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An Assessment of the Financial Sustainability of Microfinance Institutions in East Africa

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1. Microfinance – East Asia

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VIVA VOCE COMMITTEE

It is to certify that we have read and evaluated the thesis submitted by Koire Twaha. It is our judgment that it bears sufficient standard warranting acceptance by the International Islamic University for an MS degree in Economics.

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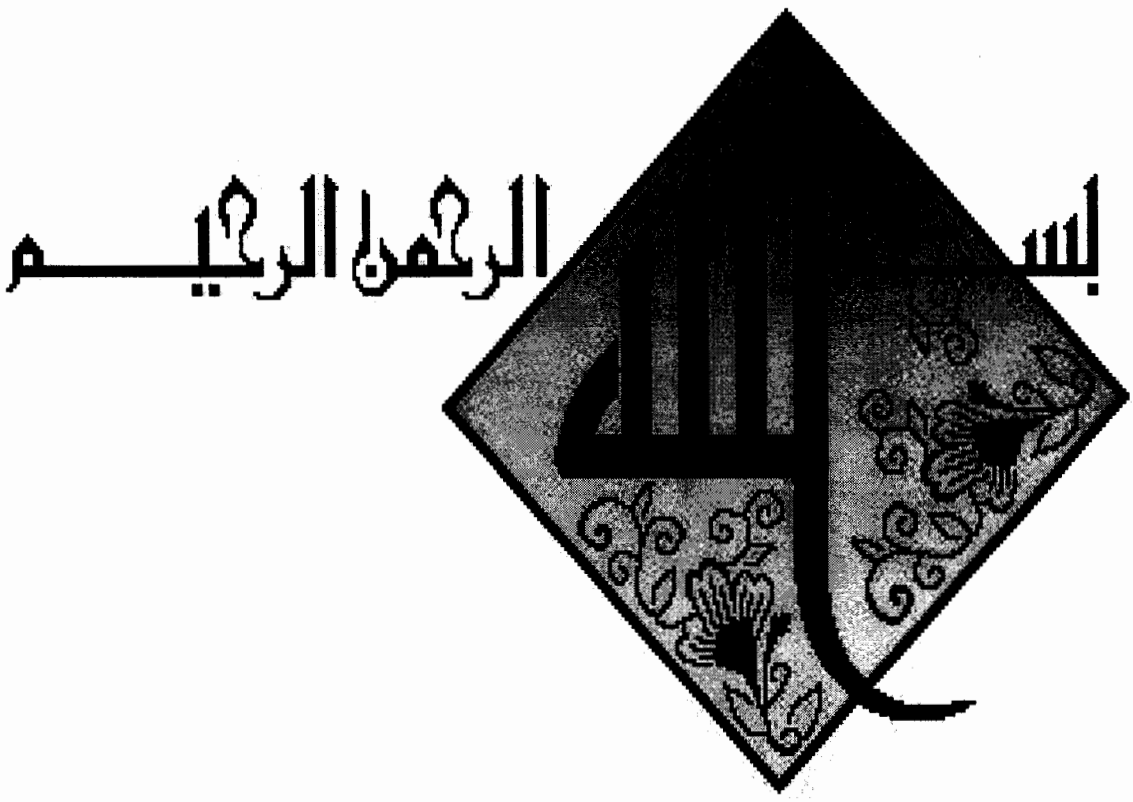

And that which you give in gift (to others), in order that it may increase (your wealth by expecting to get a better return) from other people's property, has no increase with Allah; but which you give in Zakat seeking Allah Countenance, then those they shall have manifold increase (Surah Ar – Rum 30: 29).

ABSTRACT

The poor people in the developing countries like in East Africa are constrained by savings and the absence of credit access from formal financial institutions to establish small scale enterprises as they are perceived to be un-bankable. Since the late 1980, Micro Finance Institutions have mushroomed with the primary aim of resolving this problem of poverty. However, extending financial credit to the poor is somewhat challenging given their financial strength, businesses, locations, abilities, social obligations and mindset. On this background, this study attempt to look into Micro Finance Institutions' performance from the financial sustainability angle in East Africa with secondary data sources from the Micro finance information exchange for the period 2004-2009, using Bayesian estimation technique. The study finds that financial sustainability of these institutions is enhanced and hindered by several factors. It identifies outreach, profitability as enhancing factors while capital structure, efficiency and portfolio quality as hindering ones. Specifically it noted number of active borrowers, deposit to GNP per capita, profit margin, real yield on portfolio on one hand and debt to equity, donations, personnel expenses to loan portfolio, loan loss rate and portfolio at risk more than 30 days on the other as enhancing and hindering financial sustainability respectively.

Key words: Assessment, Financial Sustainability, Micro finance Institutions.

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ESP: Earning Per Share

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MFIs: Micro Finance Institutions

NBFIs: National Bank Financial Institutes

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ROSCAs: Rotating Savings and Credit Associations

UNDP: United Nations Development Programme

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CHAPER 1

INTRODUCTION

This section provides an overview of the entire study beginning with the background, moving on to the motivation of the study, statement of the problem, objective and significance of the study and finally the research plan.

1.1 BACKGROUND

The Micro finance Industry[1] is one of the major development tools in poverty alleviation in East Africa. Several studies conducted on poverty in developing countries have cited different causes of poverty. Some have rightly argued that the poor do not have easy access to credit for financing working capital as well as investment in their small businesses (Jean – Luc 2006). One of the important stylized facts in less developed countries is that poor masses have little access to formal financial institutions. It is also widely recognized that economic progress relies heavily on access to financial services.

[1] According to the microfinance gateway, Micro finance industry includes all those institutions providing micro finance services. They range from (1) Formal financial institutions such as rural banks, cooperatives, non bank financial institutions, savings banks, agriculture banks and commercial banks. These are regulated and supervised by the central bank, and they offer a wider range of financial services and control a branch network that can extend across the country and internationally. They have been criticized for not adapting the social mission and for failing to deliver services to remote populations. (2) Semi formal institutions include NGOs. They are credited for being innovative and pioneering banking techniques like solidarity lending, village banking and mobile banking. However, they have fragile governance structures and overly depend on external donors. (3) Informal institutions include money lenders, pawn brokers, savings collectors, money-guards, Rotating Savings and Credit Associations (ROSCAs), Accumulating Savings & Credit Associations (ASCAS) and input supplier shops. Because they know each other well and live in the same community, they understand each others financial circumstances and can offer very flexible, convenient and fast services. They are however costly and offer limited products on short term basis.

heavily on access to financial services. Experience in many countries has established that Micro Finance Institutions[2] (MFIs) have tremendous potentiality to fill the gap left by formal financial institutions (Barham, Boucher, Carter, 1996). Micro Finance is therefore, increasingly being taken as a magic bullet to alleviate poverty and implement financial inclusion strategies[3]. Planners and policy makers in the developing regions have become euphoric about the potential of micro finance in poverty reducing effects and thereby channeling development aid to tackle the acute poverty issue through them. Given the primary role of MFIs in poverty reduction and generally in development of the economy, an up-to-date information about the performance of this industry is very essential not only to the MFIs managers but also to the numerous stakeholders such as the governments, donors, relevant associations and other financial authorities. In the parlance of the finance industry, the performance of MFIs is more or less synonymous to their financial sustainability, which is the nonprofit equivalent of profitability. It refers to the ability of a Micro financing program to generate surplus funds, enough to support an ever expanding but finite number of beneficiaries on a permanent basis. Thus, financial sustainability is the principal focus of Micro Finance industry at present; however this focus has certain drawbacks. It is often suspected that too much focus on financial sustainability will divert MFIs' attention and resources away from their core objective of

[2] Consultative Group to Assist the Poor (CGAP) defines micro finance institutions as those institutions that provide financial services such as deposits, loans, payment services, money transfers, and micro insurance to poor and low-income households and, their micro-enterprises. In addition to financial services, Ledgerwood (1998) while defining micro finance went further by included social intermediations. The social intermediation provided by MFIs includes group formation, development of self confidence and training in financial literacy and management.

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poverty alleviation. This reservation is based on several factors. The poor tend to be concentrated in hard-to-reach rural areas, characterized by weak and fragmented markets for goods and services, limited non-farm activities. Most often, the poor served by MFIs have no physical collateral thereby implying high credit risk, similarly some poor lack prior business skills. Likewise, the poor are generally engaged in agriculture sector, which is open to natural hazards that are difficult to predict, prevent and ward off. They often demand numerous small loans whose unit transaction cost is high on average (Hulme et al 1996, Conning 1999, Paxton et al 2002, Zeller et al 2002). Most poor are inhabited in rural areas which are widely dispersed, and this leads to pushing up monitoring, delegation and other administrative expenses of the MFIs' (Conning 1999). The difficulty is to handle clients without collateral; therefore potential screening is necessary which in turn leads to high monitoring and enforcement costs (Goodman 2000). This compels finance institutions to increase their dependence on donors, and cripples their formidability to ward off challenges in the event of donor withdraws (Kereta, 2007). In short, delivering financial services to the poor is comparatively costly and difficult, and is fraught with risk, none of which bodes well for long-term financial sustainability. Hence the belief that financial sustainability and depth of outreach are inherently contrasting objectives makes sense.

All in all, it is reasonable to believe that these fears, factors and operational circumstances, pose great challenges to the financial sustainability of MFIs, given the absence of well structured risk mitigation tools in the developing world. As pointed out by (Golin, 2001), adequate earnings are required to enable a financial institution to

Rwanda) for the purpose of evaluating the performance and to understand the financial sustainability of MFIs. These countries lie within the Sub Sahara - a region with the highest poverty incidence in the world (UNDP, 2008).

1.2 MOTIVATION OF THE STUDY

Some insightful studies have been carried out on the financial performance and sustainability of MFIs; like Kereta (2007) in Ethiopia, Lafourcade et al (2005) in Africa, Cull et al (2007) globally and Woller (2003) on the financial performance of village banks globally. However, many areas are grayish and left untouched due to inadequate coverage; we have accepted the challenge of filling the gaps in this research.

1.3 STATEMENT OF THE PROBLEM

Providing financial services to masses is risky and uncertain in general, however the intensity magnifies while dealing with the poorest of the poor. Most of the poor have no adequate collaterals to guarantee their loans; they have no business skills, and they are involved in risk bearing activities, mostly in agriculture sector that depends on nature. Further, the poor are mostly dispersed in far flung rural areas and demand numerous small loans for different purposes. These factors increase the monitoring and transaction costs of MFIs. In addition, the business environment in the developing world is punctuated by poor governance, complicated legal systems, loose enforcement of rules, and regulations, wide spread corruption, outdated technology and underdeveloped infrastructure especially in the country side. The prevalence of these problems creates

more challenges for Micro finance institutions to run their businesses effectively and efficiently and to reach the doors of the needy.

1.4 OBJECTIVES OF THE STUDY

This study is intended to identify and establish the factors affecting the financial sustainability of MFIs in East Africa. In this context, the specific objective is to identify the roles played by the following factors underlying sustainability:

(a) Outreach (b) Capital structure (c) Profitability (d) Efficiency and (e) Portfolio quality

1.5 SIGNIFICANCE OF THE STUDY

The challenges faced by developing countries of the third world regarding poverty eradication are endless which manifest in many ways. This study is in an effort to identify some of the many challenges associated with poverty eradication strategies faced by the micro finance institutions working in developing countries, which they face in their efforts to service the poor.

The current study contributes to the existing literature, both theoretically and methodologically. It explores the economic channels of the financial sustainability and performance of MFIs. The previous research works have tackled different aspects of financial sustainability and performance of Micro finance institutions, mostly outreach. We go a step further by incorporating in our model all the possible factors concurrently. Methodologically, the study improves on both the data and statistical models used in the

existing literature. Our data set includes better and up - to - date information on the operations of MFIs as compared to that used in the previous studies. Moreover, using an Empirical Bayesian estimation technique, we minimize the estimation bias due to unbalanced panel data. We explore all the hidden information regarding data, which is not possible with the classical estimation techniques.

