



**SAINT MARY'S UNIVERSITY**

**SCHOOL OF GRADUATE STUDIES**

**INTERNAL DETREMENTS OF OPERATIONAL AND  
FINANCIAL SUSTAINABILITY OF THE MICRO  
FINANCE INSTITUTIONS (MFIs) in Ethiopia**

**BY**

**ASFAW TAFESSE WORISO (ID.NO SGS/0044/2004B)**

**MARCH, 2014**

**ADDIS ABABA, ETHIOPIA**

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## ACRONYMS

AEMFIs:	Association of Ethiopia Micro financial Institutions
BRDOUT:	Breadth of Outreach
CPB:	Cost per Borrower
CSA:	Central Statistics Agency
ACSI:	Amhara Credit and Savaging Association
CGAP:	Consultative Group to Assist the Poor
DBOUT:	Depth of Outreach
DW:	Durban Watson
FDRE:	Federal Democratic Republic of Ethiopia
FSS:	Financial Self-Sufficiency
GDP:	Gross Domestic Product
MFI:	Micro financial Institution
NBE:	National Bank of Ethiopia
NGOs:	Non Governmental Organizations
OER:	Operating Expense Ratio
OLS:	Ordinary List Square Method
OSS:	Operational Self-Sufficiency
PAR:	Portfolio at Risk
SPSS:	Statistical Package for Social Science
UNDP:	United Nation Development Program
VIF:	Variance Influence Factor
WB:	World Bank

## **ABSTRACT**

*The main objective of microfinance institutions (MFIs) is to provide financial services to the poor and that population that are not served with traditional bank. The MF industry as a whole is challenged by the need to reach the poorest customers and at the same time being operationally and financially self-sufficient. The study found that microfinance yield on gross portfolio, cost per borrower, portfolio at risk, breadth of outreach and operating expense ratio affect the financial sustainability of microfinance institution in Ethiopia. While, yield on gross portfolio, size of an MFI, personnel productivity ratio, debt to equity ratio, cost per borrower, depth of outreach and age of an MFI affects the operational sustainability of Ethiopian MFIs significantly. However, the age of an MFI has insignificant impact on the financial sustainability of microfinance institution in Ethiopia. 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, and finally it has been recommended that they should increase the value of their total assets*

# **CHAPTER ONE:**

## **INTRODUCTION**

### **1.1 Background of the Study**

Microfinance programs focus on expanding local economic activities and improving the standard of living of their clients by providing financial services needed to establish small businesses. Microfinance can be defined as “the provision of banking services such as savings, credit and money transfer to poorer people who cannot access ordinary mainstream banking services” (Wilson, 2003). While the primary goal of most microfinance institutions (MFIs) is improving the economic status of poorer segments of the population, most service providers aim for a broader impact of enhanced well-being. Because households function as social and economic units, microenterprise/microfinance programs have a unique opportunity to impact the economic, social, and general well-being of households.

Microfinance is typically viewed as an economic development strategy, and it is a particularly relevant approach in countries where disadvantaged groups tend not to benefit from involvement in the formal economy. In most developing nations, the majority subsists on income from microenterprise activities; the microenterprise sector is estimated to account for 20% to 70% of all employment in many developing countries, illustrating the importance of the informal economy in the subsistence of impoverished populations throughout the world (Wilson, 2001; Waters, 2001). Microfinance is a logical approach to development because it functions at the grassroots level, can be sustainable, is capable of involving large segments of the population, and builds both human and productive capacity.

Microfinance institutions, regardless of their social mission, are financial intermediaries. Therefore, it is important to assess the viability and soundness of MFIs. To evaluate the performance of micro finance institutions SEEP Network and CGAP evaluate financial and operational performance in terms of: Sustainability and Profitability; Asset and Liability Management; Portfolio Quality and Efficiency and Productivity

Micro-finance is one of the ways of building the capacities of the poor who are often neglected by commercial banks and other lending institution and graduating them to sustainable self-employment activities by providing them financial services like credit, savings and technical support services.

Microfinance was first introduced in Ethiopia in the late 1980s, offered mostly by NGO relief and development programs. Although microfinance operation started earlier, the Government of Ethiopia issued proclamation Number 40/96 for licensing and supervision of microfinance institutions in 1997. This formalization enabled MFIs to accept and stressed the need for sound commercial principles in the sector. The Ethiopian microfinance sector is one of the world's fastest growing micro finance sector (MicroNed Ethiopia Country Scan, 2007). There are currently 32 MFIs registered with the National Bank of Ethiopia serving clients through 433 branches and 598 sub-branches (Mixmarket, 2010). Similarly, from the total of 32 MFI in the country, 30 of them are reaching about 2,470,641 credit clients and some saving clients (NBE, 2011). The service reached poor people considering with the existing demand that need financial access in both rural and urban areas are insignificant.

According to a report by NBE 2013, the number of microfinance institutions (MFIs) operating in the Ethiopia reached 32 . They serve more than 2.9 Million cliants through 1,244 branches that located in different parts of the country The top five microfinance institutions which are backed by regional governments; namely, ACSI (Amahara), DECSI (Dedebit), OCSICO(Oromiya), ADCSI (Addis) and Omo, in aggregate serve about 84.7% of the total clients of the sector; and account for more than 90% of the sector's total assets (NBE quarterly report as at June 30, 2012). The Ethiopia microfinance has showed an increasing trend since its establishment in 1996 and its total asset increased to Birr 13,3 billion as of June 30,2013. Compared to the preceding year of the same month, its gross loan grew from Birr 4.5 million as of June 2012 to Birr 9.3 billion as of June, 2013( NBE, ,2013 )

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 microfinance institutions are a member of 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

In view of the above general outlook this study is proposed to investigate the performance of the MFIs sector in Ethiopia. Consequently the study attempted to identify the factors that affect MFIs' sustainability (FSS and OSS) and also will show their degree of significance and state of interrelationship.

## **1.2 Statement of the Problem**

This study will focus on the determinants of operational and financial sustainability of microfinance institution in Ethiopia. Microfinance has been operational since the last twenty years in Ethiopia having with the objective of delivering financial service to rural and urban poor in order to contribute their part with respect to the country's poverty reduction goal.

Since then, the Ethiopian microfinance sector is characterized by its fast growth, an aggressive drive to achieve scale, a broad geographical coverage, a dominance of government supported MFI, an emphasis on rural households, the promotion of both credit and saving and a strong focus on sustainability (Ebisa, and Fikadu 2013). However, different studies in various countries related to microfinance institution reveals that institutional sustainability seems not encouraging despite the fact that international and national development programs have been giving high priority on sustainable microfinance to the poor for many years (Kimando, Kihoro and Njogu, 2012).

Despite the interest in the sector and the subsidies that have flowed into some of the mission-oriented MFIs, it appears challenging to make an MFI viable over the long term.

One survey found that 30 percent of domestic microfinance programs operating in 2001 were either no longer in operation or were no longer lending capital two years later (Bhatt, Painter and Tang 2002). Furthermore most microfinance programs report difficulty in sustaining its operations without continued reliance on grants, external fundraising, or other subsidies

Moreover, different studies have also been conducted to determine factors affecting the financial sustainability of MFIs using large and well developed MFIs in various countries. The level of significance of these factors in affecting the financial sustainability of MFIs, however, varies with studies. For instance, a study conducted by Cull *et al.*, (2007) and Christen *et al.* (1995) showed that some of the determinants are found to be significant in one economy or applicable to a set of MFIs, some are not significant.

In Ethiopia although some research such as (Kerta 2007, Tiruneh 2009, and Leteneh 2009 ) have been conducted on the performance of microfinance institutions related to impact and outreach , the effort made to build knowledge of the determinants of sustainability of microfinance institutions using FSS and OSS as predictor variables were little or no study carried out. Therefore, this study aimed to investigate the determinants of microfinance sustainability with due emphasis on operational and financial self-sufficiency and thereby will help to provide a good literature in the area and provide direction for future research

### **1.3 Objectives of the Study**

This study in general will investigate the performance of the MFIs; will assess the factor that affects sustainability /profitability of the MFIs and also look at the trends of the sustainability overtime

Thus attempt will be made to meet the following specific objective

1. To assess the determinants that affect MFIs' operational self sufficiency and their relation
2. To assess the determinants that affect MFIs' financial self sufficiency and their relation

3. To test whether MFIs are operationally and financially self sustainability

#### **1.4 Research hypothesis**

- H1: There is a significant positive relationship between the yield on gross loan portfolio of MFIs with financial and operational self sufficiency
- H2: There is significant positive relationship between number of active borrower and financial self-sufficiency
- H3: There is a significant negative relationship between debt to equity ratio of microfinance institution and operational sustainability
- H4: There is a significant positive relationship between personnel productivity ratio and operational self- sufficiency
- H5: There is a significant positive relationship between average loan balance per borrower and operational self sufficiency
- H6: There is a positive significant relationship between age of microfinance institution to operational self-sufficiency and financial self sufficiency
- H7: There is a significant positive relationship between the size of microfinance institution and operational self sufficiency
- H8: There is a significant negatively relationship between Cost per borrower and operational self-sufficiency and financial self sufficiency
- H9: There is a significant negative relationship between operating expense ratio and financial self sufficiency
- H10: There is a significant negative relationship between portfolio at risk and financial self-sufficiency

#### **1.5. Significance of the study**

This research intended to examine the determinant factors that affect financial self-sufficiency /profitability of microfinance institutions in Ethiopia. Therefore, one of the most important things that MFIs obtain from the result of this particular study will be to clearly understand the factors affecting 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.

Furthermore, the research is also aimed at to assist microfinance practitioners in measuring the financial and operational performance of MFI's and consequently to give some insights into how a MFIs' financial and operational performances could be improved by showing gap

### **1.6. Delimitation /Scope of the study**

The scope of this study was being limited to the assessment of the determinant of sustainability of microfinance institution in Ethiopia using the FSS and OSS as a predictor measure. The study was focused only on the factor of that affect the sustainability of MFIs using FSS and OSS as a major indicator for sustainability of micro finances institutions using a 10 year (2001-2011) .The study did not give attempt to look the social aspect of the MFIs goal to reach the poor households due to the time constraint and cost of needing gathering primary data to look at the impact that MFIs brought about

### **1.7. Limitation of the study**

As all research work has its own challenge, this particular project also encountered with different limitations. Firstly, the research was being entirely dependent on secondary information, Secondly, although it has been assumed to study all MFIs, of the 32 licensed MFIs in Ethiopia, only 26 have providing data on the MIX Marketing web site on annual bases and further more as the study also need long range data, only 16 MFIs has a complete data (2001-2011) on the Mix market for the considered study years .finally, the study considers only clarifying the sustainability of microfinance institutions determinants considering the FSS and OSS as a prominent indicators.



## **CHAPTER TWO:**

### **LITERATURE REVIEW**

#### **2.1. Introduction**

With a population of about 85 million people Ethiopia belongs to one of African's most populated countries. The country economy largely depends on subsistence agriculture and remains with low productivity that intern accounted the existence of high level of poor people in the country. The Ethiopian government has embarked different polices to curb the situation and improve the lives of the people. The importance of microfinance for poverty reduction has got momentum in the policy agenda of several countries like Ethiopia.

The importance of assessing the performance whether the microfinance institutions are sustainably providing access to services to clients is vital.

In the Belgian development organization or entrepreneurial NGO in Flanders (TRIAS) training session, Brussels, January 2005 on Performance Evaluation of MFIs the focus was given on basics of performance evaluation. The main financial indicators discussed in this session were Portfolio quality, Efficiency and Productivity, Financial management / Risk management and Profitability and sustainability (Rai Anand and Anil Kanwal, 2005).

Luzzi Giovanni Ferro and Weber (2006) studies on measuring the performance of MIFs, use factor analysis to construct performance indices based on several possible associations of variables without posing too many a priori restriction. The base variables are thus combined to produce different factors, each one representing a distinct dimension of performance. Then they use the individual scores ascribed to each MFI on each factor as the dependent variables of a simultaneous equation model and presents new evidence on the determinants of MFIs performance.

Kerta (2007) in his paper "Outreach and Financial Performance Analysis of Microfinance Institutions in Ethiopia" found that the industry's outreach rises in the period from 2003 to

2007 on average by 22.9 percent. It identified that while MFIs reach the very poor; their reach to the disadvantages particularly to women is limited (38.4 Percent). From financial sustainability angle, it finds that MFIs are operational 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 financial sustainable. Finally, it finds no evidence of trade-off between outreach and financial sustainability.

## **2.2. Conceptual Definition**

### **2.2.1. Defining Microfinance**

Different scholars and organizations define microfinance institutions in various ways and seem different. However, the fundamental meaning of the definitions is usually the same. Microfinance is the provision of financial access to the low income poor and very poor self-employed people (Otero, 1999). The Asian development bank (ADB) defines microfinance as the provision of a broad range of financial services such as deposits, loans, payment services, money transfers, and insurance to poor and low-income households and their micro-enterprises (ADB, 2000). 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. Schreiner and Colombet (2001, p.339) define it as the attempt to improve access to small deposits and small loans for poor households neglected and not reached by the conventional bank

As we have seen from the above definitions, financial services offered by microfinance help low income households in the reduction of poverty and women empowerment serving also at a macroeconomic level to create sustainable economic development and employment creation.

