknowledged that operational and financial self-sufficiency is significant in the commercialization of microfinance. In fact high grants or subsidies do not allow a MFI to reach self-sufficiency as well.

In general, to reach at financial self-sufficiency level, MFIs should

a. Increase the number of borrowers (they have to reach the possible maximum number of borrowers).
b. Should reduce the cost per borrower (possible by increasing the number of borrowers).
c. They should be able to utilize their short term assets to the maximum possible level to generate more cash and financial revenues.

d. MFI should increase the gross loan portfolio so as to increase the loan size that they lend to a borrower and to reduce cost per borrower in proportion to the amount they lend.
e. MFIs should increase the value of their total assets more than what they are having currently.

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Appendix: 1-a.

Regression statistics between Operational self-sufficiency ratio (OSS) and its determinants

Dependent Variable: OSS
Method: Panel EGLS (Cross-section random effects)
Date: 04/20/12 Time: 14:38
Sample: 2005 2010
Periods included: 6
Cross-sections included: 12
Total panel (unbalanced) observations: 66
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.402104	0.592156	-2.367794	0.0212
AGE	-0.021156	0.014949	-1.415158	0.1624
ALBPB	0.709360	0.339461	2.089662	0.0410
CPB	-0.918785	0.269129	-3.413919	0.0012
DER	-0.005980	0.008727	-0.685209	0.4959
PPR	-1.680898	1.157015	-1.452788	0.1517
SIZE	0.261640	0.083901	3.118434	0.0028
YIELD	4.009664	0.782340	5.125218	0.0000

Effects Specification	S.D.	Rho
Cross-section random	0.100527	0.1758
Idiosyncratic random	0.217694	0.8242

Weighted Statistics

R-squared	0.640677	Mean dependent var	0.890889
Adjusted R-squared	0.597310	S.D. dependent var	0.344399
S.E. of regression	0.218980	Sum squared resid	2.781238
F-statistic	14.77352	Durbin-Watson stat	1.932625
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.726640	Mean dependent var	1.321970
Sum squared resid	3.401543	Durbin-Watson stat	1.580192

Appendix: 1-b

Regression statistics between financial self-sufficiency ratio (FSS) and its determinants

Dependent Variable: FSS
Method: Panel EGLS (Cross-section random effects)
Date: 04/20/12 Time: 14:27
Sample: 2005 2010
Periods included: 6
Cross-sections included: 12
Total panel (unbalanced) observations: 60
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.488531	0.487649	1.001808	0.3210
AGE	0.014520	0.017503	0.829600	0.4105
CPB	-0.778329	0.275214	-2.828088	0.0066
LR	-0.005147	0.004245	-1.212556	0.2307
NAB	0.172796	0.077342	2.234183	0.0297
OER	-0.863754	1.120835	-0.770634	0.4443
YIELD	2.509728	0.779298	3.220498	0.0022

Effects Specification		
	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.265102	1.0000

Weighted Statistics			
R-squared	0.514104	Mean dependent var	0.973667
Adjusted R-squared	0.459097	S.D. dependent var	0.370501
S.E. of regression	0.272489	Sum squared resid	3.935266
F-statistic	9.346154	Durbin-Watson stat	2.147255
Prob(F-statistic)	0.000001		

Unweighted Statistics			
R-squared	0.514104	Mean dependent var	0.973667
Sum squared resid	3.935266	Durbin-Watson stat	2.147255

Appendix: 2-a

Multicollinierity test for OSS

Correlation of the independent variable of OSS							
	AGE	ALBPB	CPB	DER	PPR	SIZE	YIELD
AGE	1						
ALBPB	0.52313	1					
CPB	-0.2756	-0.1172	1				
DER	0.30703	0.24851	-0.2257	1			
PPR	-0.5008	-0.689	0.57781	-0.2774	1		
SIZE	0.57991	0.68965	-0.5646	0.36303	-0.6879	1	
YIELD	-0.291	-0.4096	0.66022	-0.2281	0.53875	-0.5135	1