1.6 RESEARCH PLAN

This paper is structured as follows; The next chapter 2 is reviewing the related literature, chapter 3 is presenting the related theories, chapter 4 provides the analytical framework and methodology, chapter 5 presents the data, chapter 6 presents the empirical findings and finally chapter 7 makes conclusions and directions for future research.

CHAPTER 2

LITERATURE REVIEW

This chapter provides an overview of sustainability and a semantic illustration of financial sustainability.

2.1 SUSTAINABILITY

There is much semantic confusion surrounding the word 'sustainability'. Sustainability has been a subject of fascination not only to policy makers, but also to social scientists, academicians, and development practitioners alike. Sustainability seems to be a context with varying definitions by various authors. Navajas et al, (1998:5) defined it as ,'the ability to reach goals in the short run without harming the ability to reach goals in the long run'; Edgcomb et al (1994: 77) considers it as 'the ability of an organization to sustain the flow of valued benefits and services to its members or clients over time'. (Edgcomb et al, 1994:86) further redefines it as, 'the ability of a financial institution to meet 100 percent auto financing'. Brinkerhoff (1991:22) defines sustainability as 'the ability of a program to produce outputs that are valued sufficiently by beneficiaries and other stakeholders that the program receives enough resources and inputs to continue production'. Generally, sustainability refers to the long term ability of an institution to meet goals or targets or endure or institutional permanence. Sa Dhan (2010) suggests that sustainability can manifest itself in different dimensions, including mission, programme, human resources, and financial, marketing, legal policy

environment. Sustainability has not only been described as the dominant development challenge of our current age (Dichter 1997); but it has also been used (albeit cautiously) as a synonym for development success (Uphoff, Esman, and Krishna 1998). Supporting sustainable development requires sustainable institutions. In development circles, therefore, sustainability is an important issue that carries with it very high stakes, and its pursuit has left an indelible hallmark on a host of development organizations. Establishing a system of sustained provision of modern financial services has however, been challenging and most controversial. Common wisdom, knowledge, theory and practice indicate that, a micro-financial program, whether formal or informal, is said to be sustainable if it can pursue its activities and provide the required services in a "continuous" and objective oriented manner. This is possible if such micro finance programs do not rely on donation but rather generate sufficient income from their efficient operations whose products are appropriately priced. Sustainability is therefore a primary issue for successful micro finance services. The sustainability of financial intermediation just like any other organizations in the business environment obviously depends on a host of numerous factors internal-external; such as institutional characteristics, outreach, portfolio quality, financing structure, productivity, efficiency, physical work environment, geographical location, economical, political, legal, socio-cultural and technological conditions. The performance of such institution therefore requires an in-depth analysis of such factors.

2.2 FINANCIAL SUSTAINABILITY

The landscape for micro financing has been reshaped in recent years. First, competition among MFIs has increased, forcing them to lower both interest rates and costs and to offer more financial products as a way of remaining financially sustainable. Secondly, commercial banks have joined the micro finance industry worsening the competition for clients and increasing its impact on the nature of their operations. Thirdly, commercial banks and investors such as Citigroup and Deutsche Bank have increasingly become interested in funding MFIs. Such commercial players have raised the need for MFIs to be financially viable. Fourthly, new banking technologies such as charge cards, Automatic Teller Machines (ATM), cellular phone, branchless banking and the internet, have rapidly entered the micro finance industry bringing down costs and improving the delivery methodology. Finally, countries have liberalized their financial markets while at the same time installing rules, regulations and standards to help improve the stability of the financial industry. These rapid changes have greatly paused challenges for MFIs in achieving financial sustainability in many dimensions.

The assessment of MFIs has traditionally been made under the framework of sustainability and outreach (Yaron, 1994). Outreach focus on social performance while sustainability focuses on financial performance. There is an apparent tension between achieving financial sustainability and achieving outreach to the very poorest. There has been a hefty debate between those who emphasis the dominance of the financial sustainability goal and those who emphasis the dominance of outreach. The two camps

are known as institutionalists and welfarists respectively (Conning, 1999; Woller et al, 1999). Jonathan Morduch (2000) refers to this division as the "*micro finance schism*". Institutionalists are concerned with financial sustainability, and appear to be having the upper hand. They defend their argument on the premises that only financially sustainable MFIs can survive in a harsh business environment without the aid of external donors (Adams et al, 1992). They focus on creating financial institutions that can service clients on a continuous basis by emphasizing breadth over depth of outreach. They further argue that the primary objective of micro finance is financial deepening, the creation of a separate system of sustainable financial intermediation for the poor. Prominent MFIs operating on institutionalists lines includes Bank Rakyat Indonesia (BRI) and Banco Solidario (Banco Sol) in Bolivia. The Welfarists on the other hand argue that MFIs' primary objective is to help the poor out of poverty first; and that financial sustainability consideration should be a secondary issue (Hulme et al, 1996). Their emphasis is on depth of outreach and they are quite explicit in their focus on immediately improving the well-being of participants. MFIs implementing welfarists' arguments include giants like the Grameen Bank in Bangladesh and its replicates elsewhere and in addition, Finca - style village banking programs in Latin America, Africa and Asia. Some enthusiastically support the win–win proposition. For this last group, MFIs that implement good banking practices will also alleviate poverty, but this proposition fails to receive good empirical evidence (Morduch, 2000).

Some studies observe that financial sustainability is one of the areas that need a deep insight to assess the performance of micro finance institutions. Meyer (2002) argued

that the poor need easy access to financial service on long-term basis rather than just a one time financial support. Navajas et al, (2000) supplemented by arguing that short-term loan worsen the welfare of the poor and hinder their incentive to repay. Meyer (2002) added on the debate by stating that the financial non-sustainability in the MFI arises due to low repayment rate or non-materialization of funds promised by donors or governments. Meyer, (2000) observed two kinds of financial sustainability in the performance of MFIs; operational and financial self sufficiency. He defined operational self-sustainability as the ability of an MFI to generate sufficient operating income, covering operational costs (salaries, supplies, loan losses, and other administrative costs). He referred to financial self-sustainability to an MFI's ability to raise sufficient funds that covers operating costs, the cost of Capital and other forms of subsidies valued at market prices. He regarded financial self sufficiency as a high standard measure of financial sustainability.

There is controversy on the linkage between financial sustainability and outreach to the poor. According to some (Christen et al. 1995; Otero and Rhyne 1994), outreach and financial sustainability are complimentary; this is because as the number of clients increase, MFIs enjoy economies of scale and hence reduce costs which help them to be financially sustainable. Hulme et al (1996) on the contrary argued that such a complementary role does not exist by arguing that higher outreach means higher transaction cost in order to get information about creditworthiness of clients.

There have been empirical studies on the relationship between financial sustainability and outreach, establishing a trade off and otherwise. In her study, Shrestha

(2001) established an inverse relationship between the two by using loan size and client drop out. Similarly Bablis, (2000) came up with similar trade off using women borrowers as proxy for outreach. Dhakal (2001), Sharma (2008) in their respective studies empirically established similar relationship. In addition, Cull (2008) identified supervision of MFIs as having a negative impact on financial sustainability. On the other hand, Cow (2006) empirically established a positive relationship between financial sustainability and outreach to the poor. He used the number of active borrowers (10,000 and above) as proxy measure of outreach.

There has been limited scholarly research detailing the funding processes, sources and terms for MFIs. D Sousa and Shields (2004) traces funding processes, sources and terms to the institutional life cycle theory. This theory claims that, most MFIs start as NGOs with a serious social mission, and during this stage of development, grants and concessional loans from donors and International financial Institutions, services as the primary source of funding. As these MFIs mature, private debt capital becomes available, though with some restrictive covenants or guarantees. In the final stage of MFI evolution, traditional equity financing becomes available. Empirical studies regarding the link between capital structure and financial sustainability in micro financing is scanty. Bogan et al, (2007), in their piece of work; "Does financial structure affect financial sustainability" found capital structure and funding instruments as being determinants of financial sustainability of MFIs. Specifically, (Bogan et al, 2007) found debt to asset, grants to assets and the share of capital as a percentage of assets to be negatively affecting financial sustainability of MFIs. They questioned the long term use of grants

(donations) by relating them to costly outreach and inefficient operations due to lack of competitive pressures associated with attracting market funding. They argued that grants hinder the development of MFIs into competitive, efficient sustainable operations. Bogan (2008) found a negative relation between donations and financial sustainability. Bablis G. Felix (2000), found governmental direct intervention through grants/ donations to be having a negative impact on financial sustainability and outreach. Sharma (2008) found depositor based MFIs to last longer (to be more sustainable) than those institutions financed by donations and government. However, the findings of Adongo et al, (2005), gave donations a lease of life. Their research resulted in a positive relationship between grants (donations) and financial sustainability.

The linkage between financial sustainability and profitability has not been much pronounced in empirical research to date. Part of the problem could be the obvious strong theoretical relationship between them. The more profitable an institution is, the more financially sustainable it would be. In an attempt to link profitability to financial sustainability in micro financing, Smith (1998) noted interest rates and fees as being the bridge. In his submission on the sustainability of MFIs in Bolivia, he concluded that low interest rates and fees were an impediment to their continued financial survival. The most comprehensive study seems to be coming from Cull et al (2007). The study suggests that MFIs that focus on individual loans perform well in form of profitability hence more sustainable.

In a nutshell, the above review shows that there is only limited empirical evidence on the compatibility or trade - off between financial sustainability and the factors to be assessed in the model. In some cases it is indirect while in others, it is completely lacking.

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1.1 BACKGROUND

The Micro finance Industry[1] is one of the major development tools in poverty alleviation in East Africa. Several studies conducted on poverty in developing countries have cited different causes of poverty. Some have rightly argued that the poor do not have easy access to credit for financing working capital as well as investment in their small businesses (Jean – Luc 2006). One of the important stylized facts in less developed countries is that poor masses have little access to formal financial institutions. It is also widely recognized that economic progress relies heavily on access to financial services.

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Experience in many countries has established that Micro Finance Institutions[2] (MFIs) have tremendous potentiality to fill the gap left by formal financial institutions (Barham, Boucher, Carter, 1996). Micro Finance is therefore, increasingly being taken as a magic bullet to alleviate poverty and implement financial inclusion strategies[3]. Planners and policy makers in the developing regions have become euphoric about the potential of micro finance in poverty reducing effects and thereby channeling development aid to tackle the acute poverty issue through them. Given the primary role of MFIs in poverty reduction and generally in development of the economy, an up-to-date information about the performance of this industry is very essential not only to the MFIs managers but also to the numerous stakeholders such as the governments, donors, relevant associations and other financial authorities. In the parlance of the finance industry, the performance of MFIs is more or less synonymous to their financial sustainability, which is the non-profit equivalent of profitability. It refers to the ability of a Micro financing program to generate surplus funds, enough to support an ever expanding but finite number of beneficiaries on a permanent basis. Thus, financial sustainability is the principal focus of Micro Finance industry at present; however this focus has certain drawbacks. It is often suspected that too much focus on financial sustainability will divert MFIs' attention and resources away from their core objective of poverty alleviation. This reservation is based

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on several factors. The poor tend to be concentrated in hard-to-reach rural areas, characterized by weak and fragmented markets for goods and services, limited non-farm activities. Most often, the poor served by MFIs have no physical collateral, thereby implying high credit risk, similarly some poor lack prior business skills. Likewise, the poor are generally engaged in agriculture sector, which is open to natural hazards that are difficult to predict, prevent and ward off. They often demand numerous small loans whose unit transaction cost is high on average (Hulme et al 1996, Conning 1999, Paxton et al 2002, Zeller et al 2002). Most poor are inhabited in rural areas which are widely dispersed, and this leads to pushing up monitoring, delegation and other administrative expenses of the MFIs' (Conning 1999). The difficulty is to handle clients without collateral; therefore potential screening is necessary which in turn leads to high monitoring and enforcement costs (Goodman 2000). This compels finance institutions to increase their dependence on donors, and cripples their formidability to ward off challenges in the event of donor withdraws (Kereta, 2007). In short, delivering financial services to the poor is comparatively costly and difficult, and is fraught with risk, none of which bodes well for long-term financial sustainability. Hence the belief that financial sustainability and depth of outreach are inherently contrasting objectives makes sense.