Although microcredit and microfinance are often used interchangeably, the difference arise from the fact that microcredit only provides loans whilst microfinance has a broader meaning as it comprehends also other financial services in addition to the provision of credit such as saving, insurance, pension and payment services (Okiocredit, 2005) .

Microfinance relies on the principle that its clients act as small entrepreneurs who are credit-worthy. In this respect microfinance institutions become an alternative to unofficial moneylenders often present in developing countries which charge extremely high interest rates for their lending services because these clients do not have the chance to access to traditional banking channels. Another important aspect is that microfinance refrains from taking collateral from its clients, concentrating more on the social collateral and therefore on the social ties that a member has within the society. Borrowers are encouraged to repay their debt because a failure in doing that would result in a social conflict with some of the other members of the community that would exercise pressure on the borrower.

### **2.2.2 The Microfinance Models**

Various types of lending and credit mechanisms are employed by different micro finance institutions. The following describes the most common lending approach and microcredit models in order to give an overview of how the actual money lending is accomplished

#### **a. Solidarity group**

The solidarity group model is also called peer lending group and normally consists of four to five individuals who group together to borrow a loan in solidarity. The members are self-selected, based on their reputation and relationship to each other. Useful here is the self-screening and group pressures imposed upon every member of the group, urging each and every one of the borrowers to contribute his part in solidarity as mutually agreed and so ensures a rather secure loan recovery for the MFI (Guntz,2011).

#### **b. Village banking**

Village banks are community-managed credit and savings associations established by NGOs to provide access to financial services, build community self-help groups and help members accumulate savings. They usually have 25 to 50 members who are low-income individuals seeking to improve their lives through self-employment activities

After receiving the loan a self-appointed village committee decides who gets smaller loans out of the group. This model further enables saving deposits. The normal payback periods range from 4 to 12 months and only after completion a new loan can be taken for the community. The role of the MFI is to assist only in administration and technical issues (Hazeltine and Bull, 2003, 104).

### **c. Grameen model**

The Grameen model was invented in 1976 by Professor Muhammad Yunus, the founder and managing director of Grameen Bank. The model proved to be successful and today is practiced in more than 250 outlets of Grameen Bank in more than 100 countries (Yunus, 1999). The Grameen model was copied and modified many times according to the respective needs of regional markets and clients. Therefore many other models are extensions of, or derived from, the Grameen Model

Basically a new branch of the MFI is set up in a village with a field officer and some qualified workers, who have already done research on the population there in advance and made their choice according to its potential demand and its need of financial support. These employees of the MFI support then up to 15 to 20 villages in the surrounding and are strive to make the local, poor people aware of the microfinance possibilities through word of mouth and personal advisory. The lending process is similar to the solidarity group approach. Groups of five are created. However in the beginning only two members of the group receive a loan and are monitored for one month. The credibility of the group will then be based on the repayment performance of the first two individuals (Hazeltine and Bull, 2003, 105).

#### **d. Individual lending**

Individual lending is usually more focused on the self-employed rather than the very poor and is similar to loans granted by traditional commercial banks without the sharing liability aspect. Moreover the successful repayment of the first individual loan leads to a second and bigger loan after some trust and repayment capability has been established.

### **2.3. Performance Measure of Microfinance**

In early time during their emergence, MFIs were financed by donor funds that focus on the objective of poverty eradication. Therefore, the performance of MFIs was measured on the outreach on how much MFI reached to the poor and the impact of those poor lives changed as a result of the financial service delivered. Since MFIs are facing double challenge of providing financial service to the poor (outreach) and cover their cost sustainably to operate their services; the assessment of microfinance performance must take in to account both dimensions. However is not always easy to measure the social aspect of the microfinance (Balkenhol, 2007, p. 153).

**Outreach to the poor:** Outreach at a glance means the number of clients served. But, Meyer (2002) noted that outreach is multidimensional concept. In order to measure outreach we need to look in to different dimensions:

The number of persons now served, which previously were denied access to formal financial services. Usually these persons will be the poor because they cannot provide the collateral required for accessing formal loans, are perceived as being too risky to serve, and impose high transaction costs on financial institutions because of the small size of their financial activities and transactions.

The number of women served: women often face greater problems than men in accessing financial services so number of women served is often measured as another criterion.

Although difficult to measure, depth of poverty is a concern because the poorest of the poor face the greatest access problem. Some measure of depth of outreach is needed to evaluate how well MFIs reach the very poor.

Finally, the variety of financial services provided is the criterion because it has been shown that the poor demand and their welfare will be improved if efficient and secure savings, insurance, remittance transfer and other services are provided in addition to the loans that are the predominant concern of policy makers.

Navajas et al. (2000), similarly, indicated that there are six aspects of measuring outreach. They are depth, worth of users, cost to users, breadth, length and scope. The depth of outreach refers to "the value the society attaches to the net gain from the use of the micro credit by a given borrower," (Navajas et al. 2000:335). This measure is to identify the poor clients. Because, the poor are the one who fail to get access to get credit from formal financial institutions since they fail to signal that they can repay their loan (Conning, 1997). And, worth of outreach to users refers to "how much a borrower is willing to pay for a loan," (Navajas et al. 2000:335). Similarly, cost of outreach to user refers to "cost of a loan to a borrower," (Navajas et al. 2000:335). These costs to users might consists of prices like interest rates and various payments that they have to pay, which could be revenue to the lender, and other loan related transaction costs like expenses on documents, transport, food, taxes, etc. (Navajas et al. 2000:336). Finally, "breadth of outreach is the number of users...length of outreach is the time frame in which a microfinance organization produces loans," and "Scope of outreach is the number of type of financial contracts offered by a microfinance organization," (Navajas et al. 2000:336).

**Financial Sustainability:** The other indicator of performance of a micro finance institution is its financial sustainability. Different literatures noted that financial sustainability is one of the areas that we need to look at to assess the performance of micro finance institutions. Meyer (2002) noted that the poor needed to have access to financial service on long-term basis rather than just a onetime financial support. Short-term loan would worsen the welfare

of the poor (Navajas et al., 2000). Meyer (2002) also stated that the financial unsustainability in the MFI arises due to low repayment rate or un-materialization of funds promised by donors or governments. According to Meyer (2002), there are two kind of sustainability that we could observe in assessing MFIs performance: i) Operational self sustainability and ii) Financial self-sustainability. Operational self-sustainability is when the operating income is sufficient enough to cover operational costs like salaries, supplies, loan losses, and other administrative costs. And financial self-sustainability (which he referred as high standard measure) is when MFIs can also cover the costs of funds and other forms of subsidies received when they are valued at market prices. Meyer (2002:4) indicated, "Measuring financial sustainability requires that MFIs maintain good financial accounts and follow recognized accounting practices that provide full transparency for income, expenses, loan recovery, and potential losses. Regarding indicator of financial sustainability, Khandker et, al. (1995) pointed out that loan repayment (measured by default rate) could be another indicator for financial sustainability of MFIs; because, low default rate would help to realize future lending.

Financial sustainability of MFI is calculated using different ratios. The most common financial ratios and indicators used to calculate are categorized by different and organizations are further elaborated. According to the Technical Guide of Performance Indicators for Microfinance Institutions (2003) there are four main categories of performance indicators: portfolio quality, efficiency and productivity, financial management and profitability (Micro Rate & Inter American Development Bank, 2003). According to Ledgerwood (1999), the performance of microfinance is measured in many parameters. This includes:

### **Portfolio quality indicator**

Portfolio quality for MFIs are often measured by Portfolio at Risk (PaR), which measures the portion of the loan portfolio "contaminated" by arrears as a percentage of the total portfolio. A loan is considered to be at risk if the payment on it is more than 30 days late. In

addition to Portfolio at Risk, we can also use Write-Offs, Provision Expenses and Risk Coverage as portfolio quality indicators (Micro Rate & Inter American Development Bank, 2003).

### **Efficiency and Productivity ratio**

To measure efficiency and productivity we can use Operating Expenses, Cost per Borrower, Personnel Productivity and Loan Officer Productivity as indicators (Micro Rate & Inter American Development Bank, 2003). The performance of an MFI can also be measured by the number of borrowers per staff. This is a ratio of borrowers to staff indicating staff productivity. All things being equal the larger the number of borrowers a staff serves the higher will be his or her productivity (CGAP, 2003). The efficiency refers to the ability to produce maximum output at a given level of input, and it is the most effective way of delivering small loans to the very poor in microfinance context (Woller, 2000).

### **Financial viability indicator**

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. To measure the financial management of a MFI we can use Funding Expense, Cost of Funds and the Debt/Equity ratio as indicators (Micro Rate and Inter American Development Bank, 2003).

### **Profitability indicator**

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. Tend to summarize performance in all areas of the company and its sustainability. Most widely indicators of Sustainability and Profitability includes: Adjusted return on equity, Adjusted return on assets, Operational self-sufficiency and Financial self-sufficiency



### **Leverage and capital adequacy ratio**

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 indicator**

These are nonfinancial 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 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

## **2.4. Perspective in Performance Measure**

There are different perspectives on the analysis of the measure of the MFIs performance. Many key player in the microfinance industry use sustainability as one core criteria to evaluate the performance of MFIs beside the outreach and impact measure.

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

Welfarists argue that MFIs can achieve sustainability without achieving financial self sustainability. They contend that donations serve as a form of equity and as such donors can

be viewed as social investors. 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). 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 (Basu and Woller, 2004).

On the contrary, institutionists 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 (Brau and Woller, 2004).

## **2.5. 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. Sustainability is an indicator for the microfinance to run without subsidy in a continual manner. Donations and subsidized loans have historically been the main source of funds. Recently, though, both to achieve growth and in response to donor pressure for sustainability, MFIs have turned to commercial funding, i.e. private capital markets (Mersland et al, 2011). 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.

The push towards sustainability has shifted the industry view of profitability, which is generally anathema to the non-profit sector. Profitability is now widely viewed as a signal of cost efficiency, portfolio quality, and sustainability. Increasingly, MFIs are transforming into for-profit organizations, which formally adds the goal of profitability to their objectives (Tchakoute-Tchuigoua, 2010).

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, financial sustainability is becoming a more important objective for MFIs as the industry matures. It indicates, by definition, the MFI's ability to cover both operating and financing costs with revenue generated from the existing loan portfolio (Hermes et al, 2011). 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

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. According to Woller and Schreiner (2002:2) "financial self-sufficiency is the nonprofit equivalent of profitability". All things being equal, profits can be considered to be a key variable in measuring a firm's financial sustainability (Glautier and Underdown, 2001). Rosenberg (2009) provided a guide to measuring indicators of MFI sustainability. He identified five 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). In this study substantiality is measured by financial and operational self sufficiency. Here below the discussion will focus on FSS and OSS indicators that this study considers to assess the financial sustainability

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 fulfill their mission. These challenges exist at the local or national, and the international level.

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

It is well known that the major goal that non-profit organization strives for is achieving financial sustainability. In this context, financial sustainability is also known as financial self sustenance (FSS) and operational self sustenance (OSS)and is measured as the ability of MFIs to continue operations indefinitely using own resources without seeking donations, grants, or subsidized loans from outside individuals, NGOs, or governments. Theoretically this financial sustainability helps us to cover administrative cost and prioritize our activities to accomplish our mission without negotiating donor who may or may not agree with our vision or with our cost percentage

The study chooses FSS and OSS to assess the financial sustainability of the microfinance institutions.

## **2. 6. Determinants of Sustainability and Profitability of MFIs**

The following section will discuss on the research result on the variables on the determinants of the sustainability and profitability of MFIs. 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 proxy indicators of sustainability stated in the previous section of microfinance institutions in Ethiopia.

### **2.6.1. Yield (Yield on Gross loan Portfolio)**

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). Higher ratios of operating expenses to gross loan portfolio imply a less efficient management. Empirical evidence points to the fact that providing microfinance is a costly business perhaps due to high transaction and information costs (Hermes and Lensink, 2007)

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 Gonzalez, (2007).

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

### **2.6.2 Depth of Outreach/Average loan size Disbursed**

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

According to Woller and Schreiner (2002) the relationship between depth of outreach and financial self-sustainability is multidimensional. In their study they found that depth of outreach has a positive relationship with financial self sustainability. Woller and Schreiners' finding put evidence against a wide spread belief that small loans are highly risky and associated with lower financial sustainability. Moreover, Cull *et al.*, (2007) indicates that institutions that make small loans are not less profitable compared to those making bigger loans, and the study by Paxton (2003) confirms that there is a negative correlation between depth of outreach and subsidy dependency index. This exhibits that there is a positive relationship between profitability and depth of outreach.

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.

### **2.6.3 Breadth of outreach**

The breadth of outreach refers to the number of poor served by a microfinance institution (Woller and Schreiner, 2002; Navajas et al, 2000 Ledgerwood, 1999) Various studies have used the number of borrowers as a measure of microfinance breadth of outreach (Ganka, 2010; Mersland and Strom, 2009; Harmes *et al.*, 2008). It is generally assumed that the larger the number of borrowers or clients the better the outreach. According to LOGOTRI (2006) larger number of borrowers found to be the biggest sustainability factor, on the contrary, Ganka (2010) on Tanzanian microfinance institutions reports negative and significant relationship between breadth of outreach and financial sustainability.

