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STATISTICAL ANALYSIS OF THE PERFORMANCE OF MICROFINANCE INSTITUTIONS: THE CASE OF ETHIOPIA

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Acronyms

ACSI	Amhara Credit and Saving Institution
AEMFI	Association of Ethiopian Microfinance Institutions
avgloan	Average Amount of Loan per Borrower
CGAP	Consultative Groups to Assist the Poor
CPB	Cost per Borrower
DCSI	Dedebit Credit and Saving Institution
FA	Factor Analysis
FRtoTA	Financial Revenue to Total Asset
HICES	Household Income, Consumption and Expenditure Survey
I-PRSP	Interim Poverty Reduction Strategy Paper
MFIs	Microfinance Institutions
NBE	National Bank of Ethiopia
nservice	Number/Types of Financial Services Rendered by an MFI
OCSSCO	Oromia Credit and Saving ~~Corporation~~ Share Company
OSS	Operational Self-sufficiency
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PCA	Principal Component Analysis
PRSP	Poverty Reduction Strategy Paper
ROA	Return on Asset
ROE	Return on Equity
SDP	Sector Development Programs
stafperbranch	Staff Size per Branch
SUR	Seemingly Unrelated Regression

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Abstract

Nowadays, governments and many development agents pay great attention to the development and enhancement of Microfinance Institutions (MFIs) anticipating that they are the shortest way to end poverty. Many scholars and stakeholders also acknowledge that MFIs are the possible panacea to under development but they stress on the proper supervision and regulation of these MFIs as they are mobilizing susceptible resources. However, evaluating the performance of MFIs is found to be among the most controversial issues throughout the world leave alone in countries like Ethiopia where the microfinancing business is at its infant age. Different researchers and practitioners found in different corners of the world employ various kinds of approaches to scrutinize the performance of MFIs.

It is crucial for countries to measure the performance of their MFIs and identify the major determinants of their performance, at any cost, in order to see their relevance and prospects prior to new policy developments, strategic planning and so on. This paper, therefore, tried to give statistical insight in measuring the performance of MFIs in the country and the determinants of their performance. A cross-sectional data from the 2006 fiscal calendar balance sheet of 26 MFIs is utilized to make the study. An effort is also made to observe the trend of the industry with respect to some indicators by collecting time series data.

Consequently, the factor analysis part of the study identified that Deposit mobilized from clients, Number of Active Borrowers, and Gross Loan Portfolio load high on one component forming the outreach performance dimension of the MFIs in the country. On the other hand, Profit Margin, OSS, Return on Asset and Gross Loan Portfolio to Total Asset Ratio load high on the other component forming the financial viability dimension of the MFIs.

The factor scores also identified that ACSI and Ocssco are among the best performing MFIs, whereas, Aggar and Metemamen are among the least performants in the country in every dimension.

In order to identify the determinants of the performance of the MFIs, on the two dimensions, a SUR model was fitted on the scores synthesized by the factor analysis anticipating the performances of outreach and sustainability of the MFIs are interrelated. However, the Breusch Pagan test exposed that there is no evidence to reject the hypothesis

that the errors are not correlated across equations ($\sigma_{12} = 0$). Besides, the significant positive correlation between outreach and sustainability performance dimensions approves that there is no trade-off between the two dimensions in the case of our particular country MFIs.

The number/types of financial services rendered, the number of staffs per branch and their capital are found to determine the outreach performance of the MFIs in the country. It was also noted that capital has an adverse impact on the outreach efforts of the MFIs. The unregulated growth of capital has a negative impact on both outreach and sustainability of the MFIs though it is not significant on the case of sustainability. MFIs in the country tend to focus on their capital for their loan-able funds rather than on deposit mobilization.

Moreover, the financial viability of the MFIs is found to be highly determined by the average amount of loans disbursed to individuals, the financial revenue ratio and the cost per borrower ratio. The signs of these determinants agree to the expectations set on the study.

To the surprise of the author, the number of branches that MFIs have is found not to affect the performance of the MFIs contrary to the expectation set. Intrinsically, one expects that the number of branches that the MFIs have affects the outreach and sustainability performance of the MFIs significantly, but that is not the case in this particular study.

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Chapter One

Introduction

1. Background

1.1. General Situation of Ethiopia

Ethiopia is among the least developed and highly populated countries in Africa. According to a report released by the Central Statistics Agency (CSA), in July 2006 the population of Ethiopia was estimated to be 75 million, of whom 63 million are rural and 12 million are urban dwellers. This population is composed of 50.13% (37.6 million) males and 49.87 % (37.5 million) females. The population growth rate is also estimated to be 3% per annum. Unfortunately, this population, which puts the country second in Africa, could not help the nation to heave itself out of the immense socio-economic problem it is in.

Though the problem of the country is multifaceted, the uncontrolled population growth rate, the low coverage and poor quality infrastructure development, the under-development of the service sectors, and the high unemployment rate are among the major factors responsible for the severity of the situation. The problem is not spatial. It affects the rural dwellers, that are characterized by agrarian economy and where 85% of the population resides, as much as, if not more, the urban dwellers.

According to the 2004/05 Household Income Consumption Expenditure Survey (HICES), the proportion of poor people (poverty head count index) in the country is estimated to be 38.7%, while the proportion of the population below the poverty line stood at 39.3% and 35.1% in rural and in urban areas, respectively. The poverty gap index is also estimated to be 8.3% at country level while it is 8.5% for rural and 7.7% for urban areas. Similarly, the national level poverty severity index stood at 0.027 with rural poverty severity index (0.027) being slightly higher than that of urban areas (0.026). Both statistical tests and stochastic dominance analysis confirmed that for all indices (head count, poverty gap and poverty severity indices) urban areas have lower poverty than that of the rural areas indicating that poverty is still more of rural phenomenon. However, over time the gap in poverty between rural and urban areas is narrowing (PASDEP, 2006).

To alleviate the prevailing problem in the country, many development programs focus mainly in poverty reduction and ultimately poverty eradication activities. In response to the commitment that the country made at the Millennium Summit in September 2000 that sets

out goals and targets-Millennium Development Goals (MDGs) to reduce poverty by half in 2015, a series of economic reforms and development programs are adopted and are already under progress. To mention some of the policies and programs developed:

A) Key Sector Development Programs (SDP), including education, health, road, and agricultural extension programs were formulated and implemented;

B) The National Policy of Ethiopian Women and the National Environmental Policy were brought into focus;

C) In 2000 an Interim Poverty Reduction Strategy Paper (I-PRSP) was developed and in 2002 the full PRSP known as Ethiopia's Sustainable Development and Poverty Reduction Programs was launched targeting an average economic growth of 7% per year in order to meet the MDGs;

D) In 2005, the second phase of the PRSP process, the Poverty Reduction Strategy Paper (PRSP), a Plan for Accelerated and Sustained Development to End Poverty (PASDEP) has been put into action; and,

E) Moreover, many resource allocations favoring vulnerable groups/regions are further reinforced (AFRODAD, 2005).

Under the theme of resource allocation favoring vulnerable groups, the effort especially on delivering financial services to poor households attracts great attention of the concerned bodies. It is believed that if the poor, particularly women and the marginalized groups are provided with financial services, they can get benefit from job opportunities, and can generate income and empower themselves. Since the formal banks have been unable to support the financial needs of these poor and marginalized but potentially bankable groups, the development of Microfinance Institutions (MFIs) is considered as a major tool to accomplish the mission.

1.2 Historical Background of Microfinancing

The emergence of microfinancing dates back to the mid 19th centaury. José Augusto Tomo Psico in his work on "Social Performance Evaluation of the Microfinance Institutions in Mozambique" put the history as follows.

"The first manifestation of microcredit movement that is known is the "Bread Association". It was created by priest Raiffeinsen in the South of Germany in 1846, after a

hard winter which left the local farmers indebted and depending on the moneylenders. The priest granted them wheat flour so that, with the making and commercialization of bread, they could obtain the necessary funds to reimburse the debt and constitute circulating capital for their activity. As time passed, the association grew and turned into a credit cooperative for the poor population.

In 1900, a journalist from Quebec Legislative Assembly created the "Caísses Populaires Desjardins". He collected an initial amount of 26 Canadian Dollars to lend the poorest, with the help of 12 friends. At the present time, five million people are associated to the "Caísses Populaires" in 1,329 branches. In 1953, Walter Krump, the chairman of a Chicago Metallurgic, created the "Help Funds" in the departments of the factory, where each participating worker deposited monthly US $1, intended for assisting the members when necessary. Later on, the Help Funds were consolidated and transformed into what was named America Credit League. After this initiative, others have established, there being, at present time, the Federation of the Credit Leagues, operated nationally in other countries.

Also in the southern hemisphere, the missionaries launched savings banks and loan-offices based on the mutualist model where the risk is shared by the people of the same village or quarter.

Many other punctual and isolated manifestations with characteristics of microcredit shall have occurred since then. However, the microcredit (in today's acceptation) is associated with the experience started in 1976 in Bangladesh by professor Muhamad Yunus. Observing that the small enterprises of the villages next to the university where he lectured were hostages of moneylenders, paying scrupulously the extortive interests, professor Yunus started to lend small amounts with personal means, which he afterwards increased asking for loans."

Particularly, following the Second World War, the effort of governments and donors in establishing microcredit projects to mitigate the imperfection of financial markets promoted the microfinancing industry (Youssoufou, 2002).

1.3 What Are Microfinance Institutions?

Microfinance institutions are institutions that provide suitable financial and other services using innovative methodologies and systems at low cost to meet the need of low-income sections of the population and act as financial intermediaries in a genuine sense. To most, microfinance means providing very poor families with very small loans (micro-credit) to help them engage in productive activities or grow their tiny businesses. Over time, microfinance has come to include a broader range of services (credit, savings, insurance, etc.) as it has been realized that the poor and the very poor that lack access to traditional formal financial institutions require a variety of financial products.

The typical microfinance clients are considered to be low-income persons that do not have access to formal financial institutions. Microfinance clients are typically self-employed, often household-based entrepreneurs (accessed from www.mixmarket.org).

1.4 General Situation of MFIs in Ethiopia

Ethiopia is among the few countries which incorporate the development of micro and small scale industries in their development strategies (Tsegaye, 2007). Equivalent to the other development and good governance polices, a microfinancing policy is reinforced as a means to fight poverty.

Particularly, following the shift in the structure of the economy-liberalization of financial markets to citizens in the middle of the 90's, apart from government banks and an insurance company, a number of private banks and insurance companies joined the economy to provide financial services in the middle of the 90's. Nevertheless, these institutions are mostly established in towns where the country's wealth is concentrated as their main target is medium and large scale businesses; the people in the rural areas were not beneficiaries since, most of the time, they do not have any asset to be held as collateral. Since the formal/conventional banks can't support the financial needs of the poor, the introduction of Microfinance Institutions (MFIs) is considered as a major tool to fill this gap.

Unlike the formal commercial banks that serve urban dwellers, MFIs focus on rural and urban poor households along with their demand for financial services. Since the MFIs are objectively established to address the financial needs of these poor, which cover the vast number of the society, they have a relative wider outreach and believed to be instrumental

to reach the marginalized (under-served) parts of the society by formal financial institutions.

However, many scholars believe that microfinance is not a panacea for poverty and related development challenges. Microfinancing alone cannot improve infrastructure, housing, water supply, education, and health services. But it can play a vital role in making the above intervention more fruitful. It is a means to empower and build the confidence and self-esteem of the poor and the marginalized groups (Wolday, 2007).

Despite this controversy on microfinance institutions, the country is striving to develop them and put an impact on the poverty status of the people. Consequently, the National Bank of Ethiopia (NBE) issued its first microfinance legislation in 1996 with regard to developing MFIs. The objective of the microfinance institutions is set to be the delivery of micro-loans, micro-savings, micro-insurance, money transfer, etc to the large number of productive but resource-poor people in rural and urban areas in a cost effective and sustainable way (Wolday, 2007). The first MFI legally registered at the NBE was the Amhara Credit and Saving Institution (ACSI); indeed, it had already begun its operation in 1995 before the issuance of the NBE's legislation.

Currently, the number of MFIs registered under the NBE has reached 27. They provide services all over the country except in Somali region. As for their distribution three MFIs are operating in Amhara Region, 11 of them in Addis Ababa City Administration, 12 of them in Oromia Region and 7 of them in Southern Nations and Nationalities People's Region (SNNPR). Tigray Region, Dire Dawa City Administraion, Harari Region and Benshangul-Gumuz Region are furnished by a single MFI each.

Nine of the MFIs (33.3%) are owned by regional governments and 16 of them (59%) are sponsored by Non-Governmental Organizations (NGO's), whereas the remaining two MFIs are owned by a private bank and different shareholders. At the end of June 2007, these MFIs had an active loan portfolio of about Birr 2.6 billion delivered to about 1.7 million clients.

Though MFIs are playing a significant tier in expanding financial interventions to low-income groups, entrepreneurs and traders still they could not address the public demand adequately. The PASDEP prevails that about one-third (33%) of households need to travel 20 or more kilometers to reach the nearest microfinance services. The proportion with

financial services within 5 Km is 77% in urban areas and only 17% in the rural areas (PASDEP, 2006). Nonetheless, it is worthwhile to notice that the newly introduced MFIs have improved the situation to some extent.

1.5 Statement of the Problem

For the overall development of any country, the development of the financial sector is crucial. Unfortunately, the finance sector, particularly the banking business, is not as matured as that of its age. The infant market led economy that the country follows still falls short of supporting the demand of the people with respect to modern and improved banking practices. The diversified interest and demand of the society in banking service is always ahead of the supply. In particular, the vast and workable but financially poor, part of the society is totally refrained by the formal banks.

The government of Ethiopia has tried to develop different policies, legislations, directives and regulatory frameworks to supervise and enhance the financial sector. This can be attested, for example, by the effort of NBE in issuing legislations that allow the involvement of MFIs into the sector and encouraging commercial banks to lend these MFIs. Nonetheless, the regulatory body, NBE, still has a lot to do to make the MFIs achieve the objectives that they have stipulated since they are mobilizing susceptible funds.

This research paper tries to assess the performance of the MFIs and identify their determinants from different perspectives for the policy makers and the entire stakeholders. In other words, the paper attempts to give statistical insight in measuring the performance of the MFIs and thereby identifying the determinants of their performances as input to the over all development of the sector.

a) Interest of the Policy makers

Policy makers and other development agents need to know the performance of the MFIs in order to make the necessary adjustments or reforms so as to have a clear insight on their prospect. Accordingly, they have to be able to measure their performance. As the saying goes "You can't manage what you can't measure." Though there are efforts by the government and the concerned bodies to regulate and control the microfinancing activities, yet they are not exhaustive. Of course, measuring the performance of MFIs is not an easy task as it involves complex multidimensional concepts.

Bearing this in mind, the paper tries to unravel the status of the MFIs with respect to meeting the social objectives they have set and their operational sustainability.

b) Interest of the Stakeholders

Nowadays the interest on the MFIs goes beyond the development perspective. Different parts of the society are attracted into the activities of the MFIs in different ways/ objectives other than the empowerment / development of the poor society in the country. For example, the deposit they mobilized and their loan recovery rate attract the attention of many formal/ conventional banks. The percentage share of deposit that they mobilized is increasing at considerable rate. As per the information obtained from the NBE report, by the end of December 31, 2006, the total client saving was Birr 822.3 million which is about 1.7% (Birr 49,260.6 million) of the total deposit mobilized by the formal commercial banking industry and 5.6% of the deposit collected by the private ones.[1]

Experience of the commercial banks shows that unlike the old days liquidity problem becomes a great challenge for the formal, particularly for the private, banks to run their activities. Official reports evidence that the private commercial banks, particularly, are suffering from meeting the directive set by the NBE to keep their loan to deposit ratio of 85%. On the other hand, the demand to get loan from these commercial banks is increasing from time to time at an alarming rate. By the end of December 2006, the loan to deposit ratio of the private commercial banks was registered to be 93.2%, which is not in line with the rule set by the NBE (85%).[2] This situation stimulates the commercial banks to look for untapped deposit sources. Nowadays MFIs are considered as among the potential deposit sources and partners in the business. As a result, these private banks are showing interest in assessing the performance of the MFIs.

