The Relationship between Outreach and Financial Sustainability: An Empirical Study on Ethiopian Microfinance Institutions

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By

Abinet yeshi

Addis Ababa University

College of Business and Economics

Department of Accounting and Finance

(Graduate Program)

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Addis Ababa, Ethiopia

Statement of Declaration

I, Abinet Yeshi declare that this thesis entitled "The relationship between outreach and financial sustainability: An empirical study on Ethiopian microfinance institutions'' is outcome of my own effort and study and that all sources of materials used for the study have been duly acknowledged. I have produced it independently except for the guidance and suggestion of the thesis Advisor.

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

By: Abinet Yeshi

Signature_____

Date_____

Statement of Certification

This is to certify that thesis entitled, "The relationship between outreach and financial sustainability: An empirical study on Ethiopian microfinance institutions'' undertaken by Abinet Yeshi for the partial fulfillment of degree of Master of Science in Accounting and Finance at Addis Ababa University, to the best of my knowledge, it is an original work and not submitted earlier for any degree either at this University or any other University.

Advised by:

Degefe Duressa(Dr.)	_____	_____
Advisor	Signature	Date

Examined by:

Abebe Yitayew (Dr.)	_____	_____
Internal Examiner	Signature	Date
Arega Siyume (Dr.)	_____	_____
External Examiner	Signature	Date

ABSTRACT

The overall objective of the study was to scrutinize the relationship between microfinance outreach and financial sustainability in Ethiopia. The study specifically aimed at establishing the relationship between loan outreach and microfinance institutions' financial sustainability in Ethiopia. MFIs in Ethiopia enable to increase industrial outreach to 3.9 million clients. Yet, the loan service outreaches to the poor in Ethiopia fall short of the escalating demand. Quantitative design was employed and it was found suitable for the study since it aimed at establishing the relationship between microfinance outreach variables and financial sustainability. The population for the study was composed of 35 microfinance institutions in Ethiopia. Secondary data was collected from 14 purposively selected microfinance institutions reporting their financial and operational data to either of AEMFI or NBE over the period 2003-2014. Multiple regression analysis was then carried out on a panel data collected in order to examine relationships between variables. Significant positive relationship between breadth of outreach measured as number of active borrowers and gross loan to asset ratio and financial sustainability was evident among microfinance institutions in Ethiopia. However, there is a trade of between microfinance institutions depth of outreach measured by average loan size and financial sustainability as this variable shown statistically significant association with financial sustainability. Operating expense per loan portfolio relate inversely with financial sustainability while yield relates directly. Thus, it was concluded that the relationship between outreach and financial sustainability of MFIs in Ethiopia is depends on the variables used. Therefore, this study recommends that microfinance institutions in Ethiopia should increase the numbers of borrowing clients they are serving to be benefited from economics of scale.

Key words: Microfinance, loan outreach, financial sustainability, economies of scale.

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List of Acronyms and Abbreviations

ACCION- Americans for Community Co-operation in Other Nations:

AEMFI- Association of Ethiopian microfinance institution

ALBPB- Average loan balance per borrower

BRI - Bank of Rakyat Indonesia

CDFIF- Community Development Financial Institution Fund

CGAP- Consultative group to assist the poor

FSS- Financial self sufficiency

GLPR- Gross loan portfolio to asset ratio

GNI - Gross National income.

GNP- Gross National Product

GPY- Gross loan portfolio yield

MDO - Microfinance enterprise development organization

MFI - Microfinance institutions

MIX - Microfinance information exchange.

NAB - Number of active borrowers

NBE- National Bank of Ethiopia

NGO -Non Government Organization

OSS- Operational self sufficiency

OER- operating expense ratio

PWB- portion of women borrowers

ROA - Return on Asset

ROE - Return on Equity

PWB- Portion of women borrowers

SFPI-Specialized financial and promotional microfinance institution

Chapter One

1. Introduction

1.1. Background of the study

Making finance accessible to the poor is a crucial mechanism for poverty reduction and wealth creation in developing economies where there exists a huge unmet demand for financial services. So far, access to financial services by the poor from financial mainstream institutions is very limited, mainly due to high costs of market contracts and constraints (World Bank, 2008 and Demirguc-Kunt and Klapper, 2012). Microfinance has emerged as a dedicated pro-poor financial institution to lend uncollateralized and tailored loan terms to the unbanked poor in low income communities. Through institutional innovations and innovative loan terms, microfinance institutions become able to dispense with information and enforcement costs and generate high repayment rates. Microfinance institutions demonstrate that the poor can borrow, pay substantial interest rates and save continuously, which in turn results greater optimism for improving credit markets in developing economies.

However, the efforts of microfinance institutions to expand and perpetuate financial services to the poor are often backed by a steady flow of subsides (Morduch, 1999). Providing financial services on a cost-covering basis and translating high repayment rates into profits remains a challenge not mastered yet. Besides the inherent costs of market contracts in micro lending, focus on outreach per se and dependence on noncommercial sources of funds, such as subsidies undermines the need for financial self sufficiency in microfinance practices (Armendáriz de Aghion, 2010). Recently, however, increasing regulations, commercialization and competition in microfinance has driven micro lenders to shift their focus from outreach and a reliance on

donated funds to achieving financial sustainability which is a demanding goal that requires the ability to cover costs out of the income generated.

The concern is, thus, the implications of shifting the focus towards financial viability on the traditional social mission of microfinance, i.e. outreach to the poor. Such a concern can be even greater in countries like Ethiopia where the financial market is less developed and microfinance institutions are promoted as a poverty reduction instrument (Wolday, 2007). As they are mainly promoted to extend financial services to the unbanked poor, failure to achieve wider breadth (scale) and deeper outreach in the pursuit of financial sustainability can be indeed a policy concern. The two most important objectives for microfinance institutions to be successful are financial sustainability and substantial outreach to the target population (Yeron 1995).

Efforts to extend microfinance services to the people who are underserved by conventional banks are termed as outreach. Outreach can be measured in terms of breadth, number of clients served and volume of services or depth which represents the socioeconomic level of clients MFIs reach. By definition, MFIs offer financial services to low-income clients. Some MFIs achieve deeper outreach by targeting the client groups that are most vulnerable such as women and/or people with very low average loan and savings (Lafourcade et al., 2005). Therefore, microfinance programs have to be developed for the poor and, local communities. To do this, MFIs should have an outreach ability and mechanism to cover poor and remote areas in need to promote the unemployed people to establish and develop income generating projects (Malkawi and Atoom, 2011).

Sustainability plays an integral part in the continued provision of financial products in the microfinance sector. Sustainability relates to organizational, managerial and financial aspects but the issue of financial sustainability of MFIs has attracted more attention in the mainstream analysis (Thapa, 2007). Rosengard (2001), defined financial sustainability as the development of products and delivery systems that meet client needs, at prices that cover all cost of providing these financial services.

Bayeh (2012) extended the meaning of financial sustainability to include the ability to keep on going towards microfinance objective without continued donor support. Financial sustainability is also said to be a pre-requisite of attracting commercial funding and thus achieving greater outreach and it was better not to have MFIs than having unsustainable ones. Meyer (2002), identified two kinds of financial sustainability measures that could be used in assessing MFIs financial performance, that is, operational self- sufficiency and financial self sufficiency. Operational self-sufficiency is when the operating income is sufficient enough to cover financial expense, loan losses and operational costs like salaries, supplies, and other administrative costs. Financial self-sufficiency (which he referred to as a high standard measure) is when MFIs can also cover the costs of funds that are valued at market and other forms of subsidies received when they are valued at market prices.

Theoretically, outreach to the poor and financial sustainability can be potentially either complementary or conflicting. On the one hand, a focus on financial performance and efficiency can reduce excess costs and attract commercial funds (including voluntary savings), which may, at the same time, contribute to expand outreach. Once the institution becomes financially sustainable, it can mean wider outreach today, tomorrow and in the future (Frank,

2008). Meyer (2002) also noted that outreach and financial sustainability are complementary because as the number of clients increases, MFIs enjoy economies of scale and hence reduce costs which help them to become financially sustainable. On the other hand, Hulme and Mosely (1996) argued that there is inverse relationship between outreach and financial sustainability. They argued that higher outreach means higher transaction cost in order to get information about creditworthiness of clients and hence make MFIs financially unsustainable.

Striving for financial sustainability and efficiency can result in a shift in the composition of new clients at the cost of lending to the poor, as lending small and customized loan terms are very costly to maintain. In other words, seeking financial sustainability can push microfinance institutions to crowd-out of their portfolio of lending the small size loans that are demanded by the poor (Hashemi and Rosenberg, 2006). Moreover, priority to achieve sustainability can lead to higher interest rates and anti-social contract enforcement methods (Roberts, 2013). As such, the relationship between social performance (outreach to the poor) and financial performance (financial sustainability) of MFIs may be a trade-off or a matter of compatibility.

1.2. Background of Microfinance institutions in Ethiopia

MFIs are 1990s phenomenon in Ethiopia. The Microfinance proclamation in 1996 marked start of deposit taking MFIs in Ethiopia. Following the economic reform in 1991, some of the NGO and government pilot credit programs engaged in financial intermediation transformed into formal (specialized or non-bank) microfinance institutions. In Ethiopia MFIs are share companies that are registered and regulated by the National Bank of Ethiopia (NBE). Almost all the MFIs operating in the country have both the dual mission of reaching poor clients and being financially sustainable (Wolday, 2007). However, the question of whether these twine objectives of MFIs are mutually inclusive or not was not answered. The

Government's hand in the MFI industry is huge ranging from extending institutional and portfolio supports to claiming ownership in MFIs. An assessment study on Access to finance (Weidmaier et al., 2008) noted that some of the government led MFIs have registered outstanding performance while targeted lending by state Governments resulted in a distorted market (Gashaw, 2014). Large MFIs in Ethiopia are characterized by huge affiliation to the government. In addition to the MFIs evolved from prior NGOs and government credit programs, the industry also witnessed new start-ups of investor-owned microfinance providers.

Since the issuance of the proclamation, 35 microfinance institutions operating throughout the country; providing financial service to its 3.9 million loan clients (of which 1.6 million or 42.1% are female clients) through 1,489 branch/sub-branch offices (NBE, 2014). Considering the potential demand, particularly in rural areas, this only satisfies an insignificant proportion. Competition within MFIs in Ethiopia does not seem to be fierce. Big-sized MFIs (Amhara, Dedebit, Oromia, Omo and Addis Credit and Saving Institutions) continued to dominate the market share of the sector with respect to total deposits 93.9%, net-loan outstanding 90.3%, total assets 90.5% and number of clients 87.6% (NBE, 2014).

1.3. Statement of the problem

Microfinance institutions play an important role in the financial system by providing financial services to those who cannot access the conventional banking services. Nevertheless, millions of potential clients still remain un-served and the demand for financial services far exceeds the currently available supply (Bogan et al., 2007). According to Microfinance Bulletin (2008a, pp:16), it is estimated that about 4 billion people worldwide live on less than US$2 per day and poverty is one of the major problems that is still prevailing in today's world. Out of 3 billion

potential clients, it is estimated that MFIs only serve about 15% of the target market (CGAPa, 2004). Robinson also estimated that about 90 percent of the people in developing countries have no access to institutional financial services (Robinson, 2001). On the other hand, out of the approximately 10,000 MFIs worldwide, it is estimated that only 3 to 5 percent have achieved full financial sustainability (Dichter and Harper, 2007, p: 49). As a rule of thumb, MFIs with annual losses of about 5 percent tend to become unsustainable (Rosenberg et al. 2009, p: 12).

According to Meyer (2002) as the number of clients increase, MFIs enjoy economies of scale and hence reduce costs which help them to be financially sustainable. However, Hulme and Mosely (1996) argue that expanded MFI outreach increase transaction cost on seeking information about the clients' creditworthiness which makes MFIs financially unsustainable. The concept of social performance has seemed to overshadow the state of health of these institutions. However, the accepted criteria in a number of studies to study the performance of any MFI have been based on financial performance and outreach (Arsyad, 2005).

There is no exception in Ethiopia. Despite the increase in industrial outreach to 3.9 million clients, overall market penetration remains weak. Indeed the figure seems large in absolute terms; however, it is small in relation to the potential poor clients. Studies also indicate that about 85% of Ethiopian poor households remain without access to formal financial service. An estimated 10.4 million borrowers will require access to financial service over the next decade, which will require an investment of over Birr 106 billion in on lending funds. MFIs in the country reach only a fraction of the country's poor, i.e., 10-20 percent of the microfinance

demands of the country (Wolday, 2008). On the other hand, considerable MFIs in Ethiopia were registered a loss for several years ago.

The literature review revealed that, so far, the relationship between outreach and financial sustainability of microfinance institutions is not yet studied in Ethiopia. The exceptions were studies on performance of MFIs by Befekadu (2007) and Letenah (2009) and they are found to be less rigorous in methodology. The results from related studies carried out on MFIs outside Ethiopia varied with studies and economies which also insures the value added by this study. Their findings are contradictory, which surface an ongoing debate between welfaristes and institutionalist comp at large. To this end, little is known about the extent to which MFIs in Ethiopia balance between financial performance and social performance in terms of outreach to the poor. It is from this perspective that the researcher sought to fill this knowledge gap statistically using MFIs financial and operational data over the period (2003-2014).

1.4. Objective of the study

Based on the basic question regarding financial sustainability and outreach of microfinance, the principal objective of this study is to scrutinize the relationship between MFIs loan outreach factors and financial sustainability in Ethiopia.

The specific objectives of the study are to:-

1. Assess loan outreach of MFIs in Ethiopia
2. Assess financial sustainability of MFIs in Ethiopia
3. Determine the influence of loan outreach factors on financial sustainability of MFIs in Ethiopia

4. Examine the level of significance of relationship between loan outreach factors and financial sustainability of MFIs in Ethiopia.

1.5. Hypothesis of the study

There is an ongoing theoretical debate between welfarits and institutionalist comp on the relationship between outreach and financial sustainability of MFIs. Based on these debates, the following theoretical hypotheses were formulated to test empirically by using twelve years data (2003-2014).

H_1. There is significant positive relationship between number of active borrowers (breadth of outreach) and financial sustainability.

H_2. There is significant positive relationship between average loan size per borrowers (depth of outreach) and financial sustainability.

H_3. There is significant positive relationship between gross loan portfolio yield (cost of outreach) and financial sustainability.

H_4. . There is significant positive/negative relationship between portion of women borrowers (depth of outreach) and financial sustainability

H_5 There is significant positive/ negative relationship between gross loan portfolio to asset ratio and financial sustainability

1.6. Scope of the study

The scope of the study is limited to examine the relationships of loan outreach and financial sustainability of MFIs in Ethiopia. Specifically, breadth, depth and cost of outreaches and their relationships with financial sustainability were covered. Further effort has made to asses

performance of MFIs in terms of outreach and financial sustainability. There are 35 MFIs in Ethiopia which were considered as a target population of this study. The study period was limited to the period 2003-2014.

1.7. Significance of the study

The study aimed at examining the relationship between loan outreach and financial sustainability of microfinance institutions in Ethiopia. Therefore, in addition to the academic importance, the findings from this study will have the potential to contribute towards building understanding whether outreach and financial sustainability are mutually inclusive or exclusive goals and about level of significance of relationship between same.

The findings of this study will help for managers in microfinance sector to understand outreach factors that influence MFIs financial sustainability and take advantage of its competencies towards building financially sustainable MFIs. For potential investor the result will assist them to develop selection criteria for their investments. To the regulators of microfinance, the study will contributes towards setting financial and outreach performance standards for MFIs and allow the government to see how their policy initiatives are going. It also provides a framework under which further research can be undertaken.

1.8. Limitation of the study

Limitations are potential weakness or problems with the study identified by the researcher. The limitations often relate to in adequate measure of variables, small sample size, error in measurement and other factors typically relate to data collection and analysis. These limitations are useful to other potential researchers who may choose to conduct a similar replication study

(Creswell, 2005). The major problem that the researcher encountered on the course of the study is actually lack of complete information. As indicated in the other sections, this research purely dependent on the secondary data which was obtained from National Bank of Ethiopia and Association of Ethiopia Microfinance Institutions. However, from the total of 35 MFIs in the country, as of June 30, 2014, it is only 14 of them have a desired data for the years under consideration (2003-2014). But on the other aspects, the researcher believes that there is no problem with regard to the methods and methodology that was applied to achieve the objectives of the study.

1.9. Structure of the study

The remaining sections of the paper are structured as follows. Section two reviews related literature. The third Section deals with research methods and methodology. The fourth and the last sections talks about findings and discussions as well as conclusions and recommendations.

Chapter Two

Review of Related Literature

The purpose of this chapter is to review the existing literature in relation to the relationship between outreach and financial sustainability of MFIs that will be used as background knowledge for the study. The chapter is organized as follows: section 2.1 presents the theoretical review; section 2.2 presents previous studies conducted in the area, section 2.3 presents variables to develop hypothesis, section 2.4 presents the conceptual framework, and finally section 2.5 presents summery of the review and the knowledge gap.

2.1. Theoretical literature review

2.1.1. Definition of microfinance

Microfinance has been defined differently by different people / agencies / institutions (for instance Woller & Schreiner,2002; Nara, 2013) however, the essence of the definitions are usually the same in which microfinance refer to the provision of financial services; primarily savings and credit to the poor and low income households that don't have access to commercial banks. CGAP (2003) defines microfinance as a credit methodology that employs effective collateral substitutes to deliver and recover short-term working capital loans to micro entrepreneurs. Légerwood (1999) and Arsyad (2005) defines it as the provision of financial services (generally saving and credit) to low income clients.

The MIX defines the microfinance institutions as a variety of financial services that target low-income clients, particularly women. Because of these varied needs, and because of the industry's focus on the poor, MIX recognizes many general definitions of microfinance: Microfinance services as opposed to financial services in general are retail financial services

that are relatively small in relation to the income of a typical individual. Specifically, the average loan size of microfinance products is no longer than 25% of the average income per person (GNI per capital).

2.1.2. The microfinance revolution: An overview

The history of micro financing can be traced back as long to the middle of 1800s when the theorist Lysander Spooner was writing over the benefits from small credits to entrepreneurs and farmers as away getting the people out of poverty. The first microenterprise program began in the developing world in the early 1960s and emerged in the United States in the early 1980s. The United States microfinance movement was influenced by the women's movement and is an integral part of the community economic development movement (U.S. G.A.O, 2003). As governor of Arkansas, Bill Clinton supported the good faith fund, one of the early United States microenterprise programs. Many of the early microloans programs in the United States, such as Women's imitative for Self- Employment, focused on women, who remain the primary borrower (Susan R, 2004).

Gender equality advocates have also recognized the importance of the microfinance industry. In 1994, women's world banking, and organization dedicated to helping low income women entrepreneurship by expanding their access to financial services, invited income women leaders to form the united nation expert group on women and finances. Contributions from the United Nations expert group on women and finances have been used by many reactionaries and policy makers in many countries to build policies, system and services that work for microfinance (Sachs J D, 2005). Microfinance services are provided by banks, credit unions, and microfinance organizations, which are also known as microenterprise development organization (MDOs). MDOs such as Americans for Community Co-operation In Other

Nations (ACCION) international were started in the early 1960s and Grameen Bank began in the 1970s when its founder, Mohammad Yunus, an economist professor in Bangladesh, began lending small amounts of money to poor people (Stephen C. 2005). The world attention was focused on microfinance when Yunus and the Grameen Bank won the Nobel Peace Prize in 2006 (Susan R, 2006).

