

**EVALUATION OF THE DETERMINANTS OF EFFICIENCY IN
OPERATION OF MICROFINANCE INSTITUTIONS IN
TANZANIA**

By

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**A Dissertation Submitted In Partial Fulfilment of the Requirements for Award of
the Degree of Masters of Science in Accounting and Finance of Mzumbe University**

2013

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled **Evaluation of the Determinants of Efficiency in Operation of Microfinance Institutions in Tanzania**, in partial fulfilment of the requirements for award of the degree of Masters of Science in Accounting and Finance of Mzumbe University.

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LIST OF ABBREVIATIONS AND ACRONYMS

AGMs	Annual General Meetings
AIMS	Assessing the Impact of Microenterprise Services
APA	Average Performing Assets
BOT	Bank of Tanzania
BRAC	Bangladesh Rural Advancement Committee
CBOs	Community Based Organisations
CO	Credit Officer
CRDB	Co-operative and Rural Development Bank
DEA	Data Envelopment Analysis
DMU	Decision Making Unit
FE	Fixed Events
FINCA	Foundation for International Community Assistance
FSS	Financial Self-Sufficiency
GBP	Great Britain Pound
IMP-ACT	Improving the impact of MFI on poverty: Action Research Programme
MEDA	Micro Enterprise Development Agency
MFIs	Microfinance Institutions
MIX	Microfinance Information Exchange
MSEs	Micro and Small Enterprises
NGOs	Non-Governmental Organisations
OER	Operating Expenses Ratio
OSS	Operational Self-Sufficiency
OVb	Omitted Variable Bias
PRIDE	Promotion of Rural Initiative and Development Enterprises
PTF	Presidential Trust Fund
RE	Random Events
SACAS	Saving and Credit Associations
SACCOS	Savings And Credit Co-operative Society

SAUT	St. Augustine University of Tanzania
SEDA	Small Enterprises Development Agency
SROI	Social Return on Investment
TAMFI	Tanzania Association of Microfinance Institutions
TPB	Tanzania Postal Bank
TZS	Tanzanian Shillings
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
USD	United States Dollar
VIF	Variance Inflation Factor

ABSTRACT

Microfinance Institutions (MFIs) worldwide strive to attain financial sustainability while at the same time being obliged to provide financial services to the poor at reasonable costs thus raised a need for MFIs to operate as efficient as possible so as to attain both goals. Efficiency in operation of microfinance institutions has gained ground among microfinance scholars, practitioners and stakeholders because its significance in assisting MFIs to achieve their main objective of poverty alleviation. The main purpose of conducting this study therefore, was to evaluate the determinants of efficiency in operation of MFIs in Tanzania.

The methodology employed in this study involved the use an Analytical Research design where a Quantitative approach of data analysis was conducted using a Fixed Effect panel regression model for the six years' panel data of 19 MFIs in Tanzania. The results obtained from the econometric analysis of data indicated that the variables gross loan portfolio, capital-to-asset ratio, cost per borrows, and personnel expenses ratio were statistically significant at 1% and 5% significant level.

It was concluded that the gross loan portfolio, capital-to-asset ratio, cost per borrows, and personnel expenses ratio were the determinants of efficiency in operation of MFIs in Tanzania. And basing on that conclusion, it was recommended that MFIs in Tanzania should increase the amount of gross loan portfolio through extending small and medium sized loans to a large number of customers, maintain optimal capital structure and efficiently utilisation of labour force in order to attain efficiency in operation, thus provide financial services to the poor at affordable cost to attain microfinance goal of poverty eradication.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

Efficiency in operation of Microfinance Institutions (MFIs) is one among the very pressing issues worldwide today due to the role it plays towards development, growth and successful running of microfinance and the financial sector in general. An efficiently operated MFI tends to achieve its financial goal of providing access to financial services to the poor in manner reasonable enough to assists in the achieving microfinance's goal of poverty alleviation.

Microfinance plays a vital role in economic development of less developed countries through providing viable development strategies to individual countries by availing credit to micro and small entrepreneurs who find it difficult to expand due to poor funding. In addition to that, there are numerous people in developing countries who are striving to start businesses which have feasible prospect of attaining relatively higher returns, but lacking collateral, thus making them virtually inaccessible to conventional or formal banking services related to provision of credit.

It is utterly important to ensure that institutions that provide microfinance services operate efficiently as possible so as to facilitate the whole process of poverty alleviation in developing countries. Because, when microfinance is properly harnessed, it offers a variety of benefits to the people of developing countries since microfinance initiatives can effectively address material poverty, physical deprivation of goods and services, and the income to attain them (UNDESA, 2000).

In a nutshell, efficiently operated MFIs can extend the benefits of microfinance beyond the just household level, but to the entire country and thus effectively support the whole process of development and thus, attain the microfinance's poverty alleviation objective.

This study was conducted to evaluate various determinants of efficiency in operation of MFIs in Tanzania.

1.2 Background History to the Problem

Millions of people in developing countries like Tanzania have been given access to financial services through various microfinance programmes. Since their emergence in the 1970's, microfinance services have been reported to successfully help social and economic development in the vast majority of developing countries (Anderson *et al.*, 2002). Therefore, large amount of governments, institutions and donor money is spent on microfinance worldwide.

Microfinance in its broader term entails the provision of financial services to micro-entrepreneurs and small businesses, which lack access to mainstream financial and banking services due to a number of reasons including high transaction costs associated with serving these categories of clients.

The growth of population, urbanization, industrial development and reformation of various economic policies in developing countries in Africa and Asia which started emerging after independence of most such countries from the colonial rule, propelled the increasingly need for financial services to support various economic activities which were aimed at poverty alleviation. Various microfinance programmes were established to provide funds in form of small loans to small and medium scale entrepreneurs so as to foster economic activities in the country.

Establishment and growth of Microfinance in Tanzania was accelerated mainly by the 1991's Financial Sector Reforms. In 1991, the government of Tanzania initiated financial sector reforms in order to create an effective and efficient financial system in the country (National Microfinance Policy, 2000). The keystone in those reforms was the Government's commitment to allow banking institutions to operate on a commercial basis, making business and management decisions free from outside interventions within the norms of prudential supervision (*ibid*).

The reformed financial sector created a levelled playing field for establishment of microfinance in the country, whereby in the year 1995, MFIs started being formed in

Tanzania beginning with Non-Government Organisations (NGOs) and Savings and Credit Cooperative Societies (SACCOS) and has continued to grow with the increased success of microfinance internationally.

Microfinance being a relatively new concepts to most Tanzanians, established mainly in the middle to late 1990s, it was mainly linked to women and poverty alleviation. Originally, MFIs were established to provide to their members a limited range of financial services, and most of such MFIs started as NGOs, and mostly operate a group lending system whereby the groups guarantee loan repayment to the group member (Nyamsogoro, 2010).

The government made efforts to attract and persuade MFIs to assist in its poverty alleviation programmes through providing various financial services to the poor who are usually the owner of micro, small and medium businesses. This was accompanied by the introduction and implementation of the National Microfinance Policy in 2001.

The objective of the policy was to establish a basis for evolution of an efficient and effective microfinance system in the country that would serve the low income segment of the society and thereby contributing to economic growth and reduction of poverty. Then, microfinance was officially recognized as a tool for poverty eradication through the stimulation of economic activities by providing range of banking and other financial services (National Microfinance Policy, 2000).

That captured the interest of banks in offering micro credit. The National Microfinance Bank (NMB) became an institutional provider of microfinance services; other commercial banks such as the AKIBA Commercial Bank (ACB) and Co-operative and Rural Development Bank (CRDB) Bank are also two big supporters of microfinance in Tanzania.

There are a number of organisations involved in microfinance in Tanzania, including Promotion of Rural Initiative and Development Enterprises (PRIDE), Foundation for International Community Assistance (FINCA), Tujijenge Tanzania, Bangladesh Rural

Advancement Committee (BRAC), Presidential Trust Fund (PTF) and Small Enterprises Development Agency (SEDA) just to mention a few, as well as the Tanzania Postal Bank (TPB), commercial banks and NGO's including CARE International and many others (Bank of Tanzania, 2012). The main financial service offered by these organizations is the provision of small loans called micro credits.

From 2000s to present, there has been a drastic increase of MFIs in Tanzania, ranging from NGO MFI, Member Based MFIs up to Formal MFIs. According to a 2005 survey done by the Bank Of Tanzania (BoT), the central bank of Tanzania and the overseer of microfinance, together with the Ministry of Finance in order to update the directory of Microfinance practitioners, it indicates that there is a total of 8 banks, 45 Community Based Organisations (CBO's), 2 companies, 95 Government programs, 1,620 SACCOS, 48 Saving and Credit Associations (SACAS) and 62 NGO's.

This growth called up to the attention of different stakeholders in and outside the country including the government, owners and donors, to enquire into efficiency in operation of such MFIs in order to avail themselves with relevant details for relevant decision making.

1.3 Statement of the Problem

The issue of efficiency in operation of MFIs has gained ground among microfinance scholars, practitioners and stakeholders in general, as attaining efficiency in operation is crucial for MFIs to achieve their financial goal of providing access to financial services at reasonable cost to the poor, which in turn assists in achieving the general goal of poverty alleviation.

Efficiency itself being a relatively abstract concept, in relative terms an MFI can be considered more efficient if it spends the same amount of money on resources as other MFIs but generates higher levels of performance (Marakkath and Ramanan, 2012).

For the past decade, there has been a significant increase in number of MFIs operating in Tanzania according to a 2005 survey done by the BoT and the Ministry of Finance in

order to update the directory of Microfinance practitioners. The concern to be raised here is whether such increase represents a sound financial sector backed by efficiently operating MFIs.

There have been few studies conducted in the country concerning efficiency of MFIs. Some literature suggests that factors such as administrative and delivery costs, staff productivity (Hudon and Traca, 2008), sources of funds (Chijoriga, 2000), average loan size (Nawaz, 2008), number of borrowers per staff (Nyamsogoro, 2010), firm size and the salary structure of MFIs workers may influence the attainment of operational cost efficiency, and some findings suggest that a microfinance institution can be termed as efficient depending on how well that particular MFI controls its administrative costs (Rosenberg, 2003).

Most of studies reviewed, employed the use of Data Envelopment Analysis (DEA) as a measure of efficiency. DEA is an efficient technique for deciding on the relative efficiency of a Decision Making Unit (DMU) by comparing it with other DMUs engaged in making the same outputs from the same inputs (Althaler and Slavova, 2000). However, DEA proved to be less reliable to be used to establish a benchmark or theoretical standards which can be used to determine absolute or real efficiency in the whole particular industry. This made considering a study with different analysis technique for the evaluation of determinants of efficiency in operations of MFIs in Tanzania worth conducting.

The growth of Microfinance in Tanzania experienced in recent years has brought about an increasing push for transparency in microfinance operation. This might be due to the fact that despite the progress in mainstream banking system, microfinance services have been slow to develop, although MFIs have been in existence for a long time, they have remained rather weak (National Microfinance Policy, 2000). Thus, MFIs stakeholders have been of much concern to inquire into the extent to which MFIs are closing by in attaining their stated objectives. The main constraint in this process is that, there has been lack of, or no suitable indicators that would reasonably produce reliable results of

evaluation of efficiency in operation of MFIs in Tanzania. A major implication of this is that financial performance does not always coincide with efficiency. This study therefore, was conducted mainly to evaluate the determinants of efficiency in operation of MFIs in Tanzania.

1.4 Objective of the Study

The overall Objective of this study was to evaluate the determinants of efficiency in operation of MFIs in Tanzania.

1.5 Specific Objectives

1. To evaluate the effect of Gross loan portfolio and associated average loan size offered by MFIs on their operating expenses ratio.
2. To analyse the effect of cost of lending, remuneration schemes and salary structure on performance of MFIs.
3. To determine the effect of capital which is used to finance MFIs activities through investment in assets on MFI's operating costs.

1.6 Research Specific Questions

1. What effects does gross loan portfolio have on performance of MFIs?
2. What is the effect average loan size offered by MFIs have impact on their operating costs?
3. What is the effect of MFIs' cost of lending, remuneration schemes and salary structure offered to their employees on their performance?
4. What effect does capital employed to finance MFIs activities through investing in assets have MFI's operating costs?

1.7 Significance of the study

Tanzania being a developing country ranked among the poorest countries in the world needs to establish an economy which is supported by a strong financial system that caters and provide for the needs of various economic units in the country. The main

actors in the economy of Tanzania are the individual households whose majority live below the poverty line, and to a very large extent, are not accessed by the financial services provided by mainstream banking system.

Most of these household units operate various types of small businesses which to a large extent form the informal sector of the economy of Tanzania. Due to their weak financial bases as a result of living in poverty, these households and firms, forming two of the major three economic units of a country, require a different range of financial services so as to enhance effective and efficient performance of their operations.

The findings of this study were expected to be of vital significance to the following listed below:

1. Microfinance institutions

MFIs play a vital role in the existence, growth and continuity of households and firms. Therefore, efficient operation of MFIs would imply a significant boost in different economic activities of such economic units in the country, leading to attainment of personal development as well as that of the country as a whole. Since this study attempted to evaluate determinants of efficiency in operation of MFIs, it ought to be useful to MFIs as it can be a suitable tool for evaluation of their performance in terms of improving their input output ratio.

2. Future researchers

The findings of the study include a comprehensive discussion of microfinance and efficiency in MFIs operations. Therefore, it may be used as the point of references by other researchers who will be interested in conducting studies and more researches on the issues pertaining efficiency and MFIs performance in general. The study will also make a suitable literature for future students and scholars who would be interested in searching for various information pertaining operation of MFIs based in Tanzania particularly.