The study by Woller (2000) on nine village banks found that the number of borrowers and cost per borrower were among the variables most highly correlated with financial self-sufficiency. However, in another study, Woller and Schreiner (2002) report that the number of borrowers had no significant impact on financial self-sufficiency. This finding is supported by a finding by Hartarska (2005)

### **2.6.4. MFIs Capital Structure /Debt to Equity Ratio**

The various sources of capital and its combination could affect profitability and, therefore, sustainability of microfinance institutions. According to Woller and Schreiner (2002), these different sources of capital include savings, deposits, loans and shares.

Various studies have been conducted to explain whether the capital structure determines the sustainability of microfinance institutions. For instance, Kyereboah (2007) found that highly leveraged microfinance institutions have higher ability to deal with moral hazards and adverse selection than their counterparts with lower leverage ratios. 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.

Ganka (2010) states that although how the capital has been structured affects the financial sustainability, having different sources of capital do not improve financial sustainability. Ganka also identified that equity is a relatively cheaper source of financing and, therefore, improves financial sustainability.

#### **2.6.5. Age of an MFI**

The age of the firm might also have an impact on the firm's performance. According to (CGAP, 2009) age have three important effects on MFIs; higher number of loans may drive scale economics, higher average loan sizes may improve the cost structure and more knowledge about customers may streamline processes. The age refers to the period that an MFI has been in operation since its initial inception.

Vast studies have been done to explain whether age of MFIs determines sustainability of the microfinance institutions. For example, Lumpkin, et al, (2001), indicated that older firms to be more experienced and can therefore enjoy higher performance.

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 indicating that an institution's age significantly and positively linked to financial performance across all three indicators (FSS, OSS, and AROA).

#### **2.6.6. Size of MFIs**

Due to economies of scale the size of a firm is considered to be an important determinant of a firm's performance. The size of an MFI is measured by the value of its assets (Mersland and storm, 2009; Hermes et al, 2008; Bogan et al, 2007; Hartarska, 2005).

According to Lislevand (2012), the size of MFI has significant positive effect on the performance measured by the return on asset. Similarly, Cull et al (2007) also indicates a positive relation between the size of MFI and financial performance



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.

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

### **2.6.7. Cost per Borrower**

The efficiency refers to the ability to produce maximum output at a given level of input, and it is the most effective way of delivering small loans to the very poor in microfinance context (Woller, 2000). This involves cost minimization and income maximization at a given level of operation, and it has an enduring impact on financial sustainability of microfinance institutions. Thus, efficiency can be measured by its productivity (for instance, number of borrowers per staff) and cost management (for instance, cost per borrower) dimensions. Woller and Schreiner (2002) examined the determinants of financial sustainability and it was found that productivity was significant determinant of profitability. Moreover, a recent study by Ganka (2010) on Tanzanian rural microfinance found a negative and strongly statistically significant relationship between number of borrowers per staff and financial sustainability. He justified that microfinance staff for rural MFIs are not efficient as a result they fail to manage borrowers when their number grows causing microfinance institutions' unsustainability

### **2. 6.8. Portfolio at Risk**

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

### **2.6.9. Operating Expense Ratio**

Efficiency in expenses management should ensure a more effective use of MFIs loan able resources, which may enhance profitability. Higher ratios of operating expenses to gross loan portfolio imply a less efficient management. Empirical evidence points to the fact that providing microfinance is a costly business perhaps due to high transaction and information costs (Hermes and Lensink, 2007; Gonzalez, 2007).

According to the finding of Nyamsogorom (2010) the operating expenses ratio strongly affects the financial sustainability of microfinance institutions

Dissanayake (2012) on his research of the determinants of operational self-sufficiency of microfinance institutions stated that there is strong significant negative correlation in Operating Expense Ratio to Operational Self Sufficiency Ratio. This indicates that, change in Operating Expense Ratio, is negatively contributing towards changes in Operational Self Sufficiency Ratio significantly

## **2.7. Empirical review on the sustainability of MFIs in Ethiopia**

Although the MFIs operation in Ethiopia accounts several years, a few research has been conducted in the area of sustainability of microfinance institution. Even those research conducted in the area are not adequately measure the performance of the microfinance institution in Ethiopia since they are weak in terms of statistical measure. To supplement this

particular research, the results of some of these researches conducted in such area are presented below

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

The study by Kidane (2007) on one of the largest MFIs in Ethiopia Amhara Credit and Saving Institution (ACSI) shows that ACSI has served more than half a million clients. Over 1.6 million loans have been disbursed worth Birr 1.5 billion. By 2005, the institution was operationally and financially self sufficient at 119.9% and 115.3% respectively. ACSI is among a few MFIs that is able to achieve the highest efficiency at the lowest cost per borrower. The operating cost was as low as five cents in 2005. ACSI also has a high portfolio quality, as delinquency rates are around 1.9%.

Letenah (2009) examines the performance of sampled microfinance institution in Ethiopia and conclude that all the MFIs are good at breath of outreach, cost management, efficiency and productivity. He also noted in his findings that MFIs charge low interest rates and the profitability and sustainability of the MFIs depend on their size. Moreover, he noted that MFIs in Ethiopia 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

From a simple correlation analysis it is found that there is a trade-off between serving the poor and being operationally self-sufficient. MFIs age correlates positively with efficiency, productivity, the use debt financing and OSS. It is also found that the use of debt financing makes firms more efficient and productive

According to research conducted by Bayeh (2012) on financial sustainability of microfinance in Ethiopia he found that the mean of FSS is 118.4 % indicating financially sustainable. Out of the total 144 observations 90(62.5) indicated sustainable MFIs and the rest 54 observations (37.5%) of the MFIs were not financially sustainable.

The study also examined that that microfinance breadth of outreach, depth of outreach, dependency ratio and cost per borrower affect the financial sustainability of microfinance institutions in Ethiopia. However, the microfinance capital structure and staff productivity have insignificant impact on financial sustainability of MFIs in Ethiopia for the study periods (2002-2010)

Tiruneh(2009) in his study of the relation between outreach and financial sustainability in Ethiopia found that in terms of average OSS the MFIs shows an encouraging result of reaching the bench mark100%. Although the average OSS of MFIs in the study showed above the benchmark, the increment in each year is not consistent and upward trend. The finding in FSS showed that the average FSS of the fifteen sampled study institutions were below the bench mark throughout the studied year indicating MFIs in Ethiopia are not financially self-sufficient.

According to Degefe (2009) on his part of study on the performance analysis of the selected microfinance taking a five years data (1999-2003) found out that of the nine studied microfinance institutions five had attended operational sustainability or operational self – sufficiency. However, with the more comprehensive indicator, financial self-sufficiency that was computed with the consideration of opportunity cost of capital, only two out of nine MFIs( ACSI and DECSI) were above 100% with OCSSCO exactly reached 100 in 2003. The rest of the MFIs were not able to reach the bench mark and financially sustainable.

Furthermore, the study also assessed the degree of leverage through the subsidy dependency index indicator and found out that only one MFI, ACSI, reached the stage of being able to operate with equity capital and therefore freed from subsidy.

As it is understood from the aforementioned studies in the area, almost all studies were focusing on the performance analysis in terms of FSS, OSS and the relation of performance with outreach. To my access on the literature reviewed there has been little or no study carried on the assessment of the determinants of FSS and OSS, this study, therefore, will help to provide a good literature in the area and provide direction for future research

## **CHAPTER THREE:**

### **METHODOLOGY**

#### **3.1. Research Design**

The proposed study mainly used quantitative methods for analysis. The methods that had been used for the quantitative analysis are descriptive statistics such as central tendencies and measure of distribution; and inferential statistics such multivariate analysis. The multivariate analysis is used to show the association among dependent and independent variables together with how they related to each other.. Basically, the premium purposes of these methods were to evaluate and describe the sustainability and state of affairs of the MFI sector in Ethiopia

#### **3.2 Research Methodology**

The research used multiple regression models to assess the significant determinant of the sustainability of microfinance institutions' in Ethiopia. To measure the sustainability of microfinance institutions in Ethiopia, Financial Self-Sufficiency and OSS ratios were applied as the dependent variables. Considering Nyamsogoro (2010), Cull et.al (2007), and Bayeh (2012) and others studies conducted in different areas, the measure of the predictor of the FSS and OSS was extracted and also applied in this study. Accordingly, to measure the predictor variable of financial self- sufficiency, six measures namely MFIs age, the Yield on Gross portfolio, PAR, Cost per Borrower, Number of Active Borrower, and Operating Expense ratio were considered. Similarly to measure the predictor variable of OSS, Age of MFIs, Average Loan Balance per Borrower, Cost per Borrower, Dept to Equity ratio, Personal productivity ratio and Size of MFIs and yield on gross portfolio were taken in to consideration.

### **3.3.1. Target population**

The target population for this particular study is all the MFIs currently operating in Ethiopia. According to NBE (2011) report currently there are 32 MFIs that are providing financial service to the poor society of the country.

### **3.3.2. Sampling Technique and sampling size**

From the total 32 MFIs operating in the country 15 MFIs did not have the information for the required period in the Mix market website to calculate their operational and financial sustainability. Based on this, the selected sample size was reduced to 16 MFIs that have data from 2002 -2011.

The purpose of using the sampling was to make inference or generalization about the population. The number of sample size does not violate the general rule of thumb that for generalizability, a ratio of number of observation to number of variable should not fall below 5:1. That is five observations are made for each independent variable in the variate (Hair et al., 2006). The variate refers to a set of independent or explanatory variable that determine a change in the dependent variable. Moreover, Hair et al.(2006) states that although the minimum is 5:1 the desired level is between 15 to 20 observation for each independent variable to be representative .

The consideration of number of variable under study is required to meet the ideal ratio. This study has two independent variables namely FSS and OSS. The FSS and OSS had 6 and 7 independent variable respectively and the explanatory variable considered under the study for OSS is highest i.e. 7 independent variables

Applying rule of thumb as desired level that is between 15:1 and 20:1; this required the number to be between 105 and 140. With 10 year data from each MFI, the above required a minimum of (10.5 when round of 11) study units of microfinance institutions. Therefore the

planned sample of 16 study units was relatively large; which increase nearly about 35 observations

### **3.3.3. Data and Methods of data Collection**

This study was anticipated to assess the determinant of microfinance institutions financial and operational self sufficiency. The study entirely bases its source from secondary data by means of their annual report of the respective MFIs under consideration. The data for this study are financial ration and outreach indicators. The data used for this study is purely secondary data taken from Association of Ethiopia Microfinance Institution (AEMFI) and the MIX Market Inc. web site over the period of 2002-2011. As most MFIs have no data before 2002 and did not submit the 2012 complete report, the research considered data of year from 2002 -2011 in this study

The study makes use of panel data to explain the relation between dependent and explanatory variables under considerations. The use of these panel data model deemed to have advantages over cross section and time serious data methodology. Panel data or longitudinal data are data sets containing repeated observation of the same individual collected over a number of period (Johnson and Dinardo, 2007; Baum, 2006; Wooldridge, 2006). A panel data approach is more useful than either cross-section or time-series data alone. As Brook (2008) states the advantages of using the panel data set; first it can address a broader range of issues and tackle more complex problems. Besides, by combining cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of the test. It can also help to mitigate problems of multicollinearity among explanatory variables that may arise if time series are modeled individually.

### **3.3.4. Operational Definition**

This section elaborates the dependent and explanatory variable used in this study. The definition and measures of the variables are stated below.



### 3.3.4.1. Dependent variable

The dependent variables in this study are the sustainability of microfinance institutions which is measured by financial self-sufficiency (FSS) and Operational Self Sufficiency (OSS). The two dependent variable is computed as follows :

#### **Financial Self Sufficiency:**

##### **Adjusted Financial Revenue**

**Loan Loss Provision Expense + Operating Expense + Financial Expense adjusted**

Similarly, the OSS is computed as:

##### **Financial Revenue (Total)**

**(Financial Expense + Loan Loss Provision Expense + Operating Expense)**

As the ratios for FSS and OSS explained above, Financial Sustainability describes the ability to cover all costs on adjusted basis and indicates the institution's ability to operate without ongoing subsidy (i.e. including soft loans and grants) or losses whereas Operational sustainability describes the ability to cover all administrative and loan loss expense from its own operating income. According to UNCDF (2009) distinguishes financial self-sufficiency (FSS) from OSS only by the fact of an adjusted basis. The FSS indicator measures the extent to which a MFI covers adjusted operating expenses with operational income. In other words adjusted means how MFIs would look like on unsubsidized base with fund raised on the commercial market plus inflation adjustment

### 3.3.4.2 Independent Variables

The independent variables for financial self-sufficiency used for this study includes yield on gross loan portfolio, cost per borrower, Breadth of outreach (number of active borrower), operating expense ratio and age of microfinance institutions. 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, Depth of outreach(average loan balance per borrower) and age of microfinance institutions. The variables and their descriptions using in both FSS and OSS model are explained in the Annex I

### 3.3.5. Model specification

The operational panel data for the regression to determine the factors determining the financial self-sufficiency of microfinance institutions is presented as follows. The independent variables for each predictor (FSS & OSS) were taken from different studies conducted in different area

$$\text{FSS}_{it} = \alpha_i + \beta_1 \text{YIELD}_{it} + \beta_2 \ln \text{CPB}_{it} + \beta_3 \text{PAR}_{it} + \beta_4 \ln \text{BRIDOUT}_{it} + \beta_5 \text{OER}_{it} + \beta_6 \text{AGE}_{it} + \varepsilon_{it}$$

Where:  $\text{FSS}_{it}$  is the financial self-sufficiency ratio of microfinance  $i$  at time  $t$  (which is the dependent variable);  $\alpha_i$  is a constant term;  $\beta$  measures the partial effect of independent or explanatory variables in period  $t$  for the unit  $i$  (MFI); Yield, natural logarithms of CPB, PAR, natural logarithms of BRIOUT, OER and Age are the considerable explanatory variables; and  $\varepsilon_{it}$  is the error term. It is distributed identically and independently normal with mean zero and variance one which is assumed to be uncorrelated with the independent variables. The variables, both dependent and independent, run under the consideration of cross-section unit  $i$  at time  $t$ , where  $i = \text{MFI}$  (1 to  $n$ ), and  $t = 1$  to 10.