The performance of their loan recovery and their relative wider outreach are also the other attractions for the formal banks. As stated above, the objectives of these MFIs is to address the financial problem of the marginalized (under served) group of the society by the formal financial institutions. This considerably large part of the society is potentially marketable and perhaps an attention seeking.

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[1] *Author's computation based on the data obtained from NBE, Second Quarter 2006/07 Bulletin.*
[2] *Author's computation based on the data obtained from NBE, Second Quarter 2006/07 Bulletin.*

These and some other reasons make the formal banks to look deep at the MFIs and share their experience. In turn, they want to know the performances of the MFIs and their prospect in the banking business; either to work or compete with them.

In light of the problems aforementioned, the study tries to address the following questions:

- What are the underlining/latent factors that construct the performance dimensions of the MFIs;
- What determine these performance dimensions;
- What type of statistical model(s) best fits to predict the performance of the MFIs;
- How are the individual MFIs performing (generating performance index of the MFIs); and,
- As to whether there is trade-off among different performance dimensions.

1.6 Overall Objective of the study

The major objective of this study is to:

- measure the performance of the MFIs in the country in the year 2006 and thereby identify the determinants of their performance.

1.7 Specific Objectives

- To assess the major factors that determine performance of MFIs in Ethiopia;
- To develop a statistical model that can predict the performance of the MFIs given the determining factors; and,
- To provide an input for further study in the area.

1.8 Significance of the study

- Make enabling environment for scientific management decision;
- To provide information and evidence for pertinent bodies and stakeholders, such as, government, MFIs' managements, commercial banks and others, while developing policies and strategies regarding development of financial services;
- To provide estimates of national MFIs' performance index; and,
- Enhance Research and Development programs in the area.

1.9 Limitation of the study

- Due to very limited number of the MFIs in the country, consideration of many variables become unrealistic which causes loss of degrees of freedom;

- Constraints of data on some social performance indicators of the MFIs under consideration delimit the study on the available data only; and,
- Due to the absence of relevant financial statistics study on the specific Ethiopian MFIs, even banks, the research's literature review relies mostly on the descriptive and qualitative assessments of the MFIs in the country.

1.10 Scope of the study

The study is delimited only to assessing the performance and identifying their determinants of the 26 MFIs spread all over the country. The 27th MFI is not included in this study as it has not operated for at least one fiscal budget year while the study was conducted. The scope of the study is also limited only to the 2006 performance of the MFIs. Moreover, the social impact of the MFIs on the society is not addressed in this particular study.

1.11 Organization of the study

The rest of the paper is organized as follows. Chapter 2 briefly reviews the few related studies and chapter 3 gives an overview of the research methodology where the data sources and the techniques employed in the study are widely dealt. Then chapter 4 presents descriptive statistics and develops the econometric model. Finally, chapter 5 finalizes the study by providing conclusions and policy implications.

Chapter Two

General Literature

2.1. Theoretical Literature Review on Measuring Performance of Microfinance Institutions

"You can't manage what you can't measure."

Will Hewlett

As the saying goes above, in this competitive world, one has to measure an organization's performance in order to regulate and make the necessary reforms so as to meet organizational objectives and speed up the expedition. And hence, measuring the performance of a company is the crux of the overall operation of that firm whether it is engaged in service rendering, industry or any other activity.

Evidently, the kind of measurement that can be taken varies according to the specific interest of the party involved. However, to evaluate, particularly, the financial condition and performance of a company, the financial analyst needs certain yardsticks. The yardstick frequently used is a ratio, or index, relating two pieces of financial data to each other. James C. Van Horne in his book on "Financial Measurement and Policy" pointed out that financial ratios help us size up a company as to trends and relative to others. That is, the analysis of financial ratios involves two types of comparison. First, the analyst can compare a present ratio with past and expected future ratios for the same company. Second, the analyst can compare the ratios of one firm with those of similar firms or with industry averages at the same point in time. Such a comparison gives insight into the relative financial condition and performance of the firm.

For example, trade creditors are interested primarily on the financial analysis of their firm, such as, the liquidity. Their claims are short term and the ability of a firm to pay these claims is best judged by means of a thorough analysis of its liquidity. Investors in a company's common stock are concerned primarily with present and expected future earnings and the stability of these earnings about a trend, as well as their covariance with the earnings of other companies (Van Horne, 2003).

The issue of performance evaluation is more crucial in financial firms like banks. It would not be surprising that measuring the performance of banks to be a customary action of the top managements of banks as they are mobilizing the resource of the society.

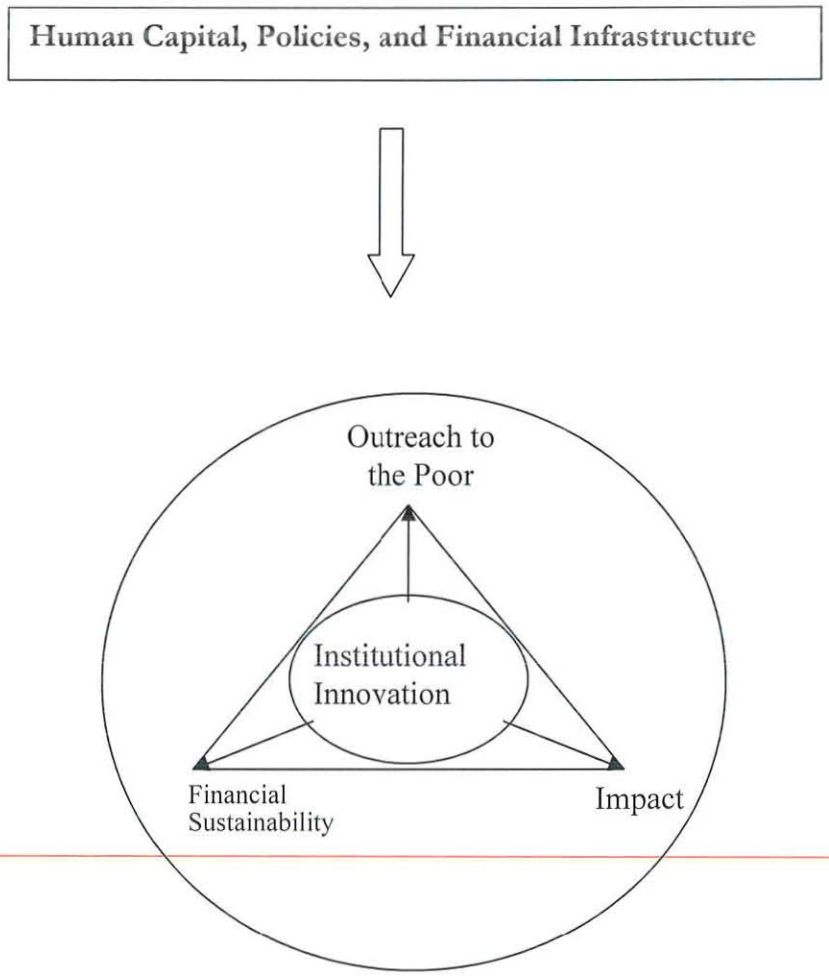
In almost all companies a single measure of performance alone doesn't suffice to evaluate the status of that company. A combination of many simultaneous measures of performance would give a better understanding of the company (Robert C. Higgins, 5th edition). This holds true for the banking business too. The most important yardsticks that the top management of a bank put an eye on are market shares and profitabily of their banks. Moreover, there are many financial ratios, like Return on Asset (ROA), Return on Equity (ROE), Operational Self-sufficiency (OSS), etc. that are used to measure and compare the performance of firms.

MFIs share similar properties with banks in such a way that they are regulated or supervised by a regulatory body; at least, because they collect deposit.[1] Nonetheless, with regard to measuring their performance, the situation is more complicated. MFIs face a double challenge: not only do they have to provide financial services to the poor (outreach), but they also have to cover their costs in order to avoid bankruptcy (sustainability). Both dimensions must therefore be taken into account in order to assess their performance (Ferro Lussi & Weber, 2006).

Others also argue that in order to make the evaluation of MFIs exhaustive, one has to consider the social impact of the MFIs besides their outreach and sustainability. Still the measurement of their impact is more argumentative and, to some extent, impossible because of subjectivity of measuring the impact of the MFIs on the society. Meyer (2002) also noted that evaluating impact presents the most serious empirical challenges. Besides, there is currently no widely accepted measure for assessing the social performance of MFIs, outreach always being defined in terms of several indicators, like the percentages of female and rural clients or the average loan size (Schreiner, 2002).

According to Meyer a consensus is emerging among analysts in evaluating performance of MFIs which is known as "Critical Triangle" (Meyer, 2002).

[1] *Note that: Two factors make a MFI's loan portfolios different from a bank's; first, because it is generally semi- or uncollateralized, and second, because repayment time is generally short, ranging from 3 to 12 months. Thus an MFI risks steep deterioration of its portfolio in a matter of weeks only (Roy Mersland and Reidar Øystein StrØm, 2007).*



In view of Meyer et al the triangle presents a conceptual framework for thinking about three overarching policy objectives: outreach to the poor, financial sustainability, and welfare impact. They believed that in order to make the evaluation exhaustive, criteria should be set for each of the three objectives and be measured accordingly (Meyer, 2002).

While explaining the diagram Meyer stated that, "The inner circle in the figure represents MFI innovations in technology, policies, organization, and management that affect how well each objective is met. The outer circle represents the environment within which micro finance operates that also affects performance. This environment broadly includes the human and social capital possessed by the poor, the economic policies of the country, and the quality of the financial infrastructure that supports financial transactions. Improvement in the environment makes it easier for the MFIs to reach the three objectives." Mayer (2002:2).

Likewise, Youssoufou et. al. remarked that "Today, there is neither an agreed upon nor a widespread definition of a well-performing MFI. The performance criteria and indicators used vary significantly from one author to another or from one organization to another, since they depend on the methodological approach, which in turn depends on the determination to give priority to the supply side or to the demand side of the financial intermediation," (Youssoufou, 2002). However, the author referring the two contrasting school of thoughts; 'welfarist'[1] and 'institutionalist'[2] pointed out the commonly known 'microfinance schism'. Youssoufou said, "This schism is also characterized by the methods to evaluate the performance of MFIs. The 'welfarist' measure the performance of MFIs on the basis of 'welfare studies' or 'household studies'. They are interested in MFIs' impact on the living conditions of the beneficiaries. Welfare studies are strongly criticized by the 'institutionalists' because of their subjectivity, their cost and the methodological difficulties they introduce. They would rather deal with 'institutional studies'. They are interested in market variables, such as the repayment rate, transaction cost, the degree of financial self-reliance, etc. The welfarists, in turn, object to the institutionalists because of their failure to take into account the outreach performance as well as MFIs effect on the poor. Therefore, they propose other performance criteria: the number of savings accounts or the number of loans, the improvements in productivity, income, capital accumulation, food expenditure, and social services (education, health, housing, etc.) (Youssoufou, 2002).

It can be figured out that, one way or the other, the issue of measuring the performance of MFIs spins at evaluating the performance of the MFIs with respect to outreach, sustainability and impact assessment. Acknowledging these indicators cited by the different authors above, it is worthwhile to look at them in detail.

i) Outreach Indicators

The term outreach covers a wider range of concepts beside the number of the clients served by an MFI. To Anne-Lucie et al (2005), outreach is the efforts of MFIs to extend

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[1] *The 'welfarist approach' or the 'directed credit approach' is reaching the greatest number of poor people and providing them with financial services at a low cost. These microcredit programs are largely subsidized and promoted by governments and donors as an integrated program of poverty alleviation and welfare improvement in favour population.*

[2] *'institutionalist approach' or 'financial market approach' focuses on establishing unsubsidized institutions which offer savings and credit services on sustainable and commercial bases (for example, by charging high interest rates).*

microfinance services to the people who are underserved by financial institutions. They believe that, "Outreach can be measured in terms of breadth – number of clients served and volume of services (i.e., total savings on deposit and total outstanding portfolio) – or depth – the social economic level of clients that MFIs reach." (Anne-Lucie et al, 2005). Here, it is worthwhile to notice that an MFI is said to have reach deeper outreach if it targets the client group that are most vulnerable such as women and/or people with very low income.

Likewise, Meyer (2002) admitted that the concept of outreach to the poor is multidimensional and emphasized on the four types of outreach measures: number of persons now served, number of women, depth of outreach and the number of financial services provided. According to him, the number of persons now served is those who were previously denied access to formal financial services whereas number of women is considered among one measure of outreach to the poor since women face greater challenges than men in accessing financial services. Moreover, Meyer et al. use depth of outreach to evaluate how well MFIs reach the very poor though it is difficult to measure. Depth of outreach literally meant to assess if the MFI is focusing on the poorest of the poor. The other measure of outreach included by Meyer et al in their "Critical Triangle" is the number of financial services provided by the MFI. As it is known, the demand of the poor and their welfare will be improved if efficient and secure savings, insurance, remittance transfer and other services are provided in addition to the loans that are the predominant concern of policy makers.

In line with the above notion many researchers and practitioners use different tools while measuring outreach. These include: growth in the number of loan clients, borrowers dropout rate, average loan size, percent of active women borrowers, growth in the number of voluntary depositors, average voluntary deposit balance and percent of voluntary women savers.

ii) Sustainability/ Profitability

The sustainability of MFIs is the other crucial measure which puts the MFIs under scrutiny. Practically, many MFIs heavily rely on donations and debts in order to finance their business. However, MFIs have to be able to finance themselves so as to stay in the economy and put a long lasting positive impact on improving the living standards of the society as the interest and/or potential of donors die out with time. Meyer (2002)

supporting this idea said that, "The poor need to have access to financial service on long term basis rather than just a one time financial support."

This could be done by collecting revenue from loans, financial services in the form of interest fees, penalties, commission and investment. These financial activities also, in turn, generate various expenses from general operating expenses and the cost of borrowing to provisioning for the potential loss from defaulted loans (Anne-Lucie et al, 2005).

One way or the other, these financial transactions should be regulated to insure the wellbeing of the MFI. The approach still could be different. For example, Meyer (2002) disintegrated financial sustainability into two levels: lower and higher level financial sustainability. The lower level of achievement is an achievement in which the MFI reaches operational self-sustainability meaning that operating income is sufficient to cover operating costs, including salaries and wages, supplies, loan loss, and other administrative costs. On the other hand, he noted that a higher standard is achieved if financial self-sustainability is attained. This is a higher standard because it means that the MFI can also cover the costs of funds and other forms of subsidies received when they are valued at market rates.

Other practitioners and researchers also used other additional indicators to assess the sustainability of the MFIs besides the Operational Self-Sustainability and Financial Self-sustainability. These include:

- Gross Financial Return: It is the ratio of Adjusted Gross Financial Margin to Average Total Asset. It measures the profitability of assets in a given period of time without considering the difference in loan loss provisioning and operating costs. This ratio focuses on the net effect of direct income and costs by netting out differences in interest and fee structures charged by and incurred by the MFI. Also it excludes effects of loan loss provision and operating costs which are included in the loan loss provision expense ratio (portfolio quality indicator) and operating cost ratio (efficiency indicator). Ideally, MFIs of different sizes and ages could be comparable using the ratio as it looks at profitability without regard to portfolio quality and scale of operations. However, this ratio could be influenced by the capital structure of the MFI as MFIs differ in their funding liabilities (commercial concessionary liabilities and/ or granted equity);

- Adjusted Return on Assets (ROA): It is the ratio of Adjusted Net Operating Income to Adjusted Average Total Asset. This ratio indicates how well an MFI uses all its assets profitably. It indicates an overall measure of profitability that reflects both the profit margin and the efficiency of the MFI. Due to differing capital structures MFIs could have ROA that could not be merely compared. [As a result, some analysts recommended adding back interest and fees they paid on their funding liabilities (plus related adjustments) to the adjusted operating income in computing this ratio.]; and,

- Adjusted Return on Equity (ROE): It is the ratio of Adjusted Net Operating Income to Adjusted Average Total Equity. This ratio measures the profit that equity is generating and thus accruing to shareholders. Because different MFIs may finance their assets using different capital structures, this ratio smoothes out difference in funding strategies and is thus superior to the Adjusted Return on Assets.

