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FINANCIAL SUSTANABILITY OF MICROFINANACE INSTITUTIONS IN ETHIOPIA

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A Thesis Submitted to

The College of Business and Economics department of Accounting and Finance in partial Fulfillment of the Requirements for the Degree of Master of Business Administration in Finance [MBA in Finance]

Addis Ababa University

Addis Ababa, Ethiopia

June 2012

Addis Ababa University

School of Graduate Studies

This is to certify that the thesis prepared by Haftom Girmay, entitled: Financial Sustainability of Microfinance Institutions in Ethiopia and submitted in partial fulfillment of the requirements for the degree of master of Business Administration in Finance [MBA in Finance] complies with the regulations of the university and meets the accepted standard with respect to originality and quality.

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ABSTRACT

Financial Sustainability of Microfinance Institutions in Ethiopia

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The persisting problem facing microfinance institutions is how to attain financial sustainability. Several studies have been conducted to determine and identify the factors affecting financial sustainability of microfinance institutions using large and well developed MFIs in various countries. However, there is no enough research done in Ethiopian MF industry where majority of MFIs are small. Consequently, the factors affecting their financial sustainability are not clearly known. This study, therefore, was set to bridge this knowledge gap.

This study used [applied] a quantitative research approach using panel data regression as the main data analysis technique. The study was based on six years secondary data for 12 sampled MFIs obtained from: AEMFI; NBE; and Mixmarket. We found that microfinance interest rates charged, average loan size, cost per borrower, MFI age, MFI size, number of borrowers, yield on gross loan portfolio, level of portfolio at risk, write-off ratio, liquidity level, staff productivity, and the operating efficiency affect the financial sustainability of microfinance institutions in Ethiopia.

The study makes the following key contributions to knowledge in addition to identifying factors affecting financial sustainability of microfinance institutions in Ethiopia: First, the study reveals that the non-existence of trade-off between financial sustainability and breadth of outreach. Second, consistent with the institutionists' view, the study provides empirical evidence that financial sustainability of microfinance institutions improves their breadth of outreach.

ACKNOWLEDGMENT

The completion of this work cannot go without acknowledging the contributions made by some few special individuals who devoted their time, means and intellectual abilities to make my Master studies at the University of Addis Ababa a success.

First and foremost, I am greatly indebted to my thesis advisor Dr. Venkati Ponnala for his unreserved involvement for the critical and detailed comments and suggestions he gave me in the thesis right from its inception to its completion. He was always there when I needed some help and guidance throughout the development of this thesis.

Second, my sincere thanks go to AEMFI [Association of Ethiopian Microfinance Institutions] officials particularly, Bethlehem and Anteneh Kifle [Admin and Finance Head], who have provided me the necessary data [information] regarding the MFIs.

My thanks are also extended to all my friends, especially to Ato wondmunegn Kebed [lecturer at Bahir Dar University] who has helped me in the data generation and by providing valuable suggestions; and Ato Abraham Gebrselema [lecturer at Bahir Dar University] who has provide and helped me the necessary information regarding SPSS software.

Finally, I appreciate the moral and spiritual support I received from my beloved Family, particularly Zafu Asgedom [my mom], May God bless them all.

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LIST OF ACRONMYS AND ABBREVATIONS

A.A – Addis Ababa

ACSI – Amhara Credit and Saving Institution

ADCSI – Addis Credit and Saving Institution

AEMFI – Association of Ethiopian Microfinance Institutions

ATM – Automatic Teller Machine

AVFS – Africa Village Financial Service

B G – Bussa and Gonofaa

CGAP – Consultative Group Assist for Poor

DCSI – Dedebit Credit and Saving Institution

FSS – Financial Self-sufficiency

IFAD – International Fund for Agricultural Development

MFI – Microfinance Institution

MIX – Microfinance Information Exchange

NBE – National Bank of Ethiopia

OCSSCO – Oromia Credit & Saving Social Corporation

OLS – Ordinary Least Square

SDI – Subsidy Dependency Index

SFPI – Specialized Financial and Pro. Institution

SNNP – Southern Nations Nationalities and Peoples'

USD – United States of America's Currency (Dollar)

CHAPTER 1

INTRODUCTION AND PROBLEM STATEMENT

2.0 INTRODUCTION

Throughout the world, financial sustainability of microfinance institutions[MFI] has been one of the issue that have recently captured attention of many researchers due to its importance in the livelihood of microfinance institutions. The financial sustainability of microfinance institutions is a necessary condition for financial sustainability (Hollis and Sweetman, 1998), and the most important requirement for any MFI (LOGOTRI, 2006).

The need for MFIs to be financially sustainable cannot be overemphasized. As it has been argued "unsustainable MFIs might help the poor now, but they will not help the poor in the future because the MFIs will be gone" (Schreiner, 2000). Moreover, they might not even help the poor now (Adam *et al*, 2008). It has been reported that it may be better not to have MFIs than having MFIs unsustainable ones. The unsustainable MFIs might hurt exactly those whom they are meant to help (Krahanen and Schmidt, 1994). This shows how important the sustainable MFIs is, and studying factors that affect sustainability of MFIs and how MFIs can be came financially sustainable becomes imperative if the objective of those MFIs should be achieved.

This study is mean to identify the factors affecting financial sustainability of Ethiopian microfinance institutions. These are also known as determinant of financial sustainability. Thus, in this study, we use factors affecting financial sustainability and determinants of financial sustainability interchangeably to mean one and the same thing.

1.1 BACKGROUND OF THE RESEARCH PROBLEM

Ethiopia is one of developing countries in Africa continent classified as one of world poorest countries with a per capital income of 390.27 U.S. dollars (International Monetary Fund [IMF] 2009). According to the world development report in 2009, Ethiopia population is about 82,825,000 of this 83% live in rural areas and the remaining about 17% live in urban areas with annual population Growth rate 2.6%. This makes the Country the second most populous country in the African Continent.

Poverty is generally perceived as individuals' or households' lack of resources to meet their needs for a healthy living or when their resources are so limited than other community members to exclude them from a traditionally acceptable way of life. Such poor people, according to World Development Report 2000/2001, often lack adequate food, shelter, education and health besides facing extreme vulnerability to economic problems and natural disasters. In addition to the very limited assets, inaccessible markets and scarce jobs that lock them in material deprivation, poor people "are often exposed to ill treatment by institutions of the state and society, and are powerless to influence key decisions affecting their lives" (World Development Report, 2000/2001). Moreover, they lack the freedom of choice and action to shape their lives; control over resources; and make decisions, as their freedom is severely curtailed by their voicelessness and powerlessness in relation to institutions such as state and market (World Bank, 2002).

Explaining this kind of extreme deprivation in Ethiopia, Development and Poverty Profile of Ethiopia (2002), which was compiled based on data gathered in 1999/2000, pointed out that 44.2 percent of Ethiopia's population was absolutely poor (unable to meet basic needs), of

which 37% was urban and the remaining 63% are rural. According to the Sustainable Development and Poverty Reduction Program (2002) of Ethiopia, poverty is observed in the country in terms of low level of consumption, household characteristics like large family size, vulnerability to shocks, poor health and low level of education, among others.

Women and men, living in such kinds of deprivations, need a wide range of assets such as land, housing, livestock and savings, and capabilities in order to lead healthy lives; withstand shocks; and expand their horizon of choices. This can be done by increasing their well-being, security, and self-confidence as well as by mitigating the extreme physical and financial limitations, which constrain their capacity and exacerbate their vulnerability (World Bank 2002).

With the view to improving the lives of the poor and mitigating the extreme conditions of deprivation in which the poor households live, various poverty reduction strategies such as promoting opportunities to the poor, empowering them and reducing their vulnerability have been taken at international, national, regional and local levels. In connection with poverty reduction, the World Development Report 2000/2001 suggested the creation of opportunities for the poor such as jobs, credit, roads, markets for their produce, schools, water facilities, health and sanitation; empowerment of the poor that is implementing action responsive to the needs of poor people to facilitate the political, social and institutional interactions of the poor; and enhancing security by reducing their vulnerability to economic shocks, natural disasters, ill health, disability, and personal violence.

Microfinance programmes have been introduced as one of these actions to alleviate poverty, empower low-income people and reduce their vulnerability to risks. According to Aguilar (1999), microfinance services have been believed to alleviate poverty by creating jobs and increasing incomes as they link the poor into productive economic activities. In many cases, basic business skill training accompanies the provision of microloans to improve the capacity of the poor to use funds (Webster and Fidler 1996). According to the 1999/2000 Annual Report on the Ethiopian Economy Vol. I, to bring about stability and improvement in the lives of people negatively affected by recurrent droughts in Ethiopia, non-governmental organizations (NGOs) were providing saving and credit services aimed at creation of employment and generating income.

Several studies noted different causes for poverty in a country. Some argued that the Cause of poverty in developing countries among other things is that the poor does not have access to credit for the purpose of working capital as well as investment for its small business. To this end many developing countries including Ethiopia have developed and have been providing credit to the poor through microfinance schemes.

The experience of several Asian, African as well as Latin American countries could be a typical example for this. The Ethiopian microfinance sector is one of the fastest growing in the world today. This time In Ethiopia there are 31 micro finance institutions (MFIs) have established and have been operating towards resolving the credit access problem of the poor. To achieve this goal the microfinance institutions should be financially sustainable.

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

The first one is impact assessment of the MF programs on the lives of the poor. It is to mean that whether the provision of financial service mostly of credit and saving has improved the lives of the poor in terms of economic, social and political indicators of poverty. Using much type of quasi experimental designs the studies about the impact of the microfinance in changing the lives of the poor have shown mixed [positive and negative] results (Hishigsuren, 2004). Sebstand and Chen, 1996 cited in Hishigsuren, 2004. So the evidence on whether Microfinance can alleviate poverty is of highly debated issue.

The second hot area in the MF industry among researchers is whether MF reaches the poorest of the poor who is in need of financial services. There are studies that show that MF doesn't reach the poorest of the poor. Rather they are reaching the marginally poor or non-poor. Besides most MFIs have no clear rules and criterion to target the poorest of the poor (Hishigsuren, 2004). This indicates that the MFIs are drifting away from their original mission of reaching and serving the poor.

The third area that got the attention in the MF industry is the issue of financial sustainability of MFIs. Historically MF has started operation with donor funds and now the industry has almost aged around 30 years. There is an intense debate on whether MFIs should continue to be donor supported or get relived from donation and stand on their own leg. There are one

school of thought which say MF should can be sustainable with donor funds (called welfarists) and the others say the MF should generate enough revenue to cover their own costs as donors funds are unpredictable (called institutionist). Hence the issue of building a sustainable MF industry that can operate without a donor funds is of an empirical enquiry.

In light of this, this paper attempts to look at MFIs financially sustainable in the country. The purpose of this specific research is to identify the determinant of financial sustainability of the MFIs in Ethiopia. There is no enough research done in Ethiopian MF industry. Some of them such as (Befekadu, 2007; Mubarek, 2006) are also poor in terms of statistical analysis simply they used descriptive statistical analysis. Hence the study, used statistical test of significance [multiple regression], to identify the factors that affect the financial sustainability of these institutions using many indicators such as capital structure, asset allocation, breadth of outreach, depth of outreach, profitabiiity and sustainability, revenue performance, expense management, efficiency, productivity and portfolio quality.

1.2 STATEMENT OF THE RESEARCH PROBLEM

This study focused on the financial sustainability of microfinance institutions in Ethiopia. The level of poverty in Ethiopia is wide and deep (Navajas *et al,* 2000).given the incidence of poverty, improved financing (method of financing, amount and accessibility) is seen as crucial in achieving the pro- poor and poverty reduction goal (Mwenda nad Muuka, 2004). Poverty is considered to be multifaceted (Zeller *et al*, 2006). The microfinance paradigm focuses on reduction poverty through improving access to finance and financial services. This is built on the premise that empowerment of the poor through creating income

generating capacity enables the poor to access all the development requirements, and thereby to get out of the multifaceted dimensions of poverty and reduce their vulnerability to unexpected events (LOGOTRI, 2006; Davis *et al*, 2004)

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

An enduring problem facing microfinance institutions, however, is how to attain financial sustainability (dunford, 2003 and Schreiner, 2000). This problem has attracted attentions of numerous researchers in recent decades and as a result many strategies' have been put in place to ensure that MFIs are sustainable (Randhawa and Gallardo, 2003; Yaron, 1992).

Randhawa and Gallardo, 2003 posit that' it does not seem likely that most MFIs will be able to sustain their operations without continued donor support for funding and technical assistance' this leaves the future of theses MFIs in uncertainty. Thus, an important question here is what should be done to make these MFIs sustainable and hence ensure sustainable provision of microfinance services and sustainable poverty reduction through outreach. The first step in doing this is to understand the factors affecting their financial sustainability.

Several studies have been conducted to determine the factors affecting their financial sustainability of microfinance institutions using large and well developed MFIs in various countries (Cull *et al*, 2007; Woller and Schriner2002; Christen *et al*, 1995). The level of significance of these factors in affecting the financial sustainability of MFIs, however, varies with studies. While some of the determinants are found to be significant in one economy or applicable to a set of microfinance institutions, some are not significant (Cull *et al* 2007; Woller and Schriner2002; Christen *et al*, 1995). Moreover, as per my knowledge there is no enough research done in Ethiopian MF industry. Some of them such as (Befekadu, 2007; Mubarek, 2006) are also poor in terms of statistical analysis simply they used descriptive statistical analysis. Hence the study, used statistical test of significance [multiple regression], to identify the factors that affect the financial sustainability of these institutions based on the accounting profitability approach to identify the factors affecting the financial sustainability of Ethiopian MFIs.

1.3 OBJECTIVE OF THE STUDY

The main objective of this study was to identify and understand the factors affecting the financial sustainability of microfinance institutions in Ethiopia.

1.3.1 Specific objectives of the study are as follows:

1. To identify the effects of MFIs outreached factors on the financial sustainability of microfinance institutions in Ethiopia.
2. To identify the effects of microfinance efficiency on the financial sustainability.
3. To identify the effects of financial sustainability on the breadth of outreach.

1.4 RESEARCH QUESTIONS

With the above research objectives in mind, this study was set forward to answer the following main question: what are the determinants of or factors affecting financial sustainability of microfinance institutions in Ethiopia? From this main research question, the following specific questions will be addressed:

(1) Does the microfinance capital structure; interest rate; cost per borrower; MFI age; depth of outreach; MFI size; gender of MFI clients; and number of borrowers affect the financial sustainability of microfinance institutions in Ethiopia?

(2) Does the microfinance efficiency, as reflected in: the yield on gross loan portfolio; portfolio at risk; liquidity ratio; staff productivity; and cost reduction affect the financial sustainability of microfinance institutions in Ethiopia?

(3) What are the effects of the financial sustainability on the breadth of outreach?

1.5 SIGNIFICANCE OF THE STUDY

MFIs are principal providers of financial services for the poor in Ethiopia. The microfinance industry has been able to serve more than 2.3 million clients through their 433 branch and 598 sub branch offices. Various studies show that this only covers 10-15% of the total microfinance demand in the country (Dr. Wolday Amaha, 2000). This indicates how much limited in breadth of outreach these microfinance institutions are. To attain large numbers of customers and offer sustainable financial services, these MFIs need to be financial y sustainable (Schreiner, 2000). This study, as an attempt to assess the determinants of financial sustainability of microfinance institutions in Ethiopia, provides evidence on what affect their financial sustainability. Understanding factors affecting the financial

sustainability of microfinance institutions in Ethiopia is a major stepping stone to enlighten what should be done if financial sustainability is to be achieved. This is curial in Ethiopia where about 80 percent of the populations were excluded from reliable [commercial] banking services.

The study contributes to knowledge on the financial sustainability of microfinance institutions in Ethiopia. In so doing, the study bridges the existing knowledge gap in microfinance literature on sustainability of microfinance institutions in as far as the MFIs in Ethiopia are concerned.

Key contributions made by this study in addition to identifying factors affecting financial sustainability of Ethiopian MFIs are: first, the study reveals that the non-existence of trade-off between financial sustainability and breadth of outreach Second, it also discusses the implications of the conclusions made and identifies that need further research.

1.6 LIMITATIONS OF THE STUDY

The general rule of thumb, that for generalizability, a ratio of number of observations to number of variables should never 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 variables that determine or explain the changes in the dependent variable. If this minimum is not followed, there is a risk for overfitting, ". . . making the results too specific to the sample, thus lacking generalizability" (Hair, Anderson, Tatham, & Black, 1995, p. 105). Moreover, although the minimum is 5:1, "the desired level is between

15 to 20 observations for each independent variable", at which level as Hair *et al* (2006) have put it, "the results should be generalizable if the sample is representative" (Hair *et al,* 2006: 196). This study is however, apply the minimum ratio [that is 5:1] this because up to April, 2012 we did not get data for the year 2011 as it was not published their report. In addition to this, the study applies [uses] small number of variables that reduces the power of the explanatory variables.

1.7 STRUCTURE OF THE THESIS

This thesis is divided in to six chapters. In this first chapter we introduce the research problem. We also explain the background to research problem, the objective of the study and main research questions guiding this study. The remaining chapters are arranged as follows: chapter two presents a review of literature explaining theoretical considerations; chapter three is on methodology. The chapter describes the data and the empirical model used for the analysis; chapter four links microfinance outreach to their financial sustainability to identify the factors affecting financial sustainability; chapter five is about microfinance efficiency and how it affects financial sustainability; Lastly, chapter six offers the conclusion and recommendation made by this thesis. It also highlights the area for future research.

CHAPTER 2

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter presents theoretical background guiding this study. The chapter starts by explaining the meaning of key concepts, followed by the main theories used in this study to explain the determinants of financial sustainability of microfinance institutions of Ethiopia. A theoretical frame work is then developed based on the accounting theory and theoretical background presented as reviewed from available literature in microfinance.

2.1 CONCEPT OF MICROFINANCE

Microfinance is the provision of small scale financial services to low income or unbanked people (kyereboah-Coleman and Osei, 2008). It is about a provision of "a broad range of financial services such as deposits, loans, payments services, money transfers and insurance, to the poor and low-income households and their farm or nonfarm micro- enterprises" (Mwenda and Muuka, 2004:145).

From the above definitions, microfinance is more than just provision of small loans also known as microcredit (karlan and Goldberg, 2007). It is about provision of various small scale financial services. Thus for this study, consistent with the above definitions, we use the term microfinance to mean the provision of small scale loans, savings, deposits, and other financial services to the poor. Institutions that provide these small [micro] financial services are known as microfinance institutions [MFIs], also known as microfinance organizations (Mersland and Strom, 2008).

2.2 CONCEPT OF SUSTAINABILITY OF MICROFINANCE

Sustainability has been generally defined as permanence (Navajas et al, 2000), also the ability to repeat performance through time (Schreiner, 2000). It "allows the continued operation of the microfinance provider and the ongoing provision of financial services to the poor" (CGAP, 2004). This will depend on the sustainability of microfinance institutions themselves [also known as institutional sustainability, CGAP 2004], sustainability of their market, sustainability of legal policy as an enabling environment, and sustainability of the impact they have on the poor.

The history of microfinance suggests that microfinance institutions did not begin as business but rather as a means to alleviate poverty through helping the poor to create livelihoods for themselves (Harper, 2003). The micro services to the poor, therefore, were mainly offered by donor funded institutions. Microfinance could reach millions of people [e.g. Grameen and Bank Rakyat Indonesia – BRI]. Moreover, it seemed as if the poor were able to save and repay the loan and even at unsubsidized rates of interest (Harper, 2003). One question however, was still apparent, what is the appropriate approach to reach the poor: financial system approach or poverty lending approach. While the financial system approach called for the need for microfinance institutions to sustain their operation without subsidy, the poverty lending approach was subsidy dependent, focusing on provision of cheap credit (Johnson, 2009). Some microfinance institutions like BancoSol in Bolivia and BRI followed the financial system approach. Still others like Grammen followed the poverty lending approach and continued to depend on subsidy to operate (Hulme, 2008).

After the 1990s more donor support became less reliable, most microfinance institutions started to think on how to sustain their operation without subsidy. This was only possible if they could earn more from their operations than their spending could require in absence of subsidy. Moreover, reaching the poorest within the framework of financial sustainability, as Johnson (2009) has put it, seemed impossible. According to Harper (2003) the issue on how to attain sustainability has received a great deal of attention, ever since it was perceived impossible to reach the poorest.

2.2.1 Dimensions of Sustainability

Sustainability of microfinance institutions [also known as institution Sustainability] can be seen in several dimensions depending on user requirements. These dimensions are: mission sustainability; programme sustainability; human resource sustainability; and financial sustainability. The mission sustainability refers to Sustainability of microfinance in its mission. This will keep the organization in its chosen path in the long-term (Mahajaan and Nagasri 1999).

Programme sustainability occurs when customers [clients] perceive that the services that they receive are of sufficient importance and valuable and are willing to assume responsibility and ownership of them (Mahajaan and Nagasri 1999). A good demand driven product design will make the programme sustainable. Microfinance institutions' product delivery should be supported by well qualified personnel who are capable of delivering the services [products] as required to meet the organization mission. This is known as human resource sustainability (Mahajaan and Nagasri 1999). Financial sustainability of microfinance institutions is explained in the next sub section.

2.2.2 Financial Sustainability

Financial sustainability of microfinance institutions is probably the key dimension of microfinance sustainability. It refers to the ability of an MFI to cover all its costs from its own generated income from operations (Thapa *et al*, 1992) without depending on external support [e.g. subsidy]. The costs here include present costs incurred to support current operations and those incurred to support growth. Dunford (2003) define financial sustainability as the ability to keep on going towards microfinance objective without continuing donor support. These definitions center on one main point, this is, the ability to depend on self-operations. The definitions also imply the possibility of making profit out of the microfinance operations.

Due to its importance in microfinance performance, quite often, in microfinance literature the terms "financial sustainability" have been used to define institutional sustainability of microfinance institutions (Hollis and Sweetman, 1998). CGAP (2004) define sustainability as the "ability of microfinance provide to cover all of its costs. Achieving financial sustainability means reducing transaction costs, offering better products and services that meet client needs, and finding new ways to reach the unbaked poor".

Financial sustainability can be measured in two to stage namely operational sustainability and financial self-sufficiency. According to Meyer (2002) operational sustainability refers to the ability of the MFI to cover its operational costs from its operating income regardless of whether it is subsidized or not. On the other hand, MFIs are financial self- sufficiency when

they are able to cover from their own generated income, both operating and financing costs and other form of subsidy valued at market prices. That is, to cover its costs if its activities were not subsidized and if it raised capital at commercial rates (Balkenhol, 2007). The self sustainability requires the MFIs to be able to cover at least opportunity cost of all factors of production and assets from self generated income (Chaves and Gonzale-Vega, 1996). MFI self-sufficiency is a nonprofit equivalent of profitability (Woller and Schreiner, 2002).

The above definitions of financial sustainability imply that a loss making MFI [MFIs with poor financial performance] will not be classified as financial sustainable. Again, a profit making MFI, whose profitability is determine after covering some of the operating costs by subsidized resources or funds, will also not be considered as financial sustainable.

In the next sections we present an overview of the conceptual framework within which this study on determinants of financial sustainability of Ethiopian MFIs was undertaken. This is done in part 2.5. However, before we present the conceptual research framework, we explain microfinance poverty reduction theories. These are also known as major approaches in which MFIs have been used as a tool to reduce poverty.

2.3 MICROFINANCE POVERTY REDUCTION APPROACH THEORIES

This section discusses two microfinance institutions' approaches to poverty reduction. As explained in the previous section, microfinance institutions are considered to be a tool for poverty alleviation through improving access to finance and financial services. The

improved access to finance and financial services creates income generating capacity which may enable the poor to access all the development requirements to get out of multifaceted dimensions of poverty and reduce their vulnerability to unexpected events. Thus, the contribution of microfinance to this end has been measure through what is known as microfinance outreach. That is, the capacity of an MFI to reach the poorer of the economically active poor.

There are two competing views as to which goal of microfinance should be given higher priority in as far as poverty reduction is concerned. These are the institutionists [also known as financial system] and welfarists [poverty lending] approach (Arun, 2005; Brau and Woller 2004).

2.3.1 Welfarists' Approach

The welfarists emphasize on poverty lending as measured by depth of outreach. That is, reaching not just a large number of clients [breadth of outreach] but a large number of poor clients also known as depth outreach (Brau and Woller, 2004). It follows, therefore, that, welfarists view microfinance as established for poverty reduction, their objective being to empower the poorer of the economically active poor and thus, depth of outreach should be given a higher priority. Microfinance institutions should be, in as far as possible, able to serve as many as possible poor clients, even when it may be appearing not profitable. The deficit in operations should be filled with donor and government support or social investors (Woller *et al*, 1999).

Taking the welfarists view aboard, many groups, especially NGOs argue that there is a trade- off between sustainability [profitability] and targeting the poor [outreach] because the poorest are cost ineffective to reach when profitability is considered and thus, donor support [to support MFI] is required to this end (Paxton, 2002). Their argument is that, to reach the poorest groups require small, exclusively focused programs which cannot be sustainable and require ongoing donor funding (Morduch, 1999).

