DETERMINANTS OF MICRO FINANCE PROFITABILITY: *The Case of Selected Micro Finance Institutions in Ethiopia.*

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DECLARATION

I herby declare that this thesis entitled "Determinants of Micro Finance Profitability : *The Case of Selected Micro Finance Institutions in Ethiopia*", has been carried out by me under the guidance and supervision of Dr. Arega Seyoum and Ato Hamdu Kedir.

The thesis is original and has not been submitted for the award of any degree or diploma to any University or Institutions.

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Abstract

As noted by Muriu (2011), micro finance has attracted significant interest in recent years, both from policy makers and in the academia, hence this study examined the determinants of profitability of Ethiopian micro finance institutions using panel data of 12 micro finance institutions operating in the country over the period of 2003-2012. Since the collected data is secondary in nature, a quantitative approach to research was considered, besides the fixed effect model was used. Under this study both internal and external factors were included, the internal factors used in this study were, breadth of outreach, capital adequacy, portfolio quality, efficiency, size and age where as the external factors were real GDP growth and inflation. ROA was used as a proxy for profitability measure. Based on the regression result, among the micro finance institution specific variables, breadth of outreach and age were found to be significant variables with a positive coefficient against ROA whereas portfolio quality and operational efficiency (lower cost) were significant variables with a negative coefficient. The remaining two internal variables i.e. capital adequacy and size were found to be statistically insignificant. More over the effect of macroeconomic variables included in the study i.e. GDP and inflation were also statistically insignificant. Based on the findings detected, the study recommended measures that the micro finance institutions may need to take in order to improve their breadth of outreach, portfolio quality, operational efficiency and the role of the government in improving the performance of micro finance institutions in the country.

KEY WORDS: Determinants of profitability, internal variables, external variables

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List of Acronyms

ACSI: Amhara Credit and Saving Institution, Share Company

AdCSI: Addis Credit and Saving Institution Share Company

AEMFI: Association of Ethiopian Microfinance Institutions

AVFS: African village financial service

CGAP: Consultative Group to Assist the Poorest

CAR: Capital adequacy ratio

CLRM: Classical linear regression model

DECSI: Dedebit Credit and Saving Institution, Share Company

ETB: Ethiopian Birr

EFF: Efficiency

FSS: Financial self-sufficiency

GDP: Gross domestic product

GLP: Gross loan portfolio

GNI: Gross national income

LDCS: Least developed countries

ln TA: Natural logarithm of total asset

MFIs: Microfinance Institutions

MIX: Microfinance Information exchange

MDG: Millennium development goals

NGOs: Non-governmental Organizations

NBE: National Bank of Ethiopia

OCSSCO: Oromia Credit and Saving Institution, Share Company

OLS: Ordinary least square

OMO: Omo Microfinance Institution, Share Company

OSS: Operational self-sufficiency

PAR>30: Portfolio at risk past due 30 days

PEACE: Poverty Eradication and Community Empowerment Microfinance Institution, Share Company

RMP: Relative market power

SFPI: Specialized Financial and Promotional Institution, Share Company

SCP: Structure- conduct-performance

UN: United Nations

CHAPTER ONE

INTRODUCTION

This chapter begins with discussing background of the study that gives some insight on the issue of MFIs. After giving some insight on the issue of MFIs, statement of the problem part that shows the direction of the study, justifies the reason to carry out the study. Following this both general and specific objectives of the study, the research hypothesis those tested against the econometric results are presented. Lastly the sub sequent section presents significance of the study, scope and limitation of the study and organization of the paper.

1.1 Background of the Study

The haves (the rich) and the have not's (the poor) live on the same planet but the majority are the have not's or the poor. It is a fact that 4 billion people worldwide live on less than US $ 2 per day (micro finance bulletin, 2011)

Micro finance is high on the public agenda. It has achieved tremendous success in improving the livelihoods of the poor, through the provision of financial services. Such initiatives are widely sponsored by a variety of organizations including; the World Bank, United Nations, National Governments and many charitable organizations (NGOs).Their aim is to help the poor cope with risk and take advantage of small income generating opportunities, by employing profit making banking practices amongst low income communities (Banerjee and Duflo, 2009; Ahlin and Jiang, 2008). By alleviating financial constraints, micro finance is capable of motivating small scale investments from otherwise unrealized market activities while rewarding investment returns (Hilson and Ackah-Baido, 2010).

The need for micro finance is highly pronounced due to the fact that the poor are 'unbankable' in the views of the formal financial institutions, because the poor fail to bet collateral which these institutions put as a pre condition for dispersment of a loan. More than 3 billion poor people seek access to basic financial services worldwide (Helms, 2010) and ignored by commercial banks for a long time.

It has been routinely said that lack of access to credit is a major obstacle to growth in LDCs (least developed countries) where a large majority of households do not have adequate collateral to secure a loan. These households rely on both informal sector and money lenders where they borrow at usurious interest rates, or they are denied access to credit and investment. Micro finance institutions (hence forth abbreviated as MFIs in this study) expand the frontier of financial services by providing credit to those who are excluded from financial markets (Muriu, 2011).

MFIs are defined in terms of the following characteristics: targeting the poor (especially the poor women); promoting small businesses; building capacity of the poor; extending small loans without collaterals; combining credit with savings; and charging commercial interest rates (Dejene, 1998 cited in Alemayehu, 2008).

Ethiopia is one of the least developed countries in the world; its peoples are among the poorest in the planet. The EPRDF government made a change in Ethiopian economic policy towards market economy, with the objective of economic growth and poverty alleviation. One of the policy instruments of the government to enable rural and urban poor to increase output and productivity is the establishment and expansion of MFIs. As cited in Amha, 2000 The establishment of sustainable MFIs that reach large number of rural and urban poor who are not served by the formal financial institutions, such as commercial banks has been a prime component of the new development strategy of Ethiopia.

Improving access to financial services is taken as an important step towards development, owing to the fact that it helps in creating employment for unemployed and increase income and consumption of peoples who were denied such services before, this would in the final analysis reduce poverty and contributes to implementation of the five year transformation and development plan. At the time of conducting this study the number of MFIs operating in the

country has reached 35; with a total capital of Br.5.6 billion and assets of Br. 24.5 billion showing their incremental importance in the economy (NBE, 2014/2015).

There seems to be a consensus among scholars about the overall mission of MFIs i.e. poverty alleviation by helping the poor who are not served by the formal financial institutions, to this end MFIs should be viably sustainable in their operations not a sporadic one time flying eagles.

Sustainability of MFIs is not something to be reached in a blue sky; sustainability is a crucial element that MFIs should strive to attain so that they achieve their intended target. Here comes the big flash point, how should this sustainability really be achieved? This is the debatable issue among the scholars.

Some scholars argue that the primary goal of MFIs is alleviation of poverity, by supporting the impoverished to have access to financial services which is denied by the formal financial institutions, therefore their goal should not be earning profit, they argue that the social mission of MFIs needs to be higher goal and therefore be more important than profits, in light of this MFIs should be subsidized sothat they attain their intended target. While others argue that even if the goal of MFIs is alleviation of poverty by helping the active poor through provision of credit; since they charge higher interest rate which they think as compensation for different costs related to the credit and since they need to strengthen their financial position, it could be said that their objective is also gaining profit, so that it cannot be said that MFIs are not generating profit which exceeds their costs. The recent trend of commercialization of MFIs even under lines a run for profits from the business conducted with customers who are poor (Sarah, 2011 cited in Sima, 2013).

Scholars who studied on the issue like (Muriu, 2011) and (Jorgensen, 2012) argue that the notion of profitability is also workable for MFIs owing to the fact that profitable MFIs reach the larger poor as well as build a sustainable institution with their own resources rather than, with subsidies from external donors.

Being in harmony with the concept of profitability, to make MFIs a sustainable source of finance for the larger poor, this study focused on identifying determinants of micro finance profitability

which contribute for the sustainability of the MFIs and make them a reliable source of finance for the poor, taking into account some selected MFIs operating in Ethiopia.

1.2 Statement of the Problem

Today the world is changing rapidly, the environment in which financial institutions are operating is changing too, the way of doing business, the way of coping the challenges encountered as of yesterday may not be relevant for today, any institution cannot have one and only one best problem solving strategy for so long, because the fast changing world makes it ridicules through time and compel for the formulation of another timely strategy which is compatible with the prevailing change.

Advanced economies (formerly well known for their donations) in recent years have suffered a severe financial and economic crisis. Donor countries are engaged in their own internal problems rather than external problems, like helping the poor in 3rd world countries, on the other hand the former well known aid recipient countries are increasingly becoming investment destinations, some countries which were synonymous for poverty before, are now enjoying a promising growth. In light of this, MFIs operating in these countries should be catalysts for change i.e. being a role player in the countries ambition to become a middle income economy. Ethiopia is not an exception, once it was known for its famine and vicious circle poverty, in recent years the country has enjoyed a double digit economic growth certified by IMF, World Bank etc. Having this big crystal of truth, MFIs operating in Ethiopia should be catalysts in the country's ambition of alleviating extreme poverty and becoming a middle income economy.

MFIs should be sustainable and increase their outreach so that they can attain their intended target. Traditionally MFIs operating in third world economies were seen as donor reliant institutions where their sustainability and outreach is dependent upon the goodwill of donors not on their own internal resources. Such kind of parasitisim on donor's aid may create hurdles on the operation of the MFIs because the aid may halt accidentally without any prior notification.

Profitability is a means for achieving long term viability and sustainability of the micro finance sector. At the micro level, profitability is a prerequisite for individual micro finance firms to compete against the other within the industry and it is the cheapest source of capital, within which no firm would attract external capital. MFIs profits are also important source of equity for

the MFIs. Reinvestment of profits may promote financial stability. Market sources of funding are accessible only to MFIs that are capable of generating profits. By curtailing the probability of financial crisis, impressive profits are crucial in reassuring MFIs, stockholders, including investors, borrowers, suppliers and regulators interests. At the macro level, a profitable micro finance is better placed to overcome negative shocks and contribute meaningfully to the stability of overall financial system (Muriu, 2011).

Large body of research on financial institutions profitability has been undertaken in the conventional banking industry like (Flamini, et al., 2009; Garcia Herrero, et al., 2009; Marccucci and Quagliarelio, 2008), but exact empirical evidence on micro finance profitability is scant. Except study regarding their sustainability and performance, having this very truth in hand it would be interesting to study determinants of profitability of MFIs since studies in this area are not rife.

In Ethiopia too, studies concerning the determinants of micro finance profitability are rare, the primary study on the determinants of profitability of Ethiopian MFIs was conducted by Sima Gudeta in 2013, but studies regarding performance of MFIs were conducted by various scholars like, Birhanu (2007), Alemayehu (2008) and Letenah (2009). In addition, Melkamu (2012) and Yonas (2012) have tried to study the determinants of financial and operational sustainability of Ethiopian MFIs. Most of the studies conducted focused merely on internal factors and gave little or no room for external factors and most of them were not addressing particularly the concept of profitability of MFIs. This has paved the way for the timeliness of this study on the determinants of profitability of Ethiopian MFIs, which may contribute to their sustainability and outreach.

1.3 Research Objectives

1.3.1 General Objective

The main objective of this study is to assess the factors that affect MFIs profitability in Ethiopia.

1.3.2 Specific Objectives

This study on the determinants of MFIs profitability assumes the following specific objectives:-

1. To asses impact of internal factors that affect profitability of Ethiopian MFIs

2. To asses impact of external factors that affect profitability of Ethiopian MFIs

3. To asses the relationship between dependent and independent variables

4. To offer suggestions that improves the profitability of Ethiopian MFIs

1.4 Hypotheses of the Study

Basing it self on the theoretical frame works available[1] on micro finance profitability, this study formulated a total of eight hypotheses.

H_1. There is a significant relationship between breadth of outreach and profitability of MFIs

H_2. There is a significant relationship between amount of capital and profitability of MFIs

H_3. There is a significant negative relationship between qualities of portfolio and MFIs profitability

H_4. There is a significant negative relationship between operational efficiency (lower cost) and MFIs profitability.

H_5. There is a significant relationship between size and profitability of MFIs

H_6. There is a significant relationship between age and MFIs profitability

H_7. There is a significant positive relationship between real domestic product (GDP) growth and profitability of MFIs

H_8. There is a significant relationship between rate of inflation and profitability of MFIs

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[1] *The theoretical backgrounds for the formulation of the research hypotheses will be discussed in chapter 3*

1.5 Significance of the Study

Numerous studies were conducted on sustainability and performance of MFIs in Ethiopia, the number of particularly tailored studies on determinants of micro finance profitability were scant until recently considering the internal and external factors simultaneously. In light of this, the finding of the study might be beneficial to the stakeholders like donors, managers and government in that it helps them to identify what factors affect the profitability of MFIs in Ethiopia and the measures that may be taken accordingly, so that the MFIs flourish in their sustainability and outreach. Additionally, it may add some motive for future researchers to conduct a more advanced study on the up to now under studied subject matter. Finally, it may contribute additional elements to the existing literature on micro finance profitability.

1.6 Scope of the Study

The study considered only limited number of internal and external profitability determinant variables. The internal variables considered by the study includes; breadth of outreach, capital adequacy, portfolio quality, efficiency, size and age of MFIs. The external variables included were GDP and inflation. Some other determinant variables were not included in the study both from internal and external factors, from internal factors; this study took only one indicator of outreach to the poor i.e. breadth of outreach (number of active borrowers) the other key outreach indicator i.e depth of outreach (proxied by, average loan size, gross loan portfolio, percent of women borrowers) was not considered and some other internal variables as; lending methodology, type of institutions, owner ship structure were also excluded in the study. More over some other external variables as; industry cocentration, unemployment rate, interest rate were excluded in the study. The secondary data was collected for a period of 2003-2012 from a total of 12 MFIs operating in the country and registered by the NBE. The included MFIs in the sample are: ACSI, AdCSI, DECSI, OCSSCO, OMO, Bussa Gonofa, Wisdom, Wasasa, AVFS, SFPI, PEACE and Meklit. Among the 12 MFIs selected, the first five are government owned as per the order mentioned.

1.7 Limitations of the Study

Before conducting this study, the researcher was hoping to include all the 35 MFIs which are registered by NBE in 2014, but the researcher was unable to do so, for one reason some MFIs are less than ten years old, for the other, lack of financial data for consecutive ten years for some MFIs has forced the researcher to include only 12 MFIs in the study. Moreover, lack of financial data for 2013 and 2014 has compelled the researcher to confine the assessment only up to 2012; this in turn has some draw back with regard to the recentness of the study.