Another milestone in the history of microfinance was the opening of the Indonesian People's Credit Bank in 1895 that became the largest microfinance system in Indonesia, Self-employed women's association Bank in India and many more (Helms, 2006). Other concepts of subsidized loans given out by NGOs and governments to farmers, which might be compared with pure micro credits, often failed since farmers took the low interest loans as grants and more importantly they did not reach the real poor at all, but rather the more influential and better-off farmers. In the 1980s the microcredit programs improved their methodologies significantly and managed to be financially viable through cost-recovering interest rates and a very high repayment quota. Recently, some innovative microfinance institutions such as Bank Rakyat Indonesia (BRI) and Banc sol in Bolivia have shown that it is possible to deliver credit to large number of poor people without the financial institution being at risk.

Today there is a strong trend towards commercialization and transformation of providers of microfinance into formal financial institutions. This stems from the motivation of profitability and sustainability of microfinance institutions. More and more institutions became independent from donor funds and raise their capital from the capital markets while increasing their outreach. Commercial MFIs utilize private, unsubsidized sources of funding to raise capital in order to grow and serve more clients. In becoming commercialized, these institutions now have

a double bottom line: a financial objective of sustainability to satisfy their funders in addition to their social objective of outreach (CGAPa, 2004). Originally, most MFIs rely on donations and subsidies for funding. Because these sources of funds are vulnerable to shocks, many MFIs chose to attract private sources of funds. These private sources of funding include: deposits, loans from commercial banks, bond issuances, other short-term financial liabilities and IPOs. By accessing deposits and loans from commercial banks, commercial MFIs can grow and avoid a liquidity crunch by tapping commercial sources of funding (Berger et al, 2006). The emphasis on profitability by depositors and lenders can push these MFIs towards an increased focuses on efficiency to control costs and the innovation of new products and technologies to stay competitive. Sustainability should also be important to MFIs, especially, if they hope to help their clients out of poverty because their longevity as an organization matters. Within the industry, commercialization has several different meanings and proxies. Commercialization is defined in two ways; first, the percentages of total MFI funding that is commercial, i.e. banks loans and deposits, and second the portion of the loan portfolio financed using commercial funds.

2.1.3. The schools of thought on microfinance service delivery

There are currently two sides of a common debate that represents the various approaches that financial services to the poor can be provided. There are the institutionist school of thought and the welfarist school of thought (Woller et.al, 1999). These schools of thought disagree on the right approach to finance the poor. This debate currently determines the approach an institution adopts in the delivery of financial services to the poor. Morduch,(2000) has referred to this debate as the microfinance schism. Woller et.al, (1999) has described the situation as 'two nations divided by a common language'.

2.1.3.1. The Institutionist Approach

The Institutionist paradigm argues that MFIs should be able to cover their operating and financial costs mainly from revenues that are generated from lending. They emphasize that, institutional financial viability and sustainability are key to a successful inclusive financial provision to the poor (Brau & Woller, 2004). To the Institutionist, an emphasis is laid on creating a sustainable microfinance institution that can adequately serve the poor. To them, a viable MFI is a pre-requisite to adequate outreach. This, they explain to mean that, if the institution is sustainable, then an inclusive financial service can be provided to the poor even at cheaper cost. Institutions that have adopted this approach focus on the breadth of outreach (scale) rather than the depth of outreach (level of poverty). Nevertheless; this has been the approach of current commercial MFIs.

MFIs according to Woller, and Woodworth (1999) should be able to cover operating and financing costs through programme revenues rather than through donations and subsidies. The approach emphasizes the fact that, raising the cost of microfinance services does not reduce demand for it. More so, it is only sustainable programs that can make a real impact on poverty but not subsidized and donor dependent programmes. Cope stake et.al, (2005) have also contributed to this thinking by pointing out that profitability as a means to sustainability of a microfinance programme is a necessary prerequisite for a sustainable poverty reduction. In providing financial services to the poor, the Institutionist argue that the institutional sustainability is very paramount and should be the focus if the numerous numbers of currently excluded poor are to be reached and provided with better financial services that can have the desired impact on poverty levels.

2.1.3.2. The Welfarist Approach

On the other hand, is the welfarist school of thought who believes and argue that the poor and poverty reduction should be placed first. They try to demonstrate that if MFIs concentrate on sustainability and financial viability, the tendency to lose focus on the poor and the very poor is very high. It is contended that, it is possible for MFIs to be sustainable since donations from donor agencies serve as a form of equity which MFIs can satisfactorily use to reach the poor without making profit and donors will be satisfied with that since it is a form of social investment.

The welfarist school of thought emphasizes poverty alleviation and depth of outreach rather than the breadth of it (Brau & Woller, 2004). They agree that institutional sustainability is very important but it is unethical to sacrifice the depth of outreach to achieve such financial viability that the Institutionists hold. In that vein they suggest that subsidies can still make an institution sustainable without necessarily focusing on profitability. It is clear that the two schools of thought have different views on the methodology that should be adopted in this drive to serve the poor.

However, (Von Pischke, 1996) has pointed out that there exist a trade-off between the two debates but the nature, extent and the implications of the trade off is not resolved; and the way the debate is resolved will have a significant impact on microfinance in terms of its guiding principles, objectives, clients and delivery (Woller et.al, 1999). The Institutionist school of thought therefore, conclude that subsidized programmes as advocated by the welfarist paradigm undermines savings culture which is an important aspect of microfinance and such credits in most cases end up in the hands of the non-poor (Morduch, 2000).

2.1.3.3. Welfarists vs. Institutionalists: Performances of MFIs and causality

Microfinance in 1990s was marked by the major debate between the leading views the financial system approach and the poverty lending approach (Robinson, 2001:22; as cited by Degefe, 2009). Therefore, it is possible to distinguish two general and contrasted approaches that emerged during the underlined periods with respect to the interaction between social performance and financial performance. The debate demarcates an "ideological rift" (Burrel, 2000) between the proponent of subsidized microcredit service identified as welfarist, in other words as supporting the poverty alleviation to microfinance services and those supporting the market approach for the provision of microfinance service on a sustainable basis.

Welfarists inspired from the studies of Morduch (1999, and 2000) and Hatch and Frederick (1998) and Woller and al. (1999)). This school of thought primarily aims at promoting the social performance of MFIs through the depth of outreach and impact assessment. It targets the poorest households, whose incomes are 50% below the poverty line ($1 per day), in order to improve their living conditions. The focus is the family loans are often dedicated to women because their control on income and household savings result in their empowerment and the improvement of their livelihood as well as that of their children. This school is primarily supported by NGOs or co-operatives, which regard microfinance as a major tool for reducing poverty of the poorest. Although it does not exclude that MFIs may be profitable, it advocates a large reliance on subsidies, even on the long run.

Institutionalists federate upon the studies of the World Bank, the Consultative Group to Assist the Poor's (CGAP), USAID and the Ohio State University Rural Finance Program. As the targeting of the poor proves very expensive, the first objective of this school is the achievement

of financial performance. Offering, small loan size with shorter maturity attracts high transaction costs (Hermes et al, 2011). However, under institutionalist view the increase in the number of clients' increases in revenue generated hence increases sustainability. This approach designed a set of best banking practices in order to increase the effectiveness of MFIs' management systems. It advocates the absence of ceiling upon lending interest rates, good institutional and human capacity and a significant transparency of financial activities and information services (CGAP, 2004). The adoption of these practices is an essential step to achieve financial self-reliance on a large scale and access the financial market. Thanks to self-reliance, MFIs can target a large number of poor and fulfill at best their social mission. This school of thought represents financial institutions that look for profitability: regulated institutions specialized in microfinance (some NGOs, NBFIs and micro credit unions), village banks that are following an upscale trend as well as some commercial banks that have recently started downscaling their activity within the microfinance sector.

According to institutionalists, any subsidy is only justified as to cover the start-up costs of MFIs. As regards the risk from national or international donors to forsake on the long run, profitability allows to enlarging the funding sources of MFIs and also enables to achieve persistent self-sufficiency. Thus, a self-reliant MFI that operates on a large scale will serve a larger set of poor customers than a MFI whose goal is restricted to target and provision services to these customers. According to this view, financial performance of Microfinance institutions is the basis for accomplishing the primary objective of outreach to the poor. A profitable Microfinance institution generates excess funds for reinvestment allowing the expansion, and growth of the firms in terms of client base, revenues, geographical coverage and asset base (Brau & Woller, 2004; Quayes, 2012; Zerai, 2012).

According to Rhyne (1998, pp. 7) sustainability is but a means to achieve outreach. According to her, the split continues between those in the poverty comp and those in the sustainability comp" everyone wants to reach the poor and everyone believes sustainability is important. She claims that one fundamental difference is that whether service can be delivering to the client to the cost clients can afford, which is ultimately about whether to subsidized interest rates. She maintains that research shows institutions that charge cost covering interest rates to have better financial self sufficiency and outreach. Sustainability is in no way an end in itself; it is only valued for what it brings to the clients of microfinance. This is a point on which the 'poverty' camp frequently misstates the motives of the 'sustainability' camp. It would do wonders for the state of the debate if the poverty camp more readily acknowledged that the sustainability camp values sustainability only as a tool.

In response to institutionalists, welfarists argue on the quality of donors, whose main concern is to alleviate hardship on the poor. Thus, there is no reason why donors should forsake microfinance they support in as much as focusing on the poor generates a better impact. Conversely, the pursuit of financial performance hampers technical innovation (group lending, dynamic incentives) and downgrades the social mission on the backstage. There is a risk of marginalizing the poor over time as well as forsaking rural areas in favor of urban areas. According to welfarists the objective of microfinance institutions is outreach to the poor and low income households, increasing focus on sustainability and profitability, result in to saving wealthier clients, increasing lending rates and little focus to the poor clients which adversely affects outreach to the poor (Ahlin et al,2011; Kablan,2012). Thus, financial sustainability may become an end rather than a means, and eschews the very goal of microfinance, i.e. to improve the well being of the poor.

The debate between institutionalists and welfarists underlines a trade-off between social performance and financial performance in the short run**.** Although they follow two different paths in order to achieve poverty alleviation; both approaches should work together in the future. When a microfinance client uses service more than once, there is a reduction in transaction costs as some trust and information has already been established. The longer an organization exists, the greater the outreach it is able to provide (Krauland, 2012).

To date, the institutionalists' approach seems to dominate academic research, prompting a drift of the MFIs' social mission. Some authors (example; Woller et al., 1999) consider that welfarists should accept the requirement of profitability of institutionalists. If the welfarists' approach enables to relieving the poor on the short run, it is only an expansion of funding sources promoted by the institutionalists' approach that will ensure the sustainability of MFIs as well as a sustainable improvement in the situation of the poor. The welfarists' and institutionalists' approach represent two phases in the development of microfinance that should combine.

2.1.4. Microfinance sustainability

The concept of sustainability originates from natural science where it refers to the ability of a society ecosystem or any such ongoing system to continue functioning into the indefinite future without being forced into decline through exhaustion of its key resources. The concept of sustainability of microfinance can be divided into four interrelated ideas; namely, financial sustainability, economic viability, institutional viability and borrower viability (Khandelker et al, 1995). Financial viability relates to the fact that a lending institution should at least equate the cost per unit of currency lent to the price it charges from its borrowers (i.e. the interest rate).

Economic viability relates to meeting the economic cost of funds (opportunity cost) used for credit and other operations with the income it generates from its lending activities. Institutional viability is related more to the efficient management and decision-making process. Borrowers' viability however, refers to whether the borrowers of the institution have achieved higher flows of income over time and is able to repay back their loans. Amongst other forms of sustainability, financial sustainability of MFIs is emphasized in previous studies as a requisite for survival and existence to continue offering financial products suitable to the poor.

2.1.4.1 Financial sustainability

A vast and growing literature posits that for MFIs to achieve full potential they must become financially sustainable (see e.g. Brau and Woller, 2004 for a comprehensive review). Financial sustainability also known as financial self sustenance (FSS) and operational self sustenance (OSS) in this context, is measured as the ability of MFIs to continue operations indefinitely using own resources without seeking donations, grants, or subsidized loans from outside individuals, NGOs, or governments.

Microfinance information exchange market defines the term financial sustainability as having an operational sustainability level of 110% or more. While, operational sustainability is defined as having an operational self-sufficiency level of 100% or more. Meyer (2002) was noted that the poor should have access to financial service on long-term basis rather than just a onetime financial support. He also stated that the financial un-sustainability in the MFI arises due to low repayment rate or un-materialization of funds promised by donors or governments. According to him, there are two measures of microfinance financial sustainability, i.e. operational self-sufficiency and financial self-sufficiency (Meyer, 2002).

2.1.4.1.1. Operational self sufficiency

Operational sustainability accompanies the concept of operational self-sufficiency (OSS) which measures operating revenue as a percentage of operating and financial expenses, including loan loss provision expense. If this ratio is greater than 100 percent, the MFI is covering all of its costs through own operations and is not relying on contributions or subsidies from donors to survive (Churchill and Frankiewicz, 2006, pp: 367). OSS in general includes all the cash costs of running a MFI, depreciation and the loan loss reserve. Sometimes donors will exclude the cash costs of funds from their analysis because those MFIs that begin to access the commercial financial markets and pay the cost of capital would look relatively worse than other institutions with the same costs and outreach, but who have remained reliant on donor capital to fund their portfolio (UNCDF, 2002,PP: 20). This applies due to the fact that some donor fund dependent institutions do not have the same financing cost as commercial MFIs. OSS is calculated as:

$$\frac{\text{Financial revenue (Total)}}{\text{(Financial expense + loan loss provision expense + operating expense)}}$$

(Microfinance bulletin, 2008a P: 13)

As Meyer 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 (Meyer, 2002). It actually refers to the future maintainability of the MFIs operational self sufficiency. As mentioned in Armendarize and modruch, (2010, p: 243-244), operational self sufficiency ratio measure the extent to which the operating revenue of MFIs cover its operating cost. Revenues mainly come from interest and fees paid by borrowers, but a typical institution also generates income from investment and other services. OSS is the most basic measurement of sustainability showing the extent at which operating revenues are enough to finance financial,

loan loss provision and operational expense (Barres et al, 2005). The United Nations Capital Development Fund (UNCDF) in 2009 also defines OSS simply as:

$$OSS = \frac{\text{operating revenue}}{\text{Financial expense + loan loss provision expense + operating expense}}$$

The financial expense is the denominator of OSS pertains to the cost of raising capital. CGAP (2003) recommended that expense for loan loss provisions also be included in the denominator. The loan loss provision expense is the amount set aside to cover the cost of loans that the MFIs do not expect to recover. The third item operating expense captures basic operating expense like rent, staff wages and transportation costs among others. For MFIs it is one of the major goals to achieve OSS in order to maintain viable and further grow in their operations. Is increases in OSS is due to larger loan sizes, high yields, low financial expenses, or efficient operations?.

2.1.4.1.2. Financial self sufficiency

Financial sustainability describes the ability to cover all costs on adjusted basis and indicates the institution's ability to operate without ongoing subsidy (i.e. including soft loans and grants) or losses. Financial self sufficiency shows the ability of the MFIs to be fully sustainable in the long run by covering all operating costs and maintains value of capital. The subsidy adjustment simply indicates the extent to which the subsidy being passed on to clients through lower interest rates or whether it is building the MFIs capital base for further expansion (AEMFI,2013). According to AEMFI there are three types of subsides: a cost of funds subsidy from loans delivered below market rates, current year cash donations to fund portfolio and cover expenses and in kind subsidies such as free office space. Here, UNCDF distinguishes

FSS from OSS only by the fact of an adjusted basis. The United Nations Capital Development Fund (UNCDF) in 2009 defines FSS as:

$$\frac{\text{Adjusted operating income}}{\text{Adjusted operating expense}}$$

Ledger wood additionally states that the FSS indicator should show whether enough revenue has been earned to cover direct costs, including financing costs, provision for loan losses and operating expenses and indirect costs including adjusted cost of capital (Ledgerwood, 1999, pp: 217). Due to the fact that donor support is not unlimited in reality, financial viability of microfinance services is crucial for expanding outreach to large numbers of the world's poor. Moreover, the retention of profits of microfinance operations is important to capitalize growth (CGAP, 1998).

This also indicates that financial services are priced so that their costs are covered and they do not disappear when donors or governments are no longer willing or capable to subsidize them (Christen, et al. 2004, P. 12). Especially by covering the financial costs they get access to the capital markets and to commercial capital which then allow MFIs to increase and grow their loan portfolio and clientele outreach. MFIs can as a rule serve their poor customers best by operating sustainably, rather than by generating losses that require constant infusions of undependable subsidies (Rosenberg et al. 2009).

Aremendareiz de Aghion and Morduch (2005, p. 16) describe the issue of donor support like this: "The hope for many is that microfinance programs will use the subsidies in their early start-up phases only, and, as scale economies and experience drive costs down, programs will eventually be able to operate without subsidy. Once free of subsidy, it is argued, the programs

can grow without the secure of donor support (be it from governments or donors). To do this, programs will need to mobilize capital by taking savings deposits or by issuing bonds or institutions must become so profitable that they can obtain funds from commercial sources. However it is not always guaranteed to obtain commercial debt because microfinance services and the unsecured lending to the poorest are still often seen as too risky by traditional banks (UNCDF, 2002, p: 21)**.** Two best practice examples of sustainable MFIs are Bank Rakyat Indonesia and BancoSol in Bolivia. Both have a large commercial outreach to poor people while being consistently profitable in their business operations (Robinson 2002, p.3). MFIs are said to be sustainable and financially self-sufficient when their FSS ratio is above 100%. Ensuring scale of outreach permanently is a function of financial self sufficiency. The financial self sufficiency ratio corrects for soft loans by making adjustments that price capital at its market cost. According to microfinance information exchange, (2010) financial self sufficiency (FSS) can also be calculated as follows;

$$FSS = \frac{\text{adjusted financial revenue}}{\text{Adjusted (Financial expense + impairment loss on loans + operating expense)}}$$

Subsidy adjustments serve two purposes. First, since institutions vary considerably in the amount of subsidy they receive, adjustments that account for subsidies allow for useful comparison across institutions. Second, to the extent that operating on a commercial basis, free from subsidy, is an objective, subsidy adjustments represent how close an institution is to reaching this goal.

2.1. 5. Outreach of microfinance

Outreach refer to financial services provision to a large portion of the society, termed breadth of outreach, and to economically poor, also called depth of outreach (Conning, 1999, p: 52). It

is a social benefit of microfinance aiming at improving the well being of the poor. Outreach is often used to indicate something about MFIs clients, for example, its client's poverty level. However, Navajas et al. (2000), Scheriner (2002) and USAID (2006) using social welfare theory, suggests a framework for measuring social benefit of microfinance in terms of six aspects: depth, breadth, worth, length, scope and cost.

2.1.5.1. Depth of outreach

Hulme and Musley (1996) assert that without the poor the 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. Besides, according to Ledger wood (1999) the number of borrowers or clients as a measure of outreach considers only the total number of clients served from various products of MFIs without their relative level of poverty. Thus, 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).

Depth of outreach refers to how poor are the clients (Gulli: 1998, p: 5). However, they argue that average loan size does not consider the relative number of the poorest with small loan sizes. Moreover, the majority of microfinance clients may be average poor or non poor whose loan sizes are relatively large and, therefore, could easily influence the computed average loan size figure. However, it is believed that poorest clients are served if the majorities are female and the average loan size is smaller (Bhatt and Tang, 2001). Most commonly, the industry uses average loan sizes and the women clients as both are linked to poverty levels as depth of outreach.

2.1.5.2. Breadth of outreach

The breadth of outreach refers to the number of poor served by a microfinance institution (Hishigsurem, 2004). Number of active borrower indicates the level of the breadth of outreach; meaning that the number of poor served by a microfinance institutions (Woller and Schreiner, 2002). All else constant, the breadth of the poverty approach depends on the level of donations that it can attract. Self-sustainable organizations with wide breadth may reach as many of the very poor as poverty-oriented organizations with narrow breadth (Rosenberg, 1996). Profound depth may compensate for narrow breadth, and wide breadth may compensate for shallow depth. Number of active borrowers is an indicator of both breadth of outreach and scale.