2.3.2 Institutionists Approach

Institutionists on the other hand focus mainly on financial sustainability of microfinance institutions. According to Woller *et al* (1999) the Institutionists view financial deepening as the main objective of microfinance institutions. Here financial deepening refers to creating sustainable financial intermediation for the poor. Institutionists assert that the financial sustainability as measured by financial self-sufficiency [profitability] should be given higher priority by all MFIs (Brau and Woller, 2004). Their argument comes from the fact that in most cases donor dependence is not certain and thus, unless an MFI is able to sustain itself financially it will not be able to serve the poor in the long run.

Contrary to prompting financial sustainability, there is a potential tension that over emphasis on financial self sustainability may lead to an MFI into moving away from its poverty reduction objective (Drake and Rhyne, 2002). This known as mission drift (Aubert *et al*, 2009).

A close examination of the argument put forward by institutionists and welfarists can reveal that it is a financing issue. On one hand, the institutionists would like to see MFIs meeting all their costs from self generated funds with a possibility of making profit [without using any external funds] this is what they would call a sustainable MFI. On the other hand, welfarists are not concerned with where the funds come from. Provided that MFIs can continue with operations and thereby meet their social objectives they have attained sustainability. Their focus is on targeted depth of outreach rather than scale [breadth of outreach] or financial self - sufficiency (Brau and Woller, 2004). Thus, as Woller et al (1999) have argued, what matter is how subsidies are used and not whether they are used or not.

2.3.3 Subsidy and Poverty Reduction Approach Theories

Subsidy refers to financial resources received by an MFI at below market prices (Woller *et al*, 1999). Subsidy [also known as donation] may be received in monetary terms or in-kind. The role of subsidy in reaching the vast majority of poor people is seen differently under the two competing poverty reduction approach theories: the institutionists' and welfarists' theories. The institutionists approach the sustainability of MFIs from the institution point of view. Their argument is that, institutional sustainability of an MFI will be attained without subsidization. The emphasis here is that, for sustainability, an MFI should be able to cover its operating and financing costs with the program revenue (Brau and Woller, 2004).

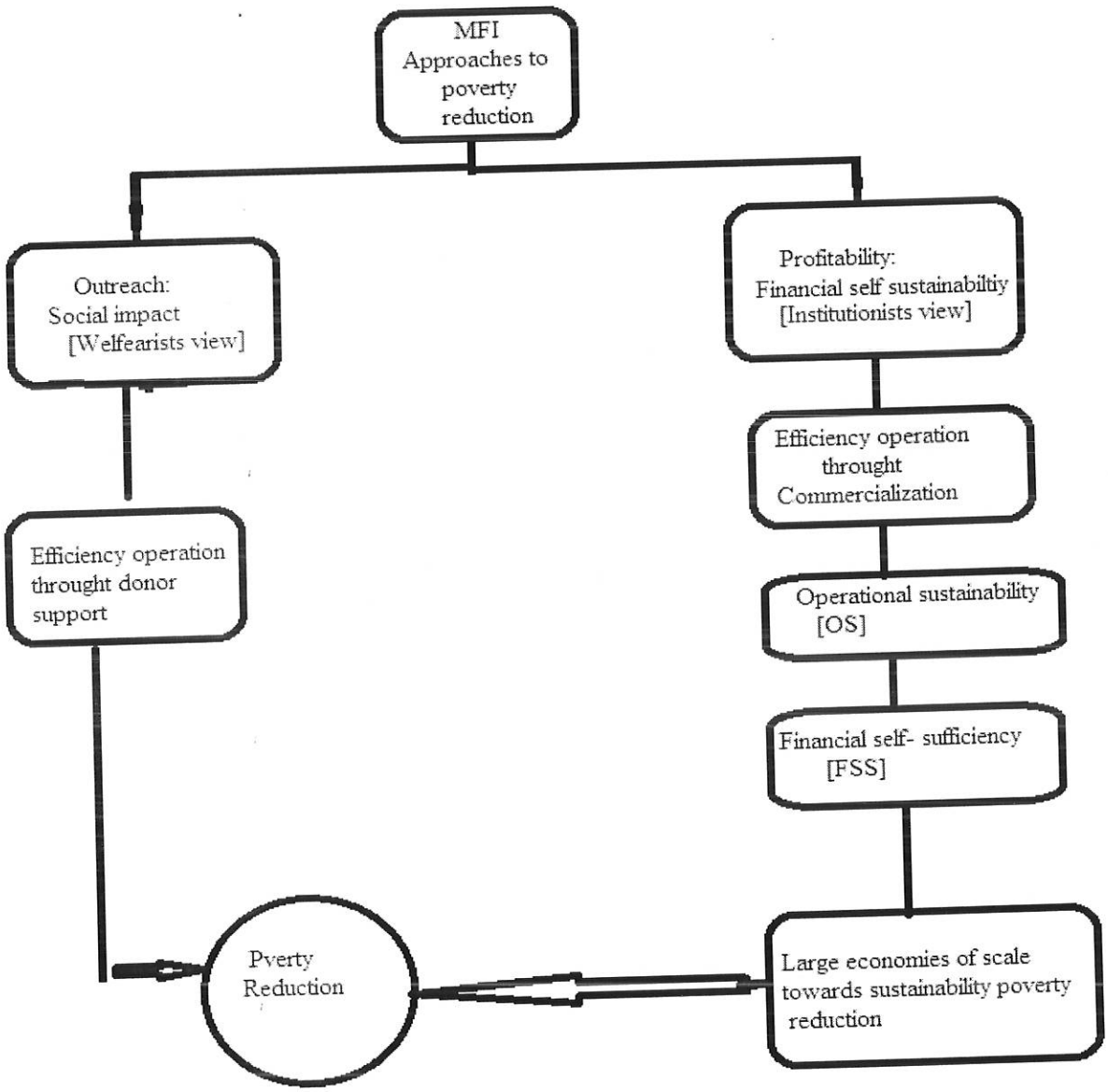
Ideally, a financial viable program is one where all costs [delivery and post delivery] of credit, provision for loan losses, inflation, and return on investment are fully taken into

account, and covered by the interest rates charged on loans (Thapa *et al*, 1992). With institutionists approach, MFIs should make profit to attract private capital because subsidies or donor funds may dry up any time and the microfinance institution may cease from its operations (CGAP, 1995).

Welfarists approach evaluates sustainability of MFIs based on MFIs' contribution to social welfare of the poor community. The argument is that, MFIs can achieve sustainability without achieving self- sufficiency. To welfarists, MFIs are sustainable when they are able to continue with operations, reaching the poorest of the poor, and thereby contributing to poverty alleviation regardless of whether they do that through subsidization or not. Their focus is on how the MFIs could have social impact to their clients, the poor. They support their argument by considering any subsidy to or finance injected in MFIs as equity invested by social investors who may not necessarily mean to make profit but to have social impact (Brau and Woller, 2004). With the welfarists approach an assessment of MFIs sustainability is not based on whether they are financially self - sufficiency but rather on social merits (Brau and Woller, 2004). Their argument is in harmony with the poverty alleviation objective of the MFIs. Figure 2- 1 summarizes the welfarists and institutionists poverty reduction approach theories.

Figure 2-1: Approaches to Attaining Poverty Reduction through MFIs

[Welfarists and institutionists theories]



Source: [Ganka D. 2010]

According to Woller and Schreiner (2002) the perceived existence of trade-off between profitability [financial sustainability] and depth of outreach [social objective] may not necessarily be mutually exclusive. Figure 2-1 shows how the two objectives could lead to

poverty reduction if followed consistently. It is possible to attain both simultaneously contingent of the adoption of "appropriate strategies, including charging real interest rates, making productive use of loan officers, paying appropriate salaries, and keeping administrative costs low and administrative efficiency high" (Woller and Schreiner, 2002). Woller and Schreiner's argument follows the institutionists' approach to poverty reduction through MFIs. Moreover, recent studies indicate that the two goals can be attained simultaneously (cull *et al*, 2007). This again is in support of the institutionists's theory.

With these two approaches of explaining sustainability of MFIs, one would wonder whether or not it makes any difference in as far as micro financing services are concerned. That is, whether or not the donor empowered MFIs performs better in sustainability than those which are not. As (Morduch, 2000) put it, "can financially sustainable programs achieve greater scale than subsidized program? Can they make a bigger dent in poverty?" This could be partly answered by looking at the roles played by subsidy in helping MFIs meet their goals.

2.3.4 Roles of Subsidy on Microfinance development

Once again, subsidy can be seen as the difference between what the MFIs receives (all resources) from donors minus what they pay back. It refers to what donors entrust to microfinance organizations at price below opportunity cost (Schreiner, 2000). Subsides may come to MFIs in financial or technical form (technical assistance), where MFIs are required either to pay back (considered as soft loan) or just as a donation (Karlan and Goldberg, 2007).

The subsidies are meant to enhance the capacity of MFIs. Technical assistance can empower a microfinance organization with tools, abilities, and incentives (Schreiner, 2000). According to Schreiner (2000) and Rhyne and Otero (1993) subsidies from donors should help infant MFIs to be able to survive in the market without funds from donors. Donor should focus on support that fosters movement to greater financial self-sufficiency as many programs require 5 – 10 years to become self-sufficient (CGAP, 1995). According to Von Pischke (2007) start-up subsidies have certainly led the microfinance institutions to change and establish a very robust basis for expansion and outreach. Study by Adongo and Stork (2006) found that donor involvement in providing start-up capital for loan portfolio was positively associated with financial sustainability. This supports the claim that at the start-up and growth stages microfinance institutions require some subsidization until they have reached market maturity (Balkenhol, 2007).

To assess the performance of MFIs donors have increasingly been using the subsidy dependency index (SDI) as a measure of dependency to subsidy and, therefore, indicating how far from sustainability an MFI is. The Subsidy Dependence Index measures the degree to which an MFI relies on subsidies for its continued operations (Ledgerwood, 1999). The more SDI decreases, the better. According to Conning (1999) the SDI is one of the most heavily weighted factor upon which further access to donor funds is conditioned.

The SDI (developed by Jacob Yaron, 1992, at the World Bank) indicates the extent to which an MFI requires subsidy to earn a return equal to the opportunity cost of capital. It is expressed as a ratio that indicates the percentage increase required in the on-lending interest

rate to completely eliminate all subsidies received during the year. The subsidy dependency index (SDI) is given by:

$$SDI = \frac{\textit{Total annual subsidies received}}{\textit{Average annual interest income}}$$

The subsidy dependence index answers a question on how MFIs would fare as commercial lenders by holding constant the lender's current business structure. However, assumption of lenders business structure being constant is unrealistic because in the process there might be changes in the nature of type of business received by client and how they will respond to the changes (Armendáriz and Morduch, 2007). Moreover, holding down the effects that changes in interest rate would bring to repayment rate is also unrealistic. The repayment rate and the loan amount are highly affected by the rate of interest that an MFI charges. They also largely affect the volume of interest income.

There are different types of MFIs whose differing nature and mission will determine the importance and duration of subsidy. According to Von Pischke (2007) microfinance is a child of subsidy. It is subsidy driven. As Woller *et al* (1999) have put it; the current innovations in microfinance industry have come from subsidized microfinance institutions. Without subsidy microfinance would be largely unknown. There are three types of MFIs namely: for profit MFIs; NGOs; and cooperatives (member-based). The next subsection discusses these MFIs and how they consider subsidies for their sustainability.

(1) For Profit MFIs

For profit MFIs seek to make profit and want to make the financial sector more efficient by taking a commercial approach. To these MFIs subsidy is used for start-up and network

expansion and to accelerate growth. This is in harmony with infant industry theory which argues for the support of MFIs at their start-up stages.

(2) Non Governmental Organizations (NGOs) and Foundations

The mission of most of the NGOs and foundations is poverty alleviation by expanding services and enlisting more clients. At the beginning of their operations, many NGOs are not meant to be 'for-profit' organisations and, therefore, subsidy is viewed as more essential for survival. To ensure that they make impacts on poverty alleviation, the NGOs clients are mainly poor people. Their view is based on the assumption or observation that subsidies are required to alleviate poverty. Lending technology is mostly group based because poor people tend to be willing to work together in groups, at least when there are few other possibilities. Social interaction is also a value in building morale, solidarity and awareness that will help the poor improve their condition.

(3) Cooperatives (Member-based MFIs)

Cooperatives promote affiliation by recruiting members, offering more services and forming more and different types of cooperative organization. Goals include helping people and making markets more equitable and efficient. Lukhele (1990) argues that interdependence that exists among independent individuals' co-operation and mutual support is central to the cultural life of the people. Theoretical ground guiding the cooperatives is that people can achieve a better standard of living for themselves through pooling together their efforts.

The cooperatives include credit unions and other financial cooperatives. Their operations extend from non-commercial to commercial. The mission of these member-based MFIs is based on making cooperatives successful in ways that help members and benefiting society at large by making markets more efficient and/or more equitable from a social perspective. Realization of these objectives provides cooperatives and their members, greater leverage in the market place (Von Pischke, 2007 and Armendáriz and Morduch, 2007). In this type of MFIs, subsidy is used wherever useful (Von Pischke 2007).

2.4 PROFITABILITY THEORY AND FINANCIAL SUSTAINABILITY

This part presents profitability theory and how it relates to the concept of financial sustainability of microfinance institutions. We discuss the concept of profit from both economists' and accountants' views. We then link these concepts with financial sustainability. That is, how profitability of MFIs can be used to indicate its financial sustainability.

2.4.1 Economic concept of profit

From John Hicks' view of income (Hicks, 1946), economists view income (also known as profit or earnings) as what a firm could spend or distribute during the period, and still have the same amount it started with at the beginning (Bodie *et al*,2009). This definition calls for recognition of unrealized gains or losses in the market value of assets and liabilities.

2.4.2 Accounting Concept of profit

Contrary to economists' view of income, accountants' view of income ignores unrealized gains or losses in the market value of assets and liabilities (Bodie *et al*, 2009). Thus, in

accounting only the book values (not the market values) are considered when determining income. Moreover, while economists view income, earnings, and profit to be the same (Bodie *et al*, 2009), the accountants make a distinction between income and profit as the excess of revenue over expenses for a transaction. That is, profit is considered as a residual calculated as an excess of income over expenditure. Profit is what remains after costs of production have been paid for (Marriott *et al*, 2004; Porwal, 2001). This is sometimes referred to as profit as a residual theory (Glautier and Underdown, 2001; McCullers and Schroeder, 1982). McCullers and Schroeder (1982) define profit as a residual from matching revenue [income] realized against costs (expenditure) consumed. Furthermore, the accountants make the difference between income and profit clearer by defining profit as a net come (Nikolai *et al,* 2009; Edmonds *et al*, 2000; McCullers and Schroeder, 1982).

All withstanding however, when the capital maintenance concept and profit as a residual theory are considered, the only difference between the economic and accounting profit is how the unrealized gains or losses in the market value of assets and liabilities are being taken care of. While the economists would consider the unrealized gains or losses immediately, it often takes time for the accountants to recognize the changes, and when they do, they do it through revaluation of assets or liabilities, or accounting for price changes.

2.4.3 Profit and financial sustainability

Microfinance profitability is linked to their financial sustainability. According to Woller and Schreiner (2002) 'financial self-sufficiency is the nonprofit equivalent of profitability'. All things being equal, profit can be considered to be a key variable in measuring a firm's

financial sustainability (Glautier and Underdown, 2001). The Hicks' definition of income explained above is based on the capital maintenance concept requires that profit be considered as a residual available for distribution once provisions have been made for maintaining the value of capital intact (Nikolai et al,2009; Glautier and Underdown,2001;McCullers and Schroeder,1982).

Considering profit as residual, Hicks' definition of income has been incorporated in financial accounts (Harvey and Keer, 1983). Implementing the capital maintenance requirement, the development of accounting profession the capital maintenance requirement, the development of accounting profession has gone hand in hand with recognizing the changes in value of assets and liabilities (Nikolai *et al*, 2009; Glautier and Underdown, 2001). Thus, with capital maintenance concept in mind, we can confidently link the financial sustainability of microfinance institutions with their profitability.

The economists' income (or accountants' profit) indicates, according to Hicks (1946) 'the amount which a firm can spend or consume without impoverishing themselves'. That reflects sustainability. According to Porwal (2001) the maintenance of capital by a firm is necessary in order to survive or become sustainable. Moreover, if profit is considered as residual (Glautier and Underdown , 2001;McCullers and Schroder, 1982) then profitability can be used as a proxy measure of financial sustainability as it considers covering all costs incurred in earning income plus any costs necessary to at least maintain the current levels of operation. Likewise, Larson *et al,* (1999) define profitability as "the ability to provide

financial rewards sufficient to attract and retain financing". For microfinance institutions that depend solely on their own generated funds to keep their current level of operations, and yet be able to reach their desire level of growth, profitability can be considered as a measure of financial sustainability.

Previous studies in microfinance field have defined sustainability from profitability point of view. They consider profitability as a high standard measure of MFIs performance (Cull *et al*, 2007; Brau and Woller, 2004). Using this approach, MFIs are considered sustainable if and only if they are able to cover all their operating and financing costs from their own generated revenue, mainly through interest rate charges. They further define sustainability as the stage of financial operations where all costs of the lender are fully met from the interest charges, and where such charges are not subsidized, partly or fully to met from outside sources (Thapa *et al*, 1992).

In this study the accounting profitability and the related accounting measures are used to measure financial sustainability. Accounting measures however, are affected by accounting conventions for valuing assets and liabilities and for revenue and income recognition, changes in which may affect the reported financial performance. This has been the main drawback against using the accounting measures to assess performance. While this is true however, the accounting measures can still be considered more appropriate especially for the long-term studies. This is because, while managers can influence the reported financial performance by merely changing the accounting policy on the applicability of accounting

conventions for a certain accounting period, their ability to manipulate statements for longer period is limited (Bhagat and Jefferie, 2002). Moreover, while we make use of the accounting profitability as a measure of financial sustainability, it is valuable to mention that using profitability as a measure of financial sustainability as used in microfinance literature and in this study strongly depends on the assumption that the microfinance institutions are going concern, maintaining the same, or achieving higher performance. Without this assumption, using a one year or few years' profitability to measure long term sustainability may be at its outset inappropriate.

2.5 DETERMINAT OF ACCOUNTING PROFITABILITY

In accounting, profitability is a state of an organization's financial performance where income exceeds its total cost (Elliott and Elliot, 2008; Atrill and McLaney, 2004). Thus, from profitability theory, profit is a function of income and expenses and, therefore, anything that affect income, and or expenses will eventually affects the resulting profit (Collier, 2006).

Profit can be increased by either increasing income while holding expenses constant, or by holding income constant and reducing expenses, or both. It comes, therefore, that determinant of income and expenses are equally the determinants of profit (Collier, 2006; Riahi-Belkaoui, 2004). This follows the capital maintenance concept of profit (Larsen *et al*, 1999). With accounting profitability in mind, in this study, we view financial sustainability of microfinance institutions as the ability of an MFI to generate income that exceeds its total costs. Thus, a sustainable MFI, all things being equal, is the one whose income exceeds total costs incurred to earn the same. In the next subsection we discuss theoretical aspects of

income and expenses based on what causes them in light of microfinance income and expenses and using the accounting profitability theory which is based on capital maintenance concept.

2.5.1 Microfinance Incomes

Income of microfinance institution is made up of all of its own generated income including fees and charges, fines, and interest earned on loan (Armenariz and Morduch, 2007). The interest rate earned on loans is the key source of self generated income to microfinance institutions (Tellis and Seymour, 2002). The total amount of interest income to MFIs will depend on the rate of interest charged, the amount of loan and the loan repayment rates. These are explained here under.

[A] Interest Rate

This is the rate charged by microfinance institutions on its outstanding loan portfolio. The higher the interest rate, the higher the microfinance income, and all things being equal, the higher the profit. Because the interest income is the major source of income to microfinance institutions, the interest rate should be set at a level where an MFI will be able to cover all its costs [both administrative and financing] and be able to earn a certain amount as target profit (Shanar, 2007; CGAP, 1996).

The amount of interest revenue and, therefore, all things being equal, the amount of profit will depend on the amount of loans made and the interest rate charged thereon. This means that the MFIs should charge interest high enough to cover their total costs to ensure that they

earn profit. The higher the interest charged, all thing being equal, the higher the income and profitability of microfinance institutions. With this in mind, one may wonder why MFIs are not doing just that to attain sustainability. However, there exists a risk return trade off. From economic theory, interest on loan is seen as a price for the loan. From normal price and demand relationship, more will be demanded at lower price than at higher prices. Thus, one will expect lower demand of loans when interest charged are very high, and vice versa. Contrary to this, there have been mixed findings about how the price and demand for MFI loans relate especially where demand for loans exceeds supply.

Armendariz and Morduch (2007) suggest that setting interest rate should be done with an incentive constraint in mind. That is, the interest rate charged should be an incentive in itself to induce borrowers' compliance. To be an incentive, the interest rate charged should be set at a level where, what the borrowers pay as interest is less than what they earn from investing the borrowed funds. This will help to mitigate the moral hazards (Armendariz and Morduch, 2007). This calls for MFIs to have demand driven products and proper market research before setting their interest rates. How appropriate the interest rate is will determine MFI's financial performance and its likely success or failure in its respective stage of growth.

Unfair regulation and government policies may affect the amount of income to be realized by microfinance institutions from interest income. For example, where a government puts an interest rate cap, as the case in Ireland in the 1960s MFIs became less competitive and later

disappeared as a result of unfair interest cap set by the government (Seibel, 2003). Besides, inflation may also affect the real interest income.

[B] Amount of Loan

Amount of loan (outstanding loan portfolio) is the amount of loaned that remain unpaid at the end of the period on which the interest amount is charged. The loan amount is the function of loan size and number of borrowers [clients], all of which are parameters of microfinance outreach. The loan size reflects the nature of clients and their poverty level (Morduch and Haley, 2002; Woller, 2002). It is generally assumed that, the smaller the loan size, the more poor clients will be reached by microfinance. The loan amount can be increased by either, increasing the loan size [however, it should be noted that increasing the loan size could end up making an MFI serving average poor and non poor clients as the poor may not afford the loan at the higher loan size.] or increasing the number of clients, or both.

(c) Loan Repayment Rate

Higher interest rates and large loan amount alone may not earn much interest income for microfinance institutions if the loan repayment rates are low. Thus, higher loan repayment rates are also required to earn higher income. According to Schreiner (2000) the sustainability of MFIs is linked to effective loan repayments and profitability. The repayment rate will depend on the nature of microfinance products, whether demand or supply driven, and its efficiency in implementing its collection policy (Evers *et al,* 2000).

The efficiency of microfinance institutions in collecting loans from its clients will lead to higher repayment rates and all things being equal, higher profitability (Schreiner, 2000). The

repayment rate may be affected by the MFI's delinquency management policy, lending type, number of and efficiency of loan offices, clients' investment opportunities, and consideration of the incentive constraint in setting the interest rates (Armendáriz and Morduch, 2007). A detailed discussion on the efficiency of microfinance and its empirical theory is made in Chapter 5, which links the efficiency of microfinance institutions with their financial sustainability.

(D) Other Income

Microfinance institutions also earn income from other activities in their operations. The activities include, sale of passbooks, application forms, and return from other products or services offered by the microfinance institution. The amount of other income to be collected by an MFI will depend on its product diversity and return expected from these products. Microfinance institutions need to be creative in introducing demand driven products to increase income from these products. However, to do it effectively there should be an enabling operating environment set by the governments to enable the MFIs to introduce new products.

2.5.2 Microfinance Expenses

Microfinance expenses are the second item used to determine profitability and, therefore, financial sustainability. The MFIs' expenses can be categorised into three main categories namely: operating expenses; administrative expenses and financing expenses. These are explained in the next subsections.

(a) Operating Expenses

Operating expenses are costs required to run the daily operations of MFIs. The operating costs of microfinance institutions include transaction costs and loan losses as a result of bad debts. According to Shankar (2007) transaction costs are a function of a number of groups that an MFI serves, and field workers compensation. The transaction costs are affected by the cost per transaction and the number of transactions. The number of transactions may depend on the number of clients and or the repayment frequencies, all of which relate to microfinance outreach. While repayment frequencies may help to improve or increase repayment rates the same also increases the total transaction costs and, therefore, may reduce profitability (Armendáriz and Morduch, 2007; Evers *et al,* 2000). As there is a trade-off between the two, microfinance institutions should strike a balance between costs and benefits of the increasing transaction costs and repayment rates. An appropriate product design and delivery methodology with flexible repayment schedules could help do this (Ledgerwood, 1999).

The transaction costs may also be affected by the nature of costs and how they relate to changes in the number of clients (that is whether the costs are fixed costs or variable costs); type of clients (poor, average poor or non poor) and the loan size. The fixed costs are those which remain unchanged in total when the number of clients changes (Brock and Herrington, 2007). The variable costs, on the other hand, represent the costs which remain unchanged per client, although they do change in total given the change in the number of clients (ibid). The way the microfinance product is designed, its delivery, and collections

arrangements will affect the transaction. This is another area in which MFIs need to show their efficiency.