1.8 Structure of the Study

The study is dissected into a total of six chapters. Chapter one gives introduction for the study, Chapter two presents the literature review part, Chapter three presents research design and methodology, chapter four and chapter five respectively present the results of the study, the analysis and discussions of the results. Lastly, chapter six discusses the conclusions attained and the recommendations forwarded as per the findings detected.

CHAPTER TWO

LITERATURE REVIEW

This chapter reviews the available literatures on the determinants of micro finance profitability which can serve as an asset of prior knowledge on the subject matter. The chapter is dissected into three sections, the first section of the chapter deals with the theoretical reviews; the second section reviews the previous studies on the subject matter, the third section summarizes the reviews and points out the knowledge gap that the current research is supposed to address.

Flash point; Microfinance performance has attracted significant interest in recent years, both from policy makers and in the academia. MFIs face unique challenges because they must achieve a double bottom line—that of providing financial services to the poor (outreach) and covering their costs (sustainability). MFIs are therefore a hybrid but some are also similar to banks because they are regulated or supervised and because they mobilize deposits (Muriu, 2011).

2.1 Theoretical Reviews

2.1.1 Definition of Microfinance

In the words of Churchill and Framkiewicz, 2006; Microfinance is commonly associated with small, working capital loans that are invested in microenterprises or income-generating activities. Micro finance is a small scale financial service primarily credit and saving provided to people who farm or fish or herd; who operate small enterprises or micro-enterprises where goods are produced, recycled, repaired or sold; who provide services; who work for wage and commission; who gain income from renting out small amount of land, vehicles, draft animals, or machinery tools; and other individual and groups at the local level of developing countries both rural and urban area (Robinson, 2001). Jorgensen, 2012 also defined MFI as; an institution

that provides the microfinance services to low income clients. Some institutions also described MFI in their own way. As noted in UNCDF, 2000; Microfinance is referred to more generally as the provision of financial services to those who are denied such services from the formal financial institutions. MFIs render a variety of financial services that target low-income clients, particularly women. Since the clients of microfinance institutions have lower incomes and often have limited access to other financial services, microfinance products tend to be for smaller monetary amounts than traditional financial services. These services include loans, savings, insurance, and remittances. Micro-loans are given for a variety of purposes, frequently for micro-enterprise development, (Micro finance information exchange MIX).

As cited in Ledger wood, 1999 the variety of products and services offered reflects the fact that the financial needs of individuals, households and enterprises can be changed significantly over time, particularly for those who live in poverty. Owing to these varied needs, and because of the industry's focus on the poor, microfinance institutions often use non-traditional methodologies which are not practiced by the formal financial institutions, such as group lending or other forms of collateral. The typical users of microfinance services are; small farmers, street vendors, small, service providers (hairdressers and rickshaw drivers), artisans and small producers, such as blacksmiths and seamstresses and belong to the economically active poor population that are living close to the poverty line and are therefore self-employed, low-income entrepreneurs in both urban and rural areas .

Microfinance services may be seen in terms of four main mechanisms. 1. Loans; allowing a lump sum to be enjoyed now in exchange for a series of savings to be made in the future in the form of repayment installments. 2. Savings; allow a lump sum to be enjoyed in future in exchange for a series of savings made now. 3. Insurance; allows a lump sum to be received at some unspecified future time if needed in exchange for a series of savings made both now and in the future. Insurance also involves income pooling in order to spread risk between individuals on the assumption that not all those who contribute will necessarily receive the equivalent of their contribution. 4. Pensions; allow a lump sum to be enjoyed as a specified and generally distant date in the future in exchange for a series of savings made now (Alemayehu, 2008).

2.1.2 History of Microfinance

The history of micro credit is traced back to the early 1700s when Jonathan Swift, an Irishman, had the idea to create a banking system that would reach the poor. The Irish Loan Fund was created during then, which gave small short term loans to the poorest people who live in the teritorial confines of Ireland, and who were not being served by the formal financial institutions. The primary goal was generating wealth in Ireland's rural areas. For this idea, to catch on it took several years , but then grew quickly and expanded globally. On the verge of the 1800's, the Irish Loan Fund had over 300 banks for the poor and was serving over 20% of the Irish citizens. In the 1800s similar banking systems were also showed up all across Europe targeting the rural and urban impoverished residents.

Turning to the other corner of western Europe, Friedrich Wilhelm Raiffeisen of Germany realized that the poor farmers were being taken advantage of by loan sharks. He pointed out that under the then lending system, the poor would never be able to create wealth; they would be stuck in a cycle of borrowing and repaying without ever making personal economic development. By the year 1864 he founded the first rural credit union to break this trend. This system was different than previous banks because it was owned by its members, provided reasonable lending rates and was created to be a sustainable means of community economic empowerment.

This idea of credit unions spread globally and by the end of the 1800s, these micro credit systems had spread all the way from Ireland to the fareast countries like Indonesia. At the turn of the century similar systems were opening in Latin America. Whereas in Europe the credit unions were owned by its members, in Latin America the institutions were owned by the government or private banks and were not as efficient as they were in European countries.

At the climax of the 1950's donors and government subsidies were used to fund loans primarily for agricultural workers to motivate economic growth but these efforts were short lived. These loans were not reaching the poorest farmers who were in need of urgent financial services; they were often ending up in the hands of the farmers who were better off and didn't need the loans as critically as others. Funds were being lent out with an interest rate much below the market rate

and there were not enough funds to make this viable long term. The loans were rarely being repaid, that the banks' capital was dwindling quickly and when the subsidized funds run out, there was no more money to pump into the agricultural economy in the form of micro credit to support the impoverished small farmers.

At the midlle of the 1970s one of the biggest developments in micro finance occurred. Grameen Bank[2]in Bangladesh started off as an action based research project by a professor who conducted an experiment credit program. This nonprofit program dispersed and recovered thousands of loans in hundreds of villages in Bangladesh. Professor Mohammed yunis (novel price lauret) tried to extend this idea to other bankers in Bangladesh, but they were afraid that it was too risky as a business and turned down the offer. Grameen Bank is now one of the world's largest micro finance institutions with over 4 million lenders. In the apex of the 1990's lenders had realized how to increase loan repayment rates enough to make micro finance institutions sustainable allies to the larger poor. They targeted women as borrowers and gave them money to invest in businesses that would increase their income and charged very low interest rates so the borrowers could pay back their loans and still have residual money, i.e. create wealth, for themselves. The term micro finance was emerged to replace micro credit during then, due to the fact that the new institutions were doing more than making loans; they were offering other financial services to the poor like savings accounts, insurance and money transfers.

The first commercial MFI was founded in the Latin American nation of Bolivia in 1992. The founders of this commercial MFI were originally the founders of a nonprofit MFI in 1986 called PRODEM. PRODEM grew so rapidly that after 2 years, it had more people desiring loans than they could support. They then created BancoSol to meet the growing needs of the borrowers in Bolivia and became the first ever MFI to issue dividends. Nonprofit micro finance institutions are successful, but reach a capacity of lending when they run out of donations.

There are currently over 10,000 micro finance institutions serving 16 million people (Jennifer Lindsay, 2010).

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[2]The first bank of the poor established in 1976 by Pro. Mohammed Yunis in Bangladesh

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.

As noted in Sudaresan, 2008 the year 2005 was declared as the "Year of microfinance" and attracted even more private investors to invest their funds into microfinance sector.

In Ethiopia microfinance services were introduced after the fall of the Derg (military) regime following the policy of economic liberalization. Microfinance is taken as a shift from government and NGO-subsidized credit programs to financial services run by specialized financial institutions. With this shift some NGO and government microcredit programs were transformed to MFIs, (Degefe, 2009, p. 3). Now a day, there are 35 MFIs in Ethiopia regulated under NBE (NBE, 2015)

2.1.3 Performance Measures of Microfinance Institutions

Performance of an institution shall be measured not only from the objectives of the organization angle, but also from the industry average. Microfinance's goal is to eradicate poverty. At the early days of MFIs estabilishment , they were financed by donor funds that have a poverty eradication goal. Hence the performance of the MFI was measured on how much MFI reach to the poor (outreach) and impact; how far the lives of those who get financial services are changing as compared to those who don't get these services from the MFIs (Melkamu, 2012).

2.1.3.1 Sustainability of an MFI

As the concept of microfinance came into consideration, the debetable issue of whether donor support is necessary in the long term and the issue of sustainability of such institutions came up as well. It could be argued that the long term sustainability of MFIs is not important as long as money was given to micro entrepreneurs and a startup help was rendered. This inturn would imply that the current operational activities of the micro enterprises are more important than the long term existence of the financial institution that stood behind the startup (Sarah, 2011). As MFIs desire to reach as many poor people as possible in the long run to fulfill their goal to

fight against the worldwide poverty, it becames apparent that this outreach is only achievable on a sustainable and efficient basis. It could be assumed that sustainable MFIs are typically for-profit commercial firms, but actually this is not the case. Almost two-thirds of the sustainable MFIs are NGOs, cooperatives, public banks, or other not-for-profit organizations (Rosenberg et al., 2009). Sustainability in general means the ability of a program to continuously carry out activities and services in pursuit of the statutory objectives. Sustainability can be separeted in to two types; operational sustainability and financial sustainability.

Operational Sustainability

As mentioned in Armendáriz and Morduch, (2010, p. 243-244), Operational self-sufficiency (OSS) ratio measures the extent to which the operating revenues of MFI cover its operating cost, interest and fees paid by borrowers are the main sources of revenue for a MFI, a typical MFI can also generate income from investment and other services. OSS is calculated as a ratio of revenues to expenses as follows:

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

The cost of raising capital is taken as a finacial expense of the period under consideration. It includes the interest and fee that the institution pays to commercial banks, shareholders and other investors. (CGAP, 2003) recommended the inclusion of loan- loss provision expenses along side financial and operating expenses.

Loan-loss provision expense is the amount set aside to cover the cost of loans that the MFIs do not expect to recover. The other expense item in the denominator captures basic operating expenses including rent, staff wages and transportation cost among others. Here, the operating revenue is calculated net of subsidy i.e it is a residual, ultimate value after subsidy adjustments are made.

OSS ratio is presented as a percent. A value of 100 percent for OSS ratio indicates full operational self-sufficiency (self reliance of the MFI on its revenue sources for its operation), while a value below 100 percent depicts that the institution have to rely on continued outside funding to sustain its current level of operation. Operational sustainability is one of the major

goals which the MFIs strive to achieve so that they maintain viability and grow in their operations. Operational sustainability actually refers to the future maintainability of the MFIs operations with own revenues.

Financial Sustainability

It is necessary to take into account subsidies from soft loans and investments, to understand the broader notion sustainability. The financial self-sufficiency (FSS) ratio looks ahead of soft loans by making adjustments that price capital at its market cost. FSS is calculated as a ratio of revenues to expenses as;

$$FSS = \frac{\text{Adjusted operating revenue}}{\text{Financial expense + loan-loss provision expense + operating expense + expense Adjustments}}$$

As it is mentioned in Armendáriz and Morduch (2010), FSS takes into consideration additional adjustments to operating revenues and expenses that could well explain the model, that the MFI could cover its costs if its operations were unsubsidized and if it were funding its expansion with liabilities at market prices. Subsidy adjustments serve two purposes. initially, since institutions vary considerably in the amount of subsidy they receive, adjustments that account for subsidies allow for useful comparison across institutions. Secondly, 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. Whether an institution can expand without subsidy or not is the main question answered by FSS.

There are two types of subsidy adjustments . The first is subsidized cost-of-funds adjustment, also known as an adjustment for concessionary borrowing. It capture the difference between what an institution pays in borrowing expenses, and what it would pay if all of its borrowing liabilities were priced at the prevailing market rates. The difference is added to financial expense. The second type of subsidy adjustment takes into consideration in-kind donations, or goods and services provided to the institution at no cost or at below-market cost. If FSS is below 100 percent, that is if adjusted cost is above adjusted income, the institution is considered subsidy reliant. Generally, financial sustainability describes the ability to cover all costs on

adjusted basis and indicates the institution's ability to operate without ongoing subsidy, including soft loans and grants. Here, (UNCDF, 2009) separates FSS from OSS only by the fact of an adjusted basis. (Ledgerwood, 1999) additionally describes 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). 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. To capitalize growth, the retention of profits of microfinance operations is important (CGAP, 1998).

In order to maintain their position in the market in the long run, it is apparent that MFIs need to cover both their operational as well as their financial costs. Specifically, by covering the financial costs, they get access to the capital markets and to commercial capital which inturn, allow MFIs to increase and grow their loan portfolio and clientele outreach. As a rule MFIs can serve their poor customers best by operating sustainably, rather than by generating losses that require constant infusions of undependable subsidies from donors (Rosenberg et al., 2009).

2.1.4 Theories of profitability

Under this section the available profitability theories are discussed. Even though there is no such particularly tailored theory of profitability for MFIs, the current study also took from commercial banking related theories as some of its predecessors used to, since MFIs provide banking service to the poor.

The market power theories

This theory states that the bank performance is influenced by the market structure of the industry. Structure-conduct-performance (SCP) and the relative market power (RMP) theory are the two constituent parts of this theory. SCP approach is that the level of concentration in the banking market tends to raise profit through raising market power. Whereas, the RMP approach says; bank profitability is influenced by market share, where it is to mean that, large banks with differential products can influence prices and increase profit (Tregena, 2009).

The efficiency theory

The efficiency theory says; more efficient banks earn high profit. X-efficiency and scale-efficiency are the two distinctive approaches under this theory. X efficiency says; firms which are more efficient tend to earn high profit due to the fact that they can lower their operating cost, the scale efficiency says; larger firms can obtain high profit because of lowering their unit costs and through economies of scale. Under X-efficiency approach, firms with lower costs tend to gain larger market share which implies high concentration.

In the scale- efficiency approach economies of scale enable the large firms to acquire higher market share which helps them to get high concentration then high profit (Athanasoglou et al., 2006).

The Balanced portfolio theory

According to the balanced portfolio theory, the optimum asset balance is a function of rates of return on all assets held in the portfolio, risks associated with the ownership of each financial assets and the size of the portfolio; which requires the decision of the management. The best portfolio composition determined for each and every asset considering risk and return, by the banks management; enables the bank to maximize profit and minimize risk (Nzongang and Atemnkeng, 2006).