3. Government agents and MFIs stakeholders

In addition to that, the findings of this study will provide a much smooth playing field for different government agents such as the Central Bank and other financial regulators in the process of policy formulation on how to improve on the efficiency of MFIs and also to assist in forming a criterion in which MFIs operation efficiency can be measured. MFIs stakeholders such as investors are availed with relevant yardsticks which can assist them in making different financial decisions on which MFIs to invest on or to affiliate with basing on the evaluation of such MFIs performance as far as the issue of efficiency in operation is concerned.

4. Potential MFI clients

An efficient MFI operates at lower or minimum operating costs while at the same time maximising the amount and value of output in terms of the products and services it provides. In so doing the costs of products and services provided by such MFIs are likely to go down as well.

This study provides criteria upon which potential MFI clients can decide on which MFIs to affiliate with and what type of loan or loan size to take. As they should be able to know in advance how the cost of borrowing is likely to be in a particular MFI mainly through evaluating its efficiency in operations.

1.8 Scope of the Study

1.8.1 Study Scope

This is confined mainly on the evaluation of determinants of efficiency of MFIs operating in Tanzania.

1.8.2 Time Scope

The study conducted a panel data analysis of dataset of Tanzanian MFIs for the period of six years from year 2006 to 2011. This six years' time scope was particularly chosen because it was the period within which relevant data could be obtained.

1.8.3 Geographical Scope

The study was conducted in Tanzania, and involved a sample of those MFIs operating in Tanzania within the period specified in the time scope of the study..

1.9 Limitations to the Study

Microfinance being a relatively new concept in Tanzania, there were few studies conducted to the date of this study concerning the issue of efficiency in operation, thus, it was difficult to obtain literature specific to efficiency in operation of MFIs in Tanzania.

This study in addition to that, involved the use of primary and secondary data from those MFIs that report their performance data to the MIX within the period of six years. However, the researcher experienced lack of transparency from some MFIs, especially the member based ones, most of which are not legally obliged by the Law to publish their financial information, and lack of co-operation from formal correspondents with MFIs contacted.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical Literature Review on Microfinance

Microfinance is a comprehensive term which in its totality entails the provision of a broad range of financial services such as deposits, loans, payment services, money transfers and insurance to poor and low income households and their micro enterprises. Microfinance does not only cover financial services but also non-financial assistance such as training and business advice (Kessy and Urio 2006).

Microfinance concentrates mainly in assisting micro, small and medium scale entrepreneurs who are less privileged from getting such financial services from mainstream banking service providers. Pilipinas (2002) defines Microfinance as the provision of a broad range of financial services such as deposits, loans, payment services, money transfer, and insurance to poor and low-income households and their micro enterprises.

Introduction of microfinance has greatly assisted and accelerated development plans among marginalized people living under extreme poverty. It has increased access to various financial services which could not be made available through mainstream banking system, whose operations usually involve playing safe to avoid risks. Before microfinance, poor class could not even have a possibility to borrow money and have an opportunity to get out of poverty because other financial institutions refused to take a risk and bypass many specific regulations (Beatriz and Jonathan, 2012)

The financial services provided by MFIs, for instance loans and savings instruments, can assist to raise household income, consumption levels, and investments in numerous ways: for instance, by providing funds which allow expanded production that will generate more income; by allowing more risk-efficient Asset Portfolios such as animals, land, material, and so on; and by smoothing consumption patterns through tiding a

family over a drought, seasonal scarcity, crop failure, illness, and so on (Zeller and Meyer, 2002).

In its broad category of services, microfinance includes provision of microcredit. Microcredit is provision of credit services (small and medium scale loans) to poor clients. Although microcredit is one of the aspects of microfinance, conflation of the two terms is endemic in public discourse. Critics often attack microcredit while referring to it indiscriminately as either 'microcredit' or 'microfinance'.

Microfinance plays a vital role in economic development of less developed countries. It provides viable strategies for growth and development of individual countries by providing credit and different financial services to micro and small entrepreneurs who have already started their business but find it difficult to expand due to shortage of funds.

2.2 History of Microfinance

The history of micro-financing can be traced way back to the middle of the nineteenth Century from the writings of Lysander Spooner, an American individualist anarchist, political philosopher, Deist, Unitarian abolitionist, supporter of the labour movement, legal theorist, and entrepreneur of the nineteenth century when the theorist Lysander Spooner was writing over the benefits from small credits to entrepreneurs and farmers as a way getting the people out of poverty. But it was at the end of World War II with the Marshall plan the concept had big impact.

In modern era's history, the use of microfinance has its origin from 1970s when an economics lecturer Muhammad Yunus, in 1974 at the University of Chittagong, Bangladesh, lent United States Dollar (USD) 27 to a group of impoverished villagers. A few years later, microfinance became the world's favourite development idea, the silver bullet that will cure world poverty and spread the wealth-creating force of capitalism across the globe (Perkins, 2006).

In 1983, Professor Muhammad Yunus founded his Grameen Bank to make very small loans as much as perhaps Great Britain Pound (GBP) 15 a time, to the poor and uncreditworthy. Since then it has loaned about GBP 3 billion to more than six million of the very poorest in Bangladesh and across the Asian sub-continent, yet it remains entirely self-financing. Borrowers' deposits cover the costs (*ibid*).

Professor Yunus is always credited for being one among the pioneers of modern microfinance operations. He went on to win a Nobel Peace prize as an acknowledgment for his efforts to conquer poverty in less developed countries.

From their emergence in the 1970's, micro-credits provided by microfinance are reported to have successfully helped social and economic development in the vast majority of developing countries in Africa and Asia (Anderson *et al.*, 2002).

Despite being considered prominent in developing countries, the Microfinance sector, although in much lesser proportions, has also gradually been consolidated in most developed countries. Microcredit programs are found in the United States and Canada (Painter, 2001; Hohman, 2005), as well as in overall Europe (Guichandut, 2006). According to the 2008-2009 overview of the Microcredit sector in the European Union (Jayo *et al.*, 2010), the mission of 70% of microcredit programs in Europe is microenterprise, followed by job creation, social inclusion and poverty reduction. Microfinance has been considered “a tool for achieving goals like improved social welfare, increased employment and further development and growth of small businesses” (European Commission Enterprise and Industry, 2007).

In fact, MFIs provide alternative credit when and where other Financial Institutions operating in the mainstream Microfinance sector don't. These financial institutions usually provide loans to individuals or organisations with sufficient collateral, thus neglect the majority who are poor and thus lack securities, even though the characteristics of the business initiatives proposed by them may prove to be worthy undertaking.

Microfinance is considered to be one of the very useful tools for alleviation of poverty. The success in operation of microfinance has attracted the attention of governments, donors and development agencies all over the world. The United Nations (UN) declared 2005 as the International Year of Microcredit. The UN recognised microfinance as one of the key ways for achieving the Millennium Development Goals, particularly the goal of halving the world's poverty rate by 2015 (Nghiem, 2005).

2.2.1 Historical Background of Microfinance in Tanzania

In Tanzania, microfinance is considered to have emerged over the past 30 years from a narrow notion of microcredit, which is a well-defined methodology used to extend small loans to targeted groups aiming at enterprise development as well as other specific purposes pertaining to an ambitious and daring concept of building a financial systems that serve low income and poor people in the country (Millinga, 2012).

The history of current MFIs in Tanzania is closely linked to emergence of SACCOS in early 1965. During that time, savings and credit cooperatives were largely associated with farming cooperative societies, and in this regard, the SACCOS were prominent in areas where agriculture was the main economic activities (Nyamsogoro, 2010).

The member based MFIs suffered from a number of problems such as lack of sufficient funding, embezzlement and mismanagement of resources largely caused by lack of clear line of responsibility among members and their leaders as well as political influences and interferences. This led to failure in their operations since members lost faith in them, and as a result, provision of financial services was left solely in the hands of mainstream banking system, despite the fact that it could not sufficiently provide micro and small scale financial services which is what was highly demanded as the majority of the population was the underprivileged and the poor. Thus, the poor had to largely depend on informal money lenders.

In the 1980s, Tanzania experienced a serious financial and economic stagnation caused by number of factors, that the government was forced to review its policies on the

country's financial system. This led to the reformation of the financial sector in Tanzania. The financial sector reform included, among others, liberalization of interest rates, eliminating administrative credit allocation and strengthening the Bank of Tanzania's role in regulating and supervising financial institutions (*ibid*).

The reform was accompanied by establishment and promotion of the Presidential Trust Fund, introduction of the trade liberalization policies which encouraged individual initiative and private ownership of property and restricting of state-owned financial institutions.

Microfinance in Tanzania started officially in 1995 with establishment of NGOs and SACCOS and has continued to grow with the increase in Microfinance internationally. Private ownership of properties encouraged majority of individual people to engage in different business enterprises, thus, created a great demand for finance to support their limited small capitals.

These individuals, however, lack collateral, steady employment and a verifiable credit history and therefore, could not meet even the most minimal qualifications to gain access to credit from mainstream banking system. Due to that reason therefore, different NGOs entered the industry to provide micro-credit which has enabled extremely impoverished people to engage in self-employment projects that allow them to generate an income, and, in many cases, begin to build wealth and exit poverty.

Being a relatively new concept in Tanzania, beginning in 1995, it was mainly linked to women and poverty alleviation. There are number of efforts done by the government to ensure that these MFIs are being convinced to support small and medium sized businesses; this was accompanied by the introduction and implementation of the National Microfinance Policy in 2001.

Through the Microfinance Policy, Microfinance was officially accepted and recognized as a tool for poverty eradication through the stimulation of economic activities by

providing range of banking and other financial services, hence, it increased their use in the country.

The principal providers of financial services to the poor and low income households in the rural and urban areas of Tanzania consist of licensed commercial banks, regional and rural unit banks; savings and credit cooperative societies; and several NGOs whose micro-credit delivery operations are funded and supported with technical assistance by international donors (Randhawa and Gallardo, 2003).

Banks have also taken interest in offering micro-credit. The NMB is and institutional provider of microfinance services, and the ACB and CRDB Bank are also two big supporters of microfinance.

Surveys done by the BoT shows that the number of organizations providing micro credits to small scale entrepreneurs is increasing very rapidly. From 2000s to present, there has been a drastic increase of MFIs in Tanzania, ranging from NGO MFI, Member Based MFIs up to Formal MFIs. According to a 2005 BoT and Ministry of Finance survey, in order to update the directory of Microfinance practitioners indicates that there is a total of 8 banks, 45 CBO's, 2 companies, 95 Government programs, 1,620 SACCOS, 48 SACAS and 62 NGOs.

A survey done by Business Guide Tanzania showed that the small scale businesses in Tanzania grow at a rate of 6.7%, 7.1% and 7.1% from 2006, 2007 and 2008 respectively (Business Guide Tanzania, 2010), which is an insignificant level of growth as compared to the number of microfinance institution providing different financial services to small and medium scale businesses as well as individual people who depend on such services to assist them in different development activities.

These called up for a need to conduct a thorough evaluation of the performance of MFIs operating in Tanzania to determine whether their operations are conducted with the level of efficiency needed to ensure attainment of the main goal of microfinance of assisting

the poor to evacuate from their lowly living standard by engaging into different undertakings which will guarantee they escape from poverty.

This study intends to evaluate the factors which can be considered to be the determinants of an efficiently operating MFI so to provide a reliable benchmark that can be used to evaluate efficiency in operation of MFIs in the financial sector of Tanzania.

2.3 Microfinance Institutions

In the financial sector, there are various types of entities specifically established to engage in the provision of different kinds of financial services. These entities are known as financial institutions. A financial institution is an institution licensed by the central bank or any other governing bodies in the particular jurisdiction, and authorized to provide financial services to individual and other institutions (BoT, 2012).

Financial institutions have traditionally been divided into different categories depending on the particular bases of classification. Some of those bases involve looking into specific characteristics, such as their institutional setting, the range of intervention, their organisation structure and the kind of services and products they provide.

Broadly speaking, there are three major types of financial institutions:

1. Depositary Institutions

These are deposit-taking financial institutions that accept and manage deposits, where they use the funds obtained from such deposits to create and provide various kinds of loans to their clients and also provide other types of financial related services such as funds transfers and different means of payments.

These institutions include commercial banks, building societies, credit unions, trust companies, microfinance institutions and mortgage loan companies.

2. Contractual Saving Institutions

These are financial intermediaries that acquire funds periodically on a contractual basis from their clients and invest (lend out) such funds to finance different development

activities which would provide them with suitable returns on investment in a way that they have various range of financial instruments maturing when contractual obligations have to be met.

In general, they can predict their liabilities fairly accurately, and thus they, unlike depository institutions, do not have to worry as much about losing funds. As a result, they mainly invest resources in longer term securities, such as, corporate stocks and bonds, and mortgages (Sahu, 1998). These institutions include life insurance companies, fire and casualty insurance companies, social security pension funds and government retirement funds.

3. Investment Institutions

These are financial institutions that provide varieties of services for businesses and some governments' institutions. These services include underwriting debt and equity offerings, acting as intermediaries between issuers of securities and the investing public, making markets, facilitating mergers and other corporate reorganizations, and acting as brokers for institutional clients. They include institutions such as Investment Banks, underwriters and brokerage firms.

MFIs on the other hand, are generally financial institutions that provide microfinance products and services to low-income clients. They target mainly poor members of the community providing to them loans with minimum affordable conditions which enable such people to get loans often without any collateral requirements; and their main immediate motive is not to maximize profit, but to provide financial assistance to less privileged members of the community who cannot acquire such services from the mainstream banking system.

Commercial banks in the formal banking system however, can be considered as MFIs when they provide microfinance services to their clients, but MFIs can also be non-profit organizations and are often not licensed in the same way as banks, so in some cases they cannot legally take deposits or handle many financial transactions.

2.4 Main types of MFIs Operating in Tanzania

In Tanzania, the microfinance industry is still at the emerging stages and it's constituted of a diverse range of practitioners and providing different kinds of microfinance products and services. The pioneering institutions of Microfinance in Tanzania were basically NGOs which started being established in the mid-1990s. However, informal microfinance services providers have been operating in Tanzania for decades now. Those institutions include the ROSCAs, ASCAs, Burial associations, clans and groups savings and so on (Millinga, 2012).