Another component of operating expenses is loan losses as a result of bad debts. According to Meyer (2001) loan losses could be a result of poor product design, inappropriate lending types, ineffective microfinance policy with regard to loan follow ups, inefficient and corrupt loan officers. Poor delinquency management is reported to be the major cause of high loan losses and low repayment rates (CGAP 2008). Under few cases the loan losses are a result of poor targeting where MFIs target a certain geographical area only which eventually is struck by natural disasters (Pantoja, 2002). Another reason which may lead to low repayment rate and, therefore, high loan losses is inconvenient repayment structure, for example, where borrowers are given a very long time to repay by which time they have spent almost everything they earned on their investments (Armendáriz and Morduch, 2007). Thus, matching clients earning time pattern with the repayment time and frequencies is crucial. One of the possible causes of low repayment rate is moral hazard. This occurs when the borrower fails to meet the repayment commitment as agreed in contract because of either poor realization of project income or just decides not to make repayment.

(b) Administrative Expenses

The second element or category of microfinance expenses is administrative expenses. These are expenses incurred in running the organization. The expenses include staff salary, office running expenses, staff visits expenses, costs of running client training, transportation expenses, and costs incurred in setting-up and running a branch or collection centre.

According to Woller and Schreiner (2002) salaries are the largest element of the administrative expenses. The administrative expenses or costs can be categorised as fixed and variable costs. Variable administrative costs are those varying in total with the number of clients (Horngren *et al,* 2006). That is, their increase or decrease depends on increase or decrease in number of clients respectively. For these kinds of costs the total costs will increase with the increase in microfinance outreach as measured by the number of clients.

Most of microfinance administrative expenses are fixed in nature. That is, their total volume does not depend on the number of clients [within a certain relevant range]. Fixed costs of microfinance institutions may include staff salaries, office rent, and costs of running a branch. With these kinds of costs microfinance may increase the number of clients [outreach] at the same level of costs [These costs however, may change in total given the changes in the total number of clients where an MFI exceeds a certain level of operations on which the fixed costs were set]. Thus, all things held constant, the MFI's outreach will increase profitability as total fixed costs remain constant while the marginal income increases [However, this will depend on the difference between marginal income and marginal costs of each additional client joining the MFI].

(c) Financing Expenses

Microfinance institutions incur financing costs when sourcing their capital. The costs paid to providers of capital are known as costs of financing (Brealey *et al,* 2006; CGAP, 2003). Sources of capital for microfinance institutions include owners' shares (share capital), loans

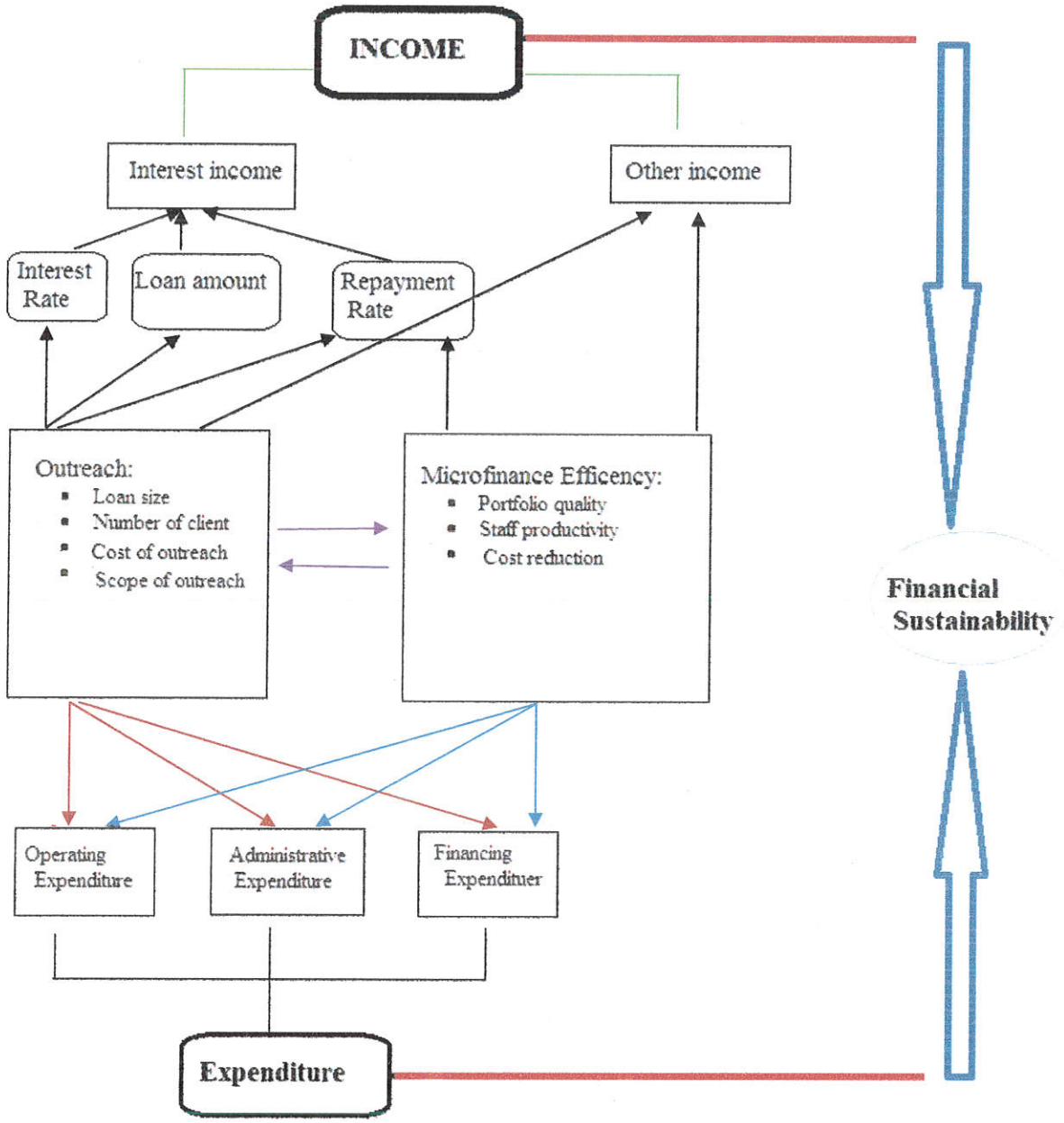
(both from capital market and concession loans), donations, and client savings and deposits. All factors held constant, higher financing costs, lead to lower profitability of an MFI.

A combination of cheap sources of capital will reduce the overall financing expenses and, therefore, increase profitability (Arun, 2005). However, this will depend on the existence of a legal and policy enabling environment. That is, whether MFIs are allowed to mobilise their capital from various sources of finance, and the costs related to complying with the rules and regulations in using these sources of funds. An efficient microfinance institution will operate at a reduced financing and overall MFI expenses. The same will also increase profitability and, therefore, lead to its financial sustainability.

2.5.3 Conceptual Framework on Financial Sustainability

In this study we develop a conceptual framework on financial sustainability of microfinance institutions from the accounting profitability theory. The framework expands on the key determinants of profitability: income and expenses. It is based on two microfinance performance parameters namely outreach and efficiency, which may affect their profitability. The outreach parameters may affect interest rate, loan amount, and repayment rates which are key determinants of interest income. They may also affect the volume of other income earned by microfinance institutions. The microfinance efficiency parameters include the quality of loan portfolio, cost reduction, and efficient use of microfinance human resources, all of which may affect the interest income and other income earned by microfinance institutions. Again, as indicated in the conceptual framework (Figure 2-2), both microfinance outreach and efficiency parameters may affect the volume of microfinance expenses, and, therefore, their profitability.

Figure 2-2: Conceptual Framework: Accounting Profitability Theory and Financial Sustainability of Microfinance Institutions



Source: [Ganka Daniel Nyamsogoro, 2010]

KEY:

Reduces average or total expenses

Increases marginal or total revenue

In the next section we explain the theoretical relationship between microfinance outreach and profitability or financial sustainability. We also present theoretical relationships between MFI efficiency and financial sustainability. Detailed discussion based on empirical theory and empirical approaches thereon on these relationships are presented in Chapters 4 and 5 which are on outreach and financial sustainability and efficiency and financial sustainability, respectively.

2.6 OUTREACH AND PROFITABILITY OF MICROFINANCE INSTITUTIONS

The long-term vision of MFIs is to provide sustainable financial services to the economically active poor who have lacked access to these services from the main stream of financial services (Satta, 2002). In developing countries, microfinance institutions also offer loans and technical assistance on how to start and develop a business (Hartungi, 2007).

From the above definitions of microfinance two goals of microfinance can be seen. These are reaching the poor (outreach) also known as social impact goal and becoming sustainable, commonly referred to as profitability objective. According to Schreiner (2000) profits are necessary but not sufficient, for sustainability. Yaron (1994) asserts that a successful microfinance institution should have both profitability and outreach in its objective. This adds another parameter to be considered when judging the sustainability of the MFIs, the outreach.

Conning (1999) defines outreach as the ability of MFIs to reach the ever-wide audience (also known as breadth of outreach) and especially the poorest of the poor (depth of outreach). It is "the social value of the output of a microfinance organization in terms of

depth, worth to users, cost to users, breadth, length, and scope" (Navajas *et al,* 2000:335) and a means to improved social welfare (Rhyne, 1998). According to Rhyne (1998) outreach is the only objective of MFIs; sustainability is but a means to achieve it. Microfinance literature, however, acknowledges the existence of the dual goals of microfinance: the outreach and profitability (Aubert *et al,* 2009; Armendáriz and Morduch, 2007; Cull *et al,* 2007; Brau and Woller, 2004)

One interesting question that normally arises when the dual goals of microfinance are being considered is whether or not there is a trade-off between sustainability (profitability) and targeting the poor (outreach). Taking the institutionists position, CGAP and best practice literature say no. Sustainability is a means to reach expanded outreach. Their argument is that the more sustainable a microfinance institution is the more possible for it to reach more poor people (Cull *et al,* 2007; Brau and Woller, 2004).

CGAP's fourth key principle of microfinance states that "financial sustainability is necessary to reach significant numbers of poor people. Most poor people are not able to access financial services because of the lack of strong retail financial intermediaries. Building financially sustainable institutions is not an end in itself. It is the only way to reach significant scale and impact far beyond what donor agencies can fund" (CGAP, 2004:1).

The arguments put forward imply that financial sustainability precedes outreach. In this study, however, we show that the two, outreach and financial sustainability depend on each other throughout the life period of microfinance institutions.

2.7 MICROFINANCE EFFICIENCY AND FINANCIAL SUSTAINABILITY OF MICROFINANCE

According to Woller (2000) there are two factors which affect MFIs self-sufficiency and, therefore, their financial sustainability. These are institutional efficiency and return on portfolio. These two form a major part in an MFI's financial performance. Efficiency refers to attaining more output at the same level of input. Thus, an MFI will be considered efficient if compared to other MFIs, at the same level of input, more output is achieved. In as far as MFIs are concerned; Woller (2000) defines efficiency as the most effective way of delivering small loans to the very poor. There are several indicators of MFIs' efficiency. These can be categorised into three main categories namely: asset and liability management; human resources management and loan portfolio quality. These measures of efficiency indicate that the more the output at a given level of input the better the contribution towards financial sustainability.

The efficiency parameters of microfinance institutions are controllable by MFI management. We, therefore, refer to these factors as internal factors. Some factors are external to an MFI and, therefore, cannot be influenced by internal management. These are external factors. One of these factors is the regulatory framework of microfinance institutions. This represents the environment within which an MFI operates.

The roles of regulatory framework and how it may affect the efficiency of an MFI need to be considered when assessing the efficiency of an MFI. According to LOGOTRI (2006) if

MFIs are to be financially sustainable they have to be registered under a suitable legal form to ensure a sufficient equity base. This means that MFIs need to be properly regulated.

Based on the accounting profitability theory reviewed in this chapter, the reviewed literature indicates that several factors could affect the financial sustainability of microfinance institutions. These factors can be grouped into two: those related to microfinance outreach and those related to microfinance efficiency. Detailed discussions on both empirical theory and empirical findings to this study are made in Chapter 4 [which links microfinance outreach and financial sustainability] and Chapter 5 [which indicates how microfinance efficiency could affect its financial sustainability].

CHAPTER 3

METHODOLOGY

3.0 INTRODUCTION

This chapter presents research methodologies and design of the study. The research design is the framework or plan for a study used to collect and analyse data (Churchill and Iacobucci, 2005). The chapter starts by description of methodologies used in this study. The second part of the chapter introduces the research design that was used in this study. The last section in this chapter presents the econometric analysis approaches used in Chapter 4 and 5.

3.1 METHODOLOGIES USED IN THIS STUDY

In this study, we tested the applicability of existing theories (what is already known as found in other studies) to MFIs in Ethiopia, by analyzing the cause and effects relationships between variables. The study followed a quantitative research approach. The quantitative research approach is useful where quantitative data are generated from large samples to test applicability of the existing theory using statistical analysis (Collis and Hussey 2003). The study builds on the methodology used in different studies in microfinance (Kyereboah-Coleman and Osei, 2008; Cull *et al,* 2007; Makame and Murinde, 2006; Woller and Schreiner, 2002), which used multiple regression to study some aspects of financial sustainability of microfinance institutions. Building on Woller and Schreiner's study, this study links outreach and financial sustainability of microfinance institutions in Ethiopia. The study also extends on the study by Kyereboah-Coleman and Osei (2008). We use measures of outreach (including number of outreach as in Kyereboah-Coleman and Osei, 2008) to measure their effect on profitability of microfinance institutions in Ethiopia. This is done in

Chapter 4. Chapter 5, which links microfinance efficiency and financial sustainability, builds on the methodology used in Cull *et al* (2007) and Makame and Murinde (2006).

The study used the accounting profitability theory approach to study the determinants of financial sustainability of microfinance institutions in Ethiopia. In addition to this, this study was attempted to show how the financial sustainability affects microfinance outreach. It also adopted the classification of MFIs in to three strata [large, medium, and small MFIs]. The classification was meant to provide clear explanation of the factors affecting their financial sustainability.

3.2 RESEARCH DESIGN

This study attempts to identify the factors affecting financial sustainability of MFIs in Ethiopia. It will also establish whether factors found to be significantly affecting financial sustainability of large MFIs in other developing countries, with highly developed MFIs, are also equally significant to Ethiopia's MFIs. We use quantitative data analysis approaches to establish the cause-effect relationships based on factors reported in previous studies as explained in theoretical background [Chapter 2] and empirical theory [Chapters 4 and 5].

The study used longitudinal research design to collect longitudinal data for six years of 12 MFIs from Association of Ethiopian Microfinance Institutions [AEMFI], mixmarket and National bank of Ethiopia [NBE]. The use of longitudinal data [panel data] enhances tracking changes in constructs [measured variables] and relationships overtime (Hair *et al*, 2006). It allows us to control for certain unobserved characteristics of individual firms

(MFIs) and facilitates causal inference in situations where inferring causality would be very difficult in case we had only one year (single cross section) data. Moreover, the use of longitudinal data allows us to study the importance of lags in behaviour or the results of decision making, as in longitudinal or panel data, both the values and the ordering of the data points have meaning (Wooldridge, 2006; Verbeek, 2004). By studying the repeated cross-section of observations, panel data are better suited to studying dynamic changes (Gujarat, 2003). Although the age of the majority of MFIs studied is more than six years, the six year period is selected because it is the period within which relevant data can be obtained.

3.2.1 Sample

According to Collis and Hussey (2003), a sample of subjects is drawn from a population and studied to make inferences about the population. In this study, a sample of MFIs in Ethiopia was studied with the intention to identify factors that affect the financial sustainability of the MFIs.

According to the NBE, currently there are 31 MFIs. The study used a sample of 12 MFIs, from a sample frame of 21 MFIs. As it is mentioned above the study period covers six years [from 2005 up to 2010]. Because of this there were only 24 MFIs available from which the study period begins [from 2005]. But some MFIs were terminated [liquidated] in some future years before the study period covers [that is before 2010] for example Aser Micro-financing Institution was liquidated in 2008 so it was dropped from sample frame. In addition to this Meqedela and Leta MFIs also dropped from the sample frame as they are not had sufficient data for the study.

As a result of these things the sample study only considers those MFIs that fulfill six year in operations [from 2005 up to 2010] and those MFIs having the required variable.

Table 3-1: Micro Finance Institutions Operating in Ethiopia as of June 2005

NO	Microfinance institutions	Region	TOTAL ASSET		
			Amount	Size	percent[%]
1	ACSI	Amhara	527,532,000	**Large**	27.7
2	DCSI	Tigray	776,538,200	**Large**	40.8
3	OCSSCO	Oromia	175,538,200	**Large**	9.2
4	OMO	SNNP	91,977,400	**Large**	4.8
5	SFPI	A.A	15,861,200	**Medium**	0.8
6	Gasha	A.A	9,243,100	**Small**	0.8
7	Wisdom	A.A	29,963,000	**Medium**	1.6
8	Sidama	SNNP	19,793,200	**Medium**	1.0
9	Aser	A.A	1,137,000	**Small**	0.1
10	AVFS	A.A	6,072,000	**Small**	0.3
11	B G	Oromia	6,191,100	**Small**	0.3
12	Peace	A.A	14,447,500	**Medium**	0.8
13	Meket	Amhara	2,205,400	**Small**	0.1
14	ADCSI	A.A	137,800,000	**Large**	7.2
15	Meklit	A.A	5,786,800	**Small**	0.3
16	Eshet	Oromia	10,739,900	**Medium**	0.6
17	Wasasa	Oromia	10,042,600	**Medium**	0.5
18	Shashemene	Oromia	3,351,400	**Small**	0.2
19	Benishangul-Gumz	Benishang	15,086,800	**Medium**	0.8
20	Metemamen	A.A	2,673,000	**Small**	0.1

21	Agar MFI	A.A	26,073,000	**Medium**	1.4
22	Meqedela	Amhara	NA	**Small**	NA
23	Harbu	A.A	NA	**Small**	NA
24	Leta	A.A	NA	**Small**	NA

Source: NBE

For meaningful analysis we stratified the MFIs based on their size [Total Asset] because the Ethiopian MFIs shows high variability (measured by coefficient of variation as different unit of measurement exist for different variables such as age is measured in years whereas Total Asset in dollar terms) in terms of size rather than age, legal status, financial intermediation, and lending method. The standard classification of MFIs in terms of size according to the Micro banking Bulletin (MBB) is those having a Total Asset of less than 2 million dollars are small, those having a Total Asset of between 2 and 8 million dollars are medium and those above 8 million dollar Total Asset are large. According to Ghauri and Gronhaug (2005) in stratified sampling the population is divided into mutually exclusive and exhaustive subsets. MFI size is used to divide the population into three exclusive and exhaustive subsets. This is done to ensure that each MFI by size is properly represented. MFIs making up the sample is categorised in three size-based strata namely: the large MFIs, the medium MFIs and the small MFIs.

Note: Currency Equivalents (As of June 2005)

1 USD (United States Dollar) = 8.3252 Birr

The 12 MFIs sample are made up of 4 from large MFIs (or33.3 percent), 4 from medium MFIs [or 33.3 percent] and 4 from small MFIs [or 33.3 percent].

Table 3-2 provides a detailed sample composition by MFI type. We call these 12 study units financial units or MFIs for data analysis purposes. Thus, when the 12 MFIs are referred to in this study we refer to the 12 financial units, which were also our study units.

Table 3-2: Sample Composition

Name of MFIs [Population]	Type of MFIs	Total number of MFIs by type	Number of sample [Study units]
1. ACSI 2. DCSI 3. OCSSI 4. ADCSI 5. OMO	Large MFIs	**5**	**4**
1. Wisdom 2. SFPI 3. Sidama 4. Peace 5. Eshet 6. Wasasa 7. Benishangul-Gumz 8. Agar	Medium MFIs	**8**	**4**
1. Gasha. 8. Harbu 2. AVFS 3. B G 4. Meket 5. Meklit 6. Shashemene 7. Metemamen	Small MFIs	**8**	**4**

(a) Sample Size

The sample size is determined after considering the purpose of using the sample and variables under study. The purpose of using the sample is to make inference about the population also known as generalization (Collis & Hussey, 2003). To achieve this, we considered the general rule of thumb that for generalizability, a ratio of number of observations to number of variables should never 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 variables that determine or explain the changes in the dependent variable. If this minimum is not followed, there is a risk for overfitting, ". . . making the results too specific to the sample, thus lacking generalizability" (Hair, Anderson, Tatham, & Black, 1995, p. 105).

Moreover, although the minimum is 5:1, "the desired level is between 15 to 20 observations for each independent variable", at which level as Hair *et al* (2006) have put it, "the results should be generalizable if the sample is representative" (Hair *et al,* 2006: 196). To meet required ideal ratio we will consider the number of variables under study. Our study is divided in two main topics: outreach and financial sustainability (Chapter 4) and microfinance efficiency and financial sustainability (Chapter 5). The outreach and financial sustainability and microfinance efficiency and financial sustainability had 9 [nine] independent variables for each of them. Applying the general rule of thumb that for generalizability, a ratio of number of observations to number of variables should never fall below 5:1 this required the number of observations should be at least 40. With six years data from each MFI and the 12 study units (financial units or microfinance institutions) the actual

number of observation in this study were 72. Moreover, compared to previous studies, the sample in this study is somewhat equal but larger for with 72 observations with a study by Woller and Schreiner (2002) had a sample size of 13 MFIs with 39 observations, while Cull *et al* (2007) had a sample of 124 MFIs with 124 observations (equal to about 18 observations per independent variable).

(b) Sample Selection

The sample selection criteria are influenced by three factors. First is to have representation of the population for generalizability, second, the MFI should have been in operation for at least six (6) years [as this is the maximum time possible for most of MFIs in our population within which the required data could be obtained] and third, the MFI is expected to have the required variables for this study.

The sample is selected using stratified sampling techniques. According to Ghauri and Gronhaug (2005) in stratified sampling the population is divided into mutually exclusive and exhaustive subsets. Total asset or size, is used to divide the population into three exclusive and exhaustive subsets. This is done to ensure that each type of MFI by size structure is properly represented. MFIs making up the sample were categorised in three size-based strata namely: the large MFIs, the medium MFIs and the small MFIs.

Variability and thus, standard error of estimates are reduced with stratified sampling (Ghauri and Gronhaug, 2005). The group members are given a higher chance of being selected within the same group rather than when they are put together in a population. Thus, stratified

sampling is appropriate in a study like this which focuses on specific issues (like MFI types by size), which need fair representation by group members. For this reason, as Ghauri and Gronhaug (2005) have explained, high precision can be achieved in stratified sampling with the same sample size or same precision with smaller sample size. Moreover, the stratified sampling can give separate results for each stratum The 12 study units sample is thus, made up of 4 from large MFIs (or33.3 percent), 4 from medium MFIs [or 33.3 percent] and 4 from small MFIs [or 33.3 percent]. It should be noted that, as the three strata had more than four MFIs we applied simple random sampling to select four (4) MFIs form each strata. The six years data from the actual sample makes a maximum of 72 observations for the study. As explained earlier, the number of observations is enough for generalizability of the results.

3.2.2 The Data

This study is meant to identify factors affecting financial sustainability of MFIs in Ethiopia. It will also confirm or contradicts the reported findings from previous studies on factors responsible for financial sustainability. Based on the reviewed literature and the conceptual framework developed, the data required for both dependent and independent variables included outreach and efficiency related data are collected from different sources such as the Association of Ethiopian microfinance Institutions, (AEMFI), National Bank of Ethiopia and mixmarket and some variables are based on author' calculations. Specific data required and their respective measurements are explained in each of the key topics under study (in Chapter 4 and 5).

3.2.3 Data Collection

This study focused on testing the existing theory based on available tools and data collected. No detailed information using informal or qualitative tools (e.g. peoples' perception) will collect. The study will base on reported behaviour not observed behaviours. The field for data collection was done between February and March 2012. Data is collected based on their significance in determining financial sustainability as predicted in the reviewed literature.

3.2.4 The Conceptual Model

The study makes the use of panel data to explain the relationship between dependent and independent [explanatory] variables. Panel data or longitudinal data are data sets containing repeated observations of the same individuals [MFIs] collected over a number of periods (Johnson and Dinardo, 2007). In essence panel data is a combination of cross-section and time series data (Gujarat, 2003). That is, cross-section data collected from the same individuals over a time.

Panel data relates to individuals [MFIs] over time, and, therefore, is bound to be heterogeneous in these individuals. The techniques in panel data estimation can take such heterogeneity explicitly in to account by allowing for individual-specific [MFI specific] variables (Gujarat, 2003). In this study where it was expected to establish the relationships between dependent and independent [explanatory] variables with specific focus on individual specific characteristics, a panel data model was an ideal one for consideration.