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

$$\text{OSS}_{it} = \alpha_i + \beta_1 \text{YIELD}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{PPR}_{it} + \beta_4 \text{DER}_{it} + \beta_5 \ln \text{CPB}_{it} + \beta_6 \ln \text{DEBOUT}_{it} + \beta_7 \text{AGE}_{it} + \varepsilon_{it}$$

Where:  $OSS_{it}$  is the operational self-sufficiency ratio of microfinance  $i$  at time  $t$  (which is the dependent variable);  $\alpha_i$  is a constant term;  $\beta$  measures the partial effect of independent or explanatory variables in period  $t$  for the unit  $i$  of the MFI; Yield, Size, PPR, DER, natural logarithms of CPB, natural logarithms of DEBOUT and Age are also the considered explanatory variables; and  $\epsilon_{it}$  is the disturbance term which is distributed identically and independently normal with mean zero and variance one and also is assumed to be uncorrelated with the independent variables. The variables, both dependent and independent, run under the custody of cross-section unit  $i$  at time  $t$ , where  $i = \text{MFI} (1 \text{ to } n)$ , and  $t = 1 \text{ to } 10$

### **3.4. Data analysis**

This section explains how the data collected and organized for analysis. Moreover, the methods and tools used for analysing the data are discussed subsequently.

To comply with the objective, the research was running based on panel data, primarily; the data required for the research has been taken from the Mix Market Website and AEMFI reports. These data were ratio values for various variables including the dependent and independent once. After the collected data had been kept in excel sheet then the data were organized for analysis. Since the data needed ratio, some variables were not a ratio value; so, transformation of data had been made. In that case for measure the change in variable over time, the researcher had transformed these data in to natural logarithm. This means that the variable were expressed as relative changes measured by the logarithmic differences.

As noted in Brooks (2008) there are basic assumptions required to show that the estimation technique, OLS, had a number of desirable properties, So that hypothesis tests regarding the coefficient estimates could validly be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators. Therefore, for the purpose of this study, diagnostic tests are performed to ensure whether the assumptions of the CLRM are violated or not.

## **Checking of the Existing of Extreme Value**

After the data was reorganized, the next activity of data processing had been carried out. The raw data was converted into suitable form for analysis and interpretation.

The quantitative method was used in the analysis. The method that had been used for this quantitative analysis was descriptive statistics such as mean values and percentages. Under the inferential methodology multivariate correlation, multiple regressions were used.

Primarily, after a multiple linear regression model run, the extreme predictor or leverage values should avoid. According to Meseret Molla (2012) STATA manual suggestion, an observation with an extreme value on a predictor variable is called a point with high leverage. Leverage is a measure of how far an independent variable deviates from its mean. These leverage points can have an effect on the estimate of regression coefficients. Generally, a point with leverage greater than  $(2k+2)/n$  should be carefully examined. Here  $k$  is the number of predictors and  $n$  is the number of observations.

## **Tests of Misspecification**

As noted in Brooks (2008) there are basic assumptions required to show that the estimation technique, OLS, had a number of desirable properties, and also so that hypothesis tests regarding the coefficient estimates could validly be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators. Therefore, for the purpose of this study, diagnostic tests are performed to ensure whether the assumptions of the CLRM are violated or not in the model. Thus, the following section discusses about the nature and significance of the model misspesification tests

## **Test for Multicollinearity**

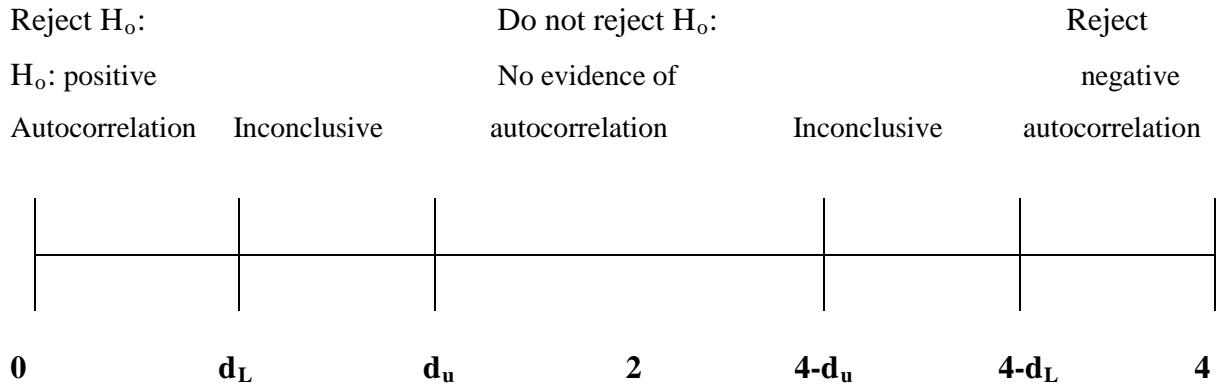
To test the correlation among independent variables or detect the existence of multicollinearity this study used the Variance Influence Factor (VIF). When there is a perfect

linear relationship among the predictors, the estimates for a regression model cannot be uniquely computed. The term collinearity implies that two variables are near perfect linear combinations of one another. When more than two variables are involved it is often called multicollinearity, although the two terms are often used interchangeably. According to Gupta, (1999) there is always the presence of multicollinearity between variables; however, a problem occurs if the degree of collinearity is high enough to bias the estimates. Variance influence factor shows how the variance is inflated by the presence of multicollinearity. Relatively as David G (1988), stated that as a rule of thumb, a variable whose VIF values are greater than 10 may merit further investigation.

### **Test for Autocorrelation**

The notion of autocorrelation defines that there is no serial correlation or autocorrelation among the disturbances term ( $u_i$ ) 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”. To test the existence of autocorrelation there are various alternative methods; whereas in the case of this study Durbin-Watson test was employed. As noted in Brooks (2008) the rejection / non-rejection rule would be held by the following figurative way:

**Figure 1: Rejection and non- rejection regions for Durban -Watson Test**



The Durban-Watson (DW) test statistics lay between 0 and 4. Terminologically, the  $d_L$  and  $d_u$  implies that the lower and above Watson critical values. The tabulated values have been registered for different numbers of explanatory variables and sample size. So, these values compared with the calculated result and give a conclusion.

**Test of Hetroscedasticity**

Hetroscedasticity implies that the variance (i.e. the dispersion around the expected mean of zero) of the residual are not constant but they are different for different observation. It means that violated the assumptions of variance of the error is assumed constant,  $\sigma_i^2 = \sigma^2$ ; or it violated the assumption of homoscedasticity. The problem of heteroskedasticity make the parameter estimator no longer blue indicating that they are still unbiased but no longer have the minimum variance. The presence of heteroskedasticity can be tested with different statistical techniques whereas in this study the researcher used a scattered plot using the standardized residual (ZRESID) verse the standardized predictor (ZPRED). The presence or absence of hetroscedasticity can be identified by observing the patterns of the plot. If in the plot existences of a funnel shape or a curve in the pattern there is an indication of hetroskedasticity.

## Normality Test

If the distribution is **normal**, its histogram has the following properties:

There is a single highest bar (the mode);

There are as many values above the mode as there are below it (it is in the middle);

The shape of the histogram is symmetrical about the mode, so the left side is a mirror image of the right;

The frequency of values gets lower as you move further from the mode in a way that produces a bell shape.

In other term, if the distribution is standardized normal its mean is zero and variance one.

Basically, you can obtain histograms of standardized residuals and normal probability plots comparing the distribution of standardized residuals to a normal distribution.

## **CHAPTER FOUR:**

### **DATA PRESENTATION AND DISCUSSION**

This chapter presents the findings of the study. The findings are presented in two sections. In the first section the descriptive statistics of both dependent and independent variables is presented. In the second section the econometrics result in which the explanatory variables are examined to see whether the explanatory variables determine the operational financial sustainability of the MFIs.

The descriptive statistics included in the analysis of financial and operational sustainability including their mean, standard deviation, minimum and maximum values for the sample of 16 MFIs during the period of 2002-2011

#### **4.1. Descriptive Statistics**

##### **4.1.1 Dependent Variables**

Operational self-sufficiency (OSS) requires MFIs to meet all administrative costs and loan losses from operating income which is measured the ratio of operating income to operating expenses. On the other hand, the financial sustainability (FSS) indicates the ability of MFI to cover all of its operating costs and costs of capital without depending on subsidies. 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.



**Table 1 Descriptive Statistics for the dependent variables**

<b>Variables</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
FSS	153	0.8904	0.32924	0.29	2.04
OSS	151	1.2535	0.45687	0.07	2.43

Source: extracted from SPSS result

As indicated in table 1 above, the mean of the financial self sustainability is 0.890 (89%) which indicated MFIs in the sample are not financially sustainable. This is based on the standard which says an MFI is sustainable if the ratio of its financial sustainability is 1 (100%) and above. The standard deviation for FSS is 0.33 indicating that there is a 33% variation in the financial sustainability of the MFIs considered in the sample. This signifies that the sustainability of MFIs in Ethiopia is close to the average. The smaller standard deviation implies that the individual MFIs in the sample are close to the average and therefore, can infer for the population. In total the study included 153 actual observations out of which 51(33%) indicated financially sustainable MFIs and the remaining 102 observations (67%) of the MFIs were not financially sustainable.

According to the result, it can be inferred that the MFIs in Ethiopia are not financially self sufficient indicating that their long term financial service to clients is constrained unless a continued external assistance or donor fund subsidy is in place.

On the other hand, as indicated in table 1 above, the mean of the operational self sustainability was 1.25 (125%) indicating sustainability of the MFIs in the sample . The standard deviation for the variable is 4.57 and relatively high indicating the dispersion in the sustainability of MFIs included in the study. However, it signifies the sustainability of MFIs under study is close to average. Based on this we can infer that the operational self sufficiency of the Ethiopia microfinance industry on the average was 1.25. In OSS model in total the study included 151 actual observations out of which 106 (70%) indicated operationally self-

sufficient MFIs and the remaining 45 observations (30%) of the MFIs were not operationally self-sufficient.

#### 4.1.2 Independent Variables

This section discussed on the independent variables used in the model for both FSS and OSS. The explanatory variables that assumed to affect or determine the financial self sufficiency have 153 numbers of observations where as all explanatory variables expect to determine the operational self sufficiency, have 151 observations.

**Table 2: Descriptive statistics for the independent variables**

<b>Variables</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std.Dev.</b>	<b>Min</b>	<b>Max</b>
<b>YIELD</b>	153	0.1946	0.0723	0.0100	0.4800
<b>CPB</b>	153	2.4843	0.4915	1.0986	3.6109
<b>PAR</b>	153	0.0898	0.1004	0.0000	0.4500
<b>BRDOUT</b>	153	10.3803	1.5860	6.8491	13.5611
<b>OER</b>	153	0.1408	0.1024	0.0100	0.6400
<b>AGE</b>	153	8.0196	3.1964	1.0000	15.0000
<b>SIZE</b>	151	15.3837	1.8246	11.8666	19.3246
<b>PPR</b>	151	0.0828	0.0563	0.0100	0.3400
<b>DER</b>	151	1.8156	1.7105	0.0100	11.1500
<b>DBOUT</b>	151	4.6769	0.4612	3.5835	5.7493

Source: Researchers extraction from the SPSS result

This research can made statistical inference for the independent variables based on the above descriptive statistics

**Yield** on the gross loan portfolio indicates the ability of an MFI to utilize the short term asset to generate financial revenue. The yield on gross loan portfolio measure is a ratio of cash financial revenue from loan portfolio to average gross loan portfolio. The higher the ratio the better the MFI is, indicating the efficiency with which the MFI has utilised its resources in generating cash revenue. The mean descriptive statistics for this variable shows that MFI in Ethiopia generate 0.1946. This means that they generate 19.46 cents cash for each single dollar in the outstanding loan portfolio. The minimum and maximum yield on gross loan portfolio for this study 0.01 and 0.48 respectively indicating that some ineffective MFIs in Ethiopia generates only 1 cents for each single dollar in the gross loan portfolio while the effective MFIs generate 48 cents . Despite the difference, one can say that the Ethiopian MFIs are generating cash revenue from their gross loan portfolio

**The cost per borrower (CPB)** is to explain the contribution of efficiency in reducing the components of cost per borrower namely, administrative expenses, financial expenses, and staff or personnel related expenses. Efficient institutions minimize costs of delivering services. The lower the cost per borrower or client will indicate the microfinance efficiency. This will also mean higher profitability and, therefore, financial sustainability. Cost per borrower ratio is computed by dividing operating expenses by average number of borrowers (CGAP, 2003). The mean cost per borrower in this study is 2.48 and the minimum and maximum value for the variable is 1.09 and 3.61 respectively. In real terms the mean of cost per borrower is USD 13.5 with the maximum value of USD 38 and minimum value of USD 3. This indicates that MFIs in Ethiopia are incurring on average 13.5 USD to serve a single borrower. Some of the inefficient MFIs incurred 38 USD while the efficient MFIs are incurring 3 USD per borrowers. The average cost per borrower among reporting African MFIs is USD 72, which is higher than MFIs in other global regions (Anne-Lucie *et al.*, 2005). Anne-Lucie *et al.* (2005) further states that within Africa, East African MFIs are highly efficient in absolute terms because they spend only USD 58 per borrower. Thus, Ethiopian microfinance institutions are more efficient in terms of cost per borrower. However, there may be some limitations in comparing efficiency of microfinance institutions in different countries as it has been reported that there are country effects like

operating and regulatory environments that affect their efficiency (Harmes *et al.*, 2008; Balkenhol, 2007).