Since 1995, there have been a growing number of practitioners of microfinance in Tanzania, ranging from NGOs, Banks, Limited companies. SACCOS is another type of Microfinance services providers which have been active in both rural and urban areas. Banks have joined the Microfinance industry mostly during the last 10 years.

Based on the background of the history of Microfinance in Tanzania, it is generally accepted to categorize MFIs by the group under which the provider belongs. These groups include NGO MFIs, Member Based Financial Institutions, Formal Financial Institutions and informal financial services providers and Government/donor programs (Nyamsogoro, 2010).

2.4.1 NGO MFIs

These are the type of MFIs owned by Non-Governmental Organisations and donors which mostly operate a group lending methodology where by a group guarantees loan repayment for its group members. The NGO MFIs also provide a limited range of individual based lending system to those individual who are able to provide collateral security as insurance for the loans they take. These NGO MFIs are not allowed by law to mobilise savings. However, most of the MFIs require their clients to have some minimum savings as loan insurance funds. Although loans are given mostly for business purposes, these NGO MFIs also have loans for other purposes like education. The business loans are meant to support the ongoing business. No loan is given to start a new

business. Some of these NGO MFIs are: FINCA, PRIDE, SEDA, BRAC and Micro Enterprise Development Agency (MEDA).

A good number of the NGO MFIs operate a graduation scheme in which clients are allowed to graduate from small loans to larger loans depending on their repayment history on previous loans. Clients are allowed to change their group membership at the completion of the repayment cycle to join those whom they think can comfortably form a new group at a reduced default risk.

2.4.2 Member-based MFIs

These are the type of MFIs formed by a group of people having an interest in common, for instance, farmers, manufacturers of raw materials, and co-workers employed in a certain institution. They mainly established to provide services to their members at a relatively convenient and less expensive manner as compare to cost charged by other MFIs operating in the market.

The Member Based MFIs in Tanzania are mainly the SACCOS and the SACAs. The loans which are provided by these MFIs are mostly limited to the members of the groups only. However, there are very rare cases where such MFIs provide loans to non-members whose financial standing can be established. Collateral of some kind is normally required under such cases.

The individual lending technology is prominently used by these types of MFIs. These institutions operate a system of compulsory saving to all the members before applying for a loan. Depending on the policy of particular MFIs, normally a member or client is given a loan of twice or thrice the amount of money he/she had saved with the group to that date. The savings in this case act as loan insurance fund. Some Member-Based MFIs also offer other products like special loans for emergence purposes. They also offer loans for education and for agricultural purposes.

The nature of loans determines their duration and interest charges due on the same. The Member Based MFIs usually charge relatively low amount of interest as compared to

other financial institution in the market. Equal instalments are commonly used during loan repayments, and they usually provide some form of return to their member at the end of a certain period basing on their involvement in raising the institutional profit for the same period.

2.4.3 Formal Financial Institutions

There are also some formal financial institutions, as mentioned earlier in the literature, which offer small scale financial services to the relatively low income earner segment of the society. The formal financial institutions include the likes of the NMB, ACB, CRDB Bank and also include some other regional community banks such as De res Salaam, Mufindi, Mwanga, and Mbinga Community Banks, and the Kilimanjaro Co-operative Bank (KCB).

The operations of these financial institutions are normally regulated by government through various regulatory authorities such as the Central bank and the Ministry of finance. With the formal financial institutions both group and individual lending are used. The financial services include small scale savings and micro-loans. Their main microfinance clients are small savers and small and medium size entrepreneurs.

The banks also offer some credit facilities to employees of various organisations whose employers are willing co-operate with the lending institutions to provide insurance to the financial institution about their employees' loan repayments by acting as guarantors. The guarantee is usually limited to the employee's terminal employment benefits. These benefits are considered as loan insurance facility to be paid by employers to the particular MFIs in case of default of someone who ceases to be an employee of such organisations.

The wages, salaries and other benefits entitled to such employees, upon mutual agreement between the three parties, are usually deposited by the employer in the accounts of the employees which are usually held in the banks or other financial institution in which a particular employee had taken a loan.

2.5 MFIs Associations in Tanzania

MFIs operating in Tanzania have had different forms of co-operations and associations amongst each other so as to smoothen their operations within the country in terms sharing some key market news and features, avoiding unconstructive completion among them and gaining a collective bargaining power in the market. One among such associations is the Tanzania Association of Microfinance Institutions (TAMFI).

TAMFI was established in 2001 as a microfinance national network drawing its members from NGO MFIs, Banks and CBOs. TAMFI's power is derived from its constitution, which is registered by the Registrar of Societies as a Non Profit and Non-Governmental Organization. TAMFI is a member based organization. The mandate is established and reviewed by Members of the association at Annual General Meetings (AGMs). Article 4 of the Constitution of TAMFI provides for two categories of members. Ordinary members comprised of MFIs legally registered in Tanzania i.e. those involved in the provision of savings and credit services to micro and small enterprises. The second category is that of associated members that includes; organizations or Institutions involved in microfinance as donors, direct providers of product and services to MFIs and those that facilitate microfinance activities such as loan guarantee funds and direct providers of technical assistance to MFIs (TAMFI, 2012).

The main goal of TAMFI is to facilitate (develop) the capability of MFIs and the microfinance sector in Tanzania through lobbying, advocacy, training and information gathering and dissemination. Its mission is to facilitate creation of an enabling environment for development of a sustainable microfinance industry in Tanzania through participation of all stakeholders (*ibid*).

TAMFI's core values should guide code of conduct of its staff and its members through Accountability and transparency; Equity, fairness, and equality in the treatment of members; Adherence to microfinance best practices; Non-discriminatory services; Good governance; Political independence; and Supporting environment-friendly enterprises (*ibid*).

2.6 Efficiency in Microfinance

Microfinance is a high cost business to run. The greatest challenge MFIs face today is to lower their operating costs in order to make financial services to the poor more affordable. Studies conducted on the cost structures of profitable MFIs in 2006, show that operating expenses represented 62% of charges to borrowers; financial expenses represented 23%; profits represented 10% and losses from defaults represented 5% (González, 2007).

Efficiency is one of the pre-requisites for microfinance industry, as it is a performance measure that shows how well the institution is streamlining its operations. Efficiency can be defined as the function of an institutions ability to utilize inputs or available resources (total administrative or non-financial costs as proxies) to maximize its output (average gross portfolio).

Woller (2000) defines efficiency as the most effective way of delivering small loans to the very poor. This involves among others, cost minimisation at a given level of operation. MFIs can reduce their total expenses at a given level of operations or increase income at the same level of operation or both. This is what we refer to as efficiency in as far as microfinance income and expenses are concerned.

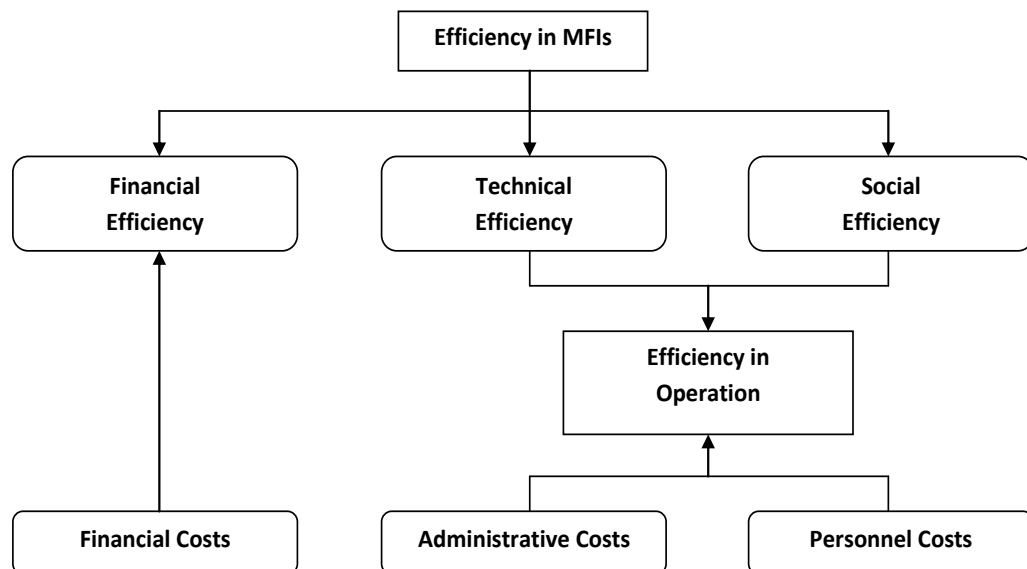
Indicators of efficiency take into account the cost of the inputs and or the price of outputs and outreach of MFIs services. Efficiency in microfinance is mainly focused on how well a MFI controls its costs of operation in the sense that an optimal combination of inputs such as staff time, staff number and cost of operation, to respectively disburse and reach the maximum number of loans and clients, while delivering a range of valued services.

This definition of efficiency clearly points to a ‘necessary’ and ‘sufficient’ distinction between efficiency and sustainability. Efficiency is a necessary condition for attaining financial sustainability.

There are different ways in which efficiency in microfinance can be classified. Efficiency can be classified in terms of input cost incurred, quality of output produced, the ratio of input output and so on. In this study, efficiency has been classified basing on the input costs incurred (Kravcenko, 2011).

The Figure 2-1 presents the classification of efficiency in MFIs basing on the elements of costs incurred by MFIs in a particular period to conducts their activities.

Figure 2-1: MFI Efficiencies and Associated Costs



Source: Adapted from Kravcenko (2011)

Financial efficiency

Financial efficiency measures the MFI's ability to attain Financial and Operational Self-Sufficiency. Financial Self-Sufficiency indicates the ability of an MFI to cover all of its operating costs and costs of capital without depending from subsidies (Nyamsogoro, 2011), whereas Operational Self-Sufficiency indicates institutional financial sustainability at growth stages. This is analyzed using ratios like return on average performing assets (APA), financial cost ratio, operational self-sufficiency (OSS) and financial self-sufficiency (FSS) (Dhakal, 2001).

Technical efficiency

Technical Efficiency refers to the ability and willingness of any firm to maximize output with a given set of inputs (Masood and Ahmad, 2010). It relates to the MFI's ability to maintain their non-financial cost to a reasonable level. Some of the proxies for technical efficiency assessment are ratios like operating cost to APA, salary cost to APA, loans per credit officer (CO), gross loan portfolio to credit officer and CO total staff ratio (Dhakal, 2001).

Social efficiency

There are no specific measures to assess MFIs social aspects; however, different methodologies are being developed. They try to measure MFIs impact in the fight against poverty. Social efficiency is usually measured in terms of MFIs' outreach in providing services not only to urban areas, but also to the rural and unprivileged areas in the country. Assessing the Impact of Microenterprise Services (AIMS) tries to measure how microfinance interacts with its borrowers' lives, placing families at the centre of the analysis. There is also an International program called 'Improving the impact of MFI on poverty: Action Research Programme' (IMP-ACT) that aims at improving the quality of microfinance services and their impact on fighting poverty. Social Return on Investment (SROI) attempts to measure, in the form of an investment ratio, the social and environmental value created by an organization, not necessarily a MFI.

The combination of both Technical and Social efficiency collectively comprises the operating efficiency of an MFI.

While the relationship between financial sustainability of microfinance and targeting poor clients maintains its importance in microfinance literature, institutional efficiency has recently come into the spotlight. This is due to two main reasons. First is the conceptual difference between sustainability and efficiency, and secondly, the changing trend of operational expense in the industry (Annim, 2010).

As a result, some questions have become apparent. These include: firstly. Does profitability/commercialisation correlate with efficiency? Secondly: Does reliance on subsidies beyond the 1995 Donor Consensus of a seven-to-ten-year transitional growth period of MFIs imply inefficiency? And lastly: What are the reasons for the sudden reversal of the falling operating expenses/gross loan portfolio ratio (*ibid*)?

While this paper does not attempt to provide answers to such questions, it mainly intends to offers a platform for understanding different factors that determines efficiency in operation of microfinance institutions in Tanzania.

2.6.1 Efficiency in Operation of MFIs

Efficiency in operation of an MFI, for the purpose of this study, can be defined as the capability of an MFI to deliver products or services to its customers in the most cost-effective manner possible while still ensuring the high quality of its products, service and support.

Operational efficiency in microfinance is basically focused on how well an MFI controls its administrative costs incurred to provide its products and services to the intended clients at a particular period of time. That is to say, efficiency in operation literally means using an optimal combination of inputs (staff time, staff number and cost of operation) to respectively disburse and reach the maximum number of loans and clients, especially the deprived ones, while delivering a range of valued services (Annim, 2010).

In order to attain efficiency in operation an entity needs to minimize redundancy and waste while leveraging the resources that contribute most to its success and utilizing the best of its workforce, technology and business processes. The reduced internal costs that result from operational efficiency enable an MFI to achieve higher return on assets and profit margins or be more successful in highly competitive markets.

Operating efficiency is often achieved by streamlining an entity's core processes in order to more effectively respond to continually changing market forces in a cost-effective

manner. It makes more sense to compare the efficiency of MFIs within the same country than between countries, given the major differences in regulatory frameworks, policy regimes and levels of competition in domestic markets (ILO, 2007).

The different kinds of MFIs operating in Tanzania provide slightly differentiated products and services, the major and the common service, although provided in different dimension, is provision of loan services to small and medium scale businesses as well as individuals.

This study attempted to establish the most significant determinant of efficiency in operation of MFIs in Tanzania, and also to evaluate how such determinants affect the performance of such MFIs.