Practically, ROA and ROE are appropriate indicators for unsubsidized institutions. But donor interventions more typically deal with institutions that receive substantial subsidies, most often in the form of grants or loans at below-market interest rate (soft-loan). In such cases, the critical question is whether the institution will be able to maintain by itself and grow when continuing subsidies are no longer available. To determine this, normal financial information must be "adjusted" to reflect the impact of the present subsidies. Three subsidy adjusted indicators are in common use: Financial Self-sufficiency (FSS), Adjusted Return on Assets (ROA), and the Subsidy Dependence Index (SDI). These measures are complex and there are slight variations in the ways of calculating each of them.

In the meantime, it would be wiser to keep in mind that sometime there could be a trade-off between sustainability and outreach. Ferro Luzzi and Weber et al (2006) noted that MFIs trying to be the most socially performant will encounter some difficulty to be financially effective. They believe that there are times when trade-offs are inevitable.

iii) Impact Assessment

The fact that poor people benefit disproportionately from financial intermediary is not a bone of contention. Conventional banks ask the poor, but economically active people, high collaterals and loan interests in order to provide them credit services. This, in turn, hinders the people from utilizing their natural and physical resources in their effort to fight

poverty. It has been well established that increasing access to finance has both private and social benefits. To this end, MFIs are believed to be the appropriate instruments to fill the gap.

Governments and many NGOs exert much energy in supporting MFIs to meet this social objective. However, these parties and many other stakeholders want to be sure that the policy they develop and the resources they mobilize really address the aimed purpose, poverty reduction and its ultimate eradication. At this junction, it necessitates them to measure the social impact of the MFIs.

But before measuring the impact of the MFIs, it is mandatory to put "poverty" in focus, first. According to the definition of the World Bank (accessed on the website www.worldbank.org), "Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom."

Similarly, to Heather Montgomery and John Weiss, poverty is an income (or more broadly welfare) level below a socially acceptable minimum. They continued on their poverty definition by saying that, "The condition of poverty has been interpreted conventionally as one of lack of access by poor households to the assets necessary for a higher standard of income or welfare, whether assets are thought of as human (access to education), natural (access to land), physical (access to infrastructure), social (access to networks of obligations) or financial (access to credit) (World Bank 2000:34)."

Yet, given the definitions of poverty, it is not a simple task to measure the impact of MFIs on their clienteles in reducing poverty. The problem basically emanates from reaching consensus on what is expected from MFIs in improving the living standards of their clienteles. Many scholars have forwarded different ways of evaluating the social impact of the MFIs in reducing poverty. For example, according to Meyer (2002), "Impact assessment is defined as attributing specific effects, impacts, or benefits to specific interventions, in this case, improved access to financial services."

He further noted that assessment of impact of the MFIs on their clients is a very difficult and controversial way of evaluating the institutions' performance. "Because of the

methodological difficulties and high costs involved in conducting robust studies, it has been argued that the most important evidence of impact should be whether or not MFI clients continue to use the services. Impact analysis, therefore, should focus on understanding the impacts on MFIs of programs offering services to the poor rather than impacts on the clients of such services. A counter argument is that most of the industry requires substantial amounts of public funds at least in the form of start-up costs if not in the form of long-term subsidization. These funds have opportunity costs (they have alternative uses for society) so policy makers need evidence as to whether or not clients are receiving direct measurable benefits from microfinance. If not, the funds should be allocated to other means to fight poverty. Moreover, in light of the large number of dropouts reported by some MFIs and the opportunity to redesign MFI products to better meet client demands (Meyer, 2002), the issue of impact on clients is increasingly important."

Swain (2004), similarly, put the situation as follows. "Proper and scientifically robust impact assessment and statistical evaluations have been limited due to the view that evaluations are a waste of time and money and a diversion from running the programs themselves. Besides, these detailed evaluations pose difficult statistical issues such as selection bias, non-random program placement and lack of instrument and paucity of properly collected data."

Despite all these complications of measuring impact of MFIs, many researchers use different approaches to measure it. The major ones are Scientific Methodology (Experimental and Quasi-Experimental), Qualitative Methodology and Participatory Learning and Action (Swain, 2004).

2.2 Empirical Literature Review on Measuring Microfinance Institutions

Many promoters of the microfinancing industry have done relevant works in measuring the performances of MFIs from different perspectives. Institutions like Consultative Groups to Assist the Poor (CGAP)/World Bank, United States Agency for International Development (USAID), Microinterprise Innovation Project, Social Performance Indicators Initiative (SPI), PEARLS by the World Council of Credit Unions, Asian Development Bank Institute (ADBI), United Nations Capital Development Fund

(UNCDF), MicroSave-Africa, etc. can be cited globally on their relevant works other than the efforts made by different practitioners and bodies at country levels.

A relatively old census conducted by International Food Policy Research Institute (IFPRI) in 1999 on MFIs in 85 countries in Asia, Africa, and Latin America prevailed that 1,500 institutions (790 institutions worldwide plus 688 in Indonesia) supported by international organizations had reached 54 million members, 44 million savers (voluntary and compulsory savings), and 23 million borrowers. The total volume of outstanding credit was also $18 billion. The total savings volume is registered to be $12 billion, or 72 percent of the volume of the outstanding loans. MFIs had developed at least 46,000 branches and employed around 175,000 staff by then. Lapenu and Zeller had also anticipated that with this figures, the Micro-Credit Summit objective to reach 100 million poor people by 2005 appeared, to them, to be achievable (Cécile Lapenu and Manfred Zeller, 2001).
"The CGAP estimated that only about 3-5 per cent of MFIs worldwide were financially sustainable by the year 2002. Another 7-10 per cent was expected to become financially sustainable within ten years. The other 90 per cent of MFIs will either fold or continue requiring subsidies (Gurgand et al. 1996)," (Yousoufou, 2002).

Mersland and StrØm, quoting Christen et al. (2004), noted that an astonishing 500 million persons are served, mostly with savings accounts, while the Microcredit Summit in the 2006-meeting in Halifax celebrated the milestone of 100 million borrowers reached (Mersland and StrØm. 2007).

At a country level, Bangladesh and Indonesia are on top of the list among those countries which promoted microfinance industry and benefited their poor citizens. Specially, ever since the mid of 1970's, the effort of professor Muhamad Yunus to create a micro credit service in Bangladish, which finally culminated by the creation of the Grameen Bank in 1978, has put a significant impact in the financial intervention in the country. This great deed of professor Yunus has made him and Grameen Bank win the Nobel Peace Prize in 2006. In 2001, Grameen Bank had lent in microcredits a total of US $2.4 billion to about 2.3 million small and medium enterprisers, of which 96% are women. Twelve million Bangladesh citizens were already assisted by Grameen Bank programs, which, in the meantime, diversified the offer with real estate credit, savings products, health insurance, etc (José Augusto Tomo Psico).

According to the research made by Anne-Lucie et al, MFIs in Africa are dynamic and growing. 57 per cent of the MFIs among the 163 included in their survey were created eight years ago and 45 percent of them were four years prior to their study (Anne-Lucie et al, 2005).[1] They have also found out that African MFIs tend to report low level profitability (as measured by return on asset) and they are among the most productive globally (as measured by the number of borrowers and savers per staff members). The other astonishing finding of their study is that MFIs in Africa also demonstrated higher level of portfolio quality with an average portfolio at risk over 30 days of only 4.0 percent (Anne-Lucie et al, 2005).

Some qualitative and descriptive studies indicated that MFIs in Ethiopia are also among the fast growing MFIs in the region. An interesting survey by the Association of Ethiopian Microfinance Institutions (AEMFI) conducted during 2005 revealed that as per end-of-year 2005, the then 26 operational MFIs served 1,277,939 borrowing clients with an aggregated portfolio of Birr 1,622 billion. In terms of outreach these figures represent a nearly 300 percent increase from end-of-year 2001. The survey also indicated that most MFIs are doing remarkably well in terms of financial performance given their relative short track records. It was reported that of the 15 MFIs under reviewed 10 MFIs have reached operational self-sufficiency, while only 5 out of 15 MFIs have reached financial sustainability[2].

Moreover, the survey also noted that personnel and loan officer productivity of Ethiopian MFIs are higher than that of the average for African MFIs (Tsegaye, 2007).
A very recent report released by Forbes magazine prevailed that two MFIs in Ethiopia, Amhara Credit and Saving Institution (ACSI) and Dedebit Credit and Saving Institution (DCSI), have been rated among the top 50 MFIs in the world. Forbes ranked ACSI sixth in the world and second in Africa, next to a Moroccon institution called Bandhan, and DCSI stood 31st in the rank (The Daily Monitor Vol. XIV, No. 305, Dec. 29-30, 2007).

As noted above, almost all methods of performance evaluation of the MFIs is based on describing the status of the MFIs on each and every performance indicator yardsticks or ratios. This approach is very hard to track as the number of performance indicators is very

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1 All indicators in their study, including the age of the MFIs, were considered at the end of 2003.
2 A higher than 100% rate is indicative of a long-term sustainability as the guideline of Performance Indicators for Ethiopian MFIs' depicted.

large and a good performance on a single indicator alone doesn't guarantee the over all wellbeing of the MFI. Hence, one has to devise a method that would address all important indicators at a time and ease the evaluation of the MFIs by reducing the number of variables into manageable ones without loss of information. With this perspective, this paper tries to add an alternative statistical insight in evaluating the performance of the MFIs by employing multivariate techniques that would reduce the number of performance indicators into a latent and unique factor by closely scrutinizing the correlation matrix of the variables considered. Accordingly, the study will try to identify the determinants of the performance of MFIs in Ethiopia based on these newly synthesized performance indicators of the MFIs.

Chapter Three

Research Methodology

3.1. Data Type and Source

The data employed in this study are secondary and cross-sectional data type. The observed performance of the 26 MFIs at the year-end of 2006 is utilized in the major data analysis part while synthesizing the performance measure of the MFIs and identifying the determinants of their performance.[1] Besides, a time series data of some variables are used in the descriptive part of the analysis in order to give a general overview of the industry in the country. In terms of reliability of the information, all of the data are self-reported by the MFIs to the AMFIE and/or NBE. No adjustments, i.e. adjustments to address the effects of subsidies, inflation, loan-loss provisioning, and other items, have been made on the data employed in this study.

3.2. Methodology

The methodology employed in this study for measuring the performance of the MFIs and identifying the determinants of their performances is discussed below. SPSS and STATA statistical software are also employed. Statistical techniques such as Explanatory Factor Analysis and Seemingly Unrelated Regression (SUR) are applied in the analysis.

3.3 Measuring the Performance of MFIs

Unlike the conventional banks, which are profit oriented, the objective of MFIs is dual purpose. MFIs are expected to improve the living standards of the society by serving as large part of the society (outreach) as possible through financial interventions besides their subsistence in the economy by themselves. This unique nature of the MFIs makes the evaluation of their performance more complicated.

Many practitioners and researchers have forwarded different evaluating mechanisms of the MFIs. The most widely used performance assessment mechanisms are descriptive analysis of financial ratios and observed scores of some indicators. Most of the analysts categorize the number of indicators broadly into two dimensions: outreach and sustainability dimensions. Others also try to incorporate the impacts of the MFIs while evaluating their

[1] *The 27th MFI is not included in this study because it had not operated for at least a year while the study was conducted.*

performance. However, since the concept of impact is very wide and hard to quantify it, its assessment is left uncovered in this study.

Among the outreach indicators, number of clients, number of savers (compulsory and voluntary), number of women borrowers, outstanding loan portfolio and the amount of deposit can be cited. On the other hand, based on the assumption that self-sustainability of the MFIs depends on the interest rates of loans, quality of loan portfolio, productivity of the staff and financial and administrative costs, analysts widely use yardsticks like operational self-sufficiency, financial self-sufficiency, return on assets, return on equity, loan portfolio quality, profit margin, and many other ratios to evaluate the sustainability of the MFIs.

Some organizations like AEMFI categorized the performance indicators into eight broad dimensions while considering the performance of the MFIs in the country, with a number of indicators in each of the eight dimensions (Tsegaye, 2007). These are:

a) ***Financial Structure:*** this includes indicators like capital to asset ratio, commercial funding liabilities ratio, debt to equity ratio, deposits to loans etc;

b) ***Outreach Indicators:*** in this category, indicators like number of active borrowers, percent of women borrowers, gross loan portfolio, etc. are included;

c) ***Overall Financial Performance:*** includes return on asset, return on equity, operational self-sufficiency, and financial self-sufficiency;

d) ***Revenue:*** this dimension includes indicators such as nominal and/or real yield on gross portfolio, profit margin, etc;

e) ***Expense:*** in this dimension total expense ratio, financial expense ratio, loan loss provision, etc are included;

f) ***Efficiency:*** the indicators included in this dimension encompass ratios such as operating expense to loan portfolio and personnel expense to loan portfolio;

g) ***Productivity:*** the indicators in this category are those of borrowers per loan officer, personnel allocation ratio and others; and

h) ***Risk and liquidity:*** indicators such as portfolio at risk greater than 30 days, write-off ratio, loan loss rate etc are included.

Methodologically, almost all researchers and practitioners employ ratio analysis and in-depth analysis of some outreach indicators. They compute the ratios specified above and try to scrutinize the status of the MFIs as per every indicator. The indicators to be utilized may vary from researcher to researcher and from research area to research area according to the availability and the importance of the data as per the researcher's belief.

The crucial fact here is that considering a single indicator alone would not make sense to judge the overall performance of the MFI. Moreover, one can not use an indicator alone as a standard one in explaining the performance of the MFI since a typical indicator may not be better than another one. Each and every indicator reflects the status of an MFI from a particular perspective it is designed to address. So, one has to use a number of indicators simultaneously from each and every dimension in order to have a complete assessment of the MFIs.

However, the evaluation of the performance of MFIs with the indicators mentioned above has its own limitations. As the number of indicators becomes numerous, it would be cumbersome to deal with each and every indicator. The other limitation of these ratios is that either they fail to capture the information they were intended to exhaustively or over specify it redundantly. In other words, there could be systematic dependencies and correlations among these indicators.

The main consequence of this approach is that it is hard to point out the determinants of the performance of MFIs as the number of performance indicators becomes numerous. Due to this, policy makers and other stakeholders lose positions as to where to concentrate their resource and energy. Hence, one needs to reduce this large number of indicators into manageable ones with out any loss of information in order to have an over all image of the MFI with respect to the other MFIs or its current status with previous periods. This, in turn, leads to devising strong data reducing statistical techniques to make the procedure easy so that everybody can have a clear image in the evaluation of the MFIs. In line with this argument Luzzi and Weber noted that aggregating numerous indicators into one single measure would be useful since it would give a straight and accurate view of the performance of MFIs (Luzzi and Weber, 2006).

Unfortunately, there are almost no notable efforts that employed data reduction techniques to aggregate the numerous indicators while evaluating the performance of

MFIs at country or international levels, at least to the knowledge of the author, except that of the work of Luzzi and Weber. Luzzi and Weber employed factor analysis to reduce the number of variables, but the number of variables they exercised was very few and, except a single indicator for the sustainability measure, all the variables they incorporated were outreach indicators. That is, they gave more emphasis in addressing the outreach dimension.

At country level, researches on measuring the performance of MFIs are not customary actions. Particularly, quantitative performance analysis of MFIs is not employed in our country except for the limited efforts of the AEMFI which also suffers from full information of the entire MFIs besides loss of consistency and continuity.

At this junction, the paper tries to fill the gap in this regard by employing statistical data reduction techniques so as to identify the common factors that explain the dimensions of outreach and sustainability and their unique factors associated to each of them independently. This is believed to ease the effort of presenting evidences on the determinants of MFIs' performance in a multidimensional context. Finally, based on the newly synthesized data, the paper will try to capture the determinants of the performance of the MFIs in the country by employing seemingly unrelated regression analysis.

3.4. Description of the explanatory Variables

The variables included are:

- **Outreach indicators**: These include the well known outreach indicators like number of active borrowers and the amount of loans disbursed to clients.
- **Sustainability indicators:** Operational self-sufficiency and financial self-sufficiency indicators are included in this dimension of performance. The variables included in the entire study are described on Table 3.4, with their descriptions to follow.