**Portfolio at risk (PAR)** is another variable which indicates microfinance efficiency. The portfolio at risk measures the efficiency of an MFI in making collections. The higher PAR will indicate inefficiency in making collections, an indication of poor repayment rates and the less sustainable the MFI. According to CGAP (1995) the portfolio at risk (PAR) should be below 10 percent once an MFI loan portfolio is operating efficiently. The mean PAR for this study is 0.089(8.9%) with the higher 0.45(45%). From this it can be inferred that the MFIs in Ethiopia is sustainable on the average, however, the performance of some of the MFIs has increased 10 percent indicating inefficiency of repayment of loan

**Breadth of outreach (BRDOU)** is measure of number of borrower. The mean of breadth of outreach (BOUTCH) measured in number of borrowers is 107,958. The MIX bench mark methodology categorized the breadth of outreach as large (> 30, 000 numbers of borrowers), medium (10,000 – 30,000 number of borrowers), and small (< 10,000 number of borrowers). Thus, the breadth of outreach for Ethiopian microfinance institutions is large with the mean of 107,958 borrowers. However, the standard deviation (172,701) is larger than the mean value indicating that there are MFIs in Ethiopia that have smaller breadth of outreach. From this it can infer that the Ethiopia MFIs on the average is reaching 107,958 number of borrower. The maximum number of borrower reached so far by the MFIs is 775,399 and the minimum is 943. In general the industry average that reached on the number of borrower is still very low compared to the country population and the income level of the people

**Operating expense ratio (OER)** measures how an MFI's management has been efficient in reducing costs of operation at a given level of operation. The level of operation is measured by the average gross loan portfolio. The lower the operating expenses ratio will indicate efficiency in microfinance institution's cost reduction strategy. That is, an MFI is operating at lower cost, which means, all things being equal, efficiency. The mean operating expense ratio in this study is 0.14 indicating on average the microfinance institution incurring 14

cents in the operating expense for each dollar in the gross loan portfolio. In this study some of the most efficient MFIs incur 1cent in operating expense for each dollar in their gross loan portfolio while the inefficient incurs an operating expense of 64 cents for each dollar in their gross loan portfolio

**Age** shows the time frame in which the microfinance institutions have been providing services. The mean value for this variable shows that MFIs in Ethiopia have served for 8 years on average. This indicates MFIs in Ethiopia are young in terms of the duration of time in which they stayed in operation. Some MFIs considered under the study have reached the age of 15 while one MFI is serving for 10 years as of 2011.

**Size** is the total asset of the microfinance institutions. It is one of the measures of growth. All things being equal, a growing MFI will indicate its growth through growth in total asset. The mean value of the variable is 15.383 in its natural logarithm value where the minimum and maximum values are 11.87 and 19.32 respectively. In the real term the mean value was 24,461,819.7 USD and the minimum and maximum values were 142,433USD and 246,933,975 USD respectively.

**Personnel Productivity Ratio (PPR)** is a combination of outreach and efficiency; it is often measured in terms of borrowers per staff member and saver per staff member. In this study the adjusted personnel expense to adjusted gross loan portfolio was used as a personal productivity ratio. In the descriptive statistics the mean, minimum and maximum personnel productivity ratios are 0.0828, 0.01 and 0.34 respectively. The lower the value means the higher the productivity of personnel. This indicates that the MFIs in Ethiopia on the average incurs 8.2 cents for each dollar in the loan portfolio. When we see the minimum and maximum, it indicates that some microfinance institutions which are efficient incurs 1 cents while the inefficient incurs 3.4 cents for each dollar in the gross loan portfolio for personnel expense

**Debt to equity ratio (DER)** is the ratio of 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 descriptive statistics the mean for the Debt to equity ratio is 1.8156 indicating that the MFI's in Ethiopia are on average leveraged than financed through equity capital. When we look the maximum value 11.15 indicated that the debt financing is more considered than equity financing although the minimum debt to equity is 0.01 indicating some MFIs were financed more through equity.

**Depth of outreach (DBOUT)** indicates the average loan size. The average balances of outstanding loans are proxy indicators used to indicate a client's socioeconomic level. In this descriptive statistics the mean, minimum and maximum depths of outreach or average loan per borrower are 4.679, 3.5385 and 5.7493 in their natural logarithm and in its real term, the mean, minimum and maximum outstanding loan per borrower are USD 107.66, USD 34.41 and USD 327.97 respectively. It entails that microfinance institution in Ethiopia on the average provided USD 108 for a single borrower. According to the Micro Banking Bulletin (2008), among reporting African MFIs the weighted average outstanding loan per borrower is USD 307. Compared to this figure, the Ethiopian MFI's average loan balance per borrower is 108 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. In this study the highest average loan size USD 327.97 is an indication of serving relatively non poor clients. However, since the mean average loan size is even below the MIX market benchmark which is (average loan size < USD 150). This statistical findings suggest that MFI in Ethiopia perform better in depth of outreach reflecting in their low loan size than the MIX benchmark

#### **4.2. Data Analysis, Result and Discussion**

This section of the study presents the econometric result on the determinants of the operational and financial sustainability of microfinance institution in Ethiopia.

Before the interpretation of the results, a diagnostic test had performed for both FSS and OSS models whether the assumption for classical linear regression model (CLRM) violated or not. Thus, the following section discussed about the nature and significance of the model misspecification test

#### **4.2.1 Test results for the classical linear regression model assumptions**

In this study as mentioned in chapter three diagnostic tests were carried out to ensure that the data fits the basic assumptions of classical linear regression model. Consequently, the results for model misspecification tests are presented as follows

##### **Test for Multicollinearity**

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*

Under this study in both cases, i.e., either of the FSS or OSS, there were not any worrisome VIF. As indicated in appendix E and F there were no variable in both FSS and OSS models that depicted a value of 10 and above for its VIF. From independent variables correlation matrix of FSS in appendix G, the highest correlation coefficient between OER and CPB was 0.68(VIF of 2.449 and 2.633 respectively) and doesn't lead any exclusion of independent variable. Similarly, the highest correlation coefficient of the explanatory variable as depicted in Appendix H between DBOUT and SIZE was 0.6824(VIF 3.435 and 4.835) that did not lead to the drop out of variables from the model. This clearly indicated that multicollinearity was not a serious problem for both FSS and OSS

### **Test for Autocorrelation**

After taking these considerations into account the DW calculated result for FSS and OSS were 2.180 and 2.143 respectively whereas in both cases 160 (16\*10) observations had to be taken into account. Moreover, there were 6 and 7 regressors involved in both FSS and OSS models respectively.

In other words, the DW critical values for FSS were  $d_L=1.665$  and  $d_U=1.802$  with 153 actual observations, 5 regressors and  $4-d_U=4-1.802=2.198$ ;  $4-d_L=4-1.665=2.335$ . In here we must remember that the observations reduced from 160 to 151 and 153 for FSS and OSS respectively indicated that 9 and 7 observations were eliminated due to leverage (an expected extreme result) from FSS and OSS. Therefore, the Durbin Watson test statistics of 2.180 for FSS is clearly between the upper limit ( $d_U$ ) which is 1.802 and the critical value of  $4-d_U$  which is 2.335. Similarly, in the case of the variable OSS relevant critical values of DW were  $d_L=1.637$  and  $d_U=1.832$  with the consideration of 151 observations and 7 regressors and  $4-d_U=4-1.832=2.168$ ;  $4-d_L=4-1.637=2.363$ . So, the Durbin Watson test statistics of 2.143 for OSS is clearly between the upper limit ( $d_U$ ) which is 1.832 and the critical value of  $4-d_U$  which is 2.363. Since both FSS and OSS had DW values between their respective  $d_U$  and the critical value  $4-d_U$ ; the null hypothesis of no autocorrelation is within the non-rejection region of the number line and thus there is no evidence for the presence of autocorrelation.

### **Test of Heteroscedasticity**

As shown in the graphs in Appendix C and D plot charts for FSS and OSS respectively, tests were made to see the real indicators of the presence and absence of the problem of heteroscedasticity under the FSS and OSS models respectively. As the plots showed there were no patterns or shapes observed to state the presence of heteroscedasticity rather it indicated that the observed distribution dispersed in a random manner. So, based on the



outcomes, the researcher concludes that heteroskedasticity was not a serious problem and concluded that the homoscedasticity problem over the assumption of OLS had not violated

### Normality Test

As indicated in the histogram annexed in appendix A and B reflecting for FSS and OSS; both graphs showed that mean values of approximately 0 and standard deviation of 1. This indicated that the standardized residual is normally distributed to the mean zero and standard deviation one having a symmetrical shape

### 4.2.2. Multiple Correlation Analysis

Multiple correlation analysis was used to see the degree of associations between the dependent variable and its explanatory variables. In this study both the dependent variables FSS and OSS have more than one explanatory variable and hence, a multiple correlation analysis was carried out to see the association between the FSS and its explanatory variables as well as OSS and its explanatory or independent variables.

The table below presents the correlation of FSS and its explanatory variable

**Table 3: The relationship between OSS and its determinant**

	FSS	YIED	CPB	PA R	BRDOUT	OER	AGE
FSS	1						
YIELD	-0.019	1					
CBP	-0.430	0.574	1				
PAR	-0.457	-0.016	0.228	1			
BRDOUT	0.497	-0.546	-0.722	-0.412	1		
OER	-0.422	0.626	0.676	0.203	-0.668	1	
AGE	0.241	-0.352	-0.323	-0.137	0.548	-0.439	1

Source: Research own extraction form SPSS

By looking the table 3 on the relation between the FSS and its explanatory variables, there is a negative correlation between FSS and yield on gross portfolio, cost per borrower, portfolio at risk and operating expense ratio. This implies that a change in each variable has a decrease to the FSS.

Similarly, there is a positive correlation in breadth of outreach, age of MFIs to the financial self-sufficiency ratios indicating that change in the explanatory variable breadth of outreach and age is positively contributing towards the change in financial self sufficiency ratio

**Table 4: The relationship between OSS and its determinant**

	OSS	YIELD	SIZE	PPR	DER	CPB	DEBOUT	AGE
OSS	1							
YIELD	-0.196	1						
SIZE	0.6923	-0.5700	1					
PPR	-0.4829	0.4956	0.5139	1				
DER	0.1684	-0.2698	0.3942	0.2495	1			
CPB	-0.5491	0.5644	0.6602	0.4704	0.2899	1		
DEBOUT	0.5223	-0.4490	0.6824	0.5783	0.3033	-0.1971	1	
AGE	0.2537	-0.3617	0.5309	0.3407	0.1973	-0.3008	0.3969	1

Source: Research own extraction from SPSS

As indicated from the above table 4 the explanatory variables; yield on gross portfolios; personnel productivity ratio; and cost per borrowers have negative correlation to Operational Self Sufficiency Ratio indicating that a unit change in these variable are negatively contributing to Operational Self- sufficiency Ratio. On the other hand, size of MFI, debt to equity ratio; depth of outreach and age of MFI have a positive correlation to the Operational Self sufficiency Ratio indicating that a unit change in the predictors;( size of MFI; debt to equity ratio, depth of outreach and age of MFI) contributed positively to the Operational Self-sufficiency Ratio

### 4.2.3. Multiple Regression

**Table 5: Econometric Results for the Determinants of FSS**

#### A. Regression Result of FFS

Variables	Coefficient	Std. Error	t -statistic	Probability
YIELD	2.1142	0.3854	5.4858	0.0000***
CBP	-0.1496	0.0658	-2.2728	0.0245**
PAR	-0.7158	0.2321	-3.0969	0.0023***
BRDOUT	0.0567	0.0236	2.4050	0.0174**
OER	-1.0623	0.3048	-3.4848	0.0007***
AGE	0.0010	0.0077	0.1325	0.8955
R-square	0.46429			
Ad.R-Square	0.44228			
F-Statistics	21.0897			
Prob.(F.Stats.)	0.00000			
DW stat	2.17898			

\*\*\* significant at 1%; \*\* Significant at 5%

Source: Researchers Extraction from SPSS

From the econometric result in table 5 above, the  $R^2$  value indicates that the proportion of variance in the dependent variables (FSS) which can be explained by the independent variables was 46.4%. That is, about 56% of the variations in the dependent variable are not explained by the independent variables included in the model. However, (Cameron, 2009 cited in Ganka, 2010) expresses that for panel data, the  $R^2$  above 0.2 is still large enough for reliable conclusions. In other words it is meant that 46.4 % of the variation in Financial Self-

sufficiency Ratio is explained by the five dependent variables (Yield on gross portfolio, Cost per borrower, Portfolio at risk, Breadth of outreach and operating expense ratio)

The reported F-statistics in the regression output and its P-value is 21.08 (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 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 FSS.