The panel data model was selected because it can better detect and measure effects that simply cannot be detected in pure cross-section or pure time series data (Wooldridge, 2006). Moreover, panel data gives "more informative data, more variability, less collinearity among

variables, more degree of freedom, and more efficiency" (Gujarat, 2003). The conceptual or general panel data regression model used is of the form:

$$\mathbf{Y}_{it} = \alpha_i + \beta \text{'} \mathbf{X}_{it} + \epsilon_{it}$$

Where: Y_{it} is the value of dependent variable [measure of financial sustainability] for cross-section unit *i* at time *t*, where $i = 1....n$ and $t = 1, ..., T$; α_i is a heterogeneity or individual effect. It contains a constant term and set of individual or group specific variables which may be observed, such as type of MFIs, Product type, and so no, or unobserved such as MFI specific characteristics [like skills of MFI personnel or preference and so on], which are taken to be constant over time (Greene, 2003); β measures the partial effect of X_{it} in period *t* for the unit *i*; X_{it} represents the j^{th} explanatory variable for unit *i* at time *t*. There are K explanatory variables indexed by j= 1.... K and, therefore, X_{it} is a K – dimensional vector; and ϵ_{it} is the error term (Greene, 2003).

In fixed effect model, the individual effect α_i is correlated with explanatory variable X_{it}, while in random effect model, the individual effect α_i is uncorrelated with explanatory variable X_{it} and thus, the error term becomes $[u_i + \epsilon_{it}]$, where u_i is a group specific random element, similar to ϵ_{it} except that for each group, there is but a single draw that enters the regression identically in each period.

3.2.5 Data Analysis

The data collected from National bank of Ethiopia [NBE] and Association of Ethiopian Microfinance Institutions [AEMFI] were arranged in one format to enable inter-MFI comparison and enter in a spread sheet before analyzing them using EVIEWS econometrics computer software.

The EVIEWS software was selected because following its ability to help researchers to analyze research easily and efficiently (Chris Brooks, 2008). Moreover, the researcher is familiar with this software and hence, convenient.

The analysis will set to indicate, first, which factors reported in the literature are relevant to Ethiopia's MFIs and, second, what are specific factors that significantly affect financial sustainability of MFIs. Specific variables description and measurement are done in each of the two major topics in this study. These are outreach and financial sustainability and microfinance efficiency and financial sustainability.

3.2.6 Dealing with Omitted Variables Bias

Coefficients derived from ordinary multiple regression models may be subject to omitted variables bias. This is when some variables which were not included in the model affect the dependent variable and, therefore, estimating the coefficients without controlling for these variables lead to omitted variable bias (Hsiao, 2007; Woodridge, 2006; Greene, 2003; Gujarati, 2003).

Dealing with omitted variables bias one needs to control for unobserved effect of these omitted variables. How the control is done will depend on the nature of the omitted variables. That is, whether they are constant or changing over time and whether they are constant or changing over cases. These are also known as the time specific and individual (case) specific effects of unobservable or omitted variables (Hsiao, 2007). Econometric literature suggests two common methods of dealing with these omitted variables. These are the fixed effect and random effect (Chris Brooks, 2008; Hsiao, 2007; Johnson and Dinardo, 2007; Woodridge, 2006)

According to Chris Brooks (2008) the fixed effect model assumes that the difference across case or MFI as used in this study can be captured in differences in the constant term. The fixed effect model allows the unobserved individual case effect to be correlated with included variables (Chris Brooks, 2008; Hsiao, 2007; Johnson and Dinardo, 2007; Woodridge, 2006). Thus, the changes in variables over time (as a result of unobservable effect of omitted variable), can be utilised to estimate the effects of the independent variables on the dependent variable., therefore, the fixed effect model is appropriate when you want to control for the omitted variables that differ across case (MFI) but are same or constant over time (ibid).

The between effects model is used when you want to control the effect of omitted variable that are same or constant across case but differ over time. In essence, when you consider the nature of the effects of omitted variables, the between effect is the opposite of the fixed effect model. The between effect model is not however, commonly used in practice as it

involves loss of information as the regression is based on the mean values of each variable from each case (Dougherty, 2006).

When however, the effect of some omitted variables differ across case but are sameover time (as in fixed effect model), and yet still the effect of other omitted variables are the same across case but differ over time, the random effect model is the appropriate model to be used (Hsiao, 2007; Dougherty, 2006; Green, 2003). The random effect model applies when the individual specific (differ across case) effects are strictly uncorrelated with the included independent variables. It is appropriate when the sample is believed to be randomly selected and, therefore, is representative of the population (Hsiao, 2007; Greene, 2003; Gujarati, 2003). The next sections present the econometric analysis approaches used in each of the two chapters where detailed study findings are discussed.

3.3 ECONOMETRIC ANALYSIS APPROACHES

This section presents the econometric analysis approaches used to analyse the relationship between outreach and financial sustainability in Chapter 4 and the relationship between microfinance efficiency and financial sustainability in Chapter 5.

3.3.1 Microfinance Outreach and Financial Sustainability

This section explains the econometric analysis approaches used in Chapter 5 which links microfinance outreach and financial sustainability to identify the factors affecting financial sustainability. It covers the correlation analysis and variable selection, model specification, and the choice between random effect and fixed effect models.

(a) Correlation Analysis and Variable Selection

Before running the regression analysis, we performed pairwise correlation analysis. The analysis was meant to first, indicate whether variables were correlated or not. If variables were not correlated then using several simple regressions or one multiple regression models could give the same results (Dougherty, 2006). We did not found that the variables were correlated. Thus, there was not multicollinearity problem in our model.

Multicollinearity condition exists where there is high, but not perfect, correlation between two or more explanatory variables (Johnston and Dinardo, 2007; Wooldridge, 2006). According to Churchill and Iacobucci (2005) when there is multicollinearity, the amount of information about the effect of explanatory variables on dependent variables decreases. As a result, many of the explanatory variables could be judged as not related to the dependent variables when in fact they are (ibid).

Following Wooldridge (2006) we did a pairwise correlation analysis (see Appendix1 (a))

(b) The Classical Linear Regression Model [CLRM] Assumptions or Diagnostic Tests

Multiple regressions are based on a set of assumptions that have to be met before running the regression analysis and some tests have been done before interpretation of the result is made. This is required to ensure that the results are what they appear to be. In this section we explain how the model was satisfied the CLRM assumptions.

The assumptions underlying the multiple regression are: normality, referring to the shape of the data distribution; homoskedasticity, which requires that dependent variables exhibit

equal levels of variance across the range of explanatory variables; linearity association between variables; and absence of correlated errors [autocorrelated] (Hair *et al,* 2006). a little

Test for ***normality*** – we tested the null hypothesis of normally distributed errors by One of the most commonly applied tests for normality is the Bera-Jarque [BJ]. If the residuals are normally distributed, the histogram should be bell-shaped and the Bera--Jarque statistic would not be significant. This means that the *p*-value given at the bottom of the normality test screen should be bigger than 0.05 to not reject the null of normality at the 5% level. In this case, the residuals are a little positively skewed and are leptokurtic. Hence the null hypothesis for residual normality is not rejected (the *p*-value for the BJ test is greater than 5 percent), implying that the inferences we make about the coefficient estimates could not be wrong. This is indicated in Appendix 1(b).

We tested for ***serial correlation*** in error term using Breusch-Godfrey test for autocorrelation in panel data. *DW* is a test only of whether consecutive errors are related to one another. So, not only can the *DW* test not be applied if a certain set of circumstances are not fulfilled, there will also be many forms of residual autocorrelation that *DW* cannot detect. Therefore, it is desirable to examine a joint test for autocorrelation that will allow examination of the relationship between u_t and several of its lagged values at the same time. The Breusch-Godfrey test is a more general test for autocorrelation up to the *r*th order.

For this regression assumption, we tested the null hypothesis that there is no autocorrelation. The p-values of the test statistics from both versions of the test in this case

is that the null hypothesis of no autocorrelation should not be rejected because the test statistics are not significant [greater than 0.05] therefore there were no serial correlation in our model. (see Appendix 1 (d)).

We further tested for existence of ***heteroscedasticity*** across the range of explanatory variables using Breusch-Pagan-Godfrey test, which tests the null hypothesis that there is no heteroscedasticity (that is there is constant variance or homoscedasticity) across the range of explanatory variables. In this case, all the F- ; $\chi 2$ ('LM'); and 'Scaled explained SS' versions of the test statistic give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values are considerably in excess of 0.05 [The test statistics were not significant indicating there were not the presence of heteroscedasticity across the range of explanatory variables]. (see Appendix 1 (c)).

Regression analysis further requires that the values of dependent variable for two different periods are independent of each other. That is they are stationery. When, however, the value of the current period equals last period's value plus a certain time dependent amount (disturbance) this is called a unit root process (Wooldridge, 2006). When a regression is run in the presence of unit root, the resulting estimates are spurious. That is, results have no economic meaning.

To check for stationarity in the dependent variable we tested for the existence of a ***Unit root*** in the dependent variable (FSS) based on the augmented Dickey-Fuller (ADF) test for panel unit root. We tested the null hypothesis that there is unit root. The p-value of the test statistic

is strongly statistically significant and we, therefore, rejected the null that there is unit root. (see Appendix 1 (e)).

(c) Random Effect versus Fixed Effect Model

This study used panel data models where the random effect and fixed effect models could be used to estimate the relationships among variables and thereby taking care of the omitted variables. Deciding on whether the random effect (RE) model or fixed effect model (FE) is an appropriate model for this study depends on whether the individual effect is fixed or random. According to Cameron and Trivedi (2009) if the effects are fixed the random effect model estimators are inconsistent and fixed effect model should be used and vice versa.

To check which of the two (RE and FE) models provided consistent estimates; we employed the standard Hausman test suggested in the econometric literature (Hsiao, 2007; Baltagi, 2005; Greene, 2003; Gujarati, 2003). The Hausman test tests the null hypothesis that RE provides consistent estimates compared to FE model. The test result was not statistically significant (at 5% significance level). The *p*-value for the test is greater than 5%. Thus, we could not reject the null hypothesis that RE provides consistent estimates, indicating that the random effects model is appropriate than the fixed effects specification (see Appendix 1 (f).

(d) The effects of financial sustainability on Breadth of outreach

The Third objective of our study is to identify the effects of MFIs' financial sustainability on their Breadth of outreach. As mentioned in theoretical background chapter microfinance institutions' breadth of outreach and financial sustainability depend on each other. Thus,

their relationship is two way with each one of them determining the other (Cull *et al*, 2007; Woller and Schreiner, 2002; Fruman and Paxton, 1998). We identified the effects of financial sustainability on the breadth of outreach where number of active borrowers [Breadth of outreach] variable is dependent, and the FSS is an explanatory variables.

3.3.2 Microfinance Efficiency and Financial Sustainability

In Chapter 5 we link the microfinance efficiency to their financial sustainability. This section explains the econometric analysis approaches used in Chapter 5. The section covers the correlation analysis and variable selection, model specification, and the choice between random effect and fixed effect models.

(a) Correlation Analysis and Variable Selection

Again in this section, pairwise correlation analysis was done to facilitate the selection of variables to be included in the model used in Chapter 5. The analysis shows no strong correlation among most of the variables. However, there was strong correlation between two variables. The correlation coefficient is 0.9152 for personnel expenses ratio and operating expenses ratio which is highest. This indicates that there is a cause for multicollinearity problem. As a result we dropped the personnel expenses ratio variable from our model. The detailed pairwise correlations are in Appendix 2(a).

(b) The Classical Linear Regression Model [CLRM] Assumptions or Diagnostic Test

This sub section explains how the model was satisfied the CLRM assumptions for used in Chapter 5 which links microfinance efficiency and financial sustainability. As we did for

Chapter 4, we checked to ensure that our model meets the basic regression assumption of ***normality***. We tested the null hypothesis of normally distributed errors by Bera-Jarque [BJ]. In this case, the residuals are a little negatively skewed and the Kurtosis coefficient is exactly 3.3056. Hence the null hypothesis for residual normality is not rejected (the *p*-value for the BJ test is strongly greater than 5 percent), implying that the errors are normally distributed. This is indicated in Appendix 2(b).

In addition to normality and linearity check, we checked for ***serial autocorrelation*** in error term using the Wooldridge test for autocorrelation in panel data. We tested the null hypothesis that there is no autocorrelation. The test statistic was statistically insignificant (see Appendix 2(c)). We, therefore, could not reject the null that there was no autocorrelation.

We also tested for the existence of constant variance (homoskedasticity) assumption. We used the Breusch-Pagan test, which tests the null hypothesis that there is no ***heteroscedasticity*** across the range of explanatory variables. The test statistic was statistically significant and, therefore, we rejected the null hypothesis that there is no heteroscedasticity. To remedy the heteroscedasticity, we adopted variable transformation using log transformation. The log transformed variables also help to attain the linearity in parameters which is a requirement for the regression analysis (Cameron and Trivedi, 2009; Hair *et al,* 2006; Wooldridge, 2006). The detail test for heteroscedasticity before and after the transformation can be seen in Appendix 2: (d) and (e) respectively. Moreover, because in

Chapter 5 the dependent variable is FSS as in Chapter 4, we did not recheck for the ***unit root*** as we had done it in the previous sections [in appendix 1 (e)].

(c) Random Versus Fixed Effect Models

For choosing between random effect (RE) and fixed effect (FE) models we employed Hausman test which compares the coefficients of two estimators where one is considered consistent under null hypothesis (Cameron and Trivedi, 2009). We tested the hypothesis that RE provides consistent estimates compared to FE model. The Hausman test statistic was not significant (see Appendix 2 (f)) and, therefore, we could not reject the null. This indicated that the RE model gives consistent result.

CHAPTER 4

OUTREACH AND FINANCIAL SUSTAINABILITY

4.0 INTRODUCTION

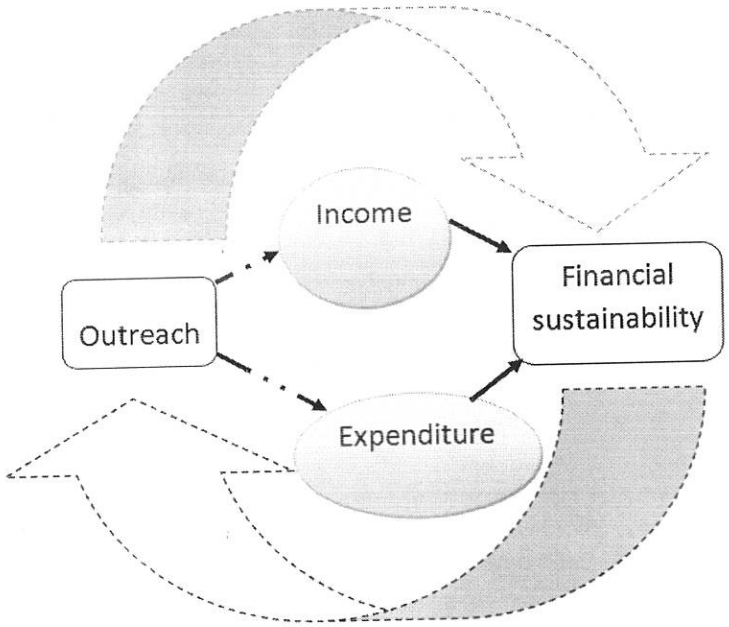
This chapter links outreach and financial sustainability, based on the accounting profitability theory as explained in Chapter 2 in order to study factors affecting financial sustainability of microfinance institutions in Ethiopia. The accounting profitability theory is used to explain various factors that can affect the number and riskiness of clients, the income and expenses of an MFI and, therefore, their profitability. First, we investigate what of the factors reported in previous studies as significantly affecting the financial sustainability of microfinance institutions also apply to Ethiopian MFIs. Second, we link financial sustainability to outreach in search of identifying causality and dependability between the two. We attempt to show how not only the microfinance breadth of outreach affects the financial sustainability but also how the financial sustainability affects the breadth of outreach.

The chapter is structured as follows: We begin the chapter by explaining the conceptual framework for outreach and sustainability. This is the first part in this chapter. Part two of this chapter presents the empirical theory based on the literature reviewed on outreach and financial sustainability thereby indicating the linkage and interdependence between the two. The third part of the chapter presents the specific research questions identified as gaps in the reviewed literature. They are the main focus of this study. Part four describes the variables and their measurement. This is followed by the descriptive results. The last section presents the econometric results.

4.1 CONCEPTUAL FRAMEWORK FOR OUTREACH AND SUSTAINABILITY

From the accounting profitability theory presented in Chapter 2, we summarize the relationship between outreach and financial sustainability in the following conceptual framework.

Figure 4-1: Outreach and Financial Sustainability Conceptual Framework



Source: [Ganka Daniel Nyamsogoro, 2010]

The conceptual framework in Figure 4-1 indicates two way relationships between outreach and financial sustainability. While outreach could lead to financial sustainability, the financial sustainability enhances the microfinance institutions' outreach. Factors that affect outreach may affect both income and expenses and, therefore, profitability of a MFI. These factors are size of microfinance, microfinance product delivery methodology, and dimensions of outreach. The dimensions of outreach are: depth of outreach (measured by loan size); breadth of outreach measured by number of clients reached); cost of outreach

(interest rate and other transaction related costs); Scope of outreach (types of products), and length of outreach (time frame within which a client enjoys the product or service). The empirical theory indicating the relationships between outreach and financial sustainability is presented in the next section.

4.2 EMPIRICAL THEORY

Studies indicate contradicting relationship between outreach and sustainability. On one hand, there are studies that indicate an existence of a trade-off between making profit (financial objective) and reaching the poorest also called social objective (Karin Korse, 2011; Hermes *et al,* 2008; Hermes and Lensink, 2007; Makame and Murinde, 2006; Olivares-Polanco 2005; Conning, 1999; Paxton and Cuevas, 1998; Hulme and Mosley, 1996; Von Pischke, 1996). A debate on the trade-off between profit and outreach is based on whether MFIs should pursue the financial objective (profitability) instead of social objective (outreach) or otherwise. Moreover, whether the MFIs should target the poor or the very poor has been an issue of debate in recent years. It has been argued that a MFI that abandons the poor by selling big loans and big deposits is not a sustainable MFI because it no longer supplies microfinance (Schreiner, 2000). Without the poor, a supposed MFI is no longer different from a bank (Hulme and Mosley, 1996).

On the other hand, however, there are studies which indicate non-existence of trade-off between outreach and sustainability (Paxton, 2003; and Woller and Schreiner, 2002; Navajas *et al,* 2000; Schreiner, 2000). It has been reported that sustainability affects outreach (Navajas *et al,* 2000) and the market for microfinance cannot be saturated if MFIs are not

making profits (Schreiner, 2000). The argument put forward is that without profits MFIs will be unable to sustain their operations (Schreiner, 2000). Moreover, a study by Woller and Schreiner (2002) has revealed that outreach and sustainability depend on each other indirectly. This further suggests the non-existence of trade-off between outreach and the financial sustainability of microfinance institutions.

The next sections discuss the dimensions of outreach developed by Schreiner (2002) which are used to study the relationship between outreach and profitability. These are: breadth of outreach; depth of outreach; cost of outreach; scope of outreach (types of products), and length of outreach. Schreiner's dimensions of outreach have also been used in other studies to explain determinants of financial sustainability (Mersland and Strom 2008; Woller 2006; Woller and Schreiner, 2002). The same aspects are also used by the USAID when evaluating the performance of microfinance institutions (Mersland and Strom 2008).

(a) Breadth of Outreach

The breadth of outreach refers to the number of poor served by a microfinance institution (Hishigsuren, 2004; Woller and Schreiner, 2002; Navajas *et al*, 2000). Various studies have used either the number of borrowers or number of clients as measures of microfinance breadth of outreach (Mersland and Strom, 2009; Hermes *et al,* 2008; Kyereboah-Coleman and Osei, 2008; Hartarska, 2005; Woller and Schreiner, 2002). It is generally assumed that the larger the number of borrowers or clients the better the outreach. According to LOGOTRI (2006) the number of borrowers is the biggest sustainability factor. Thus, larger numbers of clients would lead an MFI to become more sustainable. However, this argument

may be strong if and only if all other things are held constant. Otherwise, the volume in itself may lend no big impact on sustainability. To substantiate this, one would need to consider the Grameen bank with a very broad client base but it has not yet attained self-sufficiency (Conning, 1999) although it remains to be among the best examples in the microfinance industry.

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). The difference in findings between Woller and Schreiner (2002) and Woller (2000) could be attributed to methodological differences in the two studies. While Woller (2000) used a bi-Variate correlation, studies in Hartarska (2005) and Woller and Schreiner (2002) used multiple regression analysis approach. The two should not necessarily give the same result. These findings indicate that the number of borrower may or may not affect the financial sustainability of an MFI. This study analysed the relationship between the number of borrowers and the financial sustainability in Ethiopian context to explain whether or not the number of borrowers affect the financial sustainability.

(b) Depth of Outreach

The depth of outreach refers to the value the society attaches to a net gain of a given client (Navajas *et al,* 2000). Hulme and Mosley (1996) assert that without the poor, a supposed

MFI is no longer different from a bank. Their argument is that, outreach should not be measured by just total number of clients but it should rather be based on the number of poor clients. This is because, in the total number of microfinance clients there could be some who are non poor. According to Ledgerwood (1999) the number of clients as a measure of outreach considers only the total number of clients served from various products of an MFI without their relative level of poverty. Microfinance's loan size (average loan size) has been used as a proxy measure of depth of outreach (using relative level of poverty). Smaller loans indicate poorer customers (Mersland and Strom, 2009; Cull *et al*, 2007; Adongo and Stork 2006; Hartarska, 2005; Woller and Schreiner 2002; Schreiner, 2001).

According to Woller and Schreiner (2002) the relationship between depth of outreach and financial self-sustainability is multidimensional. Each relates to the other indirectly. In their study, Woller and Schreiner (2002) found that depth outreach (as measured by average loan size) has a positive relationship with financial self-sufficiency. Woller and Schreiner's finding as they put it, is evidence against a wide spread belief that small loans are highly-risky and associated with lower financial sustainability. Contrary to the findings by Woller and Schreiner (2002) the study by Adongo and Stork (2006) reports that both loan size and number of loans are positively associated with financial sustainability.

Although delivering small loans to the poor and the relatively hard-to-reach clientele is 'inherently' costly (Conning, 1999 and Hulme and Mosley, 1996), a recent study by Cull *et al* (2007) indicates that institutions that make smaller loans are not less profitable on average compared to those making bigger loans (Cull *et al,* 2007). Moreover, it has been reported

that there is a negative correlation between the depth of outreach and the subsidy dependency index (Fruman and Paxton, 1998). This indicates that profitability and the depth of outreach can be attained simultaneously.

The loan size, however, should be used with caution. As Woller and Schreiner (2002) have put it, 'the average loan size may not measure what we think it measures' because there is no evidence to support it apart from the current evidence that only non poor apply for larger loans (Dunford, 2002; Woller and Schreiner 2002). Moreover, when there is varying term to maturity as asserted by Schreiner (2001), the average loan size will lead to misleading conclusion. This comes from the fact that the finance is the exchange of resource through time, and thus, measures of loan size should account explicitly for the passage of time. This study follows the previous studies' approach of using average loan size as a measure of the depth of outreach by applying the Schreiner's (2001) aspects of loan size as a measure of breadth of outreach which appears to be more comprehensive.

(c) Cost of Outreach

The cost of outreach to an MFI client refers to interest rate paid and other related costs as a result of receiving financial services from an MFI. It is a cost of loan to a borrower. According to Navajas *et al* (2000) the cost of outreach is the highest amount the borrower would agree to bear to get the loan. It follows, therefore, that, the less the cost of outreach the more clients will be willing to join the microfinance (all things being equal). Interest charges could be used as a measure of cost to clients (Mersland and Strom, 2008). The difference between this cost to borrower and the benefits received from the loan is known as

incentive constraint (Armendáriz and Morduch, 2007). The higher the incentive constraint, the more incentive to the borrowers to repay, all things being equal, and the larger the number of clients will be. To the lender (microfinance) the higher the incentive constraint would mean less income to an MFI if it decides to charge low interest rate.

Financial sustainability is the ability of MFI to cover all its operating and financing costs from program revenue. A major part of revenue is return from loans portfolio (Tellis and Seymour, 2002 and Thapa *et al,* 1992). The amount of return will depend on the interest rates charged and the volume of loan outstanding. The latter will depend on average loan and the number of loans remaining outstanding. This would mean that, all things being equal, the more clients MFIs have that take loans, at the same or higher interest rates the higher the revenue.

From finance point of view, the determinant of how much financing should be done is not based only on how much is the cost of capital but also how much contribution will the same finance add to shareholders' wealth (Brealey and Myers, 2000; Vanhorn and Wachowitz, 1995). This means that, the level of interest in itself may not be the sole determinant of the amount of loan that will be demanded. It comes, therefore, that, the investment opportunities will, among other things, determine the amount of loan required given that the return from investments are higher than the interest rate (Morduch, 2000 and Rosenberg, 1996).