Table 3.4.1: Description of variables

Type of variables	Variable designation	Definition	Data type &/or measure of unit
Performance indicators of MFIs	Y1 (glptota)	Gross Loan portfolio to Total Asset Ratio	Continuous, in %
	Y2 (oss)	Operational Self-sufficiency	Continuous, in %
	Y3 (pm)	Profit Margin	Continuous, in %
	Y4 (deposit)	Total amount of deposit mobilized	Continuous, Birr
	Y5 (glp)	Gross loan portfolio	Continuous, Birr
	Y6 (nab)	Number of Active Borrowers	Discrete
	Y7 (roa)	Return on Asset	Continuous, in %
Dependent variable	Si, i=1, 2, 3,...	Performance	Continuous
Independent variables	Z1 (FRtoTA)	Financial Revenue to Total Asset	Continuous, in %
	X2 (avgloan)	Average amount of loan per capita	Continuous, Birr
	X3 (stafperbranch)	Average Number of Staffs per branch	Continuous
	Z4 (BPSS)	Average Number of Borrowers per staff size	Continuous
	X5 (capital)	Capital	Continuous, Birr
	X6 (nservices)	Number/Types of financial services	Discrete
	X7 (branch)	Branch	Discrete
	Z8 (CPB)	Cost per borrower	Continuous, Birr

3.4.1 Description of Performance Indicators

a) Gross Loan portfolio to Total Asset Ratio – This ratio measures the weight of the investment in total loan portfolio relative of total assets. The higher the ratio the better the management of loan portfolio in particular and total assets in general.

b) Operational Self-sufficiency – is among the most widely used performance indicators. It is the ratio of operating revenue to total expense. This ratio is expected to

capture whether the revenue of the MFI is sufficient enough to cover its operating costs, including salaries and wages, supplies, loan loss, and other administrative costs.

c) Profit Margin- it is the ratio of net operating income to operating revenue. This ratio is used to assess how the MFI obtains revenue. This is expected to have a positive impact on the sustainability of the MFI.

d) Total amount of Deposit – The total amount of deposit mobilized by an MFI is an immediate manifestation of the outreach performance of the MFI. One may argue that the deposit may be collected from very few customers. But this argument doesn't sound good as the clients of the MFI's are expected to be poor and almost all the savers are loaners from the MFI, otherwise, they would rather prefer to go to the formal commercial banks. Hence, the larger the amount of deposit an MFI has the greater the outreach performance of the MFI. This indicator would have an effect on the financial performance of the MFI as it is one source of financing the MFI's operation.

e) Gross amount of loan disbursed – As loan disbursement for the poor to finance their businesses is among the basic objectives that the MFIs are established for, the gross amount of loan that the MFIs have disbursed is a crucial indicator of the outreach performance of the MFIs.

f) Number of Active Borrower- among the most widely used outreach indicators number of active borrowers is the immediate one. The larger the number of the active borrowers, the more dedicated the MFI is to address the larger poor society.

g) Return on Asset- this ratio is widely used to assess the self-sustainability of the MFIs. It is obtained as a ratio of net operating income to total asset. Generally, a positive return indicates that the MFI uses all its assets profitably.

3.4.2 Description of Independent Variables

a) Financial Revenue to Total Asset – This ratio is expected to have a paramount effect on the sustainability of the MFI considered as it is a revenue indicator.

b) Average Loan per Borrower - This ratio measures the amount of loan size that the MFI disburses to its clients on average. The smaller the loan size the greater the endeavor of the MFI to address the poorest part of the society. Some authors also divide this ratio by the GNP per capita of the country in order to indicate the depth of loan services in

addressing poverty by the MFI in that country. This variable is also expected to affect the sustainability effort of the MFIs as the smaller the loan size the higher the cost of transaction and risk of loan loss.

c) Staff per Branch – This variable is expected to affect the outreach performance of the MFIs. As the number of the staff in each branch increases, the number of clients is expected to increase due to the fact that the staff would have enough time and resources to attract more clients. This may, on the other hand, has an adverse effect on the financial performance of the MFIs.

d) Borrowers per Staff Size – This variable has conceptually similar implications with that of the staff per branch variable but in reverse direction. If the number of borrowers that a single staff handles increases uncontrollably, then it will have an adverse effect on the outreach performance of the MFI.

e) Capital – The paramount effect of capital on every performance dimensions of an MFI is not controversial. And hence, this variable is included in the study anticipating it would have a multidimensional effect on the performances of the MFI.

f) Types/Number of Financial Services Rendered - This variable is thought to affect the outreach of the MFIs as the number of services rendered by the MFIs increases, the number of customers is also expected to increase. Moreover, it has an immediate effect in increasing the revenue of the MFIs. Generally, this variable is expected to have a multidimensional effect on the performances of the MFI.

g) Branch- like the number of clients and financial services rendered, this variable is also expected to have a positive effect on the dimension of outreach essentially, and the sustainability of the MFIs implicitly.

h) Cost per Borrowers – this ratio measures the efficiency of the MFI by indicating the average cost of maintaining an active borrower. As a result, it is expected to affect the sustainability of the MFI.

The variables considered in this study are limited to this width since consistent information about the MFIs that could be obtained from the data providers is restricted only to these. Besides, as the number of the MFIs operating in the country is very few, increasing the number of variables will result in a loss of degrees of freedom. For these reasons, the

variables to be considered in this study are limited to these very crucial/ important ones. At this junction, the dependent variable(s) is (are) the measures of the performance(s) of the MFIs which are to be synthesized from the performance indicators via factor analysis.

3.5 Statistical Procedures Used

3.5.1. Explanatory Factor Analysis (EFA)

Explanatory Factor Analysis (EFA) is a modeling technique that attempts to "explain" correlations among a set of observed (manifest) variables through a linear combination of a few unknown number of latent (unobserved) random factors. The procedure was originated by the psychologist Charles Spearman in the early 1900's to model human intelligence.

This technique is often confused with a similar technique called Principal Component Analysis (PCA). The reason behind is both PCA and FA usually begin with an analysis of variance of a set of variables as characterized by the correlation or covariance matrix and also both may be used to characterize the variation by a few hypothetical constructs. PCA determines the factors which can account for the total (unique and common) variance in a set of variables. This is appropriate for creating a typology of variables or reducing attribute space.

FA determines the least number of factors which can account for the common variance in a set of variables. This is appropriate for determining the dimensionality of a set of variables such as a set of items in a scale, specifically to test whether one factor can account for the bulk of the common variance in the variables.

3.5.1.1 Uses of Factor Analysis

Factor analysis is used to uncover the latent structures (dimensions) of a set of variables. It reduces attribute space from a larger number of variables to a smaller number of factors and as such is a "non-dependent" procedure (that is, it does not assume a dependent variable is specified). Factor analysis could be used for any of the following purposes:

- To reduce a large number of variables to a smaller number of factors for modeling purposes, where the large number of variables precludes modeling all the measures individually. As such, factor analysis is integrated in structural equation modeling (SEM), helping confirm the latent variables modeled by SEM. However, factor analysis can be and is often used on a stand-alone basis for similar purposes;

- To select a subset of variables from a larger set, based on which original variables have the highest correlations with the principal component factors;
- To create a set of factors to be treated as uncorrelated variables as one approach to handling multicollinearity in procedures such as multiple regression;
- To validate a scale or index by demonstrating that its constituent items load on the same factor, and to drop proposed scale items which cross-load on more than one factor;
- To identify clusters of cases and/or outliers; and,
- To determine network groups by determining which sets of people cluster together.

3.5.1.2 The Factor Model

Assume that the observable random vector Y, in this particular case the performance indicators of MFIs, with p components has mean μ and covariance $\sum$. The factor model postulates that Y is linearly dependent upon a few unobservable random variables $f_1, f_2, \ldots, f_k$ called common factors, k<< p and p additional source of variation $e_1, e_2, e_3, \ldots, e_p$ called errors or specific factors.

The factor analysis model is given by

$$Y_i - \mu_i = \sum_j \lambda_{ij} f_j + e_I = c_i + e_i, \quad i= 1,2, \ldots, p; \; j=1,\ldots,k, \qquad (3.5.1.1)$$

where, $c_i = \sum_j \lambda_{ij} f_j$.

In its matrix form it is given by

$$\underset{(px1)}{Y} - \underset{(Px1)}{\mu} = \underset{(Pxk)}{\Lambda} \; \underset{(kx1)}{F} + \underset{(px1)}{\varepsilon} \qquad (3.5.1.2)$$

where $\underset{(Pxk)}{\Lambda}$ is a matrix of unknown constants called factor loadings

$$\underset{(Pxk)}{\Lambda} = \begin{pmatrix} \lambda_{11} & \lambda_{12} & \ldots & \lambda_{1k} \\ \lambda_{21} & \lambda_{22} & \ldots & \lambda_{2k} \\ & & \ldots & \\ \lambda_{p1} & \lambda_{p2} & \ldots & \lambda_{pk} \end{pmatrix}$$

$$\mathbf{F} = [f_1, f_2, \ldots, f_k] \text{ and } \varepsilon = [e_1, e_2, \ldots, e_p]$$

The coefficient λ_{ij} is the loading of the i^{th} variable on the j^{th} factor.

F = a vector of random, unobserved latent factors; and,

ε = a vector of random errors.

In the previous expanded equation model (3.5.1.1),

μ_i = mean of variable i;

e_i = i^{th} specific factor;

f_j = j^{th} common factor; and,

λ_{ij} = loading of the i^{th} variable on the j^{th} factor.

The variance of a random observation Y_i (σ_i^2) is

$$\sigma_i^2 = \lambda_{i1}^2 + \lambda_{i2}^2 + \ldots + \lambda_{ik}^2 + \psi_i$$

$$\text{Var}(Y_i) = \text{var}(c_i) + \text{var}(e_i) = h_i^2 + \psi_i .$$

The variance of the common part of Yi is represented by h_i^2 and is called the common variance or communality of the response and the var $(e_i) = \psi_i$, the i^{th} diagonal element of Ψ, is termed the unique, or specific variance or the uniqueness of Yi.

In this study, the common factors are allowed to be correlated (non-orthogonal), rather than independent. This is because of the fact that the different dimensions of performance are expected to be linked. As a result an oblique model will be entertained. Hence, additional assumptions are set as follows:

3.5.1.3 Assumptions of factor model:

1. $E(Y) = \mu$;
2. $E(F) = E(\varepsilon) = \mathbf{0}$;
3. $\text{Cov}(F) = \Phi$, where $\Phi \neq I$;
4. $\text{Cov}(\varepsilon) = E(\varepsilon \varepsilon^T) = \Psi_{pxp}$, Ψ is a diagonal matrix
5. $\text{Cov}(\varepsilon, F) = E(\varepsilon, F^T) = \mathbf{0}$; and,
6. $\text{Cov}(Y) = \Sigma$.

3.5.1.4 Covariance Structure of the Non-orthogonal Factor Model

As a result of the assumptions set above, the covariance matrix Σ for each observation Y has the structure:

$$\Sigma = \text{Cov}(Y) = \text{Cov}(\Lambda F + \varepsilon)$$
$$= \Lambda \text{ Cov}(F) \Lambda^T + \text{Cov}(\varepsilon)$$
$$= \Lambda \Phi \Lambda^T + \Psi \qquad (3.5.1.3)$$

and the resulting common factors are said to be oblique. And hence,

1. $\text{Cov}(Y) = \Lambda \Phi \Lambda^T + \Psi$

2. $\text{Var}(y_i) = \sigma_i^2 = \lambda_{i1}^2 + \lambda_{i2}^2 + \ldots + \lambda_{ik}^2 + \psi_i$; where ψ_i is the i^{th} specific factor.

3. $\text{Cov}(y_i, y_j) = \lambda_{i1} \lambda_{j1} + \lambda_{i2} \lambda_{j2} + \ldots + \lambda_{ik} \lambda_{jk}$; $i \neq j$ (3.5.1.4)

   where $\lambda_{ij} = \text{Cov}(y_i, f_j)$

4. $\text{Cov}(Y, F) = \text{Cov}(\Lambda F + \varepsilon, F)$
   $= \Lambda \text{ Cov}(F, F) \Lambda^T + \text{Cov}(\varepsilon, F)$
   $= \Lambda \Phi \Lambda^T$, loading matrix; $\text{Cov}(\varepsilon, F) = \mathbf{0}$. (3.5.1.5)

If standardized variables are used, Σ is a correlation matrix so that (3.5.1.3) becomes

$$P_\rho = \Lambda \Phi \Lambda^T + \Psi \qquad (3.5.1.6)$$

and the loadings λ_{ij} become correlations. Then (3.5.1.4) becomes

$$\text{Cov}(y_i, y_j) = \rho_{ij} = \lambda_{i1} \lambda_{j1} + \lambda_{i2} \lambda_{j2} + \ldots + \lambda_{ik} \lambda_{jk} \qquad (3.5.1.7)$$

where, the diagonal elements of P_ρ are 1.

The goal of EFA is to obtain a few factors that adequately reproduce Σ or $P\varrho$ if one uses standardized variables. In (3.5.1.3) there are $p(p+1)/2$ elements in Σ. They are to be represented in terms of the

$pk + [\frac{k(k+1)}{2}] + p = (\frac{k+1}{2})(2p+k)$ unknown parameters in $\Lambda, \Phi \text{ and } \Psi$.

3.5.1.5 Methods of estimation of loading

If the off diagonal elements of the sample covariance S are small or those of the sample correlation matrix R essentially zero, the variables are not related. This implies that a factor analysis will not prove useful and in these circumstances, the specific factor plays a dominant role. If the covariance matrix appears to deviate significantly from a diagonal matrix, then a factor model can be entertained and the initial problem is one of estimating the factor loading λ_{ij} and specific variance Ψ_i.

There are different parameter estimation methods in explanatory factor analysis. Principal Factor Analysis (PFA), Iterated Principal Factor Analysis (IPFA), Maximum Likelihood Estimation Method and the Principal Component Methods are the major ones. Both PFA and IFPA use an "ad hoc" method to estimate the matrix of unique variances Ψ by $\hat{\psi}_0$. Using these "ad hoc" methods are not advisable for moderately correlated variables since the procedures lead to inconsistent estimates. On the other hand, the ML method has the limitation that it requires the correlation or the covariance matrix to be non-singular besides its assumption of the Y_i to have multivariate normal distribution. Due to these challenges, principal component method is employed in this study.

3.5.1.6 The Principal Component Method

The spectral decomposition of covariance $\sum$ having eigenvalue-eigenvector pairs $(\lambda i, e_i)$ with $\lambda_1 > \ldots > \lambda_m > 0$ is given as

$$\sum = \lambda_1 e_1 e_1^T + \lambda_2 e_2 e_2^T + \ldots + \lambda_p e_p e_p^T \qquad (3.5.1.8)$$

From the above equation, we can obtain the loading, $L = \left[\sqrt{\lambda_1}\, e_1, \sqrt{\lambda_2}\, e_2, \ldots, \sqrt{\lambda_p}\, e_p\right]$

3.5.1.7 The Contribution to the Total Sample Variances

In applying the principal component to perform factor analysis, the sample covariance matrix S has been used. Observe that $S_{11}+S_{22}+\ldots+S_{pp}$ = tr(S) = trace of sample covariance matrix and $\hat{\lambda}_1 + \hat{\lambda}_2 + \ldots + \hat{\lambda}_p = P$ = trace of sample correlation matrix, where, $\hat{\lambda} i$'s, i=1,..., p are the estimated eigevalues of S.

$$\left[\begin{array}{l}\text{The proportion of total sample} \\ \text{Variance due to } j^{th} \text{ factor}\end{array}\right] = \frac{\hat{\lambda}_j}{tr(S)} \quad \text{for factor analysis of sample covariance}$$

$$\left[\begin{array}{l}\text{The proportion of total sample} \\ \text{Variance due to } j^{th} \text{ factor}\end{array}\right] = \frac{\hat{\lambda}_j}{P} \quad \text{for factor analysis of correlation}$$

3.5.1.8 Determining Model Fit

Though there are no strict criteria for determining the number of factors, some rules of thumb are employed.