Detail discussions of the results for each independent variable are stated below.

#### **The Yield on Gross Loan Portfolio**

The econometric result for this variable indicated that positive and strongly relation between yield on gross portfolio and financial self- sufficiency of the microfinance institution in Ethiopia. The relationship was highly statistically significant at 1% significance level. Since the higher the ratio the better the financial sustainability of MFI is; the MFI should utilize its recourse to the maximum possible level so as to increase the financial revenue in the form of interest, fee and commissions from the gross loan portfolio. Hence, we reject the null hypothesis of which stated as there is no significant relation between the yield on gross loan portfolio and financial self- sufficiency of the microfinance institutions. The findings, therefore, supports the alternative hypothesis that the yield on gross portfolio has positive relation and significantly affected the financial self- sufficiency of microfinance institutions. The studies by Nyamsogoro (2010), Rombrughe, Tenikue and Sureda (2007), Woller and Schreiner (2002) also confirmed that the yield on gross loan portfolio affects the financial self-sufficiency of the microfinance institution.

#### **Cost per Borrower**

The econometric result on cost per borrower indicate that the increase in cost per borrower reduce the financial sustainability of microfinance institution The variable has a negative

coefficient which was statically significant at 5% significant level. 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 financial sustainability. Therefore, the study failed to accept the null hypothesis which stated there is no significant relation between cost of borrower and financial self-sufficiency of microfinance institution. Hence, this findings support the alternative hypothesis that states the cost per borrower affect the financial self sufficiency negatively and significantly. This result is in line with Ganka (2010) findings

### **Portfolio at Risk**

The portfolio at risk is one of the measures of efficiency of microfinance in making efficient collection. The economic result for this variable indicated that the variable has a negative coefficient showing inverse relation with the financial self-sufficiency. The portfolio at risk was statically significant at 1% level. Therefore, the study failed to accept the null hypothesis which stated there is no significant relation between the portfolio at risk and financial self-sufficiency of microfinance institution. Hence, we conclude that the finding of the study supports the alternative hypothesis that states the portfolio at risk affects the financial self- sufficiency negatively and strongly significant

### **Operating expense ratio**

The operating expense ratio, which is commonly referred as the efficiency ratio is also considered in the study. As the econometric result indicated the operating expense ratio showed a negative coefficient indicating an inverse relation with the financial self-sufficiency ratio. The operating expense ratio was statistically significant at 1% significance level. Based on the regression result, we reject the null hypothesis that stated there is no significant relation between operating expense ratio and financial self-sufficiency. Therefore, the study supports the alternative hypothesis that the operating expense ratio affects financial self-sufficiency of the microfinance negatively and significantly. This study is in line with the findings of Nyamsogoro, (2010).

## Age of an MFI

The econometric result for this variable indicated in this study that age of an MFI was correlated with the financial self-sufficiency. However, it is not statistically significant even at 10%. 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

**Table 6: Econometric Results for the Determinants of OSS**

### B. Regression Result of OSS

<b>Variables</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>Probability</b>
<b>YIELD</b>	2.839	.408	.000***
<b>SIZE</b>	.133	.027	.000***
<b>PPR</b>	-1.285	.555	.022**
<b>DER</b>	-.036	.014	.011**
<b>CPB</b>	-.368	.079	.000***
<b>DEBOUT</b>	.281	.089	.002**
<b>AGE</b>	-.018	.008	.033**
R-square	0.6672		
Ad.R-Square	0.6509		
F-Statistics	40.9574		
Prob.(F.Stats.)	0.00000		
DW stat	2.1434		

\*\*\* significant at 1%; \*\* Significant at 5%

Source: Researcher own extraction from SPSS

Based on the above table 6; the econometric result, the  $R^2$  value indicates that the proportion of variance in the dependent variables which can be explained by the independent variables is 66.7%. That is, about 33% of the variations in the dependent variable are not explained by the independent variables included in the model. In other words, it is meant that 66.7% of the fitness can be observed in the sample regression line. Moreover, 66.7% of the total variation in the operational Self-sufficiency is explained by the seven independent variables (yield on gross portfolio, size of an MFI; Personal productivity ratio; Debt to equity ratio; Depth of outreach and Age of an MFI).

The reported F-statistics in the regression output and its P-value is 40.95 (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 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 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.

In the table 6 above the coefficients for personal productivity ratio, debt to equity , cost per borrower and age of an MFI against OSS were negative as far as the coefficients for those variables are negative -1.285, - 0.036,-0.368, and -0.18 respectively . This indicted that there was an inverse relation in the mentioned four variables and Operational Self- sufficiency. Thus the increase of these variables will lead to a decrease in the OSS. On the other hand, variables such as yield on gross portfolio, size of an MFI and depth of outreach had a positive relation with OSS as far as their respective coefficients were 2.839, 0.133 and 0.281. This revealed that there was a direct relation between the above three independent variables and OSS. In general, as per the regression results provided in the table 6 above, all

the regressors used in this study are significant. Here below is the detail discussion and their implication for each independent variable

### **Yield on gross portfolio**

As depicted in the table 6 above, the regression result for yield on gross portfolio indicated a positive and strong relation with OSS. The yield on gross portfolio was significant at 1% significant level. This indicates that the yield on gross portfolio had an effect on OSS in Ethiopia microfinance institutions. The effect of the yield on gross loan portfolio on OSS had a direct relation indicating that an increase in yield on gross portfolio had an increase in OSS and vice versa. 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 in turn contributes for higher sustainability.

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

**Size of an MFI** measured by total assets (which is a proxy measure for the size of the MFI). According to the econometric result, the coefficient for this variable is positive and was strongly significant at 1% significance level. This indicates that the size (measured by total asset) affects strongly the operational sustainability of the MFIs in Ethiopia. In other words an increase in the total asset will lead to an increase in the operational sustainability of an MFI in Ethiopia. The finding of this study is in line with Cull et al (2007). He concluded that MFI's size is significantly and positively linked to operational self-sufficiency. Accordingly, we failed to accept the null hypothesis which was stated as there is no significant relation



between size of an MFI and the OSS. Thus, this study supports the alternative hypothesis that the size of microfinance institution affects the operational self-sufficiency positively and significantly. Furthermore, this findings is supported by the resent study findings by Mersland and storm (2009) and Bogan et al (2007)

**Personnel productivity ratio (PPR)** is one of the measures of the efficiency of microfinance institution in using its resources. The PPR in this study is calculated as personnel expense to gross loan portfolio. As indicated in the table 6 above, the regression result for the variable indicated a negative coefficient implying an inverse relation with OSS. The personnel productivity is significant at 5% significant level. A unit increase in the personnel productivity will result in a decrease in Operational self-sufficiency.

Therefore, the findings of this study fail to accept the null hypothesis that declared there is no significant relation between personnel productivity ration and operational self-sufficiency ratio. Thus, this study supports the alternative hypothesis that declares there is a negative and significant relation between personnel productivity and operational self-sufficiency.

**Debts to equity ratio (DER)** the measure of overall leverage the microfinance institutions. The capital structure in this study represents the debt to equity ratio. The result from the econometric analysis indicates the variable had a negative and statistically significant at 5% significant level. This implies that the debt to equity impact on the operational sustainability of the microfinance institution in Ethiopia. Similarly, it is to mean that, the combination of various sources of capital of microfinance institutions inversely contribute to their operational sustainability; and thus, the negative coefficient indicates that the more MFI is debt financed compared to other sources of finance, the more they be deficient in their sustainability. Therefore, the findings of this study fail to accept the hypothesis that stated there is no significant relation between debt to equity ratio and operational self- sufficiency. Thus, this study accepts the alternative hypothesis that there is negative and significant relation.

This finding is in line with the 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

**Cost per borrower (CPB)** it is a meaning full measure of efficiency of microfinance by showing the average cost of maintaining an active borrower. The study also measured the effect of cost per borrower on the operational sustainability of microfinance institutions in Ethiopia. The result from the analysis indicates that the increase in cost per borrower reduces the operational sustainability of microfinance institutions. This variable has a negative coefficient which was statistically significant at 1% significant level.

Therefore, based on the regression result, the findings of the study failed to accept the null hypothesis that stated there is no significant relation between cost per borrower and operational self-sufficiency. Thus, we accept the alternative hypothesis which stated there is negative and significant relation between the CPB and OSS. This result is in line with Ganka (2010) findings. 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 operational self- sufficiency.

**Depth of outreach (DBOUT)** is the measure of the average loan size. The coefficient for the average loan size is positive and statistically significant at 1% significant level. This indicates that microfinance operational self-sufficiency is associated with higher loan sizes since larger loans are associated with higher cost efficiency and, therefore, operational self-sufficiency. This needs critical analyses and interpretation as it may have two directions. The interpretation should be seen from various directions. The increased in gross portfolio irrespective of the number of borrower may be seen from the low level of portfolio at risk and in other words it may imply the outstanding loan are with few selected borrowers. Being the large loans are in few selected borrowers may in turn result in efficiency in collecting and processing the loan and thereby reducing cost. However, the finding may substantiate the mission drift where MFIs serves relatively non poor clients. Based on the result we can

say that an increase in average loan balance increases the Operational self-sufficiency of MFI in Ethiopia.

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 is also in line with Ganka (2010) and Adongo and Stork (2006) that profitability relates selling bigger loans. However, Cull *et al.*, (2007) argue that institutions that make smaller loans are not less profitable on average compared to those making bigger loans, and they incline to a conclusion that profitability and depth of outreach cannot be attained simultaneously.

**Age** of an MFI is the years of the function of the microfinance institution from the inception. The econometric result for this variable indicated a negative coefficient although it was expected to be positive. According to this study, the variable was statically significant at 5% significant level and hence, age of an MFI significantly affected the operational self-sufficiency of MFI in Ethiopia. The findings of significant effect of age of an MFI in operational self-sufficiency is in agreeable with the findings of Cull et al (2007), and Bogan et al (2007), however, this study finding is not inarguable with the direction of its effect. According to the regression result of this finding, we failed to accept the null hypothesis that stated there is no significant relation between age of MFI and Operational self-sufficiency. Thus, this finding supports the alternative hypothesis that states there is significant relation between age of MFI and Operational self-sufficiency.

## **CHAPTR FIVE:**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Summery and conclusion**

This study has primarily made its objective in assessing the determinants of financial and operational self-sufficiency of the microfinance institutions in Ethiopia. The following conclusion summaries the results and findings presented in the preceding chapter.

Based on the empirical result from the descriptive statistics the mean value of financial sustainability of the sampled 16 microfinance institutions was 0.89 (89%) indicating that MFIs in Ethiopia are not financially sustainable. On the other hand, the mean value of the OSS for similar sampled institutions was 1.253(125%) indicating operational sustainability of the MFI. From this we can infer that MFIs in Ethiopia are operationally sustainable on the average and none financially sustainable

Microfinance institutions in Ethiopia generate on average 19.46 cents for each single dollar in the outstanding loan portfolio. The minimum and maximum yield on gross loan portfolio for this study 0.01 and 0.48 respectively indicating that some ineffective MFIs in Ethiopia generates only 1 cents for each single dollar in the gross loan portfolio while the effective MFIs generate 48 cents

In terms of the loan collection and repayment, it can be inferred that MFIs in Ethiopia were efficient as the mean PAR was 8.9% which is slightly below the standard 10%. The breadth of outreach that could be measured in terms of number of active borrower indicated that on the average the Ethiopia MFIs reached about 107,958 borrowers. The maximum number of borrowers reached so far by microfinance was 775,399 and the minimum number of borrowers reached was 943. The average total asset of MFIs in Ethiopia was 24,461,819.7 USD. However, it is leveraged than financed through equity capital as the debt to equity ratio indicated was 1.81

Microfinance in Ethiopia on the average incurred USD 13.5 to serve a single borrower while the efficient MFIs incurred USD 3 and those that were not efficient incurred USD38 for serving a single borrower. Similarly, on the average MFIs in Ethiopia spent 14cents for each dollar in the gross loan portfolio indicating that the management of MFIs in Ethiopia entailing good management in operational cost reduction strategy. The average personal cost in the study was 8.2 cents for each dollar in gross loan portfolio while the efficient and inefficient MFIs incurred 1 and 34 cents respectively.