Risk-return trade off theory

Risk return trade off theory says; as firms increase risk through increased leverage (debt over equity), they tend to earn high profit, (Van Ommeren, 2011). On the other hand, signaling and bankruptcy cost hypotheses are opposite to the above two theories. Signaling hypothesis says that; high equity ratio (equity over debt) leads to high profit and bankruptcy cost hypothesis says that; where bank expects the bankruptcy costs will be high, they accumulate higher equity capital to shield them selves from a possible financial distress (Berger, 1995).

2.1.5 Determinants of MFIs Profitability

It is strongly believed that to reduce poverty by expanding their outreach, MFIs should be profitable. Existing literature explains profitability of a financial intermediary as the return

on assets (ROA) or the return on equity (ROE). This is measured and/or expressed as a function of internal as well external factors. Those factors which are influenced by management decisions or within the direct control of firm management are called internal factors. Such factors include firm size, capital adequacy, credit risk provisioning and efficiency in the management of operating expenses. The external determinants which cannot be directly influenced by the firm's internal management (out of the controll of the firms management) include macroeconomic and industry-specific factors which reflect the economic, legal and business frame works within which the financial institutions operate.

2.2 Empirical Literature Review

This section presents the empirical review in relation to MFIs performance and profitability. The section is dissected into three sub sections. Section 2.2.1 presents studies on the determinants of MFIs profitability. Section 2.2.2 presents studies on the area of MFIs performance and finally section 2.2.3 presents studies on the performance of MFIs in case of Ethiopia.

2.2.1 Previous studies on determinants of profitability of MFIs

Profitability of a given institution is dependent upon internal (firm specific) and external factors, as it is cited above in section 2.1.5. However, empirical literatures in relations to determinants of MFIs profitability are very limited. Prior studies conducted in the area were highly dependent up on theory of retail banking profitability, by assuming that MFIs also provide banking services to the poor. The empirical studies (available and accessable to the researcher) in connection with the determinants of MFIs profitability are presented in the following paragraphs.

Dissanayake, (2012) tried to investigate the determinants of profitability proxied by ROE for eleven MFIs operating in the Asian country of Sri-Lanka for the period covering 2005-2011. He tried to see the relationship between different internal or firm specific factors and ROE; for his study, Dissnayake used data from MIX market database and performed regression analysis. The out come showed that, debt to equity ratio and operating expense ratios have negative

statistical significance in relation with ROE. Write-off ratio and cost per borrower ratios have a positive and statistically significant relationship with ROE. The other internal variable which is the personnel productivity ratio is not statistically significant determinant of ROE. (Jordan, 2008) studied the impact of macroeconomic environment on sustainability of Latin American MFIs by selecting 85 MFIs from MIX database for the period from 1999-2005. In the study four macro-economic factors were included namely; unemployment rate, per capita GDP, interest rate and inflation. The measures used for the sustainability of the MFIs were ROE and repayment rates; for which regression analysis is done using random effect model. The out come depicted that none of the macro economic factors have significant impact on repayment rate. In contrast, ROE is highly influenced by per capita GDP. Two divisions were set to consider the impact of per capita GDP, one is low income developing nations and the other is high income developing nations. In this regard per capita GDP has no impact on low income developing nations however; there is a high significant impact of per capita GDP on high income nations. Inflation was not statistically significant, apart from other macroeconomic indicators.

The Danish scholar, Jorgensen in 2012 studied profitability in connection with yield on gross profit by taking sample of 879 MFIs all over the world. The objective was to find factors that determine profitability and to find weather high interest rates go hand in hand with high profits for MFIs. His study focused on factors such as outreach, financing structure, expense, revenue, efficiency, quality of portfolio and different peer group comparisons like age, deposit taking, legal status and profit status. The data source was MIX for the 879 MFIs for the study year i.e. 2009 and ROA and profit margin were used as the proxies for profitability and gross yield portfolio respectively. The finding of the study depicted that number of active borrowers, cost per borrower, deposit and legal status have negative significant relation with ROA. The factors having positive and significant impact on ROA includes gross loan portfolio, capital to asset ratio, gross loan portfolio to asset, operating expense to gross loan portfolio and age of new MFI. In conclusion Jorgensen put; yield on gross portfolio did not show a significant explanatory variable for profitability, hence, there is no general trend between increase in profitability and increase in interest rate.

The preemitive empirical study on the determinants of profitability of African MFIs is done by Muriu of Birmingham University in England in 2011. Muriu, under the study entitled ‘what

explains the low profitability of MFIs in Africa' tried to find the factors contributing to profitability of MFIs. Muriu used Generalized Method of Moments (GMM) system using an unbalanced panel dataset comprising of 210 MFIs across 32 countries operating from 1997 to 2008. The proxies for profitability were both ROA and ROE. The factors studied are classified into three categories: Firstly, MFIs specific including capital, credit risk, size, age efficiency and gearing ratio; secondly, macroeconomic factors including Gross national Income (GNI) per capita and inflation; thirdly, freedom from corruption was used as a proxy for institutional developments.

The data for the study were gathered from MIX database, world development indicator and Heritage foundation for the three categories of determinants. In concluding his study Muriu stated that; capital, size (scale of economy) and freedom from corruption had significant positive relationship with profitability. Factors such as credit risk and efficiency have significant negative relation with profitability. As the study also revealed; Gearing ratio, inflation, GNI per capita and age were insignificant factors among others.

2.2.2 Studies on MFIs Performance

For the fulfilment of the long term objectives of the MFIs i.e poverty reduction, studies in relation to performance measure are done, by drawing different policy conclusions and helping the institutions to make the right move to achieve their goals. To mention some of the studies; (Michael and Gerard, 2004) compared financial performance of MFIs with commercial banks, they used 57 self-sufficient MFIs and banks from Africa, Asia, Europe and Latin America. Their study focused mainly in measuring efficiency, profitability and leverage of both the institutions and finally to compare the two. The finding shows that self-sufficient MFIs are strong performers' interms of ROA and ROE compared to their commercial peers. Their ultimate conclusion was that; majority of MFIs are very weak and in need of continued out side funding for their operations.

In their study of financial performance and outreach of MFIs, Cull et al. (2007), sought to address three things. Does raising interest rates exacerbate agency problems as detected by lower repayment rates and less profitability? Is there evidence of a trade-off between the

depth of outreach to the poor and the pursuit of profitability? Has mission drift occurred (have micro banks moved away from serving their poorer clients in pursuit of commercial viability?). Taking a high quality survey of 124 MFIs from 49 countries, the study found answers to the questions depending on an institution's lending method. For example, the study found that individual-based lenders that charge higher interest rates are more profitable than others but only up to a point. Beyond threshold interest rates, profitability tends to be lower. In contrast, for solidarity group lenders, throughout most of their sample range, they found that financial performance tends not to improve as yields increase.

While turning to trade-offs between outreach to the poor and profitability, the simple relationship between average loan size and profitability is insignificant in the base regressions. Controlling for other relevant factors, institutions that make smaller loans are not necessarily less profitable, but it was found that larger loan sizes are associated with lower average costs for both individual-based lenders and solidarity group lenders. And financially self-sustaining individual-based lenders tend to have smaller average loan size and lend more to women, implying that pursuit of profit and outreach to the poor can go side by side. However there are countervailing influences: larger individual-based and group-based lenders tend to extend larger loans and lend less frequently to women. Older individual-based lenders also do worse on outreach measures than younger ones, while this is not evidence of mission drift (shifting to another objective) in the strict sense. The results for larger and older micro banks are consistent with the idea that clients who can absorb larger loans get the increasing focus of the institutions as the institutions mature and grow.

Generally, the outcome suggested that institutional design and orientation matters importantly in considering trade-offs in microfinance. These trades-offs can be stark: village banks, which focus on the poorest borrowers, face the highest average costs and the highest subsidy levels. Taking a more consideration; even if, individual-based lenders do least on indicators of outreach to the very poor, they earn the highest average profits.

By the year, 2007 Coleman tried to see the impact of capital structure on performance of MFIs in the west African nation of Ghana. Coleman used ten years data (1995-2004) using fixed and random effect regression analysis for 52 MFIs. The source of data was the financial statements of the selected institutions for the study. The study concluded that; most of the MFIs employ high

leverage and finance their operations with long-term as against short-term debt. And Also, highly leveraged MFIs perform better by reaching out to more clientele, enjoy scale economies, and therefore are better able to deal with moral hazard and adverse selection, promoting their ability to deal with risk. In 2009; Cull et al.,studied the impact of regulatory supervision on profitability and outreach of MFIs, where they examined using 346 MFIs from 67 developing countries. The study found that regular onsite supervision is positively associated with average loan size and negatively associated with the share of lending to women; there is no significant relationship between supervision and profitability in treatment. The pattern of the aquired results is compatible with the idea that profit-oriented MFIs that have to comply with prudential supervision respond by minimizing their outreach to segments of the population that are more costly to render micro finance services. In contrast, MFIs that rely on noncommercial sources of funding (e.g., donations), and thus are less profit-oriented, do not adjust loan sizes or lend less to women when supervised, but their profitability is significantly diminished.

The study of Ayayi in 2009; took emphasis on whether debt or equity has good implication on profitability and social welfare for MFIs. The results found in the study showed that, equity contract generate more social welfare and profit than debt contract. By becoming a stakeholder in the micro-venture rather than a lender, the MFI is in a more tightly coupled relationship, providing knowledge and guidance necessary for ensuring success of the venture. An MFI providing micro-equity receives equity in the micro-business in return for its investment; the return is entirely dependent on the success of the micro venture, whereas an MFI providing a loan gets paid first regardless of the profit conditions encountered. The detected results also showed that microcredit financing places a heavy cash drain on micro-enterprises because the coupon is a precious resource needed to nurture and sustain the growth of micro-enterprises to propel them to the next developmental stage.

2.2.3 Studies on Performance of MFIs in Ethiopia

In Ethiopia most of the research work is conducted in a fragmented manner, there is no integrated way of doing similar researches, which in turn leads to double effort, unnecessary cost

and most of the research works are simply 'lions on the shelf' rather than being an asset for policy makers. But recently an initiative has been started to coordinate the fragmented individual efforts. In this regard, Jimma University has started in 2014 a new research mechanism (but not yet fully implemented) which integrates staffs and prospective graduates under a broad researchable topic and the outcome will be the result of a coordinated effort of the staffs and the students, this in turn will reduce wastage, plagiarism, cost, time and there will be an experience sharing among the students and the staffs (instructors) and above all, the students realize that researches are conducted not only as a partial fulfillment to get their desired degree but researches are social greases that ease the problem of a society and a country as whole.

Different researches have been so far conducted by different scholars on the subject of micro finance. To initiate from the recent studies; Sima Gudeta (2013) under his study entitled; determinants of profitability, an empirical study on Ethiopian MFIs examined internal and external factors affecting profitability of Ethiopian MFIs for a total of 13 MFIs for the period of 2003-2010. The regression result using fixed effect model showed up, operational efficiency and portfolio quality have a negative statistically significant effect on profitability while age of MFIs has a positive statistically significant effect, whereas capital adequacy, size and the only macroeconomic variable used in the study i.e. GDP were found to be statistically insignificant variables.

Yonas' s study in 2012 focused on determinants of financial sustainability of Ethiopian MFIs, using 6 year data for 12 MFIs from AEMFI. In his study, Yonas concluded three things. Firstly, a high quality credit portfolio, coupled with the application of sufficiently high interest rates that allow a reasonable profit and sound management are instrumental to the MFIs financial sustainability. Secondly, the percentage of women among the clientele has a statistically insignificant negative effect on financial sustainability of MFIs and finally, on attainment of financial sustainability, client out reach of micro finance program and the age of MFIs have a positive but lesser impact.

In his study on determinants of operational and financial self –sufficiency of Ethiopian MFIs in, 2012; Melkamu used 6 years data of 12 MFIs from MIX data base where he used two multiple regression analysis for OSS and FSS independently. The outcome of the study showed that average loan per borrower, size of MFIs, cost per borrower and yield on gross loan

portfolio affect the operational self sufficiency of the institutions in a significant manner. Additionally, cost per borrower, number of active borrowers and yield on GLP are found to be determinants of financial self-sufficiency with a significant effect. Generally, the following conclusions are attained from the study: Ethiopian MFIs are operationally self- sufficient but, they are not financially self- sufficient; Ethiopian MFIs are young in terms of duration of time (but benchmark used is not cited), the average loan size of Ethiopian MFIs is small compared to other MFIs in Africa, Ethiopian MFIs are efficient in cost management; this is compatible with the findings of Letenah in 2009 and finally, in terms of asset size Ethiopian MFIs are big enough relative to African peer groups. The tests of classical linear regression model are performed in the study and all the variables met the assumptions of CLRM; but in the comparisons made with African countries, the benchmarks used for comparison were not enumerated.

By the year 2009, Letenah took data of 16 MFIs from MIX data base where he looked into their performance and compared against micro banking bulletins benchmark. This study was the first of its kind that compared performance of Ethiopian MFIs towards international benchmarks. Letenah used one sample t test, one way ANOVA with Scheffe Post Hoc Comparison tests, Kruskal-Wallis test and Pearson correlation coefficients. The outcome of the study showed that; Ethiopian MFIs are poor performers on depth of outreach; hence, they are not reaching the poorest of the poor. However, they are good at breadth of outreach. The study also concluded that the MFIs are poor in terms of gross loan portfolio (GLP) to asset, allocating a lower proportion of their total asset into their loan portfolio. The outcome is in contrary to the findings of Alemayehu in 2008. Large and small MFIs allocate more loan loss provision expense than industry average and also portfolio at risk is high for these MFIs. Ethiopian MFIs are good in cost management, efficiency and productivity. The MFIs charge lower interest rate compared to the benchmarks used in the study. The results also depicted that, profitability is dependent on size of institutions. There is a tradeoff between serving the poor and operational self-sufficiency; in contrary to the findings of Birhanu in 2007. Age of the institutions is positively correlated with efficiency, productivity, debt financing and operational self-sufficiency. And finally, the use of debt financing makes the institutions more efficient and enables them to increase productivity.

By the year, 2008; Alemayehu studied the performance of six MFIs in Ethiopia representing two institutions from the available three categories, (large, medium and small MFIs). The aim of the study was to look the performance of the institutions from profitability and sustainability, asset and liability management and from efficiency and profitability angles, using five years data (2002-2006). The outcome of his study revealed that Ethiopian MFIs have achieved positive ROA and ROE based on operational and financial self- sufficiency. Additionally, more of the institutions assets (75%) are allocated in making loans, the average cost of financing is 4.5% which is below commercial interest rate (7%) and their liquidity position is almost 50%. And Finally, even though cost per borrower is 99.9 birr, the personnel and administrative cost is 10 cents per 1 birr loan, the study again evidenced that Ethiopian MFIs are on promising stage even though their portfolio quality is not considered in the study.