2.1.5.3. Worth of outreach

Worth or quality of outreach hinges on contractual terms related to amount of loan, credit period, amortization of debt, interest rate, safety and unlimited withdrawal of savings that fit with the demands of clients (Schreiner, 2002, p:591). Worth of outreach to users refers to "how much a borrower is willing to pay for a loan,"(Navajas et al. 2000, p: 335). For loans, worth increases as the term of the contract are more closely matched to borrowers demand. Example dimensions of a loan include the amount disbursed, the term to maturity, and the size of the installment. For deposits, worth increases with the interest rate and as the contract is less restrictive, for example when minimum balances are low and when withdrawals are convenient and unlimited. Schreiner (2001), defines worth to users as the clients' willingness to pay which can be measured by dropout rate. Repeated purchases are the best and straightforward way of measuring worth. MFIs with a vision to stay in the market as a going concern should display to their clients that they will stay in the business for indefinite period of time. Showing sustainability and stability in the business is a decisive factor for clients to repay today in

expectation of getting services in the future. The reason behind failure of short-sighted credit service interventions is that clients default in expectation of no pressure to settle their debt from a project to phase-out. They compare the cost and benefit of defaulting vis-à-vis repaying the loans. Worth estimates to what the degree the clients value the services. Worth is omitted from this study since it is subjective and according to Schreiner the most difficult to define and measure.

2.1.5.4. Length of outreach

Length of outreach is the provision of microfinance services for indefinite period of time in the future. Length of outreach is the time frame of the supply of microfinance. The profits of the organization are one proxy because, in the absence of guaranteed donations, these profits signal some ability to buy resources on the market and thus offer some hope to survive if donors leave. In principle, profits are not sufficient for length. Furthermore, profits are not necessary for length because donations could last forever.

According to Schreiner (2001), length of outreach is measured by operational self-sufficiency or some other indicator of financial performance, such as ROA, or ROE. When a client uses an organization more than once, there is a reduction in transaction costs as some trust and information has already been established. The longer an organization exists, the greater the outreach it is able to provide (Krauland, 2012). Microfinance providers with longer and repeated client relationships are more profitable than those offering one time or less repetitive loans (Scheriner, 2002).

2.1.5.5. Scope of outreach

Scope of outreach implies the types of products and services offered to clients. Scope of outreach is the number of types of financial contracts supplied. Scope between products might mean both loans and savings services. Scope within a product might mean loans to both groups and individuals. Furthermore, scope within a product means contracts with different terms. The poverty approach tends to limits its scope to just loans. As described by Cull et al. (2007), in the microfinance industry, uniformity of products provided by lenders (i.e., lack of variations in contracts, interest rates, loan size, etc.) and homogeneity in institutional structure and size make it difficult for researchers to systematically assess the effects of products and institutional changes on social and economic outcomes.

2.1.5.6. Cost of outreach

Cost of outreach refers to how expensive the products and services of MFIs are to clients considering both price costs and transaction costs. Price costs are cash expenses of interest and fees that are major income sources for the microfinance organization. Transaction costs refer to non-price costs assumed by the clients but not incomes to the institution (Schreiner, 2002). In lieu of actual interest rates, the portfolio yield is a simple and widely available proxy. In lieu of actual transaction costs (admittedly very difficult to estimate), proxies may be used, such as the average time spent in meetings per week, the average time and distance required to travel to conduct financial transactions, the average time spent completing the loan application, or the average time elapsed between the loan application and loan disbursement. These costs to users might consists of prices like interest rates and various payments that they have to pay, which could be revenue to the lender, and other loan related transaction costs like expenses on documents, transport, food, taxes, etc. (Navajas et al. 2000,p:336).

2.2. Empirical literature review

In this section, the researcher tried to review some of empirical studies which are carried out related to MFIs outreach and financial sustainability.

Hulme and Musley (1996), state that delivering small loans to the poor and the relatively hard-to-reach clientele is inherently costly. However, according to Woller and Schreiner (2002) the relationship between depth of outreach and financial self-sustainability is multidimensional. In their study they found that depth of outreach has a positive relationship with financial self sustainability.

Woller and Schreiners' finding put evidence against a wide spread belief that small loans are highly risky and associated with lower financial sustainability. Paxton (2002) examined the relationship between depth of outreach and financial sustainability 18 MFIs (in Africa and Latin America) and found strong correlation between outreach and financial sustainability in Latin America and weak correlation in Africa. The study concludes that outreach and financial sustainability are not mutually exclusive concepts. Cull et al (2007) cross sectional study on 124 institutions in 49 countries concluded that there is possibility of increasing yield while maintaining repayment rates and thereby meeting both the social mission and viability given that the clients are economically active poor.

The most comprehensive study of sustainability-outreach trade-off is by Hermes, (2011). Using data for 435 MFIs for the period 1997-2007, he focus on the relationship between cost efficiency as a proxy for sustainability of MFIs and the depth of outreach measured by the average loan balance and percentage of women borrowers. He concludes that outreach is

negatively related to sustainability of MFIs. The results remain robustly insignificant even after taking into account a long list of control variables. This is consistent with Cull et al (2009a) who shows evidence of such trade off from recent commercialization trend in microfinance. Although Olivares-Polanco (2005) uses less rigorous techniques and/or smaller datasets, their study also confirms the existence of this trade-off. These findings are however inconsistent with Ayayi and Sene (2010) who after estimating a pooled regression model, show that outreach and the percentage of women among the clientele do not significantly influence the MFIs' financial sustainability. Their findings confirm Cull, Demirgüc-Kunt and Morduch (2007) who shows that MFIs can expand outreach without compromising financially sustainability.

Using panel data collected from 53 MFIs in Uganda over a period of six years, Okumu (2007) examined the determinants of sustainability and outreach of MFIs. The study indicates that sustainability is negatively and significantly related to the ratio of gross loan outstanding portfolio to total assets. However, according to Tilahun (2013) on his studies of determinants of financial sustainability in east Africa; he reported that the coefficient of loan to asset ratio (loan intensity) is positive and statistically significant at 5% level. This shows that financial sustainability is positively and significantly influenced by the ratio of gross loan portfolio to total asset.

A study by Ganka (2010), on Tanzanian rural microfinance found negative and strongly statistically significant relationship between the number of borrowers per staff and financial sustainability. Quayes (2012) studied the Depth of outreach and financial sustainability of microfinance institutions by utilizing data from 702 MFIs (from Mix market) operating in 83

countries and found empirical evidence that shows positive complementary relationship between financial sustainability and depth of outreach. Chemining'wa (2013), Microfinance breadth of outreach (numbers of borrowers) was found to be insignificantly related with financial sustainability in Kenya. On the other hand, depth of outreach was negative and significantly correlated with financial sustainability implying that MFIs with higher loan sizes are associated with sustainability.

Kipesha and Zhang (2013) examined the presence of tradeoffs between sustainability, profitability and outreach using a panel data of 47 Microfinance institutions for four years of 2008 to 2011 from Mix market Data using unbalanced panel regression analysis model. Using Welfarists approach the study found the presence of negative tradeoffs between profitability and outreach to the poor. Under Institutionalist view, the study found that outreach to the poor has a positive relationship with both sustainability and profitability measures. Specifically, they found out that OSS and ROA have positive correlation with gross loan to asset ratio but insignificant coefficient with OSS. They also report insignificant relationship between yield (cost of outreach) and OSS and ROA. However, Gashaw (2014) states significant relationship between yield and OSS incase Uganda or Kenya MFIs. Marakkath (2014) on his studies of sustainability's of Indian microfinance institutions, average loan size significantly but negatively and percent of women borrowers again negative and insignificantly affects OSS, while, gross loan portfolio has positive and significant effects on OSS in India.

In Ethiopia, the relationship between outreach and financial sustainability is not yet studied. Therefore, there is no empirical evidence on the underlined study. However, there are few studies on the area of performance of microfinance institutions and determinants of MFIs

financial sustainability. Even, as described in the other sections of this paper, these researches, which are very few in number are not sufficiently measured the performance of MFI in the country, because they are very weak in terms of statistical measures. However, for the purpose of this particular study, the results of some of them are presented as follows.

As per the study conducted by Befikadu (2007) on outreach and financial performance, it is found that MFIs are operationally sustainable measured by return on asset and return on equity and the industry's profit performance is improving over time. Similarly, using dependency ratio and Non-performing Loan (NPLs) to loan outstanding ratio proxies the study also finds that MFIs are financially sustainable. He is also found that individual MFI's outreach has shown increment over the period of the study with different rates of growth, leading the industry's outreach to rise in the period from 2003 to 2007 on average by 22. 9 %. He also concluded that the institution's financially sustainability is improving from time to time measured in terms of ROA and ROE.

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

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

On the other hand, another study by Letenah (2009) on performance analysis of sample of Ethiopian MFI indicates that Ethiopian MFIs in general are poor performers on depth of outreach. They are not reaching the poorest of the poor. They are also poor in terms of the ratio of GLP to assets, allocating a lower proportion of their total assets in to loans. All MFIs are good at breath of outreach, cost management, efficiency and productivity. They also charge low interest rates. The finding also indicates that the profitability and sustainability of the MFI depend on their size. From a simple correlation analysis it is found that there is a trade-off between serving the poor and being operationally self-sufficient. MFIs age correlates positively with efficiency, productivity, the use of debt financing (commercialization) and OSS

Degefe (2009), on his studies of Elixir or poison of microfinance of microfinance in Ethiopia, scale of outreach of microfinance in Ethiopia increased from time to time, though not all MFIs showed equal growth. He also concluded that average loan size is the lowest in sub Saharan Africa. Bayeh (2012) following a quantitative approach using a balanced panel data set of 126 observations from fourteen MFIs operating in Ethiopia over the period 2002-2010, reveals that microfinance breadth of outreach, depth of outreach, dependency ratio and cost per borrower affect the financial sustainability of microfinance institutions in Ethiopia.

From the above empirical evidence the researcher concludes that those studies conducted on the issue provide mixed result as regards the relationship between financial sustainability and outreach of microfinance institutions (from no relation to some relation to positive relation). In addition in Ethiopia there was no previous study conducted on this issue. As the result in

Ethiopia what relation exists between financial sustainability and outreach of microfinance institutions is not known.

2.3. Loan outreach and financial sustainability: Hypothesis development

Number of active borrowers

It indicates the level of the breadth of outreach; meaning that the number of poor loan clients served by microfinance institutions (Woller and Schreiner, 2002). Self-sustainable organizations with wide breadth may reach as many of the very poor as poverty-oriented organizations with narrow breadth (Rosenberg, 1996). Convention holds that scale is inversely related to costs and positively related to profitability, because the fixed costs of production are amortized across a larger number and value of outputs. Therefore, the hypothesis is that the increased number of borrowers enhances the financial sustainability.

Average loan balance per borrower

It is the adjusted loan portfolio divided by adjusted number of active borrowers**.** Average loan balance per borrower is a proxy for depth of outreach. It is the most widely used proxy for depth of outreach and are generally perceived, the smaller its size the better the depth of outreach (Scheriner, 2002 and Cull el al., 2007). Smaller loans are generally taken to indicate greater depth of outreach. However, loan size may not represent the true economic position of the borrower unless it is either compared with or adjusted by any standard national income measure. Therefore, alongside, loan size per borrower; average loan size per borrower per capital has been used to measure depth of outreach. It is derived by dividing adjusted loan per borrower to GNI per Capita. It normalizes the variable for different price and income levels found in different countries, thereby making cross-country comparisons more valid. It is

industry preferred measure for outreach as loan size is significantly correlated with the borrower's poverty level (Schreiner, 2002). In general, offering small size loan with shorter maturity attract high transaction costs (Lupenu & Zeller, 2002; Hulme & Mosley, 1996). Microfinance institutions which offer small size loan with shorter maturity, experiences declining sustainability and profitability due to high costs in the customer screening, monitoring and loan administration.

Portion of women borrowers

The other indicator for depth of outreach included in the models was outreach to women. This indicator measures proportion of women from total loan clients. Women traditionally lack access to finance so MFIs reaching more women are assumed to reach more of the poorest potential clients (D'Espallier et al, 2011). It is important to use portion as it controls for differences in the number of borrowers for each different MFI.

According to Armendarize de Aghion and morduch (2005) noted that there are basically three underlining principles for targeting women in a credit program. Firstly women are generally overrepresented among the hard core-poor. Secondly, women borrowers have high repayment rates on loans. Thirdly, women clients are likely to be more concerned over the health and education of their children. Therefore, if the number of women clients increase over time, the MFI concerned may not be floating away from its original mission. As a result from the very beginning of microfinance movement women borrowers target for the MFIs. So, a higher percentage of women borrowers (alternatively, a lower percentage of male borrowers) will signal a better outreach to the poorest. However, the institutionalist argues that women are poorer and more excluded than men especially in developing countries. The focus on more

women clients increases the chances for low repayment rates which affect the sustainability and profitability of the firms (Hermes et al, 2011). Therefore, the transmissions from proportion of women clients to OSS and FSS, as argued in the literature, are predominantly two. On the one hand, women clients on average are proven to be creditworthy in many countries i.e. loans extended to women are likely to be repaid than loans extended to male clients. Thus, more loans to women leads to less default risk, higher profit and hence improved financial sustainability. On the other hand, more loans to women means higher operating costs and hence lower financial sustainability (as women take small loans).

Gross loan to asset ratio

The gross loan portfolio is the main source of income to MFI and thus, other things constant, the higher the loan the higher the interest revenue and financial sustainability. As Bourke, if the loan markets, especially credit to households and firms is risky and has a greater expected return than other assets, there may be a positive relationship between loan intensity (gross loan/total asset) and sustainability (Bourke, 1989). Moreover, due to economics of scale MFIs can be profitable because of the fixed cost of production remain constant with the increasing gross loan portfolio and hence, financial sustainability increases.

Microfinance institutions which focus on outreach to the poor invest more of their funds in to client loans which increase gross loan portfolio. The higher of this ratio indicates that most of the institution funds are invested in client loans which increase outreach to the poor with declining financial sustainability (Kipsha and Zhang, 2013). Moreover, if MFIs risk increases when its loan to asset ratio increases, then financial sustainability may decrease (Tilahun, 2013).

Yield on Gross loan Portfolio

The gross portfolio yield is a proxy for interest rates charged by MFIs following Millson (2013), Cull et al. (2007), Kipesha and Zhang, (2013) and Gashaw,(2014).The depth of outreach-financial sustainability controversy precipitates whether or not to subsidize interest rate. If poor people are unable to afford the market rate of interest and yet they are taking loans knowing that they would not payback and if the loss from interest rate induced default is greater than the revenue gain from higher interest rate, then yield is expected to affect OSS and FSS adversely.

However, MFIs repayment rates are one of their success stories i.e. MFIs have managed to keep the default risk sufficiently low. It is widely argued that MFIs' clients are able and willing to pay commercial interest rates. And MFIs need capital to widen and deepen their outreach. Moreover, against the walfarists; the institutionalists claim that financial viability and social objectives can be achieved together because costs of finance do not bother the poor as much as denied access to finance. Enormous empirical works found a significant link between yield and viability although they differ in their conclusion as to the direction of relationship. It is the interest of this study to include yield as a function of financial sustainability. Financial sustainability is a prerequisite to attract capital and viability requires sustainable interest rate (yield). Thus, the hypothesis held is a positive relationship between yield and OSS and FSS.

Operating expense per loan portfolio (**control variable**)

Cost minimization is among the ways to facilitate financial sustainability. MFIs, in the pursuit of sustainability, may try to achieve cost efficiency. These could be capital or labor costs. The hypothesis is that higher costs per service delivered, in this case loan service, adversely affects

financial sustainability. Such costs have been included in the models of several authors (for instance, Millson (2013), cull et al, (2007) and Gashaw, (2014) as a control variable. Poor clients take small loans and administration of small loans requires higher average cost from increased transaction costs. The trade-off between serving the poor and achieving viability has been justified, on one hand, by highest average cost per loan required to serve as poor clients. The reason is poor clients take small loans that require huge transaction costs.

2.4. Conceptual framework

The study adopts the outreach framework by subdividing outreach to the poor into six variables of the breadth of outreach, depth of outreach, length of outreach, scope of outreach and the worth of outreach (Schreiner, 2002; USAID, 2006). According to Schreiner, some of these outreach factors may be difficult to measure since they require data that may not be available. Therefore, this study is limited to examine the influence of breadth, cost and depth of outreach proxies on financial sustainability.

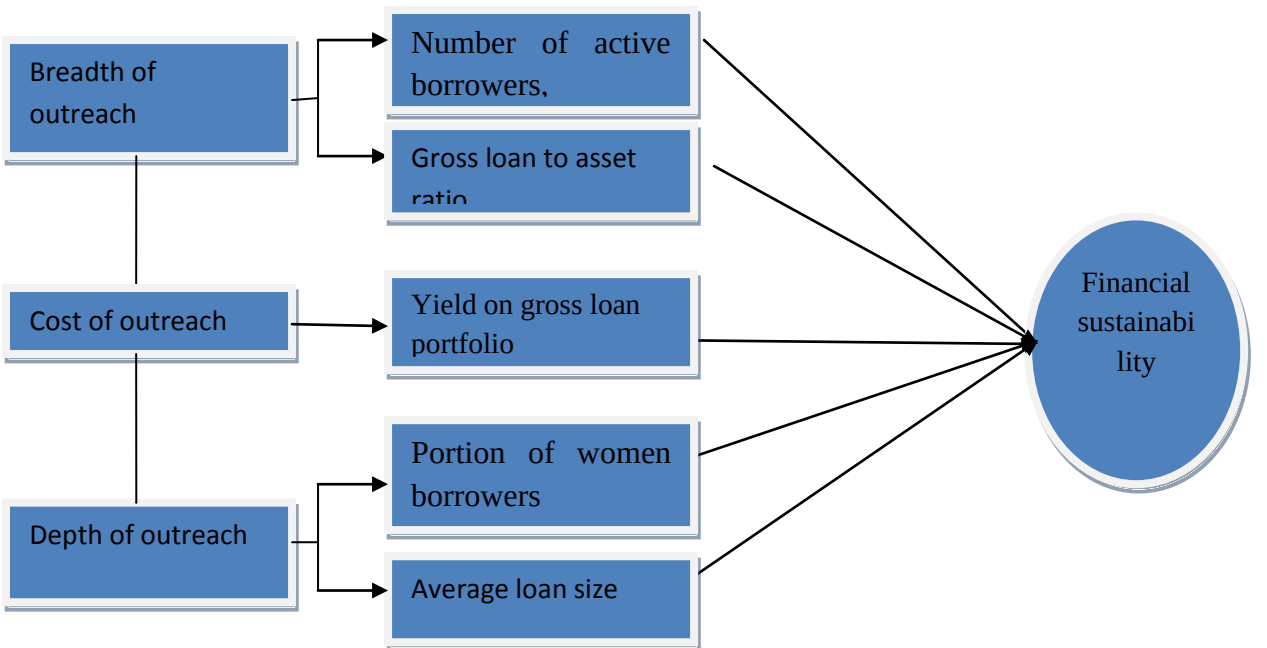


Figure 1. Theoretical model on the relationship between outreach and financial sustainability. (Source: author's own construct based on literature review and previous empirical works).