All in all, it is reasonable to believe that these fears, factors and operational circumstances, pose great challenges to the financial sustainability of MFIs, given the absence of well structured risk mitigation tools in the developing world. As pointed out by (Golin, 2001), adequate earnings are required to enable a financial institution to maintain solvency, survive, and grow steadily in a competitive environment. There is

need for an in depth inquiry to establish as to how MFIs are enduring under such difficult circumstances. We choose four countries in East Africa (**Tanzania, Kenya, Uganda and Rwanda**) for the purpose of evaluating the performance and to understand the financial sustainability of MFIs. These countries lie within the Sub Sahara - a region with the highest poverty incidence in the world (UNDP, 2008).

1.2 MOTIVATION OF THE STUDY

Some insightful studies have been carried out on the financial performance and sustainability of MFIs; like Kereta (2007) in Ethiopia, Lafourcade et al (2005) in Africa, Cull et al (2007) globally and Woller (2003) on the financial performance of village banks globally. However, many areas are grayish and left untouched due to inadequate coverage; we have accepted the challenge of filling the gaps in this research.

1.3 STATEMENT OF THE PROBLEM

Providing financial services to masses is risky and uncertain in general, however the intensity magnifies while dealing with the poorest of the poor. Most of the poor have no adequate collaterals to guarantee their loans; they have no business skills, and they are involved in risk bearing activities, mostly in agriculture sector that depends on nature. Further, the poor are mostly dispersed in far flung rural areas and demand numerous small loans for different purposes. These factors increase the monitoring and transaction costs of MFIs. In addition, the business environment in the developing world is punctuated by poor governance, complicated legal systems, loose enforcement of rules,

and regulations, wide spread corruption, outdated technology and underdeveloped infrastructure especially in the country side. The prevalence of these problems creates more challenges for Micro finance institutions to run their businesses effectively and efficiently and to reach the doors of the needy.

1.4 OBJECTIVES OF THE STUDY

This study is intended to identify and establish the factors affecting the financial sustainability of MFIs in East Africa. In this context, the specific objective is to identify the roles played by the following factors underlying sustainability:

(a) Outreach (b) Capital structure (c) Profitability (d) Efficiency and (e) Portfolio quality

1.5 SIGNIFICANCE OF THE STUDY

The challenges faced by developing countries of the third world regarding poverty eradication are endless which manifest in many ways. This study is in an effort to identify some of the many challenges associated with poverty eradication strategies faced by the micro finance institutions working in developing countries, which they face in their efforts to service the poor.

The current study contributes to the existing literature, both theoretically and methodologically. It explores the economic channels of the financial sustainability and performance of MFIs. The previous research works have tackled different aspects of financial sustainability and performance of Micro finance institutions, mostly outreach.

We go a step further by incorporating in our model all the possible factors concurrently. Methodologically, the study improves on both the data and statistical models used in the existing literature. Our data set includes better and up - to - date information on the operations of MFIs as compared to that used in the previous studies. Moreover, using an Empirical Bayesian estimation technique, we minimize the estimation bias due to unbalanced panel data. We explore all the hidden information regarding data, which is not possible with the classical estimation techniques.

1.6 RESEARCH PLAN

This paper is structured as follows; The next chapter 2 is reviewing the related literature, chapter 3 is presenting the related theories, chapter 4 provides the analytical framework and methodology, chapter 5 presents the data, chapter 6 presents the empirical findings and finally chapter 7 makes conclusions and directions for future research.

CHAPTER 2

LITERATURE REVIEW

This chapter provides an overview of sustainability and a semantic illustration of financial sustainability.

2.1 SUSTAINABILITY

There is much semantic confusion surrounding the word 'sustainability'. Sustainability has been a subject of fascination not only to policy makers, but also to social scientists, academicians, and development practitioners alike. Sustainability seems to be a context with varying definitions by various authors. Navajas et al, (1998:5) defined it as ,'the ability to reach goals in the short run without harming the ability to reach goals in the long run'; Edgcomb et al (1994: 77) considers it as 'the ability of an organization to sustain the flow of valued benefits and services to its members or clients over time'. (Edgcomb et al, 1994:86) further redefines it as, 'the ability of a financial institution to meet 100 percent auto financing'. Brinkerhoff (1991:22) defines sustainability as 'the ability of a program to produce outputs that are valued sufficiently by beneficiaries and other stakeholders that the program receives enough resources and inputs to continue production'. Generally, sustainability refers to the long term ability of an institution to meet goals or targets or endure or institutional permanence. Sa Dhan (2010) suggests that sustainability can manifest itself in different dimensions, including mission, programme, human resources, and financial, marketing, legal policy

environment. Sustainability has not only been described as the dominant development challenge of our current age (Dichter 1997); but it has also been used (albeit cautiously) as a synonym for development success (Uphoff, Esman, and Krishna 1998). Supporting sustainable development requires sustainable institutions. In development circles, therefore, sustainability is an important issue that carries with it very high stakes, and its pursuit has left an indelible hallmark on a host of development organizations. Establishing a system of sustained provision of modern financial services has however, been challenging and most controversial. Common wisdom, knowledge, theory and practice indicate that, a micro-financial program, whether formal or informal, is said to be sustainable if it can pursue its activities and provide the required services in a "continuous" and objective oriented manner. This is possible if such micro finance programs do not rely on donation but rather generate sufficient income from their efficient operations whose products are appropriately priced. Sustainability is therefore a primary issue for successful micro finance services. The sustainability of financial intermediation just like any other organizations in the business environment obviously depends on a host of numerous factors internal-external; such as institutional characteristics, outreach, portfolio quality, financing structure, productivity, efficiency, physical work environment, geographical location, economical, political, legal, socio-cultural and technological conditions. The performance of such institution therefore requires an in-depth analysis of such factors.

2.2 FINANCIAL SUSTAINABILITY

The landscape for micro financing has been reshaped in recent years. First, competition among MFIs has increased, forcing them to lower both interest rates and costs and to offer more financial products as a way of remaining financially sustainable. Secondly, commercial banks have joined the micro finance industry worsening the competition for clients and increasing its impact on the nature of their operations. Thirdly, commercial banks and investors such as Citigroup and Deutsche Bank have increasingly become interested in funding MFIs. Such commercial players have raised the need for MFIs to be financially viable. Fourthly, new banking technologies such as charge cards, Automatic Teller Machines (ATM), cellular phone, branchless banking and the internet, have rapidly entered the micro finance industry bringing down costs and improving the delivery methodology. Finally, countries have liberalized their financial markets while at the same time installing rules, regulations and standards to help improve the stability of the financial industry. These rapid changes have greatly paused challenges for MFIs in achieving financial sustainability in many dimensions.

The assessment of MFIs has traditionally been made under the framework of sustainability and outreach (Yaron, 1994). Outreach focus on social performance while sustainability focuses on financial performance. There is an apparent tension between achieving financial sustainability and achieving outreach to the very poorest. There has been a hefty debate between those who emphasis the dominance of the financial sustainability goal and those who emphasis the dominance of outreach. The two camps

are known as institutionalists and welfarists respectively (Conning, 1999; Woller et al, 1999). Jonathan Morduch (2000) refers to this division as the *"micro finance schism"*. Institutionalists are concerned with financial sustainability, and appear to be having the upper hand. They defend their argument on the premises that only financially sustainable MFIs can survive in a harsh business environment without the aid of external donors (Adams et al, 1992). They focus on creating financial institutions that can service clients on a continuous basis by emphasizing breadth over depth of outreach. They further argue that the primary objective of micro finance is financial deepening, the creation of a separate system of sustainable financial intermediation for the poor. Prominent MFIs operating on institutionalists lines includes Bank Rakyat Indonesia (BRI) and Banco Solidario (Banco Sol) in Bolivia. The Welfarists on the other hand argue that MFIs' primary objective is to help the poor out of poverty first; and that financial sustainability consideration should be a secondary issue (Hulme et al, 1996). Their emphasis is on depth of outreach and they are quite explicit in their focus on immediately improving the well-being of participants. MFIs implementing welfarists' arguments include giants like the Grameen Bank in Bangladesh and its replicates elsewhere and in addition, Finca - style village banking programs in Latin America, Africa and Asia. Some enthusiastically support the win–win proposition. For this last group, MFIs that implement good banking practices will also alleviate poverty, but this proposition fails to receive good empirical evidence (Morduch, 2000).

Some studies observe that financial sustainability is one of the areas that need a deep insight to assess the performance of micro finance institutions. Meyer (2002) argued

that the poor need easy access to financial service on long-term basis rather than just a one time financial support. Navajas et al, (2000) supplemented by arguing that short-term loan worsen the welfare of the poor and hinder their incentive to repay. Meyer (2002) added on the debate by stating that the financial non-sustainability in the MFI arises due to low repayment rate or non-materialization of funds promised by donors or governments. Meyer, (2000) observed two kinds of financial sustainability in the performance of MFIs; operational and financial self sufficiency. He defined operational self-sustainability as the ability of an MFI to generate sufficient operating income, covering operational costs (salaries, supplies, loan losses, and other administrative costs). He referred to financial self-sustainability to an MFI's ability to raise sufficient funds that covers operating costs, the cost of Capital and other forms of subsidies valued at market prices. He regarded financial self sufficiency as a high standard measure of financial sustainability.

There is controversy on the linkage between financial sustainability and outreach to the poor. According to some (Christen et al. 1995; Otero and Rhyne 1994), outreach and financial sustainability are complimentary; this is because as the number of clients increase, MFIs enjoy economies of scale and hence reduce costs which help them to be financially sustainable. Hulme et al (1996) on the contrary argued that such a complementary role does not exist by arguing that higher outreach means higher transaction cost in order to get information about creditworthiness of clients.

There have been empirical studies on the relationship between financial sustainability and outreach, establishing a trade off and otherwise. In her study, Shrestha

(2001) established an inverse relationship between the two by using loan size and client drop out. Similarly Bablis, (2000) came up with similar trade off using women borrowers as proxy for outreach. Dhakal (2001), Sharma (2008) in their respective studies empirically established similar relationship. In addition, Cull (2008) identified supervision of MFIs as having a negative impact on financial sustainability. On the other hand, Cow (2006) empirically established a positive relationship between financial sustainability and outreach to the poor. He used the number of active borrowers (10,000 and above) as proxy measure of outreach.

There has been limited scholarly research detailing the funding processes, sources and terms for MFIs. D' Sousa and Shields (2004) traces funding processes, sources and terms to the institutional life cycle theory. This theory claims that, most MFIs start as NGOs with a serious social mission, and during this stage of development, grants and concessional loans from donors and International financial Institutions, services as the primary source of funding. As these MFIs mature, private debt capital becomes available, though with some restrictive covenants or guarantees. In the final stage of MFI evolution, traditional equity financing becomes available. Empirical studies regarding the link between capital structure and financial sustainability in micro financing is scanty. Bogan et al, (2007), in their piece of work; "Does financial structure affect financial sustainability", found capital structure and funding instruments as being determinants of financial sustainability of MFIs. Specifically, (Bogan et al, 2007) found debt to asset, grants to assets and the share of capital as a percentage of assets to be negatively affecting financial sustainability of MFIs. They questioned the long term use of grants

(donations) by relating them to costly outreach and inefficient operations due to lack of competitive pressures associated with attracting market funding. They argued that grants hinder the development of MFIs into competitive, efficient sustainable operations. Bogan (2008) found a negative relation between donations and financial sustainability. Bablis G. Felix (2000), found governmental direct intervention through grants/ donations to be having a negative impact on financial sustainability and outreach. Sharma (2008) found depositor based MFIs to last longer (to be more sustainable) than those institutions financed by donations and government. However, the findings of Adongo et al, (2005), gave donations a lease of life. Their research resulted in a positive relationship between grants (donations) and financial sustainability.

The linkage between financial sustainability and profitability has not been much pronounced in empirical research to date. Part of the problem could be the obvious strong theoretical relationship between them. The more profitable an institution is, the more financially sustainable it would be. In an attempt to link profitability to financial sustainability in micro financing, Smith (1998) noted interest rates and fees as being the bridge. In his submission on the sustainability of MFIs in Bolivia, he concluded that low interest rates and fees were an impediment to their continued financial survival. The most comprehensive study seems to be coming from Cull et al (2007). The study suggests that MFIs that focus on individual loans perform well in form of profitability hence more sustainable.