In his study on outreach and financial performance analysis of MFIs in 2007; Birhanu, found that outreach of Ethiopian MFIs is increasing from 2003 up to 2007 on average by 22.9%. Birhanu also concluded that the institutions financial sustainability is improving from time to time as measured in terms of ROA and ROE. Additionally, his study revealed that there is no tradeoff between outreach and financial sustainability of Ethiopian MFIs. He also noted that the credit access of women is still limited (34%) and also default rate of some not all MFIs is increasing steadily so care should be taken. Finally, he concluded that Ethiopian MFIs are increasingly becoming profitable.

2.3 Conclusions and Knowledge Gap Emerged from Empirical analysis

After one reviewed all the above literatures regarding micro finance profitability studies he/she will find a vacuum in between. To have a quick bird's eye view of the literatures, starting from abroad, Muriu of Birmingham University in England developed a model based on the retail banking theories since there are no developed theories for the MFIs profitability, in this regard the works of Jorgenson (2012) and Dissanayake (2012) could be cited too. These studies were conducted abroad and they were not particularly tailored to an Ethiopian case.

While turning to the studies that took place in Ethiopia and when we start from the relative recent studies, Sima (2013) used only limited number of internal variables leaving some key

determinants of profitability like number of active borrowers and some other macroeconomic variables like inflation etc. Looking into the study of Yonas in 2012; he used only six years data (which is too small) to assess the determinants of financial sustainability of MFIs. Melkamu's (2012) study was concerning determinants of operational and financial self-sufficiency of Ethiopian MFIs. His ultimate conclusion was Ethiopian MFIs are performing well compared to their African counterparts but he hasn't cited the benchmark used. To have some say on the study of Letenah, he made a comparative study on the performance of Ethiopian MFIs with the micro bulletin benchmarks and accordingly, he found Ethiopian MFIs to be poor performers. While Alemayehu's 2008, study looked at asset, liability, efficiency and productivity and used only internal factors leaving no place for external factors in assessing the performance of MFIs, and Birhanu's 2007 study, used some internal factors to assess the performance of MFIs but kept muted on the determinants of MFIs profitability.

To sum up; in some of the studies, inconsistency is witnessed in the results found; only internal determinant factors are taken into account, most of the studies kept silent on external factors like inflation etc. Again some studies took only narrow observation which can contribute to the variance of the results detected. Operational self- sufficiency or financial self-sufficiency were used as a proxy to assess performance of MFIs and they kept muted on profitability parameters like ROA and ROE, most of the studies came short of giving emphasis in black and white about the importance of being profitable in order to be sustainable MFI and increase in outreach.

Having all this facts, the current study may have something to minimize the vacuum or the knowledge gap available in micro finance profitability studies in Ethiopia. Especially this study tries to incorporate external factors like inflation (now a days the challenge of developing economies) in the assessment of micro finance profitability in addition to the internal factors and this will add some value to the recent need of having this study. To the best of the researcher's knowledge there is no prior studies on the determinants of MFIs profitability which took GDP and inflation simultaneously as external micro finance profitability determining factors in Ethiopia.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This study aimed to examine the determinants of profitability of Ethiopian MFIs. Accordingly this chapter discusses the research procedure that was used to carry out the study. In case it presents respectively, research design and approach, nature of data and instruments of data collection, sampling design, data analysis and presentation, determinant selection and hypotheses, conceptual frame work of the study and finally model specification.

3.1 Research Design and Approach

Research design is a master plan specifying the methods and procedures for collecting and analyzing the required data. The choice of research design depends on objectives that the researchers want to achieve (John, 2007). Since this study was designed to examine the relationships between profitability of MFIs and its determinants, a logical reasoning either deductive or inductive is required. Deductive reasoning starts from laws or principles and generalizes to particular instance whereas inductive reasoning starts from observed data and develops a generalization from facts to theory. Besides, deductive reasoning is applicable for quantitative research whereas inductive reasoning is for qualitative research. Thus, due to quantitative nature of data, the researcher used deductive reasoning to examine the cause and effect relationships between profitability and its potential determinants.

As noted in Kothari (2004), explanatory research design examines the cause and effect relationships between dependent and independent variables Therefore, since this study examined the cause and effect relationships between profitability and its potential determinants, it is an explanatory research.

The objective to be achieved in the study is a base for determining the research approach for the study. In case, if the problem identified is factors affecting the outcome having numeric value, it

is quantitative approach (Creswell, 2003). Therefore, the researcher employed quantitative research approach to see the regression result analysis with respective empirical literatures on the determinants of MFIs profitability. Thus, the researcher used panel data for the period of 2003-2012.

3.2 Nature of Data and Instruments of Data Collection

This study used panel data. The researcher preferred to use panel data since panel data can take heterogeneity among different units into account over time by allowing for individual-specific variables. Besides, by combining time series and cross-section observations, it gives more informative data. Furthermore, panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data (Gujarati, 2004).

Accordingly, the researcher used secondary sources of data that is panel in nature. A secondary source of data was preferred by the researcher since it is less expensive in terms of time and money while collecting. And also, it affords an opportunity to collect high quality data (Saunders et al. 2007; cited in Belay, 2012.) Secondary data may either be published or unpublished data (Kothari, 2004). Accordingly, secondary data was obtained from AEMFIs published bulletins for each corresponding year, for the MFI specific variables and from annual report held by NBE for the macroeconomic variables

3.3 Sampling Design

Sample design deals with sample frame, sample size and sampling technique. Sampling is a technique of selecting a suitable sample for the purpose of determining parameters of the whole population. Population is the list of elements from which the sample may be drawn (John, 2007). A sample is drawn to overcome the constraints of covering the entire population with the intent of generalizing the findings to the entire population.

As noted by Kothari (2004), good sample design must be viable in the context of time and funds available for the research study. Besides, judgmental sampling offers the researcher to deliberately select items for the sample concerning the choice of items as supreme based on the

selection criteria set by the researcher. Accordingly, this study employed purposive sampling technique to select the required sample of MFIs from the 35 MFIs registered by NBE. Since it is viable in line with time and funds available for this study, the selection criteria settled for the study was first, the MFI has to operate at least for the last ten years under consideration, second, only those MFIs with an available financial performance data for the last consecutive 10 years considered by the study.

Accordingly, for this study data was collected from 12 MFIs operating in the country. The selected MFIs are; ACSI, AdCSI, DECSI, OCSSCO, OMO, Bussa Gonofa, Wisdom, Wasasa, AVFS, SFPI, PEACE and Meklit. Among the 12 MFIs selected the first five are government owned as per the order mentioned.

Even if the researcher's initial target was to incorporate all the MFIs under operation before conducting this study, which the researcher was unable to do so while conducting the study owing to the selection criteria settled in advance, it is believed that the sample size is sufficient to infer about the population since 35% of the population is included in the sample.

3.4 Data Analysis and Presentation Techniques

As noted by Kothari (2004), data has to be analyzed in line with the purpose of the research plan after data collection. Accordingly, secondary data collected from AEMFIs and NBE was analyzed to determine its suitability, reliability, adequacy and accuracy. Thus, this study utilized both descriptive and econometric analysis based on a panel data from 2003-2012 to examine the relationship between profitability of MFIs and its potential determinants.

The data collected from different sources were coded, checked and entered in to MS- Excel program to make the data ready for analysis. Then the collected data was processed and analyzed through E-views version 7 software packages.

Various diagnostic tests such as, Heteroskedasticity, autocorrelation, normality and multicolinearity were conducted to decide whether the model used in the study is appropriate and fulfill the assumption of classical linear regression model. Results of the descriptive statistics such as mean, standard deviation, minimum and maximum values were reported to describe the

characteristics of variables under investigation. Thus, in order to examine the possible degree of Multicolinearity among variables, a correlation matrix was used.

To this end, the researcher used fixed effect regression model analysis to examine the effect of each explanatory variable on the profitability of Ethiopian MFIs. Thus, regression results were presented in a tabular form with the appropriate test statistics and then an explanation of each parameter was given in line with the evidence in the literature.

3.5 Determinant Selection and Hypotheses

Based on the formulated objective of this particular research in chapter one, i.e. identifying factors that could have impact on the profitability of MFIs in Ethiopia, this study formulated around 8 hypothesises for the purpose of investigation of the relationship between the dependent and independent variables.

3.5.1 Dependent variable

MFI performance studies rely on accounting and profit or cost efficiency indicators based on the efficiency and productivity analysis (Muriu, 2011). The current study also uses accounting-based profitability indicators. The dependent variable is Return on Assets which is a measure of ex-post MFI profits.

ROA reflects the ability of a MFI management to generate profit from a MFI asset, although it may be biased due to off balance-sheet activities. It can however be argued that such activities may be negligible in MFIs (Muriu, 2011). While the risk associated with leverage is likely to be substantial. This is despite the institutional innovations that MFIs embrace in order to compensate for informational asymmetries. ROE captures the return on shareholders' equity.

Since an analysis of ROE disregards the risks associated with high leverage and financial leverage is often determined by regulation, ROA emerges as the key ratio for the evaluation of MFI profitability. Moreover, ROA is more appropriate since MFIs equity in developing countries is abnormally low (Lafourcade, et al., 2006 as cited in Muriu, 2011) and ROA is a more comprehensive measure of profitability. It is also widely used in the literature, which allows

comparison with previous studies. Debt/equity levels also differ considerably between MFIs. Having this crystallized truth in hand, the current study also selected ROA over ROE as a dependent variable for the measurement of profitability of Ethiopian MFIs.

ROA is measured as adjusted net operating income, net of tax dividend by adjusted average total assets (AEMFI Bulletin 10, p. 63)

3.5.2 Independent variables

Since profitability is believed to be affected by internal and external factors as in the studies of (Muriu, 2011 and Jorgensen, 2012) this study also dissects independent variables into firm specific (internal) and macroeconomic (external factors). Firm specific factors are those controllable by the internal managerial organ of the firm and those of macroeconomic variables are out of their control that is why they have been called external.

Additionally, this subsection presents hypotheses by proposing the expected sign of the coefficients, as per the academic literature available and accessible to the researcher. Note that some relationships between selected independent variables and profitability are rather straightforward. Nevertheless, the presence of irrelevant variables does not lead to biased coefficients or standard deviations while the absence of relevant variables does. Hence, some variables that look rather predictable at first sight are included to prevent biased results.

Internal variables

As it was cited in the literature review in chapter two most theories of profitability are fetched from the retail banking industry. Theories related to micro finance profitability are rare so that the theories that are formulated to the retail banking industry are in planted to MFIs presuming that they are also workable to MFIs.

MFIs specific factors included in the study were, breadth of outreach, financing structure, portfolio quality, operational efficiency, size and age.

- Note that the variables are selected by using some key drivers of profitability like financing structures, efficiency, risk and liquidity, size and age (learning effect)

Breadth of outreach

The breadth of outreach refers to the number of poor served by a micro finance institution (Hishigsurem, 2004). Various studies have used the number of active borrowers as a measure of micro finance breadth of outreach (Ganka, 2010, Mersland and strom, 2009, Harmset et. al. 2008). It is generally assumed that the larger the number of borrowers the better the outreach. Therefore this study measured breadth of outreach using market share of number of active borrowers similar to the aforementioned studies.

As MFI increase its breadth of outreach (number of active borrowers) its profitability increases too, but up to a certain threshold limit, after that point the management of the MFI fails to implement sound credit management (it would be above the capacity of management to serve the increasing number of borrowers properly), therefore the expected sign of breadth of outreach is indeterminate. Accordingly the formulated hypothesis is:

H_1: There is a significant relationship between breadth of outreach and profitability of MFIs.

Financing structure

The study used this variable to measure how much of the MFIs assets are funded with owners fund (inverse to leverage ratio). The ratio selected to measure the capital structure of MFIs is capital to asset ratio measured as adjusted total equity divided by adjusted total assets (AEMFI). The risk return trade off assumes high leverage (more debt financing) do have higher return whereas signaling and bankruptcy hypothesis says high equity ratio leads to high profitability due to signaling effect and lower financial distress. Considering the above literatures simultaneously leaves the expected sign of capital adequacy indeterminate for this study. Therefore, the formulated hypothesis accordingly is:

H_2. There is a significant relationship between amount of capital and profitability of MFIs.

Portfolio quality

It is vivid that as the asset quality increases profitability increases since they are directly related; that is poor credit quality has negative effect on profitability and vice versa (Ayayi and Sene, 2010). This relationship exists because an increase in the doubtful assets, which do not accrue income, requires the financial institutions to allocate a significant portion of their gross margin to provisions to cover expected credit losses; thus, profitability will be lower. This was in line with the theory that increased exposure to credit risk is normally associated with decreased firm profitability. To capture the quality of portfolio for MFIs the study used portfolio at risk past due 30 days (PAR>30). As it was used in Muriu (2011); hence the expected sign of portfolio quality is determinate and accordingly the formulated hypothesis is:

H_3. There is a significant negative relationship between quality of portfolio and MFIs profitability.

Operating efficiency

Efficiency in expense management should ensure a more effective use of MFIs loan able resources, which may enhance profitability. Higher ratios of operating expenses to gross loan portfolio imply a less efficient management. Empirical evidence points to the fact that providing microfinance is a costly business perhaps due to high transaction and information costs (Hermes and Lensink, 2007; Gonzalez, 2007 as cited in Muriu, 2011). Because the administrative costs per dollar lent are much higher for small loans than for large ones; to maintain the same level of profitability, the interest rates necessary to cover all costs including costs of funds and loan losses are much higher for MFI loans than for conventional bank loans (Cull et al. 2007). A well-managed MFI that applies best practices can effectively control its operating expenses. X-efficiency theory also states that the more efficient firms will generate higher profit. This is in line with Muriu (2011) and Dissanayake (2012). Operating efficiency is proxied by operating expense ratio which is adjusted operating expense divided by adjusted average gross loan portfolio (AEMFI). Therefore, the expected sign of operating efficiency is determinate so that the formulated hypothesis as per the literatures available is:

H_4. There is a significant negative relationship between operational efficiency and MFIs profitability

Size

This variable is included to capture the economies or diseconomies of scale. There is consensus in academic literature that economies of scale and synergies arise up to a certain level of size. Beyond that level, financial organizations become too complex to manage and diseconomies of scale arise. The effect of size could therefore be nonlinear (Amdemikael, 2012). Natural logarithm of total asset of MFIs was used as a proxy of size. The study observed that since the dependent variable in the model (ROA) can be deflated by total assets it would be appropriate to log total assets before including it in the model. Since the expected sign of the effect of size on profitability is indeterminate as per the literatures available the formulated hypothesis is:

H_5. There is a significant relationship between size and profitability of MFIs.