In Ethiopia the MFI on average provided 107.7 USD for a borrower. The minimum and maximum amounts of average loan balance per borrower are USD 34.41 and USD 327.97 respectively. This indicated that the loan size offered to a borrower is small

Based on the econometric analysis the conclusion in this model for FSS would be that yield on gross portfolio, cost per borrower, portfolio at risk, breadth of outreach, and operating expense ratio were found to be important variable in determining financial sustainability of microfinance institutions in Ethiopia. In this study although age of an MFI were hypothesized as a determining variable, it was not significant in determining the financial sustainability in Ethiopia. Similarly, yield on gross portfolio, size of an MFI, personnel productivity ratio, dept to equity ratio, cost per borrow, depth of outreach and age of an MFI were fund to be important variables in determining the operational sustainability or operational self-sufficiency of MFIs in Ethiopia. All hypothesized variables for OSS were statistically significant and had association to affect the operational self-sufficiency in Ethiopia

As the descriptive statistics reveled, the debt to equity ratio, which is the capital structure of microfinance institution, indicated significant negative relation to operational self-sufficiency.

The findings of this research on gross loan portfolio are supported with the results 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. The finding of Size of an MFI is also agreed with Cull et al (2007), Mersland and storm (2009) and Bogan et al (2007). The result on depth of outreach is also supported by Ganka (2010) and Adongo and Stork (2006). The cost borrower result of this study supported by Ganka (2010) findings. Similarly, the result on debt to equity ratio also supported by Dissanayake (2012).

Generally, based on the findings of the research, the following conclusion has been drawn. From this study the researcher conclude that MFIs in Ethiopia are operationally sustainable but not financially sustainable, it was also conclude that the low average level of PAR indicating a good loan collection management and thereby contribute to the sustainability of MFIs. The MFIs in Ethiopia are efficient in terms of Cost per borrower and operating expenses. The microfinance institutions in Ethiopia are much better than the African countries when compared in terms of size of the total asset as the being relatively enough. The econometric result in this study showed a significant relation between financial sustainability and breadth of outreach implying that an MFI financially sustainable will perform better in their breadth of outreach (number of active borrowers). This is the more profitable MFIs, the higher it achieves the breadth of outreach and we can conclude that financial sustainability improves the breadth of outreach. This confirms the institution's view that financial sustainability will lead MFIs to operate at large economics of scale enable them reach more client (Brau and Woller, 2004). However, selling high volume of loan alone may not guarantee financial sustainability. It should be accompanied by effective follow-ups to ensure higher repayment rate and strive to operate at relatively lower operating cost per borrower

Moreover, from the empirical econometric result factor that affects or determine the financial sustainability of the MFIs in Ethiopia are: Yield on gross portfolio, cost per borrower, portfolio at risk, breadth of outreach, operating expense ratio as they are

statistically significant variables. However, age of the microfinance is not statistically significant variable in determining the financial self- sufficiency of the microfinance institution in Ethiopia

Similarly, yield on gross portfolio, size of an MFI, personnel productivity ratio, debt to equity ratio, cost per borrower, depth of outreach (Average loan balance per borrower) ,and age of MFIs are statistically significant variables in determining the operational self-sufficiency of the microfinance institutions in Ethiopia

## **5.2 Recommendation**

Based on the findings of the study the researcher points out some recommendations that would assume paramount importance if implemented by the microfinance institutions to ensure their operational and financial self-sufficiency

The research 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.

Microfinance to be stands by their own in order for continually providing financial service; they have to be financially self- sufficient. Unless they are self sufficient, they will be reliant on donor or external fund. Financially sustainability of microfinance can also be achieved when micro finance institutions are able to use their short term assets to generate cash financial revenue so as to increase the yield on gross loan portfolio. It is because the more an MFI utilize its short term asset the greater it generates higher financial revenue which leads to financial self-sufficiency

As indicated in the study, in order to improve the operational self sufficiency, microfinance institutions has a role to reduce costs per borrower to the possible minimum extent so as to reduce the overall cost of operation

The findings points out that at there are an increase in the breadth of outreach (number of borrower) will lead to the financial self -sufficiency. Other things held constant large number of borrower lead to MFI become more sustainable. 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

Generally, to reach the financial sufficiency level, MFIs should increase their breadth of outreach, reduce the cost of borrower , utilize their short term asset to generate revenue and increase their value of total asset



## REFERENCES

- Adongo, J. and C. Stork. (2006), “ *Factor influencing the financial sustainability of the selected microfinance institution in Nambia*” , The Nambia economic research unit. Research report No 39
- Alemayehu Yirsaw (2008), “*The performance of Micro Finance Institutions in Ethiopia*”: *A case of six microfinance institutions*”, Addis Ababa University
- Asian Development Bank (ADB), (2000), “*Finance for the poor-Microfinance Development Strategy*”, (available on <http://www.adb.org/documents/policies/microfinance/financepolicy.pdf>, accessed 27.04.2009)
- Baum, C. F. (2006), “ *An Introduction to Modern Econometric Using STATA*”. Texas: Stata Press Publication
- Balkenhol, B. (2007), “*Microfinance and public policy: Outreach, performance and efficiency*”, Working paper, Palgrave Macmillan, Geneva
- Bayeh Asnake (2012), *Financial Sustainability of Microfinance Institutions in Ethiopia*: European Journal of Business and Management, Vol 4, November 15, 2012
- Befekadu B. Kereta, (2007), *Outreach and Financial Performance Analysis of Microfinance Institution in Ethiopia*, African Economic Conference, United Nation Conference Center (UNCC), Addis Ababa, Ethiopia
- Bhatt, Nitin, Gary Painter, and Shui-Yan Tang (2002), *The challenges of outreach and sustainability*, In *Replicating Microfinance in the United States*: Carr, Eds. J.H. Carr and Z.Y. Tong. Washington, DC: Woodrow Wilson Center Press, 19-221
- Bogan, V., Johnson, W., and Mhlanga, N. (2007), “Does Capital Structure Affect the Financial Sustainability of Microfinance Institutions?”
- Brau, J. C. and Woller, G. M. (2004), *Microfinance: A Comprehensive Review of the Existing Literature.*” *Journal of Entrepreneurial Finance and Business Ventures*, 9(1), 1-26.

- Brooks, C (2008), *“Introductory Econometrics for Finance,”* 2nd edn, Cambridge University Press, New York
- Cameron, A. C. and Trivedi, P. K. (2009), *Micro econometric Using Stata*, USA: Stat Press Publication.
- Christen, R.P., Rhyne, E., Vogel, R. and McKean, C. (1995) *“Maximizing the Outreach of Microenterprise Finance”*: An Analysis of Successful Microfinance Programs. Available at <http://www.microfinancegateway.org/files/150701507.pdf>, (Accessed: 26 November 2007).
- Conning, J. (1997), *Joint liability, peer monitoring, and the creation of social Capital*, Williams College, Williamstown
- Consultative Group to assist the Poorest (CGAP), (2003), *“The Impact of Microfinance”*, Donor brief No. 13, July 2003, Washington DC, CGAP (available on: [http://www.cgap.org/gm/document-1.9.2407/DonorBrief\\_13.pdf](http://www.cgap.org/gm/document-1.9.2407/DonorBrief_13.pdf), accessed 05.05.2009
- Consultative Group to assist the Poorest (CGAP), February (2009), *Shedding Light on Microfinance Equity Valuation: Past and Present*, Occasional Paper No.14, February 2009, Washington DC, CGAP (available on: <http://www2.cgap.org/gm/document-1.9.9021/OP14v3.pdf>, accessed 30.04.2009)
- Cull, R., Demirguc-Kunt, A. and Morduch, J. (2007), *Financial performance and outreach”*: A global analysis of leading micro banks, *The Economic Journal*, vol. 117, pp. 107-133
- David G. Kleinbaum, Lawrence L. Kupper, and Keith E. Muller,(1988),” *Applied Regression Analysis and other Multivariate Methods*”, 2d ed., PWS-Kent, Boston, Mass., p. 210
- Degefe Duressa (2009), *Microfinance in Ethiopia: Elixir or poison?* Shaker publication, published PhD Thesis, Netherlands
- Dissanayake (2012), *“The Determinants of Operational Self Sufficiency: An Empirical Analysis of Sri Lankan Microfinance Institutions”*, University of Kelaniya

- Ebisa Deribie, Getachew Nigussie and Fikadu Mitiku (2013), *Filling the breach: Microfinance*. J. Business Economics Management 1(1):10-17.
- Ganka Daniel Nyamsgoro (2010), *Financial sustainability of rural microfinance institutions in Tanzania*.
- Gupta. V (1999) , “SPSS for beginner” . VJ Books.Inc. [www.vgupta.com](http://www.vgupta.com)
- Gonzalez, A. (2007) “*Efficiency Drivers of Microfinance Institutions (MFIs): The Case of Operating Costs*.” Micro-Banking Bulletin, Microfinance Information Exchange (MIX), No. 15, Autumn: 37-42.
- Guntz.S,(2011), *Sustainability and profitability of microfinance institutions*, Research papers in the international finance and economics; Georg Simon Ohm University of Applied Sciences Nuremberg, Research paper, Number 4, 2011
- Hair J. F, Black, W. C, Babin, B. J, Anderson, R. E, and Tatham, R. L. (2006) ,”*Multivariate Data Analysis*”. 6th edn. New Jersey: Pearson Education
- Harker.P., Zenios, S.,(1997), *Performance of Microfinance institutions, efficiency, innovation and regulation*, Cambridge university Press
- Hartarska, V. (2005). “*Governance and Performance of Microfinance Institutions in Central and Eastern Europe and the Newly Independent States.*” World Development, 33(10), 1627-1643
- Hazeltine, Barrett and Bull, Christopher, (2003), “*Field guide to appropriate technology*”, Academic Press
- Heskett, James L., Thomas O. Jones, Gary W. Loveman, W. Earl Jr. Sasserand Leonard A. Schlesinger, (1994), *Putting the Service-Profit Chain to Work*, Harvard Business Review, 72, 2, 164-174.
- Honohan, P. (2004b), *Data on microfinance and access: thinking about what is available and what is needed*. World Bank mimeo
- Johnson, J. and Dinardo, J. (2007) ,”*Econometric Methods*”. 4th International edn. New York: McGraw–Hill

- Khandker, Shahidur R.; Khalily, Baqui; and Zahed Khan, (1995), *Grameen Bank: Performance and Sustainability*, Discussion Paper No. 306, Washington, D.C.: World Bank
- Kindane A. (2007) *Outreach and Sustainability of the Amhara Credit and Saving Institutions (ACSI) Ethiopia*, MA thesis, Norwegian University of Life Sciences
- Kyereboah–Coleman, A. (2007).”*The Impact of Capital Structure on the Performance of Microfinance Institutions.*” *The Journal of Risk Finance*, 8(1), 56-71.
- Lafourcade, A.C., J, Isern., P, Mwangi and M, Brown (2006),*Overview of the outreach and financial performance of microfinance institutions in Africa*, *Micro banking Bulletin*, April
- Ledgerwood, J. (1999), *Microfinance Handbook: An Institutional and Financial Perspective*, World Bank, Washington D.C.: World Bank, Sustainable Banking with the Poor Project
- Letenah Ejigu (2009), *Performance analysis of a sample microfinance institutions of Ethiopia*, *International NGO Journal* Vol. 4 (5), pp. 287-298, May, 2009
- LOGOTRI (2006), *Building sustainable microfinance system: A growth of catalyst for the poor*”, Local government training and research institute, society for development studies, [Online] Available: <http://www.logotri.net> (September 10,,2011).
- Lumpkin, G. T. and Gregory G. (2001), *Linking two dimensions of entrepreneurial orientation to firm performance*, the moderating role of environment and industry life cycle. *Journal of Business Venturing*, 16:429-451
- Meyer, R. L. (2002), *Track Record of Financial Institutions in Assisting the Poor in Asia* ADB Institute Research Paper, No 49, December 2002
- Luzzi Giovanni Ferro and Weber,(2006). *Measuring the performance of Micro Finance Institution*
- Mersland, R. and Strøm, R. Ø. (2009).”*Performance and Governance in Microfinance Institutions.*”*Journal of Banking and Finance*, 33, 662-669

- Meseret Molla (2012). *Basic STATA 11 Manual*, Unpublished Lecture Manual. University of Gondar. Ethiopia
- Meyer, R. J. (2002) ,”*Track Record of Financial Institutions in Assessing the Poor in Asia.*” ADB Institute Research Paper, No. 49. Available at: <http://www.esocialsciences.com/data/articles/Document113212009240.6883051.pdf> (Accessed: 16 December 2009).
- MicroNed Ethiopia Country Scan, (2007). [http://www.microned.nl/documents/doc/ethiopia\\_country\\_scan.pdf](http://www.microned.nl/documents/doc/ethiopia_country_scan.pdf)
- MicroRate, & InterAmerican DevelopmentBank. (2003). “*Performance Indicators for Microfinance Institutions*” (3 ed.). Washington D.C
- MIX Market, (2010). <http://www.mixmarket.org/mfi/country/Ethiopia>
- Nadiya M (2011), *An inside View of the Factors Affecting the operational self-sufficiency of Indian Microfinance institutions: A mixed method enquiry*, Oikos Foundation for Economy and Ecology.
- National Bank of Ethiopia, (2013), *Biritu quarterly magazine*, No 115, Addis Ababa
- Navajas, S., Schreiner, M., Meyer, R. L., Gonzalez-vega, C., & Rodriguez-meza, J. (2000). “*Microcredit and the Poorest of the Poor*”: Theory and Evidence from Bolivia. [Article]. *World Development*, 28, 333-346. doi: 10.1016/s0305-750x(99)00121-7
- Okio credit (2005) ,”*Non credit financial services and Micro credit in Nigeria*”, a textbook, 2nd endition, Bolubestway Press limited, Nigeria.zzas
- Otero, M., (1999), “*Bringing Development Back into Microfinance*”. *Journal of Microfinance*, 1(1), 8-19.
- Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1994), *Reassessment of expectations as a comparison standard in measuring service quality: implications for future research*, *Journal of Marketing*, Vol. 58, pp. 111-124.
- Paxton, J. (2003),“*A poverty outreach index and its application to microfinance*”, *Economics Bulletin*,vol.9, pp.1-10