In a nutshell, the above review shows that there is only limited empirical evidence on the compatibility or trade - off between financial sustainability and the factors to be assessed in the model. In some cases it is indirect while in others, it is completely lacking.

CHAPTER 3

THE THEORETICAL FRAMEWORK

Several factors have been identified in the study to assess the financial sustainability of MFIs in East Africa. In this section, the theories associated with those factors are presented, illustrating their relevancy in not only understanding financial sustainability but also responding to the major issues raised in the study.

3.1 FACTORS AFFECTING FINANCIAL SUSTAINABILITY

3.1.1 OUTREACH

Outreach is an important factor in understanding financial sustainability in MFIs. Literary, outreach refers to taking services to the masses. In the Micro finance industry, it refers to taking financial services to the poor masses or the extent and number of clients served by MFIs in the course of their operations. Mark Schreiner, (2002) introduced six dimensions of outreach; breadth, depth, scope, worth, cost and length of outreach. The first four; breadth, depth, scope and worth of outreach according to him, provides a good approximation of the extent and pattern of institutional growth, the remaining two cost and length of outreach are good indicators of financial performance, efficiency and productivity of MFIs. It should be noted however that each of these aspects of outreach have correlation with each other in one way or another, they too affect the financial and human resources of MFIs either negatively or positively. A brief explanation of the six aspects of microfinance is given as below:

3.1.1.1 Breadth of Outreach

It simply involves the number of poor people reached by an MFI irrespective of their poverty levels and is traditionally measured as the total number of active borrowers. In a detailed assessment of the breadth of outreach, we need to look also at; the number of persons being served now than previously, the number of women being served, rural inhabitants, and the uneducated, the increase in Branch network and staff hired over time. Other things being constant, breadth of outreach has a direct relation with financial sustainability- that is the more active client an MFI has the more business and henceforth the more profits. However on the other hand, breadth of outreach sometimes presents risk to the MFIs and thus financial non sustainability, depending on factors such as the poverty profiles of the clients, the location of the clients, their business activities, the social and economic pressures and other natural factors.

3.1.1.2 Depth of Outreach

Depth of outreach is defined in terms of the number of the poorest of the poor clients being served or relative poverty of clients (Navajas et al, 2000). Microfinance clients are often described according to their poverty levels - vulnerable non-poor, upper poor, poor, very poor and all those without easy access to formal finance. MFIs have a social obligation to serve clients who fall near the international poverty line, both above and below (CGAP). However, the poorest have a lot of problems that makes them not attractive to most MFIs. They lack any valuable assets for security, lack basic business skills, dwell in remote and introspective rural areas, mostly engaged in rudimentary agriculture that depends on nature, often sickish, often short of resources for subsistence

and demand numerous small loans (Hulme et al 1996, Conning 1999, Paxton et al 2002, Zeller 2002). All these and others increase the overall operational costs, and risk of delivering financial services to that dominant segment of the population in the developing world.

The ultra poor (destitute) constituting 10 percent of the population lack stable cash flows as whatever comes across their hands goes directly to their mouths. They ultra poor have a lot of financial pressure that can force them to divert the loans into non productive ventures such as food, medicine and funeral, thus failing to repay in the process, driving the institutions into financial weakness. Thus depth of outreach measured as ratio of loan size, loan size to GDP per Capita, number of active women borrowers to total borrowers and also measured as distribution of borrowers in rural and urban areas would indicate the extent to which MFIs deal with the very poor segment of the population.

3.1.1.3 Scope of Outreach

It involves the diversity of financial contracts; this is to say, products and services offered by an MFI. It explains whether it is a one product/service institution or has the capacity to offer diverse products/services to its customers. Most MFIs are restricted to credit services, however, some are allowed in addition to mobilize savings and to carry out other activities like micro insurances after fulfilling certain conditions aimed at safeguarding clients. Those allowed in East Africa are referred to as Micro finance deposit taking institutions. They offer products such as different kinds of

accounts suited to the client's needs, like marriage, education and several other products like insurance, enterprise development and training services. Conviction tells us that, the more diversity of products or services a financial institution has, the more clients, and mitigation against risk and consequently, the more financially sustainable. However, when such diversification of products and service is not cost effective and in some circumstances where majority of products do not break even, an institutions may experience increasing losses which may reduce the chances of its continued survival. Scope of outreach is measured as the total number of deposit accounts, total number of depositors holding savings accounts and ratio of women savers to total savers among others.

3.1.1.4 Worth of Outreach

Worth of outreach refers to how much a MFI client is willing to pay for the loan. It hinges on many factors including the terms of the financial contract (loan terms, loan amount, duration, frequency of installment, collateral requirements, interest rates/ fees), the tastes, constraints, and opportunities of clients. Worth of outreach affects the sustainability of an MFI and its clients. The financial contracts may result into poor portfolio quality which might negatively affect financial sustainability and likewise, the taste might lower the demand for existing products which might negatively affect an MFI's financial viability. Just like depth of outreach, worth of outreach can statistically be measured as loan size prevailing in the market among others.

3.1.1.5 Cost of Outreach

Cost of outreach to user refers to "cost of a loan to a borrower," it is the sum of price costs and transaction costs. These costs to users might consists of prices like interest rates and various payments that they have to pay, which could be revenue to the lender, and other loan related transaction costs like expenses on documents, transport, food, taxes, the valuable time, etc. From the client's point of view, cost of outreach in some cases prevents potential clients from joining the MFI, causes delinquency, default, drop out which are detrimental to financial sustainability. Cost of outreach may also emanate from the institution providing credit. In which case, higher costs associated with reaching out to the poor inflate operating costs which will hinder the financial strength of the institutions. Cost of outreach can be measured as a ratio of financial revenue to financial expense.

3.1.1.6 Length of Outreach

Length of outreach refers either to the time frame in which an MFI produces loans or to the longer the micro finance programme is extended to the clients. The time frame an MFI takes to produce a loan determines the volume of clients normally, since clients usually needs quick financial services to accomplish their pressing financial needs and to build up assets. Institutions with quick services tend to draw more clients and as a result other things being constant perform financially well. The length of financial programme is important since the poor needs funding continually. MFIs that guarantee the length of outreach over a longer period of time are associated with higher levels of active clients which tend to drive them into financial sustainability.

3.1.1.7 Mission Drift

Mission drift is a new form of outreach in which a considerable number of clients is drawn from the rich clients. CGAP (2001) noted that mission drift has slowly but steadily entered into micro financing due to basically massive penetration of commercial banks into micro financing and partly due to the demands from donors for MFIs to be financially sustainable. There is a consensus in the micro finance industry that mission drift has a positive relationship with financial sustainability since the operating costs of serving the rich is less as they demand larger loans whose transaction costs is less. In addition, the rich have wide knowledge in business and normally invests profitably. An increasing mission drift trend in micro financing is increasingly affecting reaching out to the poorest of the poor and to the inhabitants of the rural areas and thus undermining their primary objective and social obligations.

From the foregoing discussion, we can rightly conclude that outreach may have a multi dimensional relationship with financial sustainability.

3.1.2 CAPITAL STRUCTURE

Demand for micro-credit by the poor outstrips the financial resources micro finance institutions have, a factor which forces them to solicit for funding from different sources to be in position to offer sustained financial services to the clients. According to Vicki Bogan (2009), the source of financing that MFIs decides to take depends on the anticipated costs like bankruptcy, agency and transaction. In addition to this, he argues that the tax advantage, asymmetric information, corporate control and ownership also

have an influence while deliberating on the nature of capital. In addition to these factors, Froot and Stein (1998) and Cebenoyan and Strahan (2004) suggests that the type of capital structure any MFI adapts depends on the risk management objective that management undertakes.

As an internal financial control measure, MFIs usually set a target capital structure around which they can determine future demands for further capital. This target capital is a reflection of the optimal capital structure which will maximize the MFI's value.

The different sources of financing that constitute the capital structure of MFIs have a great bearing on their performance. Quite often, the target and optimal capital is the same in normal operations, however, in some cases fluctuations do arise setting a divergence between the two. There are two possibilities that can be advanced to explain such a scenario; first, exploitation of opportunities in a specific funding source and second, market value fluctuations.

With regards to the *exploitation of opportunities in a specific financing source*, a temporary raise in the firm's stock price may create a good opportunity for management to issue additional equity, which would result in a higher percentage of equity than the target. Similarly, for *market value fluctuations*, changes in bond and stock markets will cause fluctuations in the firm's bond and stock prices. Since capital structure weights are determined by market values, market fluctuations may cause the firm's actual capital structure to vary from the target.

Organizations dedicated to the availing of micro finance information to the public like micro finance exchange inc. and CGAP have documented different sources of financing for MFIs, categorized in two traditional forms; Internal and External.

3.1.2.1 Internal Sources

These are the sources that come from within the MFIs during the course of their operations. Prominent of these includes internal equity, compulsory savings and to some extent reserves.

1. Internal Equity

Internal equity of MFIs results from the positive net cash flows generated from their operations. They take the funds from operations obtained from loan portfolios as a measure which is subtracted from all the expenses they incurred while generating those funds.

$$Funds\ from\ operations = Revenue - Expenses\ requiring\ the\ use\ of\ funds$$

Since MFIs' expense comprises those that uses funds and those that do not, the expenses that do not require the use of funds such as depreciation and provisions for loan losses are added back to their profits, hence;

$$Funds\ from\ operations = Operating\ profit\ before\ tax + Non\ fund\ using\ expenses$$

To make use of funds from operations as capital, MFIs deducts all mandatory taxes and dividend payable from such funds, thus;

$$Total\ internal\ equity = Funds\ from\ operations - income\ tax - dividend$$

The availability of internal equity finance therefore apart from the successfulness of the MFI depends on: taxes and dividends. Higher taxes and higher dividend payments imply lower internal equity source of financing. Micro finance institutions tend to avoid taxes in some countries by registering their operations as NGOs while others manipulate their true financial positions. For dividend payouts, some of the institutions offer dividend reinvestment plans in which funds for shareholders are directly reinvested into the MFI instead of being paid out on quarterly basis. There are several advantages that accrue for MFIs in using internal equity that includes:

- No effect on control of an MFI since no additional share issuing hence no further dividend pay outs.
- No issue costs like brokerage, fees paid to advisers and other transaction costs.

2. Compulsory Savings from Clients

There are two broad categories of client savings in MFIs; compulsory and voluntary. Compulsory savings are those imposed by the industry on clients before receiving financial services from MFIs. The potential clients after loan approval are required to open up an account with the institution in which future transactions will be carried in. The money deposited on this account usually depends on the amount on the loan to be given and have to be kept by the institution until retiring of the loan. Though

meant to act as an additional security, it is always readily available to the institution to use it in fulfilling its mandated obligations. Therefore compulsory saving is a costless source that reinforces firm value and sustainability. Voluntary savings are those from either MFI's credit clients or outsiders (savings clients). Accumulated savings from an MFI's clients provides ready funds to these institutions of which they have to pay interest to savers into their accounts. As such type of savings increase, the amount of money MFIs have to use equally increases, in addition to their value and financial sustainability. However, voluntary savings are limited to few MFIs due prudent requirements with regards to deposit mobilization from the public. This source of funding is not more stable as savings deposits of the poor are more prone to income disruptions from natural disasters, health issues, crime, and other factors. (CGAP)

3. Reserves

MFIs just like any formal financial institutions are required by law to have a reserve with the Central Banks in the countries they are operating. In few situations of sudden demand in their services and given their social objective of serving the poor, they are always allowed to utilize part of the reserve in their operations on a short term basis. Well, as the money is always in the account of the Central Bank, the mere fact is that it legally belongs to MFIs and it is at its deposal in critical circumstances make reserve an internal source of capital and thus a source of sustainability. It has costs such as security/ guarantee requirement and a fee depending on the duration.