Age

Age is another variable that influences profitability as per the theoretical literatures available. There has been an enormous progress in the existence of MFIs and client outreach. As more and more MFIs start up, it is also interesting to investigate whether only the mature MFIs have found their way to profitability, or whether the new MFIs entering the industry has different set of goals and operational set of skills leading to profitability, (Jorgensen 2012). Age is denoted by the number of years MFI has been in operation in order to capture learning effect in MFI performance (AEMFI). As per the literatures available the expected sign of age is indeterminate. Therefore, the stated hypothesis is:

H_6. There is a significant relationship between age and MFIs profitability.

Macroeconomic (external) variables

The macroeconomic variables are external for the MFIs managers and uncontrollable. This study used real GDP and inflation as a proxy for the external macroeconomic environment.

Real GDP

GDP, Arguably this is the most informative single indicator of progress in economic development. Poor economic conditions can worsen the quality of the loan portfolio, thereby reducing profitability. In contrast, an improvement in economic conditions has positive effect on the profitability of MFIs, (Muriu, 2011). The expected sign of GDP is determinate so that the formulated hypothesis is:

H_7. There is a significant positive relationship between real gross domestic product (GDP) growth and profitability of MFIs.

Inflation

Inflation is a galloping rise in price. Inflation has a significant negative impact, Athanasoglou, et al. (2008), find inflation and cyclical output to affect the performance of the banking sector negatively. Pasiourasa and kosmidou (2007) find inflation to be positively related to domestic banks, implying that during the period of their study the levels of inflation were anticipated by domestic banks. This gave the banks the opportunity to adjust the interest rates accordingly and consequently earn higher profits. With regard to foreign banks, inflation triggered a higher increase in costs than revenues as the negative relationship between inflation and foreign banks profits shows. These mixed results can be attributed to different levels of country-specific macroeconomic conditions and expectations concerning inflation rate between domestic and foreign banks. As per the above literatures, expected sign of the effect of inflation on profitability is indeterminate, accordingly the formulated hypothesis is:

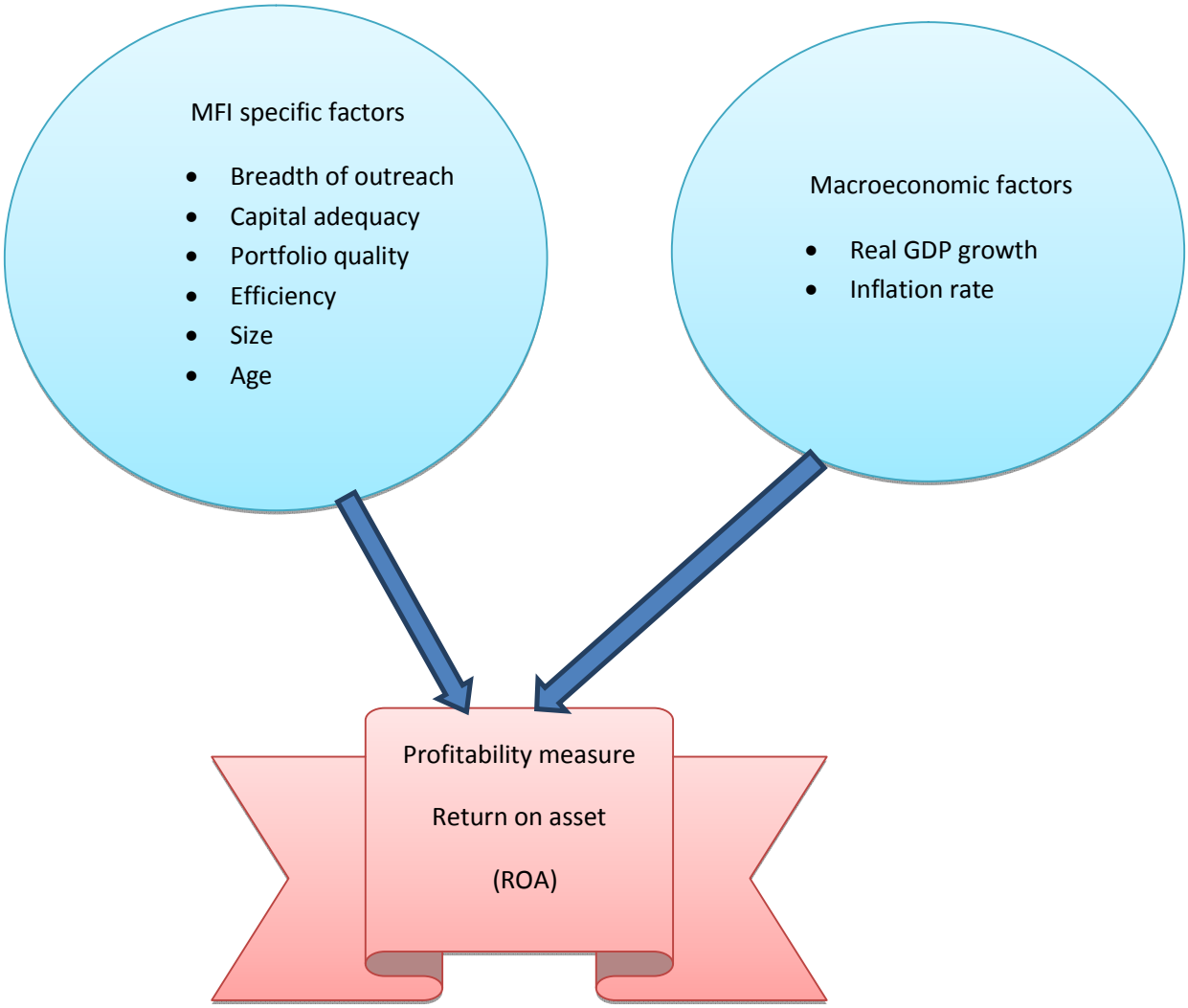
H_8. There is a significant relationship between inflation and MFI profitability

- Note that the accepted level of significance for the explanatory variables in this study is only $\leq 5\%$.

3.6 Conceptual Framework

As it was discussed so far, profitability is affected by both MFIs specific and macroeconomic factors; accordingly the following conceptual model is framed to summarize the main focus and scope of this study in terms of variables included.

Fig 3.1 Conceptual frame work of the study



Source: Self extracted

3.7 Variables and Measurements

The following table summarizes the variables used in the study, their measurement and expected sign along with some empirical evidence thereof.

Table 3.1 Summary of variables and measurement

Variable	Measurement	Notation	Expected sign	Some empirical evidence
Dependent variable				
Profitability	Adjusted operating income, net of tax/adjusted average total assets	ROA		
Independent variables				
MFI-specific variables				
Breadth of outreach	Market share of active borrowers	NAB	Indeterminate	Jorgensen, (2012) Crabb, (2008)
Financing structure	Adjusted total equity/ adjusted total assets	CAR	Indeterminate	Jorgensen, (2012) Muriu, (2011) Ayayi, (2009)
Quality of portfolio	Outstanding balance, loans overdue> 30 Days/ Adjusted Gross Loan Portfolio		Negative	Sima, (2013) Dissanayake,(2012) Muriu, (2011)
Operational efficiency	Adjusted operating expenses/adjusted	EFF	Negative	Sima, (2013) Dissanayake,(2012)

	average gross loan portfolio			Muriu, (2011)
Size	Natural log of total assets	SIZE	Indeterminate	Melkamu, (2012) Muriu, (2011) Letenah, (2009)
Age	Number of years of operation	AGE	Indeterminate	Sima, (2013) Yonas, (2012)
Macroeconomic factors				
Economic growth	Real GDP growth (in %)	GDP	Positive	Sima, (2013) Muriu, (2011) Jordan(2008)
Inflation	Annual inflation rate	INF	Indeterminate	Muriu, (2011) Athanasoglou, (2008) Kosmidon, (2007)

Source: Sima (2013), Jorgensen (2012), Melkamu (2012), Dissanayake (2012), Muriu (2011), Letenah (2009), Ayayi (2009), Jordan (2008), Athanasoglou (2008), Crab (2008), Kosmidon (2007) and other literatures used as a reference for this study.

3.8 Model Specification

To investigate the effect of MFI-specific and macroeconomic determinants of MFIs profitability, the following general multivariate regression equation was used as a base equation similar to Muriu of Birmingham University (2011).

$$\Pi_{it} = \beta o + \Sigma^{J}_{j=1} \beta_j X^{j}_{it} + \Sigma^{M}_{m=1} \beta_m X^{m}_{it} + \varepsilon_{it}\,;\ \varepsilon = V_i + \mu_{it}$$

Where πit is the profitability of MFI i at time t, with i=1… N, t=1… T, βo is a constant term; Xit is the explanatory variables and εit the disturbance, with vi the unobserved MFIs-specific effect and μit the idiosyncratic error.

This is a one-way error component regression model, where $vi \sim$ IIN $(0,\sigma v2)$ and independent of $\mu it \sim$ IIN $(0,\sigma v2)$. The Xit's are grouped into MFIs-specific X^{j}_{it} and macroeconomic variables X^{m}_{it}.

Accordingly, the researcher manipulated the above general multivariate regression equation to suit the study in hand, therefore the modified regression equation for this study is:

$$ROA_{it} = B_O + B_1 NAB_{it} + B_2 CAR_{it} + B_3 PAR_{it} + B_4 EFF_{it} + B_5 SIZE_{it} + B_6 AGE_{it} + B_7 GDP_{it} + B_8 INF_{it} + E_{it}$$

Where;

ROA_{it} =Return on asset for MFI i at time t (profitability)

NAB_{it} = Market share of active borrowers for MFI i at time t (Breadth of outreach)

CAR_{it} =Capital adequacy ratio for MFI i at time t (capital strength)

PAR_{it} =portfolio quality of MFI i at time t (portfolio quality)

EFF_{it} =Operating efficiency for MFI i at time t (operational efficiency)

$SIZE_{it}$ =the natural logarithm (ln) of total asset for MFI i at time t (size)

AGE_{it} =Age of MFI i at time t (age)

GDP_{it} =Real GDP growth for MFI i at time t (GDP)

$INFL_{it}$ =Inflation rate for MFI i at time t (inflation)

E_{it} = *the error term*

CHAPTER FOUR

RESULTS

In the previous chapter a detail insight was given concerning the research methodology followed in this study, this chapter presents the results of documentary reviews and the different tests made to ascertain the fulfillment of classical linear regression model assumptions

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4.1 Documentary Analysis

The objective of this study was to identify internal and external determinants of profitability of MFIs in Ethiopia. The secondary data was collected from performance analysis report published by AEMFIs for the internal factors and from annual report held by NBE for the external factors. The following section presents, the results for the tests of classical linear regression model assumptions, the descriptive statistics, the correlation analysis between the dependent and independent variables and the outcomes of the panel data regression analysis respectively.

4.1.1. Test results for the classical linear regression model assumptions

Test for Heteroskedasticity

In the classical linear regression model, one of the basic assumptions is homoscedasticity assumption that states as 'the probability distribution of the disturbance term remains same for all observations'. That is the variance of each u_i is the same for all values of the explanatory variable. However, if the disturbance terms do not have the same variance, this condition of non-constant variance or non-homogeneity of variance is known as heteroskedasticity (Bedru and Seid, 2005).

In this study as it is shown in table 4.1, both the F-statistic and Chi- square version of the test statistic gave the same conclusion that there is no evidence for the presence of hetroskedasticity, since the p- values are in excess of 0.05.

Table 4.1 Hetroskedasticity test: White

F-statistic	0.631250	Prob. F(44,75)	0.9498
Obs* R-squared	32.43005	Prob. Chi-square(44)	0.9013
Scaled explained SS	66.09700	Prob. Chi-square(44)	0.0172

Source: AEMFI, NBE and own computation via E-views 7

Test for autocorrelation

To identify determinants of Ethiopian micro finance profitability 120(10*12) observations were used in the model. The researcher tested the autocorrelation assumptions that imply zero covariance of error terms. That means errors associated with one observation are uncorrelated with the errors of any other observation. As noted in Gujarati (2004), the best renowned test for detecting serial correlation is the Durbin Watson test. Accordingly as it is shown in table 4.2 the Durbin Watson test statistic value for this study was 1.57, that it is clearly between the DL and DU which is 1.358 and 1.715 respectively hence there is no evidence for the presence of autocorrelation.

Table 4.2 Autocorrelation test: Durbin Watson

Variables	DW test statistics result
All specific and macroeconomic factors	1.57

Source: AEMFI, NBE and own competition via E-views 7

Test for normality

One assumption of classical linear regression model (CLRM) is the normal distribution of the residual part of the model. As noted by Gujarati (2004), OLS estimators are BLUE regardless of whether the u_i are normally distributed or not. If the disturbances u_i are independently and identically distributed with zero mean and constant variance and if the explanatory variables are constant in repeated samples, the OLS coefficient estimators are asymptotically normally distributed with means equal to the corresponding β's.

Additionally, as per the central limit theorem, if the disturbances are not normally distributed, the OLS estimators are still normally distributed approximately if there are large-sample data. Thus, since the sample size for this study is large enough, it is approximately considered as normally distributed. This implies that residuals are asymptotically normal in this study.

Test for multicolinearity

The term Multicolinearity indicates the existence of exact linear association among some or all explanatory variables in the regression model. When independent variables are multi collinear, there is overlapping or sharing of predictive power. Thus, if multicolinearity is perfect, the regression coefficients of the independent variables are undetermined and their standard errors are immeasurable (Gujarati, 2004). The multicolinearity makes significant variables insignificant by increasing p-value since increased p-value lowers the t-statistics value. Thus, the panel regression results with multicolinearity will show significant variables as insignificant variables. The multicolinearity problem is solved by dropping highly correlated variables (Ahmad and Bashir, 2013) then the result provide more significant variables than before. This is due to the fact that when explanatory variables are highly correlated with one another, they share the same information. Thus, the multicolinearity problem reduces the individual explanatory variable's predictive power. That is none of the predictor variables may contribute uniquely and to the prediction model after the other independent variable is included (Theodros, 2011).

As noted by Hair et al. (2006) correlation coefficient below 0.9 may not cause series multicolinearity problem. As shown in table 4.3 correlations between size and breadth of outreach (0.76) and between efficiency and size (0.70) are relatively higher than the rest

coefficients but still it can be said fair. The rest of the correlation coefficients were lower indicating the absence of multicolinearity in this study, making the regression analysis more reliable.