2.6.2 Indicators of Efficiency in Operation of Microfinance

There are two main indicators that are recommended by different professionals and experts of microfinance to measure if a retail microfinance provider is cost effective. These indicators are expressed in ratios. Both ratios put a focus on non-financial operating expenses. They both exclude the amount paid as interest on the MFI's liabilities or loan loss provision expenses. Both of these ratios can be calculated on any type of MFIs (Rosenberg, 2009).

The most commonly used indicator of operational efficiency expresses non-financial expenses as a percentage of average gross loan portfolio. It is presented on Table 2-1.

Table 2-1: Operation Efficiency Ratio

$$\text{Operational efficiency Ratio} = \frac{\text{Operational expenses}}{\text{Average loan portfolio}}$$

The ratio can also be presented as

$$\text{Operating Expenses Ratio (OER)} = \frac{\text{Personnel and Administrative expenses}}{\text{Period-Average Gross Loan Portfolio}}$$

Source: Adapted from Rosenberg (2009) and Ledgerwood (1999)

OER is the most widely used indicator of efficiency. This is because it allows a quick comparison between an MFI's portfolio yield with its personnel and administrative expenses; how much it earns on loans versus how much it spends to make them and monitor them. Its substantial drawback, however, is that it will make an MFI doing small loans look worse than an MFI doing large loans, even if both are efficiently managed (Rosenberg, 2009).

Thus, a preferable alternative is a ratio that is based on clients served, not amounts loaned. Table 2-2 below indicate the Cost per client ratio

Table 2-2: Cost Per Client Ratio

$$\text{Cost Per Client (or loan)} = \frac{\text{Personnel and Administrative expenses}}{\text{Period-Average Number of active clients (or loans) [x GNI per capital]}}$$

Source: Adapted from Rosenberg (2009)

This indicator shows how much it costs the retail financial service provider to serve each client. Because it does not penalize MFIs making smaller loans, cost per client is a better efficiency ratio for comparing institutions. If one wishes to benchmark an MFI's cost per client against similar MFIs in other countries, the ratio should be expressed as a percentage of per capita GNI, which is used as a rough proxy for local labour costs (*ibid*).

Measured in terms of costs as a percentage of amounts on loan, tiny loans are more expensive to make than large loans. Only a few extremely efficient MFIs have an OER below 10%; commercial banks making larger loans usually have OERs well below 5%. The median OER of MFIs reporting to MIX Market for 2006 was about 19% (*ibid*).

As mentioned earlier, OER tilts the scales against MFIs making smaller loans: six Tanzanian Shillings (TZS) 50,000 loans cost more to make than one TZS 300,000 loan. Measured this way, an MFI can become more "efficient" by simply dropping its smaller

borrowers, even without making any improvements in operating systems. Cost per Client avoids this perverse result.

When a microfinance market starts to mature and MFIs have to compete for clients, price competition on interest rates will usually push the MFIs to become more efficient. But many MFIs do not yet face much real competition. External monitoring of efficiency is especially important in those cases.

Young or fast-growing MFIs will look less efficient by either of these measures, because those MFIs are paying for staff, infrastructure, and overhead that are not yet producing at full capacity.

2.6.3 Efficiency in Tanzanian MFIs

Issue of microfinance efficiency has remained to be one of the topics of academic and professional concern among Tanzanian microfinance promoters and practitioners. It is commonly argued that Tanzanian microfinance industry is inefficient mainly due to the fact that many MFIs are not able to fully exploit economies of scale required to maximize efficiency and there are many small MFIs serving too few clients to operate efficiently and an MFI operates in non-competitive environment with little pressure on efficiency improvement.

It is due to these factors that the study intends to evaluate the factors which can suitably be considered to be determinants of efficiency for MFIs operating in Tanzania, unlikely many studies which used a DEA method to evaluate efficiency in microfinance institutions.

The term DEA was first used by the authors Charnes, Cooper and Rhodes (1978), when they proposed a model with an input orientation and that assumed constant returns to scale CRS (Martínez-González, 2008).

DEA is an efficient technique for deciding on the relative efficiency of a DMU by comparing it with other DMUs engaged in making the same outputs from the same

inputs (Althaler and Slavova, 2000). However, DEA proved to be less reliable to be used to establish a benchmark or theoretical standards which can be used to determine absolute or real efficiency in the whole particular industry. This made considering a study with different analysis technique for the evaluation of determinants of efficiency in operations of MFIs in Tanzania worth conducting.

2.7 Empirical Literature Review

There is a number of literature and publications containing studies done by different authors on the issue of efficiency in microfinance institutions. In reviewing microfinance literature that available to-date one would say there is but few systematic studies which focus specifically on how Tanzanian microfinance institutions' operational efficiency can be determined.

A few studies reviewed, however, have indicated the relationship between efficiency and financial sustainability by looking at various cost and revenue elements (Nyamsogoro, 2010) and linking efficiency of microfinance institutions to their financial sustainability, using accounting profitability theory model to show how efficiency in MFIs operations relates to their sustainability, but less concerned was put in how operational efficiency can be determined among Tanzanian MFIs.

Chijoriga (2000) evaluated the performance and financial sustainability of MFIs in Tanzania, in terms of the overall institutional and organisational strength, client outreach, and operational and financial performance. In the study, 28 MFIs and 194 Micro and Small Enterprises (MSEs) were randomly selected and visited in Dar es Salaam, Arusha, Morogoro, Mbeya and Zanzibar regions.

The findings revealed that, the overall performance of MFIs in Tanzania is poor and only few of them have clear objectives, or a strong organisational structure. It was further observed that MFIs in Tanzania lack participatory ownerships and many are donor driven. Although client outreach is increasing, with branches opening in almost all regions of the Tanzanian mainland, still MFIs activities remain in and around urban

areas. Their operational performance demonstrates low loan repayment rates and their capital structures are dependent on donor or government funding.

In conclusion, the author pointed to low population density, poor infrastructures and low house hold income levels as constraints to the MFIs' performance. Many of these MFIs have no clear mission and objectives. Also their employees lack capacity in credit management and business skills. Among the questions which arise out of these research findings is whether these MFIs whose performance is questionable will have any impact on poverty alleviation.

A review of the study done by Haq *et al*, (2006) which examined the cost efficiency of microfinance institutions across Africa, Asia and Latin America concluded that non-governmental microfinance institutions, particularly under production approach, are the most efficient. While in practice, it is difficult to determine operational efficiency of institutions situated in unlevel playing field because MFIs in different regions are faced by different level of competition, and have serve clients with different levels of income, thus a comparison of institutions within on particular region or country would provide a more reliable result as compared to MFIs from different areas of the world taken together.

Annim (2010) argues that patterns, trends and drivers of the efficiency of microfinance institutions (MFIs) depend on the scope of financial sustainability measures and on MFIs' inclination to either of the dual objectives of financial systems and outreach, while to the contrary, literature suggest that that efficiency is one of the drivers of sustainability, as an efficient MFIs is likely to attain high degree of sustainability due to operating using optimal resources and producing a proportionately higher output compared to other MFIs in the industry

Kravcenko (2011) investigates efficiencies of MFIs by the legal status of NGO and non-NGO basing on the evidence of increasing number of MFIs, the study was concerned on whether the institutions are able to manage their financial funds and serve social

mission. The study is much focused on inter-firm comparison between NGO and non-NGO by the use of DEA to assess both technical and social efficiency. Less concern was put on evaluating what factors determine efficiency before focusing on evaluating efficiency between NGO and non-NGO MFIs, so there were no clear criteria used to measure efficiency.

Heidmann and Nilsholm (2012) conducted an efficiency study and the results from this study suggested that there was indeed a negative correlation between outreach to the poor and efficiency of MFIs, as have been found in previous studies. Although, this study also suggests that a high percentage of women borrowers not necessarily have to be positively correlated with a higher level of inefficiency, which is a new finding. This study tried to point out some factors which can influence the level of efficiency in MFIs, although the matter was of very less concerned, only linked to the relationship between high percentage of women borrowers and level of inefficiency in MFIs.

Brand and Gerschick (2000) presented a monograph addressing strategic and operational approaches to maximizing efficiency-utilizing and organizing resources to maximize outreach and revenue generation while minimizing costs. They posed that Maximizing Efficiency provides microfinance management, boards of directors, investors, donors and regulators with a framework for measuring and analyzing efficiency. That it also provides a framework by which MFIs can analyze their mission, strategy, organizational structure, processes, and human and technological resources from an efficiency point of view. The monograph also provides specific examples of efficiency-enhancing strategies, drawing from a mixture of best practices in the field of microfinance internationally and innovations in lending in the United States. They also stated that Maximizing Efficiency offers guidance regarding the reengineering of organizational structures, processes, and resources.

This article presents a vital idea of maximizing efficiency, this goals in line which the measures that can be used to optimally use the operating expenses to bring about higher output which will eventually minimize operational cost. The article, however, failed to

present which factors are significant in the whole process of efficiency maximization, thus the issue of maximizing efficiency becomes difficult to actuate if there is no core determinants of efficiency in MFIs.

The study by Gonzalez (2007), however, provided a well analyzed argument on the core efficiency drivers of MFIs. That the greatest business challenge is to lower operating costs in order to reduce the cost of service borne by borrowers. An analysis of the cost structure of profitable MFIs reporting to the Microfinance Information Exchange, Inc. confirms the assertion that in 2006 operating expenses (both personnel and administrative) represented 62% of charges to borrowers, financial expenses 23%, profits 10%, and losses from defaults five percent. Since operating expenses are the main component of interest rates, identifying their drivers and quantifying them constitute the first steps in finding ways to improve efficiency of MFIs worldwide. This article however, failed to include many important variables with a high influence on the cost levels of MFIs in the analysis because data was not available. This reduces reliability of the findings from this study due to a number of significant variables being excluded from the analysis.

Lastly, but not least, Estapé-Dubreuil and Torreguitart-Mirada (2009)s' paper concerning analysis of MFIs' policies in the allocation of resources to business projects state that Microcredit Programs' objective is to grant (part of) the capital micro-entrepreneurs lacking material collateral need to found economic activities engaged to self-employment and earnings. They considered the ex-ante efficiency of a program based on the decisions and funds finally allocated. Using DEA in a panel of data gathered from the MFIs' applications, they characterized efficient frontier considering various relevant variables to feature all applications submitted to the MFI. Results thus obtained were compared with the actual allocation funds made by the MFI, taking into account its mission. This allowed them to see the actual relevance of the businesses plans in the final decision to grant a loan, as well as the evolution of the MFIs decisions through time.

This study, just like many mentioned above, employed the use of DEA method to analyze efficiency in MFIs. DEA is a data oriented approach for evaluating the performance of a set of entities that converts multiple inputs into multiple outputs. The DEA method however, is suitable when we want to measure the level of efficiency in input output relationship between one firm and another, but does not predict which factors are the significant determinants of efficiency. Also, economies of scale do not seem to be a significant factor in determining efficiency. After this threshold, the largest MFIs are by no means the most efficient.

2.8 Conceptual Framework and Research Model

2.8.1 The concept and need for efficiency in operation of MFIs

Efficiency in microfinance is one of the highly debated issues in the financial sector worldwide due to increasing need for a shift to commercialization of Microfinance Products. MFIs were originally established for the purpose of serving a general interest of certain groups of poor and or underprivileged people so as to improve their living standards and hence eradicate poverty. MFIs were basically not-for-profit organizations.

In recent years, there has been a continued commercialization of the microfinance industry and it has unleashed the market forces that are powerfully impacting the field and the priorities of the relevant players. This is experienced through increased competition, in terms of number of institutions and range of services provided, customers' discrimination, growth and institutional development demands, regulations-ranging from reporting requirements to usury laws, and donor fatigue are placing new pressures on MFIs.

The number of financial institutions serving the once-neglected microfinance market is increasing, while at increasing rate, is the increase in the quantity and sophistication of clients served by MFIs. Neither competitors nor knowledgeable customers tolerate complacency.

So while the majority of MFIs still enjoy oligopoly-like control of their local markets and enthusiastic donor support, the explosive growth of the field in terms of existing portfolios, increased competition and new, more demanding stakeholders is forcing MFIs to think differently about efficiency (Brand and Gerschick, 2000).

2.8.2 Measuring Operating Efficiency

According to theories of efficiency in the literature reviewed for this study, there are many ways which can be used to measure efficiency (Gonzalez, 2007). However, there are two major measures which are commonly used to determine efficiency in operation. These are Administrative Expense Ratio (also known as) and the number of loans per loan officer. But for purposes of this study we will focus on efficiency measured by the Operating Expenses Ratio which is expressed as operating expenses over average gross loan portfolio.

The main reason for this choice is the simple link between OER and interest rates. For example, if an MFI reduces OER 5 percentage points without changes in losses from defaults and financial expenses, this MFI could potentially reduce the interest rate 5 percentage points, or increase profits 5 percentage points (as percentage of average Gross Loan Portfolio), or any combination of both that adds to a total change of 5 percentage points (Gonzalez, 2007).

The Operating Expenses Ratio is expressed in terms of total Administrative Expenses as a percentage of average Gross Loan Portfolio. This ratio takes into account the amount of inputs and outputs, as well as their prices and value. Although the ratio improves as the average loan size increases, it does not detract from the importance of this indicator. It is possible to adjust for differences in loan sizes, the age of the operations, and other factors by grouping institutions based on these characteristics.

Successful MFIs tend to have operating cost ratios of between 13 and 21 percent of their average loan portfolios and between 5% and 16% of their average total assets

(Lederwood, 1999). As of June 1999, the leading institutions in Latin America have administrative expense ratios between 15% and 20%.

The Number of Loans per Loan Officer reflects the productivity of the field staff. Of course, quantity without quality is an easy objective, which raises the point that none of these measures can be understood out of context. This indicator reflects the institution's ability to streamline credit operations. For institutions that allow clients with strong credit records to borrow multiple loans concurrently; a more revealing measure is the number of clients managed by each loan officer.