3.1.2.2 External Sources

Despite the shortages in money supply, particularly after the onset of the global financial crisis, there are a number of ample and diverse sources of capital for microfinance which managers in these entities are increasingly becoming aware of. Here we present some of the external sources of funds for MFIs:

1. Voluntary Saving Deposit

Retail-deposits or Micro-saving products, provides micro finance institutions with a low-cost source of capital for some institutions. However to safeguard depositors, governments sets conditions for any MFI to get into mobilizing deposits from the public which leaves many out. The conditions include a strong equity base and a proven record of financial management. Those that fulfill these conditions in East Africa are registered as Micro finance deposit taking institutions. Potential pitfalls here include too much or too little liquidity of cash.

2. Commercial Debt

A wide range of both Short-term loans and long-term debt are acquired from commercial banks with market rates of interest. Short-term loans are available readily while long-term loans are available to MFIs in large numbers. Short-term loans are very costly while long-term debts are cheap. Additionally, Microfinance investment vehicles, which either invest directly into micro finance institutions or act as intermediaries between investors and MFIs, by selling securitized debt. Market mix information

exchange inc. on its home page provides a long list of funders, including Development Financial Institutions, Financial Institutions, Foundations/NGO, Funds, Multi-and Bilateral Development Agency and Peer-to-peer lender scattered in different parts of the world. It should be noted that despite the high costs involved in debt funding, empirical evidence from different studies reveals that commercial debts remains the most popular source of capital for most micro finance providers in the developing world.

3. Soft Loans and Grants

Some MFIs with proven social objective are advanced concessionary loans or grants from the public, notably from development banks, aid agencies, NGOs (International and Local) and Charitable trusts. These in Africa include ADB, USAID, CARE, IMF, UNCDF, WB, Grameen Trust, Bill and Melinda Gates Foundation, Pride International and BRAC. Well, as most of those agencies deals directly with governments, a few of them provides funding to MFIs directly.

4. Individual Philanthropic

This source of funding is provided by individual investors interested purely in the social impact of microfinance. They advance loans to MFIs mostly through peer-to-peer online platform. Famous examples of these individual philanthropic sources of financing to micro finance institution include Kiva and Micro-Place. However, raising funds through the internet is a tricky business. Similarly, high net worth individuals who are interested in philanthropy, often give away great sums of money to MFIs, in an act known as 'venture philanthropy'.

5. Equity Capital

This one is acquired through the sale of ownership shares, in the secondary capital markets. Although this source has proved to be the most expensive source of capital for MFIs, it has become the most attractive for investors because of high returns prevalent in the microfinance industry. This source of funding has become the subject of widespread criticism from many development advocates with social objective mindset.

6. Leasing

Recently most managers of MFIs have recognized that earnings are derived from the use of assets not its ownership and leasing has become another alternative financing method. They are leasing many types of equipment such as office blocks, vehicles, motor cycles, computers, etc. There are two types of leases; *non-tax oriented leases* and *tax-oriented true leases. Non-tax oriented leases*, all incidents of ownership are transferred to the lessee (MFI) and the MFI is given a fixed price bargain purchase option or renewal option not based on fair market value at the time of exercise. In this type of lease, the MFI is entitled to depreciate the property for tax purpose, claims any tax credit which may be available and deduct as an expense the imputed interest portion of the lease payments. *Tax-oriented true lease* on the other hand does not transfer incidents of ownership to the MFI. With it however, there are substantial cost savings that are achieved by the MFI. True the lessor claims and retains the tax benefit of ownership, a portion of such benefits are passed through to the MFI in form of reduced lease payments. The owner claims tax benefits such as tax depreciations and the MFI deducts

the full lease payments as an expense. The principal advantage here is the economic benefit that comes from the indirect realization of tax benefits that might otherwise be lost because the MFI can not use the tax benefit. This is true with NGOs and other MFIs which are excluded from taxation and hence do not have ability to use tax benefits.

7. Factoring

In this type of financing, the MFI sell outright the expected receivable (interest income) from clients to formal financial institutions (commercial bank or investment bank). This sell can be done *with* or *without recourse*. In a factoring arrangement *without recourse*, the formal financial institution performs all the account receivable functions: evaluating client's credit, approving credit, and collections on account receivables. An arrangement with recourse on the other hand, the MFI assumes the responsibility of account receivables. There are typically two types of factoring; *maturity* and *conventional factoring*. They differ with respect to when cash is received for the receivables. In *maturity factoring*, the clients send cash to the formal financial institution which in turn sends it (less commission) to the MFI. In *conventional factoring*, the formal financial institution advances cash to the MFI when the accounts are factored, and then keep the MFI's payments as they come in.

3.1.3 PROFITABILITY

Profitability in micro financing refers to the potential of the programs to be financially successful. It can be assessed before the program or after, however, it is

difficult to accurately forecast the financial success of the loan portfolios given the nature of business and clients. Given the asymmetric information, business ventures of the clients, their skills, location, numerous amounts of loans and poverty levels chances of default and delinquency are high which may result into losses. Besides these, operational factors such as pricing and costs involved in credit designing and delivery greatly affects profitability.

There are three basic situations that can describe an MFI's financial situation. It can be profitable, it can break even, or it can operate at a loss. Mostly, an MFI's goal is to reduce mass poverty. However, to be in position to do so on a continuous basis, they need operate profitably. The volume of transaction does not render these institutions to be profitable due to the higher transaction costs given the small loans demanded by clients. To determine profitability in micro financing, it is necessary to access the interest rate of the financial products being offered to the poor clients and other service charges. There are several things that need to be considered when determining these prices. This includes variable costs and fixed costs. Peculiar to MFIs, there is a need to put into consideration the cost of capital and the financial risks while determining interest rate to charge the poor.

Tracking profitability in this industry may require two things. First, an MFI will likely need good and accurate records of its expenses and losses. Second, due to the size and complexity of the micro financing, personnel with good accounting and social skills

are needed to ensure proper calculations and encouraging of clients to fulfill their obligations to the institutions.

There are a number of parties interested in the profitability of a particular micro finance programs. The clients need access to credit on a continuous basis to graduate from poverty henceforth are interested in their financial success. The owners of these institutions, who are not operators, are too interested in the financial health and direction of the venture. Stakeholders who have money invested like the government and donors are also highly concerned with the profitability of a business. Employees, especially those at the managerial level, care because lack of profit threatens their job security and damages their professional reputation.

Profitability Management enhances the MFI's ability to achieve higher levels of outreach, generate internal funding, delivery credits effectively and efficiently, to improve quality in portfolio, which further increases their profitability. Profitability is therefore a very crucial and direct factor in measuring the success and financial sustainability of MFIs, their various types, leading methodologies, and products. Besides this, profits are too valuable indicators of the performance of management, staff, and board of directors besides being a performance incentive. Higher profit levels preserve the value of capital in economies experiencing inflations. There are a number of sources and factors influencing profitability in MFIs, we discuss a few of them in this section as follow:

1. Interest Receipts

Income from interests charged on micro loans advanced to the poor clients is basically the main source of revenue for MFIs. Other additional sources includes but not limited to processing fees, commission, fines, franchise and sale of idle assets supplements revenue from interests. Compared to other main stream financial institutions, interest rates in micro finance institutions should be higher due to higher transaction costs and the high risks involved in lending without collateral security. Lending out a million dollars in 100,000 loans of $100 each will obviously require a lot more in staff salaries than making a single loan for the total amount.

There are three kinds of costs the MFI has to cover when it makes micro-loans. The first two, the cost of the money that it lends and the cost of loan defaults, are proportional to the amount lent. For instance, if the cost paid by the MFI for the money it lends is 10 percent, and it experiences defaults of 1 percent of the amount lent, then these two costs will total $11 for a loan of $100, and $55 for a loan of $500. An interest rate of 11percent of the loan amount thus covers both these costs for either loan. The third type of cost, transaction costs, is not proportional to the amount lent. The transaction cost of the $500 loan is not much different from the transaction cost of the $100 loan. Both loans require roughly the same amount of staff time for meeting with the borrower to appraise the loan, processing the loan disbursement and repayments, and follow-up monitoring. Suppose that the transaction cost is $25 per loan and that the loans are for one year. To break even on the $500 loan, the MFI would need to collect interest of $50 + 5 + $25 =

$80, which represents an annual interest rate of 16 percent. To break even on the $100 loan, the MFI would need to collect interest of $10 + 1 + $25 = $36, which is an interest rate of 36 percent.

Besides those costs, other factors need to be put inconsideration in determining a variable interest rate. Credit decisions for borrowers who have neither collateral nor a salary cannot be based on automated scoring. These decisions require substantial intervention of a loan officer in judging the risk of each loan. MFIs may operate in areas that are remote or have low population density, making lending more expensive.

Best practices calls for cutting costs as much as possible to raise profits and not just raising interest rates to whatever the market will bear. This in a way calls for emphasis on improving efficiency in order to bring down these costs, so that poor clients are not paying unnecessarily high rates. New technology such as ATM, cell phones, internet, etc are helping in reducing costs and henceforth making interest rates affordable to the poor clients while increasing profit levels.

Besides income from interest, MFIs do generate income by charging processing fees, commission, franchise, and fine. These to an extend project the profit level of MFIs.

2. Deposits

Deposit mobilization is yet another avenue for generating profits for financial institutions. In the micro finance industry, there are two types of saving deposits; compulsory and voluntary saving. Compulsory saving represents funds that must be

contributed by borrowers as a condition for receiving a loan, sometimes as a percentage of the loan, sometimes as a nominal amount. These types of deposit raise the much needed funds that are in turn extended to clients. MFIs utilize compulsory savings without paying for them; therefore, they are a sure vehicle for generating cost free income. On the other hand, voluntary savings are the savings provided to both borrowers and non-borrowers who can deposit or withdraw according to their needs. Interest rates paid range from relatively low to slightly higher than those offered by formal financial institutions. This type of saving represents a stable source of funds to the MFI and henceforth, a source of earning.

3. Repayments

Most MFIs normally achieve very high repayment rates, 95%, 98% and so forth. Adequate collection provides for greater extension of funds to other clients thereby further generating funds, which translate into the profitability of these financial institutions.

4. Productivity and Efficiency

Productivity and efficiency of financial institutions determines the ways they generate revenue to cover their expenses. They ensure maximizing the use of resources (financial and otherwise) to generate enough revenue thereby becoming profitable. Productivity calls for generating large volumes of business (output) for a given resource or asset (input); while efficiency for managing the cost per unit of out-put generated. By generating large volumes of output at a reasonable cost, much more revenue and thus

profit are likely to be generated other things being constant. Productivity calls for a reasonable consideration and pondering on the following issues; number of borrowers per staff , loans per staff , borrowers per loan officer ,loans per loan officer, depositors per staff , deposit account per staff , and personnel allocation ratio among others. Optimality in and among those issues is essential in achieving reasonable productivity levels. Similarly, for efficiency, management must sort out operating expenses to loan portfolio, personnel expense to loan portfolio, average salary to GNI per capita, cost per borrower, cost per loan, and cost per unit of currency. The arrangement that reduces costs is ideal in achieving efficiency.

3.1.4 EFFICIENCY

Efficiency indicators provide information about the rate at which MFIs generate revenue that cover their expenses. Calculation of efficiency ratios over time helps MFIs determine whether they are maximizing the use of their resources. Efficiency ratios measure the cost of providing services to generate, this is to say, the cost per unit of output. These costs are generally known as operating costs. Total operating costs are expressed in some many ways such as portfolio outstanding, performing assets, total assets, number of borrowers, etc depending on the objective of the analysts. For a detailed analysis, operating costs can be broken down to measure the efficiency of specific cost elements such as salary and benefits, occupational expenses such as rent, utilities and travel.

Bartel et al (1995) notes that in analyzing the credit operations of an MFI, the turn over of loan portfolio and average loan size should be considered since they influence the level of activities and hence operating costs and efficiency. Additionally the efficiency of institutions depends on many factors, from within or without, which can broadly be categorized into: internal and external.