Table 4.3 correlation matrix of independent variables

	BOR	CAR	PAR	EFF	SIZE	AGE	GDP	INF
BOR	**1**							
CAR	**-0.39967**	**1**						
PAR	**-0.11975**	**0.0055**	**1**					
EFF	**-0.54858**	**0.4798**	**0.06346**	**1**				
SIZE	**0.76324**	**-0.4626**	**-0.16391**	**-0.70430**	**1**			
AGE	**0.26111**	**-0.3812**	**-0.02388**	**-0.39309**	**0.65136**	**1**		
GDP	**0.00031**	**-0.2261**	**-0.14576**	**-0.20543**	**0.21972**	**0.34946**	**1**	
INF	**-0.00014**	**-0.0228**	**-0.02276**	**-0.19628**	**0.27088**	**0.51241**	**-0.00140**	**1**

Source: AEMFI, NBE and own computation via E-views 7

4.1.2 Model selection

Random effect versus fixed effect models

Econometrics model used to examine the impact of breadth of outreach, capital adequacy, portfolio quality, efficiency, size, age, GDP and inflation on profitability of MFIs in Ethiopia was panel data regression model which is either fixed-effect or random-effect model. The appropriate test used to decide whether fixed effect or random effect model is appropriate was Hausman Specification Test. Thus, Hausman Specification Test identifies whether fixed-effect or

random-effect model is most appropriate under the null hypothesis that unobservable individual effects (u_i) are uncorrelated with one or more of explanatory variables (*Xi)*.As noted by Gujarati (2004), fixed effect model is most appropriate when null hypothesis is rejected whereas random effect is appropriate when null hypothesis is not rejected.

For Hausman test, the null and alternative hypotheses are as follows:

Ho*:* u_i is not correlated with *Xi* (random - effects model appropriate)

H_1*:* u_i is correlated with *Xi* (fixed-effects model appropriate)

Thus, to test the null hypothesis, it requires comparing the estimates from the random-effects and the fixed-effects estimator. Random-effect estimator is consistent under the null hypothesis, but inconsistent under the alternative hypothesis whereas fixed-effect estimator is consistent under both the null and alternative hypothesis. If the estimates for the random-effects estimators are not significantly different from the estimates for the fixed-effects estimator, then the null hypotheses is accepted and conclude that u_i is not correlated with *Xi,* and therefore the random-effect model is the appropriate model. If the estimates for the random effect estimator are significantly different from the estimates for the fixed-effect estimator, the null is rejected and conclude that u_i is correlated with *Xi* and then the fixed effect model is appropriate.

As cited in Muriu (2011) fixed effect is further reinforced by the absence of heteroskedasticity in the residuals, therefore under the null hypothesis the two estimates differ systematically as indicated by the P- values in table 4.4. This means that the coefficients of interest are statistically different in the two estimates hence, the random effect solution is rejected both on substantive and statistical grounds, as a result the fixed-effect model is the appropriate model for this study.

Table 4.4 Hausman fixed-random specification test

Variable	Fixed	Random	Var (diff.)	Prob.
BOR	0.326325	0.158679	0.006220	0.0335
CAR	0.061084	0.041922	0.000641	0.4490

PAR>30	-0.223937	-0.254232	0.001456	0.4272
EFF	-0.297712	-0.275187	0.002205	0.6315
Size	-0.011131	-0.014880	0.000018	0.3747
Age	0.012056	0.011949	0.000001	0.9287
GDP	0.033126	0.058690	0.000366	0.1814
Infl.	0.058246	0.0754300.	0.0000310	0.0020

Source: AEMFI, NBE and own computation via E-views 7

4.1.3 Descriptive statistics

This section presents the outcome of the descriptive statistics for main variables involved in the regression model. Key figures, including mean, median, standard deviation; minimum and maximum values were reported. This was generated to give overall description about data used in the model and served as data screening tool to spot unreasonable figure.

As it is clearly depicted in table 4.5, profitability of Ethiopian MFIs measured in terms of ROA for 120 observations showed up a mean value of 1.1% during the study period (2003-2012), with a maximum value of 23% and minimum value of -10.9%. This depicts that the profitable MFIs earned 23 cents of profit after tax for one birr investment made on total assets. On the other hand, not profitable MFIs lost 19 cents from profit for one birr investment made on total asset of the firm. The standard deviation statistics for ROA was 5.4% which indicates the profit variation among the selected MFIs.

Table 4.5 descriptive statistics

Variables	**Observation**	**Mean**	**Maximum**	**Minimum**	**Std. Dev.**
ROA	**120**	**0.01117**	**0.23000**	**-0.10900**	**0.05422**

BOR	**120**	**0.08327**	**0.40900**	**0.00360**	**0.11113**
CAR	**120**	**0.40802**	**0.88600**	**0.03300**	**0.17699**
PAR	**120**	**0.04406**	**0.23800**	**0.00000**	**0.04401**
EFF	**120**	**0.11364**	**0.41800**	**0.01370**	**0.07634**
SIZE	**120**	**18.3325**	**22.20078**	**14.66993**	**1.90612**
AGE	**120**	**9.08333**	**15.00000**	**3.00000**	**3.12104**
GDP	**120**	**0.09890**	**0.13300**	**-0.02100**	**0.04211**
INF	**120**	**0.16710**	**0.36400**	**0.02800**	**0.11101**

Source: AEMFI, NBE and own computation via E-views 7

Looking into the independent variables, starting from breadth of outreach of the selected MFIs, the result shows that there is much deviation in breadth of outreach of the selected MFIs the maximum being 40.9% and the minimum 0.36% and the average is 8.3%. Looking into capital to asset ratio of the selected MFIs it is clearly shown that there is large deviation among the MFIs the maximum being 88.6% and the minimum 3.3%, the average capital to asset ratio showed a value of 40.8 which is above the statuary requirement of 12% set by NBE (as cited in Sima, 2013). The standard deviation of capital adequacy among the MFIs was 17.7% showing the existence of large deviation among the MFIs for the study period. Quality of portfolio measured in terms of portfolio at risk greater than 30 days for the selected MFIs was on average 4.4%. The range was between 23.8% and 0%, the standard deviation for quality of portfolio was 4.4%, showing a significant deviation among the MFIs. The result depicts that MFIs showing highest PAR>30 days (lower portfolio quality) are in higher default risk and hence lowering their profitability compared to others. On the other hand, the computation of average efficiency of selected MFIs was 11.4%, where the maximum efficiency was 41.8% and the minimum 1.4%, the standard deviation for efficiency was 7.6% showing a large disparity in terms of operational efficiency (operating expense management). The result depicts that the most efficient MFIs have

a larger tendency in managing their operating expenses in connection to their loan portfolio in relation to least efficient MFIs. As the researcher measured the size of the MFIs in natural logarithm of their total assets, the standard deviation was 190.6%, and the standard deviation for age of MFIs was 312%. Both results depict the existence of large disparity in size and age of the MFIs. This is actually visible in Ethiopian MFIs.

Turning to the external variables i.e. GDP and Inflation, economic growth proxied by real GDP growth showed a mean value of 9.8% during the study period of 2003-2012 with a maximum of 13.3% and a minimum of -2.1%. The standard deviation for GDP is 4.2% which is the smallest of all other deviations in this study, indicating that Economic growth in Ethiopia during the study period of 2003-2012 remains fairly stable and the result is more or less in line with the government's report in relation to the improvement in the economic conditions of the country. Inflation during the study period on average was 16.7% with maximum of 36.4% and minimum of 2.8% showing unstable price level during the study period.

4.1.4 Correlation matrix among variables

Looking into the correlation coefficients between the dependent variable and the independent variable in table 4.6, BOR is positively correlated with ROA (0.224), indicating when breadth of outreach increases profitability increases. CAR is negatively correlated with ROA depicting that when equity to total assets of MFIs increases profitability decreases; this is in contrary to signaling and bankruptcy cost hypothesis. As portfolio at risk and operating expense to gross loan portfolio increases, ROA moves in opposite direction which is depicted by -0.26 and -0.40 respectively. The result is in line with prior expectations, the less efficient MFIs and those having low quality assets tend to generate negative profits.

As it is also shown in table 4.6 size and age showed up a positive correlation with ROA (0.402 and 0.553) respectively, depicting that the increase in size (total assets) of MFIs and the increase in the number of years of operation tends to increase profitability.

The macro economic variables which are GDP and inflation are also positively correlated with 0.249 and 0.425 respectively. This shows that improvement in the country's economic conditions and increase in the price index of consumers tends profitability to increase.

Table 4.6 Correlation matrix of dependent and independent variables.

	ROA	BOR	CAR	PAR	EFF	SIZE	AGE	GDP	INF
ROA	**1**								
BOR	**0.2241**	**1**							
CAR	**-0.2245**	**-0.3997**	**1**						
PAR	**-0.2602**	**-0.1197**	**0.0055**	**1**					
EFF	**-0.4002**	**-0.5486**	**0.4798**	**0.0634**	**1**				
SIZE	**0.4016**	**0.7632**	**-0.4625**	**-0.1639**	**-0.7043**	**1**			
AGE	**0.5532**	**0.2611**	**-0.3812**	**-0.0239**	**-0.3931**	**0.6513**	**1**		
GDP	**0.2494**	**-0.0003**	**-0.2261**	**-0.1458**	**-0.2054**	**0.2197**	**0.3494**	**1**	
INF	**0.4254**	**-0.0001**	**-0.1492**	**-0.0228**	**-0.1963**	**0.2709**	**0.5124**	**-0.0014**	**1**

Source: AEMFI, NBE and own computation via E-views 7

4.1.5 Results of regression analysis

This section presents the regression result of fixed effect model that was made to examine the determinants of profitability of MFIs in Ethiopia. Accordingly, the regression result was made and coefficients of the variables were estimated via E-views 7 software package. As stated above, fixed effect regression model is an appropriate model used in this study. Thus, the model used to examine the determinants of profitability of MFIs in Ethiopia in this study was:

$$ROA_{it} = B_O + B_1NAB_{it} + B_2CAR_{it} + B_3PAR_{it} + B_4EFF_{it} + B_5SIZE_{it} + B_6AGE_{it} + B_7GDP_{it} + B_8INF_{it} + E_{it}$$

The estimation result of the operational panel regression model used in this study is presented in table 4.7. From the table it is shown that the R-squared statistics and the adjusted R-squared

statistics of the model were 70.1% and 64.5% respectively. The result depicts that the change in the independent variable explained 64.5% of the changes in the dependent variable. That is breadth of outreach, capital to asset ratio, portfolio at risk, operational efficiency, size, age of MFIs, GDP and inflation collectively explained 64.5% of the changes on ROA. The remaining 35.5% of changes is explained by other factors which are not included in the model. Thus, these variables collectively are good explanatory variables of the profitability of MFIs in Ethiopia as the R-squared is more than 50%. The null hypothesis of F-statistic (the overall test of significance) that the R- squared is equal to zero was rejected at 1% as the P- value was sufficiently low. F- Value of 0.000 indicates strong statistical significance, which increased the reliability and validity of the model.

Table 4.7 Regression results for factors affecting profitability of Ethiopian MFIs for the period of 2003-2012

Variable	Coefficient	Std. Error	t-statistic	Probability
C	0.084316	0.113022	0.746015	0.4574
BOR	0.326325	0.103470	3.153824	0.0021*
CAR	0.061084	0.038062	1.604862	0.1117
PAR	-0.223937	0.089956	-2.489422	0.0144*
EFF	-0.297712	0.087583	-3.399193	0.0010*
SIZE	-0.011131	0.006658	-1.671872	0.0977
AGE	0.0112056	0.002289	5.266173	0.0000*
GDP	0.033126	0.085356	0.388089	0.6988
INFL	0.000582	0.000339	1.718051	0.0889

R-squared	0.701949	Durbin- Watson stat		1.570471
Adjusted R-squared	0.645319			
S.E of regression	0.032293			
F-statistic	12.39543			
Prob(F-statistic)	0.000000			

*denote statistically significant variables

Source: AEMFI, NBE and own computation via E-views7

Looking into the results in table 4.7, among firm specific independent variables, breadth of outreach, portfolio quality, efficiency and age of MFIs has statistically significant impact on profitability whereas capital adequacy and size are insignificant factors. On the other hand the external macroeconomic variables which are GDP and inflation were found, both to be statistically insignificant factors.

CHAPTER FIVE

ANALYSIS AND DISCUSSION

The previous chapter presented the results of documentary analysis of the study. This chapter presents the analysis of the results and tries to test the stated hypotheses.

5.1 Research Hypotheses (H)

In this study the researcher formulated a total of eight hypotheses, as it was mentioned in chapter one and three for the identification of determinants of Ethiopian MFIs profitability. The formulated hypotheses were the following:

H_1. There is a significant relationship between breadth of outreach and profitability of MFIs

H_2. There is a significant relationship between amount of capital and profitability of MFIs

H_3. There is a significant negative relationship between qualities of portfolio and MFIs profitability

H_4. There is a significant negative relationship between operational efficiency and MFIs profitability.

H_5. There is a significant relationship between size and profitability of MFIs

H_6. There is a significant relationship between age and MFIs profitability

H_7. There is a significant positive relationship between real domestic product (GDP) growth and profitability of MFIs

H_8. There is a significant relationship between rate of inflation and profitability of MFIs

5.2 Analysis of the Results

The researcher made the analysis based on the theoretical framework and the results of regression analysis for the collected data. The study included, breadth of outreach, capital adequacy, efficiency, portfolio quality, size and age as internal determinants of profitability of Ethiopian MFIs whereas GDP and inflation as external determinants.

Breadth of outreach

As the study measured breadth of outreach as the market share of active borrowers of the MFIs, the ratio showed up a positive coefficient (0.326) and it is statistically significant variable at a significance level of 1% (P-value of 0.002). This indicates that for the study period (2003-2012) breadth of outreach is one of the key profitability determinants of Ethiopian MFIs. Hence, the hypothesis saying, there is a significant relationship between breadth of outreach and profitability of MFIs is accepted because the data supports the hypothesis. The result is in line with prior expectations and it is similar with Crab (2008) and opposite to Jorgensen (2012).