The ratio of loan officers to total staff is a proxy for the institution's ability to allocate resources to its core business: lending. Remarkably, even in the most efficient institutions fewer than half of staff members are loan officers. In fact, the ratio seems to decrease as microfinance institutions mature, suggesting an increase in middle management that may not bode well for future efficiency enhancements.

2.8.3 Drivers of Efficiency

Having identified the measures of efficiency, there is also a need to understand what factors drive their change. The followings seven factors are considered in this study to be important efficiency drivers: Gross loan portfolio, Average loan size, Cost per borrower, Capital to assets ratio, Personnel expenses, Loan loss rate and Borrower per staff.

1. Gross loan Portfolio

Gross loan portfolio indicates the amount of loan issued and remained outstanding by the end of the period (Lederwood, 1999). Below a certain loan portfolio size it is difficult for an MFI to be efficient as operation cost per unit will normally go high, and vice versa. This is because, as institutions with lower portfolio grow and increase operational and financial leverage, profitability will come within their reach. Profitability is a function of efficiency, not of size, but only up to a certain point,

economies of scale do not seem to be a significant factor in determining efficiency. After this threshold, the largest MFIs are by no means the most efficient.

2. Average Loan Size

MFIs with the smallest loans usually have administrative expense ratios around 50% or more, compared to 20% or less for the top performers. When the expense ratio is high, donor dependency is usually at work. Dependency increase cost to a MFI, and high-cost MFIs shy away from commercial credit because of the additional cost of borrowing funds. And donor dependence cultivates inefficiency; MFIs assured of subsidized funding do not need to subject themselves to the painful quest for efficiency.

As MFIs mature, their loan sizes typically increase. Some move up-market deliberately. In most institutions, loan size tends to creep up, partly because, as clients become successful, they want larger loans.

3. Cost per Borrower

The choice of methodology usually affects operating cost of MFIs. A look at the three most efficient companies reveals a mix: FUCAC (Uruguay) makes individual loans; Genesis (Guatemala) does solidarity, individual and village bank lending; BancoSol (Bolivia) lends mainly to groups. In fact, many loan officers consider the costs of forming and maintaining borrower groups to be quite high. Again, the multiple factors contributing to efficiency make generalizations pointless. In each of these cases other efficiency drivers contribute heavily to their performance.

This driver also is a factor that neutralizes the distorting effect of loan size on the ratio of administrative expense to average portfolio (Brand and Gerschick, 2000).

4. Capital-to-Assets Ratio

This indicates a percentage of MFI assets represented by its capital. It is the ratio of capital and reserves to total assets. Depending on the relative risk of loss, an MFI with a high capital-to-asset ratio is protected against operating losses more than the one with a lower ratio. Also, the process of mobilizing savings increases administrative expenses,

which makes retail financial intermediaries appear less efficient than credit-only institutions. The trade-off, however, is between marginally higher administrative expenses and a significantly lower cost of funds. Assuming that there is a prudent management and supervision, capturing savings is invariably worth the additional administrative costs.

5. Personnel expenses

Salaries are usually the largest component of administrative expenses, allowing companies operating in low-wage environments to be comparatively more efficient. Loan officer productivity is also affected by wage rates and structure, although less directly. When properly structured, variable incentive pay for productivity and quality is a strong driver of efficient operations. High personnel expenses increase operating costs of a firm and thus reduce the level of operating efficiency of that firm

6. Loan loss rate

This is the rate of loan losses for a specific period, usually a year. It indicates the figure of declared non receivable and written off net recoveries, during the year over the total amount of loans outstanding during the year. This indicates the amount of losses incurred by an MFI resulting from clients' defaults in repayments of the loans extended to them. High loan loss rate indicating operating inefficiency as it implies that the firm is unable to collect the outstanding loan balances from clients, thus increase its operating costs.

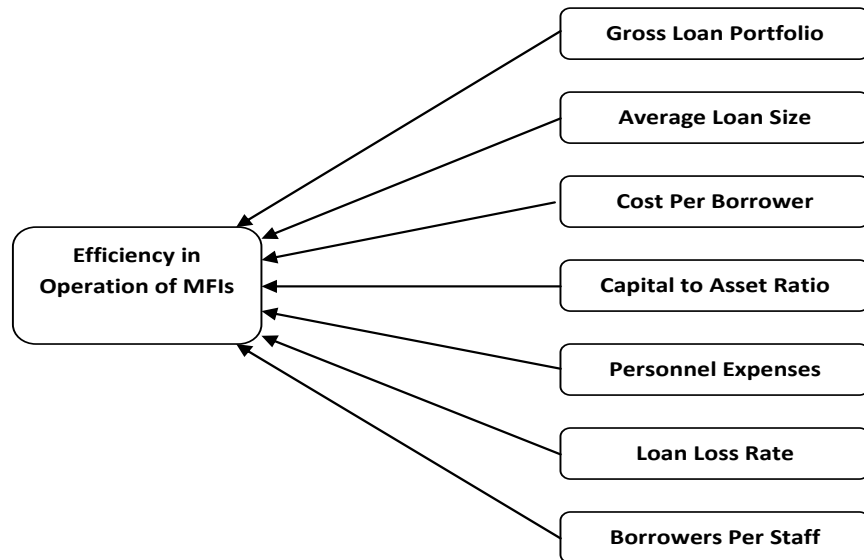
7. Borrowers per staff

The Borrowers per staff driver indicates the average number of clients which were served by each member of staff in an MFI. This is the ratio of borrowers to staff indicating productivity (Nyamsogoro, 2010). Other factors remaining the same, at the same salary rate, the higher the number of borrowers a member of staff serves, the better the operating expenses rate, thus means an MFI can be operating efficiently.

2.8.4 Conceptual Model

The variable of the study can be reduced to the following models.

Figure 2-2: Conceptual Framework: Drivers of Efficiency of MFIs



Operating Efficiency = f(x (Gross loan portfolio + Average loan size + Cost per borrower + Capital asset ratio + Personnel expenses + Loan loss rate + Borrower per staff + Error term))

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research design

This study employed an Analytical Research design and applied a Quantitative approach of data analysis. One of the fundamental purposes of research design in explanatory research is to avoid invalid inferences. This is because research design articulates what data are required, what methods are going to be used to collect and analyse those data, and how to arrive at a reliable and valid conclusion which can answer the study's specific questions and thus attain the overall objective of the study.

The use of Analytical design was basically due to the fact that, the researcher intended to use information available, and analyse it to make a critical evaluation of the material (Kothari, 2004). The main reason for using quantitative approach of data analysis was because the researcher wanted to identify any causal links between the factors or variables that pertain to the research problem, which was to establish the causal and effect of different determinants of efficiency in operation of MFIs.

3.2 Study Area

This area of study area in which this study was conducted is mainland Tanzania, and it involved an analysis of MFIs which were operating in the country providing different kinds of financial services within the jurisdiction of the country.

The reason for the choice of this area of study, as suggested in the literature, was due to the fact that, an evaluation of efficiency in operation on MFIs is more reliable if it is conducted among MFIs operating in one specific country or region because it creates a level playing field for evaluation of such institutions because the institutions will be subjected to more or less the same external environment, thus factors such as level of competition, donors, customer base and government policies, regulations and interferences can be held constant, since they will be the same to all institutions operating in such regions.

3.3 Units of Analysis

The unit of analysis in this study is an individual MFI operating in Tanzania and annually reporting its performance data to the Microfinance Information Exchange. The unit of analysis is the major entity that was being analysed in the study. It is the 'what' or 'whom' that is being studied.

3.4 Population of the study

This study used a population of elements which were composed of MFIs operating in Tanzania and reporting their performance data to the MIX Market. The MIX Market is a non-profit, web-based, microfinance information platform which acts as a business information provider in the microfinance sector and features financial and social performance information for approximately 2000 MFIs as well as information about funders, networks, and service providers.

The MIX collects and validates financial, operational, product, client, and social performance data from MFIs in all regions of the developing world, standardizing the data for comparability.

3.5 Sampling Design

3.5.1 Sample size

The sample size of this study was made up of a total population of 19 elements. The elements in the sample included a population of MFIs operating in Tanzania, reporting their annual financial data on the Microfinance Information Exchange website. The sample dataset contained observations from the year 2006 to year 2011.

3.5.2 Sampling technique

The study used a non-probability sampling technique of **Purposive Sampling** to select a sample from which reliable data could be collected. The study purposefully selected a total population of 24 MFIs on the country profile of Tanzania reported on the MIX

website from year 2006 to 2011 and questionnaires were issued to those elements for data verification purpose against those reported on the MIX.

The elements selected in the sample were only those which we managed to get correspondence on the questionnaires issued to them. The quality of data from those MFIs have been judged on the basis of their legal form, their age and the frequencies with which theses MFIs are reporting data to the MIX.

3.6 Variables and their measurements

This section present the description and measurement of variables as used in study. The variable measurement used in this study, conforms to the reviewed literature and in previous studies. Both dependent and independent variables have been used in the study.

Presented on Table 3-1 is the Dependent Variable of the study and its measurement scale.

Table 3-1: Dependent Variable Description	
Variable Name	Measurement
<i>Operating Expenses Ratio (OER)</i>	<i><u>Personnel and Administrative expenses</u></i> <i>Period-Average Gross Loan Portfolio</i>

The dependent variable of this study is Efficiency in Operation of MFIs is expressed in terms of the ratio of Operating Expense. This ratio is also commonly referred to as the Operating Efficiency Ratio: it measures the institutional cost of delivering loan services. The lower the operating expense ratio, the higher will be the efficiency in operation and vice versa (MicroRate *et al*, 2003).

Ratio is calculated by dividing all non-financial expenses related to the operation of the institution (including all the administrative and personnel expenses, depreciation and board fees) by the period average gross loan portfolio. Expenses such as interest and provision expenses, as well as extraordinary expenses are not included. This ratio

provides the best indicator of the operation efficiency of a lending institution (MicroRate *et al*, 2003).

There has not been established a clear-cut percentage level of OER which would indicate operating efficiency in operation of MFIs, although any ratio below 30% is considered ideal indicator of MFI's efficiency in operation (*ibid*).

Independent variables' descriptions and their measurements are presented in Table 3-2.

Table 3-2: Independent Variables Description			
Variable Name	Description	Variable name in regression model	Effect on OER
Gross loan portfolio	Loans that have been made or bought and are being held for repayment	<i>Lngrossloanpo</i>	(-ve)
Capital to asset ratio	This is the ratio of capital and reserves to total assets.	<i>Capitalassetr</i>	(+ve)
Cost per borrower	Operating expenses/average number of active borrowers	<i>Lncostperborr</i>	(+ve)
Borrower per staff	This indicates the average number of clients which were served by each member of staff in an MFI	<i>borrowerspers</i>	(+ve)
Loan loss rate	Loan loss rate is the figure of declared non receivable and written off net recoveries, during the year over the total amount of loans outstanding during the year	<i>Inloanlossrate</i>	(+ve)
Personnel expenses ratio	Staff salaries divided by the amount of loan disbursed	<i>personnelexpe</i>	(+ve)
Average loan size	Is a ratio of outstanding loan portfolio over number of active borrowers	<i>lnaverageloan</i>	(-ve)

3.6.1 The Conceptual Model

The researcher employed the use of a panel data regression model in explaining the relationship between the dependent and independent variables of the study. Panel data (also known as longitudinal or cross-section time-series data) is dataset in which the behaviour of entities are observed across time. A panel data set consists of a time series for each cross-sectional member in the data set. Panel data set is constructed from repeated cross sections over time (Wooldridge, 2007).

Panel data allows you to control for variables you cannot observe or measure, for instance cultural factors or difference in business practices across companies; or variables such as national policies, federal regulations, and International agreements and so on, that may change over time but not across entities. That is, it accounts for individual heterogeneity (also called omitted variable bias), thus making it especially useful since unobserved heterogeneity is a serious problem of non-experimental research (Brüderl, 2005). Moreover, panel data give more informative data, more variability, less collinearity among variables, more degree of freedom and more efficiency (Nyamsogoro, 2010)

The conceptual or general panel data regression model which was used in this study is of the form:

$$Y_{it} = \alpha_i + \beta_1 X_{it} + \varepsilon_{it}$$

Where:

Y_{it} is the value of dependent variable for entity i at time t ,

α_i is the unknown intercept for each entity ($i=1 \dots n$: n entity-specific intercepts),

β_1 is the coefficient of an independent variable X_{it} ,

X_{it} represents the independent variable for entity i at time t ,

And ε_{it} is an error term.

3.7 Data Analysis and Statistical Approaches

The process of data was analysis was done using STATA econometrics software. The software was selected because it has extensive capabilities for analysis of survival data, time series, panel data and complex survey data, also because STATA is easy to use, either by point and click or through its intuitive command syntax (Rabe-Hesketh and Everitt, 2007).

In this study, a Panel Data Multiple Regression model was adapted to analyse six-year panel data of 19 MFIs in Tanzania, which reported their performance data to the MIX.

The data was rearranged in a spread sheet according to the specific variable measurement as specified in the literature.

The analysis focused main on determining which of the variables included in the study did affect operating efficiency of MFIs and also evaluation the effect of each individual independent variable on the dependent variable of the study.

3.7.1 Dealing with Omitted Variable Bias

In econometrics, statistical inferences may be erroneous if, in addition to the observed variables under study, exist other relevant variables that are unobserved, but correlated with the observed variables (Arellano, 2003). This is known as Unobserved Heterogeneity. Controlling for unobserved heterogeneity is a fundamental challenge in empirical finance research because most corporate policies including financing and investment depend on factors that are unobservable to the econometrician (Gormley and Matsa, 2012).

If these factors are correlated with the variables of interest, then without proper treatment, then the estimated model is said to have been infected by Omitted Variables Bias (OVB), and precludes causal inference. OVB exists in slope coefficients if a relevant variable is omitted and the omitted variable is correlated with one or more of the included variables.