The cost of outreach from the lenders' perspective means the costs incurred by a microfinance institution to reach the poor. This includes the transaction costs. The higher the

costs required to be paid by clients would mean reduced number of clients, and increased income to an MFI. On the other side the higher the cost incurred to serving its clients would mean a reduced profitability to an MFI.

Studies have reported that MFIs that target the poorest borrowers have "higher staff costs per dollar loaned" which implies reduced profitability (Conning, 1999). These MFIs also generate revenue sufficient to cover just 70 percent of their full cost (Morduch, 2000). This implies that in order to achieve sustainability, the MFIs that target poorer borrowers 'must charge higher interest rates' (Conning, 1999:51). Charging higher interest rates, which could lead to profitability, may however, price the poorest out of the microfinance services and thereby adversely affecting the attainment of the social objective of the MFIs (Morduch, 2000). This implies that charging higher interest rate may be necessary but not sufficient condition to attain financial sustainability. This study attempts to explain how the cost of outreach affects the financial sustainability of microfinance institutions in Ethiopia.

(d) Scope of Outreach (MFIs Product Ranges)

In addition to the depth of outreach, MFIs should think of enhancing the attainment of sustainability by providing a broader range of financial services to the poor. These may include savings, credit, insurance cover, and house loans (LOGOTRI, 2006) depending on economic environment and customer needs. The larger the number of types of products the larger the number of clients (breadth of outreach) will be expected to be served by the microfinance institution. It has been reported that the demand for saving facilities far exceeds the demand for loans (Woller 2002). Savings and deposits to microfinance

institutions, especially member based MFIs, make a larger and most reliable source of capital to these MFIs. Moreover, non-loan products like savings and deposits could be more useful to poor clients as these products do not need demonstration of credit worthiness.

Researchers suggest that the main determinants of microfinance sustainability are proper or demand driven products and proper product delivery methodology incorporating clients' cash flow patterns and timing (Armendáriz and Morduch, 2007; Chetan, 2007). As Morduch (2000) has put it, mechanisms clearly matter. Morduch was referring to the cheaper ways to deliver the financial services to the poor. This calls among others, proper product pricing, cost effective accounting system and management structure, and emphasis on demand driven product. Morduch's argument is consistent with MkNelly and Dunford (1996), which reports that other MFI programs such as the village banks found substantial benefits in bundling financial services with client education. That is, broader mix of financial products and services at more favourable interest rates has also made MFIs to expand their outreach to more low- and middle-income clients (Richardson and Lennon, 2001). Good MFIs staff and customer relationships are also important. Navajas *et al* (2000) argue that the scope of outreach strengthens the length of outreach and sustainability. Thus, we considered the scope of outreach to be one of the factors that could affect the financial sustainability of microfinance institutions in Ethiopia.

(e) Size of an MFI

Another factor that can affect the level of outreach of an MFI is its size. The size of an MFI is measured by the value of its assets (Mersland and Strom, 2009; Hermes *et al,* 2008; Mersland and Strom, 2008; Bogan *et al,* 2007; Hartarska, 2005; Lafourcade *et al,* 2005).

According to Cull *et al* (2007) the size of an MFI is significantly positively linked to its financial performance. Large micro banks on average have lower measures of outreach (Cull *et al,* 2007). This is probably due to scaling up of institutions whereby most institutions, motivated by higher profit motives, just focus on wealthier clients, leaving the poorest financial needs unattended (Christen, 2000 and Woller, 2002). This is consistent with the worry that the move towards financial self-sufficiency could lead to mission drift, where the poorest are not served.

While Hartarska (2005) found that the size of an MFI did not significantly affect its financial sustainability, recent studies by Mersland and Strom (2009) and Bogan *et al* (2007) have reported that the size of a microfinance institution is associated with its financial sustainability. Furthermore, the size of microfinance could also imply that large microfinance institutions have larger capital and, therefore, can reach a relatively bigger number of clients than small microfinance institutions. A study by Kyereboah-Coleman and Osei (2008) supports this. In their study on outreach and profitability of microfinance institutions in Ghana Kyereboah-Coleman and Osei (2008) found that the size of an MFI had significant positive impact on profitability. This study investigates the effects of the size of an MFI on its financial sustainability.

(f) MFIs Capital Structure

The composition of the various sources of capital to an MFI is known as capital structure (Bodie *et al,* 2009; Brealey *et al*, 2006). That is, the different sources of capital make a capital structure of an MFI. According to Amidu (2007) the size of microfinance institutions

will determine their capital structure. Robinson (2001) asserts that a large number of clients depend on microfinance commercial sources of funds, which in turn depends on institutional sustainability. This suggests that microfinance institutions with higher capital are expected to have more clients than those with less capital. Apart from the volume of capital, that is, the amount of capital of an MFI, the combination of various components of the capital could also affect profitability and, therefore, sustainability of microfinance institutions.

There are different sources of capital from which an MFI may tap. These include loans, savings, deposits, and shares (Bogan *et al,* 2007; Kyereboah-Coleman, 2007; Woller and Schreiner 2002). Woller and Schreiner (2002) perceives saving to be a more stable source of long-term capital than donation and, that its demands exceeds that of loans.

Studies have been conducted to explain whether the capital structure determines the sustainability of microfinance institutions (Bogan *et al,* 2007; Kyereboah-Coleman, 2007). Kyereboah-Coleman (2007) for example, found that the capital structure affects the outreach of an MFI. He also found that highly leveraged microfinance institutions' have higher ability to deal with moral hazards and adverse selection than their counterparts with lower leverage ratios. 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 structures were associated with their financial sustainability. With these findings in mind, this study seeks to analyse and explain the relationship between capital structure and the financial sustainability of microfinance institutions in Ethiopia.

(g) Age of an MFI

Sustainability could also relate to the age of MFIs. The age refers to the period that an MFI has been in operation since its initial inception. Studies indicate that the MFIs' age relates to their efficiency and growth in terms of outreach especially in the early years of operations (CGAP, 2009; Cull *et al,* 2007; Gonzalez, 2007). Basing on Micro-banking Bulletin data (MBB), Robinson (2001) found that experienced microfinance institutions (those with age above six years) were 102 percent financially self sufficient. Those which were in 3 to 6 years of age were 86 percent financially self sufficient, while it was 69 percent for those in operation for less than 3 years. The findings by Robinson (2001) imply that the age of microfinance can affect its financial sustainability level. Robinson (2001) also reports that mature MFIs can achieve substantial outreach to the poor. Moreover, Bogan *et al* (2007) and Cull *et al* (2007) also found that the age of a microfinance institution relates to its financial sustainability.

In contrast to the findings by Bogan *et al* (2007); Gonzalez (2007); and Robinson (2001) a study by Kyereboah-Coleman and Osei (2008) reports that the age of an MFI is insignificant in determining the level of outreach. The contradiction between these studies pose a knowledge gap as to whether for microfinance institutions in Ethiopia the age of microfinance is relevant in determining its outreach or not, and how the same affects its sustainability.

The above discussion (subsection A to G) indicates how sustainability and outreach depends on each other and, therefore, making outreach an important variable of study under financial

sustainability studies like this one. Outreach is particularly crucial in Ethiopia where the sector is currently serving only 2.3 million clients. In sight of the large population size the outreach of MF in Ethiopia is still relatively limited. It was estimated that the 20 registered MFIs meet less than 9% of the demand for financial services of the active poor (Chao-Beroff *et al*, 2000). This indicates that there is significant unmet potential demand for MF services in Ethiopia.

4.3 RESEARCH QUESTIONS

This chapter links outreach and financial sustainability. The reviewed empirical literature in this chapter provides mixed results on what affects the financial sustainability of microfinance institutions. Some factors that were found to be significantly affecting the financial sustainability in one economy or applicable to a set of microfinance institutions in some studies, were not significant in others, thus, making it unclear about what factors specifically apply to the MFIs in Ethiopia. In an attempt to fill this knowledge gap, the data analysis and the discussion of the findings in this chapter are focused to answer the following specific research questions as introduced in Chapter 1:

(i) Does the microfinance capital structure; interest rate; cost per borrower; MFI age; the depth of outreach; MFI size; gender of MFI clients; and number of borrowers affect the financial sustainability of MFIs in Ethiopia?

(ii) What are the effects of the financial sustainability of the MFIs in Ethiopia on their breadth of outreach?

4.4 VARIABLE DESCRIPTION

As explained earlier in the methodology chapter this study used a panel regression model to explain the relationship between variables and, therefore, determinants of financial sustainability. This section describes the variables used as dependent and independent (explanatory) variables in this study. The study used variable measurement as used in the reviewed literature and in previous studies. The measurement also conforms to MFI consensus guidelines issued by the Consultative Group to Assist the Poor (CGAP, 2003). The detailed econometric approaches for the data analysis done in this chapter were discussed in part 3.3 of the methodology chapter. Table 4-1 and Table 4-2 below summarises the dependent and independent variables and their definition / measurement as used in this study respectively.

Table 4-1: Dependent Variable

Variable Name	Measurement [Formula]
Financial Self- Sufficiency [FSS]	$\frac{\text{Adjusted Financial Revenue}}{\text{Operating expenses + Financial expenses + Loan loss provision expenses + Expenses adjustment}}$

The financial sustainability also known as the financial self-sufficiency (FSS) as indicated in Table 4-1, is the ratio of adjusted operating revenues to adjusted operating expenses. A measure above one indicates that an MFI is financial sustainable while a measure below one would indicate an unsustainable MFI. The expense adjustments made were to deduct the amortized amount of subsidies as adopted by MFIs assessed. The adjustments are meant to indicate whether or not the microfinance institutions are able to cover their costs without any

subsidization also assuming that the capital is raised at commercial rates (Balkenhol, 2007; CGAP, 2003). The effects of taking off the subsidies however were very small due to the fact that most of MFIs assessed did not have substantial amounts of subsidies during the period under which the study was undertaken. Moreover, the concessional loan amounts were also not substantial making the effect of cost of capital adjustment not to be felt. Table 4-2 presents the description of the independent or explanatory variables used in this study. Some variables appear in log form for regression purposes as explained in methodology chapter under section 3.3.

Table 4-2: Independent Variables

S/N	Variable Standard Name	Description	Variable Name in regression model	Variable description as used in regression model	Expected effect on FSS
1	Capital structure	Various sources of fund making up the capital structure of an MFI	*CAPSTR*	*Equity as a percentage of total capital*	+
2	Cost per borrower	Operating expenses/average number of active borrowers	*CPB*	*Natural log of the cost per borrower*	-
3	Average loan size	It is a ratio of outstanding loan portfolio over number of active borrowers	*ALS*	*Natural log of the average loan size*	+
4	Borrowers	Number of individuals who currently have an outstanding loan balance with an MFI.	*BORRW*	*Natural log of the number of borrowers*	+
5	Interest rate	The rate of interest charged on outstanding loan	*INTR*	*Rate of interest charged by an MFI*	+

6	MFI size	The size of MFI is measured by value of its assets	*MSIZE*	*Natural log of total assets of an MFI*	+
7	MFI age	Years since its establishment to when the evaluation is considered. It also measures the length of outreach	*MAGE*	*Age of an MFI*	+
8	Female	Percentage of female clients served by an MFI	*FEMALE*	*Percentage of female clients served by an MFI*	+

4.5 DESCRIPTIVE RESULTS

In this section we present the results based on the descriptive statistics for both dependent variable, the financial self-sufficiency (FSS), and independent variables over 6 years. The independent variables were explained in Table 4-2, descriptive statistics of which are detailed in Table 4-4.

4.5.1 Dependent Variable

The financial self-sufficiency (FSS) is a ratio of microfinance income to their total expenses. The ratio above 1 indicates sustainability while the ratio below 1 indicates incapability of the MFIs to pay all of their expenses from their own generated income, and, therefore, not financially sustainable. Table 5-3 below indicates the descriptive statistic for the FSS variable.

Table 4-3: Descriptive statistics for dependent variable (Financial Self-sufficiency) FSS

Mean	Median	Maximum	Minimum	Std. Dev.	Observations
0.952076	0.910000	2.040000	0.290000	0.387575	72

The financial sustainability (FSS) indicates the ability of an MFI to cover all of its operating costs and costs of capital without depending on subsidies. It is a ratio of total microfinance income from operations over total costs incurred to earn the same. Thus, a ratio above 1 will indicate financial sustainability. From Table 4-3, the mean FSS is 0.9521 (95.21 percent) indicating not financial sustainability. The standard deviation for this variable is somewhat high (0.3876), an indication of the existence of dispersion in the sustainability of microfinance institutions studied. In total, we had 72 observations out of which 28 (38.88 %) indicated sustainable MFIs and the remaining 44 observations (61.12%) the MFIs were not financially sustainable. From the 72 observations, 24 (33.33%) were large MFIs of which 17 (70.83%) were financially sustainable and 7 observations (29.17%) were not sustainable; 24 (33.33%) observations, were medium MFIs of which 8 (33.33%) were financially sustainable and 16 observations (66.67%) were not sustainable; and the remaining 24 observations (33.33%) were small MFIs of which only 3 (12.5%) were financially sustainable and 21 observations (87.5%) were not sustainable. These statistics tend to suggest that small and medium MFIs were less sustainable than large MFIs. In addition to this, the test for mean difference between the three types MFIs is statistically significant at 5 percent significance level. For detail descriptive statistics for the three types of MFIs see appendix 3 (a) Mean for the three types of MFIs and (b) Mean difference between the three types of MFIs. The next section presents the descriptive statistics for the independent variables.

4.5.2 Independent Variables

A total of eight independent variables are described in Table 4-4. All these variables have 72 observations for each of them.

Table 4-4: Descriptive statistics for independent variables

	ALS	BORRW	CAPSTR	CPB	FEMALE	INTR	MAGE	MSIZE
Mean	1471.681	134324.9	1.000757	136.5139	0.529167	0.172500	8.986111	3.59E+08
Median	1232.500	31239.00	1.000000	125.0000	0.540000	0.170000	9.000000	50477100
Maximum	3651.000	710576.0	1.018400	365.0000	0.960000	0.210000	14.00000	2.53E+09
Minimum	505.0000	5454.000	0.993200	39.00000	0.100000	0.140000	3.000000	2673000.
Std. Dev.	702.7242	197665.3	0.003360	68.50496	0.195064	0.017503	2.475190	6.31E+08
Skewness	0.987574	1.571140	3.371232	1.104858	-0.08626	-0.06944	-0.17479	2.049356
Kurtosis	3.499573	4.131862	15.77919	4.147666	2.158135	2.664114	2.462793	6.142497
Jarque-Bera	12.45236	33.46512	626.3054	18.59994	2.215500	0.396320	1.232373	80.02416
Probability	0.001977	0.000000	0.000000	0.000091	0.330301	0.820239	0.540000	0.000000
Sum	105961.0	9671394.	72.05450	9829.000	38.10000	12.42000	647.0000	2.58E+10
Sum Sq. Dev.	35061308	2.77E+12	0.000802	333198.0	2.701550	0.021750	434.9861	2.82E+19
Observations	72	72	72	72	72	72	72	72

The average loan size **[*als*]** indicates the depth of outreach. The mean for this variable is birr 1,472 (equal to USD 85.67). The highest average loan size birr 3,651 (equal to USD 209.61) is an indication of serving relatively non poor clients. The mean average loan for the large MFIs is birr 2,119.46 (equal to USD 121.68); the mean for the medium MFIs is birr 1,366.75 (equal to USD 78.47); the mean for the small MFIs is birr 928 (equal to USD 53.28). These statistics tend to suggest that small MFIs perform better in the depth of outreach (lower loan size) than their counterpart. However, the test statistics for mean difference indicates that the difference between three types of MFIs is strongly statistically significant.

The **female** clients are 53 percent of total clients. The mean number of borrowers **[*borrw*]** is 134,324. From the statistics we observe that, the mean number of borrowers for the large MFIs' is 357,308; the mean number of borrowers for the medium MFIs' is 30,237; and the mean number of borrowers for the small MFIs' is 15,428. Again, from these statistics, it appears that large MFIs achieve more breadth of outreach than medium and small MFIs. The test of mean difference indicates that the difference between the large MFIs with the medium and small MFIs is statistically significant at 1 percent significance level. Thus, the statistics support that large MFIs have higher breadth of outreach than their counterparts. This meets our expectation. The finding confirms the findings by Mersland and Strom (2009) and Hartarska and Nadolnyak (2007), which indicated that large MFIs performed better in breadth of outreach than other MFIs.

While the test of mean difference between the medium and small MFIs are not statistically significant even at 10 percent significance level.

This, however, must be interpreted carefully. The difference in the number of clients here may not necessarily indicate good or bad performance.

The mean capital structure **[*capstr*]** is 100.00% equity. It is interesting to note that some MFIs are not financially sustainable to the extent that they have eroded their capital (negative capital structure). The mean interest rate **[*intr*]** is 17.25% with the highest interest rate being 21%. The descriptive statistics show that the cost per borrower **[*cpb*]** ranges between birr 39 (USD 2.24) to birr 365 (USD 20.95) with the mean cost per borrower of birr 136.51 (USD 7.84).

Finally, it appears that the mean of MFIs age **[*mage*]** is 8.98 years. The mean of MFIs age ranges between 3 years to 14 years. For detailed descriptive statistics for the three types of MFIs see appendix 3 (c) mean for the different variables for the three types of MFIs and (d) the mean difference of the different variables for the three types of MFIs.

Note: 1 USD is 17.4182 as of April 20, 2012

4.6 ECONOMETRIC RESULTS

In this section we present the econometric results on factors affecting the financial sustainability of microfinance institutions in Ethiopia. The effects of financial sustainability on the breadth of outreach are also explained.

4.6.1 Determinants of Financial Sustainability

This section presents the empirical findings from the econometric results on the factors affecting the financial sustainability of microfinance institutions in Ethiopia. The section covers the operational panel data regression model used and the results.

(a) Operational Model

The specific or operational panel regression model used to study the determinants of financial sustainability was:

$$FSS_{it} = \alpha_i + \beta_1 CAPSTR_{it} + \beta_2 INTR_{it} + \beta_3 MAGE_{it} + \beta_4 MSIZE_{it} + \beta_5 CPB_{it} + \beta_6 ALS_{it} + \beta_7 BORRW_{it} + \beta_8 FEMALE_{it} + \varepsilon_{it}$$

Where: FSS is the financial self-sufficiency, which is the dependent variable; α_i is a constant term; $\beta_i s$ measure the partial effect of independent or explanatory variables in period t for the

unit i (*MFI*); X_{it}s are the independent variables as described in Table 4-2; and ε_i is the error term. The variables, both dependent and independent, are for cross-section unit i at time t, where i = MFIs (1 to n), and t = 1 to 6.

(b) Results

The econometric results indicate that the overall Wald statistic or F-statistic is statistically significant at 1 percent significance level leading us to reject the hypothesis that all coefficients are equal to zero. The adjusted r-squared (R-sq) values indicate that the proportion of variance in the dependent variable which can be explained by the independent variables is 29 percent. That is, about 71 percent of the variations in the dependent variable are not explained by the independent variables used. However, for panel data, the r-squared above 0.2 is still large enough for reliable conclusions (Cameron and Trivedi, 2009; Hsiao, 2007). The results and comments for each of the individual independent variables are given here below. The econometric results are given in Table 4-5, details of which are in Appendix 4.

Table 4-5 Economic Results for the Determinants of Financial sustainability [Outreach Parameters]

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.192257	13.08764	0.473138	0.6381
CAPSTR	-5.643398	12.95269	-0.435693	0.6649
***DALS	0.342638	0.003714	2.710207	0.0008
***DBORRW	-0.005790	0.003617	-2.200750	0.0006
***DCPB	-0.003471	0.002187	-1.986825	0.0087
**DMSIZE	0.006366	0.002845	2.237622	0.0296
FEMALE	0.097053	0.349103	0.278008	0.7821
***INTR	2.482206	0.008706	2.633425	0.0003
**MAGE	0.076667	0.033767	2.270448	0.0274

R-squared	0.476077	Mean dependent var	0.574937
Adjusted R-squared	0.294089	S.D. dependent var	0.351565
S.E. of regression	0.319501	Sum squared resid	5.206124
F-statistic	2.554531	Durbin-Watson stat	1.822672
Prob(F-statistic)	0.000019		

Note: ***significant at 1%; **significant at 5%;

The results from econometric analysis indicate that the combination of various sources of capital [**capital structure**] of microfinance institutions is negatively related to its financial sustainability indicating that capital structure does not improve rather it reduce their financial sustainability. However, this relationship is not statistically significant even at 10 percent significance level. The capital structure variable here represents the percentage of equity to total long-term capital. Thus, the negative coefficient indicates that the more an MFI is equity financed compare to other sources of finance, the more the downgrading in its sustainability. In other words, although how the capital has been structured affects the financial sustainability (Bogan *et al*, 2007) having different sources of capital do not improve the financial sustainability.

The sustainability of microfinance depends on how much interest income they earn from their operations. The income depends on the amount outstanding loan and the interest rate applied. The economic result on the **interest rate** are significantly affects the financial sustainability. It has positive coefficients and are strongly statistical significant at 1 percent significance level. The finding on effects of interest rate confirms the findings by Conning (1999) that the financial sustainability is associated with higher interest rates.

The **average loan size** also measures the depth of outreach. The coefficient for the average loan size is positive and statistically significant. This indicates that, microfinance profitability is associated with higher loan sizes. This finding confirms the claims in Morduch (2000) on mission drift where MFIs serve relatively non poor clients. The finding is also in line with Adongo and Stork (2006) that profitability relates to selling bigger loans. However, the finding contradicts the one by Cull *et al* (2007) that institutions that make smaller loans are not less profitable on average compared to those making bigger loans. This also provides evidence that profitability and the depth of outreach cannot be attained simultaneously.

All withstanding, however, the interpretation of this variable should be done with caution. Although the average loan size has been used to measure the depth of outreach as explained in the previous sections, the same is affected by repayment rate, which could affect the results without changing the economic status of the borrowers. For example, all things being equal, higher repayment rates will lead to low outstanding loan portfolio. As a result, small loan size which in turn could be interpreted as serving poorer clients (depth of outreach)

even if only the well to do clients were served, and the same influenced higher repayment rates! The opposite could also be true when the MFIs are serving only poorer clients with very low repayment rates, leading to higher outstanding amounts and larger average loan size of the outstanding portfolio. Thus, we suggest the comparison between the effects of the average loan size to be done with reference to loan repayment rates. Moreover, this calls for researchers to not only consider outreach and sustainability relationships, but also microfinance efficiency.

We also measured the partial effect of **cost per borrower** on the financial sustainability of microfinance institution in Ethiopia. The results from the analysis indicate that the increase in cost per borrower reduces the financial sustainability of microfinance institutions. This variable has a negative coefficient which is strongly statistically significant at 1 percent significance 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 the financial sustainability.

All things being equal, we expect mature MFIs to be more sustainable than younger ones. We tested how this applies to MFIs in Ethiopia using the MFI age variable. The econometric results indicated that the age of an MFI is positively related to its financial sustainability indicating that **MFI age** improve its financial sustainability. The variable has a positive coefficient and statistically significant at 5 percent significance level. This meets our expectation. This finding does not confirm the previous study by Bogan *et al* (2007) and Cull *et al* (2007).

As MFI age improves their financial sustainability, their size also improves their financial sustainability. The econometric result indicates positive relationship between **MFI size** and their financial sustainability. This relationship is statistically significant at 5 percent significance level. This finding contradicts Bogan *et al* (2007) and Cull *et al* (2007).

MFI literature suggests that female clients relate to higher repayment rate (Makombe *et al*, 2005; Premchander, 2003) and, therefore, financial sustainability. We analysed this relationship to establish whether the more **female clients** an MFI has the better it will perform in financial sustainability. The result tends to suggest that female clients are positively related to financial sustainability. However, the relationship is not statistically significant even at 10 percent significance level.

Finally, the **number of borrowers** which measures the breadth of outreach does not improve the financial sustainability of microfinance institutions. The econometric result for this variable indicates negative relationships between the number of borrowers and MFIs' financial sustainability. The relationship was statistically significant at 1 percent significance level. Contrary to the findings by LOGOTRI (2006) that reports the large number of borrowers as the biggest sustainability factor, the findings in this study indicates that increased number of borrower in itself does not improve financial sustainability of microfinance institutions. The reason for this could be increased inefficiency as a result of increased number of borrowers. Section 5.7 in Chapter 5 gives further explanations from econometric results on how microfinance staff efficiency affects profitability in as far as number of borrowers is concerned. The significant coefficient for this variable, however,

contradicts the findings by Hartarska (2005) and Woller and Schreiner (2002) who report that the number of borrowers had no significant impact on financial sustainability.

Ranking the effects of outreach on financial sustainability based on beta coefficients, we found that the depth of outreach has higher effects than breadth of outreach on financial sustainability. Their beta coefficients are 0.342638 and -0.005790 for depth and breadth of outreach respectively. The beta coefficients which are used to measure the relative strength of various predictors within the model are measured in standard deviations instead of unit of variables (UCLA, 2007). The next section presents the econometric results on how the financial sustainability and breadth of outreach affect each other.