3.1.4.1 Internal Factors

Staff efficiency could be substantially enhanced through automating the Management Information Systems, as well as introducing different technologies such as the ATM, availing transport facility for instance motor-bicycles, innovation in products, staff incentives, and so forth. Many of these require resources and capacity. Staff incentives schemes also help in motivating them for great achievements in loan appraisals, approvals, disbursements, monitoring and recovery. These help institutions to keep costs very low, while enhancing efficiency and thus financial sustainability. These include direct monetary benefits, bonuses, promotion, etc., as well as enhancing some moral-building up mechanisms.

Efficiency in the loan delivery could on the other hand be improved by hiring the right staff both in quality and quantity, and through group lending methodology.

3.1.4.2 External Factors

The external environment, especially the economic, political, socio – cultural, technology, legal, location - geography, infrastructure, etc have a huge impact on institutional efficiency. The economic environment characterized by or with hyper inflation, high taxes, low economic growth, etc will adversely affect the efforts of institutions to operate efficiently. The political situation pronounced by corruption, instability, etc will create a poor atmosphere for institutions to be efficient by enhancing costs. The conservative nature of society, such as having a mind set loans are hand outs for keep, paying for the cost of loans is irreligious, and so forth drives up the recovery costs hence retarding efficiency. In addition poor working cultural in the society will also impend on efficiency. Habitual absenteeism, late reporting and early retiring from work, gossiping etc will unnecessarily cost the institution for no substantive work done. Weak legal system will frustrate the efforts to recover loans, make it costly since delinquency and default will tend to skyrocket and henceforth raising the question of inefficiency. Most critical is the limited and costly access to services caused by long distance from farming households to a financial institution's branch, particularly in low population density areas and dispersed geographical set up. This greatly enhances operational costs. Underdevelopment of rural infrastructure (physical and human) is yet another challenge. The inadequate rural infrastructure has direct and indirect adverse impact on the level and cost of financial intermediation. It directly increases the cost of financial intermediation to both clients and financial institutions as a result of poor performing roads, electricity,

telecommunication and security systems that increase the cost and risk associated with lending to farming households and servicing their savings.

3.1.5 PORTFOLIO QUALITY

Portfolio quality depends greatly on loan appraisal and approval. Loan appraisal process screens potential loan clients. Extra care should be placed on this process to ensure selection of potentially good clients who will possess both the ability and willingness to repay. In some instances, this process is performed poorly resulting into poor portfolio quality. Possible causes of poor appraisals range from lack of skills and commitment on the part of staff, personal interests or motives of the staff, to bribery and inadequate information about the potential clients among others. Loan approval involves formulating a credit policy regarding loan amount, period, installment, repayment plans, and security. The right amount of loan affects how good the quality of loan portfolio is. It will not burden the client to repay on one hand and it will also solve the apparent financial needs of the client to such an extent that he will raise enough income for himself and for the institution. Loan period based on the nature of business a client is undertaking is also a good indicator of loan quality. Farmers expecting harvests in three month's time can not have a loan with duration of two months, in the same way poultry farmers expecting a return after six months can not have a loan of six month period. They are more likely to default not because they are unwilling to repay but because they are unable to fulfill their obligations. Optimal installment based on the capacity of the client and amount of loan will help in determining the quality of loan. A $500 loan for six month

should not be repaid in two equal installments for instance. Such installment plan is likely to reduce the capacity of the client to generate enough income to repay the loan and will it will impair his ability to honour his commitment. With regards to repayment plans based on the client's nature and type of business will have a profound effect on the quality of loan portfolio? A poor man with a fruit cart can be in position to repay twice a week, weekly, since he gets income from his business daily but not a vegetable farmer who will expect it possibly once after the harvest in three months. The type of security obviously has a lot to do with loan quality. A worthless security as compared to the loan, untraceable guarantors will increase the temptation of a client to default on the loan since he has nothing worth to loss but more to gain if he did so.

There are several barometers that can help to understand the portfolio quality ranging from repayment rates, arrear rates, number of delinquent borrowers, portfolio at risk, loan losses. These barometers provide information on the percentage of non earning assets, which in turn decrease the revenue and liquidity position of MFIs.

1. Repayment Rates

A higher rate of loan repayment is a good sign of portfolio quality and thus a good indication of financial sustainability. It gives a clue that the loans were given to the right clients with the ability and willingness to repay. They are the most popular measure of portfolio quality by the donor community. However, repayment rate is not useful in indicating; the current quality of portfolio outstanding since they simply measure the historical rate of recovery, and in understanding the external success of an MFI. They are

particularly misleading if the MFI portfolio is growing rapidly and if loan terms are long. This is because the percentage that has become due (the numerator) compared to the amount disbursed or amount outstanding (the denominator) is relatively low, which means that a delinquency problem, in fact, may not show up right away. The many variations used to calculate repayment rates too, makes it a difficult barometer in measuring portfolio quality unless all organizations whose performances are being analyzed use the same method. Some MFIs measure the repayment rates based on loans made in a particular period, some based on the amount disbursed yet others use the amount still outstanding.

1. Arrear Rates

A higher arrear rate represents poor portfolio quality and hence a sign of financial non-sustainability of an MFI. The arrears rate represents the amount of principal that has become due and has not been received. Arrears generally do not include interest except when a financial institution records the interest owing as an asset at the time of disbursement. It provides an indication of the risk that a loan will not be repaid. Some organizations calculate the arrear rate as 1-repayment rate. However, this works only when repayment rate on the entire portfolio outstanding is considered, including past due amounts, and not just for a certain period of loan disbursements. The arrear rate shows how much of a loan has become due and has not been received. However, the arrear rate understates the risk to the portfolio and understates the potential severity of a delinquency

problem, because it considers payments as they become past due, not the entire amount of loan outstanding that is actually at risk.

2. Delinquent Clients

Ledgerwood (1998) noted three kinds of delinquent clients; 1) *Willing* but *Unable* to repay, 2) *Unwilling* but *Able* to pay, and 3) *Willing* and *Able* to pay but lacks self discipline. *Willing* but *Unable* to pay are defaulters with the *will* but with *no ability* to pay. Such clients without the ability to repay back the loans may have incurred losses in their businesses, had a lot of social problems like prolonged illness, marriage, etc that consumed all the funds. MFIs respond to such clients by either rescheduling the loans repayments or by refinancing or recover from guarantors or recovering through auctioning the little assets in possession or simply write the loan. *Unwilling* but *Able* to pay are defaulters with the *ability/ way* but *no will* to pay. These clients represent a significant percentage of defaulters and represent a big problem to the MFIs. They evade loan officers by being highly mobile continuously changing their business premises, some times migrating from one region to another. MFIs usually attempts to recover funds by dragging such client are into courts of law, auctioning some of the assets or imprisoning them to effect repayment. Finally the *Willing* and *Able* to pay but lacks self discipline are defaulters with *capacity* and *will* to repay but needs to be reminded. The loan department usually pays frequent visits to the business premises of such customers with a view of encouraging them to fulfill their obligations with the institutions. Another measure MFIs usually uses is promising further funding based on the repayment habits of

the clients and some times giving bonuses for quick and timely repayment. All in all, delinquent clients represent a big challenge and problem to the financial sustainability of MFIs. They disrupt the timings of the MFI's revenue hence reducing its working capital and portfolio growth. They present additional operating costs in form of additional monitoring and recovery costs. Delinquent client is normally expressed relative to the volume of delinquent loans.

3. Portfolio at Risk

The portfolio at risk is another important measure of portfolio quality. It reflects the outstanding balance of loans that have an amount overdue. It portrays the true risk of delinquent problem because it considers the full amount of loan at risk. Portfolio at risk is declared after a specified number of days have passed since the repayment became due and has not been received, based on the fact that many clients are able to repay their loans within a few days of the due date. Traditionally, portfolios are considered at risk when repayment due date is more than either 30 days, or 60 days or 90 days. Periodic calculation of portfolio at risk rate helps in determining improvement or deterioration in portfolio quality. Portfolio at risk is affected by numerous factors. There are a number of causes of portfolio at risk in micro finance institutions, some institutional based while others client based. Institutional based causes ranges from failure to institute a proper loan policy, failure to review properly loan applications before approval, improper screening and use of guarantors and poor loan appraisal, approval and tracking system among others. Client based causes includes lack of the will to pay back loans, slump in

the business activities, family problems that may lead to misappropriation of funds, diversion of funds to non essential consumptions, death, sickness or natural calamities befalling the client, etc. Loan losses reduce the working capital, make institutions insolvents, reduce growth in terms of portfolio size or geographical outreach, etc thereby making them financially unsustainable. Rescheduling, refinancing, write offs, fresh disbursement for which repayments are yet to begin, incorrect aging of past due, sequence of repayment and the period of repayments (weekly or balloon). These and others lower the portfolio at risk while the default risk still remains.

4. Loan Losses

Micro finance institutions just like any other business institutions incur losses during the course of their operations. Often loans are defaulted in which case the institution losses both the principal and the expected earnings in form of interest and other fees. Just like portfolio at risk, loan losses are as a result of institution and client based causes but has far-reaching adverse effects than portfolio at risk since the loans once declared, shows the inability for an institution to recover them in the future. There are a number of variables identified as proxy measures of loan losses that includes loan loss reserve, loan loss rate, loan write offs and risk coverage.

In a nutshell, apart from the internal factors distorting portfolio quality such as loan rescheduling, refinancing, write off, fresh disbursements, incorrect aging of past dues, and sequence of payments, weekly and balloon repayments, the external factors such as, corruption, weak legal system, dispersed populations in rural areas, lack of

physical addresses for some of the clients, death, and natural calamities, nature of clients (habitual defaulters), equally have an adverse impact on the quality of portfolio.

3.2 CAPITAL STRUCTURE AND PROFIT THEORIES

3.2.1 THEORIES OF CAPITAL STRUCTURE

The objectives of a firm's capital structure decision is to determine the optimal proportion of debt and equity financing that minimizes the firm's weighted average cost of capital and maximize firm value. It is this optimal combination which helps a firm to achieve its financial sustainability. The optimal capital structure differs from one industry to another due to among other factors, differences in the levels of business risk. The higher the level of business risk in a given industry, the greater the chances of financial distress and consequently, the lower the debt to equality ratio and vice versa. Even within an industry, the competitive position of a firm, its growth potential, and the caliber of management may cause variations in degrees of business risk and henceforth optimal capital structure. Financial analysts have advanced a number of theories regarding optimal capital structure a discussion of them is presented, discussed and illustrated in this section.

3.2.1.1 THE MODIGLIANI – MILLER THEOREM

The Modigliani-Miller (1958) suggests that any combination of debt to equity financing can optimize firm value by arguing that increasing the use of cheaper debt financing serves to increase the cost of equity, which results in a zero net change in the

firm's net weighted cost of capital. Though this theorem provides a foundation for understanding capital structure, it is based on unrealistic assumptions. There are costs associated with both equity and debt financing which reduces firm value and the pace of its financial sustainability. Besides interest expense obligation, debt financing is associated with the cost of financial distress. Equity has also costs such as annual dividend pay out and loss of ownership in case shareholders are of preferred type. In the context of MFIs, donations and grants too, have associated costs such as the strings attached those funds by donors. In brief, costs associated with any particular kind of funding do affect its firm value and further have a negative impact on its financial sustainability.

3.2.1.2 THE TRADE – OFF THEORY

Alan Kraus and Robert H. Litzenberger (1973) suggest that the optimal combination of capital a firm uses is a result of cost - benefits analysis of debt and equity funding. With the benefit of debt being the tax - shield and the associated costs financial distress such as bankruptcy and non-bankruptcy costs (staff turn-over, suppliers demanding disadvantageous payment terms, bondholder and / or stockholder infighting), this theory argues that as the cost of debt increases, the cost of equity equally increases since most of the costs of financial distress are effectively borne by the equity holders. It further argues that this trend continues up to that point when the marginal benefit of further increases in debt provided by the tax – shield declines while the marginal cost of financial distress increases and this is the point the optimal combination of capital

structure is determined since at this point, the firm will be minimizing its weighted cost of capital while maximizing the firm's value.