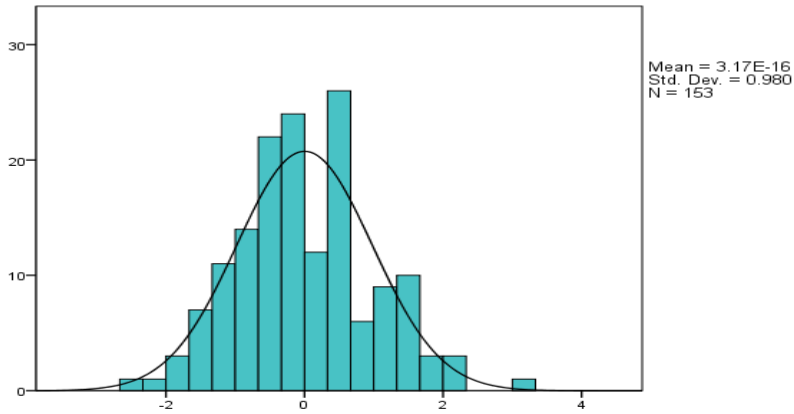
- Rai Anand and Anil Kanwal (2005) , *financial performance of microfinance institution: bank VS NBFC* “, international journal of management strategy, (IJMS) 2011, Vol. No.II, Issue II, January-June 2011
- Robinson, M. S. (2001) *The Microfinance Revolution: Sustainable Finance for the Poor*. Volume 1. Washington, DC.: World Bank
- Rosenborg, R. (2009). “*Measuring results of microfinance institutions-minimum indicators that donors and investors should track*”. In CGAP (Ed.). Washington
- Sa Dhan, (2003), *Technical Tool Series 1: “Tracking Performance Standards Of Microfinance Institutions”*: an Operational Manual, New-Delhi:
- Shah, D. P.,( 1999). ”*ADB and its experience in rural and microfinance attitude*”, Quarterly Development Review, vol. XVI, no. 20, November
- S. Schoeffler, R. D. Buzzell, and D. F. Heany, (1974), *Impact of strategic planning on profit performance*, Harvard Business Review, pages 137–145
- Sherman, H. and Gold, F. (1985), *Bank branch operating efficiency*, Journal of Banking and Finance, 9, 297-325
- Sharma ,S.R.&Nepal,V., (1997) “*Strengthening of credit institutions/programs for rural poverty alleviation in Nepal*” :United Nations ,Economic and social council (ECOSOC) for Asia and pacific ,Bangkok, Thailand
- Tchakoute-Tchuigoua, H (2011). “*Is there a difference in performance by the legal status of microfinance institution:*”, The Quarterly Review of Economics and Finance, 50:436-442
- Tiruneh Tadesse (2009), “*An analysis of the Relation between Financial Sustainability and Outreach*”: Micro finance in Ethiopia. Addis Ababa University
- United Nations Capital Development Fund (UNCDF), 2002, *Microfinance Distance Learning Course*, New York, United Nations Publications
- United Nations Capital Development Fund (UNCDF), 2009, “*Microfinance Distance Learning Course*”, online format (available on: [http://www.uncdf.org/mfdl/index.php?\\_mode=students.home](http://www.uncdf.org/mfdl/index.php?_mode=students.home), accessed 10.04.2009)

- Waters, W., Kombe, G., & Hong, R. (2001), *Final evaluation report: World Vision Enterprise for Health project*. Un published report. Washington, DC: GW Center for International Health
- Wilson, T. (2001), *Action research on microfinance in post-conflict settings: Post-conflict microfinance*. London: Concern/The Springfield Centre.
- Wilson, T. (2003), *Lessons from a microfinance pilot project in Rwanda*. Field Exchange, 20, 3–5
- Woller, G. and Schreiner, M. (2002), *Poverty lending, financial self-sufficiency, and the six aspects of outreach*, working paper, Washington, DC, USA
- Wooldridge, J. M. (2006), *”: A Modern Approach*. International Student edition, 3e, Canada: Thomson South–Western
- Yunus, Muhammad, 1999, *“Banker to the poor-micro-lending and the battle against world poverty”*, New York, Public Affairs

# Appendix

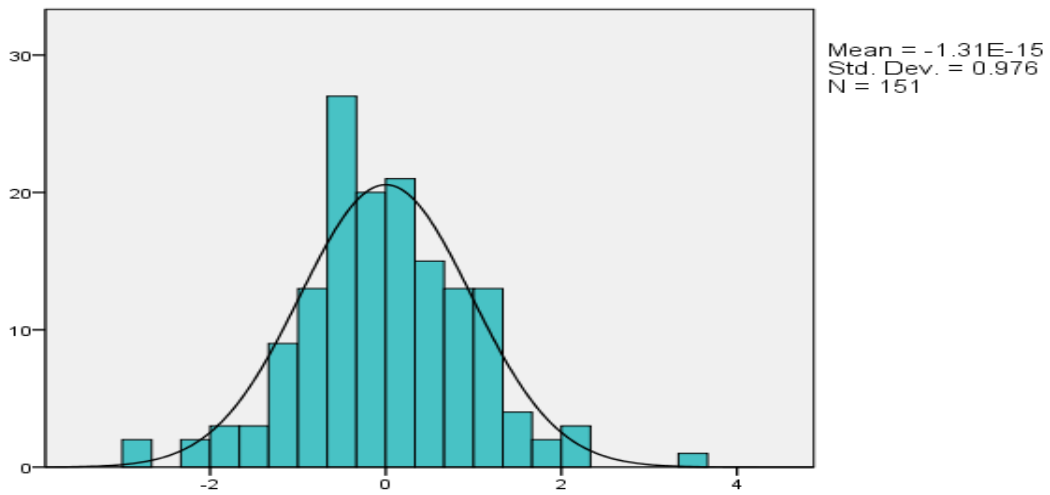
## Appendix A: Normality graph for FSS

Normality test for the residuals- Histogram for FSS model



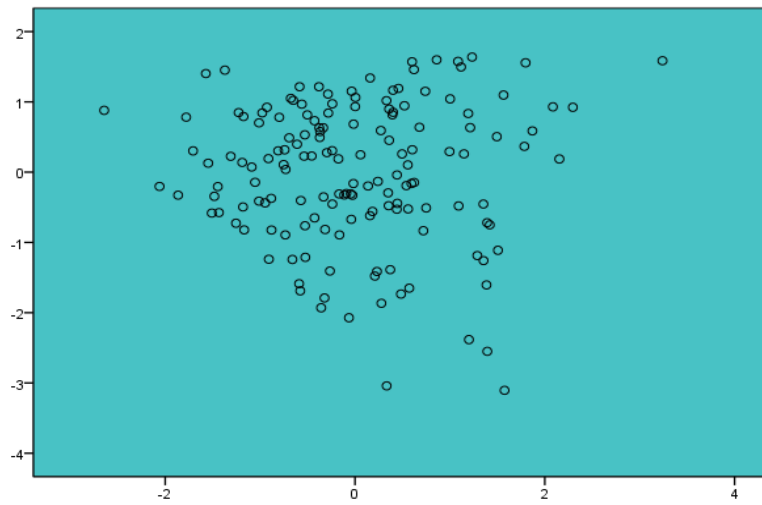
## Appendix A: Normality graph for OSS

Normality test for the residuals- Histogram for OSS model

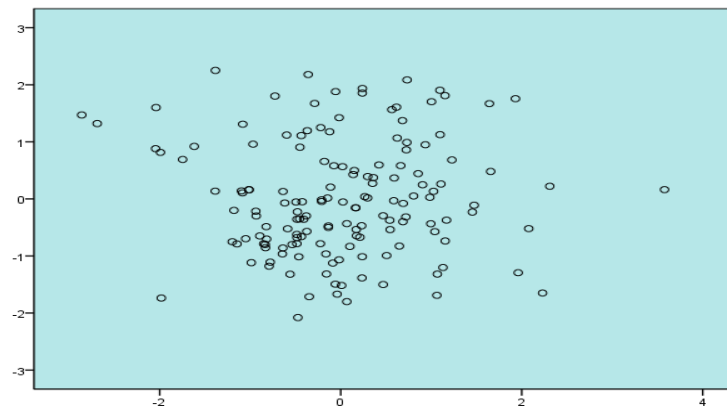




**Appendix C : Scattered plot graph for FSS, Hetrodksasitc test for the residuals**



**Appendix D: Scattered plot graph for OSS; Hetrodksasitc test for the residuals**



**Appendix E: Multicollinierity test for OSS**

Variable	Coefficient	Std. Error	t-Statistics	Probability	Collinearity Statistics	
					Tolerance	VIF
YIELD	2.839	.408	6.967	.000	.549	1.820
SIZE	.133	.027	4.997	.000	.207	4.835
PPR	-1.285	.555	-2.328	.022	.498	2.008
DER	-.036	.014	-2.573	.011	.837	1.195
CPB	-.368	.079	-4.646	.000	.322	3.207
DEBOUT	.281	.089	3.175	.002	.291	3.435
AGE	-.018	.008	-2.150	.033	.696	1.437

**Appendix F: Multicollinierity test for FSS**

	Coefficients	Std. Error	t-Statistics	Probability	Collinearity Statistics	
					Tolerance	VIF
<b>YIELD</b>	2.114	.385	5.486	.000	.512	1.954
<b>CPB</b>	-.150	.066	-2.273	.025	.380	2.633
<b>PAR</b>	-.716	.232	-3.097	.002	.738	1.354
<b>BRIDOUT</b>	.057	.024	2.405	.017	.285	3.514
<b>OER</b>	-1.062	.305	-3.485	.001	.408	2.449
<b>AGE</b>	.001	.008	.132	.896	.651	1.535

## Appendix G : Multicollinearity test for FSS

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Correlation of the independent variables of FSS

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	YIELD	CPB	PAR	BRDOUT	OER	AGE
YIELD	1					
CPB	0.5736	1				
PAR	-0.0155	0.2280	1			
BRDOUT	-0.5456	-0.7215	-0.4118	1		
OER	0.6260	0.6757	0.2035	-0.6684	1	
AGE	-0.3518	-0.3232	-0.1367	0.5479	-0.4385	1

## Appendix H: Multicollinearity test for OSS

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Correlation of the independent variables of OSS

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	YIELD	SIZE	PPR	DER	CPB	DBOUT	AGE
YIELD	1						
SIZE	-0.5700	1					
PPR	0.4956	-0.5139	1				
DER	-0.2698	0.3942	-0.2495	1			
CPB	0.5644	-0.6602	0.4704	-0.2899	1		
DBOUT	-0.4490	0.6824	-0.5783	0.3033	-0.1971	1	
AGE	-0.3617	0.5309	-0.3407	0.1973	-0.3008	0.3969	1

## Appendix I: Description of the independent variables in the study

Se. No	Variable standard	Description	Variable name in regression model	Variable description as used in the 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	SIZE	Natural Logarithm of 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	Depth of outreach/Average loan balance per borrower	Adj. GLP/Adj. Number of Active Borrowers	lnDEBOUT	Natural logarithm of the average loan size	+
7	Age of MFIs	Age of MFIs since their establishment	AGE	Number of operation years	+
8	Term to maturity of individual lending	The maximum time period that the loan is allowed to remain outstanding. It is the duration within which the loan should be Paid.	PAR	Payment at risk	+
9	Breadth of outreach	Number of active borrowers with loans outstanding	lnBRDOUT	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	-

### **Lists of sampled MFIs of this study**

1. Amhara Credit and Saving Institute (ACSI)
2. Addis Credit and Saving Institute (ADCISI)
3. Agar Micro Finance INstitution
4. African Village Financial Service (AVFS)
5. Bussa Gonfa Micro finance Institution
6. DECSI : Dedebit Credit & Saving Institutions
7. Eshe Microfinance Institution
8. Gasha Microfinance Institution
9. Meklit Microfinance Institution
10. Metemanen Microfinance Institution
11. Oromia Credit and Saving S.C(OCSSCO)
12. Omo Microfinance Institution
13. Poverty Eradication and Community Empowerment (PEACE) MFIs
14. Specialized Financial and Promotional Institution (SFPI)
15. Sidama Microfinance Institution
16. Wassa Microfinance Institution

## **DECLARATION**

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Dr. Degefe Duressa . All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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Name

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Signature& Date

## ENDORSEMENT

This thesis has been submitted to St. Mary's University College, School of Graduate Studies for examination with my approval as a university advisor.

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Advisor

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Signature & Date