Appendix: 2-b

Multicollinierity test for FSS

Correlation of the independent Variables of FSS						
	AGE	CPB	LR	NAB	OER	YIELD
AGE	1					
CPB	-0.3011	1				
LR	-0.2943	-0.1241	1			
NAB	0.59169	-0.5521	-0.2676	1		
OER	-0.5087	0.74578	0.31073	-0.6029	1	
YIELD	-0.3684	0.6568	-0.1255	-0.4935	0.56808	1

Appendix: 3-a

Heteroskedastisity Test for OSS Model			
Heteroskedasticity Test: White			
F-statistic	0.23799	Prob. F(7,53)	0.9739
Obs*R-squared	1.85895	Prob. Chi-Square(7)	0.9672
Scaled explained SS	0.75947	Prob. Chi-Square(7)	0.9978

Appendix: 3-b

Heteroskedatisity Test for FSS Model			
Heteroskedasticity Test: White			
F-statistic	0.44583	Prob. F(6,51)	0.8445
Obs*R-squared	2.89049	Prob. Chi-Square(6)	0.8225
Scaled explained SS	1.25872	Prob. Chi-Square(6)	0.9739

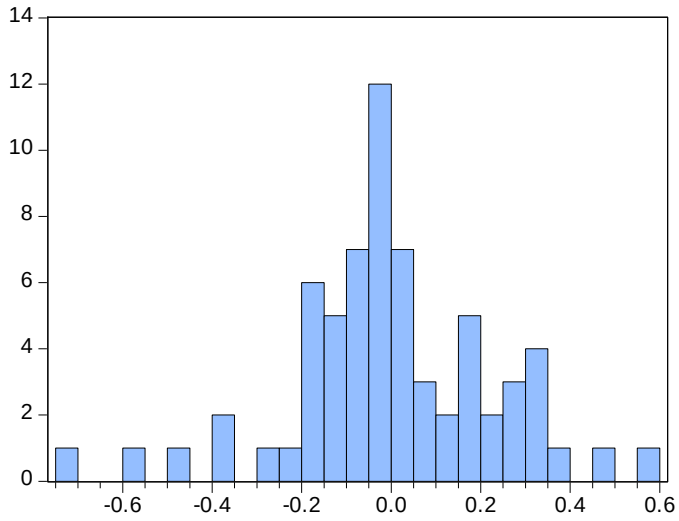
Appendix: 4

Autocorrelation test for both OSS and FSS models

Models	R. Square	Adj. R. Square	S.E. of the estimates	DW
OSS	0.64	0.597	0.219	1.93
FSS	0.514	0.459	0.272	2.14

Appendix: 5-a

Histogram for OSS model

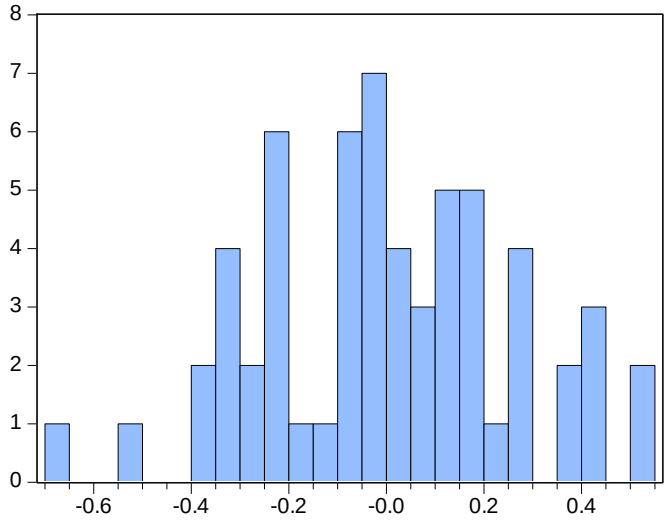


Series: Standardized Residuals	
Sample 2005 2010	
Observations 66	
Mean	0.001151
Median	-0.022623
Maximum	0.555675
Minimum	-0.714936
Std. Dev.	0.228758
Skewness	-0.311157
Kurtosis	4.027086
Jarque-Bera	3.965998
Probability	0.137656

Fig.: 1. Normality graph for OSS

Appendix: 5-b

Histogram for FSS model



Series: Standardized Residuals	
Sample 2005 2010	
Observations 60	
Mean	-1.85e-18
Median	-0.018270
Maximum	0.513571
Minimum	-0.679780
Std. Dev.	0.258262
Skewness	-0.127143
Kurtosis	2.737992
Jarque-Bera	0.333273
Probability	0.846507

Fig.: 2. Normality graph for FSS

Appendix: 3. Data used in the analysis.