2.5. Summary of literature review and knowledge gap

From the literature review, the researcher found out that amongst other forms of sustainability, financial sustainability of MFIs is emphasized in previous studies as a requisite for survival and existence to continue offering financial products suitable to the poor. There are two kinds of financial sustainability measures that could be used in assessing MFIs performance, that is, operational and financial self sufficiency (Meyer, 2002). According to him, operational self-sufficiency is when the operating income is sufficient enough to cover operational costs like salaries, supplies, loan losses, and other administrative costs. Financial self-sufficiency (referred to as a high standard measure) is when MFIs can also cover the costs of funds that are valued at market and other forms of subsidies received when they are valued at market prices (Befekadu, 2007).

Depth is poverty level of clients. Breadth is number of clients, length is years of service, worth is clients willingness to pay, cost is price and transaction costs bear by clients and scope is types of contracts (Navajas, 2000). MFIs are usually faced with the challenge of reaching the poor while at the same time expected to be financial sustainable (Chemining'wa, 2013). Therefore, the relationship between social performance (outreach to the poor) and financial performance (financial sustainability) of MFIs may be a trade-off or a matter of compatibility.

The literature review revealed that, so far the relationship between loan outreach factors and OSS and FSS is not yet studied in Ethiopia. There are attempts, which were conducted on financial performance of MFIs in Ethiopia, but, they are less rigorous in methodology. Another few studies were carried out on factors affecting MFIs sustainability; among others overlooked proper analysis of the link between loan outreach and financial sustainability. The results from

related studies carried out on MFIs outside Ethiopia varied with studies and economies which insures the value added by the study. The researcher therefore, sought to bridge the existing knowledge gap in microfinance literature on relationship between loan outreach factors and financial sustainability of microfinance institutions in Ethiopia as far as a large sample size and the longer the time period is concerned.

Chapter Three

3. Research methodology and Methods

The literature review part above, tried to discuss the theories in relation to the link between outreach and financial sustainability and also the knowledge gap. Here under, the research methodology and the reason for the appropriate research methods used for the current study were discussed.

3.1. Research Approaches

As noted in Creswell (2003, p.13) in terms of investigative study there are three common approaches to business and social research namely, quantitative, qualitative and mixed methods approach. Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell 2009).

On the other hand, qualitative research approach is a means for exploring and understanding the meaning of individuals or groups ascribe to a social or human problem with intent of developing a theory or pattern inductively (Creswell 2009). Finally, mixed methods approach is an approach in which the researchers emphasize the research problem and use all approaches available to understand the problem (Creswell, 2003). Hence, based on the above discussions of the three research approaches and by considering the research problem and objective, this study used the quantitative method.

3.1.1. Method adopted: Quantitative research approach

Quantitative research is one in which the researcher mainly uses post positivist claims for developing knowledge (Creswell, 2009). Post positivism on which quantitative research design is based holds a deterministic philosophy in which causes probably determine effects or outcomes. Thus, the problems studied by post positivists reflect the need to identify and assess the causes that influence outcomes. As a result, quantitative research is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures. The goal is to measure and analyze causal relationships between variables within a value free framework. In line with this Creswell (2009) also noted that researchers who engage in quantitative research form of inquiry have assumptions about testing theories deductively, building in protections against bias, controlling for alternative explanations, and being able to generalize and replicate findings.

The purpose of quantitative studies is for the researcher to project his or her findings onto the larger population through an objective process. To do so, as noted in Creswell (2009), in quantitative research approach data are collected by using two strategies of inquiry. The first is survey design which provides a quantitative or numeric description of trends, attitude or opinion of a population by studying a sample of that population. It includes cross-sectional and longitudinal studies using questionnaires or structured interviews for data collection, with the intent of generalizing from a sample to a population. The second type of design is experimental design which seeks to determine if a specific treatment influences an outcome. This impact is assessed by providing a specific treatment to one group and withholding it from another and

then determining how both groups scored an outcome. In experiment design researcher may also identify a sample and generalize to a population (Creswell, 2009).

The purpose of this study is to examine the influence of loan outreach factors on financial sustainability of MFIs by establishing relationship of same and is also interested both in generalizing the findings to a population and to conduct an in-depth investigation, the current study adopted quantitative approach. Quantitative methods are a good fit for deductive approaches, in which a theory or hypothesis justifies the variables, the purpose statement. The hypothesis being tested and the phrasing of the research questions govern how data will be collected as well as the method of statistical analysis used to examine the data (Creswell, 2003). Quantitative data includes closed-ended information such as that found on attitude, behavior, or performance instruments. As a result, in order to generalize the findings to the MFIs existing in the country, in the current study the researcher adopted survey research method.

3.2. Survey design: Documentary analysis

Creswell (2003, p. 153) stated that the purpose of survey is to generalize description of trends, attitudes, or opinions from a sample to a population so that inferences can be made about some characteristic, attitude, or behavior of this population. Moreover, as noted in Fowler (1986), it is also reasonable to use survey design because of its benefits such as the economy of the design and the rapid turnaround in data collection and identifying attributes of a large population from a small group of individuals. Therefore, application of survey method for this study was logical. The survey was carried out by means of structured document review.

3.3. Population

Dormyel (2007), defines population as those units for which the findings of the survey are meant. From a statistical point of view, the term 'population' refers to the total of items about which information is desired. The attributes that are the object of study are referred to as characteristics and the units possessing them are called as elementary units. The aggregate of such units is generally described as population (Kothari, 2004). The population in the study comprised of all MFIs in Ethiopia who are registered and licensed by National Bank of Ethiopia.

3.4. Sampling design: Sampling frame, sample size and Sampling technique

A sample design is a definite plan for obtaining a sample from the sampling frame. It refers to the technique or the procedure the researcher would adopt in selecting some sampling units from which inferences about the population is drawn (Kothari, 2004). Sampling frame is the elementary units or the group or cluster of such units may form the basis of sampling process in which case they are called as sampling units. In this study, the sample frame shall consists of MFIs established before 2003 and accordingly, started to report their financial and operational data to Association of Ethiopian Microfinance Institutions and National Bank of Ethiopia.

The sample size for this study is 14 which, is 40% (14/35) of the total MFIs. Mugenda and Mugenda (2003) stated that a sample size of 10-30% of the total population is considered enough for the generalization of the findings to the whole study. The general rule of thumb is 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 variety (Hair et al., 2006). Moreover, Hair et al. (2006) states that although the minimum is 5:1, the

desired level is between 15 to 20 observations for each independent variable to be representative. Applying the general rule of thumb as a desired level (that is between 15:1 and 20:1); this required the number of observations to be between 90 and 120. In this study, a sample of 14 MFIs for 12 years is relatively large; which increases 78 observations above the minimum requirement. The following table presents the sample MFIs taken in this study.

Table. 3.1. Sample microfinance institution taken.

No.	Name of MFI	Ownership	Year of Establishment
1	Dedebit Credit and Saving Institution	Government	28/04/97
2	Amhara Credit and Saving Institution	Government	09/04/97
3	Bussaa Gonnoffa microfinance institution	NGO backed	17/05/99
4	Addis Credit and Saving Institution	Government	27/01/00
5	Eshet microfinance institution	NGO backed	15/03/00
6	Gasha microfinance institution	NGO backed	15/05/98
7	Meklit microfinance institution	NGO backed	16/02/00
8	Omo microfinance institution	Government	01/10/97
9	Oromia credit and Saving Institution	Government	04/08/97
10	Peace microfinance institution	NGO backed	18/11/99
11	SFPI microfinance institution	NGO backed	21/06/98
12	Sidama microfinance institution	Government	27/07/98
13	Wassasa microfinance institution	NGO backed	20/09/00
14	Vision Fund microfinance institution	NGO backed	17/06/98

Source: NBE

Sampling techniques means selecting a group that represents the entire population. In order to ensure homogeneity of subjects used in a sample and for easy matching of data, purposive sampling technique was employed and which is a non-probability approach. This study employed purposive non random sampling in selecting MFIs which have financial and outreach

data for the last twelve years. This sampling method involves purposive or deliberate selection of particular units of the universe for constituting a sample which represents the universe (Kothari, 2004). The rationale behind adopting purposive sampling is to select MFIs whose data is available for the study periods of 12 years (2003-2014).

3.5. Model specification: Identification of dependent and independent variables

The objective of this study is to examine the influence of loan outreach factors on financial sustainability of MFIs in Ethiopia. Therefore, the following general form of panel regression model similar to Kipesha and Zhang (2013) was adopted.

$$Y_{it} = \gamma + \beta' X_{it} + u_{it}$$

Where: γ_{it} is the dependent variable, γ is the intercept term, β is a K*1 vector of parameters to be estimated on the explanatory variables, X_{it} is the 1*K vector of observations on the explanatory variables, i denote cross section unit, i=1….N and t is the time period when the cross sections are observed. u_{it} is the combined time serial and cross sectional error term.

In order to examine the influence of loan outreach on financial sustainability, the researcher builds two econometric panel data models. These models specify operational and financial self sufficiency as a function of loan outreach factors. Therefore, the operational models that were used to test this empirical study are given as:

$$OSS_{it} = \alpha + \beta_1 LNALBPB_{it} + \beta_2 GPY_{it} + \beta_3 \text{PWB}_{it} + \beta_4 LNNAB_{it} \beta_5 GLPR_{it} + \beta_6 OER_{it} + \omega_{it}$$

$$FSS_{it} = \alpha + \beta_1 LNALBPB_{it} + \beta_2 GPY_{it} + \beta_3 \text{PWB}_{it} + \beta_4 LNNAB_{it} + \beta_5 GLPR_{it} + \beta_6 OER_{it} + \omega_{it}$$

Where: OSS_{it} is operating self sufficiency, FSS_{it} is the financial self sufficiency

$LNALBPB_{it}$ is the natural logarithm of average loan balance per borrowers (depth of outreach)

PWB_{it}, is the percentage of women borrowers (depth of outreach),

GPY_{it} is gross portfolio yield (cost of outreach)

$LNNAB_{it}$ is the natural logarithm of number of active borrowers (breadth of outreach)

$GLPR_{it}$ is the Gross loan portfolio to asset ratio (breadth of outreach)

OER_{it} is the operating efficiency ratio (control variable), i is the i^{th} microfinance institution, t is the time period, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 are the coefficients for each independent variables in the model, $\omega_{it} = \mu_{it} + \varepsilon_{it}$ where ε_{it} is the individual error term and μ_{it} is the combined time serial and cross sectional error term which control for all omitted variables (example, size and age).

Dependent variables

The dependent variables are financial sustainability measures (i.e. operational and financial self sufficiency) as indicated by Meyer (2002). Operational self sufficiency is the extent to which financial revenue cover financial expense, loan impairment charge and operating expense without making adjustment for non lending activities or other income such as donations. Financial self sufficiency is similar to operational self sufficiency; however, the ratio includes subsidy adjustments.

Most studies (for instance; Woller and Schreiner, 2002, Melkamu, 2012 and Nara, 2013) were used similar measures. To be consistent with these previous studies and to reach on a firm conclusion, in this study, both operational and financial self-sufficiency were used as proxies to measure financial sustainability. The dependent variables used in this study and the associated proxies were presented as follows:

Table 3.2. Description of dependent variables

No.	Dependent variables	Proxies
1	OSS	Financial revenue/ (financial expense +operating expense+ loan loss provision expense)
2	FSS	Adjusted financial revenue/ adjusted (financial expense +operating expense+ loan loss provision expense).

Independent variables

According to MIX (2010), loan outreach can be assessed by an annual comparative analysis through measurement of several variables including number of active borrowers, average loan balance per borrower, average loan balance per borrower/GNI per Capita, percentage of woman borrowers and gross loan portfolio. Likewise, previous studies for instance, Meyer and Zeller (2002), Zerai and Rani (2012), and Nara (2013) were used similar indicators in their framework, for measuring microfinance outreach. Those researches have most specifically preferred measuring variables such as Depth and Breadth. Moreover, Okomu (2007), and Tilahun (2013) were among others who used gross loan to total asset ratio to measure breadth of outreach. Moreover, Milson (2013) and Gashaw (2014), were included yield and operating expense to gross loan portfolio ratio in their models.

Following this convention, and to be consistent with these previous studies; in this study, the following loan outreach indicators were used to measure and assess the various aspect of MFIs loan outreach in Ethiopian.

Table 3.3. Description independent variables

No.	Variable Standard Name	Description of Variable name used in regression models	Expected Relationship
1	Number of active borrowers (NAB)	Natural logarithm of (Number of active borrowers with loan outstanding adjusted for standardized written-off)	+
2	Average loan balance /borrower(ALBPB)	Natural logarithm of (Adjusted Gross Loan Portfolio / Adjusted Number of Active borrowers.)	+
3	Yield on gross loan portfolio(GPY)	Adjusted financial revenue from Loan Portfolio/Adj. average GLP	+
4	Operating expense ratio(OER)	Adjusted operating expense/adjusted average gross loan portfolio	-
5	Gross loan to asset ratio (GLPR)	Adjusted gross loan portfolio/ Adjusted total asset	+/-
6	Portion of women borrowers(PWB)	Number of active women borrowers/ adjusted number of active borrowers	+/-

3.6. Method of data analysis

To examine the influence of loan outreach factors on financial sustainability of microfinance institutions in Ethiopia, in this study, a panel /longitudinal research design was adopted. As noted by Baltagi (2005), the advantage of using panel data is that it controls for individuals heterogeneity, less co linearity among variables and tracks trends in the data something with simple time series and cross sectional data cannot provide. Besides, by combining cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of the test (Brook, 2008).

The collected panel data was analyzed using both descriptive and inferential statistics such as regression and correlation. According to Blaikie (2001), the characteristics of a group of

numbers representing information or data are called descriptive statistics. Thus, descriptive analysis was performed to evaluate the performance of outreach and financial sustainability. Correlation matrix was used to examine the association between dependent and independent variables. Multiple liner regression models were used to determine the level of significance of each loan outreach factors in explaining the financial sustainability of MFIs. The multiple linear regressions models were performed and thus ordinary least square (OLS) was conducted using EVIEWS 7 econometric software package, to test the relationship between the MFIs loan outreach and financial sustainability.

Chapter Four

4. Findings and Discussions

This part presents the study in to four sections. Under the first section diagnostic tests were performed. Under the second section, results of descriptive statistics of dependent and independent variables were presented. Under the third and fourth sections, summery of multiple regression results and correlation matrix were presented. Accordingly, findings of the study were discussed in view of theoretical frameworks and available empirical woks.

4.1. Regression Diagnostic tests

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

Test for Heteroscedasticity

To test for the presence of heteroscedasticity, the popular white test was employed. This test involves testing the null hypothesis that the variance of the errors is constant (homoscedacticity) or no heteroscedasticity versus the alternative that the errors do not have a constant variance.

H_a = The error has constant variance; H_b = the error has no constant variance

Table 4.1.White Heteroskedasticity test result summery for both models

Hetroskedasticity test :white		OSS .Model probability	FSS. Model Probability
F-statistic	Prob. F(27,140)	0.0957	0.6374
Obs*R-squared	Prob. Chi-Square(27)	0.1098	0.6073
Scaled explained SS	Prob. Chi-Square(27)	0.2310	0.2922

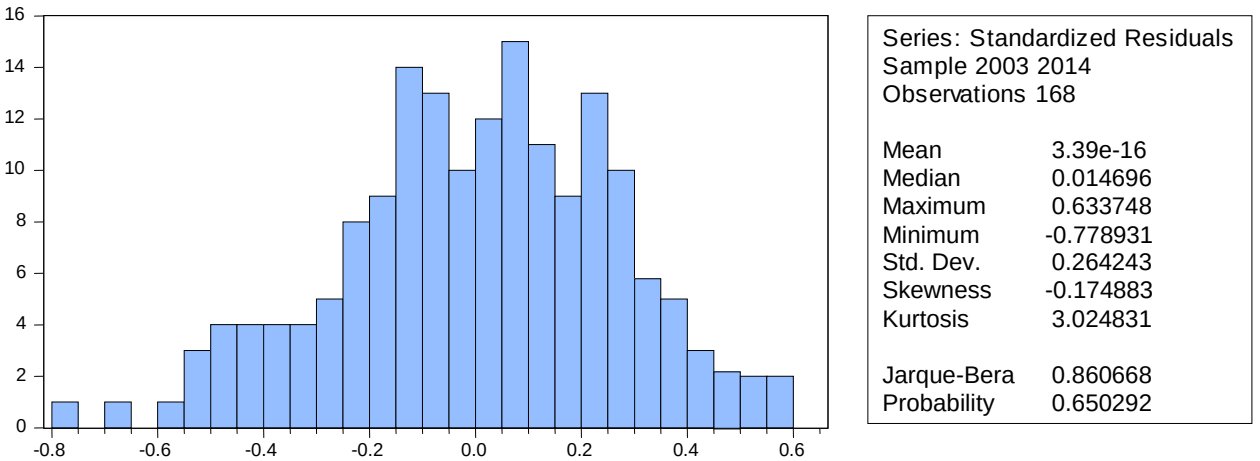
EViews presents three different types of tests for heteroscedasticity and then the auxiliary regression in the first results table displayed. The test statistics give us the information we need to determine whether the assumption of homoscedasticity is valid or not, but seeing the actual auxiliary regression in the second table can provide useful additional information on the source of the heteroscedasticity if any is found (Brooks, 2008). In this study, both the *F*, $\chi 2$ ('LM') and scaled explained SS versions of the test statistics 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. Therefore, the alternative hypothesis was rejected in favor of the null hypothesis. Therefore, in this study the error terms are constant (homosekedasic) overtime.

Normality test (the disturbances are normally distributed)

One of the most commonly applied tests for normality is the Bera--Jarque (hereafter BJ) test. BJ uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments, (i.e. the mean and the variance). The standardized third and fourth moments of a distribution are known as its skewness and kurtosis. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how far the tails of the distribution are. A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3. It is possible to define a coefficient of excess

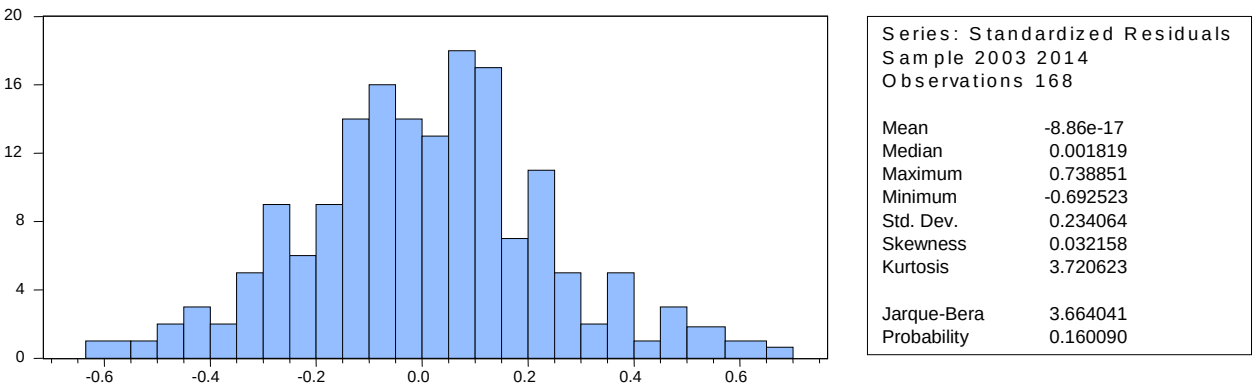
kurtosis, equal to the coefficient of kurtosis minus 3; a normal distribution will thus have a coefficient of excess kurtosis of zero. If the residuals are normally distributed, the histogram should be bell-shaped and the BJ statistic would not be significant at 5%. This means that the *p*-value given 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.

Figure.4.1. Normality test for residuals: OSS



As we have seen from figure 4.1 above, the residuals are mesokurtic and the histogram is likely to be bell shaped. Its kurtosis is almost approaching to 3 and the p- value of BJ test is 0.65, which is insignificant at 5% level. This urged to not reject the null hypothesis of the errors are normally distributed. Therefore, the conclusion is the error terms are distributed normally implying that the inferences we make about the coefficient estimates could be reliable.