The best way to deal with OVB is to conduct an experiment. Where conducting and experiment is not possible, then collect at least panel (longitudinal) data. As we saw above, with panel data it is possible to identify the true effect, even in the presence of self-selection (Brüderl, 2005).

However, panel data alone do not remedy the problem of unobserved heterogeneity. One has to apply special regression models. Econometric literature suggests two common methods of dealing with the omitted variables. These are fixed effect and random effect (Nyamsogoro, 2010).

3.8 Econometric Analysis Approach

This section presents econometric analysis approaches used to evaluate the determinants of efficiency in operations of MFIs.

3.8.1 Correlation Analysis and Variable Selection

A correlation analysis is conducted to check whether variables were correlated to one another, this means if the changes in the value of one variable are accompanied by the change in the other. The analysis is aimed at computing the coefficient of correlation which can be used in evaluating the strength of the relations between variables. The coefficient of correlation is also a measure of liner association between two variables.

We conducted a correlation analysis (Appendix 4) and found out that variables were correlated thus making a multiple regression model appropriate for the analysis. The variable Average Loan Size had a high coefficient of correlation with Cost per Borrower at 0.5986. However, the same variable, Average Loan Size, had a lowest coefficient of 0.0126 when paired with Gross loan portfolio. As suggested in econometrics literature, we considered a correlation coefficient of above 0.8 to be an early sign of multicollinearity in the model.

Multicollinearity is the undesired situation where there is high (but not perfect) correlation between two or more of the independent variables (Wooldridge, 2007).

Although the problem of multicollinearity cannot be clearly defined as to what degree of correlation coefficient causes it, one thing is clear: everything else being equal, for estimating coefficient of one independent variable, it is better to have less correlation between the particular variable and the other independent variables (*ibid*).

In multiple regression, the variance inflation factor (VIF) is used as an indicator of multicollinearity. VIF measures how much the variance of the estimated coefficients increased over the case of no correlation among the predictor variables. Researchers desire lower levels of VIF, as higher levels are known to affect adversely the multiple

regression analysis results. A value of 10 has been recommended by Kennedy (1992) and Hair *et al* (1995) as the maximum level of VIF.

In our model, the variable Average Loan Size had the highest VIF of 3.24 whereas Loan loss rate had the lowest VIF at 1.27. The mean VIF for all the variables was 2.13 (Appendix 5) indicating that multicollinearity was not a problem in our model.

3.8.2 Model Specification

Quantitative models always rest upon a number of assumptions about the way the world works, and regression models are no exception. Regression assumptions clarify the conditions under which multiple regression models work well, ideally with unbiased and efficient estimates

There are four basic principal assumptions which justify the use of linear regression models for purposes of prediction. These include normality: means unobserved error is normally distributed in the population, homoskedasticity which requires that dependent variables exhibit equal levels of variance across the range of explanatory variables, linearity association between variables and absence of correlated errors (Wooldridge, 2007 and Nyamsogoro, 2010)

Test for normality

The variables were tested for normality using Kernel Density distribution plot of the residuals. From the visual plot, it was discovered that the variables Gloss loan portfolio, Cost per borrower, Loan loss rate and Average Loan size were not normally distributed. As suggested in the literatures, we decided to use variable transformation in order to solve that problem (Rabe-Hesketh and Everitt, 2007). The visual plot output before and after transformation is indicated in Appendix 6.

Test for heteroskedasticity

We also tested for heteroskedasticity across the range of explanatory variables using Breusch-Pagan test (Nyamsogoro, 2010) which tests the null hypothesis that there is

constant variance that is no heteroskedasticity. The p-value of the test statistics for the model was statistically significant; therefore we rejected the null hypothesis of constant variance, implying presence of heteroskedasticity (Appendix 7).

Serial autocorrelation

Moreover, we tested for serial correlation in the error term using Wooldridge test for autocorrelation in panel data. We tested the null hypothesis that there is no first order autocorrelation. The p-value of the test statistics was statistically significant (Appendix 8), so we rejected the null hypothesis, thus indicating presence of serial correlation.

Thus, we ran the regression analysis model using robust standard errors so as to control the heteroskedasticity and autocorrelation in the error term.

3.8.3 Random Effect and Fixed Effect model

As suggested in the literature, there are two principal methods which can be used in panel data model to deal with the problem of omitted variable bias. These are Random effect (RE) and Fixed effect (FE) models.

Deciding on whether to use RE model or FE model was appropriate model for the study depended on if the individual effect were random or fixed, because if the effects are fixed the random effect model estimators are not consistent thus a fixed effect model should be used and vice versa (Nyamsogoro, 2010).

We conducted a standard Hausman test that tests the null hypothesis that RE provides consistent estimates as compared to FE model, and the test result was significant at 5% significance level (Appendix 9), and thus we rejected the null hypothesis, and therefore the fixed effect model was used as it would provide a consistent estimate.

3.9 Validity and reliability

Validity is the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure (Kothari 2003). In other words, validity is the

extent to which differences found with a measuring instrument reflect true differences among those being tested.

The findings of this study are expected to be valid because the measurement method used by the research have been used by different other studies and conforms to literatures on measurement of efficiency. The reliability of this study also relied on the quality of the data collected, treatment of omitted variable biases and model specification to check for outliers and ensure that all the multiple regression model specification assumptions are met.

CHAPTER FOUR

RESEARCH FINDINGS

4.1 Introduction

This chapter presents both statistical and econometrical summaries of the analysis of data collected for the study, and also provide a comprehensive interpretation and discussion of findings done in an attempt to fill the knowledge gap identified by the study in the literature reviewed. The exchange rate used in analysis of this study for a unit of USD was TZS 1650 as quoted on April 20th, 2013.

The data analysis and the discussion of the findings presented in this chapter were focused mainly on providing answers to the research's specific questions so as to attain the specific objectives of the study which would in turn assist in accomplishing the main objective of the study.

4.2 Descriptive results

The summary statistics for both dependent and independent variables used in this study are presented in this section. The dependent variable Operating Efficiency, which was measured in terms of Operating Expenses Ratio (OER) is presented in Table 4-1, while the independent variables are presented in Table 4-2.

4.2.1 Dependent variable

The OER is calculated by dividing all non-financial expenses related to the operation of a financial institution (including all the administrative and salary expenses, depreciation and board fees) by the period average gross loan portfolio. Expenses such as interest and provision expenses, as well as extraordinary expenses are not included. This ratio provides the best indicator of the operation efficiency of a lending institution (MicroRate *et al*, 2003).

The ratio is also commonly referred to as the efficiency ratio: it measures the institutional cost of delivering loan services. The lower the operating expense ratio, the

higher the efficiency (*ibid*). This is mainly because there has not been established a clear-cut percentage level of OER which would indicate operating efficiency. However, any ratio below 30% is considered ideal for MFIs (MicroRate *et al*, 2003).

The descriptive statistics for the variable Operating Expenses Ratio is presented on Table 4-1.

Table 4-1: Descriptive Statistics for Dependent Variable					
Variable	Obs	Mean	Std. Dev.	Min	Max
Operating Expense Ratio	73	0.5695479	0.4272304	0.0537	2.7836

Source: STATA output of research data

From Table 4-1, the mean OER is 0.57 which is equal to 57%. Considering 30% to be the maximum OER within which the institution is considered to have an ideal rate representing efficiency in operation, the 57% mean OER however, indicates that there is existence of inefficiency in operation of MFIs in Tanzania. The standard deviation of this variable (0.43) is slightly lower, meaning that there exists less dispersion in the variable OER.

Despite the fact that the mean OER shows inefficiency in operation of the MFIs, there were 14 observations out of the total 73 observations which had an OER of less than or equal to 30%, thus implying that 19.2% of all observation showed efficiency in operation.

4.2.2 Independent variables

The models in this study used seven independent variables. Presented in Table 4-2, are the results of the descriptive statistics for different independent variables used in this study.

Table 4-2: Descriptive Statistics for Independent Variables					
Variable	Obs	Mean	Std. Dev.	Min	Max
Gross loan portfolio	78	42,700,000	144,000,000	57562	833,000,000
Capital/asset ratio	72	0.3365167	0.2802428	-0.0752	1.05
Cost per borrower	71	197.4648	197.9109	7	812
Borrower per staff	75	163.4267	137.4341	22	798
Loan loss rate	64	0.0265422	0.040922	-0.0034	0.1812
Personnel expenses ratio	64	0.1329344	0.0879663	0.0191	0.3719
Average loan size	68	570.5588	695.3532	15	2412

Source: STATA output of research data

The variable **Gross Loan Portfolio** indicates the amount of loans that have been made or bought and are being held for repayment. The mean statistics for this variable is USD 42,700,000 (TZS 70,455 million). The highest amount of loan portfolio is USD 833 million (TZS 1,374,450 million) indicating presence of large MFIs in Tanzania providing services to a large number of clients countrywide, although this does not necessarily means that the MFI is operating efficiently. However, a minimum amount of loans outstanding is USD 57,562 (TZS 94,977,300) indicating presence of relatively small MFIs with minimal number of clients. Literature suggests that a very small amount of loan portfolio increase operating costs and thus lender inefficiency in operation. However, very large loan portfolio also leads to a Diminishing Return to Scale and thus increase long run average costs. Therefore, MFIs in Tanzania should keep an optimal amount of Gross Loan Portfolio in order to operate efficiently.

The **Capital to Asset Ratio** variable indicates a percentage of MFI's assets represented by its capital. It is the ratio of capital and reserves to total assets. Depending on the relative risk of loss, an MFI with a high Capital-to-Asset ratio is protected against operating losses more than the one with a lower ratio. The minimum rate agreed internationally is at 8%.

The descriptive statistics results indicated a means statistic of 0.337 (33.7%) and a standard deviation of 0.28 (28%). In this variable, 4 out of 72 observations (equal to 5%

of the total observations) had a ratio of less than 8%. However, the highest rate was very high at 105%. This indicates that more than 90% of the observations are protected from operating losses.

The variable **Cost per Borrower** had a mean statistic of 197.46 and a standard deviation of 197.91. The lowest amount which an MFI incurred per borrower was USD 7 (TZS 11,550) while the highest cost incurred by MFI to serve a borrower was USD 812 (TZS 1,339,800). This variable shows how efficient an MFI is in allocating cost to its clients. To determine whether the cost per borrower incurred by an MFI indicates its operating efficiency, will depend on a number of factors including the proportionate size of the loan given. An MFI will be efficient if it incurs a lower proportion of cost per borrower for each amount of loan extended to its clients.

The **Borrower per Staff** variable indicates the average number of clients which were served by each member of staff in an MFI. Other factors remaining the same, at the same salary rate, the higher the number of borrowers a member of staff serves, the better the operating expenses rate, thus means an MFI can be operating efficiently.

The descriptive results of this variable indicated a mean statistic of 163.43 meaning that on average, one staff member provided services to an average number of 163 clients per annum. The lowest number of clients served by a staff member was 22 per annum and a maximum of 798 clients were served by a staff member. Although the general rule for this variable is the higher the better, this information alone cannot reliably be used to tell if an MFI was efficient in utilising its work force, this is because an MFI can have small number of clients taking big loans at an ideal interest rate, thus the firm may still be operating efficiently. There for, many other factors must be put into consideration.

The descriptive statistics results for the variable **Loan Loss Rate** indicated a mean loan loss of 0.027 (2.7%) and a standard deviation of 0.04 indicating less dispersion in the variable. Loan loss rate is the figure of declared non receivable and written off net recoveries, during the year over the total amount of loans outstanding during the year.

This variable indicates the amount of losses incurred by an MFI resulting from clients' defaults in repayments of the loans extended to them. The minimum loss rate was - 0.0034 while the highest loss from clients' defaults, was up to 18%. High loan loss rate indicating operating inefficiency as it implies that the firm is unable to collect the outstanding loan balances from clients, thus increase its operating costs.

The **Personnel Expense Ratio** variable descriptive results indicated a mean statistics of 0.133 (13.3%) which was not very adverse, coupled with the minimum rate of 1.9%. However, the maximum personnel expense rate was high at 37.2% which indicates that personnel expenses amounted to more than a third of MFI's gross loan portfolio.

High personnel expenses increase operating costs of a firm and thus reduce the level of operating efficiency of that firm.

The variable **Average Loan Size** is a ratio of outstanding loan portfolio over number of active borrowers. This variable indicates the depth of outreach of an MFI. The mean for this variable is USD 570.56 (equal to TZS 941,424). The highest average loan size was USD 2,412 (equal to TZS 3,979,800) which is an indication of serving relatively non poor clients; while the lowest average loan size was USD 15 (TZS 24,750) indicating attaining of MFI goal of extending small loans to the poorest member of the society.

Rosenberg (2003) suggests that MFIs with the smallest loans size usually have higher administrative expense ratios around 50% or more, compared to 20% or less for the top performers. This however, could not be taken as a reliable conclusion as, it tend to differ from one firm to another.

4.3 Econometric results

This section presents econometrics results of the evaluation of the determinants of efficiency in operations of MFIs basing on the dependent variable identified on Table 4-1, and the independent variables presented on Table 4-2. The results of the analysis under this section were used in attempting to answer the specific questions of the study.

4.3.1 Operational model

As introduced in the methodology section in Chapter Three, the study employed the following specific model:

$$OER_{it} = \alpha_i + \beta_1 Grossloanportfolio_{it} + \beta_2 Capitalasstrati_{it} + \beta_3 Costperborrower_{it} + \beta_4 Borrowerperstaff_{it} + \beta_5 Loanlossrate_{it} + \beta_6 Personnelexpratio_{it} + \beta_7 Averageloansize_{it} + \varepsilon_{it}$$

Where:

OER is the Operating Expenses Ratio, which is the dependent variable of the study;

α_i is a constant term;

β_j measures the partial effect of independent or explanatory variables in period t for the unit i (MFI) for the j^{th} explanatory variable;

X_{its} are the independent variables as described in Table 3-2;

and ε_{it} is the error term.