1. Kaiser Criterion: a common rule of thumb known as Kaiser Rule is utilized to determine the number of factors to retain. This rule suggests dropping all components with eigenvalues under 1.
2. Scree Plot: to support the decision made by the Kaiser rule of thumb, this additional visual technique is utilized. A close examination of the plot of the eigenvalues against the corresponding factor numbers is made to determine how many factors to retain in the analysis.
3. Another method considered is to keep just enough factors so that the cumulated variance explained is not less than 70% (Timm, 2002).

3.5.1.9 Factor rotation

In order to obtain a simple structure for the loading matrix, so that the interpretation of the factors to be easy, an oblique transformation is employed. Using a nonsingular transformation matrix T, such that $F^* = TF$ and $\Lambda^* = \Lambda T^{-1}$ the Cov $(F^*) = TT^T \neq I$ so that the factors are correlated. Hence, the variance of the common part of y_i now has the form:

$$\text{Var}(c_i) = \sum_{j=1}^{k} \lambda_{ij}^2 + \sum_{j=1}^{k} \lambda_{ij}\lambda_{ij+1}\rho(f_i, f_{j+1})$$

so that it depends on the correlations among factors (Timm, 2002).

3.5.2 Seemingly Unrelated Regression (SUR)

At the outset it is noted that the different dimensions of the performance of the MFIs are expected to be interrelated. As a resulted, SUR is utilized while establishing the determinants of the performance of the MFIs since it allows for the correlation of the error terms in the different performance dimensions. The basic reason for this is that there might be some common factors influencing the disturbances in the different equations that have not been specified explicitly in the matrices of explanatory variables.

3.5.2.1 The SUR Model

Suppose that the i^{th} equation in a set of m equations is

$$\mathbf{S}_i = \mathbf{X}_i\beta_i + \mathbf{u}_i \; ; i = 1, \ldots, m \qquad (3.5.2.1)$$

where

$\mathbf{S}_i$ is an n×1 vector of the performance or score on the i^{th} response variable;

$\mathbf{X}_i$ an n × k_i matrix of observations (MFI i's characteristic that explain both its social and financial performance) on explanatory variables;

β_i a k_i × 1 vector of coefficients; and,

$\mathbf{u}_i$ an n × 1 vector of disturbances.

Moreover,

$\mathbf{u} = [\mathbf{u}_1^T, \mathbf{u}_2^T, \ldots, \mathbf{u}_M^T]$

and $E[\mathbf{u}|\mathbf{X}_1, \mathbf{X}_2,\ldots,\mathbf{X}_M] = \mathbf{0}.$

$E[\mathbf{u}\mathbf{u}^T|\mathbf{X}_1, \mathbf{X}_2,\ldots,\mathbf{X}_M] = \Sigma.$

The disturbance and explanatory variables in each equation are assumed to be uncorrelated. Here, the S_i variables are a set of performance scores of MFIs in the different performance dimensions synthesized under the factor analysis part.

The set of equations might be written as

$$\begin{bmatrix} s_1 \\ s_2 \\ . \\ . \\ . \\ s_m \end{bmatrix} = \begin{bmatrix} X_1 & 0 & . & . & . & 0 \\ 0 & X_2 & . & . & . & 0 \\ . & . & . & & & . \\ . & . & & . & & . \\ . & . & & & . & . \\ 0 & 0 & . & . & . & X_m \end{bmatrix} \begin{bmatrix} \beta_1 \\ \beta_2 \\ . \\ . \\ . \\ \beta_m \end{bmatrix} + \begin{bmatrix} u_1 \\ u_2 \\ . \\ . \\ . \\ u_m \end{bmatrix}$$

or $\mathbf{S} = \mathbf{X}\beta + \mathbf{u}$ (3.5.2.2)

We assume that a total of T observations are used in estimating the parameters of the M equations. Each equation involves Km regressors, for a total of $K = \sum_{i=1}^{n} K_i$, where $T>K_i$.

We also assume that the disturbances are uncorrelated across observations. Therefore,

$E[\mathbf{u}_{it}\mathbf{u}_{js}|\mathbf{X}_1, \mathbf{X}_2,\ldots,\mathbf{X}_M] = \sigma_{ij}$, if t=s and 0 otherwise.

3.5.2.2 Covariance Structure of the Error Terms

By definition the variance-covariance matrix for **u** is

$$\Sigma = \mathrm{E}(\mathbf{u}\mathbf{u}^{\mathrm{T}}) = \begin{bmatrix} E(u_1u_1^T) & E(u_1u_2^T) & \cdot & \cdot & \cdot & E(u_1u_m^T) \\ E(u_2u_1^T) & E(u_2u_2^T) & \cdot & \cdot & \cdot & E(u_1u_1^T) \\ \cdot & & \cdot & & & \cdot \\ \cdot & & & \cdot & & \cdot \\ \cdot & & & & \cdot & \cdot \\ E(u_mu_1^T) & E(u_mu_2^T) & \cdot & \cdot & \cdot & E(u_mu_m^T) \end{bmatrix} \qquad (3.5.2.3)$$

Each term in the principal diagonal of Σ is an n × n variance-covariance matrix. Thus,

$$\mathrm{E}(\mathbf{u}_i\mathbf{u}_j^{\mathrm{T}}) = \sigma_{ij}\boldsymbol{I};\ \mathrm{i, j} = 1, \ldots, \mathrm{M}. \qquad (3.5.2.4)$$

Setting i=j gives the disturbance in any equation as homoscedastic and nonautocorrelated. The value of the constant variance may, of course, be different in different equations. When i ≠ j the assumption gives a nonzero correlation between contemporaneous disturbances in the ith and jth equation but zero correlations between all lagged disturbances. Substituting equation (3.5.2.4) in equation (3.5.2.3) gives

$$\Sigma = \begin{bmatrix} \sigma_{11}I & \sigma_{12}I & \cdot & \cdot & \cdot & \sigma_{1m}I \\ \sigma_{21}I & \sigma_{22}I & \cdot & \cdot & \cdot & \sigma_{2m}I \\ \cdot & & \cdot & & & \cdot \\ \cdot & & & \cdot & & \cdot \\ \cdot & & & & \cdot & \cdot \\ \sigma_{m1}I & \sigma_{m2}I & \cdot & \cdot & \cdot & \sigma_{mm}I \end{bmatrix} = \begin{bmatrix} \sigma_{11} & \sigma_{12} & \cdot & \cdot & \cdot & \sigma_{1m} \\ \sigma_{21} & \sigma_{22} & \cdot & \cdot & \cdot & \sigma_{2m} \\ \cdot & & \cdot & & & \cdot \\ \cdot & & & \cdot & & \cdot \\ \cdot & & & & \cdot & \cdot \\ \sigma_{m1} & \sigma_{m2} & \cdot & \cdot & \cdot & \sigma_{mm} \end{bmatrix} \otimes \boldsymbol{I} = \Sigma_c \otimes \boldsymbol{I} \qquad (3.5.2.5)$$

where $\boldsymbol{I}$ is the identity matrix of order n × n and the ⊗ symbol denotes Kronecker multiplication, that is, each element in Σ_c is multiplied by $\boldsymbol{I}$.

3.5.2.3 Parameters Estimation Methods of the SUR Model

In view of eq. (3.5.2.5), generalized least squares (GLS) will give a best linear unbiased estimator of the β vector in eq. (3.5.2.2); that is, the set of equations should be estimated as a group not separately. The GLS estimator is

$$\mathbf{b}_{\mathrm{GLS}} = (\mathbf{X}^{\mathrm{T}}\boldsymbol{\Sigma}^{-1}\mathbf{X})^{-1}\mathbf{X}^{\mathrm{T}}\boldsymbol{\Sigma}^{-1}\mathbf{s} \qquad (3.5.2.6)$$

$$\text{where } \boldsymbol{\Sigma}^{-1} = \boldsymbol{\Sigma}_c^{-1} \otimes \boldsymbol{I} = \begin{bmatrix} \sigma^{11}I & \cdot & \cdot & \cdot & \sigma^{1m}I \\ \cdot & \cdot & & & \cdot \\ \cdot & & & \cdot & \cdot \\ \cdot & & & & \cdot \\ \sigma^{m1}I & \cdot & \cdot & \cdot & \sigma^{mm}I \end{bmatrix} \qquad (3.5.2.7)$$

The variance-covariance matrix for the GLS estimator is

$$\text{Var}(\mathbf{b}_{GLS}) = (\mathbf{X}^T\Sigma^{-1}\mathbf{X})^{-1} \quad (3.5.2.8)$$

Obtaining the GLS estimator of β requires knowing Σ up to scale. That is, we must able to write $\Sigma = \Sigma_c C$ where C is known M × M positive definite matrix and Σ_c is allowed to be unknown constant. Therefore, we turn to the analysis of feasible GLS (FGLS) estimation. A FGLS estimation is obtained by replacing Σ with a consistent estimator. Zellner (1962) proposed replacing Σ by $\hat{\Sigma}$ which is a consistent estimator, i.e,

$$\underset{M\to\infty}{P\lim}\ \hat{\Sigma} = \Sigma \quad (3.5.2.9)$$

When Σ is allowed to be a general positive definite matrix, the following estimation approach can be used. First, obtain the system OLS estimator of β, which we denote by $\tilde{\beta}$. $\tilde{\beta}$ is consistent for β.

A natural estimator of Σ is

$$\hat{\Sigma} = M^{-1}\sum_{i=1}^{M}\tilde{u}_i\tilde{u}_i^T \quad (3.5.2.10)$$

where $\tilde{u}_i = y_i - X_i\tilde{\beta}$ are the system OLS residuals so that

$$\tilde{u}_i\tilde{u}_i^T = u_iu_i^T - u_i(\tilde{\beta}-\beta)^T X_i^T - X_i(\tilde{\beta}-\beta)u_i^T + X_i(\tilde{\beta}-\beta)(\tilde{\beta}-\beta)^T X_i^T \quad (3.5.2.11)$$

Therefore, given $\hat{\Sigma}$, the feasible GLS (FGLS) estimator of β **is**

$$\hat{\beta} = (\sum X_i^T\hat{\Sigma}^{-1}X_i)^{-1}(\sum X_i^T\hat{\Sigma}^{-1}S_i) \quad (3.5.2.12)$$

or, in full matrix notation,

$$\hat{\beta} = [X^T(I_M\otimes\hat{\Sigma}^{-1})X]^{-1}[X^T(I_M\otimes\hat{\Sigma}^{-1})S]^{-1}.$$

With this platform, the next chapter (Chapter Four) is devoted to the analysis of the data and tries to provide the interpretation of the findings.

Chapter Four

Data Analysis and Interpretation

4.1 Descriptive Analysis

Before getting deep into the factor analysis and econometric analysis of the data it would be appropriate to look the overall performance of the microfinancing industry in the country.

4.1.1 Overview of the Microfinancing Industry in Ethiopia

Though the microfinancing activity is very infant relative to other developing countries in Africa, Ethiopia has shown a remarkable growth in the past decade. It would be helpful to look at the following sections closely in order to see how fast the industry is growing in the country.

a) Growth of Number of MIFs

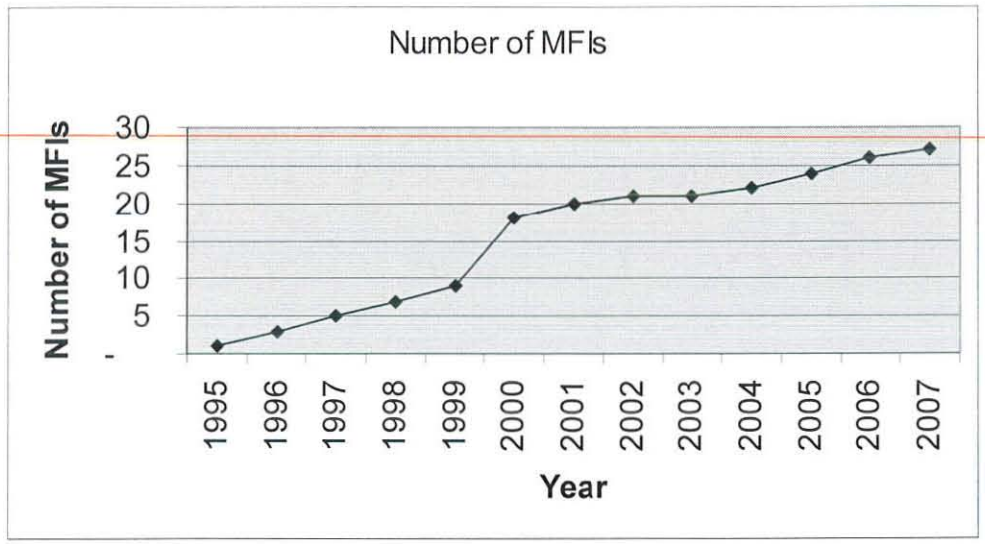

Figure 4.1.1 Growth in the Number of MFIs

As can be observed from Figure 4.1.1, the number of MFIs rendering different financial services to the poor in the country is showing a relative growth with time. According to the data obtained from the AEMFI, the number of MFIs has increased by 30 percent in the past five years (2001 up to 2006). A significant improvement in the number of MFIs has happened in the year 2000 where 9 new MFIs joined the economy.

Despite the considerable growth in the number of MFIs in this short period of time, the number of branches they have still falls short of the demand. For example, the NBE's second quarter bulletin of the year 2006/07 reported that the formal commercial banks

had a total number of 453 branches throughout the country, whereas, the MFIs had about 225 branches in the same period. Though the spatial distribution of the MFIs differs from that of the formal banks, emanated from their objective, one can clearly see the noticeable branch-population ratio differences. The challenge of the MFIs is that regardless of the prevailing gap they could not increase their outreach due to limited human and physical resource.

b) Growth of Number of Clients

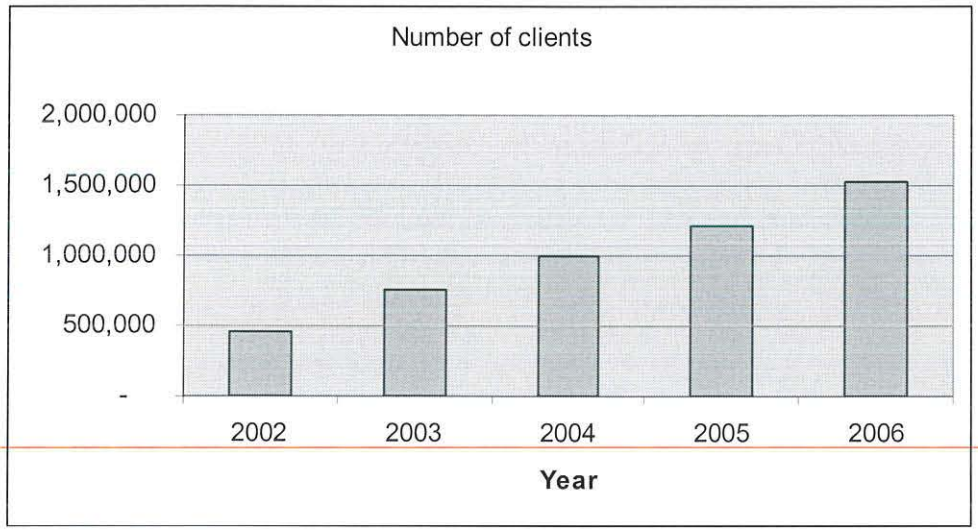

Figure 4.1.2 Growth in the Number of Clients

The number of clients receiving financial services from the MFIs in the country is increasing at a considerable rate. The 233% growth in the number of clients in the past five years, with an average growth of 36% per year, is an indication of the high demand of the society for financial services. Moreover, the awareness of the society is improving in utilizing banking resources so as to improve its living standard.

As per the information obtained from AEMFI, the number of clients at the end of June 2007 was registered to be 1.7 million. However, the existing MFIs alone could not satisfy the demand of the large poor society for financial interventions.

Table 4.1 below depicts the individual efforts of each MFIs to serve the poor by the year 2006. Among the major manifestations of the efforts of MFIs to serve the larger part of the society is the record of their number of active borrowers and depositors. However, since almost all depositors are the loaners, it would suffice to see the number of active loaners at this stage.