Figure.4.2. Normality test for residuals: FSS.



The BJ test conducted for FSS as indicated in Figure 4.2.above, the histogram is likely to be bell shaped. However, its excess kurtosis of 0.7 (3.7-3) is a sign of non normality. The p- value of the corresponding BJ test is 0.16 which is insignificant at 5% level. Therefore, the conclusion is there is no or little evidence of non normality. Thus, the alternative hypothesis is rejected in favor of the null hypothesis that is the errors are normally distributed.

Test of Autocorrelation (Serial Correlation)

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

A test for this assumption is therefore required which is tested by the DW test in this study. The DW test is a test for first order autocorrelation (a test for a relationship between an error and its

immediately previous value). Therefore to conduct the DW test, the hypothesis is stated as follows. Ho: No Autocorrelation ($\rho = 0$), Ha: Autocorrelation ($\rho \neq 0$);

As a rule of thumb if the DW test approaches 2, then it is an indication for no autocorrelation. But if the value of the test is zero, then it is an indication for the existence of perfect positive autocorrelation. On the other hand, if the value of the DW test equals 4, that means there is perfect negative autocorrelation (Brooks, 2008). In this study, the DW test statistic stands at 1.73 for OSS and 1.79 for FSS model (see, appendix 3&5). This indicates that both models do not correspond with autocorrelation since their values are not far from 2. The lower and upper critical values for 168 observation and six independent variables are 1.44 and 1.65, respectively. Therefore, when we subtract the upper critical value from 4 we get 2.35 (4-1.65). As the value of DW test statics tells, in both models it falls between the upper critical value (1.65) and 4 minus the upper (2.35). The values of the DW test are a few points away from the point that indicates no autocorrelation, therefore, it can be concluded that there is no or little evidence of a relationship between successive residuals and based on this, in both models, and we fail to reject the null hypothesis of no autocorrelation.

Multi co linearity test

This test is made to check whether the independent variables are correlated or not. If the correlation coefficient is low it indicates there is no problem of multicollinearity. Moreover, Kennedy (2008) stated that multicollinearity problem exists when the correlation coefficient among the variables are greater than 0.80. From the table below, correlations among explanatory variables are below the threshold. As shown in table 4.2, the higher correlation is between operating efficiency ratio and number of active borrowers is (0.65) and operating

efficiency and yield on gross loan portfolio (0.66), which is even below the threshold. The rest of the correlation coefficients were low indicating the absence of multi-co linearity in this study; making the regression analysis more reliable.

Table. 4.2. Correlation matrix of explanatory variables

	NAB	ALBPB	GPY	PWB	OER	GLPR
NAB	**1**					
ALBPB	**O.4403**	**1**				
GPY	**-0.5719**	**-0.4677**	**1**			
PWB	**-0.2251**	**-0.0120**	**0.3553**	**1**		
OER	**-0.6525**	**-0.4482**	**0.6697**	**0.1681**	**1**	
GLPR	**-0.0037**	**0.1841**	**0.0167**	**-0.0140**	**-0.2073**	**1**

4.2. Descriptive statistics of variables

This part of the study presents the descriptive statistics of both the dependent and independent variables. This was done for the years under consideration (2003-2014) and cross section units of 14 MFIs. The results from descriptive statistics were done separately for the dependent and independent variables. The result includes but not limited to mean, median, maximum and minimum value, standard deviation and number of observations**.** Table 4.3 and 4.4 presents the descriptive statistics of dependent and independent variables included in the analysis of the relationship between loan outreach and financial sustainability.

Table 4.3. Descriptive statistics of the dependent variables.

	Mean	Median	Maximum	Minimum	Std.dev.	Observation
OSS	1.347938	1.300000	2.40000	0.304000	0.423793	168
FSS	0.950458	0.953500	1.760000	0.117000	0.308469	168

As indicated in table 4.3 above, the mean value of operational self sufficiency is (1.34). This depicted that the sample MFIs in the study periods have an average OSS of 134.7%, which is above the breakeven threshold of 100% for operational sustainability. Following the MIX Market definition of sustainability, Bogan et al (2007) described an MFI being operationally sustainable when OSS reaches 100%. MIX market defines operational sustainability as having an operational self-sufficiency level of 100% or more. An operational self-sufficiency of 1 (100%) is the first stage that an institution should reach in its way to long term financial viability (Berne, 2005). According to Berne, if an MFI does not reach that, eventually its equity will be reduced by losses or must be compensated by grants.

The maximum and minimum value of this variable is 2.40 and 0.30, respectively. Its standard deviation is 0.42 (42%), indicating that the dispersion in the operational sustainability of microfinance institutions under consideration from mean value. Therefore, as the variation of the OSS indicates, microfinance institutions under consideration are varying in OSS level. Therefore, we can conclude the result to the population that MFIs in Ethiopia have an average operational self-sufficiency beyond the requirement and hence, operationally they are sustainable.

Financial self sufficiency is similar to operational self-sufficiency; however, the ratio also includes inflation and subsidy adjustments. The effect of adjustment increases financial expense loan loss provision expense and operating expense. The difference between FSS and OSS is that the financial self sufficiency measures not only an institutions ability to cover its operating costs but also the ability to maintain the value of its equity relative to inflation and to operate and expand without subsidies (AEMFI, 2012). On average MFIs in Ethiopia were able to cover merely 95% of their cost after the mentioned adjustments. Furthermore, the FSS ratios

subsidies adjustments amend below market liabilities in kind donation and grant to reflect a breakeven environment devoid of donors and development agencies. The descriptive statistics for FSS indicated in table 4.3 above, the mean of the financial self sufficiency is 0.95 (95%), which indicates that MFIs in the sample are not financial self-sufficient. This revealed that the sector cannot be self reliant without the assistant of donor funds and subsidies. The standard deviation for this variable is 30%. This indicates that there is 30% variation in the financial self sufficiency of MFIs under consideration. This signifies that MFIs in Ethiopia have varying FSS level from their mean value and up to that extent representative of the entire population. Since, we can infer the result for the entire population.

Table. 4.4. Descriptive statistics of the explanatory variables:

	Mean	Median	Maximum	Minimum	Std.Dev.	Observation
NAB(#)	145,933.5	38789.0	955,218.0	3577.00	216,144.5	168
ALBPB ($)	149.1853	134.7767	351.9898	43.1847	66.2364..	168
PWB (%)	0.475690	0.44000	0.820000	0.136000	0.185767	168
GPY (%)	0.186093	0.180000	0.483000	0.050000	0.070466	168
OER	0.122355	0.115300	0.510000	0.015000	0.082680	168
GLPR	0.769405	0.780000	0.950000	0.420000	0.107373	168

As indicated in table 4.4 above, the mean value of active borrowers served is 145,934, which is the extent of providing financial services to the low income or underserved clients. The MIX benchmark methodology classifies the breadth of outreach as large (greater than 30,000 number of borrowers), medium (10,000-30,000 number of borrowers), and small as having less than 10,000 number of borrowers (Bayeh, 2012). Thus, the breadth of outreach for Ethiopian microfinance institutions is large with the mean of 145,934 borrowers. The maximum and minimum values of this variable are 955, 218 and 3,577 active loan clients, respectively. Its

standard deviation is 216,145, which is larger than the mean indicates Ethiopian MFIs is also composed, to a larger extent, MFIs with smaller breadth of outreach (number of active clients served).

Depth of outreach as measured by percentage of women borrowers have a mean value of 0.48 (48%). This means that MFIs in Ethiopia lend predominantly to men. The maximum and minimum value this variable is 82% and 13.6%, respectively and its Standard deviation is 19%. This shows that the sample comprises of MFIs with varying proportion of women borrowers and is to that extent representative of the different MFIs in the population.

The average loan balance per borrower shows a mean value of 149.2 USD, which is the lowest compared to the average global and African MFIs. In 2010, the global and Africa MFIs average loan size is 1703 USD and 708 USD, respectively (MIX, 2010). According to a study by Lafourcade and Brown, 2005, as cited by Melkamu, 2012, an average loan balance for East Africa and African region was 175 USD and 307 USD, respectively even in 2005. Moreover, Degefe (2009), states the loan size in Ethiopia is the lowest in sub Saharan Africa. The maximum and minimum values of this variable are 351.9 USD and 43 USD implying MFIs in the sample varying in loan size and to that extent representative to the population of the study.

When it is adjusted to the country income level; average loan size of sample MFIs have a mean value (ratio) of 49.8%, which is also the lowest compared to its counterpart of global and African MFIs standard of 70.5% and 108.7%, respectively even in 2010. The MIX defines the microfinance loan size as a microfinance loan product no longer than 25% of GNI per capital). The maximum and minimum value of this variable is also 147% and 12%, respectively and its standard deviation is 24%, which also indicates MFIs in the sample are varying with respect to

loan size. Therefore, it is possible to conclude that MFIs in Ethiopia continues to reach economically active poor clients, but does not necessary mean that they are serving more women clients.

The yield on gross loan portfolio is 0.19 (19%). This is the lowest as compared to the average global and Africa MFIs yield of 39.1% and 29%, respectively (MIX, 2010). In 2006, the average worldwide microfinance lending rate stood at 24.8 percent (CGAP, 2009). The global average interest rate in 2008 was approximately 35% (Rosenberg, 2008). But also rates above 50 percent up to 80 percent and even 100 percent are not uncommon (Guntz, 2011). Its value of dispersion (7%) implies that sample MFIs charges interest rates on loan clients close to the average value. The maximum and minimum value of this variable is 48% and 5%, respectively.

MFIs interest rates in Ethiopia are said to be low, even by sub-Saharan African standards (Wolday, 2003 as cited by Degefe, 2009). A loan product survey conducted by AEMFI found that MFIs disbursed loans to clients at rates that ranged between 10% and 25% (Wolday, 2008). The inexpensive funding can partly explain the low interest rates on loans existent in most of the MFIs in Ethiopia (Weidmaier et al., 2008).

The mean value of gross loan portfolio to asset is 76.9%, which is significantly above African MFIs average of 11.9% in 2010. Its standard deviation is (10%) indicates sample MFIs invested 76.9% of their asset on gross loan portfolio, which is close to their average value. The maximum and minimum value of this variable is 95% and 42%, respectively. The sample MFIs has a mean value of an operating efficiency ratio of 12.2%. The maximum and minimum value of this variable is 51% and 2%, respectively. This means that the highly efficient MFI incurred

2% and least efficient one incurred 51% of gross loan outstanding and to that extent representative of the different MFIs in the sample. However, as its standard deviation 8% indicates sample MFIs in Ethiopia relatively incur operating costs close to average value.

4.3. Multiple regression results

This section measures the Goodness of fit of the regression line by applying the multiple coefficients of determination (R^2) and presents the regression result. The coefficient of determination (R^2), measures the proportion of the total variation in the dependent variable "Y " explained by the explanatory variables the "Xs" jointly (Gujarati D. N, 2008).

As it is presented in chapter three, the empirical models to examine the relationship between loan outreach factors and financial sustainability of MFIs are presented as follows.

$$OSS_{it}=\alpha+\beta_1 LNALBPB_{it} + \beta_2\ GPY_{\ it} + \beta_3 \mathrm{PWB}_{\mathrm{it}} + \beta_4 LNNAB_{it} + \beta_5\ GLPR_{it} + \beta_6 OER_{it} + \omega_{it}$$

$$FSS_{it} = \alpha+\beta_1 LNALBPB_{it} + \beta_2\ GPY_{\ it} + \beta_3 \mathrm{PWB}_{\mathrm{it}} + \beta_4 LNNAB_{it}\ \beta_5\ GLPR_{it} + \beta_8 OER_{it} + \omega_{it}$$

With the above multivariate regression equation, the researcher estimated the two regression models using panel data estimation models which take into account of endogeneity caused by omitted variables. Endogeneity problem in the panel regression arises when there correlation between some variables of the model with the error term. It may result from measurement error, autocorrelation of error terms, simultaneity or omission of variable that have a significant impact on dependent variable (Greene, 2003; Gujarati, 2003). The researcher uses the two panel methods (fixed and random effects) which controls for endogeneity problem caused by omitted variables. The fixed effect model is useful when controlling for variables that are constant over time, but they differ between cases while the random effect model is useful when controlling for variables which vary across time and across cases (Brooks, 2008). Thus,

Hausman tests were conducted to identify which estimation model is appropriate for this particular study based on the statistical p-value. If the hausman test result is insignificant at 1%; random effect is appropriate and fixed effect otherwise (Brooks, 2008). In this study, the Hausmann test results shows a p-values of 0.10 and 0.13 for OSS and FSS model, respectively, which is above 1% significance level for not reject the null hypothesis that is random effect is appropriate. Therefore, for this study, the random effect model is appropriate.

Table.4.5.Summary of multiple regression results.

Dependent variables	OSS			FSS		
Appropriate model	Random effect(EGLS)			Random effect(EGLS)		
Explanatory variables	Coeff.	t-stastices	Pro.	Coeff.	t-statistics	Pro.
C	-1.371714	-3.40043	0.0008*	-0.087182	-2.630954	0.0093*
NAB	0.150373	5.64446	0.0000*	0.068818	4.012322	0.0001*
ALBPB	0.065540	1.891316	0.0604***	0.066836	2.115396	0.0359**
GPY	2.539831	5.336421	0.0000*	2.497524	6.200489	0.0000*
PWB	0.082595	0.563527	0.5739	0.097199	0.894913	0.3702
OER	-2.063992	-5.117842	0.0000*	-1.856889	-5.241148	0.0000*
GLPR	0.453505	2.289633	0.0233**	0.3896693	2.112011	0.0362
R^2	0.48			0.42		
Durban Watson	1.73			1.79		
F-statistics.(p-value)	25(0.0000)			19.8(0.0000)		

*, ** and *** denotes significant at 1%, 5% and 10% level, respectively.

Now we have all the coefficients, we can construct the regression models; the models are shown below;

OSS = -1.371714 +0.150373(NAB) +0.065540(ALBPB)+2.539831(GPY)+ O.453505(GLPR) -2.063992(OER) +0.082595 (PWB)

FSS = -0.871892+ 0.68818(NAB) +0.066836(ALBPB)+2.497524(GPY)+0.389693(GLPR) - 1.856889 (OER) + 0.097199(PWB)

From table 4.5.above, the coefficient of determination (R^2) values for OSS and FSS are 0.48 and 0.42, respectively. This signifies that 48% and 42% variation of OSS and FSS respectively are explained by the independent variables used. Though, the R square value is low, the F value of the model is significant. This denotes that the independent variables used in the models have significant explanatory power. Moreover, there are few specific reasons as to why the regression model used in this study has a low R square value. One of the reasons is that most outreach factors are correlated with one another, which their inclusion in the regression, unduly inflate the R square value and violate the statistical principle with which regression works. It will also adversely affect the predictive power of the model (Gujarati and Sangeetha, 2007). Secondly, a statistical reason for a low R square is due to the data constraints that this study confronts.

However, (Cameron, 2009 as cited by Ganka, 2010) expresses that for panel data; R square above 0.2 is large enough for drawing reliable conclusions. The overall performance of the model is good with the computed f-statistics values of 25 for OSS and 19.8 for FSS. The p-value is 0.0000 which is significant at 1% level means that the model fits the data. Therefore, the null hypotheses which were articulated as the predictor variables coefficients are simultaneously equal to zero are rejected. Thus, the concluding remark here is that the predictor variables are significant in influencing the changes in the OSS and FSS. The rule of thumb for the rejection of the null hypothesis is that, the P-value of the f-statistics is strongly significant at 5% and zero for five decimal points.

4.4. Multiple correlation matrixes among variables

The correlation between two variables measures the degree of linear association between them. If it is stated that *y* and *x* are correlated, it means that *y* and *x* are being treated in a completely symmetrical way. Thus, it is not implied that changes in *x* cause changes in *y*, or indeed that changes in *y* cause changes in *x*. rather, it is simply stated that there is evidence for a linear relationship between the two variables, and that movements in the two are on average related to an extent given by the correlation coefficient (Brooks, 2008).

Table 4.6. Correlation matrix of dependent and independent variables **(**Coefficients in the parenthesis)

	OSS	**FSS**	**NAB**	**ALBPB**	**GPY**	**PWB**	**OER**	**GLPR**
OSS	1							
FSS	(0.812) 0.000	1						
NAB	(0.604) 0.000*	(0.387) 0.000*	1					
ALBPB	(0.387) 0.000*	(0.281) 0.0002*	(0.440) 0.000*	1				
GPY	-0.160) 0.037**	(-0.003) 0-.965	(-0.571) 0.000*	(-0.467) 0.000*	1			
PWB	(0.079) 0.303	(0.098) 0.205	(-0.225) 0.003*	(-0.012) 0.876	(0.355) 0.000*	1		
OER	-0.588) 0.000*	(-0.421) 0.000*	(-0.652) 0.000*	(-0.448) 0.000*	(0.669) 0.000*	(0.168) 0.029**	1	
GLPR	(0.235) 0.002*	(0.274) 0.0003*	(-0.003) 0.961	(0.184) 0.016**	(0.016) 0.829	(-0.014) 0.856	(-0.207) 0.007*	1

* And ** denotes significance level at 1% and 5%, respectively

Looking into the correlation coefficients between the variables in table 4.6 above, there is significant positive correlation between OSS and FSS and number of active borrowers, average loan size and gross loan to asset ratio while, negative with yield on gross loan portfolio and operating efficiency ratio. The correlation between and OSS and FSS and portion of women borrowers is still weak but positive. Moreover, the yield on gross loan portfolio also has negative and significant correlation with both number of active borrowers and average loan size. These negative associations doesn't mean that yield is responsible to decline OSS and FSS

as well as numbers of borrowers, loan size, rather, changing in these considered variables taking place in opposite direction.

4.5. Discussions of findings

There have been three different arguments in literature between the relationship of MFIs financial sustainability and the outreach. The first argument is there is inverse relationship between MFIs financial sustainability and outreach because as get more vulnerable groups the transaction cost will increase as a result there is a decrease in financial performance. The second group argues that MFIs financial sustainability and outreach has a complementary relationship in the sense that larger number of clients enables MFIs to boost economics of scale and reduce costs. The third group argues that MFIs financial sustainability and the outreach has no significant relationship. Accordingly, this section discussed the findings of the research in view of the aforementioned arguments.

Number of active borrowers (Breadth of outreach)

Number of active borrower indicates the level of the breadth of outreach; meaning that the number of poor served by a microfinance institution. Number of active borrowers is a proxy for breadth of outreach as it relies on the assumption that increasing the client basis reaches more poor people. The number of borrowers which measures the breadth of outreach improves the financial sustainability of microfinance institutions. The econometric result for this variable indicates positive relationship between the number of borrowers and MFIs' financial sustainability. The relationship was highly statistically significant at 1% significant level. This is due to the fact that increasing number of borrowers will increase the volume of sell; and increasing volume of sell is one means to maximize profitability, and then financial

sustainability. Its coefficient of determination is positive (0.15) and (0.068); for OSS and FSS, respectively.

This study has found out that the number of active borrower is among the variables that most highly and significantly affects the operational and financial self sufficiency of microfinance institutions. Furthermore, an increase in breadth of outreach could also urge to product diversification for divers' client groups and this enables an MFI to cushion itself against risk. Thus, if all other things are held constant, larger number of borrowers would lead an MFI to become more sustainable. The larger the number of borrowers the better the sustainability is. Therefore, the hypothesis is accepted which was expressed as there is significant positive relationship between the number of active borrowers and operational and financial self-sufficiency of microfinance institutions.