YEAR	MFI	OSS	FSS	SIZE	YIELD	CPB	OER	ALBPB	DER	WOR	PPR	PAR	NBPS	NAB	LR	Age
2005	1	1.99	1.50	7.83	0.18	0.84	0.044	2.07	2.09	0.00%	0.044	0.091	2.36	5.64	0.75	8
2006	1	2.24	1.46	7.98	0.18	0.84	0.040	2.16	2.34	0.07%	0.034	0.016	2.41	5.73	0.39	9
2007	1	2.26	1.39	8.14	0.18	0.90	0.040	2.27	2.72	0.10%	0.031	0.013	2.41	5.78	0.38	10
2008	1	2.01	0.88	8.29	0.16	1.04	0.044	2.34	3.25	0.00%	0.020	0.014	2.44	5.85	0.47	11
2009	1	2.04	1.68	8.27	0.18	0.90	0.028	2.29	2.81	0.00%	0.030	0.038	2.40	5.83	0.50	12
2010	1	2.23	2.04	8.18	0.09	0.48	0.010	2.19	2.60	0.00%	0.019	0.030	2.40	5.83	0.37	13
2005	2	0.76	0.64	6.07	0.24	1.34	0.181	1.94	0.51	1.32%	0.158	0.004	2.12	4.00	0.54	6
2006	2	1.24	0.94	6.24	0.32	1.23	0.165	1.81	0.51	-0.10%	0.141	0.006	2.17	4.26	0.80	7
2007	2	1.29	0.97	6.50	0.37	1.20	0.160	1.84	1.32	0.00%	0.152	0.017	2.27	4.50	0.71	8
2008	2	1.44	0.82	6.64	0.31	1.20	0.152	1.91	1.25	0.03%	0.110	0.024	2.31	4.60	0.63	9
2009	2	1.45	1.20	6.65	0.28	1.11	0.120	1.93	1.31	1.00%	0.080	0.020	NA	4.62	NA	10
2010	2	1.47	1.35	6.56	0.28	1.08	0.130	1.89	1.02	0.00%	0.0721	0.020	2.20	4.58	0.72	11
2005	3	1.97	1.51	8.01	0.13	0.60	0.021	2.27	3.30	0.00%	0.016	0	2.53	5.62	0.35	8
2006	3	1.94	1.27	8.07	0.11	0.70	0.018	2.33	3.75	0.37%	0.017	0.029	2.45	5.60	0.37	9
2007	3	1.73	1.00	8.23	0.12	0.84	0.020	2.44	3.98	0.41%	0.019	0.017	2.40	5.62	0.40	10
2008	3	1.30	0.44	8.27	0.10	0.95	0.021	2.49	4.20	0.16%	0.020	0.018	2.40	5.67	0.32	11
2009	3	1.95	1.61	8.22	0.11	0.90	0.020	2.34	1.63	0.00%	0.020	0.050	NA	5.69	0.345	12
2010	3	1.02	0.93	8.11	0.05	0.56	0.010	2.34	3.13	0.00%	0.022	0.070	2.30	5.62	0.339	13
2005	4	1.48	1.17	6.32	0.27	1.08	0.081	2.03	2.63	0.18%	0.067	0.002	2.29	4.09	0.41	6
2006	4	1.59	1.23	6.55	0.26	1.08	0.082	2.06	2.11	0.00%	0.064	0.006	2.30	4.39	0.24	7
2007	4	1.04	0.87	6.62	0.27	1.11	0.084	2.13	2.55	0.00%	0.062	0.097	2.30	4.44	0.20	8
2008	4	1.01	0.62	6.63	0.23	1.17	0.097	2.13	2.87	0.00%	0.068	0.106	2.25	4.43	0.24	9
2009	4	NA	NA	6.57	NA	NA	NA	2.02	2.86	NA	NA	NA	NA	4.40	NA	10
2010	4	0.92	0.84	6.43	0.21	1.22	0.110	2.04	3.05	0.00%	0.065	0.170	2.05	4.26	0.14	11
2005	5	1.09	0.91	6.27	0.23	1.25	0.099	2.22	1.30	3.03%	0.087	0.181	2.07	3.40	0.48	7