This theory has some important implication for MFIs. First, due to high business risk in their industry, they should use less debt financing since the greater the business risk, the greater the probability of financial distress. Secondly, MFIs operating in environments with high tax rates should use more debt in their capital structure than those operating in environments with lower tax rates. High corporate taxes lead to greater benefits from debt, other factors held constant, and so more debt can be used before the tax shield is offset by financial distress and agency costs. Such considerations, we suggest will going along in raising the value of MFIs thereby achieving considerable levels of financial sustainability.

3.2.1.3 THE PECKING –ORDER THEORY

Stewart C. Myers and Nicholas S. Majluf (1984) argue that the optimal combination of funding should follow the principle of least effort or least resistance. It suggests a strict hierarchy to be followed in determining the optimal capital structure with internal equity being most preferred followed by debt, the preferred equity and finally external equity (new common stock). According to this theory, MFIs' value and consequently financial sustainability can be reached by utilization of internally generated funds (retained earnings). However, given the high business risks in micro financing backed by large volumes of clients, raising sufficient internal funds becomes a nightmare,

forcing these institutions to resort to other sources in an effort to fulfill their mandated obligations.

3.2.1.4 THE AGENCY THEORY

Formally, agency theory in financial economics emerged in the 1970s through the works of scholars like Armen Alchian, Michael Jensen, Harold Demsetz, S.A. Ross and William Meckling. The theory views firms as nexus of contracts between resource holders with basic business relationships emerging between the stockholders and managers on one hand and debt holders and stockholders on the other characterized by some elements of conflicts between the agents and the principals. In addition to the conflict, agency occurrence does give rise to agency costs in order to sustain an effective agency relationship. Notable agency costs as articulated by Michael Jensen and William Meckling (1976) includes; audit expenses, organizational restructuring expenses and opportunity costs of limiting the authority of managers.

In the absence of the ability by the shareholders to meet the agency costs, in addition to self interest of the management driven by economic motives, and the fact that not being owners that had nothing regarding compensation in case of bankruptcy, managers trend to exercise their power in such a way that debt funding becomes more pronounced than equity.

To overcome this, shareholder of institutions like MFIs need to increase performance based bonuses to management, and increase their shares in the institutions.

3.2.1.5 INFORMATION ASYMMETRY THEORY

The origin of this theory is attributed to three eminent researchers George Akerlof, Michael Spence and Joseph Stiglitz in the 1970s in their study of asymmetry information in markets. Information asymmetry it is where there is imbalance with regards to information in the transaction, with one party having more than another which leads the transaction awry at times in the form of adverse selection and moral hazards. Adverse selection prompts in the transaction when a party lacks information while negotiating and moral hazard is as a result of lack of information about the performance of what is being negotiated. George Akerlof (1970) proposes two solutions to the problem of adverse selection; signaling and screening. In the context of financing, the primary solutions to adverse selections are customized to debt signaling and poor pricing of new securities by Ross and Myer.

a. Debt Signaling

Ross (1977) argues that managers armed with valuable information about the firm, usually use more debt than equity in the firm's capital structure to stimulate positive signals to the outsiders (investors) about the firm's stability in income and ability to pay. Positive signals raise investors' confidence, hence firm value and concurrently financial sustainability. With regards to MFIs, this theory suggests that the arrangement of capital structure with more debt can go a long way in stimulating the confidence of investors which will in turn raise their values and thus financial sustainability.

b. Poor Pricing of New Securities

Myers and Majluf (1984)) contend that due to information asymmetry, investors perceive managers to use private information to issue risky securities when they are overpriced, which leads investors to under price new equity, sometimes causing substantial loss to the existing shareholders, and hence lowering firm value. This outcome of information asymmetry makes firms avoid issuing equity to finance new project and rather resort to utilization of internally generated sources and debt, since issuing equity is typically viewed as a negative signal that managers believe a firm's stock is overvalued. From the foregoing discussion, MFIs should not issue new securities (equity) in financing new poverty programs but rather they should resort to retained earnings and debt to avoid under pricing of the securities of both potential and existing shareholders which might lower their value.

3.2.2 THEORIES OF PROFIT

For most organizations, profitability is the main objective and target and it is often the measure of performance and henceforth an indicator of financial sustainability. There are a number of theories detailing institutional profitability.

3.2.2.1 WALKER'S THEORY

Walker (1887) argues that "*profit is rent of the exceptional abilities that an entrepreneur may possess over the least efficient entrepreneurs*". According to this theory, profit raises from the unique abilities that firms have. Those abilities could range

from financial, managerial, efficiency, productivity, research and development. With regards to MFIs, they need to cultivate exceptional abilities in financial service delivery and mobilization to harvest sufficient profits and hence ensure financial sustainability. The associated costs of rising up entrepreneurs' with exceptional abilities should be analyzed for the institutions to yield profits.

3.2.2.2 CLARK'S DYNAMIC THEORY

Clark (1891) suggests that *"profit is a reward for inventing products and production techniques and for coordinating functions of entrepreneurship under dynamic conditions"*. In other words, profit is an outcome of product/service and production inventions. According to this theory therefore, MFIs' profits and hence financial sustainability are a result of designing new products/ services and inventing new delivery methodologies. The new products could include different kinds of saving accounts tailored to the poor clients' needs, micro insurance, mortgage, short training programmes for marketing, investment, entrepreneur and project planning, etc. Regarding loan delivery techniques, the new information technology prevailing today that has been revolutionized by the internet, cell phones, etc should be adopted. In addition, there should be investment in research and development to come up with new techniques of delivering, monitoring and recovering loans, based on their operating environment. Continuous designing and redesigning of products and invention of new micro credit delivery methods can, holding other factors constant help MFIs raise sufficient profits

and achieve financial sustainability. However, MFIs should be mindful of the associated costs and undertake a cost benefit analysis.

3.2.2.3 HAWLEY'S RISK THEORY

This theory by Hawley (1893) contends that "*the riskier the industry the higher its profit rate*". According to this theory, profit is the price paid for business risk and consists of two parts; one representing compensation for actual or average losses incidental to the various classes of risks necessarily assumed by the entrepreneurs and the second representing an inducement to suffer the prospect of being exposed to the risk. In brief the theory suggests that profit accrues from undertaking risk. According to this theory, MFIs should serve the poorest of the poor without collaterals, living in remote and introspective rural areas, having little business skills and opportunities and who are very illiterate to maximize profit and hence to achieving of higher levels of financial sustainability. Well as risk has a positive relationship with profit, the nature of MFI business is rather complicated so extra care should be taken while selecting clients, otherwise extreme risk might eat up all anticipated profits.

3.2.2.4 KNIGHT'S RETURN TO UNCERTAINTY THEORY

Knight (1950) suggests that profits are results of an organization's ability to handle uncertainty as they arise. It treats profits as residues return to uncertainty - bearing. According to this theory, uncertainty is risk that can not be statistically calculated such as the strategies of competitors, demand fluctuations, trade cycles,

technological changes, outbreak of wars and changes in government policies. Efficient and effective handling of uncertainty as it arises by an entrepreneur; according to this theory is the main source of profit. According to this theory, MFIs must have in place proper procedures of handling uncertainties arising from competition, client drop outs, business cycles, technology changes, wars and insecurity, government policies and other environmental changes, for them to be profitable and financially sustainable.

3.2.2.5 SCHUMPETER'S INNOVATION THEORY

This theory formulated by Schumpeter (1938) is embedded in the theory of economic development. The theory suggests that profit in organizations is a result of innovations in manufacturing and distribution chains. It specifically suggests innovations in; products/ services or their quality, methods of production, market, sources of raw materials and organizing the organization. This theory is similar to Clark (1891) dynamic theory of profit. For MFIs to become both profitable and financially sustainable, they need to make a lot of innovations in product, services, quality assurance methods, micro credit delivery and marketing, sources of capital and in management.

CHAPTER 4

THE ANALYTICAL FRAMEWORK

This chapter provides the theoretical connections between the financial sustainability and the various factors whose influence and role is to be assessed. Thereafter, it presents the methodology to be used in the analysis. The detailed analysis and illustration of all the variables (dependent and independent) included in the model is covered here.

4.1 DEPENDENT VARIABLE

Although MFIs have specialized in serving the very poor masses without collaterals and have been credited for achieving high rates of repayments, they still have a challenge of translating such high rates of repayment into financial sustainability. In this regard, we develop a model to establish and evaluate various factors responsible for financial sustainability of MFIs. Three proxies of the dependent variable (financial sustainability) are to be employed in the analysis; financial self sufficiency, return on assets and return on equity. Financial self sufficiency is the lead proxy measure of financial sustainability in our study. It is a variable directly concerned with self sufficiency, which has been widely used in similar studies of financial sustainability (Cull et al 2007, Woller 2003) and offered reliable results, and according to Meyer (2000), it is a higher value measure of financial sustainability than standard ratios used in the

situation like operational self sufficiency. For robustness however, return on assets and return on equity will be used. Firms have different kinds of assets and equities, the returns on each can indirectly provide a clue of what is happening in that firm. Therefore we give these variables due regard in our assessment since they may supplement and give additional information on the performance of the institutions under consideration. Besides, return on assets has also been used in analyzing the performance of financial institutions (Sufian et al 2008). The three proxy variables (for financial sustainability) used in the model are discussed below:

4.1.1 Financial Self Sufficiency (FSS)

Financial self sufficiency is an important measure of the sustainability of lending operations as it directly determines the extent to which operations are becoming self sustaining. It is expressed as follows:

$$FSS = \frac{Operating\ Revenue}{\text{Operating Expense} + \text{Financial Expense} + \text{Loan Loss Provision} + \text{Cost of Capital}}$$

Financial self sufficiency indicates the ability of MFIs to generate sufficient revenues that cover both direct costs (operating costs, financial costs and loan loss provision) and indirect costs (adjusted cost of capital). At break even, MFIs must attain 100% financial self sufficiency ratio (Ledgerwood, (1998). Operating below the break even point will endanger the long term survival of the institution since sufficient funds will not be available in the future. The higher set up costs, for market share, lack of experience in handling clients, delinquency- defaults and lack of diversified capital

structure among others render attainment of financial self sufficiency a serious problem for MFIs, more so the young ones.

A strong correlation between financial self sufficiency (dependent variable) and the independent variables in this study can be established. Higher levels of financial self sufficiency helps in generating the much needed internal source of capital (retained earnings). With sufficient levels of internally generated funds, the weighted cost of capital will go down (interest on debt, dividend to equity holders, donor demands), leading to availability of funds for further investments and therefore furthering financial self sufficiency, improving on outreach, efficiency, profitability, etc. Financial self sufficiency strengthens the ability of MFI to reach out to large number of clients (outreach) and thus increases their profitability. The attainment of this objective at the institutional level calls for proper cost management during the course of operations (efficiency) and improvement in portfolio quality. This needs improvement in delivery methods and staff motivation. A good portfolio quality reduces loan losses (costs) and improves on income (profit) thereby strengthening financial self sufficiency. For instance, innovation in progressive lending such as issuing new loans or increasing loan size or increasing the number of clients, when tied to the ability and level of repayments; reduces loan losses, costs and improves on revenues. Finally, achieving higher levels of outreach in both depth and breadth can help in increasing the loan portfolio (number of clients) and loan size. This can also help in achieving profitability and financial self sufficiency. Enhanced outreach can only be expected if delivery is efficient and portfolio quality is good. In fact, there is a complex interrelationship between the dependent and

independent variables which justifies the inclusion of financial self sufficiency in the model as the main dependent variable.

4.1.2 Return on Assets (ROA)

Return on assets is a good indicator to show how efficient a company's operations are in generating revenue. It reflects the ability of a firm to optimally utilize the investable resources for profit generation leading to financial sustainability. Return on assets can be computed as:

$$Return\ on\ Assets = \frac{\text{Net Income (Excluding Donations and Grants)}}{\text{Total Assets}}$$

In the context of MFIs, this statistics is used in evaluation on the basis of their financial performance, such as the decisions made to purchase fixed assets, land and buildings or to invest in securities. To determine how MFIs are performing, portfolios are used instead of assets (Ledgerwood, 19998). This specifically indicates the productivity of the lending activities, measuring the average revenue generated per unit of floated loans. In this regard, the statistics is improved as follows:

$$Return\ on\ Assets = \frac{\text{Net Income (Excluding Donations and Grants)}}{\text{Outstanding Portfolios}}$$

Like financial self sufficiency, similar correlation exists between return on assets and the various independent variables (like capital structure, profitability, efficiency, portfolio quality and outreach).