Besides, Befekadu (2007) confirms that number of clients served and financial sustainability are complimentary. This finding also match with previous findings by Cull et al (2007), Ayayi and Sene (2010) and Zerai and Rani (2012), they reported the absence of tradeoffs between number of active borrowers and financial sustainability measures. Crombrugghe et al (2008), confirms the fact that increasing the number of borrowers per MFI would lower the average operating cost and would raise total operating costs less than proportionately with the number of borrowers. This is a clear indication for an increasing number of borrowers per field officer would raise the sustainability indicators in FSS and OSS. This finding is consistent with the theory of Meyer (2002) as he noted that breadth of outreach and financial sustainability are complementary because as the number of clients increases, MFIs enjoy economies of scale and hence reduce costs which help them to become financially sustainable.

Contrary to this finding, Ganka (2010) reported a negative relationship between number of borrowers and financial sustainability as inefficiency increases as a result of increased number of borrowers. Moreover, Hulme and Mosely (1996) argue that there is inverse relationship between breadth of outreach and financial sustainability. Here the argument is higher outreach means higher transaction cost in order to get information about creditworthiness of clients and hence make MFI financially unsustainable.

Therefore, the finding of this study concludes that breadth of outreach as measured by number of active borrowers is among the variable, which positively and significantly influence MFIs financial sustainability i.e. OSS and FSS in Ethiopia. The increases in number of borrower urge MFIs to enjoy economies of scale essentially as a result of reduction in average cost of operation.

Average loan size per borrower (Depth of outreach)

The average loan size measures the depth of outreach. The lower the average loan size, the higher the poverty level of the clientele and the lower the MFIs financial sustainability is. This variable is measured by dividing the gross loan portfolio by the number of borrowers. The value for this variable will be increased if the gross loan portfolio is increased, other thing being constant. If the gross loan portfolio is increased instead of increasing the number of borrowers, it increases the efficiency of MFIs in making collection in two terms. The first thing is that the portfolio at risk will be reduced; if the outstanding loans are on the hand of few numbers of borrowers, for the MFI, there is nothing to worry about since it is on the hand of critically selected borrower. Second, if the borrowers are relatively few in number, the

collection effort made by the MFI will be reduced which will greatly affects the cost spend per borrower and increases personnel productivity. Thirdly, the cost will be minimal for an MFI when it process and manage large loans with the lower number of borrowers.

The coefficient of this variable is positive (0.065) and (0.066) and statistically significant at 10% and 5% significant level for OSS and FSS, respectively. This indicates that microfinance financial sustainability is associated with higher loan sizes since larger loans are associated with higher cost efficiency and, therefore, financial sustainability. This also signifies that there is a tradeoff between serving the poor and being financially sustainable in Ethiopian MFIs, but does not necessary mean that MFIs drifted from their primary mission of serving the poor in favor of saving wealthier clients as the average loan size is small in Ethiopia. Rather, this would mean that Ethiopian MFIs are not profiting unless otherwise lending higher loan size demanded by wealthier clients. An increase loan size though reduces transaction cost on loans and augment financial sustainability, indicates a drift from the mission of reaching the poor. This will not be the case if variations in operating costs required to administer loans of different sizes can be kept minimal i.e. weakening the relationships between decreased loan sizes and increased operating expenses.

The result of this study is consistent with the trade-off argument between serving the poor and attaining sustainability. Such contrasting results have been supported by Ashim (2010) in his dissertation on sustainability and mission drift in microfinance. Crombrugghe et al. (2008) has also observed a similar relationship in Indian context. The finding substantiates the mission drift where MFIs serves relatively non poor clients. This finding is also consistent with Ganka (2010) that profitability relates selling bigger loans. However, Cull et al., (2007) argue that

institutions that make smaller loans are not less profitable on average compared to those making bigger loans, and they incline to a conclusion that sustainability and depth of outreach cannot be attained simultaneously. The conclusion in this subject is that, depth of outreach as measured by average loan size has positive and statistically significant relationship with OSS and FSS. This is the evidence for the strong tradeoff between serving the poor and being financially sustainable and the substantial cost differentials across loans of different size.

Yield on gross loan portfolio (Cost of outreach)

The yield on gross loan is the proxy measure for interest rates charged by microfinance institutions to loan clients. The "Institutionalists" stand against the walfarists claim that financial viability and social objectives can be achieved together because cost of finance do not bother the poor as much as denied access to finance. As shown in table 4.5 above; the coefficient of this variable is (2.534) and (2.497) for OSS and FSS, respectively. This implies that a percentage point increase in yield leads to 2.5 and 2.4 percent improvements in operational and financial self sufficiency, respectively. The variable is also statistically significant at 1% and its p-value is zero to three decimal points. Therefore, the hypothesis is accepted, which express there is significant positive relationship between yield and financial sustainability. The assertion is that when the interest rate on client's loan increases the financial sustainability of MFIs is also grown up.

This finding is consistent with Cull et al (2007), argued for the possibility of increasing yield while maintaining repayment rates and thereby meeting both the social mission and viability given that the clients are less poor (economically active poor).

Woller and Schreiner (2002) also found statistically significant and positive relationship between financial self-sufficiency and yield. All have indicated that the relation between yield and FSS is immediate and positive through interest and fee revenues. The result is also consistent with the findings of (Adair, 2012, Marakkath, 2014 and Kipesha and Zhang, 2013 and Gashaw, 2014), whose reported the linear relationship of yield and financial sustainability. The situation could be reversed as we go on increasing real yield beyond a certain threshold.

According to (Kar, 2011 and Gashaw, 2014), there is an interest rate levels that will positively impact profitability, up to a point, and hurt outreach, but if rates are raised too high this may reduce demand, client quality, and thus profits. The relationship between profitability and interest rates is, therefore, not always expected to be linear as there will be a turning point when rates are too high and profitability decreases. Therefore, yield can have two transmission channels to affect OSS and FSS. On one hand, increase in yield could negatively affect clients' borrowing decision when it passed the threshold; its significance again depends on clients' loan demand elasticity. On the other hand, increase in yield means higher income per unit of loan outstanding. However, in the current case, the increase in yield has lead to improved OSS and FSS without compromising outreach. This is due to the lowest interest rate charged by MFIs in Ethiopia.

Percentage of women borrowers (Depth of outreach)

It denotes the portion of women clientele, among the total number of active loan clients of the MFI. In microfinance, the belief is that women clientele needs to be empowered through financial strength; for women are perceived to be poorer than men and less autonomous in all financial respects. The more women clients (alternatively, the lesser the number of men clients)

indicates the more the MFIs reaches the poor. This variable has positive coefficient of determination (0.082), and (0.097) with OSS and FSS, respectively, without affecting same variables, even at 10% significance level.

This finding is inconsistent with D'Espallier et al (2011), who reported negative correlation with women suggesting that MFIs that lend to more women are less sustainable. Therefore, in this study, the tradeoff hypothesis of the institutionalist view (women are poorer and more excluded than men especially in developing countries and the focus on more women clients increases the chance for low repayment rates which affect the sustainability of the MFIs) is not yet supported. This finding is also inconsistent with the findings of Kipesha and Zhang (2013) whose report is negative and has significant relationship between percent of women borrowers and OSS; and Marakkath (2014), also reported negative but insignificant relationship between percent of women borrowers and OSS. Therefore, in Ethiopia the self sufficiency of MFIs should indifference whether the portion of women loan clients increasing or not from the total borrowing clients, beyond the mission they stand for.

Operating expense ratio (Control variable)

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. Operational costs are very high for lending to the poor especially the poorest and the rural poor so sustainability and outreach may be conflicting. This means that the higher ratio of the operational cost per average gross loan portfolio implies the better the outreach and the lower the financial sustainability. The coefficient of this variable (OER) is (-2.063) for OSS and (-1.85) for FSS. As the MFI operating expense per loan portfolio ratio increase by a percentage point, their OSS and FSS

ratios were declined by 2.1 and 1.9 percent, respectively. The variable was also statistically significant at 1% level. This indicates that, the more MFIs are efficient in reducing operating costs at a given level of outstanding loan portfolio, the more profitable they become and, therefore, financially sustainable. Specifically, this also implies that in the period under consideration across the cross section unit, the MFIs incurred substantial operating costs to administer their loan portfolio. This is again the justification for the strong tradeoff between efficiency and outreach to the poor. Larger loans are associated with lower average costs (Cull et al, 2007). As per the correlation analysis made, OER have inverse association with average loan size and direct relationship with percent of women borrowers. This also signifies that, there is strong trade of between depth of outreach and efficiency and then financial sustainability.

This finding is compliment with (D' Espallier, 2011), whose reported that even though women are better credit risks, and their loans are often smaller, which negatively impacts efficiency. This finding is also consistent with the finding of Gashaw (2014) who's documented a negative and statistically significant at 1 percent significance level. Dissanayake (2012) in Sri Lanka also stated that there is strong significant negative correlation in operating expense ratio to operational self sufficiency ratio. These suggest that MFIs that emphases outreach are less efficient, so if MFIs need for efficiency then there are justifiable concerns about mission drift. Therefore, the transmission mechanisms are twofold. First, increase in operating cost per loan portfolio obviously means growth of operational expense components in the OSS as well as FSS financial formula. However, the fact that operational expense increased alone does not necessarily indicate an overall negative impact on OSS and FSS. Secondly, it could be that the

increased operational expense has also led to increased operational revenue. Untimely what matters is the net effect.

Gross loan portfolio to asset ratio (Breadth of outreach)

Microfinance institutions which focus on outreach to the poor invest most of their funds in to client loans which increases gross loan portfolio. The higher gross loan to asset ratio indicates most of the institution's funds are invested on client loans which increase outreach to the poor. The gross loan portfolio is the main source of income to MFI and thus, other things constant, the higher the loan the higher the interest revenue and profits. Gross loan portfolio is the highest earning asset of the MFIs to exist as a financial intermediation. However, if MFIs risk increases when its loan to asset ratio increases, then profitability may decrease (Tilahun, 2013). Moreover, according to institutionalist, the higher of this ratio indicates that microfinance institutions do not invest in other profitable investments than gross loan portfolio and therefore, their financial performance may compromise too.

The beta coefficient of gross loan to asset ratio is positive and (0.45) and (0.38) for OSS and FSS, respectively. This means that a percentage point increase in loan portfolio to total asset ratio, leads to a 0.45 and 0.38 percent improvement in OSS and FSS, respectively. This variable is also statistically significant at 5% level in influencing both OSS and FSS. Therefore, the negative hypothesis is rejected in favor of the positive one and the higher of this ratio affects OSS and FSS in the same direction.

The result is consistent with (Kipsha, and Zhang, 2013) whose reported the absence of trade of between investing more assets on loan portfolio and operational self sufficiency. Marakkath

(2014), also reported gross loan portfolio has the highest beta coefficient in determining operational self sufficiency. This indicates the higher of this ratio is the most significant factor contributing to financial sustainability. Tilahun (2013) also reported the significant and positive relationship between loan intensity (gross loan to asset ratio) and financial self sufficiency. However, this result contradicts with findings of previous empirical works (Okumu, 2007), which document a negative impact of loan to asset ratio on MFIs sustainability. Thus, being other things held constant, MFIs in Ethiopia are generating revenue predominantly from their investment in loan portfolio rather than other assets. The conclusion is that the relationship between breadth of outreach as measured by loan intensity and financial sustainability is too complimentary.

Chapter Five

5. Conclusions and Recommendations

The aim of the study was to examine the relationship between loan outreach and financial sustainability of MFIs. The study was conducted using a sample of 14 Microfinance institutions in Ethiopia operating for the last 12 years and data obtained from National Bank of Ethiopia and Association of Ethiopian Microfinance Institutions. Accordingly, the following conclusions and recommendations have drawn based on the findings and discussions presented in the aforementioned sections.

5.1. Conclusions

This study found out that microfinance institutions in Ethiopia were operationally sustainable as measured by operational self sufficiency. They have passed the minimum threshold of operational sustainability (100%). The mean operational self sufficiency ratio of the 14 MFIs is 1.35 (135%), which is above the threshold and therefore, we can infer that, Ethiopian MFIs are operationally sustainable. However, after subsidy adjustments MFIs are not financially sustainable as measured by financial self sufficiency ratio. The average financial self sufficiency ratio of 14 MFIs is 0.95 (95%), which is below the minimum threshold of 100%. The level of financial self sufficiency signifies the extent to which MFIs subsidy is being passed on to clients through lower interest rates.

In regard to outreach, the study concludes that microfinance institutions in Ethiopia are reaching considerable poor clients in absolute terms. The average loan size is very small, which indicates that Ethiopian MFIs continue to reach active poor clients. The low MFI lending rate

implies that subsidized lending would take higher share, which again indicates that poverty lending is pervasive in Ethiopia.

The relationship between breadth of outreach and financial sustainability is complimentary. The increase in number of active borrowers and gross loan to total asset ratio (breadth of outreach) significantly improves financial sustainability of MFIs in Ethiopia. There is strong tradeoff between serving the poor (lending small loan size) and being financially sustainable as the decrease in loan size negatively and significantly impacts financial sustainability. The significant inverse relationship between ratio of operating expense per loan portfolio and financial sustainability justifies the tension between efficiency and outreach to the poor. To sum up, the relationship between outreach and financial sustainability depends on the variable used in the regression models.

5.2. Recommendations

1. To the MFIs;

1.1. Microfinance institutions in Ethiopia should augment their self sufficiency while serving the poor. To increase self-sufficiency, the MFIs must increase their yield on gross loan up to a point, and hurt outreach. They should also decrease operating costs through increasing the number of borrowers they are serving and their volume of sales. This is needed because to be benefited from the economics of scale. This means that the fixed cost of production will be reduced when the number of borrowers increased because total cost will be distributed over the total number of borrowers.

1.2. Microfinance institutions in Ethiopia should also control variations in operating costs required to administer loans of different sizes through weakening the relationships between decreased loan sizes and increased operating expenses.

1.3. However, the focus on efficiency and sustainability should be controlled at certain levels above which institutions generate profit at the expense of outreach to the poor. This enables them to ensure their going concern with less dependence on subsidies without compromising outreach to the poor.

2. Policy Implication

2.1. The microfinance support scheme should recognize the possibility of mutualism between lending to the poor and financial sustainability, if operating cost differentials across different loan sizes can be kept minimal. Government and donors support should target empowering MFIs to change around their operating cost per a unit of loan outstanding.

3. Suggestions for further research

3.1. This research examined the influence of loan outreach on financial sustainability; specifically focusing on breadth, depth and cost of loan outreach. Therefore, further study may also consider the influence of saving outreach on financial sustainability of MFIs by establishing their relationship.

References:

Ahlin, C., Lin, J., (2011). "Where does microfinance flourish? Microfinance institution performance in macroeconomic context". *Journal of Development Economics 95(2), 105.*

Alemayehu Yirsaw (2008),'The performance of Micro Finance Institutions in Ethiopia: A case of six microfinance institutions", Addis Ababa University.

Arsad, L. (2005). "An assessment of microfinance institutions performance: The importance of Institutional environment", Gadjah Mada *International Journal of Business, September-December 2005, Vol.7, No.3, pp.391-427.*

Armendáriz de Aghion, Beatriz and Morduch, Jonathan, 2005, "The economics of microfinance", Cambridge, MA: MIT Press

Ashim KK (2010) Sustainability and mission drift in microfinance: empirical studies on mutual exclusion of double bottom lines. Published Doctoral Thesis, Hanken School of Economics, Helsinki

Association of Ethiopian microfinance institutions, ''Ethiopian microfinance institutions performance analysis report'', Bulletin, 4-9

Armendáriz de Aghion, B. and Morduch, J (2010). The Economics of Microfinance, Second edition MIT Press, Cambridge, Massachusetts

Ayayi, A and Sene, M (2010). "What drives microfinance institution's financial sustainability?", *The Journal of Developing Areas, vol 44, pp. 303-324.*

Baltagi, BH (2005), Econometric analysis of panel data, 3rd edn, John Wiley & Sons, Ltd, Chichester, .

Barres, I. (2002). Focus on standardization. The Micro Banking Bulletin

Barres, I., Norell, D., Porter, B., and Curran, L. (2005). Ed. Tillman Bruett. Measuring performance of microfinance institutions: a framework for reporting, analysis, and monitoring developed by the SEEP network financial services working group and alternative credit technologies, LLC. USAID

Befekadu .K. (2007). Outreach and financial performance: analysis of microfinance institutions in Ethiopia. UNCC, Addis Ababa, Ethiopia.

Berger, (2006):. "Pioneers in the Commercialization of Microfinance: The Significance and Future of Upgraded Microfinance Institutions." Inside View of Latin American Microfinance. Washington: Inter-American Development Bank 37-77.

Berne, (2005), "Monitoring system for savings and credit operation; guide and explanation of data and ratio", by inter-cooperation.

Bhatt, N. & Tang, S. (2001). Delivering microfinance in developing countries: controversies and policy perspectives. Policy Studies Journal. Vol. 29(2).

Blaikie,N.W.H.(2001). Desining socisl research the logic of anticipation Cambridge

Bogan, V., Johnson, W. and Mhlanga, N. (2007). Does capital structure affect the financial sustainability of microfinance institutions? Department of applied economics and Management, Cornell University, New York, July 2007.

Bogan, V. (2009). Capital structure and sustainability: an empirical study of microfinance institutions. Department of economics and Management, Cornell University, New York, 2009.

Brau, J. & Woller, G. (2004). "Microfinance institutions: a comprehensive review of the existing literature and an outline for future financial research". *Journal of Entrepreneurial Finance and Business Ventures. Vol. 9*

Brooks, C. (2008), Introductory Econometrics for Finance, 2nd ed., the ICMA Centre, University of Reading

Brouke;P. (1989); concentration and other determinants of Bak profitability in Europe, N.America.

Burrel,(1999), the Gramen bank and Banko Solidario: a case study in the study of trade of between financial self sufficiency and poverty allivation

Cameron, A.C., and Trivedi, P.K. (2009). Microeconometric using stata. Stata Press Publication, USA.

Conning, Jonathan. (1999) "Outreach, Sustainability and Leverage in Monitored and Peer-Monitored Lending", forthcoming in *Journal of Development Economics,*Vol. 60, No. 1.

Consultative Group to assist the Poorest) CGAP,) 1998, "Cost Allocation for Multi-Service MicrofinanceInstitutions",OccasionalPaperNo.2,April1998,WashingtonDC,CGAP(availabl eon:http://www.uncdf.org/mfdl/readings/CGAPocc2.pdf, accessed 25.11.2012)

Consultative Group to assist the Poorest (CGAP) 2003 asseing the relative poverty of microfinanceclients:ACGAP operational tool. Available at: http//www.cgap.org (accesed on 07.03.2010

Consultative Group to assist the Poorest (CGAP). (2004a). Financial Inclusion with a Double Bottom Line: Implications for the Future of Microfinance. CGAP Occasional Paper 8

Consultative Group to assist the Poorest (CGAP). (2004b).Foreign Investment in Microfinance: Debt and Equity from Quasi-Commercial Investors. CGAP Focus Note 25

Consultative Group to assist the Poorest (CGAP), February 2009, "Shedding Light on Microfinance Equity Valuation: Past and present",

Chemining'wa (2013), the relationship between MFI outreach services and financial sustainability in kenya

Churchill, Craig and Frankiewicz, Cheryl, 2006, "Making microfinance work: managing for improved performance", Geneva, International Labor Organization.

Christen, Robert P., Rosenberg, Richard and Jayadeva, Veena, 2004, "Financial Institutions with a "Double Bottom Line": Implications for the future of Microfinance", Occasional Paper No.8, July 2004,

Copestake, J., Greely, M., Johnson, S., Kabeer, N., and Simanowitz, A. (2005). Money with a Mission (Vol. 1). Warwichshire: Institute of Development Studies

Creswell, JW 2003, Research design: qualitative, quantitative and mixed methods approaches, 2nd edn, Sage Publications, California.