Table 4.1.1 Performance of MFIs

MFI	nab	glp	deposit	total asset	capita paid-in
Asser	1,338	425,638	262,475	461,933	658,406
Digaf	551	504,260	90,000	626,550	181,190
Benishangul	16,940	19,795,821	5,142,508	25,759,261	200,000
Letta	309	511,085	159,501	756,415	200,000
ACSI	536,804	687,389,165	45,949,355	842,352,082	2,000,000
ADCSI	83,000	121,480,471	7,697,787	175,613,702	517,000
Aggar	2,115	3,912,126	1,220,518	6,011,528	4,247,600
AVFS	7,739	7,738,893	1,411,689	11,826,918	204,000
Bussa Gonofa	18,217	10,177,869	2,329,837	15,138,923	213,000
DECSI	392,693	749,491,631	44,261,327	1,039,411,856	4,775,000
Dire	629	3,892,167	774,686	10,965,383	1,001,000
Eshet	24,490	24,701,387	3,025,909	31,108,020	225,000
Gasha	10,337	12,706,659	2,853,959	15,665,347	203,700
Ghion	169	309,818	62,702	482,383	200,000
Harbu	3,457	3,023,410	445,202	4,014,325	200,000
Meket	7,426	10,262,990	131,583	14,445,872	200,000
Meklit	7,426	8,294,336	1,226,615	10,108,999	200,000
Metemamen	7,002	3,762,011	1,090,611	5,071,402	200,000
Ocssco	181,403	218,542,421	15,850,685	255,697,340	59,900,000
Omo	115,999	113,233,042	10,013,488	142,591,904	500,000
PEACE	19,285	27,207,938	2,488,900	29,292,786	200,000
SFPI	19,169	21,092,883	2,605,848	25,931,277	406,000
Shashemene/SEYA MFI	1,917	2,315,132	718,423	3,676,090	1,275,300
Sidamo	26,567	15,492,452	2,446,169	25,045,591	200,000
Wasasa	22,691	18,480,957	2,853,718	26,008,738	201,000
Wisdom	44,940	46,666,837	7,582,545	53,455,252	200,000

The two big MFIs ACSI and DECSI have recorded high number of active borrowers. By the end of December 2006, ACSI had a total number of 536,804 active borrowers whereas DECSI registered 392,693. Their large records of active number of borrowers attribute to

their ages and large area coverage exclusively. They have been in the industry for more than 12 years.

c) Growth of Loans and Deposit

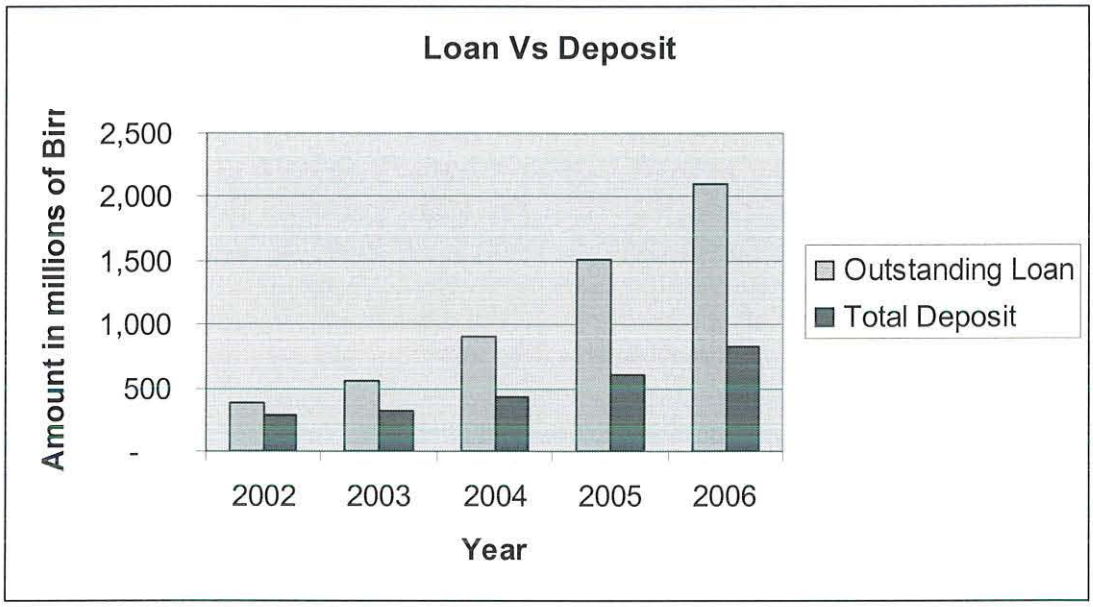

Figure 4.1.3 Growth of Loans and Deposit

The outstanding loan provided by MFIs has registered a 40% increase in the past five years. This loan rendered to customers is showing a 53% increase every year demonstrating a good performance of the MFIs to serve the public. The country average loan per GDP per borrower is found to be about Birr 85 by the year 2006.

On the other hand, the deposit mobilized by the MFIs is also recording a steady growth. The MFIs have managed to mobilize a total of over 823 million birr as of December 2006 according to the data obtained from the NBE. Much of the deposit is obtained from compulsory savings of the clients when they are permitted to get loan. However, some MFIs do not force their clients to save some portion of the loan they are allowed to obtain. MFIs like BUUSSA Gonofa and Eshet can be cited with this regard. In contrast, customers are obliged to compulsory savings in many of the MFIs. But the amount of the voluntary saving is not also to be disregarded. A considerable amount of the total deposit is obtained from volunteer savors. A number of MFIs have also mobilized time deposits. Generally, the tradition of the poor to save money is improving from time to time. The 31% average annual growth rate of saving is a witness for the improvement.

Table 4.1 also depicts the individual efforts of each MFI to disburse loans and mobilize deposits by the year 2006. As can be noted from the table, ACSI, DECSI and to some extent OCSSCO take the lion's share in these respects. These outstanding performances are also attached to their ages in the business and large area coverage.

At this stage, it would be appropriate to mention the loan quality of the MFIs. However, obtaining information on loan recovery performance of the MFIs is found to be very hard. Even the supervisory organ of the MFIs, NBE, could not provide us detailed information on loan recovery performance. Despite all these difficulties, an attempt was made to obtain information from this similar office enlightening that the NPL ratio at least 90 days past due was 3.4%, about 91.3 million Birr, in 2006. According to Tsegaye (2007) the quality of portfolio in 2005 was indicted in Table 4.1.2 below:

Table 4.1.2 Risk & Liquidity (in 2005)

Risk and Liquidity	Status (Average of all MFIs in Ethiopia)
Portfolio at Risk > 30 Days	3.7%
Portfolio at Risk > 90 Days	3.1%
Write-off Ratio	6.1%
Loan Loss Rate	6.1%
Risk Coverage	38.3%
Non-earning Liquid Assets as a % of Total Assets	21.4%

Source: Tsegaye (2007)

These low risk rates of the portfolios imply that the loan recovery rates of the MFIs is very encouraging.

d) Growth of Total Capital and Assets

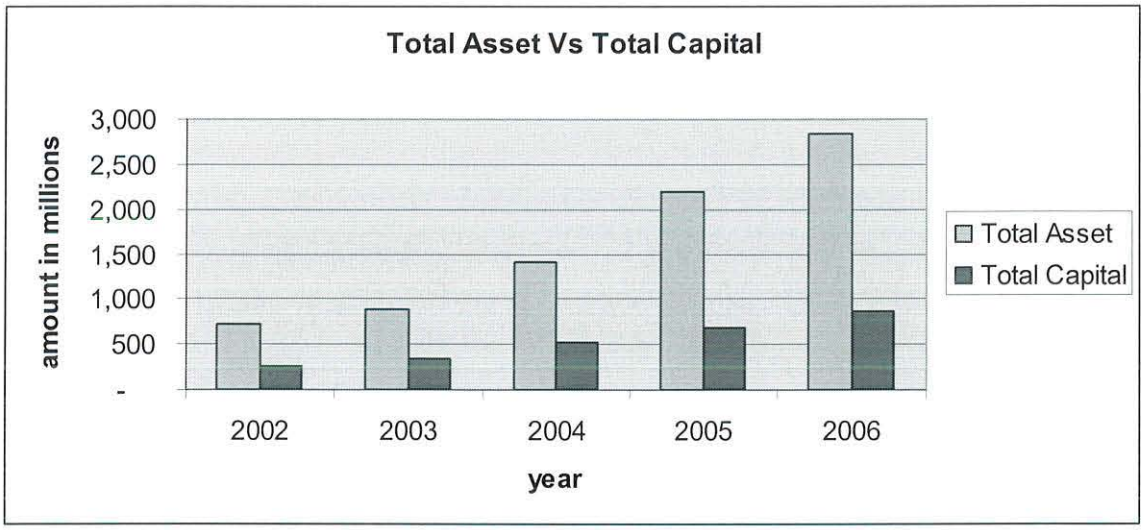

Figure 4.1.4 Growth of Total Capital and Assets

In order to finance their activities and meet the demand of the society the existing MFIs are exerting their level best to improve their financing structure. For example, the total assets and capital of the MFIs have grown by 296 and 225 percents in the past five years, respectively, whereas, their average annual growth rate of total assets and capital is recorded to be 42 and 35 percent, respectively. The most promising situation in the microfinancing industry is that much of the assets of the MFIs is funded by liabilities. A close look at the capital to asset ratios reveals this fact. For example, the average capital to asset ratio of the microfinance industry in the country is recorded to be 35 percent on average for the five years considered. That is, more than 65 percent of the assets of the MFIs are supplied by liabilities. Moreover, this ratio has decreased by 18 percent in those five years, which is by 5 percent, annually, on the average.

The individual performances of MFIs with respect to their capitals and assets by the year 2006 can be noted from table 4.1 above. Like the other performances raised above ACSI and DECSI has shown extra ordinary performances here too.

e) Return on Asset (ROA) and Return on Equity (ROE)

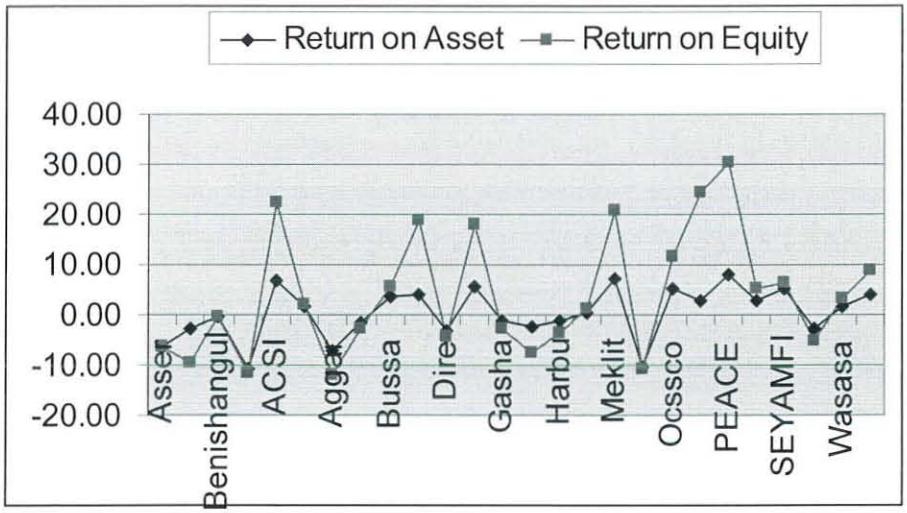

Figure 4.1.5 ROA and ROE

A close look at Figure 4.1.5 above prevails that a good number of MFIs have registered positive ROA and ROE. Moreover, it is also noted that about 54% of the MFIs have positive returns on both assets and equity.

4.1.2 Peer Grouping

MFIs considered in this study are grouped according to the Microbanking Bulletin (MBB) grouping methodology which is also applied by the Microfinance Information Exchange (The MIX Market), currently.

MFIs are categorized into three age groups: New, Young and Mature:

Table 4.1.2.1 MFIs by Age Group

Category	Definition	Frequency	Percent	Cumulative Percent
New	MFIs less than or equal to 4 years old	5	19.2	19.2
Young	Between 5 and 8 years old, inclusive	14	53.9	73.1
Matured	Greater than 8 years old	7	26.9	100
Total		26	100	

As can be observed from Table 4.1.2.1 above, the majority of the MFIs (53.9%) in the country are young. This attributes to the immaturity of the industry.

Table 4.1.2.2 Size (Number of Borrowers)

Category	Frequency	Percent	Cumulative Percent
large	6	23.1	23.1
medium	8	30.8	53.8
small	12	46.2	100.0
Total	26	100.0	

MFIs can also be categorized according to their number of borrowers which is referred to as size. MFIs with less than or equal to 10,000 Active Borrowers are considered as Small, whereas MFIs with Active Borrowers between 10,000 and 30,000 are categorized under Medium. MFIs with more than 30,000 are considered as Large MFIs.

Accordingly, the majority of the MFIs (46.2 %) considered in this study are Small sized.

Table 4.1.2.3 Gender Sensitivity

(Greater or equal to 50%, Gender Sensitive "yes")

	Frequency	Percent	Cumulative Percent
no	11	42.3	42.3
yes	15	57.7	100.0
Total	26	100.0	

As financial mediatory for the marginalized society is the underlining objective of the MFIs, they are expected to serve the majorities of the women who are highly liable to poverty than men. Accordingly, MFIs can be categorized as per their gender sensitivity. MFIs with percentage of women borrowers greater than 50 are considered as "Gender Sensitive", whereas MFIs with women borrowers less than 50% are considered "Non-Gender Sensitive". As a result, most of the MFIs (57.7%) in the country are found to be gender sensitive in agreement with their social objective.

Table 4.1.2.4 Scale of Operation (Gross Loan Portfolio)

Category	Frequency	Percent	Valid Percent	Cumulative Percent
large	6	23.1	23.1	23.1
medium	10	38.5	38.5	61.5
small	10	38.5	38.5	100.0
Total	26	100.0	100.0	

Like size of the active borrowers, MFIs can also be categorized according to their Scale which is their Gross Loan Portfolio. MFIs with Gross Loan Portfolio less than or equal to 8 million Birr are categorized under Small; MFIs with Gross Loan Portfolio between 8 million and 30 million Birr are grouped under Medium whereas MFIs with Gross Loan Portfolio greater than 30 million Birr are considered as Large MFIs.

Under this categorization, the Small Scale MFIs have managed to couch up their forerunners, Medium Scale MFIs, by registering an equal percentage of Gross Loan Portfolio, 38.5%. The larger MFIs did manage to register 23.1% of the total Gross Loan Portfolio by the end of December 2006.

Table 4.1.2.5 (a) Operational Self-Sufficiency (OSS)

Category	Frequency	Percent	Cumulative Percent
Insufficient	12	46.2	46.2
Sufficient	14	53.8	100.0
Total	26	100.0	

MFIs can also be categorized as operationally self-sufficient or not. MFIs with OSS equal or more than 100% are taken to be as operational self sufficient, otherwise, they are taken to be non-operationally self-sufficient. From Table 4.1.2.5 above, we can learn that 53.8% of the MFIs in the country are operationally self-sufficient. Hence, one can deduce that most MFIs in the country are operationally self-sufficient. Figure 4.1.6 below also reveals that SEYAMFI, Dire and ACSI are on the top of the list of the sustainable ones.