4.6.2 The Effects of Financial Sustainability on Breadth of Outreach

In the previous section we indicated the determinants of financial sustainability. One of these determinants was the breadth of outreach as measured by the number of borrowers. The reviewed literature indicates that outreach and sustainability depends on each other. Their relationship is two way with each one of them determining the other (Cull *et al*, 2007; Woller and Schreiner, 2002; Fruman and Paxton, 1998).

In this section we identified the effects of financial sustainability on the breadth of outreach, which was the third objective of the study.

(a) Operational Models

$$Dborrow_{it} = \alpha_i + \beta_1 FSS_{it} + \varepsilon_{it}$$

Where: dborrowers is the natural log of the number of borrowers, which is the dependent variable; αi is a constant term; βis measure the partial effect of independent or explanatory variables in period t for the unit i (*MFI*); and the εi is the error term. The variables, both dependent and independent, are for cross-section unit i at time t, where i = MFIs (1 to n), and t = 1 to 6. And FSS is the financial self-sufficiency, which is the independent variable.

(b) Results

The econometric result on how FSS affect the breadth of outreach indicate that, The results reveal positive statistically significant relationships between breadth of outreach and microfinance profitability (FSS) implying that an MFI that is financially sustainable will perform better in breadth of outreach than an MFI, which is not. That is, the more profitable the MFI becomes, the higher it will achieve the breadth of outreach. This confirms the institutionists' view that financial sustainability will lead MFIs to operate at larger economies of scale and enable them reach more clients (Brau and Woller, 2004).

Table 4-6 Econometric Results on the Effect of FSS on the Breadth of Outreach

Dependent Variable: DBORRW
Method: Panel EGLS (Cross-section random effects)
Date: 05/03/12 Time: 04:30
Sample (adjusted): 2006 2010
Periods included: 5
Cross-sections included: 12
Total panel (balanced) observations: 60
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.86961	6.911929	3.308716	0.0016
FSS	-7.868591	6.636515	-1.185651	0.0006

R-squared	0.023924	Mean dependent var	14.50355
Adjusted R-squared	0.007095	S.D. dependent var	20.08641
S.E. of regression	20.01502	Sum squared resid	23234.87
F-statistic	1.421589	Durbin-Watson stat	1.807737
Prob(F-statistic)	0.237997		

As we saw in Table 4-5 [Economic Results for the Determinants of Financial sustainability for Outreach Parameters] the economic results of the coefficient of the breadth of outreach variable (*borrow)* is negative and statistically significant at 1 percent significance level. This indicates that, the positive change in the number of borrowers will reduce the level of financial sustainability. This situation can be well understood especially where the increase in the number of borrowers is not matched with the increase in staff productivity. When MFI staffs are inefficient, the increase in the number of borrowers will reduce loan repayment rates, increase default rates and, as a result, the operating costs become higher compared to the benefits brought about by the increase in the number of borrowers. Thus, although, the FSS affects positively the breadth of outreach as a result of enjoying the economies of scale and creating a broader capital base, the increase in number of borrowers, if not matched with the increase in staff productivity, will reduce the financial sustainability.

4.7 CONCLUSION

Based on the findings reported above, we conclude that microfinance average loan size, interest rates, cost per borrower, microfinance age, microfinance size, and the number of borrowers affect the financial sustainability. The results for these variables were statistically significant at 5 percent significance level. Other factors reported to be significant in other studies were not significantly affecting the financial sustainability of microfinance institutions in Ethiopia. These are: capital structure and percentage of female borrowers. We also conclude that the financial sustainability and breadth of outreach affect each other. While the financial sustainability improves the breadth of outreach, the breadth of outreach reduces the financial sustainability where MFIs are inefficient. Moreover, it unveils the non-existence of trade-off between financial sustainability and breadth of outreach.

CHAPTER 5

MICROFINANCE EFFICIENCY AND FINANCIAL SUSTAINABILITY

5.0 INTRODUCTION

According to Gonzalez-Vega (1998) to be efficient there should be a reason acting as an incentive of why one should. One of the reasons, and probably the main one, is to attain financial sustainability. There could be other reasons as well. International foundations and donors have recognised that efficiently-run microenterprises and efficient microcredit programs can cover a large portion of their costs, and are beginning to demand an increasing level of financial sustainability from them (Thapa *et al,* 1992).

This chapter links efficiency of microfinance institutions to their financial sustainability. We use the accounting profitability theory model presented in Chapter 2 to show how efficiency in MFIs operations relates to their sustainability. The chapter is meant to identify the effects of microfinance efficiency on the financial sustainability. This was the second objective of this study.

The chapter is divided into seven interrelated parts: the first part (5.1) presents the conceptual framework guiding the study on efficiency of microfinance institutions and financial sustainability. The second part (5.2) discusses the various measures of microfinance efficiency while part three (5.3) explains the empirical theory on the relationship between efficiency and financial sustainability. In the fourth part (5.4) we present the main research question addressed in this chapter, while the fifth part (5.5)

provides the descriptions of the variables used in this chapter. Part six (5.6) and seven (5.7) presents descriptive and econometric results respectively. The last part is conclusion.

5.1 MICROFINANCE EFFICIENCY AND FINANCIAL SUSTAINABILITY: CONCEPTUAL FRAMEWORK

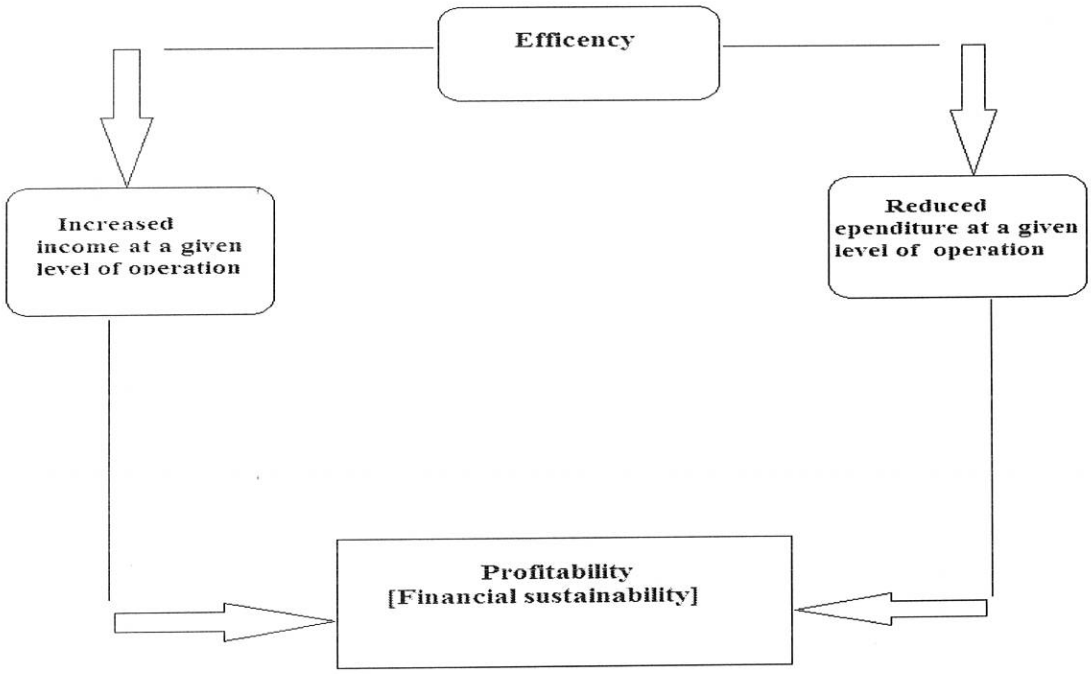
Efficiency refers to the ability to produce maximum output at a given level of input (Chua and Llanto, 1996). Woller (2000) defines efficiency as the most effective way of delivering small loans to the very poor. This involves among others, cost minimisation at a given level of operation. MFIs can reduce their total expenses at a given level of operations or increase income at the same level of operation or both. This is what we refer to as efficiency in as far as microfinance income and expenses are concerned. According to Glautier and Underdown (2001) profit can be used to measure efficiency of an organization. This is particularly true under competitive condition and, therefore, fairly applicable to MFIs in Ethiopia which operates under competition condition.

The expenditure [costs] and income [revenue] of the microfinance institutions can be affected by either internal factors or external factors or both. The level of the impact that these factors cause on profitability may vary from one factor to another regardless of whether they are internal or external factors. The internal factors are those internal to the MFI and, therefore, are controllable within the MFI. These include: the number of staff, amount of loan disbursed, and the volume of costs and revenue of the MFIs. Anything that management of an MFI does to influence these factors will have an impact on the overall profitability of an MFI.

There are also other factors that may drive the level of income or expenditure of microfinance institutions, which are not controllable within the microfinance institutions. We call them external factors. Examples of the external factors are where the government through its regulating body sets interest rate caps beyond which MFIs are not allowed to charge the interest rates; and where the government has set high wage and salary levels that some small MFIs may not be able to employ a qualified personnel without significantly affecting its overall operating expenses and, therefore, its sustainability as measured by its profitability.

In this chapter, we cover the internal factors as they are the ones indicating whether management has been efficient in their operations or not. Some of the external factors were covered in Chapter 4 which linked microfinance outreach and their financial sustainability. Figure 5-1 depicts the relationships between efficiency and profitability. It indicates that, efficiency of microfinance institutions in managing their liabilities and assets, including loan portfolio, and efficient utilization of human, that is, loan officers and other staff in general, will lead into increased income and reduced expenditure. The increased income and reduced expenditure will improve the profitability, which transforms to financial sustainability.

Figure 5-1: Conceptual Framework on Efficiency and Financial Sustainability



Source: [Ganka Daniel, 2010]

5.2 MEASURES OF MICROFINANCE EFFICIENCY

The measures of efficiency of microfinance institutions can be categorised into three: assets and liabilities management; portfolio quality; and human resource productivity. The measures under these three main categories capture how efficient the microfinance institutions are in utilising their assets (both monetary valued assets, including loan portfolio, and human resource or MFI staff) and the MFI's liabilities. The results from the efficient utilisation of assets and management of liabilities leads an MFI to increase income at given level of operation and reduce expenditure at the same level. In the next subsections we discuss these measures, both theoretically and empirically. Definitions and formulas used in this section follow the 2003 Microfinance Consensus Guidelines issued by the Consultative Group to Assist the poor (CGAP).

5.2.1 Asset and Liability Management Measures

The assets and liability management measures indicate how well the microfinance institutions' management manage liabilities, and how they manage the assets to generate income towards financial sustainability. Current assets are the working capital for the microfinance institutions. They make a higher proportion of the total assets of the microfinance institutions. The current assets of an MFI are made up of cash, loans to clients or members, and other short-term investment. The liabilities of microfinance institutions are made up of trade creditors, short-term loans, and other creditors. The measures under the assets and liabilities management are: the yield on gross loan portfolio; current ratio; yield gap; funding-expenses ratio; and cost-of-funds.

(a) Yield on Gross Loan Portfolio

The yield on gross loan portfolio indicates the ability of an MFI to utilize the short-term assets to generate cash financial revenue. The cash revenue could be from interest on loan, fees, penalties, and commissions. According to CGAP (2003) the yield on gross loan portfolio does not include any unpaid revenue. That is, even if the revenue has accrued, it is not included in this computation as long as it has not yet been received in cash by the MFI. This is because, part of MFIs accrued interest revenue never get received as the borrowers default.

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.

(b) Current Ratio

An MFI's current ratio is a ratio of its current assets to current liabilities. The current ratio indicates the dollar value of current assets, also known as short-term assets, available to meet each one dollar short-term obligation, also known as short-term liabilities or current liabilities (Brealey *et al,* 2006). Thus, it is called liquidity ratio. It measures the efficiency with which an MFI matches its assets and liabilities (Brealey *et al,* 2006; Collier, 2006; CGAP, 2003).

5.2.2 Portfolio Quality Measures

The portfolio quality measures are generally a part of asset management measures with specific emphasis on how management makes and manages the loan portfolio. That is, among others, how they select customers to minimise the effects of adverse selection, and how they make repayment follow-ups to enhance higher repayment rates, and, therefore, reduce the effects of ex-post and ex-ante moral hazards. The adverse selection refers to a situation where lender may make wrong risk estimation about the borrower and thus, ends up selecting a risky borrower (Hermes and Lensink, 2007; Tirole, 2006). The portfolio quality measures are: the portfolio at risk (PAR) ratio; write-off ratio; and risk coverage ratio.

(a) Portfolio at Risk

According to CGAP (2003) the portfolio at risk is probably the most acceptable measure of portfolio quality. Microfinance literature indicates that, interest from loan is the main source

of income to microfinance institutions (Fernando, 2006; Tellis and Seymour 2002; CGAP, 1998). The amount of interest income to be received from loans will depend on the quality of loan portfolio. The quality of a loan portfolio indicates, among other things, the loan principal and interest repayment performance (Godquin, 2004). It is, therefore imperative that, the management of a loan portfolio should be one of the key daily tasks of an MFI's management. The longer the loan remains unpaid, the higher the risk that the same will not be repaid, thus, known as loan at risk. (CGAP, 2003) defines portfolio at risk as the "outstanding amount of all loans that have one or more installments of principal past due by certain number of days". The portfolio at risk measure is given by the value of the portfolio at risk, at a given number of days, divided by gross loan portfolio. The higher portfolio at risk will indicate poor collection policy, and or that an MFI is not efficient in making collection. Sometimes the poor collection is an indication of adverse selection and or moral hazards (Armendáriz and Morduch, 2007).

(b) Write-off Ratio

Some loans never get repaid and thus, they are written-off as bad debts. The written-off ratio represents the proportion of loans that have been removed from the balance of gross loan portfolio because they appeared unlikely to be repaid (CGAP, 2003). When these debts are identified, they are written off as unrecoverable amount. The policy to write-off debts differs from one microfinance institution to another. The debts written-off as bad form part of the operating expenses of an MFI and, therefore, reduce its profitability. The written-off ratio is given by the value of loans written-off divide by average gross loan portfolio (ibid). An inefficient MFI will have high volume of unpaid debts and thus, higher write-off. That is,

higher write-off indicates laxity of an MFI in debt collection. This could be a result of many factors among which are: poor loan payment and follow-up policies; untrustworthy personnel; and wrong loan assessment, all of which reflect a condition of an inefficient MFI.

5.2.3 Productivity Measures

The productivity measures indicate how well an MFI utilises its assets and staff in general, and loan officers in particular in influencing loan repayment, enhancing increase in income, and reduction in overall microfinance expenditure. According to CGAP (2003) the productivity measures indicate how efficient an MFI is in using its resources. Efficiency of microfinance staff has a role to play in bringing about profitability and, therefore, sustainability of microfinance institutions. To measure staff efficiency, the following staff productivity measures are commonly used: loan officer productivity; personnel productivity; average disbursed loan size; average outstanding loan size; operating expenses ratio; cost per borrower or client; and other expenses ratios like a ratio of administrative expenses; a ratio of salary expenses; staff costs per client, and administrative cost per client.

(a) Loan Officer Productivity

Loan officers of an MFI are regularly involved directly in revenue generating activities of microfinance institution. Duties of the loan officers vary from one microfinance institution to the other. However, to most microfinance institutions, loan offices are the ones involved with finding clients, screening and selecting clients, and when loan is granted, making follow-ups for loan repayment. Their efficiency in this task then deserves to be measured. The loan officer productivity measure is computed by dividing number of active borrower by number of loan officers (CGAP, 2003). The loan officer productivity measure indicates

that, all things held constant, the larger the number of clients served by a loan officer, the efficient is the microfinance in utilising the loan officers.

(b) Operating Expenses Ratio

According to CGAP (2003) the operating expenses ratio is the most commonly used measure of microfinance efficiency. It 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 institutions' cost reduction strategy. That is, an MFI is operating at lower cost, which means, all things being equal, efficiency.

The operating expenses ratio is computed by dividing operating expenses by average gross loan portfolio. The operating expenses includes all administrative and staff expenses. CGAP (2003) suggests the average total assets to be an appropriate denominator for microfinance institutions which have other products other than loan. This is because, when an average gross portfolio is used as denominator, comparative between loan-only MFIs and with other products like savings and deposits becomes biased and unfavorable.

(c) Personnel Expenses ratio

Apart from using loan officer's productivity measure alone, some microfinance institutions compute the Personnel Expenses ratio. According to CGAP (2003) the personnel Expenses ratio measures how efficient an MFI is in utilising its total human resources in managing its clients and thereby contributing to income for the microfinance institution.

The personnel Expenses ratio is computed by dividing total personnel salary, by the gross loan portfolio. The lower the ratio the efficient will be the microfinance institution in managing its gross loan portfolio and thereby increasing in its income [profitability] or financial sustainability.

(d) Cost per Borrower and Cost per Client Ratios

Cost reduction is one of the efficiency parameter of an MFI. The cost per borrower and the cost per client ratio measure the efficiency of microfinance institutions in serving their client. They determine the average cost of maintaining a borrower or client. 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). Again, when an MFI has other non loan products, the appropriate denominator is the average number of clients. This indicates the cost per clients as a measure of how much it costs an MFI to maintain a client.

5.3 EMPIRICAL THEORY

As we have just explained, profitability is highly linked to sustainability. In other words, profitability is a stepping stone to financial sustainability (Schreiner, 2000). It has also been widely used as a measure of financial sustainability (Armendariz and Morduch, 2007). Gonzale-Vega (1998) argues that, many MFIs are inefficient because they think in terms of level of speed of collections, not in terms of operational costs. Cost reduction is thus, as

important as increasing revenue. This is what we have referred to as microfinance efficiency.

Reviewing microfinance literature that we have to-date one would say there is but few [if any] systematic study which focuses specifically on how microfinance institutions' efficiency affects their financial sustainability. Few studies that we know have indicated the relationship between efficiency and sustainability by looking at various cost and revenue elements (Cull et al, 2007; Chriten, 2000; Woller, 2000). Some studies have also used the personnel productivity measures as part of their analysis (Woller and Schreiner, 2002; Christen *et al*, 1995). In the next section we explain each of these.

5.3.1 Cost and Revenue Elements

Interests from loan are the major sources of revenue to most MFIs (Tellis and Seymour, 2002). Studies indicate that there is no relationship between the amount of loans made and the amount of interest charged. Demand for loans appears to be inelastic because the demand for loans is higher compared with supply of the same (Rosenberg, 1996). This means that MFIs can increase interest rates [charge higher interest rates] without affecting the amount of loan demanded and thus, increase revenue and profitability.

Studies have reported that interest rates affect profitability of MFIs. Christen *et al* (1995) for example, using cross country comparison data, for 11 successful MFIs from 9 countries found that the real interest rates charged on loans are significant determinant of profitability [self-sufficiency]. Subsequent studies by Christen (2000) and Woller and Schreiner (2002) also found the real interest rates to be significant determinants of profitability. Woller and

Schreiner's study was examining determinants of financial self-sufficiency using thirteen village banks.

All withstanding however, MFIs cannot continue raising interest rates indefinitely. Recent study on financial performance and outreach of lending micro banks, by Cull *et al* (2007) has shown that raising interest rates to very higher level while it improves profitability where group lending is used, it does not ensure greater profitability for individual lending. This is because the higher the interest rates, the heavier the repayment burden, and, therefore, the lower will be the level of compliance (Conning, 1999). This is consistent with the theory of moral hazard and adverse selection (Robinson, 2001).

While considering increasing interest rates MFIs need to also consider the possible effect of their decision. Experience from bank lending business shows that higher interest rates leads to moral hazard and adverse selection problems as a result of asymmetric information between borrower and lender (Robinson, 2001). This happens when one party to a transaction has more information about the transaction than the other. Adverse selection also known as negative selection refers to a situation where bad or untrustworthy customers are more likely to be selected. Moral hazard on the other hand refers to a situation where borrowers become untrustworthy because of the high payment burden pressed on them as a result of higher interest rates (Armendariz and Morduch, 2007). Both adverse selection and moral hazard increase the likelihood of default in an MFI's loan portfolio.

Moreover, it has been reported that, "the ability to pay high interest rates depends on the amount of capital used as well as the amount of all other inputs available. It cannot be inferred that because one group of poor households can pay high rates then every poor

households can pay those high interest rates as well" (Morduch, 2000:621). A recent study by Cull *et al* (2007) investigated, among others, whether or not raising interest rates could lead to agency problems as detected by lower repayment rates and less profitability. The Cull *et al* (2007) study has provided evidence that MFIs can raise interest rates without undermining repayment rates, especially where group lending technology is being used, and thereby achieving both profit and sustainable outreach to poorer population, and staying true to initial social missions even when aggressively pursuing commercial goals. Their findings were consistent with Woller and Schriener (2002) suggests that MFIs can successfully pursue all goals, financial and social.

5.3.2 Staff productivity

Studies also have used in addition to cost and revenue elements, staff or personnel productivity measures to indicate whether or not efficient utilization of MFI's personnel could affect their profitability (Woller and Schreiner, 2002; Christen *et al*, 1995). Christen *et al*, (1995) for example, found that average salary levels relative to GDP and real interest rates to be significant determinant of financial sustainability. The staff productivity measures were found not to be associated with the financial sustainability as determined by profitability. In another study, Christen (2000) based on numerous regressions on Micro-Banking Bulletin data, found that administrative expenses ratio and real portfolio yield are significant determinants of profitability.

Woller (2000) conducted a study on financial viability of village banking to reassess the past performance and future prospects of village banking. He found that interest spread, the spread between yield and administrative expenses ratio, and portfolio yield are among the

variables most strongly correlated with financial sustainability. The finding was consistent with Christen (2000). Additionally, the number of borrowers and cost per borrower was also found to be among the variables most highly correlated with financial sustainability. Later Woller and Schreiner (2002) examined the determinants of financial self-sufficiency using thirteen village banks. It was found that the interest rates, administrative efficiency, loan officer productivity, and staff salary were significant determinant of profitability.

Empirical theory presented above indicates that one variable which is relevant to MFI operating at one area may not be equally applicable to other paces. Thus, to identify what among these factors are also relevant to MFIs in Ethiopia is the main focus of this chapter.

5.4 RESEARCH QUESTIONS

In light of the above discussion on the empirical literature review on how the microfinance efficiency relates to their financial sustainability, the data analysis and discussions of the findings in this chapter were focused to answer the following research question: does the microfinance efficiency, as reflected in: the yield on gross loan portfolio; portfolio at risk; write-off ratio; liquidity ratio; staff productivity [as explained by loan officer productivity, personnel expenses to gross loan portfolio]; and cost reduction affect the financial sustainability of microfinance institutions in Ethiopia?

5.5 VARIABLE DESCRIPTION

Table 5-1 and table 5-2 describe the dependent and independent [explanatory] variables that are used for analysis in this chapter. Their meaning and measurement is as explained in the previous sections following the CGAP (2003b) definitions and measurements as has been used in other studies reviewed in this chapter.

(a) Dependent Variable

The dependent variable in this chapter is the financial self-sufficiency [FSS], which is a measure of financial sustainability. A measure above one indicates that an MFI is financial sustainable while a measure below one would indicate an unsustainable MFI. Table 5-1 below indicates how this variable is measured adopting the standard measures provided by the Consultative Group to Assist the Poor (CGAP, 2003).

Table 5-1: Dependent Variable

Variable Name	Measurement [Formula]
Financial Self- Sufficiency [FSS]	$\frac{\text{Adjusted Financial Revenue}}{\text{Operating expenses + Financial expenses + Loan loss provision Expenses + Expenses adjustment}}$

(b) Independent Variable

The variables used as independent or explanatory variable are those reviewed in this chapter as indicators of microfinance efficiency. An analysis was carried out to identify the cause-effect relationships between these variables and indicators of financial sustainability for the microfinance institutions in Ethiopia. Some indicators of microfinance efficiency discussed in theoretical part were not included under independent variable due to lack of sufficient data required for a multiple regression analysis given the number of independent variables. These are yield gap and risk coverage ratio. Moreover, funding expenses, cost of funding ratio, and other expenses ratio were also not used because they are component of the overall operating ratio and, therefore, they are appeared to cause multicollinearity. The staff productivity was used to represent the loan officer productivity because there seemed to be

no differences in their duties and the data to facilitate their separation was not obtained. Further, the average outstanding loan portfolio was not used because it is mean to indicate the effect of loan repayment on sustainability which has already been taken care of with the portfolio at risk as a proxy of loan repayment. The independent variables used in this chapter are described in Table 5-2. Some variables appear in log form for regression purposes as explained in methodology chapter under section 3.4.2.