2006	5	0.94	0.61	6.25	0.19	1.28	0.110	2.14	1.28	1.83%	0.078	0.373	2.06	4.01	0.83	8
2007	5	1.13	0.73	6.25	0.24	1.25	0.120	2.07	1.10	3.18%	0.096	0.220	2.14	4.11	0.75	9
2008	5	1.12	0.49	6.31	0.17	1.39	0.110	2.57	3.14	10.24%	0.080	0.262	1.67	3.62	0.80	10
2009	5	1.30	1.07	6.23	0.32	1.32	0.160	1.95	3.05	6.00%	0.120	0.240	NA	4.15	NA	11
2010	5	0.69	0.63	6.04	0.20	1.18	0.180	1.83	1.41	5.00%	0.113	0.130	2.16	4.11	0.94	12
2005	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
2006	6	0.90	0.77	5.66	NA	1.25	0.148	2.00	2.00	0.10%	NA	0.005	1.20	3.54	0.41	1
2007	6	0.91	0.72	5.94	0.17	1.17	0.152	1.79	2.16	0.00%	0.102	0.022	2.37	4.01	0.47	2
2008	6	1.03	0.40	6.08	0.20	1.11	0.141	1.89	1.96	0.00%	0.091	0.028	2.34	4.07	0.39	3
2009	6	1.01	0.83	6.11	0.20	1.11	0.120	1.81	1.58	0.00%	NA	0.030	NA	4.10	NA	4
2010	6	1.11	1.01	6.04	0.10	0.59	0.060	1.71	1.35	0.00%	0.081	0.050	2.38	4.24	0.404	5
2005	7	0.35	NA	5.52	0.24	1.36	0.318	1.57	0.01	0.00%	0.308	0.138	2.22	3.66	36.76	3
2006	7	0.52	0.41	5.76	0.21	1.32	0.265	1.78	0.03	0.00%	0.206	0.066	2.35	3.84	44.37	4
2007	7	0.81	0.55	5.99	0.24	1.17	0.168	1.79	0.31	4.36%	0.135	0.069	2.40	4.03	3.39	5
2008	7	1.02	0.39	6.07	0.23	1.17	0.143	1.93	0.28	4.00%	0.124	0.090	NA	NA	92.13	6
2009	7	1.16	0.96	6.07	0.21	1.04	0.147	1.75	0.25	0.00%	0.110	0.114	2.43	4.15	38.06	7
2010	7	0.62	0.57	6.00	0.04	0.34	0.030	1.68	0.27	0.00%	0.033	0.120	2.48	4.15	58.05	8
2005	8	1.81	1.10	7.46	NA	0.90	0.052	2.09	1.29	0.21%	NA	0.012	2.14	5.26	NA	8
2006	8	1.82	1.04	7.77	NA	1.07	0.051	2.25	2.38	1.30%	NA	0.002	2.19	5.42	NA	9
2007	8	1.66	1.05	7.76	0.15	0.90	NA	2.24	2.50	2.00%	0.038	NA	3.31	5.62	NA	10
2008	8	1.51	0.63	7.89	0.11	0.90	0.048	2.23	2.95	0.00%	0.030	0.030	2.27	5.56	0.25	11
2009	8	1.55	1.61	8.01	0.14	1.00	0.044	2.22	3.00	0.00%	0.040	0.070	2.32	5.66	0.26	12
2010	8	1.45	1.32	7.92	0.13	0.81	0.040	2.14	29.6	0.00%	0.038	0.050	2.34	5.66	0.27	13
2005	9	1.03	0.81	6.34	0.16	1.17	0.092	2.11	2.60	0.00%	0.054	0.001	2.30	4.14	0.27	6
2006	9	1.96	1.41	6.52	0.19	1.08	0.072	2.21	2.73	0.03%	0.043	0.007	2.36	4.28	0.09	7
2007	9	1.88	1.37	6.61	0.21	1.11	0.067	2.25	2.19	0.16%	0.043	0.005	2.32	4.29	0.17	8
2008	9	1.65	0.78	6.64	0.19	1.23	0.080	2.29	1.98	0.21%	0.040	0.005	2.28	4.3	0.14	9