The variables, both dependent and independent, are for cross-section unit i at time t , where i = MFIs (1 to 19), and t = year (1 to 6).

4.3.2 Regression analysis results

Using STATA 11 econometric software, the researcher ran a Fixed Effect panel regression model where the p-value associated with the model's F-statistic used in testing the null hypothesis that all of the model's coefficients are zero was statistically significant at 1% significance level, the null hypothesis was rejected, indicating that the coefficients were not equal to zero. The overall R-Squared was 0.61, meaning that more than 60% of variance in the dependent variable can be explained by the independent variables of the model.

Table 4-3 presents a summary of econometric results; however, detailed regression results are presented in Appendix 10.

Table 4-3: Econometric Results for Determinants of Operating Efficiency of MFIs			
Variable	Coefficient	Robust Std. Err	P>z
Lngrossloanportfolio	-0.2607402	0.1196295	0.045**
Capitalassetratio	0.6517655	0.1672389	0.001***
Lncostperborrower	0.5299198	0.1867167	0.012**
Borrowerperstaff	0.0007153	0.0005164	0.185
Lnloanlossrate	0.0069197	0.0198037	0.731
Personnelexperatio	3.184182	1.001562	0.006***
Lnaveragealoansize	-0.0104971	0.1865653	0.956
Cons	1.296429	0.4579788	0.012
R- Squared	Within = 0.8901	Between = 0.4009	Overall = 0.6061

***significant at 1%; ** significant at 5%

Econometrics results indicated that **Gross Loan Portfolio** had a negative coefficient and it is statistically significant at 5% significance level. This indicates that MFI's operating efficiency is associated with the higher levels of gross loan portfolio. The negative coefficient indicates that an increase in one unit of gross loan portfolio leads to a decrease in the OER by 0.261. Thus, the higher the loan portfolio, the lower will be the average operating expenses and therefore cost reduction which would eventually enhance efficiency in operations. This analysis attempted to answer the first research question about the effect of gross loan portfolio on the performance of MFIs.

The **Capital to Asset Ratio** variable's econometric results indicated that this variable reduces operating efficiency. The variable had a positive coefficient of 0.652 and it was statistically significant at 1% significance level.

The positive coefficient indicates that an increase in one unit of the variable increase the OER by 0.652. Thus, a very high Capital to Asset ratio is not ideal in an MFI as it tends to increase the cost of operations which in turn raises the OER and therefore, the firm operate inefficiently. This analysis is closely linked to the third specific objective, thus answered the fourth research question about the effect of Capital to asset ratio on MFIs operating costs.

The econometric results for the variable **Cost Per Borrower** showed a positive coefficient and it was statistically significant at 5%. From the analysis it can be inferred that this variable affect the operating efficiency of an MFI adversely, since an increase in one unit of cost per borrower will increase the OER by 0.53 (equal to 53%).

Unless the increase of cost per borrower brings about a significant proportionate increase in an MFI's profitability, other things being the same, an increase in cost per borrower reduces the operating efficiency of MFIs institution operating in Tanzania. The analysis attempted to answer the third research question on the effect of cost of lending on operating performance of an MFI.

The variable **Borrower Per Staff** had a positive coefficient meaning that it would affect the Operating Efficiency of MFIs; however, it was not statistically significant. Meaning that the number of clients a staff serves per annum has no significant effect on the operating costs a firm incurs in respect of increasing personnel expenses.

In an event of a small scale MFI where clients take small loans and usually take a considerably long time to repay. The small number of borrower per staff may lead to increase in average operating costs, thus lender inefficiency in operations.

Theoretically, productivity can be measured in terms of borrowers per staff member and savers per staff member (Haq et al, 2006). Therefore, MFIs with high level of operation efficiency may be a result of maintaining high productivity per employee level.

Econometric results of the variable **Loan Loss Rate**, which indicates the amount of losses incurred by an MFI resulting from clients' repayment defaults, its coefficient was statistically insignificant implying that the cost which MFIs incur in respect of losses resulting from clients defaults is no significant enough to affect operating efficiency of such MFIs.

Personnel Expenses Ratio's coefficient was a positive one, and it was statistically significant at 1% significance level. This variable seem to have much effect on the

dependent variable OER, as an increase in one unit of personnel expenses ratio brings about a 3.18 increase in the operating expenses ratio.

Therefore, the cost which MFIs incur to pay for personnel expenses constitutes a large percentage of all their operating costs.

And lastly is the **Average Loan Size**. The econometrics results indicates that the coefficient of this variable affect the dependent variable OER negatively, meaning that the higher the average loan size the better will be the MFI in terms of operating efficiency.

This variable however was not statistically significant, meaning that the variable is not a significant determinant of Operating efficiency in MFIs. Although Rosenberg (2003) suggest that MFIs with the smallest loan size usually have administrative expense ratios around 50% or more. This analysis suggests an attempted answer to the second research question on impact of average loan size on MFIs' operating costs.

The analysis above attempted to answer the specific research questions of the study which in turns, helped to attain the study's specific objectives and finally the main objective of this study which was to evaluate the determinants of efficiency in operation of microfinance institutions in Tanzania.

4.4 Effect of Gross loan portfolio and average loan size on OER

The first specific objective of the study aimed at evaluating the effect of Gross Loan Portfolio and Average loan size on operating expenses of MFIs. From the analyses done on these variables, it was evident that they both have an inverse relationship with the dependent variable since they had negative coefficients. Gross loan Portfolio was a significant determinant of efficiency in operation of MFIs. From this variable, the higher the size of portfolio and MFI had the better was the OER. In practise however, a very large Gross Loan Portfolio may lead to decrease in operating efficiency since the firm will start to experience diseconomies of scale in terms of increase in long run average cost incurred to finance the firm's expansion.

The effect of Average Loan Size according to the analysis, was not statistically significant on the dependent variable, meaning that the variable is not a significant determinant of Operating efficiency in MFIs although in practice, the smallest loan size are usually very expensive to administer (Rosenberg, 2003). However, for socially oriented MFIs with low average loan sizes, efficiency is a key component of success in reaching poorer segments in a viable manner to maximize impact (Brand and Gerschick, 2000).

4.5 Cost of lending and personnel expenses' effect on MFIs' performance

This objective was purposely set to analyse the effect which the cost of lending incurred by MFIs as well as the money spent for paying their employees have on their overall performance. Both variables under this specific objective, that is Cost Per Borrower, Borrower Per Staff and Personnel Expenses Ratio, were positively correlated with the dependent variable basically because they are all cost elements in nature.

The variables Personnel Expenses Ratio and Cost Per Borrower significantly affected the dependent variable OER at 1% and 5% significant level respectively. This means that the two variables were both the determinants of operating efficiency of Tanzania MFIs. Personnel Expenses Ratio highly affected the dependent variable in the sense that a change in this variable brought about a very significant change on the OER. MFIs are usually labour intensive, which is proved by the result of this variable.

The Cost Per Borrower variable affect the operating efficiency of an MFI adversely, since an increase in one unit of cost per borrower will increase the OER by more than 50%. An increase in cost per borrower reduces the operating efficiency of MFIs institution operating in Tanzania.

The variable Borrower Per Staff (representing the number of clients a staff serves per annum) on the other hand was not statistically significant thus was not a significant determinant of efficiency in operation of MFIs in Tanzania. This variable can however be used to measure productivity of an MFI (Haq et al, 2006).

However, for a small scale MFI where clients take small loans and usually take a considerably long time to repay. The small number of borrower per staff may lead to increase in average operating costs, thus lender inefficiency in operations.

4.6 Effect of capital investment in assets on MFI's operating costs

This specific objective aimed at determining the effect of capital which is used to finance MFIs activities through investment in assets on MFI's operating costs. The variable Capital to Asset Ratio which indicates the percentage of MFI capital represented in terms of its capital, affected the dependent variable positively, meaning that a unit increase in this ratio brings about an increase in the OER.

The analysis indicated that this variable was a determinant of efficiency in operation of MFIs in Tanzania as it statistically affected the dependent variable OER at a 1% significance level. An increase in the capital to asset ratio brings about an increase in the OER. Thus it must be controlled by the MFIs.

MFIs need to maintain a relatively lower Capital to Asset ratio if they want to operate efficiently. This is because a very high capital to asset ratio tends to increase the cost of operations of an MFI which would in turn raises the OER and therefore, the firm operate inefficiently.

The attainment of those specific objectives paved a way in to accomplishing the overall objectives of this study aimed at evaluating the determinants of efficiency in operation of MFIs operating in Tanzania.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY IMPLICATION

5.1 Introduction

This chapter, in line with the specific objectives of the study, gave a summary of the assessment of the findings following the analysis done in chapter four, and thus presented the major conclusion of the study, policy implication basing on the findings and the recommendations drawn from the this study.

5.2 Summary and Conclusion

The study's main objective was to evaluate the determinants of efficiency in operation of MFIs in Tanzania. Considering the analysis of data conducted and its resulting descriptive and econometrics output, and the evaluation of findings reported in Chapter Four, it can be therefore be concluded that, efficiency in operation of MFIs is highly influenced by gross loan portfolio, capital to assets ratio, the amount of cost per borrowers and the ratio of personnel expenses. We came into that conclusion because the coefficients from econometrics results of those variables were statistically significant at 1% and 5% significance level, which implied that those variables significantly affected the dependent variable of the study and therefore form the determinants of operating efficiency of MFIs in Tanzania.

The variables borrowers per staff, loan loss rate, and average loan size reported in others studies as efficient drivers were not statistically significantly as far as this is concerned. Thus basing on the analysis of this study, those variables were not the determinants of efficiency in operations of Tanzanian MFIs as far as this study was concerned.

5.3 Policy Implication

Basing on the conclusion drawn from this study, in order for MFIs in Tanzania to attain efficiency in operation, they should increase the size of gross loan portfolio through extending small and medium sized loans to a large number of customers. This will

enable MFIs in Tanzania to minimise their operating costs per unit, at attain operating efficiency while still achieving the main microfinance objective of providing loans to the poor, since the findings suggest that the average loan size does not affect efficiency of an MFI.

Tanzanian MFIs should also keep an optimal number of staff according to their client base and proportional to the gross loan portfolio held by firm. This is due to the fact that, the findings indicated personnel expenses are highly correlated with operating expenses, thus tend to have a considerably large impact on the operating expenses ratio. So MFIs management can attain operating efficiency through proper utilisation of their human resources which in turn will help reducing cost per borrowers which seem to affect the operating expense ratio significantly as well.

5.4 Recommendations

An efficiently operated MFI earns high yield on gross loan portfolio it holds since a small percentage of its revenue generated is used to cover its operating costs. This will eventually enhance sustainability of such MFI. From the findings of this study, it can be recommended that MFIs in Tanzania should control gross loan portfolio, capital to assets ratio, the amount of cost per borrowers and the ratio of personnel expenses, and use these factors to act as a starting point when conducting evaluation of their operating performance in order improve on their overall efficiency, since efficiently operated MFIs would lead to a significant boost in different economic activities of households, firms and in the economy as whole, leading to attainment of personal development as well as that of the country as a whole.

In addition to that, different government agents such as the Central Bank and other financial regulators should formulate policies which can influence efficiency in the microfinance industry so as to ensure that MFIs operate at lower or minimum operating costs, and therefore provide financial services to the poor at a reasonable cost thus accelerate the goal of poverty alleviation in the country.

5.5 Knowledge contributed, limitations and suggestion for further research

The vital contribution to knowledge that findings deduced from this study has provided as far as MFIs in Tanzania are concerned, are the main operating cost drivers that can be influenced and assist MFIs to attain the microfinance mission of poverty eradication through controlling the cost elements which increase their operating costs, as this will enable them to earn a proportionate high amount of return without having to raise interest rates or providing large loans only to non poor clients who can afford to pay high interest. This is because the value of a loan portfolio depends not only on the interest rates earned on the loans, but also on the quality or likelihood that interest and principal will be paid.

The major limitation of this study however, it was not able to provide a clear cut operating efficiency ratio to act as a benchmark which can be an overall measure of operating efficiency for MFIs in Tanzania. This gives room for further studies to be conducted so as to create a generally acceptable benchmark of measuring operating efficiency in MFIs worldwide.

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Appendix 1: Coverage Letter

P. O. Box 7602,
Mwanza.
Feb 25th, 2013

Dear Respondent,

**RE: KINDLY REQUESTING FOR YOUR RESPONSE ON THIS
QUESTIONNAIRE**

My name is Yuda Thadeo. I'm a postgraduate student at Mzumbe University taking a Master of Science in Accounting and Finance. I'm conducting a research on Microfinance to evaluate the determinant of operating efficiency of MFIs in Tanzania.

I'm kindly requesting for your co-operation in responding to the questions asked in the attached questionnaire, as your response will be of great assistance in getting the appropriate finding in this research.

Everything that you will include in your correspondence is guaranteed to be confidential between you and the researcher.

Yours sincerely



Thadeo Yuda
The researcher

Appendix 2: Introductory Letter from the University



**MZUMBE UNIVERSITY
(CHUO KIKUU MZUMBE)
SCHOOL OF BUSINESS
Department of Accounting and Finance**

E-mail: sob@mzumbe.ac.tz
Tel: +255 (0) 23 2604380/1/3/4
Fax: +255 (0) 23 2604382
Website: www.mzumbe.ac.tz

P.O. BOX 6,
MZUMBE,
MOROGORO, TANZANIA

Ref: No. MU/DAF/MSc. THESIS/55/Vol. IV/57/89

19/02/2013

TO WHOM IT MAY CONCERN

**Re: Field Research for MSc. Dissertation
YUDA THADEO**

Yuda Thadeo our student pursuing Master of Sciences – Accounting and Finance). All our graduate students are required to write dissertation as part of their evaluation. In this respect they need to conduct field research in organizations within the country.