Table 5-2: Independent Variable

No	Variable Standard Name	Variable name as used in regression model	Variable description as used in regression model	Expected effect on Financial sustainability
1	Yield on Gross Loan Portfolio	*YGLP*	*Yield on gross loan portfolio*	(+)
2	Portfolio at Risk [PAR]	*PAR*	*Portfolio at Risk*	(-)
3	Liquidity Ratio [Current Ratio]	*CR*	*Natural log of liquidity*	(+/-)
4	Number of borrowers per staff	*NBPS*	*Natural log of number of borrowers per staff*	(+/-)
5	Cost per borrower	*CPB*	*Natural log of cost per borrower*	(-)
6	Write-off ratio	*WOR*	*Write-off Ratio*	(-)
7	Operating Expenses Ratio	*OER*	*Natural log of operating expenses ratio*	(-)
8	Loan Officer Productivity	*LOP*	*Natural log of the loan officer productivity*	(+/-)
9	Personnel Expenses ratio	*PER*	*Adjusted Personnel Expenses Ratio*	(-)

5.6 DESCRIPITIVE RESULT

This section presents the results based on the descriptive statistics for both dependent and independent variables over 6 years. The dependent variable in this chapter is the financial self-sufficiency [FSS] as in chapter 4. So the descriptive results for this variable are already presented in the previous chapter [chapter 4] Table 4-3 and the detailed descriptive statistics for this variable is in appendix 3 (a) and (b). The descriptive statistics for explanatory variables [independent variables] are explained below in Table 5-3. And for the detailed descriptive statistics for mean for the different variables for the three types of MFIs and the mean difference of the different variables for the three types of MFIs see appendix 5 (a) and (b) respectively.

Table 5-3 Descriptive Statistics for independent variables

	YGLP	PAR	CR	WOR	NBPS	LOP	PER	CPB	OER
Mean	0.1911	0.0413	2.6405	0.0264	188.583	454.9306	0.0738	136.5139	0.1204
Median	0.1908	0.0300	1.5516	0.0100	189.500	424.0000	0.0700	125.0000	0.1200
Maximum	0.4648	0.2600	9.8307	0.1490	334.000	1012.000	0.2300	365.0000	0.4000
Minimum	0.0400	0.0000	0.0964	0.0000	94.0000	141.0000	0.020	39.0000	0.0200
Std. Dev.	0.0690	0.0424	5.2048	0.0345	55.1138	200.7696	0.0459	68.5050	0.0806
Obsern.	72	72	72	72	72	72	72	72	72

The **yield on gross loan portfolio** [YGLP] indicates the ability of an MFI to utilize the short- term assets to generate cash financial revenue. It indicates the efficiency with which an MFI has utilized its resources in generating cash revenue. The higher the ratio, the better, is indicating MF efficiency. Descriptive statistics for this variable show that MFIs in Ethiopia generate 19.11 cents cash for each 1 birr in the outstanding loan portfolio. While

some few MFIs generate 4 percent, some efficient MFIs generate up to 46.48 percent cash revenue out of their loan portfolio.

The mean yield on gross portfolio for the large MFIs was 13.37 percent; for the medium MFIs were 20.18; and for the small MFIs was 23.78 percent. The test for mean difference was statistically significant at 5 percent significance level between the three types of MFIs. Thus, we find evidence on differences in the level of efficiency between the three types of MFIs in as far as the yield on gross portfolio is concerned.

Portfolio at risk [PAR] is another variable which indicates microfinance efficiency. The portfolio at risk as explained in theoretical framework in chapter 2 measures the efficiency of MFI in making collections. The higher PAR will indicate inefficiency in making collections, an indication of poor repayment rates. From the descriptive statistics indicated in Table 5-3 the mean PAR for MFIs in Ethiopia was 4.1 percent, with highest PAR being 26 percent. The large and medium MFIs had the same PAR of 2.9 percent while the small MFIs had PAR of 6.5 percent. Comparatively, the large and medium MFIs appeared to have higher repayment rate [low PAR ratio] than small MFIs. The test statistic of mean difference indicated that the difference was statistically significant between the large and medium MFIs in one side and small MFIs in other side. However the mean difference between the large and medium MFIs was not statistically significant. Thus, indicated that there is no difference between the large and medium MFIs as far as portfolio at risk is concerned.

The **current ratio [CR] or liquidity ratio** measures the ability of MFIs to meet their short-term obligations when they fall due. The descriptive statistics for this variable indicates that, on average, the MFIs in Ethiopia, the value of the current assets were 2.6 times the value of their short-term liabilities [obligations]. Only in 3 observations [4.2%] out of 72 MFIs had liquidity ratio of less than 1. All things being equal, this is a good indication of good working capital [current assets] management. Again, for the large and medium MFIs the mean liquidity ratio was the same 1.56 times while for the small MFIs was 4.79 times. The test statistic of mean difference indicated that the difference was statistically significant between the large and medium MFIs in one side and small MFIs in other side. However the mean difference between the large and medium MFIs was not statistically significant as they had the same mean. Thus, indicated that there is no difference between the large and medium MFIs as far as liquidity ratio is concerned.

Very high liquidity ratios could indicate idle short-term resources. However, given the nature of institutions, the microfinance institutions, sometimes it may be reasonable to have higher liquidity to meet any unplanned resource requirement. Moreover, as opposed to banks, that treat savings and deposits as short-term liabilities, for most MFIs, the saving and deposits are considered as part of capital and, therefore, categorized as part of long-term liabilities and capital.

Number of borrowers per staff [NBPS] is another indicator of microfinance productivity and, therefore, efficiency. All beings equal, the higher number of borrowers per staff would indicate efficiency of MFI staff, as they comparatively handle more borrowers. From the

descriptive statistics in Table 5-3, the mean number of borrowers per staff for Ethiopian MFIs was 188. The minimum number of borrowers per staff was 94 while the maximum was 334 borrowers per staff. A comparison of the mean difference for the large MFIs and medium MFIs indicated insignificant difference; the same is also for medium MFIs and small MFIs but this is at 5 percent significance level. While the mean difference between large MFIs and small MFIs were significant.

The large MFIs had mean of 213; the medium MFIs had a mean of 190; and the small MFIs had a mean of 162 borrowers per staff. So the large MFIs more productivity and, therefore, efficiency than the medium and small MFIs regarding number of borrowers per staff alarmed.

Some loans never get repaid and thus, they are written-off as bad debts. The **written-off ratio** [WOR] represents the proportion of loans that have been removed from the balance of gross loan portfolio. From the descriptive statistics in Table 5-3, MFIs in Ethiopia operates at mean written-off ratio 2.6 percent. While some few MFIs written-off as bad debts 14 percent out of their loan portfolio, some efficient MFIs written-off as bad debts nothing [zero percent written-off ratios].

The test statistic of mean difference indicated that the difference was statistically significant between the large and medium MFIs in one side and small MFIs in other side. However the mean difference between the large and medium MFIs was not statistically significant. Thus, we find evidence on differences in the level of efficiency between the large and medium MFIs in one side and small MFIs in other side as far as the written-off ratio is concerned.

In addition to number of borrowers per staff as measure of microfinance productivity, MFIs also use the **loan officer productivity** [LOP]. The loan officer productivity measure indicates that, all things held constant, the larger the number of clients served by a loan officer, the efficient is the microfinance in utilising the loan officers. The descriptive statistics for this variable indicate that on the overall, MFIs in Ethiopia operates at mean loan officer productivity was 465, which means on average one loan officer entertain 465 clients. While some few MFIs entertain 1012 clients with one loan officer, some in efficient MFIs entertains141 clients with one loan officer.

The mean loan officer productivity for the large MFIs was 536; for the medium MFIs were 454; and for the small MFIs was 373 clients. The test for mean difference was statistically significant at 5 percent significance level only between the large and small MFIs. Thus, the large and medium MFIs are efficient than small MFIs in as far as the loan officer productivity is concerned.

The **personnel Expenses ratio** [PER] measures how efficient an MFI is in utilising its total human resources in managing its clients and by this means contributing to income for the microfinance institution. The mean personnel Expenses ratio for Ethiopian MFIs was 7.4 percent. The minimum personnel Expenses ratio was 2 percent while the maximum was 23 percent personnel Expenses ratio. Comparisons of the mean difference between the three types of MFIs with regard to this variable were statistically significance even at 1 percent

significance level. Thus, means as far as personnel Expenses ratio the three types of MFIs had different efficiency.

The last cost related variable is the **operating expenses ratio** [OER]. This is the ratio of the overall operating expenses of the MFIs to their outstanding loan portfolios. It shows how much it costs the microfinance institutions in lending. Again, with other costs related variables, the lower the operating ratio, the more efficient the MFI will be. The lower the operating ratio also, other thing being equal, will indicate higher profitability and, therefore, financial sustainability. The descriptive statistics for this variable indicate that on the overall, MFIs in Ethiopia operates at mean operating expenses ratio of 12 percent of their outstanding portfolio. This ratio for the large MFIs was 4.1 percent; for the medium MFIs it was 12.6 percent; and for the small MFIs was19.4 percent. Thus, is an indication that the small MFIs operate at relatively higher costs than their counterparts. The test statistic for the mean difference for this variable was strongly statistically significant among the three types of MFIs.

To sum up our discussion regarding on the descriptive statistics, we observed that while the large and medium MFIs were performing equally on productivity related variables; the large MFIs performed better in income and cost related variables than their counterparts. The large MFIs were more efficient than their counterparts in that they operate relatively at lower costs. The differences between these three types of MFIs in as far as efficiency in cost reduction is concerned were strongly statistically significant. Finally we would like to note

that there may be some limitations in comparing efficiency of microfinance institutions in different countries as it has been reported that there are country effects that affect their efficiency.

5.7 ECONOMETRIC RESULTS

Considering the microfinance efficiency indicators discussed in chapter 2 and the empirical theory part of this chapter, this section presents the econometric result on which of these factors affect the financial sustainability of microfinance institutions in Ethiopia. The section covers the operational model and results.

(a) Operational Model

The specific or operational model panel regression model used to study the effects of microfinance efficiency on the financial sustainability was:

$$FSS_{it} = \alpha_i + \beta_1 YGLP_{it} + \beta_2 PAR_{it} + \beta_3 CR_{it} + \beta_4 NBPS_{it} + \beta_5 CPB_{it} + \beta_6 LOP_{it} + \beta_7 OER_{it} + \beta_8 PER_{it} + \beta_9 WOR_{it} + \varepsilon_{it}$$

Where: FSS is the financial self-sufficiency, which is the dependent variable; α_i is a constant term; β is measure the partial effect of independent or explanatory variables in period t for the unit i [MFI]; the X_{it} are the explanatory variables as explained in Table 5-2; and ε_{it} is the error term. The variables both dependent and independent, are for cross-section unit ***i*** at time ***t***, where ***i***= MFIs (1 to n), and ***t***= 1 to 6.

(b) Results

The econometric results indicate that the overall Wald statistic or F-statistic is statistically significant at 1 percent significance level leading us to reject the null hypothesis that all coefficients are zero. Summary of econometric results on how the microfinance efficiency parameters affect the financial sustainability are presented in Table 5-4, details of which are in Appendix 6.

Table 5-4 Economic Results for the Determinants of Financial sustainability

[Efficiency Parameters]

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.142450	0.170685	6.693325	0.0000
***DCPB	-0.002609	0.002292	-2.658071	0.1035
*DCR	0.170641	0.000953	-1.772857	0.1041
DLOP	-0. 457456	0.001215	-0.375559	0.7088
**DNBPS	0.172640	0.003208	2.233142	0.0543
**OER	-1.946665	2.021559	-5.962952	0.0502
***YGLP	3.936820	0.000249	2.846020	0.0002
***WOR	-2.609649	0.000498	-2.414829	0.0033
***PAR	-1.116437	1.337555	-4.834685	0.0009

R-squared	0.540618	Mean dependent var	0.847787
Adjusted R-squared	0.322929	S.D. dependent var	0.386631
S.E. of regression	0.353734	Sum squared resid	6.256403
F-statistic	2.275983	Durbin-Watson stat	1.891789
Prob(F-statistic)	0.000002		

Note: ***significant at 1%; **significant at 5%; *significant at 10%

The yield on gross outstanding loan portfolio [YGLP] indicates the efficiency of microfinance institutions in generating cash revenue from their outstanding loan portfolios. The higher yield on gross outstanding loan portfolio ratio, other things being equal, indicates efficiency. The econometric results in Table 5-4 show strong positive relationship between

this variable and financial sustainability of the microfinance institutions. This provides evidence that the efficiency of microfinance institutions in generating cash revenue will positively affect their financial sustainability.

The **portfolio at risk** [PAR] measure indicates how efficient an MFI is in making collections. The higher the PAR implies low repayment rates, an indication of inefficient MFI. The higher the PAR, the more inefficient the MFI will be and, therefore, the less financial sustainable. The econometric results indicate a negative relationship between PAR and financial sustainability. This shows that, the less efficient the MFI is (higher PAR) the less will be its financial sustainability. The coefficient for the PAR variable was statistically significant at 1 percent level of significance.

Apart from being able to influence higher repayment rates, microfinance institutions should also have enough resources [working capital] to meet their outstanding short-term obligations including disbursing loans and repay clients' savings and deposits. The ability to pay short-term obligation when they fall due is determined by the **current ratio** [CR] or liquidity level. All things being equal, the higher the liquidity ratio the better, an indication of microfinance efficiency. The econometric result in Table 5-4 above conforms this. The coefficient for the current ratio variable is positive and statistically significant at 10 percent level. This indicates that, the microfinance liquidity level affects their financial sustainability, and that holding all factors constant, the higher the liquidity the more financial sustainable MFI will be.

The efficiency of microfinance institutions also can be measured by their staff productivity.

The **number of borrower per staff** [NBPS] variable measures the efficiency with which MFIs utilize their staff to serve and mange a certain number of borrowers. All things being equal, the higher the number of borrowers per staff means efficiency utilization of microfinance staff. The above econometric result conforms this. The number of borrower per staff was positive and statistically significant at 5 percent significance level related to the financial sustainability. This shows that the increase in number of borrowers per staff affected positively the financial sustainability of Ethiopian MFIs.

In addition to number of borrower per staff to measure their staff productivity microfinance institutions also used loan officer productivity to measure their [staff productivity] efficiency. The **loan officer productivity** [LOP] measure indicates that, all things held constant, the larger the number of clients served by a loan officer, the efficient is the microfinance in utilising the loan officers. The econometric result for this variable was positive but statistically insignificant even at 10 percent significance level.

MFIs are expected to operate at relatively low costs to be able to maximize their profit and become financial sustainable. The **cost per borrower** variable measures this. The lower the cost per borrower, all things being equal, would indicate microfinance efficiency.

As in case of outreach the coefficient for the cost per borrower [CPB] in Table 5-4 is negative and statistically significant at 10 percent significance level. The negative coefficient of this variable indicates that the higher the amount spent in managing the portfolio, all things being equal, the lower will be the financially sustainable. This relationship is incompliance with the accounting profitability theory that higher cost, all things being equal, reduces profitability.

On expenses related variables, we finally assessed the effects of the **operating expense ratio** [OER] on financial sustainability of MFIs in Ethiopia. The operating expense ratio is the ratio of total operating cost to outstanding loan portfolio. The lower the ratio, all things being equal, will imply efficiency. The econometric result for this variable suggests that the operating expense ratio affects the financial sustainability of MFIs. The coefficient for operating expenses ratio variable was negative and statistically significant at 5 percent level. This indicates that, the more MFIs are efficient in reducing the operating costs at a given level of outstanding loan portfolio the more profitable they become and, therefore financially sustainable.

The last variable that we focused on this chapter on how efficiency relates to financial sustainability was **written-off ratio** [WOR]. Some loans never get repaid and thus, they are written-off as bad debts. The written-off ratio represents the proportion of loans that have been removed from the balance of gross loan portfolio. The lower the ratio, all things being equal, will imply efficiency. The econometric result in Table 5-4 above indicated that the

written-off ratio was negatively and strongly statistical significance related to the financial sustainability. This shows that the increase in written-off affected negatively the financial sustainability of Ethiopian microfinance institutions.

5.8 CONCLUSION

Based on the descriptive statistics presented above, we observed that while the large and medium MFIs were performing equally on productivity related variables; the large MFIs performed better in income and cost related variables than their counterparts. The large MFIs were more efficient than their counterparts in that they operate relatively at lower costs. From the economic result we observed that the following efficiency indicators of MFIs significantly affected their financial sustainability: the yield on gross loan portfolio; the level of portfolio at risk; the liquidity level; the number of borrowers per staff; cost per borrower; write-off ratio and the operating efficiency. Moreover, selling higher volumes of loans alone does not improve financial sustainability. The same should be accompanied by effective follow-ups to ensure higher repayment rates. We generally conclude that the efficiency of MFIs affects their financial sustainability. The findings in this chapter support the microfinance theory that links efficiency to the financial sustainability. Thus, to become financially sustainable, MFIs should strive to operate at relatively low costs while keeping the staff productivity and repayment rates higher.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATION

6.0 INTRODUCTION

This chapter presents the key conclusion made in this study, their implications, and the area for future research. The conclusions are presented in four sections with reference to the main research objectives. The first section [6.1] presents both the outreach and, efficiency related factors that affect the financial sustainability of Ethiopian MFIs. The effects of the financial sustainability on breadth of outreach are presented in the second section [6.2]. The third section [6.3] is implication of the conclusions made [recommendation] and finally, the areas for future studies [6.4].

6.1 Factors affecting the financial sustainability of microfinance institutions in Ethiopia

This section presents the factors affecting the financial sustainability of MFIs in Ethiopia. The factors are grouped into two, the outreach and efficiency-related factors.

6.1.1 Outreach Related Factors

Based on the empirical evidence from the economic analysis provided in chapter 4, we conclude that the factors affecting the financial sustainability of Ethiopian MFIs are: the interest rates charged; cost per borrower; MFI age; MFI size; average loan size; and number of borrowers. The p-values of these variables were significant at 5 percent level of

significance. Additionally, we also conclude that the financial sustainability and breadth of outreach affect each other. While the financial sustainability improves the breadth of outreach, the breadth of outreach reduces the financial sustainability where MFIs are inefficient. Moreover, it unveils the non-existence of trade-off between financial sustainability and breadth of outreach.

6.1.2 Efficiency Related Factors

From the empirical evidence obtained from the econometric results in chapter 5, we generally conclude that microfinance efficiency affects the financial sustainability. Specific efficiency related factors that affect the financial sustainability of Ethiopian MFIs are: the yield on gross loan portfolio; level of portfolio at risk; liquidity level; number of borrowers per staff; cost per borrower; write-off ratio; and operating efficiency. The p-values of the coefficient of these variables were statistically significant at 5 percent significance level except liquidity level and cost per borrower which are significance at 10 percent significance level.

6.2 The effects of the financial sustainability on the Breadth of outreach

The econometric results presented in this study revealed positive statistically significant relationships between the financial sustainability and the breadth of outreach. This implies that an MFI that is financially sustainable will perform better in breadth of outreach than an MFI, which is not. That is, the more profitable the MFI becomes, the higher it will achieve the breadth of outreach. We therefore conclude that, financial sustainability improves the breadth of outreach. This conclusion confirms the institutionists' view that financial

sustainability will lead MFIs to operate at large economies of scale and enable them reach more clients (Brau and woller, 2004). Moreover, this study provides empirical evidence that the microfinance breadth of outreach and the financial sustainability affects each other.

6.3 RECOMMENDATION

The conclusions made in this chapter imply that, to be financially sustainable, microfinance institutions in Ethiopia should first, charge interest rates high enough to enable them to cover not only the operating costs but also to cover for the possible losses as a result of loan default. This however, should be done with caution considering the impact of increasing the interest rate on repayment and breadth of outreach. Second, they should utilize their human resources efficiently and effectively in managing their clients this can be done through updating the knowledge of their workers; expose the workers to new technological innovation equipments; and providing them to off the job and on the job training. In addition to this the MFIs should introduce new mechanism [like ATM] to reduce their operating costs and thereby contributing to income [financially sustainable] for the microfinance institution.

Third, selling higher volumes of loans alone may not improve financial sustainability. It should be accompanied by effective follow-ups to ensure higher repayment rates. This means, MFIs should keep their yield from the gross portfolio higher, strive to keep low the portfolio-at-risk and write-off ratio, all things being equal, have high liquidity level to meet any outstanding obligations to support smooth running of the operations, ensure that staff

productivity goes in hand with the increase in number of borrowers, and strive to operate at relatively lower operating costs.

Fourth, while these are being done however, microfinance institutions should be aware of what all these imply to their initial mission. This is because, the econometric results indicated [an evidence] that the profitability of these MFIs had been growing hand in hand with the average loan size of the outstanding loan portfolio, implying less depth of outreach, which indicates early signs of mission drift. Although we did not find and evidence for existence of a mission drift, ensuring that their profitability growth goes with their objectives becomes imperative if the MFIs still have to make their initial mission sustainable.

Moreover, for policy makers and those advocating the replication of the 'microfinance best practice' the findings in this study imply the need for scrutinizing what is applicable and what is not before embarking on the replications.

6.4 AREAS FOR FUTURE STUDIES

In this study we attempted to identify factors affecting financial sustainability of MFIs in Ethiopia. The research design, therefore, was specifically focused to address this specific microfinance institutions problem. Thus, the finding in this study may not apply to other microfinance institutions in other countries. The areas that were not at the center of this

study's design are good avenues for future research. These are, first, in this study it was revealed that staff productivity affects the financial sustainability. Thus, future studies may focus on what affects the staff productivity. Second, this study used eight up to nine explanatory [independent] variables to identify factors that affect the financial sustainability of MFIs but those variables are not enough. Thus, future studies may include other variables. These are, among other: lending type [individual or group lending], geographical location, product type [saving, loan or saving and loan] may consider.

Lastly, this study used six years data to identify factors affecting the financial sustainability. However, the six years period is short to allow some detailed econometric analysis. For example although, the minimum number of observation for one independent variable is 5:1, the desired level is between 15 to 20 observations for each independent variable for reliable generalization. Thus, future studies may consider taking longer study period. The longer study period may help to unveil what was probably not unveiled in this study.