2009	9	1.24	1.01	6.59	0.23	1.32	0.094	2.23	1.70	0.09%	0.030	0.055	2.19	4.26	0.37	10
2010	9	1.07	0.98	6.50	0.20	1.20	0.040	2.15	1.67	0.00%	0.027	0.000	2.11	4.26	0.28	11
2005	10	1.04	0.80	6.33	0.19	1.14	0.095	2.04	0.81	0.00%	0.068	0.086	2.28	4.15	1.28	8
2006	10	1.27	0.85	6.47	0.18	1.17	0.097	2.09	0.90	0.00%	0.067	0.041	2.32	4.28	0.77	9
2007	10	1.11	0.59	6.57	0.17	1.17	0.097	2.07	1.19	0.00%	0.064	0.068	2.34	4.40	0.67	10
2008	10	1.19	0.54	6.63	0.22	1.20	0.101	2.08	1.19	3.11%	0.080	0.038	2.27	4.42	0.95	11
2009	10	1.20	0.99	6.63	0.26	1.17	0.100	1.96	1.31	5.00%	0.100	0.030	NA	4.46	NA	12
2010	10	1.61	1.48	6.57	0.15	0.73	0.050	1.91	1.23	0.00%	0.099	0.030	2.28	4.49	0.65	13
2005	11	1.18	0.76	6.19	0.26	1.08	0.097	1.85	1.06	4.34%	0.099	0.076	2.14	4.08	0.88	5
2006	11	1.13	0.91	6.47	0.24	1.11	0.100	1.97	1.16	4.32%	0.088	0.009	2.29	4.35	0.53	6
2007	11	1.48	1.01	6.62	0.24	1.04	0.083	1.99	1.35	0.24%	0.065	0.017	2.39	4.49	0.50	7
2008	11	1.65	0.78	6.73	0.19	1.04	0.078	2.06	2.03	0.26%	0.050	0.009	2.37	4.58	0.24	8
2009	11	1.84	1.52	6.82	0.24	1.04	0.076	2.07	2.15	0.24%	0.060	0.014	2.39	4.62	0.40	9
2010	11	1.45	1.33	6.75	0.12	0.64	0.030	2.07	2.19	0.00%	0.038	0.040	2.37	4.63	0.14	10
2005	12	1.01	0.91	6.55	0.22	1.34	0.154	2.05	1.49	3.75%	0.092	0.033	2.10	4.43	0.28	6
2006	12	1.29	1.05	6.78	0.18	1.32	0.153	2.07	1.12	2.18%	0.087	0.055	2.12	4.65	0.25	7
2007	12	0.99	0.73	6.90	0.21	1.41	0.170	2.14	1.77	3.28%	0.111	0.027	2.10	4.68	0.27	8
2008	12	1.01	0.56	5.97	0.18	1.44	0.170	2.17	1.29	2.00%	0.102	0.039	2.10	4.75	0.29	9
2009	12	0.92	0.88	5.86	0.22	1.47	0.270	2.12	1.27	2.16%	0.130	0.049	2.07	4.73	0.31	10
2010	12	0.71	0.65	6.86	0.18	1.34	0.140	2.05	0.77	1.00%	0.132	0.090	2.00	4.68	0.31	11