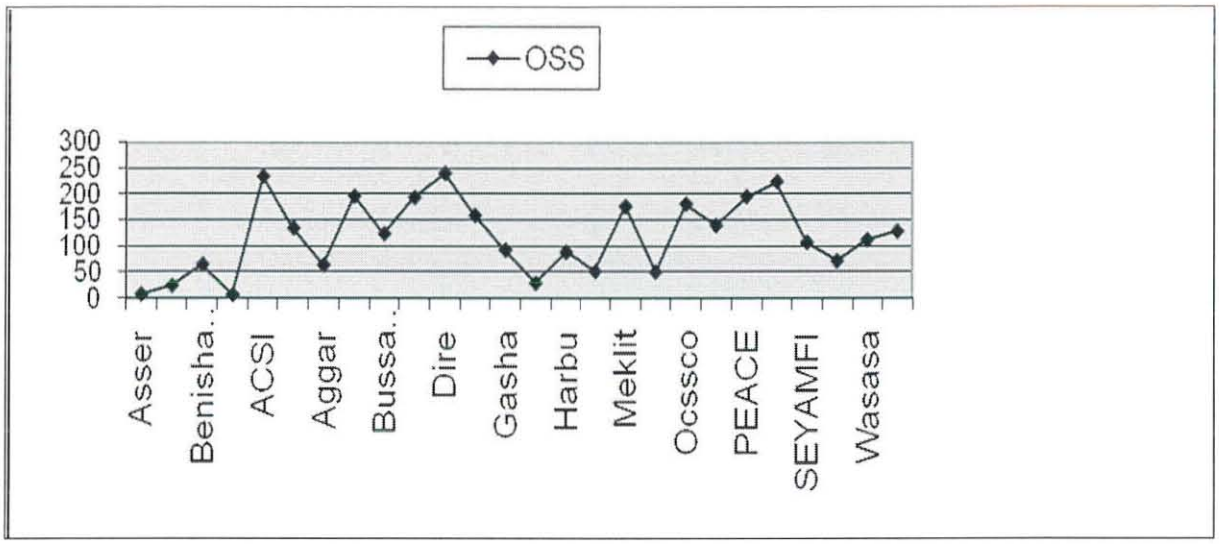

Figure 4.1.6 OSS of MFIs

4.2. Factor Analysis

As stated before, factor analysis starts with scrutinizing the correlation matrix of the performance indicators of the MFIs in order to find out the underlining common pattern that governs the performance of the MFIs in the country. But factor results are usually displayed in tables. This Section, therefore, will give emphasis on interpreting the tables containing factor results.

4.2.1 Description of the Performance indicators

It would give a sense to look at the descriptive part of the variables incorporated in the factor analysis part at the out set. The performance of the MFIs on the fiscal budget year 2006 is dealt with the aforementioned performance indicators. Their means and standard deviations are pointed out in the table to follow.

Table 4.2.1 Descriptive Statistics

	Mean	Std. Deviation	Analysis N	Missing N
Number of Active Borrowers	59716.04	127820.03	26	0
Gross Loan Portfolio to Total Asset Ratio	73.95	11.77	26	0
Return on Asset	.3346	5.1639	26	0
Profit Margin(Net Operating Income/Financial Revenue)	-26.71	129.42	26	0
OSS (Total Revenue/Total Expense)	108.75	60.63	26	0
GLP	81977361.50	193944284.42	26	0
Total deposit	30851282.15	80141934.93	26	0

Table 4.2.1 tries to depict the country-averages for each performance indicators with their respective standard deviations for the fiscal year 2006. The standard deviations are observed to be higher than their corresponding means in almost all performance indicators. This indicates a noticeable disparity among the performance of MFIs in the country. The difference is mainly emanated from their age in the industry besides their area coverage.

4.2.2 Correlation Matrix

Table 4.2.2 Correlation Matrix of the performance of MFIs

	Number of Active Borrowers	Gross Loan Portfolio to Total Asset Ratio	Return on Asset	Profit Margin (Net Operating Income/Financial Revenue)	OSS(Total Revenue/Total Expense)	GLP	Total deposit
Number of Active Borrowers	1.000						
Gross Loan Portfolio to Total Asset Ratio	.173 (.199)	1.000					
Return on Asset	.397 (.022)	.336 (.047)	1.000				
Profit Margin(Net Operating Income/Financial Revenue)	.256 (.103)	.203 (.160)	.720 (.000)	1.000			
OSS (Total Revenue/Total Expense)	.601 (.001)	.292 (.074)	.891 (.000)	.647 (.000)	1.000		
GLP	.975 (.000)	.131 (.262)	.364 (.034)	.239 (.119)	.574 (.001)	1.000	
Total deposit	.986 (.000)	.157 (.222)	.361 (.035)	.224 (.135)	.561 (.001)	.942 (.000)	1.000

a. Determinant = 3.775E-05

Table 4.2.2 reveals the fact that the off-diagonal elements of the correlation matrix are noticeably different from zero. This immediately confirms the appropriateness of employing factor analysis to obtain the common traits that govern the performance of the MFIs in the country. The figures in bracket are the p-values of the correlations.

What we can observe from the correlation matrix is that performance indicators like Total Deposit and Number of Active Borrowers, Gross Loan Portfolio and Number of Active

Borrowers, OSS and Return on Asset, and OSS and Profit Margin are highly and linearly related.

The strong positive correlations of OSS with performance indicators like number of active borrowers, gross loan portfolio and total deposit reveals the absence of trade-off between insuring financial sustainability and addressing social objectives.

4.2.3 Factor Results

While dealing with factor analysis, the primary task to do is to check whether the data are appropriate for factor analysis. As stated above, existence of high correlations among the variables indicates that the variables can be grouped into homogeneous sets of variables such that each set of variables measures the same underlining constructs or dimensions. Indeed, in this particular study the correlation matrix has approved the qualification of the performance indicators for factor analysis.

Next to this, the question of the measure of sampling adequacy follows. The frequently used measure of sample adequacy is the well known Kaiser's measure of sampling adequacy. Kaiser-Meyer-Olkin (KMO) provides a means to assess the extent to which the indicators of a construct belong together. That is, it is a measure of the homogeneity of variables. Though the whole MFIs in the country, except the Harari MFI which had not operated for at least one year while the study was conducted, are considered in this study, the data were exposed to KMO's measure for the sake of completeness. As a result the KMO measure becomes 0.693, which is more than tolerable, according to Kaiser and Rice, middling (Sharma, 1996).

The composite reliability for the seven measures of performance indicators of MFIs accounted for 0.4666. Multivariate analysis in the form of factor (principal components) was, therefore, conducted on all performance indicator variables with three main objectives:

i) It helps to identify interdependencies among those variables and no arbitrary weight needs to be ascribed to each variable, as "the data speak for themselves", in that the weights are computed from the correlation matrix of the chosen variables;

ii) To derive a limited number of manageable and meaningful constructs with minimum loss of information; and,

iii) It enabled reliable indicator of those interdependent constructs that formed the key outcomes.

With these underlining objectives the next crucial step involves choosing the appropriate number of latent factors. With the virtue of the factor determining methods mentioned on the methodology part, two factors are retained. This is due to the fact that the factors with eigenvalues greater than one are found to be two such that these factors account for more variance than the average for the variables. A factor with an eigenvalue of 1 captures as much variance as there is in one variable. Besides, the cumulative variance explained by the two factors is found to be more than 80%, which can be considered as reasonable. Apart from these techniques, the Scree Plot also approved the retention of two factors as the rate of decline tends to be fast for the first two factors but then levels off. The "elbow", or the point at which the curve bends, is considered to indicate the maximum number of factors to extract, which is two in this specific case.

Table 4.2.3.1 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.057	57.959	57.959	4.057	57.959	57.959	3.575
2	1.605	22.930	80.889	1.605	22.930	80.889	3.142
3	.866	12.374	93.263				
4	.333	4.756	98.019				
5	7.748E-02	1.107	99.126				
6	5.662E-02	.809	99.935				
7	4.583E-03	6.546E-02	100.000				

Extraction Method: Principal Component Method.

It should be noted that the eigenvalues equal the sum of the column of squared loadings for each factor. They measure the amount of variation accounted for by a pattern. Dividing the eigenvalues either by the number of variables or by the sum of h^2 (the communality of each variable) values and multiplying by 100 determines the percent of either total or common variance, respectively. But in our specific case, since we are dealing

with the common factors, the communalities are employed. Hence, the sum of these eigenvalues (4.057 + 1.605 + … + 0.004583) is 6.99968. As a result, the first two eigenvalues explain 80.889% of the total common variation. That means [(4.057 + 1.605)/ 6.99968]*100 = 80.889% of the variance was distributed among two factors.

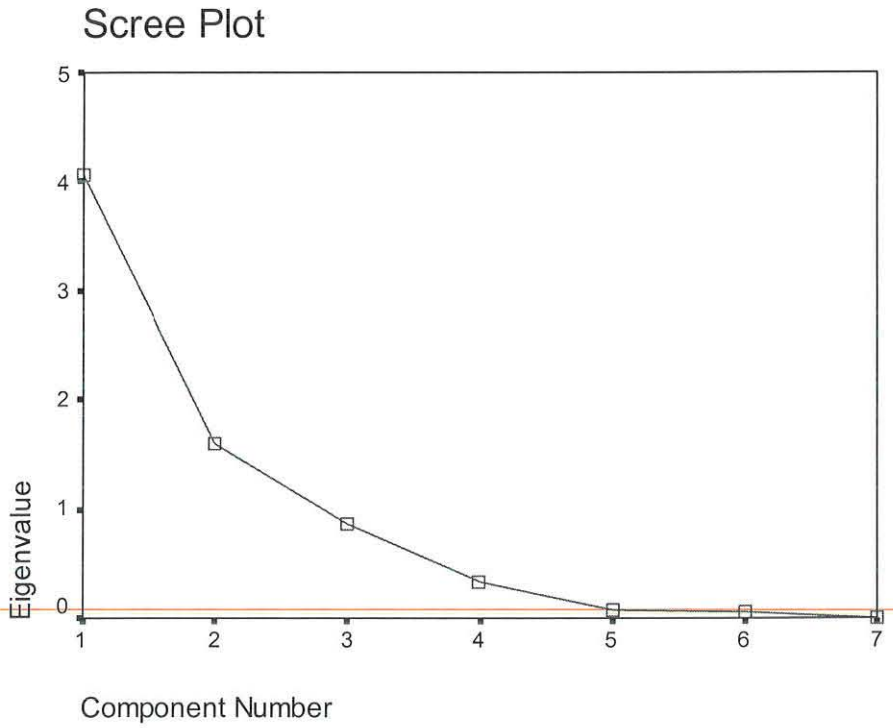

Figure 4.2.3 Scree plot of performance components of MFIs

Following the identification of the relevant constructs, factor rotation is employed in order to ease the interpretation of the factors and to identify meaningful factor names or descriptions. To this end, oblique rotation is employed as it allows the factors to be correlated. Oblique rotation has greater flexibility in searching out patterns regardless of their *correlation*. A common technique is the *Promax* rotation, which allows factors to be correlated. That is the rotation employed here.

The Rotated Factor Matrix gives the loadings after the rotation (Table 4.2.3.2). Notice that performance indicators 1 through 3 loaded positively on Factor 1 and performance indicators 4 through 7 on Factor 2. This reveals the fact that higher values of the Deposit mobilized from the clients, Number of Active Borrowers, and Gross Loan Portfolio lead to a higher score on the Factor 1. On the other hand, higher values of Profit Margin, OSS, Return on Asset and Gross Loan Portfolio to Total Asset Ratio load strongly on Factor 2. Since large amount of deposit collections, a large number of active borrowers and large

amount of loan disbursement to customers by an MFI refer to its dedication to serve the poor society, this dimension, Factor 1, clearly indicate the outreach dimension. So, Factor 1 can be leveled as "Outreach Performance". In contrast, the indicators which loaded high on the second factor are purely financial capability indicators of the MFI to survive by itself. Then, it would not be a bone of contention to level this factor as "Sustainability Performance".

Table 4.2.3.2 Rotated Pattern Matrix

Performance indicators	Component	
	1	2
total deposit	1.00	-4.984E-02
Number of Active Borrowers	1.00	-8.457E-03
GLP	1.00	-4.186E-02
Return on Asset	8.077E-04	.946
Profit Margin (Net Operating Income/Financial Revenue)	-.15	.91
OSS (Total Revenue/Total Expense)	.29	.78
Gross Loan Portfolio to Total Asset Ratio	-7.398E-02	.51

Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Next, the performance indicators which load high on the two factors are subjected to item analysis on SPSS, separately. The output for the first three items, which comprise the outreach performance gives a Cronbach's alpha value of .5999 and standardized item alpha of 0.989. It can be noted that the Number of Active Borrowers has a relatively low item-total correlation and alpha would increase if we were to remove it from the scale. As a result, the alpha if this variable were to be deleted would be improved to 0.7988. But the item is believed to trap an important part of outreach dimension. Therefore, we proceed without removing this variable because the cost would weigh high if the item is to be deleted while measuring the outreach performance of the MFIs.

The output for the second four items also shows an acceptable alpha, .5099 with standardized item alpha .8094. Items Gross Loan Portfolio to Total Asset Ratio and Return on Asset have relatively low item-total correlations, and their deletion would increase alpha, to some extent.

As can be noted from the Component Correlation matrix (see the Appendix A), the correlation between the two factors is found to be 0.438 with .025 two tailed level of significance. And hence, in order to avoid the unanticipated repercussions we proceed with that of our first assumption that the factors are related in the next analysis of the determinants of the performance of MFIs.

Finally, the performances index developed for the MFIs is presented in Appendix A, which is the factor scores of the MFIs on both dimensions. From Table A.14, it can be learned that ACSI, DECSI and Ocssco are the top three best performants with regard to outreach, while, PEACE, ACSI and Ocssco construct the best three sustainable MFIs in the country with their order respected. To the contrary, Asser, Digaf and Ghion are the least three performants in addressing their social objective (large outreach) respectively. Likewise, Letta, Dire and Metemamen construct the three least sustainable MFIs in the country with their order respected.

4.3 Assessing the Determinants of the Performance of MFIs

In this part of the data analysis we will try to see what determines the performances of the MFIs in every dimension; outreach and sustainability performance dimensions of the MFIs. The dependent variables here are the scores ascribed to the MFIs through factor analysis. Denoting the performance or score of MFI *i* on dimension $j = 1, 2$ by S_{ji}, we can posit the following regression model:

$$S_{1i} = x_{1i}\beta_1 + z_{1i}\gamma_1 + \varepsilon_{1i}$$

$$S_{2i} = x_{2i}\beta_2 + z_{2i}\gamma_2 + \varepsilon_{2i}$$

where x_{ji} is a row vector of MFI *i*'s characteristics that explain both its outreach and sustainability performance, while z_{ji} contains variables that are presumed to affect either its outreach or its sustainability performance. In accordance with the assumption set above that the factors are inter-related by a possible trade-off, we here impose a restriction that:

$E(\varepsilon_{1i}, \varepsilon_{2i}) = \sigma_{12} \neq 0$, implying that the equations could be estimated with the seemingly unrelated regressions model (SUR).

Deciding which variables belongs to either the x_i or z_{ji} vectors is the other challenging task as a variable may have an effect not only on one of the performance dimension but also on both. In reality, a variable will affect both dimensions of performance, though the strength of its effect may differ from dimension to dimension.

The variables which are expected to affect the different dimensions of performance are those which are listed on table 3.4 under "Independent Variables". The challenges in identifying the numbers and kinds of performance indicator variables to be used while synthesizing the performance of MFIs have been also experienced in the choice of variables to be employed in the identification of the determinants of different performances of the MFIs.

The STATA output presented in table 4.3.1 indicates what determine the performances of outreach and sustainability in the Ethiopian microfinancing industry. A glance at this table shows that the R-squares for outreach and sustainability model fits to be 0.6335 and 0.7264 respectively. The correlation between the two dependent variables is found to be 0.0353. Moreover, the Breusch Pagan χ^2 statistics exhibits that we cannot reject the hypothesis that the errors are not correlated across equations ($\sigma_{12} = 0$).

Table 4.3.1. The Coefficients and Standard Errors of Output of the Seemingly Unrelated Regression

Variable	Outreach (Factor 1)	Sustainability (Factor 2)
nservice	.4609873* (.1417891)	.1266463 (.1295703)
avgloan	.0001927 (.0001173)	.000816* (.0002409)
branch	.0215498 (.0178405)	.0048225 (.0167705)
stafperbranch	.0110339* (.0036192)	.0018365 (.0032673)
BPSS	.0021734 *** (.0012791)	
capital	-2.20e-07* (7.92e-08)	-2.82e-08 (7.06e-08)
FRtoTA		.1342353* (.0235454)

Variable	Outreach (Factor 1)	Sustainability (Factor 2)
CPB		-.00601* (.001593)
Constant	-2.252199* (.4970733)	-2.104454* (.4731642)
Chi^2	44.84	69.02
P-value	0.0000	0.0000
Breusch Pagan	0.8571	

* Significant at 0.01 level

** Significant at 0.05 level

*** Significant at 0.10 level.

Thus, the fitted model would be:

$$S_{1i} = -2.252199 + .4609873x_6 + .0110339x_3 + -2.20e\text{-}07x_5$$

$$S_{2i} = -2.104454 + .000816x_2 + .1342353z_1 + -.00601z_8$$

where, S_{1i} is outreach performance, S_{2i} is sustainability performance, x_6 is types of financial services rendered, x_3 is staff per branch, x_5 is capital, x_2 is average loan per borrower, z_1 is FRtoTA and z_8 is CPB.