Capital adequacy

Capital adequacy ratio measured in terms of adjusted total equity to adjusted total assets was used to measure the capital strength of Ethiopian MFIs in the study. The ratio showed a positive coefficient (0.061) and it is statistically insignificant even at 10% significance level (P-value of 0.11). This depicts that for the study period of 2003-2012 capital adequacy of Ethiopian MFIs do not have a significant relationship with their profitability. Accordingly the hypothesis which

says, there is a significant relationship between capital adequacy and profitability of MFIs is rejected because the data failed to ascertain it, i.e. even if capital adequacy has a positive coefficient against profitability it is statistically insignificant factor during the study period of 2003-2012. The result of the study is similar to Sima (2013) and opposite to the findings of Muriu (2011), Jorgensen (2012) and Ayayi (2009). Even though, capital strength can affect profitability, the current study failed to proof its statistical significance.

Portfolio quality

Loan overdue greater than 30 days to gross loan portfolio was used to measure the portfolio quality of Ethiopian MFIs. This ratio was used to check whether there is a relationship between quality of portfolio and profitability of MFIs, the negative coefficient of the ratio (-0.224) was in line with prior expectations of the study and it is also in agreement with the theory which indicates negative relationship between profitability and portfolio quality. The coefficient was statistically significant at 1% significance level (P-value of 0.01); this indicates that the increase in uncollectible balance will tend profitability to decrease. The result is compatible with the findings of Sima (2013), Muriu (2011) and it is opposite to Dissanayake (2012). Thus, it can be said that the quality of portfolio was one of the key determinants of profitability of Ethiopian MFIs. Accordingly, this study failed to reject the hypothesis saying, there is a significant negative relationship between quality of portfolio and Ethiopian MFIs profitability.

Operating efficiency

As the study measured efficiency of the MFIs management in terms of adjusted operating expense to adjusted average gross loan portfolio as the prior studies used too, showed up a coefficient of (-0.298) and it was statistically significant at 1% significance level (P-value of 0.001). The implication is that there was a negative relation between efficiency and profitability of Ethiopian MFIs during the study period. The result is consistent with prior expectations and it is in agreement with X- efficiency theory which is stated as ‘efficient firms (lower cost) tend to earn high profit’. This study has failed to reject the hypothesis which says, there is a significant negative relationship between efficiency and MFIs profitability. The outcome is similar with the findings of Sima (2013), Dissanayake (2012), Muriu (2011) and opposite to Jorgensen (2012).

As the result ascertained, efficiency was one of the key determinants of profitability of Ethiopian MFIs for the study period of 2003-2012.

Size

As the study measured size by taking the natural logarithm of total assets of the MFIs, the coefficient was negative (-0.011) and was statically insignificant to be encompassed as a significant variable in this study. Size is significant at 10% significance level (P-value of 0.09), which indicates less significance of size as a profitability determinant factor during the study period compared to the other key significant determinant variables. The result is opposite to prior expectations and also with relative market power theory and scale efficiency theory; this indicates that Ethiopian MFIs has not yet well exploited the benefit of economies of scale. The result is similar with Sima (2013) and opposite to Melkamu (2012), Muriu (2011), Letenah (2009) and Cull et al. (2007). Accordingly, the hypothesis which says, there is a significant relationship between size and profitability of MFIs is rejected. Off course, the real practice in Ethiopia shows that the large MFIs constitute the largest portion of the market share from the industry; this study found that size was not a key determinant of profitability of Ethiopian MFIs.

Age

The researcher included this variable to check whether there is a learning effect in the operations of the MFIs in Ethiopia. The coefficient was positive (0.012) and it was statistically significant at 1% significance level (P-value of 0.000). This indicates the fact that age was a key determinant of profitability of Ethiopian MFIs having a direct relationship with ROA. Accordingly the study failed to reject the formulated hypothesis which says, there is a significant relationship between age and profitability of MFIs during the study period. The finding is similar with Sima (2013) and Yonas (2012).

GDP

The macroeconomic variable GDP had a positive coefficient of 0.033 and it was statistically insignificant (P-value of 0.699) which indicates that improvement in economic conditions did not significantly affect profitability of Ethiopian MFIs during the study period 2003-2012. The outcome is similar to the findings of Sima (2013), Muriu (2011) and Jordan (2008). As the current study ascertained, GDP is not a key determinant of profitability of Ethiopian MFIs, the hypothesis which says there is a significant positive relationship between GDP and profitability of MFIs is rejected since the data failed to support it.

Inflation

The other macroeconomic factor included in the study was inflation as measured with consumer price index, had a positive coefficient of 0.0006 and it was statistically insignificant variable with (P-value of 0.0889). Inflation was significant at 10% significance level depicting that during the study period inflation was not a key determinant of profitability of Ethiopian MFIs. Accordingly, the hypothesis saying, there is a significant relationship between inflation and profitability of Ethiopian MFIs has been rejected as per the findings of the study. The result is consistent with the findings of Muriu (2011) and Jordan (2008).

CHAPTER SIX

CONCLUSIONS AND RECCOMENDATIONS

The previous chapter analyzed the results detected in the study and accordingly tested the formulated hypotheses for validity. And also, the researcher separated the significant determinants of profitability of Ethiopian MFIs from the insignificant ones for the study period. This chapter presents the conclusions attained and the recommendations forwarded by the researcher as per the findings detected and finally the chapter raises issues for further study in the subject matter.

6.1 Conclusions

The main objective of this study was to examine the internal and external factors affecting profitability of Ethiopian MFIs. Previous studies on the determinants of profitability of MFIs are rare. This study reviewed the existing studies and used commercial banking theories as a base ground, presuming they are also workable for MFIs. Profitability is assumed to be highly dependent on internal (firm specific) factors, external factors can also contribute to the profitability of a given firm. The internal factors include, outreach, capital adequacy, portfolio quality, efficiency, size, age and other variables which are under the control of the managerial organ of the firm. The external factors include macroeconomic variables like GDP, inflation and other macroeconomic variables.

Basing itself on the previous studies, this study examined the effect of internal and external factors of profitability of Ethiopian MFIs for the study period of 2003-2012. The firm specific factors included in this study were, breadth of outreach (number of active borrowers), capital adequacy, portfolio quality, efficiency, size and age of MFIs. The external macroeconomic variables included in the study were GDP and inflation.

To achieve the stated objective of the study, quantitative research method was adopted. The data for the study were gathered from performance analysis report annual bulletin (for each corresponding year) by AEMFI for the internal factors for the selected 12 MFIs; and the external factors were extracted from the annual reports of NBE. As per the collected quantitative data, multiple regression analysis was run to test the different hypotheses formulated in the study. The empirical findings of the study provided the following conclusions.

Breadth of outreach showed a positive coefficient against ROA, which is in line with prior expectations and the variable was statistically significant; implying that the increment in the number of active borrowers increases the profitability of Ethiopian MFIs.

Portfolio quality showed up a negative coefficient against ROA which is in accordance with prior expectations and also the variable was statistically significant, depicting that as Ethiopian MFIs hold low quality assets their profitability declines.

Efficiency as measured in terms of operating expense to gross loan portfolio showed a negative coefficient against ROA and the variable was statistically significant as it was predicted. This depicts that the higher the cost, the lower the profitability of Ethiopian MFIs.

Age of MFIs as measured with the number of years a MFI is under operation showed a positive coefficient and statistically significant variable as it was expected; implying that the more the maturity of the MFI the more the profitability will be.

The other variables included in the study, capital adequacy ratio, firm size, GDP and inflation were found to be statistically insignificant profitability determinants for Ethiopian MFIs. Capital adequacy of Ethiopian MFIs showed on average a result greater than the statuary requirement set by NBE which is 12%, as the study verifies on average 40% of the MFIs asset is funded by owners‘equity but the study found that capital adequacy is a statistically insignificant profitability determinant for Ethiopian MFIs during the study period of 2003-2012. The study tried to see the effect of economies or diseconomies of scale for Ethiopian MFIs, the outcome of the study showed that size was not a significant determinant of Ethiopian MFIs profitability for the study period. Finally, the macro economic variables included in this study i.e. GDP and inflation were found to be statistically insignificant profitability determinants for Ethiopian MFIs.

6.2 Recommendations

As per the findings detected in this study the researcher forwarded the following recommendations.

- Breadth of outreach (number of active borrowers) is one of the key determinants of profitability for Ethiopian MFIs. Ethiopia is a large country (equal to the size of Spain and France combined) with more than 1.14 mill. Square Kilometers land area and more than 90 mill. Population, it has a vast yet unexploited market potential for MFIs operation. The current MFIs served very limited number of clients compared to the available potential micro credit clients in the country. In line with this, they may need to increase their breadth of outreach through different mechanisms. One mechanism could be through their association i.e. AEMFI, this association can provide different awareness upgrading programs to the population specially to rural-urban poor citizens, how micro credit programs change the life of poor peoples in other developing countries, how micro credit could bring a change on individuals living standards on those who use the credit wisely. This may be through electronic Medias like radios, TV etc. or through community awareness upgrading programs in different parts of the country especially through Kebeles, "Edirs" etc. Individual MFIs who operate in different parts of the country may need to form an alliance in their operational regions to teach peoples the benefit of micro credit services and how it could play a vital role in alleviating extreme poverty in the locality and in the country as a whole.

- Quality of portfolio is one of the key determinants of profitability of Ethiopian MFIs. In view of this, the management may need to develop a good credit management policy. And through the same mechanisms cited above for breadth of outreach, creating an awareness on the minds of their clients, how the prompt payment of a loan can contribute for the future expansion of the micro credit programs throughout the country and how it positively contributes for the country's ambition of alleviating extreme poverty.

- Operational efficiency (lower cost) is the other key determinant factor of profitability of Ethiopian MFIs. In this regard, the management may strive to reduce operating costs (mainly transaction costs) by employing different technologies which can minimize cost like mobile micro banking, curtailing the frequency of installment payments so that increased profit help the MFIs to come out from being dependent on donated funds, in addition the management need to insure the efficiency of operations from year to year as learning effect positively affects profitability.

- In all this, the role of the government is compulsory, the role of the government in insuring the development of infrastructures and other facilities like technological advancements to reduce poverty is crucial in addition to the role of MFIs. Therefore, to keep the MFIs efficient at a reduced cost, the government needs to enhance the development of the different areas where difficulties are being faced on the way to provide microfinance services.

6.3 Direction for Further Research

This study examined only limited internal and external variables by using 10 years data. There are other variables which are not included in this study like, depth of outreach, lending methodology, type of institutions, ownership structure from internal factors and industry concentration, unemployment rate, interest rate, from external factors. Having further investigation with the inclusion of the above variables might have a better role in identifying other factors which contribute for the profitability of Ethiopian MFIs.

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APPENDICES

Appendix –I: Heteroskedasticity Test: White

Heteroskedasticity Test: White

F-statistic	0.631250	Prob. F(44,75)	0.9498
Obs*R-squared	32.43005	Prob. Chi-Square(44)	0.9013
Scaled explained SS	66.09700	Prob. Chi-Square(44)	0.0172

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/16/15 Time: 04:34
Sample: 1 120
Included observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.200027	0.257486	-0.776847	0.4397
BOR	-0.301209	0.355731	-0.846733	0.3998
BOR^2	-0.048959	0.120440	-0.406502	0.6855
BOR*CAR	0.029287	0.108290	0.270446	0.7876
BOR*PAR_30	-0.012593	0.298343	-0.042209	0.9664
BOR*EFF	0.004096	0.313399	0.013071	0.9896
BOR*SIZE	0.019137	0.020963	0.912875	0.3642
BOR*AGE	-0.007766	0.007389	-1.051044	0.2966
BOR*GDP	-0.033658	0.183803	-0.183120	0.8552
BOR*INFL	0.016424	0.113887	0.144211	0.8857
CAR	0.041647	0.120053	0.346907	0.7296
CAR^2	0.014425	0.017932	0.804445	0.4237
CAR*PAR_30	-0.089565	0.080689	-1.110004	0.2705
CAR*EFF	-0.064331	0.115666	-0.556177	0.5797
CAR*SIZE	-0.002011	0.007018	-0.286571	0.7752
CAR*AGE	-0.000957	0.002754	-0.347419	0.7292
CAR*GDP	0.021584	0.080470	0.268219	0.7893
CAR*INFL	-0.003765	0.034631	-0.108720	0.9137
PAR_30	0.003231	0.402914	0.008019	0.9936
PAR_30^2	0.065984	0.194340	0.339531	0.7352
PAR_30*EFF	-0.235729	0.407284	-0.578781	0.5645
PAR_30*SIZE	0.005707	0.025268	0.225857	0.8219
PAR_30*AGE	-0.005170	0.007738	-0.668112	0.5061
PAR_30*GDP	-0.109717	0.293283	-0.374100	0.7094
PAR_30*INFL	-0.038164	0.118927	-0.320902	0.7492

EFF	0.246475	0.236809	1.040816	0.3013
EFF^2	-0.051167	0.145481	-0.351708	0.7260
EFF*SIZE	-0.012486	0.013838	-0.902273	0.3698
EFF*AGE	0.004633	0.005421	0.854600	0.3955
EFF*GDP	-0.170997	0.221798	-0.770957	0.4432
EFF*INFL	0.058952	0.096600	0.610270	0.5435
SIZE	0.022124	0.029429	0.751782	0.4545
SIZE^2	-0.000713	0.000864	-0.825298	0.4118
SIZE*AGE	0.000547	0.000605	0.904789	0.3685
SIZE*GDP	-0.006010	0.017916	-0.335462	0.7382
SIZE*INFL	-0.000874	0.007248	-0.120564	0.9044
AGE	-0.006696	0.010175	-0.658073	0.5125
AGE^2	-0.000174	0.000140	-1.241066	0.2184
AGE*GDP	0.007675	0.013599	0.564384	0.5742
AGE*INFL	0.000629	0.005034	0.124858	0.9010
GDP	0.210210	0.304891	0.689460	0.4927
GDP^2	-0.168834	0.729139	-0.231552	0.8175
GDP*INFL	-0.988387	0.859080	-1.150517	0.2536
INFL	0.145694	0.197759	0.736725	0.4636
INFL^2	-0.104902	0.069948	-1.499719	0.1379

R-squared	0.270250	Mean dependent var	0.001559
Adjusted R-squared	-0.157869	S.D. dependent var	0.003418
S.E. of regression	0.003678	Akaike info criterion	-8.092990
Sum squared resid	0.001014	Schwarz criterion	-7.047680
Log likelihood	530.5794	Hannan-Quinn criter.	-7.668485
F-statistic	0.631250	Durbin-Watson stat	1.698820
Prob(F-statistic)	0.949761		