Creswell.J.W.(2005). Educational research; planning, conducting, and evaluating quantitative Research (2nd Ed.) upper saddle River. NJ; Pearson.

Creswell, JW 2009, Research design: quantitative, qualitative and mixed methods approaches, 3rd edn, Sage Publications, California.

Crombrugghe AD, Tenikue M, Sureda J (2008) Performance analysis for a sample of microfinance institutions in India. Ann Pub Coop Econ 79(2):269–299

Cull, R., Demirgüç-Kunt, A. and Morduch, J. (2007), "Financial performance and outreach: A global analysis of leading micro banks". The Economic Journal, 117, 107–133.

Degefe D. (2009), microfinance in Ethiopia: Elixir or Poison? Shaker publishing 2009, Maastricht, The Netherlands.

Demirgüç-Kunt, A. And Klapper, L. (2012), "Financial inclusion in Africa: An overview". Policy Research working paper 6088, The World Bank, Washington DC.

D'Espallier, Bert, Isabelle Guérin, and Roy Mersland(2011): "Women and Repayment in Microfinance: A Global Analysis." World Development 758-72.

Dormyei, Z. (2007). reasearch method in applied linguitics. newyork: oxforg university press.

Dichter, Thomas and Harper, Malcolm, (2007), "What's wrong with Microfinance?", Rugby, Warwickshire, Practical Action Publishing

Dissanayake (2012), "The Determinants of Operational Self Sufficiency: An Empirical Analysis of Sri Lankan Microfinance Institutions", University of Kelaniya.

Dunford, C. (2003). The Holy grail of microfinance: helping the poor and sustainable Microfinance evolution, achievements and challenges. ITDG, London

Fowler, FJ (1986), Survey research methods, 3rd edn, Sage Publications, USA

Gashaw (2014); microfinance in Kenya, Uganda and Ethiopia: loan outreach to the poor and the quest for financial viability

Ganka, D. (2010). Financial sustainability of rural microfinance institutions in Tanzania. PHD thesis, University of Greenwich, Australia.

Greene, W. (2003). Econometric Analysis (Vol. 5th). New Jersey: International education, Prentice Hall.

Gujarati, D. (2003). Basic Econometric. USA International edn, McGraw–Hill, 4th

Gujarati D, Sangeetha S (2007) Basic econometrics. Tata McGraw-Hill, New York

Gulli, H. (1998). Microfinance and poverty. Questioning the conventional wisdom. The Inter-American Development Bank. Washington, DC, USA.

Guntz, (2011), sustainability and profitability of microfinance institutions; university of applied science Nuremberg.

Hair, F., Black, C., Babin, J., Anderson, E. and Tatham, L. (2006), Multivariate data analysis, 6th ed., Pearson education, New Jersey.

Hashemi, S. and Rosenberg, R. (2006), "Graduating the poor into microfinance: Linking safety nets and financial services-does microfinance reach the poorest?". Focus notes No. 34, Consultative Group to Assist the Poorest (CGAP), Washington DC.

Hatch, J. & Frederick, L. (1998). Poverty assessment by microfinance institutions: a review of current practices. Development alternatives Inc. MD, USA.

Helms, B. (2006). Access for all . Building inclusive financial systems. Consultative group to assist the poor. Capturing 10 years of CGAP experience. CGAP/the World Bank Group, Washington DC, USA

Hermes, N., Lensink, R. and Meesters, A. (2011), "Outreach and efficiency of microfinance institutions". World Development, 39 (6), 938–948.

Jones, Susan R. (2004). "Supporting Urban Entrepreneurs: law, policy & the role of Lawyers in small Business Development. "Western New England law review 30: 71-91

Jones S R (2006), Legal guide to microenterprise development, American Bar Association, USA

Hishigesuren, (2004), scaling up and mission drift, can microfinance institutions maintains a poverty allocation mission while scaling up?

Hulme, D. and Mosley, P. (1996). Finance against poverty. Routledge, London. Institutional and Financial Perspective. The World Bank, Washington, DC.

Kar, Ashim Kumar. (2011): "Microfinance Institutions: A Cross-Country Empirical Investigation of Outreach and Sustainability." *Journal of Small Business and Entrepreneurship 24.3 427-46.*

Khanker,S,R.B Khalily andZ Khan(19995); Gramen Bank: performance and sustainability Washington, Wold Bank disscusion paper, 306.

Kothari, C.R (2004). Research methodology: Methods and techniques. New Delhi: New Age International (P) Ltd Publishers.

Kablan, S. (2012). Microfinance Efficiency in the West African Economic and Money Union, Have reforms Promoted Sustainability or Outreach. Germany: University Library of Munich.

Kennedy, P (2008), Guide to econometrics, 6th edn, Blackwell Publishing, Malden.

Kipesha, E. and Zhang (2013), Sustainability, Profitability and Outreach Tradeoffs: Evidences from Microfinance Institutions in East Africa

Kinde, B.A. (2012). "Financial Sustainability of Microfinance Institutions (MFIs) in Ethiopia". *European Journal of Business and Management, Vol. 4. No. 12, 2012.*

Kumar rai (2012), A comparative analysis of the financial performance of microfinance institutions of india and bangladesh

Kruland.A.(2012); The Changing Role of Non-Profit Microfinance: An analysis of the changes in aspects of microfinance outreach over the last decade.

Lafourcade, A., Isern, J., Mwangi, P. and Brown, M. (2005).Overview of the outreach and financial performance of microfinance institutions in Africa. MIX, 2005.

Ledgerwood, J. (1999). An institutional and finance perspective. Microfinance handbook. The World Bank Publications, USA.

Letenah Ejigu (2009), "Performance analysis of a sample microfinance institutions of Ethiopia", *International NGO Journal Vol. 4 (5), pp. 287-298, May, 2009.*

Lapenu, C., & Zeller, M. (2002). Growth, and performance of the microfinance institutions in Africa, Asia and Latin America: a recent inventory. Savings and Development, 1(XXVI), 87 111.

Malkawi, E. and Atoom, R. (2011). Jordan Microfinance institutions' Financial Viability to Achieve Microcredit Outreach.

Marakkath (2014), sustainability of Indian microfinance institution.

Mekamu (2012), Determinants of Operational and Financial Self-Sufficiency: An Empirical Evidence of Ethiopian Microfinance Institutions

Meyer, J. (2002). Track record of financial institutions in assessing the poor in Asia. ADB research institute paper, No. 49, September 30, 2011.

Mersland, Roy, and R Strøm. (2009)"Performance and Trade-Offs in Microfinance Organizations - Does Ownership Matter?" Journal *of International Development 20.4 (: 598-612.*

Microfinance Bulletin, (2008a), Issue No.16 Spring, Washington DC, Microfinance InformationExchange,Inc.(MIX)(availableon:http://www.themix.org/sites/default/files/MIX_MBB16_Spring%202008%2 0Issue.pdf, accessed 30.03.2009)

Millson, H. F. (2013). The Trade-Off between Sustainability and Outreach: The Experience of Commercial Microfinance Institutions.

Morduch, J. (1999). "The microfinance promise". *Journal of Economic Literature. Vol. 37(4).*

Morduch, J. (2000). The microfinance schism. World Development. Vol. 28(4).

M.M .Mugenda, A, (2003) research methods: qualitative and quantitative approach; Africa center for technology studies, Nairobi Kenya.

MIX. (2010). MIX (microfinance information exchange), 2010, descriptive microfinance performance bench marks; from http://www.mixmarket.org/

Nara, H.J.(2013), " Outreach And Sustainability Of Nepalese Microfinance Institutions", Centre for Empowerment and Development, Kathmandu ,Nepal

Navajas, S., Schreiner, M., Meyer, R., Gonzalez-Vega, C and Rodriguez-Meza, J (2000). Microcredit and the poorest of the poor: theory and evidence from Bolivia. World Development, **28:**333-346.

National Bank of Ethiopia (2014), Risk based supervision manual of MFIs and (quarterly Birritu and offsite report data base). NBE; Addis Ababa:

Nyamsogoro, G. (2010). "Microfinance Institutions in Tanzania: A Review of Growth and Performance Trends". *The Accountant Journal, 26(3), 3-16.*

Okumu,LJ, (2007); The microfinance industry in Uganda: sustainability, outreach and regulation; unpublished PHD dissertation; university of Stevenbosch

Olivers-Polanco F (2005), Commercializing microfinance and deepening outreach? Empirical evidence from Latin America. J Microfinance 7(2):38–40

Quayes, S. (2011), Depth of outreach and financial sustainability of microfinance institutions. Applied Economics, 44 (26), 3421–3433.

Rhyne,E. (1998), the yin and yang of microfinance: reaching the poor and sustainability: in Micro banking bulletin VOL.2, NO.1

Roberts, P.W. (2013), The Profit Orientation of Microfinance Institutions and Effective Interest Rates. World Development, 41, 120–131.

Robinson, Marguerite S., (2001), "The microfinance revolution", Washington DC, World Bank Publications.

Robinson, Marguerite, (2002), "Lessons from Indonesia", Washington DC, WorldBank Publications.

Rosenberg, Richard. (1996), "Microcredit Interest Rates", Occasional Paper No. 1, Washington, D.C.: Consultative Group to Assist the Poorest, www.worldbank.org/html/cgap/occ1.htm.

Rosenberg, R., (2009), Measuring Results of Microfinance Institutions. Minimum Indicators That Donors and Investors Should Track. CGAP. A Technical Guide

Rosengard, J.K. (2001), Kinks in Links: Financial intermediation for Africa's poor. Africa Economic Policy Discussion Paper. 84. Boston: John F. Kennedy School of Government, Harvard University.

Sachs J D (2005), "The end of poverty, Allen Lane, New Delhi

Scheriner.M. (2001); seven aspect of loan size"; *journal of microfinance,Vo.3.No. 2pp 27-47.*

Schreiner, M. (2002)," Aspects of outreach: a framework for discussion of the social benefits of microfinance". *Journal of International Development. Vol. 14.*

Nara, H.J.(2013), " Outreach And Sustainability Of Nepalese Microfinance Institutions", Centre for Empowerment and Development, Kathmandu ,Nepal

Thapa, G. (2007), "Sustainability and governance of microfinance Institutions: Recent Experiences and some Lessons for Southeast Asia". *Asian Journal of Agriculture and Development, Vol.4, No.1*

Tilahun (2013); determinants of microfinance sustainability in East Africa.

U.S. general Accounting Office (2003), Report to the Chairman, Committee on International program has Met some Goals; Annual reporting Has Limitations. Washington, DC: U.S. general accounting office

United Nations Capital Development Fund (UNCDF, 2002), "Microfinance Distance Learning Course", New York, United Nations Publications

United Nations Capital Development Fund (UNCDF), 2009, "Microfinance Distance Learning Course",onlineformat(availableon:http://www.uncdf.org/mfdl/index.php?_mode=students .home, accessed 10.04.2009)

USAID. (2006), Evaluating Microfinance Institutions Social Performance: A Measurement Tool. Micro Report No. 35, USA: USAID.

Von Pischke, J. (1996), "Measuring the trade-off between outreach and sustainability of micro enterprise lenders". *Journal of International Development , 8 , 225-239*

Wiedmaier-Pfister, M., Gesesse, D., Amha, W., Mommartz, R., & Steel, E. D. (2008), Access to finance in Ethiopia Sector assessment study,Volume 2. German Technical Cooperation.

Wolday Amha. (2001), **"**Review of micro finance industry in Ethiopia'': regulatory frameworks and performance, Occasional Papers , Addis Ababa, Ethiopia.

Wolday Ameha 2002), **"**Review of micro finance industry in Ethiopia'': regulatory frameworks and performance, Occasional Papers , Addis Ababa, Ethiopia.

Wolday Amha(2003), Microfinance in Ethiopia; performance and challenges and a role in poverity reduction;Addis Ababa:AEMFI; ocational paperN. 7;Feb.

Wolday Amha, (2007), "Review of microfinance industry in Ethiopia: Regulatory framework and performance". Occasional paper No. 2, Association of Ethiopian Microfinance Institutions

Wolday Amha (2008), efficiency, outreach and sustainability of Ethiopian microfinance institutions.

Woller, G. , Dunford, C., & Warner, W. (1999), Where to Microfinance. International Journal ofEconomic Development, . 1(29–64).

Woller, G. & Woodworth, W. (2001). Microcredit as a grass-roots policy for *international development. Policy Studies Journal. Vol.29 (2).*

Woller ,G. and Schreiner,M.(2002), Poverty lending, financial self-sufficiency, and six aspects ofoutreach. Working paper, Washington, DC, USA.

Woller, G. and Schreiner, M. (2004), Measuring outreach: conceptual workshop proceedings. Washington, DC, USA.

World Bank (2008), Finance for all: Policies and pitfalls in expanding access. A World Bank Policy Research Report, the International Bank for Reconstruction and Development / The World Bank, Washington, DC.

Yunus, Muhammad, (2003), Banker to the poor; Micro-Lending and the Battle agins world poverty. New York: Public Affairs

Yaron Jacob, (1995).Successful Rural Finance Institutions, Discussion Paper, vol. 150, Washington, D.C., World Bank,

Zeller M. & Meyer R.L. (2002), "The Triangle of Microfinance: Financial Sustainability, Outreach, and Impact"; International Food Policy Research Institute Baltimore, U.S.

Zerai B. and Rani L. (2012) "Is There a Tradeoff between Outreach and Sustainability of Micro finance institutions? Evidence from Indian Microfinance Institutions (MFIs)", *European Journal of Business and Management, Vol 4, No.2, PP: 90-9*

Appendixes

Appendix.1

Heteroskedasticity Test: White:OSS

F-statistic	1.426987	Prob. F(27,140)	0.0957
Obs*R-squared	36.25643	Prob. Chi-Square(27)	0.1098
Scaled explained SS	32.02861	Prob. Chi-Square(27)	0.2310

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/07/15 Time: 11:08
Sample: 2003 214
Included observations: 168

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.228179	2.445100	-0.093321	0.9258
NAB	0.206816	0.194674	1.062368	0.2899
NAB^2	-0.007284	0.006724	-1.083384	0.2805
NAB*ALBPB	0.000888	0.016422	0.054098	0.9569
NAB*GPY	-0.326654	0.195076	-1.674499	0.0963
NAB*PWB	0.041376	0.053792	0.769185	0.4431
NAB*OER	0.015455	0.159805	0.096711	0.9231
NAB*GLPR	-0.000590	0.082648	-0.007140	0.9943
ALBPB	-0.300976	0.376876	-0.798609	0.4259
ALBPB^2	0.016429	0.017384	0.945081	0.3462
ALBPB*GPY	-0.131972	0.397488	-0.332014	0.7404
ALBPB*PWB	-0.041400	0.088270	-0.469017	0.6398
ALBPB*OER	0.764269	0.385989	1.980027	0.0497
ALBPB*GLPR	-0.006067	0.164541	-0.036872	0.9706
GPY	6.103912	3.908254	1.561800	0.1206
GPY^2	1.898245	3.437625	0.552197	0.5817
GPY*PWB	-1.512882	0.985693	-1.534842	0.1271
GPY*OER	-5.973465	5.540235	-1.078197	0.2828
GPY*GLPR	-1.195302	1.979219	-0.603926	0.5469
PWB	-0.890379	1.035568	-0.859797	0.3914
PWB^2	0.556849	0.296121	1.880481	0.0621
PWB*OER	1.365563	1.201012	1.137011	0.2575
PWB*GLPR	0.512784	0.509777	1.005899	0.3162
OER	-5.654183	3.994279	-1.415570	0.1591
OER^2	4.259999	1.510668	2.819943	0.0055
OER*GLPR	-1.321280	1.580182	-0.836157	0.4045
GLPR	0.536418	1.539111	0.348524	0.7280
GLPR^2	-0.247190	0.695362	-0.355484	0.7228

R-squared	0.215812	Mean dependent var	0.066418
Adjusted R-squared	0.064576	S.D. dependent var	0.092398
S.E. of regression	0.089364	Akaike info criterion	-1.841177
Sum squared resid	1.118039	Schwarz criterion	-1.320516
Log likelihood	182.6589	Hannan-Quinn criter.	-1.629867
F-statistic	1.426987	Durbin-Watson stat	1.996783
Prob(F-statistic)	0.095741		

Appendix. 2

Heteroskedasticity Test: White:FSS

F-statistic	0.881621	Prob. F(27,140)	0.6364
Obs*R-squared	24.41356	Prob. Chi-Square(27)	0.6073
Scaled explained SS	30.50021	Prob. Chi-Square(27)	0.2922

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/07/15 Time: 11:09
Sample: 2003 214
Included observations: 168

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.196836	2.489068	-0.079080	0.9371
NAB	0.175446	0.198175	0.885308	0.3775
NAB^2	-0.009314	0.006845	-1.360807	0.1758
NAB*ALBP	0.005186	0.016718	0.310206	0.7569
NAB*GPY	-0.209102	0.198584	-1.052969	0.2942
NAB*PWB	0.054603	0.054760	0.997131	0.3204
NAB*OER	-0.075513	0.162679	-0.464187	0.6432
NAB*GLPR	0.020933	0.084134	0.248808	0.8039
ALBPB	-0.182802	0.383653	-0.476477	0.6345
ALBPB^2	0.004059	0.017696	0.229358	0.8189
ALBPB*GPY	-0.352132	0.404636	-0.870244	0.3857
ALBPB*PWB	-0.023786	0.089857	-0.264710	0.7916
ALBPB*OER	0.568365	0.392930	1.446478	0.1503
ALBPB*GLPR	0.089988	0.167500	0.537244	0.5920
GPY	5.378218	3.978533	1.351809	0.1786
GPY^2	-0.527618	3.499442	-0.150772	0.8804
GPY*PWB	-0.375993	1.003418	-0.374713	0.7084
GPY*OER	-1.776738	5.639861	-0.315032	0.7532
GPY*GLPR	-0.087312	2.014810	-0.043335	0.9655
PWB	-0.464446	1.054190	-0.440572	0.6602

PWB^2	-0.123040	0.301445	-0.408166	0.6838
PWB*OER	0.771039	1.222609	0.630651	0.5293
PWB*GLPR	0.296951	0.518944	0.572222	0.5681
OER	-3.812110	4.066105	-0.937533	0.3501
OER^2	2.048932	1.537834	1.332349	0.1849
OER*GLPR	-0.669683	1.608597	-0.416315	0.6778
GLPR	-0.416147	1.566788	-0.265605	0.7909
GLPR^2	-0.349769	0.707866	-0.494118	0.6220

R-squared	0.145319	Mean dependent var	0.054460
Adjusted R-squared	-0.019513	S.D. dependent var	0.090097
S.E. of regression	0.090971	Akaike info criterion	-1.805532
Sum squared resid	1.158611	Schwarz criterion	-1.284871
Log likelihood	179.6647	Hannan-Quinn criter.	-1.594222
F-statistic	0.881621	Durbin-Watson stat	1.751736
Prob(F-statistic)	0.636425		

Appendix.3

Dependent Variable: OSS
Method: Panel EGLS (Cross-section random effects)
Date: 05/07/15 Time: 10:10
Sample: 2003 2014
Periods included: 12
Cross-sections included: 14
Total panel (balanced) observations: 168
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.371714	0.403393	-3.400439	0.0008
NAB	0.150373	0.026641	5.644466	0.0000
ALBPB	0.065540	0.034653	1.891316	0.0604
GPY	2.539831	0.475943	5.336421	0.0000
PWB	0.082595	0.146568	0.563527	0.5739
OER	-2.063992	0.403293	-5.117842	0.0000
GLPR	0.453505	0.198069	2.289633	0.0233

Effects Specification		
	S.D.	Rho
Cross-section random	0.124825	0.2283
Idiosyncratic random	0.229512	0.7717

Weighted Statistics			
R-squared	0.482800	Mean dependent var	0.631955
Adjusted R-squared	0.463525	S.D. dependent var	0.317645
S.E. of regression	0.232657	Sum squared resid	8.714850

F-statistic	25.04856	Durbin-Watson stat	1.730274
Prob(F-statistic)	0.000000		

	Unweighted Statistics		
R-squared	0.611223	Mean dependent var	1.347938
Sum squared resid	11.66070	Durbin-Watson stat	1.293154

Appendix. 4.