4.4 Interpretations of the SUR Model

Despite the literature reviews claim the existence of a trade-off between outreach and sustainability at times, their correlation coefficient and the SUR model revealed that the argument does not hold true in our specific case. This might have been due to the fact that the industry is not yet matured and stiffen in the country. That is, at least at this infant stage of the industry, MFIs can perform well in addressing the larger poor society (outreach) as the demand for loan and other financial services is high and earn profit at the same time owing to the high quality of the portfolio.

A close look at the signs of the coefficients depicts that all determinants have the expected signs, except capital. Normally, capital is expected to affect the outreach and sustainability performances of MFIs positively. What is found in this particular study is the other way

round. The growth of capital has a negative impact on both outreach and sustainability of the MFIs though it is not significant on the case of sustainability. In order to figure out the possible causes, further scrutiny of capital on the performance of the MFIs has been made via the performance indicators.

The partial correlation of capital with these performance indicators proved that capital has a strong but negative correlation with deposit. That is, their partial correlation is -0.6055 and significant at .01 levels. It is to be recalled that deposit is among the major performance indicators which formed the outreach dimension of the MFIs' performance. Hence, one can speculate that as the MFIs exert more energy only in capital collection, they fail to mobilize deposit which in turn deteriorates their outreach.

The outreach performance of the MFIs is also found to be determined by the number/types of financial services rendered by the MFIs and the staff per branch distribution of the MFIs. These two factors are found to influence the outreach of the MFIs positively as expected. To put it in a nut shell, an increase in the number/types of financial services rendered by an MFI and the staff per branch distribution of the MFI will enhance its outreach performance as diversified financial services and adequate staff size are the major customer attractions.

The rest of the determinants have the expected impact on the sustainability dimension of the performance of the MFIs. The positive coefficient of avgloan on sustainability agrees with the expectation set before. Since disbursing small amount of money to many customers has high risk plus transaction costs MFIs will face challenge to sustain their profitability. In other words, disbursing large amount of money to few selected customers has low loan loss risk and operating costs thereby ensuring sustainability.

The revenue indicator, FRtoTA ratio, is also found to have a positive impact on the sustainability of the MFIs as expected. As the degree to which all the assets of an MFI managed in generating income increases, the profitability of the MFI will be secured in return. This ultimately guarantees the financial viability of the MFI. Moreover, the efficiency indicator, CPB, is also found to affect the sustainability of the MFIs adversely in line with the expectation set before. That is, as the cost of maintaining an active borrower by an MFI increases the MFI becomes inefficient which, finally, leads it to bankruptcy.

As for the significances of the determinants, nservice, stafperbranch and capital are found to determine the outreach performance of the MFIs at 0.01 levels of significance. Besides, avgloan, FRtoTA and CPB determine the sustainability performance of the MFIs at the same levels of significance.

4.5 Major Findings

- The underlining/latent factors that construct the outreach performance dimension of the MFIs are total deposit mobilized, the gross amount of loan disbursed and the total number of active borrowers that the MFIs have, whereas, the return on asset, profit margins, OSS and gross loan portfolio to total assets ratio constructed the sustainability dimension of the MFIs' performance;
- There is no trade-off between outreach and sustainability performance dimensions in the Ethiopian MFIs context.
- The unregulated growth of capital has a negative impact on both outreach and sustainability of the MFIs though it is not significant on the case of sustainability.
- MFIs in the country tend to focus on their capital for their loan-able funds rather than deposit mobilization.
- The number/types of financial services rendered by MFIs and the number of staffs per branch highly determine the outreach performance of the MFIs.
- avgloan, FRtoTA and CPB determine the sustainability performance of MFIs at 0.01 levels of significance. CPB determines the sustainability negatively unlike the other two.
- ACSI and Ocssco are among the best performing MFIs, whereas, Aggar and Metemamen are among the least performants in the country in every dimension.

Chapter Five

Conclusions and Recommendations

5.1 Conclusions

Unlike any other profit oriented firms, the MFIs have dual challenges; not only to be financially viable but also socially obliged to serve the large poor society. This unique nature of the microfinancing business makes the evaluations of their performance to be difficult. Consequently, standard performance evaluation indicators have not yet been defined and utilized by practitioners and researchers all over the world. Different researchers and practitioners employ different techniques to evaluate the outreach and financial sustainability of MFIs in the different corners of the world based on the practical situations they are in. Moreover, in order to address every aspects of performance, these researchers and practitioners use a large number of indicators. This, in turn, incurs high costs and complexity in analyzing and interpreting the findings.

In response to these problems, this study tried to give some statistical insights by employing strong statistical techniques to reduce the large number of performance indicators, without any loss of information, and finally identified the determinants of the different performances of the microfinancing business in the country.

Consequently, the factor analysis part of the study identified that Deposit mobilized from the clients, Number of Active Borrowers, and Gross Loan Portfolio load high on one component establishing the outreach performance of the MFIs in the country. On the other hand, Profit Margin, OSS, Return on Asset and Gross Loan Portfolio to Total Asset Ratio load strongly on another component forming the financial performance of the MFIs.

In order to identify the determinants of the performance of the MFIs, on the different dimensions, a SUR model was fitted on the scores synthesized by the factor analysis anticipating that the performances of outreach and sustainability of the MFIs are interrelated. However, the Breusch Pagan test revealed that there is no evidence to reject the null hypothesis that the errors are not correlated across equations ($\sigma_{12} = 0$). This is expected to answer the question of many stakeholders as to whether there is a trade-off in outreach and sustainability efforts of MFIs in our particular country case.

Moreover, the number/types of financial services rendered by MFIs, number of staffs per branch and capital are found to determine the outreach performance of the MFIs in the country at 0.01 levels of significance. It should also be noted that capital has an adverse impact on the outreach efforts of the MFIs. The possible cause for this could be the strong negative correlation of capital with deposit which could have been formed by the negligence of the MFIs to mobilize deposit from the public to finance their loans instead they focus on generating capital only. Besides, the financial viabilities of the MFIs are found to be highly determined by the average amount of loans disbursed to individuals, the financial revenue ratio and the cost per borrower ratio. The signs of these determinants agree to the expectations set on the outset of the study.

The other unexpected result obtained is that of the effect of the number of branches the MFIs have. Intuitively, one expects that an increase in number of branches of an MFI will enhance the outreach and sustainability efforts of the MFI. But, in this particular study the number of branches that an MFI has been found to affect the performances of the MFI insignificantly. Increment in number of branches has no effect on either of performance dimensions. This may trigger another qualitative in-depth analysis for the why's and how's of the situation. However, qualitative in-depth analysis of the situation is out of the scope of this paper and left for other interested persons to deal with.

5.2 Policy implications

- The performance of most MFIs in the country is found to be very encouraging. However, policy makers should develop strong monitoring and regulating mechanisms of the performance of the MFIs. Particularly, there should be a clear directive for the loan to deposit ratio of the MFIs, like the conventional commercial banks do have, as the MFIs are totally dependent on their capital to finance their business, which is very risky. Besides, MFIs should be allowed or encouraged to fairly increase the average amount of loans they disburse to their customers in order to secure their sustainability in the business and attract many clients.

- MFIs should also exert much effort to accomplish their social obligations without compromising for sustainability as no trade-off is observed between outreach and sustainability in Ethiopian MFIs case, different to other countries' experience. In order the outreach efforts of the MFIs to reach the desired goal they should attract the

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- MFIs should also exert much effort to accomplish their social obligations without compromising for sustainability as no trade-off is observed between outreach and sustainability in Ethiopian MFIs case, different to other countries' experience. In order the outreach efforts of the MFIs to reach the desired goal they should attract the

marginalized societies by diversifying their financial interventions. This would demand the involvements of the MFIs in financial activities like local transfer, remittance, insurance and other services in abundance. Moreover, MFIs should try to allocate the optimum staff size on each and every branch of theirs in order to enhance their performance. Besides, they have to improve their efficiency by reducing their total cost per borrower and thereby increase their revenues so as to stay in the business and have a sustainable impact on the living standards of the society. On the other hand, MFIs need to device an efficient mechanism to mobile deposit from the public instead of depending only on their capital to finance their business.

- Different stakeholders in general and the commercial banks in particular should see these MFIs as opportunity for an alternative dimension of the financing sector in the country. Particularly, commercial banks should see the MFIs as their complements, instead of competitors, which can act in their absence. The MFIs can be used as stretched hands of the conventional banks or work partners if they are linked. Commercial banks can mobilize the resources found in the unbanked parts of the society via these MFIs as the MFIs have proved that there is an untapped market in urban and rural parts of the country. They can achieve this goal by working in collaboration with the strong MFIs in the country and by making further relevant studies on how to address the demand.

Appendixes

Table A.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.693
Bartlett's Test of Sphericity	Approx. Chi-Square	222.360
	df	21
	Sig.	.000

Table A.2 Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.057	57.959	57.959	4.057	57.959	57.959	3.575
2	1.605	22.930	80.889	1.605	22.930	80.889	3.142
3	.866	12.374	93.263				
4	.333	4.756	98.019				
5	7.748E-02	1.107	99.126				
6	5.662E-02	.809	99.935				
7	4.583E-03	6.546E-02	100.000				

Extraction Method: Principal Component Analysis.

a When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table A.3 Component Matrix

	Component	
	1	2
Number of Active Borrowers	.890	-.449
Operational Self Sufficiency=Total Revenue/Total Expense	.870	.346
GLP	.863	-.469
total deposit	.862	-.477
Return on Asset	.749	.577
Profit Margin=Net Operating Income/Financial Revenue	.588	.621
Gross Loan Portfolio to Total Asset Ratio	.336	.343

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Table A.4 Component Correlation Matrix

Component	1	2
1	1.000	.438
2	.438	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

Table A.5 Component Score Coefficient Matrix

	Component	
	1	2
Number of Active Borrowers	.321	.003
Gross Loan Portfolio to Total Asset Ratio	-.021	.196
Return on Asset	.006	.366
Profit Margin=Net Operating Income/Financial Revenue	-.042	.351
Operational Self Sufficiency=Total Revenue/Total Expense	.097	.302
GLP	.320	-.010
Total deposit	.322	-.013

Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization. Component Scores.

Table A.6 Pattern Matrix

	Component	
	1	2
total deposit	1.00	-4.984E-02
Number of Active Borrowers	1.00	-8.457E-03
GLP	1.00	-4.186E-02
Return on Asset	8.077E-04	.946
Profit Margin=Net Operating Income/Financial Revenue	-.147	.909
Operational Self Sufficiency=Total Revenue/Total Expense	.287	.775
Gross Loan Portfolio to Total Asset Ratio	-7.398E-02	.508

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
a Rotation converged in 3 iterations.

Table A.7: Reliability Statistics for overall (outreach and sustainability) performance indicators

Cronbach's α	Cronbach's α Based on Standardized Items	N of Items
.4666	.8649	7

Table A.8: Item-Total Statistics for overall (outreach and sustainability) performance indicators

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's α if Item Deleted
GLPtoTA	112888442	7.3389619E+16	.1402	.1564	.4799
OSS	112888407	7.3389601E+16	.5774	.8709	.4799
Profit Margin	112888543	7.3389603E+16	.2379	.5231	.4799
Gross Loan	30911155	6.4429642E+16	.9421	.9686	.0038
Number of Active Borrowers	112828800	7.3321055E+16	.9903	.9931	.4793
Total Deposit	82037234	3.7662770E+16	.9421	.9832	.0015
ROA	112888516	7.3389618E+16	.3681	.8548	.4799

Table A.9: Hotelling's T-Squared Test

Hotelling's T-Squared	F	df1	df2	Sig.
1486.0585	198.1411	6	20	.0000

Table A.10: Reliability Statistics for outreach performance

Cronbach's α	Cronbach's α Based on Standardized Items	N of Items
.5999	.989	3

Table A.11: Item-Total Statistics for outreach performance

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's α if Item Deleted
Total Deposit	82037077	3.7662743E+16	.9421	.9807	.0026
Number of Active Borrowers	112828643	7.3321017E+16	.9903	.9915	.7988
Gross loan portfolio	30910998	6.4429534E+15	.9421	.9649	.0063

Table A.12: Reliability Statistics for sustainability performance

Cronbach's α	Cronbach's α Based on Standardized Items	N of Items
.5099	.8094	4

Table A.13: Item-Total Statistics for sustainability performance

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's α if Item Deleted
GLPtoTA	82.3773	32124.3	.2554	.1163	.5450
OSS	47.5823	18535.9795	.6740	.7943	.1312
Profit Margin	183.0373	4858.0178	.6504	.5197	.3138
ROA	155.9965	31752.6354	.8481	.8351	.5286

Table A.14 Performance Index

MFI	Performance Index	
	Outreach	Sustainability
ACSI	3.69331	1.30164
DECSI	2.73997	0.79899
Ocssco	0.80856	1.0711
Omo	0.29668	0.57448
ADCSI	0.20064	0.27711
Wisdom	-0.1736	0.73027
PEACE	-0.20146	1.51369
Eshet	-0.24009	0.91119
Shasheme	-0.27714	0.74466
SFPI	-0.29323	0.51452
Wasasa	-0.29816	0.16115
Meklit	-0.31455	1.03504
Bussa Go	-0.32064	0.34336
Sidamo	-0.33499	-0.61876
Meket	-0.37177	0.11245
Letta	-0.38106	-2.96803
Gasha	-0.3873	0.00017
Benishan	-0.39166	-0.12958
AVFS	-0.39998	-0.35277
Dire	-0.40057	-1.27566
Harbu	-0.42873	-0.12613
Aggar	-0.44371	-0.96244
Metemame	-0.46695	-1.21477
Ghion	-0.50594	-0.85279
Digaf	-0.53692	-0.64715
Asser	-0.57072	-0.94176

Table B.1 seemingly unrelated regression

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
Outreach	26	6	.5936396	0.6335	44.84	0.0000
Sustainability	26	7	.5129093	0.7264	69.02	0.0000

Outreach	Coef.	Std. Err.	z	P>|z|	95% Conf. Interval]	
nservice	.4609873	.1417891	3.25	0.001	.1830858	.7388887
avgloan	.0001927	.0001173	1.64	0.100	-.0000372	.0004226
branch	.0215498	.0178405	1.21	0.227	-.0134169	.0565165
stafperbranch	.0110339	.0036192	3.05	0.002	.0039405	.0181273
BPSS	.0021734	.0012791	1.70	0.089	-.0003335	.0046803
capital	-2.20e-07	7.92e-08	-2.77	0.006	-3.75e-07	-6.42e-08
constant	-2.252199	.4970733	-4.53	0.000	-3.226445	-1.277953
sustainability						
nservice	.1266463	.1295703	0.98	0.328	-.1273069	.3805994
avgloan	.000816	.0002409	3.39	0.001	.0003438	.0012882
branch	.0048225	.0167705	0.29	0.774	-.0280471	.0376921
stafperbranch	.0018365	.0032673	0.56	0.574	-.0045672	.0082403
capital	-2.82e-08	7.06e-08	-0.40	0.690	-1.67e-07	1.10e-07
FRtoATA	.1342353	.0235454	5.70	0.000	.0880871	.1803836
CPB	-.00601	.001593	-3.77	0.000	-.0091323	-.0028877
constant	-2.104454	.4731642	-4.45	0.000	-3.031839	-1.177069

Table B.2 Correlation matrix of residuals:

	outreach	sustainability
outreach	1.0000	
sustainability	0.0353	1.0000

Breusch-Pagan test of independence: chi2 (1) = 0.032, Pr = 0.8571.

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Declaration

I, the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

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