APPENDIX- II: Hausman specification test

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

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	8	1.0000

* Cross-section test variance is invalid. Hausman statistic set to zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
BOR	0.326325	0.158679	0.006220	0.0335
CAR	0.061084	0.041922	0.000641	0.4490
PAR_30	-0.223937	-0.254232	0.001456	0.4272
EFF	-0.297712	-0.275187	0.002205	0.6315
SIZE	-0.011131	-0.014880	0.000018	0.3747
AGE	0.012056	0.011949	0.000001	0.9287
GDP	0.033126	0.058690	0.000366	0.1814
INFL	0.058246	0.075430	0.000031	0.0020

Appendix-III: Regression results for factors affecting profitability of Ethiopian MFIs

Dependent Variable: R0A
Method: Panel Least Squares
Date: 05/15/15 Time: 12:06
Sample: 2003 2012
Periods included: 10
Cross-sections included: 12
Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.084316	0.113022	0.746015	0.4574
BOR	0.326325	0.103470	3.153824	0.0021
CAR	0.061084	0.038062	1.604862	0.1117
PAR_30	-0.223937	0.089956	-2.489422	0.0144
EFF	-0.297712	0.087583	-3.399193	0.0010
SIZE	-0.011131	0.006658	-1.671872	0.0977
AGE	0.012056	0.002289	5.266173	0.0000
GDP	0.033126	0.085356	0.388089	0.6988
INFL	0.058246	0.033902	1.718051	0.0889

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.701949	Mean dependent var	0.011175
Adjusted R-squared	0.645319	S.D. dependent var	0.054223
S.E. of regression	0.032293	Akaike info criterion	-3.876945
Sum squared resid	0.104281	Schwarz criterion	-3.412363
Log likelihood	252.6167	Hannan-Quinn criter.	-3.688276
F-statistic	12.39543	Durbin-Watson stat	1.570471
Prob(F-statistic)	0.000000		

Appendix IV: Ratio data

YEAR	MFI	R0A	BOR	CAR	PAR>30	EFF	SIZE	AGE	GDP	INFL
2003	ACSI	0.038	0.409	0.38	0.017	0.076	19.5	6	-0.021	0.109
2004	ACSI	0.048	0.3718	0.335	0.05	0.062	19.9	7	0.117	0.073
2005	ACSI	0.043	0.3615	0.324	0.011	0.062	20.2	8	0.126	0.061
2006	ACSI	0.045	0.3776	0.3	0.08	0.05	20.6	9	0.115	0.106
2007	ACSI	0.041	0.35	0.27	0.005	0.046	21	10	0.118	0.158
2008	ACSI	0.08	0.3388	0.31	0.02	0.03	21.4	11	0.112	0.253
2009	ACSI	0.06	0.3241	0.26	0.04	0.04	21.6	12	0.099	0.364
2010	ACSI	0.04	0.3054	0.28	0.035	0.02	21.7	13	0.104	0.028
2011	ACSI	0.066	0.2938	0.28	0.0146	0.0481	21.9	14	0.133	0.181
2012	ACSI	0.071	0.305	0.28	0.01	0.039	22.2	15	0.086	0.338
2003	AdCSI	-0.078	0.0202	0.823	0.078	0.143	16.7	3	-0.021	0.109
2004	AdCSI	-0.059	0.0337	0.886	0.206	0.079	17.9	4	0.117	0.073
2005	AdCSI	0.005	0.0439	0.7	0.009	0.041	18.8	5	0.126	0.061
2006	AdCSI	-0.065	0.0386	0.707	0.035	0.041	19	6	0.115	0.106
2007	AdCSI	0.061	0.0536	0.67	0.01	0.0459	14.7	7	0.118	0.158
2008	AdCSI	0.04	0.0416	0.7	0.03	0.04	19.5	8	0.112	0.253
2009	AdCSI	0.03	0.0718	0.72	0.04	0.03	19.8	9	0.099	0.364
2010	AdCSI	0.04	0.0724	0.65	0.046	0.03	20.1	10	0.104	0.028
2011	AdCSI	0.031	0.066	0.49	0.0378	0.0338	20.5	11	0.133	0.181
2012	AdCSI	0.034	0.0731	0.39	0.025	0.045	20.9	12	0.086	0.338
2003	DECSI	-0.005	0.3205	0.431	0.062	0.061	19.5	6	-0.021	0.109
2004	DECSI	0.021	0.3565	0.336	0.023	0.038	20	7	0.117	0.073
2005	DECSI	0.034	0.3484	0.233	0.01	0.028	20.6	8	0.126	0.061
2006	DECSI	0.019	0.2762	0.212	0.01	0.025	20.8	9	0.115	0.106
2007	DECSI	-0.003	0.2482	0.203	0.005	0.029	21.2	10	0.118	0.158
2008	DECSI	0.02	0.2215	0.19	0.02	0.03	21.3	11	0.112	0.253
2009	DECSI	0.03	0.1922	0.38	0.05	0.03	21.5	12	0.099	0.364
2010	DECSI	0	0.1867	0.24	0.067	0.02	21.5	13	0.104	0.028
2011	DECSI	0.019	0.1615	0.24	0.0216	0.0188	21.7	14	0.133	0.181

2012	DECSI	0.025	0.1409	0.25	0.045	0.044	21.8	15	0.086	0.338
2003	OCSSCO	-0.065	0.0882	0.63	0.078	0.108	18.3	6	-0.021	0.109
2004	OCSSCO	-0.007	0.0921	0.54	0.05	0.09	18.6	7	0.117	0.073
2005	OCSSCO	0.011	0.1046	0.513	0.053	0.075	19	8	0.126	0.061
2006	OCSSCO	0.004	0.1276	0.438	0.002	0.064	19.4	9	0.115	0.106
2007	OCSSCO	0.007	0.1546	0.286	0.01	0.06	20	10	0.118	0.158
2008	OCSSCO	0.04	0.1978	0.22	0.03	0.04	20.5	11	0.112	0.253
2009	OCSSCO	0.03	0.1719	0.25	0.07	0.05	20.6	12	0.099	0.364
2010	OCSSCO	0.03	0.2069	0.24	0.046	0.05	21.1	13	0.104	0.028
2011	OCSSCO	0.054	0.2125	0.26	0.0352	0.0502	21.2	14	0.133	0.181
2012	OCSSCO	0.065	0.2008	0.29	0.032	0.045	21.5	15	0.086	0.338
2003	OMO	-0.109	0.1001	0.171	0.114	0.14	17.6	6	-0.021	0.109
2004	OMO	-0.059	0.0799	0.143	0.055	0.145	17.9	7	0.117	0.073
2005	OMO	-0.02	0.0685	0.092	0.012	0.103	18.6	8	0.126	0.061
2006	OMO	-0.05	0.0816	0.099	0.029	0.083	18.8	9	0.115	0.106
2007	OMO	-0.013	0.0919	0.123	0.02	0.086	19.3	10	0.118	0.158
2008	OMO	0.02	0.1015	0.09	0.05	0.04	20	11	0.112	0.253
2009	OMO	0.02	0.1398	0.1	0.07	0.02	20.1	12	0.099	0.364
2010	OMO	0	0.1349	0.27	0.066	0.05	20.3	13	0.104	0.028
2011	OMO	0.014	0.1604	0.24	0.1516	0.0512	20.4	14	0.133	0.181
2012	OMO	0.026	0.1831	0.18	0.094	0.082	21	15	0.086	0.338
2003	BuG.	-0.046	0.0085	0.841	0.058	0.4	15.1	4	-0.021	0.109
2004	BuG.	-0.051	0.0069	0.768	0.039	0.418	15.7	5	0.117	0.073
2005	BuG.	-0.085	0.0084	0.662	0.004	0.304	16.1	6	0.126	0.061
2006	BuG.	-0.013	0.0128	0.666	0.012	0.233	16.5	7	0.115	0.106
2007	BuG.	-0.008	0.0182	0.435	0.013	0.252	17.2	8	0.118	0.158
2008	BuG.	0.07	0.0186	0.44	0.02	0.18	17.6	9	0.112	0.253
2009	BuG.	0.07	0.0199	0.49	0.02	0.15	17.9	10	0.099	0.364
2010	BuG.	0.07	0.0171	0.49	0.016	0.16	17.9	11	0.104	0.028
2011	BuG.	0.141	0.022	0.53	0.0068	0.1259	18.2	12	0.133	0.181
2012	BuG.	0.23	0.0216	0.46	0.006	0.159	18.6	13	0.086	0.338
2003	Wisdom	-0.038	0.0172	0.568	0.053	0.208	16.8	4	-0.021	0.109

2004	Wisdom	-0.025	0.0211	0.472	0.035	0.199	17.1	5	0.117	0.073
2005	Wisdom	-0.021	0.0228	0.393	0.033	0.195	17.3	6	0.126	0.061
2006	Wisdom	0.011	0.0316	0.473	0.047	0.177	17.8	7	0.115	0.106
2007	Wisdom	-0.078	0.0282	0.364	0.027	0.199	18.1	8	0.118	0.158
2008	Wisdom	0	0.027	0.44	0.03	0.17	18.3	9	0.112	0.253
2009	Wisdom	-0.02	0.0265	0.44	0.05	0.2	18.5	10	0.099	0.364
2010	Wisdom	-0.01	0.0215	0.47	0.094	0.19	18.6	11	0.104	0.028
2011	Wisdom	-0.026	0.0192	0.48	0.0211	0.1675	18.7	12	0.133	0.181
2012	Wisdom	0.013	0.023	0.48	0.014	0.16	19.4	13	0.086	0.338
2003	Wasasa	0.017	0.0053	0.696	0.059	0.169	15	3	-0.021	0.109
2004	Wasasa	0.034	0.0095	0.522	0.001	0.179	15.9	4	0.117	0.073
2005	Wasasa	-0.051	0.0101	0.476	0.076	0.165	16.4	5	0.126	0.061
2006	Wasasa	-0.016	0.0158	0.466	0.009	0.151	17.1	6	0.115	0.106
2007	Wasasa	0.03	0.0183	0.458	0.017	0.113	17.5	7	0.118	0.158
2008	Wasasa	0.06	0.0184	0.033	0.02	0.08	17.8	8	0.112	0.253
2009	Wasasa	0.08	0.0199	0.32	0.01	0.06	18.3	9	0.099	0.364
2010	Wasasa	0.03	0.0193	0.31	0.041	0.04	18.4	10	0.104	0.028
2011	Wasasa	0.064	0.0228	0.35	0.0225	0.0713	18.7	11	0.133	0.181
2012	Wasasa	0.075	0.0229	0.32	0.013	0.077	19.1	12	0.086	0.338
2003	AVFS	-0.094	0.0041	0.568	0.116	0.21	14.9	5	-0.021	0.109
2004	AVFS	-0.101	0.0052	0.638	0.023	0.185	15.4	6	0.117	0.073
2005	AVFS	-0.08	0.0049	0.622	0.033	0.147	15.9	7	0.126	0.061
2006	AVFS	-0.078	0.0054	0.598	0.043	0.151	16.3	8	0.115	0.106
2007	AVFS	-0.057	0.0053	0.616	0.054	0.18	16.7	9	0.118	0.158
2008	AVFS	0.01	0.0054	0.62	0.1	0.14	16.6	10	0.112	0.253
2009	AVFS	0.03	0.0053	0.62	0.09	0.18	16.7	11	0.099	0.364
2010	AVFS	-0.02	0.0071	0.56	0.036	0.27	16.8	12	0.104	0.028
2011	AVFS	-0.018	0.0073	0.56	0.0739	0.2678	16.8	13	0.133	0.181
2012	AVFS	0.032	0.0053	0.55	0.095	0.222	16.9	14	0.086	0.338
2003	SFPI	-0.04	0.0135	0.526	0.009	0.185	16.2	5	-0.021	0.109
2004	SFPI	-0.033	0.0121	0.496	0.015	0.158	16.5	6	0.117	0.073
2005	SFPI	-0.034	0.0119	0.547	0.043	0.135	16.7	7	0.126	0.061

2006	SFPI	-0.027	0.014	0.524	0.031	0.127	17.1	8	0.115	0.106
2007	SFPI	-0.093	0.0137	0.307	0.018	0.125	17.3	9	0.118	0.158
2008	SFPI	0.03	0.0134	0.46	0.04	0.12	17.6	10	0.112	0.253
2009	SFPI	0.01	0.0137	0.43	0.03	0.16	17.8	11	0.099	0.364
2010	SFPI	0.07	0.014	0.45	0.032	0.07	17.9	12	0.104	0.028
2011	SFPI	0.068	0.014	0.46	0.0599	0.1309	18.1	13	0.133	0.181
2012	SFPI	0.076	0.0134	0.43	0.027	0.122	18.3	14	0.086	0.338
2003	PEACE	-0.053	0.0077	0.426	0.002	0.206	15.9	4	-0.021	0.109
2004	PEACE	0.034	0.0082	0.443	0.001	0.175	16.2	5	0.117	0.073
2005	PEACE	-0.03	0.0114	0.279	0.001	0.121	16.8	6	0.126	0.061
2006	PEACE	0.059	0.0135	0.269	0.007	0.081	17.2	7	0.115	0.106
2007	PEACE	0.052	0.0114	0.315	0.005	0.075	17.4	8	0.118	0.158
2008	PEACE	0.07	0.0095	0.33	0	0.08	17.6	9	0.112	0.253
2009	PEACE	0.02	0.0086	0.33	0.06	0.05	17.7	10	0.099	0.364
2010	PEACE	0.07	0.0082	0.34	0.04	0.11	17.8	11	0.104	0.028
2011	PEACE	0.093	0.0077	0.44	0.0034	0.1176	17.9	12	0.133	0.181
2012	PEACE	0.065	0.0071	0.45	0.001	0.0137	18	13	0.086	0.338
2003	Meklit	-0.067	0.0051	0.462	0.097	0.142	14.7	3	-0.021	0.109
2004	Meklit	-0.087	0.0042	0.16	0.177	0.153	15.1	4	0.117	0.073
2005	Meklit	-0.042	0.0036	0.152	0.07	0.174	15.5	5	0.126	0.061
2006	Meklit	0.076	0.0052	0.337	0.029	0.155	16.8	6	0.115	0.106
2007	Meklit	0.024	0.0066	0.289	0.024	0.049	16.6	7	0.118	0.158
2008	Meklit	0.03	0.0065	0.28	0.04	0.09	16.8	8	0.112	0.253
2009	Meklit	0	0.0061	0.27	0.16	0.1	16.9	9	0.099	0.364
2010	Meklit	-0.02	0.0064	0.23	0.238	0.11	17	10	0.104	0.028
2011	Meklit	0.065	0.005	0.28	0.2133	0.1066	17.1	11	0.133	0.181
2012	Meklit	0.095	0.0038	0.34	0.102	0.132	17.3	12	0.086	0.338