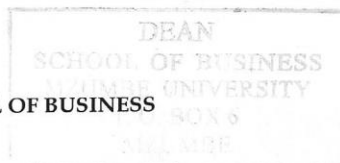
Yuda Thadeo Dissertation Topic: **Evaluation of the Determinants of Efficiency in Operations of Microfinance Institutions in Tanzania.**

We kindly request you to provide him with the necessary information he may require from your organization in order to accomplish his study.

We wish to express our gratitude for your continued support to our graduate programmes.

Sincerely,


Jasinta Msamula
For DEAN SCHOOL OF BUSINESS



Appendix 3: Questionnaire

For official use only

MFI's code:	Legal status:
----------------------	------------------------

A. BASIC INFORMATION ABOUT THE INSTITUTION

1. Name of MFI.....
2. Physical Address.....
3. Telephone No.....
4. Email address.....
5. Key person contacts.....
6. Number of loan officers.....
7. Total Number of staff.....

B. FINANCING AND INVESTING INFORMATION

1. How much was the value for:	2006	2007	2008	2009	2010	2011
i. Capital?						
ii. Capital reserves (if any)?						
iii. Total Assets?						

C. LOAN PORTFOLIO INFORMATION

2. How much was the outstanding balance:	2006	2007	2008	2008	2010	2011
i. For Loan portfolio?						
ii. For the amount of loan disbursed?						
iii. For loans written off as bad?						
iv. For Provisions for loan loss?						

D. OPERATING EXPENSES INFORMATION

3. How much was the annual value of:	2006	2007	2008	2009	2010	2011
i. Administrative expenses?						
ii. Personnel (staff) expenses?						

E. CUSTOMER BASE INFORMATION

4. What was the number of your?	2006	2007	2008	2009	2010	2011
i. Loan clients with loans?						
ii. Loan Clients without loans?						
iii. Non-loan clients?						
iv. Inactive clients?						
v. Total number of clients?						

TERMS OF THE LOANS

5. How much was the size of the loans?	2006	2007	2008	2009	2010	2011
i. Minimum (initial) amount						
ii. Maximum size						

Thank you for your co-operation

Appendix 4: Correlation Coefficients

	grossloanp~o	capitalass~o	costperbor~r	borrowersp~r	loanlossrate	personnele~s	averageloa~e
grossloanp~o	1.0000						
capitalass~o	-0.1825	1.0000					
costperbor~r	0.4185	0.0259	1.0000				
borrowersp~r	0.0520	0.3555	-0.3126	1.0000			
loanlossrate	-0.1027	0.1795	0.0196	-0.1501	1.0000		
personnele~s	-0.3038	0.0169	-0.1702	-0.1067	0.3723	1.0000	
averageloa~e	-0.0126	-0.2346	0.5986	-0.4151	-0.1622	-0.3699	1.0000

Appendix 5: Variance Inflation Factor (VIF)

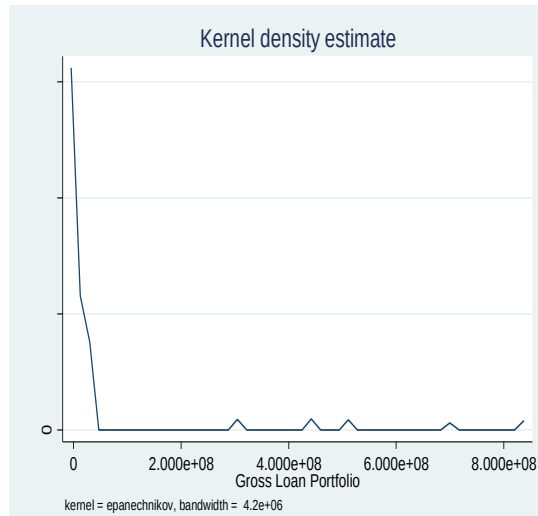
variable	VIF	1/VIF
averageloa~e	3.24	0.308202
costperbor~r	3.15	0.317666
grossloanp~o	2.22	0.449899
personnele~s	1.77	0.565868
capitalass~o	1.66	0.602813
borrowersp~r	1.58	0.633116
loanlossrate	1.27	0.787723
Mean VIF	2.13	

Appendix 6: Kernel Density estimates

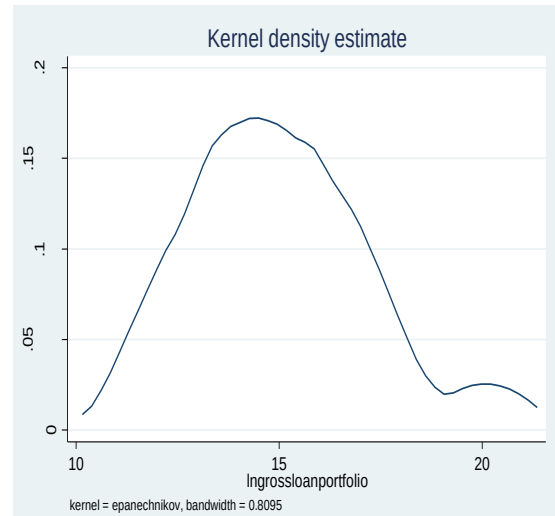
Before Log Transformation

After Log Transformation

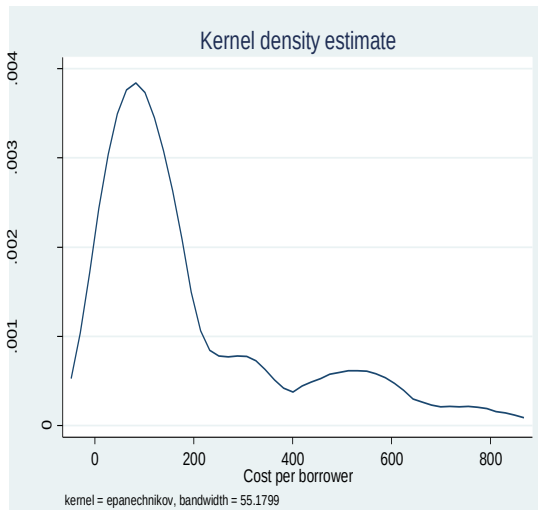
Gross loan portfolio



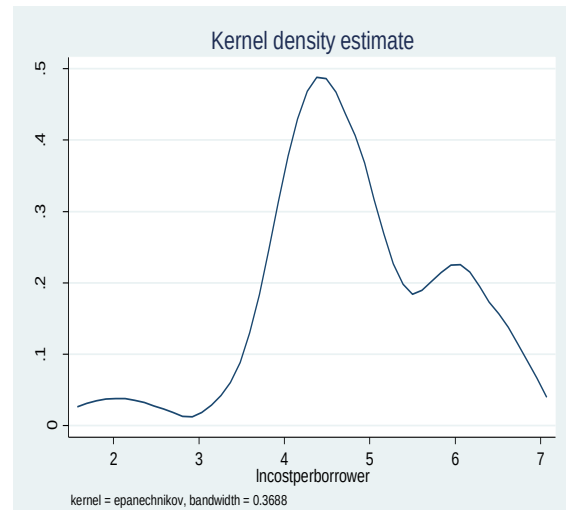
Gross loan portfolio



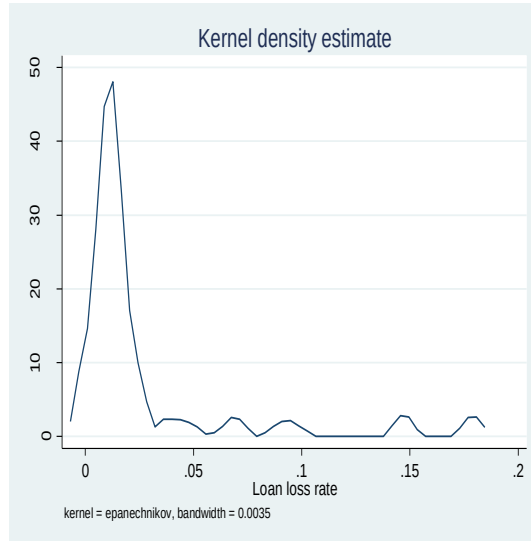
Cost per borrower



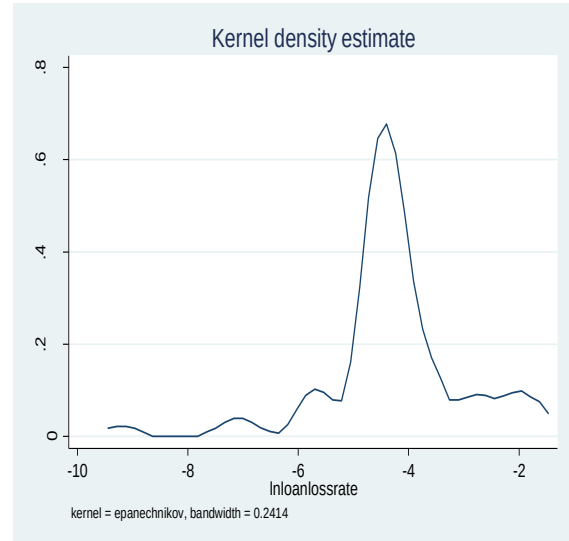
Cost per borrower



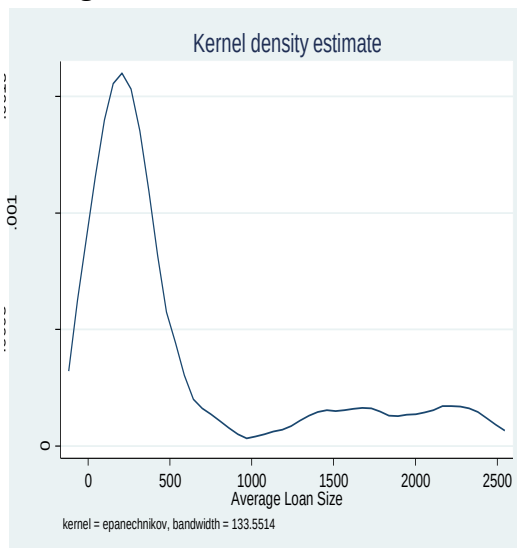
Loan loss Rate



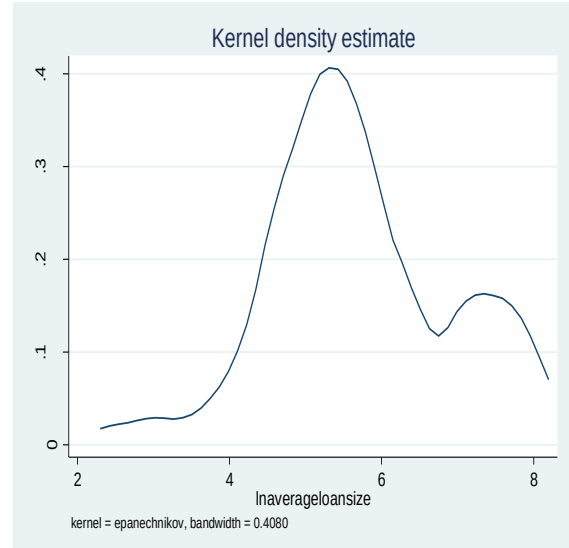
Loan loss Rate



Average loan size



Average loan size



Appendix 7: Heteroskedasticity Test Results

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

H0: Constant variance

Variables: fitted values of operatingexpenseloanportfolio

chi2(1) = 32.85
Prob > chi2 = 0.0000

Appendix 8: Autocorrelation Test Results

```
. xtserial OER lngrossloanportfolio capitalassetratio  
> ate personnelexpenseassets lnaverageloanportfolio
```

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(1, 10) = 18.900
Prob > F = 0.0014

Appendix 9: Hausman Test Results for FE vs RE

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
lngrossloanportfolio	-.2607402	-.0755334	-.1852068	.0683601
capitalassetratio	.6517655	.642119	.0096465	.1087018
lncostperborrower	.5299198	.2205907	.3093291	.1190473
lnloanlosses	.0007153	-.0012547	.0019699	.000943
personnelexpenses	.0069197	.0223482	-.0154285	.0048782
lnaverageloanportfolio	3.184182	3.243612	-.0594294	.9791609
lnaverageloanportfolio	-.0104971	-.1063617	.0958646	.1300053

b = consistent under H0 and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under H0; obtained from xtreg

Test: H0: difference in coefficients not systematic

chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 20.57
Prob>chi2 = 0.0045
(V_b-V_B is not positive definite)

Appendix 10: Fixed Effect panel regression results

```
. xtreg OER lngrossloanportfolio capitalassetratio lncostperborrower borrowerspe
> personnelexpenseassets lnaveragealoansize, fe robust
```

```
Fixed-effects (within) regression      Number of obs   =       56
Group variable: mfiid                 Number of groups =       17

R-sq:  within = 0.8901                obs per group: min =       1
      between = 0.4009                  avg =       3.3
      overall  = 0.6061                  max =       6

corr(u_i, Xb) = -0.7810                F(7,16)          =    415.33
                                      Prob > F           =     0.0000
```

(Std. Err. adjusted for 17 clusters in mfiid)

OER	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
lngrossloan~o	-.2607402	.1196295	-2.18	0.045	-.5143435	-.0071369
capitalass~o	.6517655	.1672389	3.90	0.001	.2972348	1.006296
lncostperb~r	.5299198	.1867167	2.84	0.012	.134098	.9257416
borrowersp~r	.0007153	.0005164	1.39	0.185	-.0003794	.00181
lnloanloss~e	.0069197	.0198037	0.35	0.731	-.0350623	.0489017
personnele~s	3.184182	1.001562	3.18	0.006	1.060966	5.307399
lnaveragele~e	-.0104971	.1865653	-0.06	0.956	-.4059979	.3850037
_cons	1.296429	.4579788	2.83	0.012	.3255574	2.267301
sigma_u	.56683627					
sigma_e	.12429746					
rho	.95412113	(fraction of variance due to u_i)				