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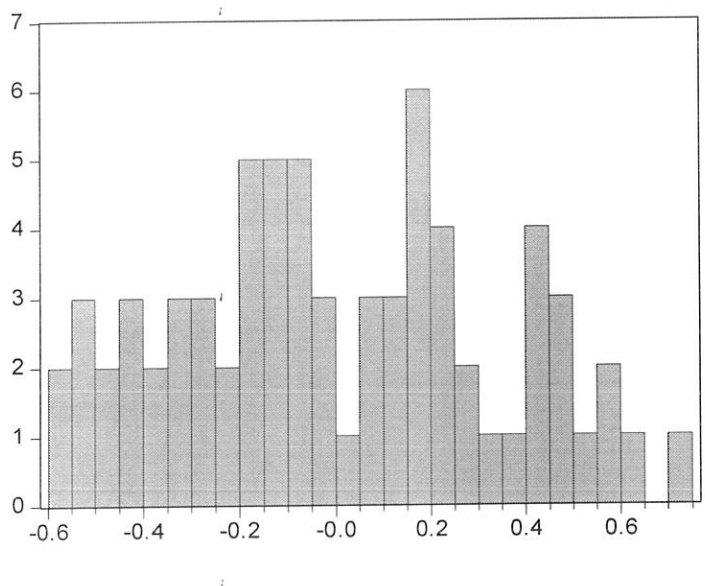
LIST OF APPENDIXS

APPENDIX 1: Multicollinearity; Normality; heteroscedasticity; serial correlation [Autocorrelation]; and stationarity test for outreach and financial Sustainability Parameters

[A] Correlation Analysis [Multicollinearity]

	CAPSTR	DALS	DBORRW	DCPB	DMSIZE	FEMALE	INTR	MAGE
CAPSTR	1	0.0576	-0.1616	-0.0918	-0.2296	-0.1543	-0.1661	0.1905
DALS	0.0576	1	-0.3344	0.2365	0.1135	0.1144	-0.0135	0.0396
DBORRW	-0.1616	-0.3344	1	-0.3547	0.5913	-0.1467	0.1748	-0.4403
DCPB	-0.0918	0.2365	-0.3547	1	-0.1367	0.0500	0.0930	0.0219
DMSIZE	-0.2296	0.1135	0.5913	-0.1367	1	0.0635	0.0441	-0.4621
FEMALE	-0.1543	0.1144	-0.1467	0.0500	0.0635	1	0.3411	-0.3396
INTR	-0.1661	-0.0135	0.1748	0.0930	0.0441	0.3411	1	-0.5591
MAGE	0.1905	0.0396	-0.4403	0.0219	-0.4621	-0.3396	-0.5591	1

[b] Normality Test



Series: Residuals
Sample 2 72
Observations 71

Mean	5.48e-15
Median	-0.042141
Maximum	0.704689
Minimum	-0.586946
Std. Dev.	0.334127
Skewness	0.151967
Kurtosis	2.137420
Jarque-Bera	2.474411
Probability	0.290194

[C] Heteroscedasticity Test

Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.969639	Prob. F(8,62)	0.4679
Obs*R-squared	7.895322	Prob. Chi-Square(8)	0.4438
Scaled explained SS	3.423950	Prob. Chi-Square(8)	0.9050

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/03/12 Time: 09:35
Sample: 2 72
Included observations: 71

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.186199	4.378553	-0.270911	0.7874
CAPSTR	1.372999	4.357978	0.315054	0.7538
DALS	0.000790	0.000909	0.868920	0.3882
DBORRW	-1.85E-05	0.000946	-0.019569	0.9844
DCPB	-0.000640	0.000446	-1.434675	0.1564
DMSIZE	-6.56E-07	0.000775	-0.000847	0.9993
FEMALE	-0.003104	0.085218	-0.036423	0.9711
INTR	-0.667330	1.077457	-0.619357	0.5380
MAGE	0.004420	0.007728	0.571925	0.5694

R-squared	0.111202	Mean dependent var	0.110068
Adjusted R-squared	-0.003482	S.D. dependent var	0.118223
S.E. of regression	0.118429	Akaike info criterion	-1.311030
Sum squared resid	0.869577	Schwarz criterion	-1.024211
Log likelihood	55.54155	Hannan-Quinn criter.	-1.196971
F-statistic	0.969639	Durbin-Watson stat	1.751927
Prob(F-statistic)	0.467925		

[d] Serial correlation [autocorrelation] Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.648198	Prob. F(2,61)	0.2008
Obs*R-squared	3.691349	Prob. Chi-Square(2)	0.1579

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/05/12 Time: 00:56
Sample: 1 72
Included observations: 72
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.16841	14.84619	0.684917	0.4960
ALS	1.23E-05	0.000109	0.112726	0.9106
BORRW	-1.49E-07	5.96E-07	-0.249408	0.8039
CAPSTR	-10.51426	14.86835	-0.707157	0.4822
CPB	-0.000131	0.000764	-0.171805	0.8642
FEMALE	-0.013410	0.246631	-0.054374	0.9568
INTR	1.649208	3.436434	0.479918	0.6330
MAGE	0.009404	0.026715	0.351998	0.7261
MSIZE	3.63E-11	2.03E-10	0.178884	0.8586
RESID(-1)	0.268805	0.149632	1.796438	0.0774
RESID(-2)	-0.037675	0.167847	-0.224461	0.8231

R-squared	0.051269	Mean dependent var	-1.14E-16
Adjusted R-squared	-0.104261	S.D. dependent var	0.313314
S.E. of regression	0.329242	Akaike info criterion	0.755717
Sum squared resid	6.612428	Schwarz criterion	1.103541
Log likelihood	-16.20583	Hannan-Quinn criter.	0.894187
F-statistic	0.329640	Durbin-Watson stat	2.031181
Prob(F-statistic)	0.969849		

[e] Test for stationarity

Null Hypothesis: FSS has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.547328	0.0000
Test critical values:	1% level	-3.525618	
	5% level	-2.902953	
	10% level	-2.588902	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FSS)
Method: Least Squares
Date: 05/04/12 Time: 08:57
Sample (adjusted): 2 72
Included observations: 71 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FSS(-1)	-0.609878	0.109941	-5.547328	0.0000
C	0.575106	0.112321	5.120210	0.0000

R-squared	0.308429	Mean dependent var	-0.002127
Adjusted R-squared	0.298406	S.D. dependent var	0.425409
S.E. of regression	0.356328	Akaike info criterion	0.801833
Sum squared resid	8.760890	Schwarz criterion	0.865570
Log likelihood	-26.46506	Hannan-Quinn criter.	0.827179
F-statistic	30.77284	Durbin-Watson stat	2.060265
Prob(F-statistic)	0.000000		

[f] Test for Random Effect

Correlated Random Effects - Hausman Test
Equation: EQ03
Test cross-section random effects

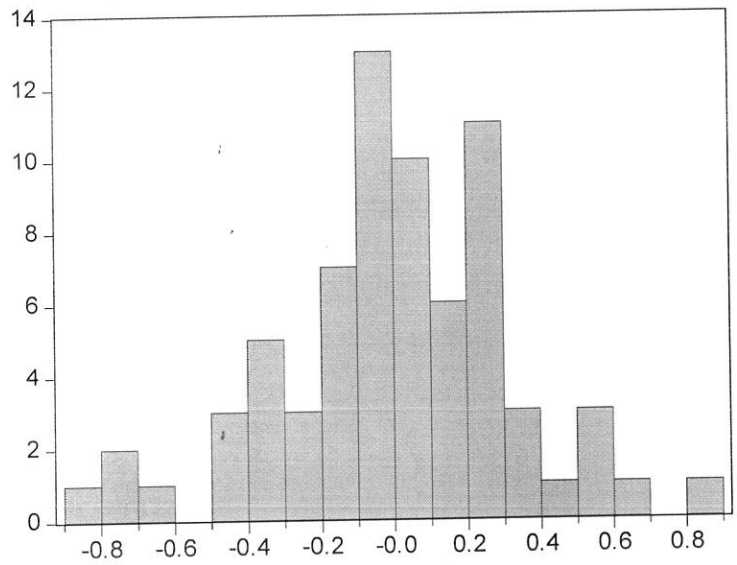
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	7.280304	8	0.5067

APPENDIX 2: Multicollinearity; Normality; heteroscedasticity; serial correlation [Autocorrelation]; and stationarity test for Efficiency and Financial Sustainability Parameters

[A] Correlation Analysis [Multicollinearity]

	DCPB	DCR	DLOP	DNBPS	OER	PAR	PER	WOR	YGLP
DCPB	1	-0.2151	-0.1502	-0.2699	0.0969	-0.0831	-0.0075	-0.1555	0.0591
DCR	-0.2151	1	-0.1618	0.0739	-0.0198	0.1741	0.0636	0.1153	-0.0162
DLOP	-0.1502	-0.1618	1	0.5516	0.0336	-0.1439	0.0174	0.0340	0.0819
DNBPS	-0.2699	0.0739	0.5516	1	-0.0242	-0.1105	0.0429	0.0564	0.0529
OER	0.0969	-0.0198	0.0336	-0.0242	1	0.1162	0.9153	0.3020	0.6004
PAR	-0.0831	0.1741	-0.1439	-0.1105	0.1162	1	0.1802	0.3118	-0.0157
PER	-0.0075	0.0636	0.0174	0.0429	0.9153	0.1802	1	0.2559	0.4980
WOR	-0.1555	0.1153	0.0340	0.0564	0.3020	0.3118	0.2559	1	0.1325
YGLP	0.0591	-0.0162	0.0819	0.0529	0.6004	-0.0157	0.4980	0.1325	1

[b] Normality Test



Series: Residuals
Sample 2 72
Observations 71

Mean	5.00e-17
Median	0.005661
Maximum	0.806960
Minimum	-0.803411
Std. Dev.	0.314970
Skewness	-0.197194
Kurtosis	3.305683
Jarque-Bera	0.736577
Probability	0.691918

[c] Serial correlation [autocorrelation] Test

reusch-Godfrey Serial Correlation LM Test:

F-statistic	1.494129	Prob. F(2,60)	0.2327
Obs*R-squared	3.368348	Prob. Chi-Square(2)	0.1856

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/05/12 Time: 03:25
Sample: 2 72
Included observations: 71
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.037236	0.126736	-0.293807	0.7699
DCPB	0.000365	0.001332	0.274099	0.7850
DCR	-0.000108	0.000770	-0.139791	0.8893
DLOP	6.68E-05	0.001007	0.066327	0.9473
DNBPS	0.000170	0.002223	0.076404	0.9394
OER	-0.120069	0.657284	-0.182674	0.8557
PAR	-0.102194	1.029333	-0.099282	0.9212
WOR	0.124217	1.391934	0.089241	0.9292
YGLP	0.275599	0.742412	0.371220	0.7118
RESID(-1)	0.228918	0.135230	1.692804	0.0957
RESID(-2)	-0.099422	0.146296	-0.679594	0.4994

R-squared	0.047442	Mean dependent var	5.00E-17
Adjusted R-squared	-0.111318	S.D. dependent var	0.314970
S.E. of regression	0.332039	Akaike info criterion	0.774394
Sum squared resid	6.614989	Schwarz criterion	1.124950
Log likelihood	-16.49100	Hannan-Quinn criter.	0.913799
F-statistic	0.298826	Durbin-Watson stat	2.008676
Prob(F-statistic)	0.978797		

[d] Heteroscedasticity Test before data [variables] transformation

Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.595586	Prob. F(8,62)	0.0017
Obs*R-squared	22.50096	Prob. Chi-Square(8)	0.0041
Scaled explained SS	19.78051	Prob. Chi-Square(8)	0.0112

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/05/12 Time: 03:32
Sample: 2 72
Included observations: 71

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.261404	0.049203	5.312711	0.0000
DCPB	0.000170	0.000505	0.336107	0.7379
DCR	-0.000197	0.000300	-0.656759	0.5138
DLOP	-0.000646	0.000398	-1.622677	0.1097
DNBPS	0.001340	0.000877	1.528671	0.1314
OER	-0.571985	0.256500	-2.229959	0.0294
PAR	0.162790	0.399845	0.407133	0.6853
WOR	-0.728673	0.506004	-1.440053	0.1549
YGLP	-0.425692	0.285554	-1.490758	0.1411

R-squared	0.316915	Mean dependent var	0.097809
Adjusted R-squared	0.228775	S.D. dependent var	0.149575
S.E. of regression	0.131356	Akaike info criterion	-1.103837
Sum squared resid	1.069771	Schwarz criterion	-0.817018
Log likelihood	48.18620	Hannan-Quinn criter.	-0.989778
F-statistic	3.595586	Durbin-Watson stat	1.444107
Prob(F-statistic)	0.001732		

[e] Heteroscedasticity Test after data [variables] transformation

Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.303334	Prob. F(8,28)	0.9585
Obs*R-squared	2.950923	Prob. Chi-Square(8)	0.9374
Scaled explained SS	1.857831	Prob. Chi-Square(8)	0.9851

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/05/12 Time: 03:52
Sample: 2 69
Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.055169	0.018973	2.907788	0.0070
DCPB	0.000831	0.000929	0.894287	0.3788
DCR	-0.000121	0.000282	-0.428155	0.6718
DLOP	-0.000237	0.000469	-0.503974	0.6182
DNBPS	0.000643	0.001132	0.568088	0.5745
DOER	-0.001175	0.001235	-0.951340	0.3496
DPAR	0.000107	0.000184	0.577781	0.5680
DWOR	8.88E-05	0.000176	0.503524	0.6185
DYGLP	0.001117	0.001028	1.087203	0.2862

R-squared	0.079755	Mean dependent var	0.061145
Adjusted R-squared	-0.183173	S.D. dependent var	0.091916
S.E. of regression	0.099981	Akaike info criterion	-1.559901
Sum squared resid	0.279893	Schwarz criterion	-1.168056
Log likelihood	37.85816	Hannan-Quinn criter.	-1.421757
F-statistic	0.303334	Durbin-Watson stat	0.606098
Prob(F-statistic)	0.958479		

[f] Random Effects Test

Correlated Random Effects - Hausman Test
Equation: EQ03
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.552843	9	0.8714

APPENDIX 3: Descriptive Statistics for Outreach and Financial Sustainability [Chapter 4]

Parameters

[a] Mean for the three types of MFIs [for dependent variable]

FSS

Types of MFIs	N	Mean	Std. Error	Minimum	Maximum
large	24	1.170917E0	.0954343	.2900	2.0400
medium	24	.946208	.0586277	.5400	1.5200
small	24	.739104	.0521570	.3400	1.3500
Total	72	.952076	.0456761	.2900	2.0400

[b] Mean difference of the three types of MFIs [for dependent variable]

FSS

LSD

(I) MFIs	(J) MFIs	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
large	medium	.2247083*	.1008803	.029	.023458	.425959
	small	.4318125*	.1008803	.000	.230562	.633063
medium	large	-.2247083*	.1008803	.029	-.425959	-.023458
	small	.2071042*	.1008803	.044	.005853	.408355
small	large	-.4318125*	.1008803	.000	-.633063	-.230562
	medium	-.2071042*	.1008803	.044	-.408355	-.005853

*. The mean difference is significant at the 0.05 level.

[c] Mean for the different variables for the three types of MFIs

Independent Variables	Types of MFIs	N	Mean	Std. Error	Minimum	Maximum
ALS	large	24	2,119.46	141.775	1,020	3,651
	medium	24	1,366.75	94.651	621	2,339
	small	24	928.83	54.061	505	1,382
	Total	72	1,471.68	82.817	505	3,651
BORRW	large	24	357,308.62	42,017.492	52,820	710,576
	medium	24	30,237.33	2,795.717	12,151	56,735
	small	24	15,428.79	2,175.971	5,454	42,146
	Total	72	134,324.92	23,295.078	5,454	710,576
CPB	large	24	74.25	3.609	39	108
	medium	24	164.83	16.580	73	365
	small	24	170.46	7.886	120	255
	Total	72	136.51	8.073	39	365
INTR	large	24	.1567	.00260	.14	.17
	medium	24	.1750	.00248	.16	.20
	small	24	.1858	.00275	.16	.21
	Total	72	.1725	.00206	.14	.21
CAPSTR	large	24	1.001012E0	.0009629	.9932	1.0184
	medium	24	1.000417E0	.0004214	.9998	1.0101
	small	24	1.000842E0	.0005823	.9999	1.0101
	Total	72	1.000757E0	.0003960	.9932	1.0184
FEMALE	large	24	.4158	.03239	.19	.75
	medium	24	.5917	.03079	.36	.81
	small	24	.5800	.04535	.10	.96
	Total	72	.5292	.02299	.10	.96
MSIZE	large	24	1.01E9	1.541E8	1.E8	3.E9
	medium	24	50,625,855.75	6,215,746.099	10,042,600	1.E8
	small	24	18,930,099.08	2,999,544.511	2,673,000	60,405,900
	Total	72	3.59E8	74,331,677.965	2,673,000	3.E9

MAGE	large	24	10.46	.426	6	14
	medium	24	8.75	.422	5	13
	small	24	7.75	.515	3	12
	Total	72	8.99	.292	3	14

[d]The mean difference of the different variables for the three types of MFIs

Multiple Comparisons

LSD

independent Variables	(I) MFIs	(J) MFIs	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
ALS	large	medium	752.708*	146.017	.000	461.41	1,044.01
		small	1,190.625*	146.017	.000	899.33	1,481.92
	medium	large	-752.708*	146.017	.000	-1,044.01	-461.41
		small	437.917*	146.017	.004	146.62	729.21
	small	large	-1,190.625*	146.017	.000	-1,481.92	-899.33
		medium	-437.917*	146.017	.004	-729.21	-146.62
CAPSTR	large	medium	.0005958	.0009811	.546	-.001361	.002553
		small	.0001708	.0009811	.862	-.001786	.002128
	medium	large	-.0005958	.0009811	.546	-.002553	.001361
		small	-.0004250	.0009811	.666	-.002382	.001532
	small	large	-.0001708	.0009811	.862	-.002128	.001786
		medium	.0004250	.0009811	.666	-.001532	.002382
BORRW	large	medium	327,071.292*	34,428.869	.000	258,387.58	395,755.01
		small	341,879.833*	34,428.869	.000	273,196.12	410,563.55
	medium	large	-327,071.292*	34,428.869	.000	-395,755.01	-258,387.58
		small	14,808.542	34,428.869	.668	-53,875.17	83,492.26
	small	large	-341,879.833*	34,428.869	.000	-410,563.55	-273,196.12
		medium	-14,808.542	34,428.869	.668	-83,492.26	53,875.17
MSIZE	large	medium	9.554E8*	1.260E8	.000	7.04E8	1.21E9
		small	9.871E8*	1.260E8	.000	7.36E8	1.24E9
	medium	large	-9.554E8*	1.260E8	.000	-1.21E9	-7.04E8

		small	31,695,756.667	1.260E8	.802	-2.20E8	2.83E8
	small	large	-9.871E8*	1.260E8	.000	-1.24E9	-7.36E8
		medium	-31,695,756.667	1.260E8	.802	-2.83E8	2.20E8
MAGE	large	medium	1.708*	.645	.010	.42	3.00
		small	2.708*	.645	.000	1.42	4.00
	medium	large	-1.708*	.645	.010	-3.00	-.42
		small	1.000	.645	.126	-.29	2.29
	small	large	-2.708*	.645	.000	-4.00	-1.42
		medium	-1.000	.645	.126	-2.29	.29
FEMALE	large	medium	-.17583*	.05198	.001	-.2795	-.0721
		small	-.16417*	.05198	.002	-.2679	-.0605
	medium	large	.17583*	.05198	.001	.0721	.2795
		small	.01167	.05198	.823	-.0920	.1154
	small	large	.16417*	.05198	.002	.0605	.2679
		medium	-.01167	.05198	.823	-.1154	.0920
INTR	large	medium	-.01833*	.00370	.000	-.0257	-.0110
		small	-.02917*	.00370	.000	-.0365	-.0218
	medium	large	.01833*	.00370	.000	.0110	.0257
		small	-.01083*	.00370	.005	-.0182	-.0035
	small	large	.02917*	.00370	.000	.0218	.0365
		medium	.01083*	.00370	.005	.0035	.0182

*. The mean difference is significant at the 0.05 level.

APPEDIX 4: Detailed Econometric Results for Outreach Variables

Dependent Variable: FSS
Method: Panel EGLS (Cross-section random effects)
Date: 05/01/12 Time: 08:51
Sample (adjusted): 2006 2010
Periods included: 5
Cross-sections included: 12
Total panel (balanced) observations: 60
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.192257	13.08764	0.473138	0.6381
CAPSTR	-5.643398	12.95269	-0.435693	0.6649
DALS	0.342638	0.003714	2.710207	0.0008
DBORRW	-0.005790	0.003617	-2.200750	0.0006
DCPB	-0.003471	0.002187	-1.986825	0.0087
DMSIZE	0.006366	0.002845	2.237622	0.0296
FEMALE	0.097053	0.349103	0.278008	0.7821
INTR	2.482206	0.008706	2.633425	0.0003
MAGE	0.076667	0.033767	2.270448	0.0274

Effects Specification	S.D.	Rho
Cross-section random	0.191018	0.2606
Idiosyncratic random	0.321779	0.7394

Weighted Statistics

R-squared	0.476077	Mean dependent var	0.574937
Adjusted R-squared	0.294089	S.D. dependent var	0.351565
S.E. of regression	0.319501	Sum squared resid	5.206124
F-statistic	2.554531	Durbin-Watson stat	1.822672
Prob(F-statistic)	0.000019		

Unweighted Statistics

R-squared	0.306285	Mean dependent var	0.955500
Sum squared resid	6.648346	Durbin-Watson stat	1.427281

APPENDIX 5: Descriptive Statistics for Efficiency and Financial Sustainability [Chapter 5]

Parameters

[a] Mean for the different variables for the three types of MFIs

Independent Variables	Types of MFIs	N	Mean	Std. Error	Minimum	Maximum
YGLP	large	24	.133683	.0071323	.0500	.1898
	medium	24	.201804	.0068629	.1200	.2593
	small	24	.237792	.0164531	.0400	.4648
	Total	72	.191093	.0081278	.0400	.4648
LOP	large	24	536.46	47.894	141	1012
	medium	24	454.58	43.023	221	917
	small	24	373.75	21.547	175	588
	Total	72	454.93	23.661	141	1012
PAR	large	24	.029250	.0040861	.0020	.0700
	medium	24	.029250	.0050373	.0000	.0900
	small	24	.065271	.0123191	.0040	.2600
	Total	72	.041257	.0049991	.0000	.2600
NBPS	large	24	213.50	12.749	121	334
	medium	24	190.12	8.487	126	250
	small	24	162.17	9.914	94	265
	Total	72	188.60	6.492	94	334
OER	large	24	.0413	.00297	.02	.08
	medium	24	.1258	.01034	.04	.20
	small	24	.1942	.01447	.05	.40
	Total	72	.1204	.00950	.02	.40
CR	large	24	1.571838E0	.1129526	1.1462	3.3012
	medium	24	1.560679E0	.0648884	.7355	2.0714
	small	24	4.789029E0	1.7794453E0	.0964	36.8307
	Total	72	2.640515E0	.6133962	.0964	36.8307
WOR	large	24	.01146	.003445	.000	.070
	medium	24	.01771	.004103	.000	.060

	small	24	.05012	.009330	.000	.149
	Total	72	.02643	.004067	.000	.149

[b] The mean difference of the different variables for the three types of MFIs

Multiple Comparisons

LSD

Independent Variable	(I) MFIs	(J) MFIs	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
YGLP	large	medium	-.0681208*	.0156775	.000	-.099397	-.036845
		small	-.1041083*	.0156775	.000	-.135384	-.072833
	medium	large	.0681208*	.0156775	.000	.036845	.099397
		small	-.0359875*	.0156775	.025	-.067263	-.004712
	small	large	.1041083*	.0156775	.000	.072833	.135384
		medium	.0359875*	.0156775	.025	.004712	.067263
LOP	large	medium	81.875	55.432	.144	-28.71	192.46
		small	162.708*	55.432	.005	52.12	273.29
	medium	large	-81.875	55.432	.144	-192.46	28.71
		small	80.833	55.432	.149	-29.75	191.42
	small	large	-162.708*	55.432	.005	-273.29	-52.12
		medium	-80.833	55.432	.149	-191.42	29.75
PAR	large	medium	.0000000	.0113675	1.000	-.022678	.022678
		small	-.0360208*	.0113675	.002	-.058698	-.013343
	medium	large	.0000000	.0113675	1.000	-.022678	.022678
		small	-.0360208*	.0113675	.002	-.058698	-.013343
	small	large	.0360208*	.0113675	.002	.013343	.058698
		medium	.0360208*	.0113675	.002	.013343	.058698
NBPS	large	medium	23.375	14.897	.121	-6.34	53.09
		small	51.333*	14.897	.001	21.62	81.05
	medium	large	-23.375	14.897	.121	-53.09	6.34
		small	27.958	14.897	.065	-1.76	57.68
	small	large	-51.333*	14.897	.001	-81.05	-21.62

		medium	-27.958	14.897	.065	-57.68	1.76
CR	large	medium	.0111583	1.4567989E0	.994	-2.895076	2.917393
		small	-3.2171917*	1.4567989E0	.031	-6.123426	-.310957
	medium	large	-.0111583	1.4567989E0	.994	-2.917393	2.895076
		small	-3.2283500*	1.4567989E0	.030	-6.134584	-.322116
	small	large	3.2171917*	1.4567989E0	.031	.310957	6.123426
		medium	3.2283500*	1.4567989E0	.030	.322116	6.134584
WOR	large	medium	-.006250	.008784	.479	-.02377	.01127
		small	-.038667*	.008784	.000	-.05619	-.02114
	medium	large	.006250	.008784	.479	-.01127	.02377
		small	-.032417*	.008784	.000	-.04994	-.01489
	small	large	.038667*	.008784	.000	.02114	.05619
		medium	.032417*	.008784	.000	.01489	.04994
PER	large	medium	-.04500*	.00837	.000	-.0617	-.0283
		small	-.08750*	.00837	.000	-.1042	-.0708
	medium	large	.04500*	.00837	.000	.0283	.0617
		small	-.04250*	.00837	.000	-.0592	-.0258
	small	large	.08750*	.00837	.000	.0708	.1042
		medium	.04250*	.00837	.000	.0258	.0592
OER	large	medium	-.08458*	.01472	.000	-.1140	-.0552
		small	-.15292*	.01472	.000	-.1823	-.1235
	medium	large	.08458*	.01472	.000	.0552	.1140
		small	-.06833*	.01472	.000	-.0977	-.0390
	small	large	.15292*	.01472	.000	.1235	.1823
		medium	.06833*	.01472	.000	.0390	.0977

*. The mean difference is significant at the 0.05 level.

APPEDIX 6: Detailed Econometric Results for Efficiency Variables

Dependent Variable: FSS
Method: Panel EGLS (Cross-section random effects)
Date: 05/01/12 Time: 10:17
Sample (adjusted): 2006 2010
Periods included: 5
Cross-sections included: 12
Total panel (balanced) observations: 60
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.142450	0.170685	6.693325	0.0000
DCPB	-0.002609	0.002292	-2.658071	0.1035
DCR	0.170641	0.000953	-1.772857	0.1041
DLOP	-0. 457456	0.001215	-0.375559	0.7088
DNBPS	0.172640	0.003208	2.233142	0.0543
OER	-1.946665	2.021559	-5.962952	0.0502
YGLP	3.936820	0.000249	2.846020	0.0002
WOR	-2.609649	0.000498	-2.414829	0.0033
PAR	-1.116437	1.337555	-4.834685	0.0009

Effects Specification	S.D.	Rho
Cross-section random	0.086159	0.0513
Idiosyncratic random	0.370599	0.9487

Weighted Statistics			
R-squared	0.540618	Mean dependent var	0.847787
Adjusted R-squared	0.322929	S.D. dependent var	0.386631
S.E. of regression	0.353734	Sum squared resid	6.256403
F-statistic	2.275983	Durbin-Watson stat	1.891789
Prob(F-statistic)	0.000002		

Unweighted Statistics			
R-squared	0.325444	Mean dependent var	0.955500
Sum squared resid	6.464728	Durbin-Watson stat	1.830826