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

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	10.442728	6	0.1072

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NAB	0.156896	0.150373	0.000940	0.8315
ALBPB	0.055954	0.065540	0.000253	0.5468
GPY	2.286344	2.539831	0.046331	0.2389
PWB	-0.071536	0.082595	0.008495	0.0945
OER	-1.753676	-2.063992	0.023598	0.0434
GLPR	0.465633	0.453505	0.007390	0.8878

Cross-section random effects test equation:
Dependent Variable: OSS
Method: Panel Least Squares
Date: 05/07/15 Time: 10:20
Sample: 2003 2014
Periods included: 12
Cross-sections included: 14
Total panel (balanced) observations: 168

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.298210	0.466502	-2.782860	0.0061
NAB	0.156896	0.040615	3.863036	0.0002
ALBPB	0.055954	0.038130	1.467468	0.1444
GPY	2.286344	0.522353	4.377011	0.0000

PWB	-0.071536	0.173138	-0.413173	0.6801
OER	-1.753676	0.431560	-4.063576	0.0001
GLPR	0.465633	0.215921	2.156503	0.0327

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.740074	Mean dependent var	1.347938
Adjusted R-squared	0.706705	S.D. dependent var	0.423793
S.E. of regression	0.229512	Akaike info criterion	0.005624
Sum squared resid	7.796038	Schwarz criterion	0.377524
Log likelihood	19.52759	Hannan-Quinn criter.	0.156559
F-statistic	22.17854	Durbin-Watson stat	1.914929
Prob(F-statistic)	0.000000		

Appendix.5.

Dependent Variable: FSS
Method: Panel EGLS (Cross-section random effects)
Date: 05/07/15 Time: 10:23
Sample: 2003 2014
Periods included: 12
Cross-sections included: 14
Total panel (balanced) observations: 168
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.871829	0.331374	-2.630954	0.0093
NAB	0.068818	0.017152	4.012322	0.0001
ALBPB	0.066836	0.031595	2.115396	0.0359
GPY	2.497524	0.402795	6.200489	0.0000
PWB	0.097199	0.108613	0.894913	0.3722
OER	-1.856889	0.354291	-5.241148	0.0000
GLPR	0.389693	0.184513	2.112011	0.0362

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.236034	1.0000

Weighted Statistics			
R-squared	0.424232	Mean dependent var	0.950458
Adjusted R-squared	0.402774	S.D. dependent var	0.308469
S.E. of regression	0.238386	Sum squared resid	9.149285

F-statistic	19.77106	Durbin-Watson stat	1.791277
Prob(F-statistic)	0.000000		
	Unweighted Statistics		
R-squared	0.424232	Mean dependent var	0.950458
Sum squared resid	9.149285	Durbin-Watson stat	1.791277

Appendix. 6.

Correlated Random Effects - Hausman Test

Equation: FSS

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.714383	6	0.1372

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NAB	0.107937	0.068818	0.001450	0.3043
ALBPB	0.041179	0.066836	0.000539	0.2693
GPY	1.920856	2.497524	0.126336	0.1047
PWB	-0.126074	0.097199	0.019908	0.1136
OER	-1.394647	-1.856889	0.071457	0.0838
GLPR	0.252092	0.389693	0.015264	0.2654

Cross-section random effects test equation:

Dependent Variable: FSS

Method: Panel Least Squares

Date: 05/07/15 Time: 10:24

Sample: 2003 2014

Periods included: 12

Cross-sections included: 14

Total panel (balanced) observations: 168

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	-0.842481	0.479759	-1.756051	0.0811
NAB	0.107937	0.041769	2.584157	0.0107
ALBPB	0.041179	0.039213	1.050132	0.2954
GPY	1.920856	0.537196	3.575704	0.0005
PWB	-0.126074	0.178058	-0.708047	0.4800
OER	-1.394647	0.443823	-3.142347	0.0020
GLPR	0.252092	0.222056	1.135261	0.2581

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.481113	Mean dependent var	0.950458
Adjusted R-squared	0.414499	S.D. dependent var	0.308469
S.E. of regression	0.236034	Akaike info criterion	0.061665
Sum squared resid	8.245409	Schwarz criterion	0.433565
Log likelihood	14.82015	Hannan-Quinn criter.	0.212600
F-statistic	7.222413	Durbin-Watson stat	1.955878
Prob(F-statistic)	0.000000		

Appendix.7.Data for regression and correlation analysis

MFI-ID	YEAR	OSS	FSS	NAB	ALBPB	GPY	PWB	OER	GLPR
1	2003	1.78	1.37	12.6	6.57	19%	29%	0.08	0.77
1	2004	2.32	1.56	12.8	6.78	19%	30%	0.06	0.7
1	2005	2	1.50	13.0	6.93	18%	39%	0.06	0.73
1	2006	2.24	1.46	13.2	7.15	18%	50%	0.05	0.81
1	2007	2.26	1.39	13.3	7.43	18%	51%	0.05	0.84
1	2008	2.4	0.88	13.5	7.69	16%	60%	0.03	0.88
1	2009	2.1	1.68	13.4	7.79	18%	63%	0.04	0.73
1	2010	2.23	1.76	13.4	7.87	9%	64%	0.02	0.7
1	2011	2.14	1.23	13.5	7.93	20%	68%	0.05	0.6
1	2012	2.44	1.34	13.6	8.25	20%	69%	0.04	0.69
1	2013	2.3	1.26	13.7	8.50	18%	64%	0.04	0.73
1	2014	2.1	1.15	13.8	8.62	19%	63%	0.05	0.63
2	2003	0.85	0.60	9.6	6.42	18%	71%	0.14	0.6
2	2004	1.03	0.54	10.4	7.16	10%	65%	0.08	0.7
2	2005	1.97	1.07	10.9	7.69	10%	75%	0.04	0.86
2	2006	1.35	0.50	10.9	7.69	8%	56%	0.04	0.7
2	2007	1.56	0.49	11.4	7.54	10%	42%	0.05	0.7
2	2008	1.29	0.29	11.4	7.94	9%	57%	0.04	0.86
2	2009	1.77	1.46	11.9	7.65	9%	45%	0.03	0.83
2	2010	1.95	1.37	12.0	7.88	10%	54%	0.03	0.8
2	2011	1.66	1.09	12.0	7.87	10%	55%	0.03	0.74
2	2012	1.41	1.01	12.1	8.15	8%	48%	0.03	0.64
2	2013	1.7	1.21	12.3	8.41	11%	50%	0.02	0.63
2	2014	1.8	1.28	12.4	8.78	13%	51%	0.02	0.73
3	2003	1.04	0.87	8.7	5.87	48%	82%	0.40	0.66
3	2004	1.00	0.80	8.6	5.94	46%	76%	0.42	0.59
3	2005	0.77	0.64	9.2	6.65	25%	71%	0.30	0.47
3	2006	1.25	0.94	9.9	6.33	32%	70%	0.23	0.78
3	2007	1.3	0.97	10.3	6.46	38%	75%	0.25	0.76
3	2008	1.45	0.82	10.6	6.69	31%	78%	0.18	0.9
3	2009	1.45	1.20	10.6	7.06	28%	72%	0.15	0.8
3	2010	1.47	1.37	10.5	7.16	28%	79%	0.16	0.82
3	2011	1.59	1.14	10.9	7.29	29%	80%	0.13	0.91
3	2012	1.51	1.04	10.9	7.58	29%	71%	0.16	0.88
3	2013	1.5	1.03	11.1	7.77	23%	75%	0.16	0.84
3	2014	1.6	1.09	11.3	7.94	18%	66%	0.14	0.86
4	2003	1.80	0.96	12.3	9.01	15%	25%	0.06	0.59

MFI-ID	YEAR	OSS	FSS	NAB	ALBPB	GPY	PWB	OER	GLPR
4	2004	2.16	1.25	12.7	7.02	13%	20%	0.04	0.81
4	2005	1.97	1.51	12.9	7.39	13%	23%	0.03	0.85
4	2006	1.94	1.27	12.9	7.53	11%	19%	0.03	0.73
4	2007	1.73	0.97	13.0	7.84	12%	38%	0.03	0.75
4	2008	1.3	0.44	13.0	8.05	10%	25%	0.03	0.79
4	2009	2.02	1.66	12.9	8.11	11%	38%	0.03	0.67
4	2010	1.02	0.88	12.9	8.21	5%	33%	0.02	0.71
4	2011	1.72	1.07	12.9	8.49	10%	25%	0.02	0.64
4	2012	1.39	1.01	12.8	8.63	9%	53%	0.04	0.65
4	2013	1.2	0.79	12.8	8.75	13%	26%	0.06	0.65
4	2014	1.4	0.98	12.9	8.84	14%	25%	0.05	0.66
5	2003	1.04	0.80	8.8	6.37	32%	34%	0.25	0.54
5	2004	1.55	1.20	9.2	6.63	31%	26%	0.15	0.91
5	2005	1.48	1.17	9.4	6.84	27%	24%	0.12	0.91
5	2006	1.60	1.23	10.1	6.92	26%	35%	0.11	0.8
5	2007	1.05	0.87	10.2	7.04	28%	28%	0.10	0.9
5	2008	0.9	0.62	10.2	7.17	26%	32%	0.51	0.86
5	2009	1.1	0.82	10.2	7.19	23%	32%	0.24	0.8
5	2010	1.2	0.84	10.0	7.26	22%	32%	0.25	0.7
5	2011	0.86	0.71	9.8	7.68	23%	42%	0.15	0.89
5	2012	0.77	0.56	10.0	7.71	22%	35%	0.27	0.94
5	2013	1.2	0.87	10.0	7.85	19%	33%	0.20	0.91
5	2014	1.1	0.80	9.9	7.99	21%	35%	0.24	0.88
6	2003	0.61	0.41	8.8	6.06	32%	54%	0.43	0.42
6	2004	0.725	0.45	9.0	6.57	31%	68%	0.25	0.52
6	2005	1.10	0.76	9.2	7.23	27%	40%	0.15	0.72
6	2006	0.94	0.61	9.0	7.23	20%	66%	0.14	0.71
6	2007	1.14	0.73	9.4	7.01	24%	41%	0.15	0.72
6	2008	1.12	0.49	9.5	7.10	17%	25%	0.13	0.76
6	2009	1.3	1.07	9.5	7.03	32%	23%	0.22	0.74
6	2010	0.69	0.66	8.6	7.05	20%	35%	0.22	0.7
6	2011	0.72	0.57	8.6	8.07	19%	35%	0.20	0.74
6	2012	1	0.79	8.6	8.19	20%	27%	0.25	0.86
6	2013	1	0.80	8.6	8.52	15%	34%	0.25	0.81
6	2014	0.94	0.74	8.5	8.59	18%	37%	0.28	0.8
7	2003	0.89	0.76	8.2	6.24	26%	70%	0.14	0.73
7	2004	1.10	0.69	8.3	6.47	24%	61%	0.15	0.67
7	2005	0.85	0.79	8.4	6.67	23%	54%	0.17	0.58
7	2006	1.58	1.43	8.9	7.02	30%	66%	0.16	0.83
7	2007	1.34	1.11	9.3	7.13	24%	41%	0.12	0.87
7	2008	1.24	0.72	9.5	7.20	18%	57%	0.09	0.95

MFI-ID	YEAR	OSS	FSS	NAB	ALBPB	GPY	PWB	OER	GLPR
7	2009	1.36	1.12	9.5	7.31	18%	39%	0.10	0.93
7	2010	0.9	0.88	9.6	7.39	19%	43%	0.11	0.93
7	2011	1.24	1.07	9.4	7.69	19%	44%	0.11	0.94
7	2012	1.57	1.27	9.2	8.00	24%	46%	0.13	0.9
7	2013	1.2	0.90	9.1	8.30	19%	33%	0.04	0.84
7	2014	1.7	1.30	9.3	8.35	18%	27%	0.03	0.88
8	2003	0.89	0.49	11.2	5.83	16%	38%	0.14	0.71
8	2004	1.06	0.63	11.2	6.01	19%	34%	0.16	0.45
8	2005	1.12	0.83	11.3	6.71	17%	31%	0.10	0.74
8	2006	1.41	0.96	11.7	6.80	15%	29%	0.08	0.73
8	2007	1.22	0.90	12.0	7.04	13%	44%	0.09	0.76
8	2008	1.29	0.73	12.3	9.90	10%	33%	0.04	0.82
8	2009	1.02	0.84	12.6	7.35	6%	32%	0.02	0.88
8	2010	1.03	0.95	12.6	7.49	11%	30%	0.05	0.86
8	2011	1.16	0.78	12.8	7.48	11%	31%	0.05	0.87
8	2012	1.1	0.81	13.1	7.58	9%	31%	0.08	0.7
8	2013	1.5	1.10	13.3	7.34	13%	26%	0.03	0.72
8	2014	1.4	1.02	13.3	7.71	14%	68%	0.04	0.75
9	2003	0.95	0.64	11.0	6.93	14%	14%	0.11	0.76
9	2004	0.61	0.47	11.4	6.92	16%	20%	0.09	0.8
9	2005	1.47	1.10	11.7	6.99	15%	23%	0.08	0.79
9	2006	1.82	1.04	12.1	7.09	15%	22%	0.06	0.89
9	2007	1.66	1.06	12.5	7.31	15%	26%	0.06	0.82
9	2008	1.53	0.63	12.9	7.44	11%	25%	0.04	0.86
9	2009	1.95	1.61	12.8	7.61	14%	39%	0.05	0.81
9	2010	1.45	1.33	13.0	7.73	13%	31%	0.05	0.74
9	2011	1.6	1.13	13.1	7.89	12%	35%	0.05	0.8
9	2012	2.05	1.28	13.2	8.11	14%	38%	0.05	0.78
9	2013	1.6	0.99	13.5	8.11	13%	35%	0.12	0.82
9	2014	1.5	0.92	13.8	8.20	13%	35%	0.12	0.75
10	2003	0.80	0.67	8.6	6.86	14%	65%	0.21	0.7
10	2004	1.53	1.20	9.0	6.90	29%	70%	0.18	0.73
10	2005	1.03	0.81	9.5	7.04	16%	80%	0.12	0.76
10	2006	1.96	1.41	9.9	7.25	19%	74%	0.08	0.9
10	2007	1.88	1.37	9.9	7.40	22%	81%	0.08	0.94
10	2008	1.65	0.78	9.9	7.58	19%	77%	0.08	0.85
10	2009	1.23	1.01	9.8	7.76	23%	81%	0.05	0.87
10	2010	1.07	1.01	9.8	7.76	20%	81%	0.11	0.8
10	2011	1.43	1.00	9.8	7.96	24%	82%	0.12	0.79
10	2012	1.34	1.00	9.8	7.96	23%	82%	0.14	0.81
10	2013	1.6	1.19	10.0	8.08	17%	79%	0.12	0.88

MFI-ID	YEAR	OSS	FSS	NAB	ALBPB	GPY	PWB	OER	GLPR
10	2014	1.5	1.11	10.0	8.24	17%	81%	0.12	0.83
11	2003	0.57	0.37	9.3	6.60	12%	38%	0.19	0.51
11	2004	0.83	0.51	9.3	6.70	14%	32%	0.16	0.49
11	2005	0.75	0.42	9.9	6.28	14%	26%	0.16	0.55
11	2006	0.73	0.42	10.2	6.35	13%	56%	0.16	0.62
11	2007	0.65	0.41	10.4	6.45	10%	21%	0.11	0.69
11	2008	0.92	0.78	10.4	6.62	12%	21%	0.13	0.78
11	2009	0.84	0.70	10.4	6.64	11%	21%	0.14	0.79
11	2010	1	0.86	10.8	6.38	13%	21%	0.11	0.78
11	2011	1.11	0.92	10.8	6.72	17%	23%	0.15	0.84
11	2012	1.2	0.98	10.8	7.03	19%	57%	0.11	0.86
11	2013	1.2	0.98	10.4	7.91	19%	75%	0.10	0.84
11	2014	1.3	1.06	10.6	7.93	15%	25%	0.09	0.91
12	2003	1.06	0.79	9.2	6.65	22%	69%	0.19	0.65
12	2004	1.04	0.81	9.3	6.76	20%	60%	0.16	0.64
12	2005	1.04	0.81	9.6	6.83	20%	55%	0.14	0.76
12	2006	1.27	0.85	9.9	6.95	19%	55%	0.13	0.79
12	2007	1.11	0.59	10.1	7.02	17%	54%	0.13	0.81
12	2008	1.19	0.54	10.2	7.04	22%	55%	0.12	0.85
12	2009	1.2	0.99	10.3	7.06	26%	53%	0.16	0.76
12	2010	1.61	1.36	10.3	7.23	15%	56%	0.07	0.7
12	2011	1.43	0.93	10.4	7.33	15%	56%	0.13	0.73
12	2012	1.44	0.96	10.5	7.83	15%	53%	0.12	0.77
12	2013	1.5	1.00	11.5	7.96	16%	20%	0.11	0.73
12	2014	1.6	1.06	10.5	8.13	19%	50%	0.10	0.75
13	2003	1.40	1.08	8.2	6.40	32%	61%	0.17	0.88
13	2004	1.45	1.18	9.1	6.39	33%	39%	0.18	0.86
13	2005	0.99	0.76	9.4	6.43	26%	39%	0.17	0.78
13	2006	1.13	0.91	10.0	6.71	24%	36%	0.15	0.84
13	2007	1.48	1.02	10.4	6.80	24%	36%	0.11	0.91
13	2008	1.62	0.78	10.6	7.58	19%	43%	0.08	0.87
13	2009	1.84	1.52	10.7	7.32	24%	46%	0.06	0.9
13	2010	1.45	1.30	10.7	7.57	12%	45%	0.04	0.88
13	2011	1.63	1.18	10.9	7.65	13%	43%	0.07	0.89
13	2012	1.85	1.28	11.0	7.85	23%	41%	0.08	0.78
13	2013	1.5	1.03	11.1	8.02	14%	44%	0.08	0.83
13	2014	1.4	0.97	11.1	8.21	18%	42%	0.09	0.81
14	2003	0.89	0.79	9.4	6.86	20%	33%	0.21	0.6
14	2004	0.30	0.12	9.9	6.85	21%	42%	0.20	0.59
14	2005	1.07	0.91	10.2	6.89	22%	47%	0.20	0.78

MFI-ID	YEAR	OSS	FSS	NAB	ALBPB	GPY	PWB	OER	GLPR
14	2006	1.29	1.05	10.7	6.84	18%	57%	0.18	0.85
14	2007	0.99	0.73	10.8	7.13	21%	60%	0.20	0.83
14	2008	0.96	0.56	10.9	7.28	18%	65%	0.17	0.9
14	2009	1.07	0.88	10.9	7.44	22%	66%	0.20	0.88
14	2010	0.71	0.65	10.8	7.54	18%	78%	0.19	0.74
14	2011	0.86	0.67	10.7	8.29	19%	64%	0.17	0.73
14	2012	0.96	0.82	11.0	8.03	20%	65%	0.16	0.72
14	2013	2	1.70	11.1	8.38	17%	66%	0.14	0.72
14	2014	1.3	1.11	10.9	8.54	15%	63%	0.15	0.66