4.1.3 Return on Equity (ROE)

Most often, MFIs float their stock in the market to collect funds, besides getting donations. Return on equity measures the rate of return (interest) on the ownership of the common stocks (shareholders' equity). It measures a firm's efficiency in generating profits from every unit of shareholders' equity. Return on equity shows how well a company uses investable funds to generate earnings steadily. It is expressed in percentage and estimated as:

$$Return\ on\ Equity = \frac{Net\ Income\ (excluding\ donations)}{Shareholder's\ Equity}$$

Net income is the income generated during a fiscal year after deducting the costs of operations and after deducting the dividends on preferred stocks. Obviously, the remainder has to be distributed among common stock holders. This ratio is useful for comparing the profitability of a company to that of other firms in the same industry.

High Return on equity yields no immediate benefit for the company since stock prices are strongly determined in the market by earnings per share (EPS). The benefit comes from the earnings reinvested by the company, which in turn ensures a high growth rate. The benefits can also come as a dividend on common shares or as a combination of dividends and reinvestment in the company. Return on equity is presumably irrelevant if the earnings are simply divided among shareholders and not reinvested.

highlights a number of factors in the course of analysis. As already mentioned, these include outreach, capital structure, profitability, efficiency, and portfolio quality. We discuss them briefly.

4.2.1 Outreach

As already mentioned, outreach refers to the number of clients being served by MFIs. Outreach plays a very important role in micro financing, for it is a direct measure of the performance. Its role seems to be multi-dimensional; that is to say, outreach can enhance the performance but at the same time it may be an impediment as well for one reason or the other. Two indicators of outreach have been identified namely, the number of active borrowers and deposit size to GDP per capita.

4.2.1.1 Number of Active Borrowers ratio (NAB)

The number of borrowers is an indicator of breadth of outreach and scale. Convention holds that scale is inversely related to costs and positively related to profitability, because the fixed costs of production are amortized across a larger number of clients and value of output. Holding other things constant, the more active clients are there on the rolls of an MFI, the more revenue it might generate by the end of the day and the more financially sustainable it might be, provided the stuck up loans are not significant.

Hypothesis: The number of borrowers is thus hypothesized to be positively associated with financial sustainability measures.

4.2.1.2 Deposit size to GNP per capita ratio (DS)

The deposit size as ratio of GNP per capita ratio is expressed as deposit (per borrower) to percentage of GNP per capita.

$$Deposit\ Size\ to\ GNP\ per\ Capita = \frac{\text{Deposit Size}}{\text{GNP per Capita}}$$

It is a good measure of scope of outreach of MFIs reflecting the diversity of financial products an institution is offering to the clients. It, too, gives a clue of the efforts an institution is placing on local financial resources mobilization. A higher ratio is a positive indication of the diversity of products and resource mobilizing efforts by an MFI, thus outreach.

Hypothesis: This ratio is hypothesized to be positively associated with financial sustainability.

4.2.2 Capital Structure

Capital is the blood that flows in veins of financial institutions and therefore a symbol of their economic life. It is the capital that enables firms, the Micro finance institutions to fulfill their mandated roles of extending financial and other services to the poor. There are two most important sources of financing for MFIs, the debt and donations. We have selected the debt to equity ratio and donations to (performing) assets ratio as the two variables to proxy the capital structure due to their dominant role and their strong theoretical linkages with the dependent variables.

4.2.2.1 Debt-to-Equity ratio (DER)

The debt-to-equity ratio indicates the relationship of debt to equity financing. This ratio expresses the relationship between capital contributed by creditors and that contributed by stockholders. It expresses the degree of protection provided by the owners for the creditors.

The higher the Ratio, the greater will be the risk assumed by creditors. A lower ratio generally indicates greater long-term financial safety, which provides an institution greater flexibility to borrow in the future and substantiates financial sustainability. The Formula for calculating this ratio is as follows:

$$Debt\ to\ Equity\ ratio = \frac{Total\ debt\ liabilities}{Total\ equity}$$

This ratio is of particular interest to lenders (creditors) as it indicates how much of a safety cushion in form of equity is there in the institution to absorb losses.

An average debt to equity ratio is desirable. A rapidly increasing debt to equity ratio will make an institution to approach its upper limit of borrowing which will in turn force it to curtail growth and hence, financial sustainability. Similarly, rapid increase in debt based funding is bound to put pressure on an institution's profit margins.

In the context of Micro finance institutions, this ratio is heavily affected by unaccounted, unreported and/ or hidden subsidies and by other factors that affect both debt and equity.

Hypothesis: This ratio is expected to have an inverse relation in all the models of financial sustainability.

4.2.2.2 Donations to Assets ratio (DN)

Donations constitute a reasonable portion of financing operations of most MFIs, particularly the NGOs. The donations and grants can be expressed as ratio of performing assets.

$$Donation\ to\ assets\ ratio = \frac{Donations}{Performing\ Assets}$$

This ratio shows the dependence of the MFIs on external free funding for their operations and hence a bottleneck to self sufficiency. Heavy dependence on donations and grants is harmful in the long run in that such institutions may fail to adjust or even to continue in the event of donor withdrawals. Donations/grants most often come with a chain of strings attached to them such as changes in management, ownership and governance. Mostly, the funds are donated for specific projects and specific time period. Therefore, a decreasing ratio of donations and grants is more desirable for financial sustainability of MFIs.

Hypothesis: Donation and grant ratio is expected to have an inverse relation in all the models of financial sustainability.

4.2.3 Profitability

Profitability is a more direct measure of financial sustainability; the more profitable institutions are the more financially sustainable. There are a number of ratios

used in analyzing profitability but for the current study were confining to profit margin and real yield on portfolio. The basis for the selection of these two ratios is due to their importance in measuring profitability in MFIs.

4.2.3.1 Profit Margin

Profit margin is one of the standard measures of profitability in institutions and it is obtained by expressing net profits as percentage of revenues as seen below:

$$Profit\ Margin\ Ratio = \frac{Profits\ (after\ taxes)}{Revenues}$$

A high profit rate indicates a high margin of safety and lower risk in attracting funds and thus higher potential growth and financial sustainability. It reflects the soundness of pricing policies, cost management, portfolio quality and outreach. It is affected by the competitive strategies, product, service mix and many other factors that affect costs and revenues, positively or negatively. A higher and positive profit margin is obviously desirable.

Hypothesis: Profit margin is hypothesized to be positively related with financial sustainability measures.

4.2.3.2 Real Portfolio Yield

The real portfolio yield is the inflation-adjusted return on the portfolio and a proxy for the real interest rate charged on loans. It is the initial indicator of an institution's ability to generate sufficient revenue that can cover its financial and operating expenses. In other words, it is an indicator of financial sustainability. It is denoted by the average real returns in proportion to the portfolio outstanding. It is expressed as:

$$Real\ Profit\ Yield\ Ratio = \frac{Interest\ and\ fee\ during\ the\ period}{Outstanding\ loan\ portfolio}$$

Real Portfolio Yield measures how much the MFI actually received, in the form of interest from its clients during the period. It also provides an insight into the portfolio quality as it is a better indicator of delinquency than portfolio at risk. A positive and increasing Real Portfolio Yield is considered a positive sign.

Real portfolio yield is also affected by growth in portfolio. It is very sensitive to the sequence of payments that an MFI makes out of the repayments from clients. For example, an institution that uses the sequence of principal first and interest last, would have a lower yield as compared to another institution that uses the conventional sequence of, 'interest first and principal last'. Sometimes Portfolio Yield (gross or real) is different from what is expected, mostly lower due to a number of factors: first, large loan disbursements towards end of financial year, which tend to distort average loan outstanding and yield, second, loan terms which impact effective interest rate and yield, third, principal first paid versus interest first paid concept, fourth, delinquency, re-scheduling, write-offs etc that shroud a serious delinquency problem and finally a small proportion of total assets as loans outstanding (San Dhan, 2010)

Hypothesis: Profit margin ratio is hypothesized to be positively associated with financial sustainability.

4.2.4 Efficiency

The nature of micro finance business calls for efficiency in order to remain on board. Without efficiency, achievement of profitability, outreach, portfolio quality and hence financial sustainability remains a nightmare. Thus a proper assessment of financial sustainability is best possible with an analysis of efficiency. We have selected personnel expense to loan portfolio as proxy measure of efficiency.

4.2.4.1 Personnel Expense to Loan Portfolio ratio (PXR)

Personnel costs include all the salaries and wages of employees engaged in loan provision, including the mandatory and customary benefits such as housing, health and conveyance. The personnel expense ratio is calculated by expressing personnel expenses as percentage of outstanding loan portfolios.

$$PXR = \frac{Personnel\ cost\ during\ period}{Outstanding\ Loan\ Portfolio\ during\ the\ period}$$

The personnel cost to loan portfolio ratio depends on the loan delivery model, the density of the population and the salary level in the country. A lower personnel expense ratio obviously shows increasing efficiency and financial sustainability.

Hypothesis 4: This ratio is hypothesized to have an inverse relation with financial sustainability.

4.2.5 Portfolio Quality

The quality of portfolio of an MFI has great bearing on its profitability, efficiency, productivity and hence financial sustainability. We consider it fruitful to analyze portfolio quality since the sustainability and survival of MFIs depend greatly on the quality of loans they advance to their clients. The better the portfolio quality the lower the losses and the more financially sustainable an institution would be. This study will utilize loan loss rate and portfolio at risk for more than 30 days as proxy measures of portfolio quality. A brief discussion is as follows:

4.2.5.1 Loan - Loss Rate Ratio (LLR)

The loan loss rate represents the annual loss due to defaulted loans. It reflects the loans that must actually be written-off and provides an indication of the volume of loan losses in a period, relative to the average portfolio outstanding.

The loan loss rate indicates the percentage of total outstanding loans which have not been recovered during the accounting period. Prudent financial management and full disclosure would imply that this figure reflects the fundamental loss to the financial institution since the stuck up loans disturb the plans and halt the operations. Because loan write-offs generally occur in case of older loans, the loan loss rate may not be an indicative of the current loan portfolio quality. It is expressed as:

$$Loan\ loss\ rate = \frac{Amount\ written - off\ in\ the\ period}{Portfolio\ outstanding\ loan\ portfolio\ for\ the\ period}$$

It can be evaluated regularly and compared overtime to see if the loan losses as percentage of portfolio outstanding are increasing or decreasing. It can also be compared to the amount of loan loss reserve to determine if the said reserve is sufficient enough to absorb such losses. Normally, sustainable institutions have a loan loss rate of less than or equal to 3%, (Ledgerwood, 1998) but keeping the ratio tailored to the actual portfolio quality is the most crucial aspect.

However, apart from absolute percent values, another factor is important while using loan loss rate trends, in terms of decreasing/increasing values as compared to the last (reference) period. A decreasing loan loss rate trend is a positive signal, however, this trend since sudden and large disbursements of loans could mask the actual default risk. For an MFI that is fast expanding in terms of loan disbursements, the same limitation applies. For instance, when the repayment periods for these loans are yet to begin, the problem is exacerbated. Likewise, re-scheduling, refinancing and loan write-offs can portray a lower LLR ratio while the (default) risk may still be high.

Hypothesis: Loan loss rate ratio is hypothesized to have a negative association with financial sustainability.

4.2.5.2 Portfolio at Risk Ratio (PAR)

One of the most important tools used to assess MFI's asset quality is portfolio at risk. The portfolio at risk greater than 30 days is a percentage (%), which represents the proportion of total outstanding loan portfolio that is at default risk for more than 30 days. The general formula for Portfolio at risk greater than 30 days is:

$$PAR = \frac{Sum\ of\ unpaid\ principal\ balance\ of\ loans\ with\ payments\ past\ due\ more\ than\ 30\ days}{Total\ Portfolio\ outstanding\ loan\ portfolio\ for\ the\ period}$$

Generally, this ratio attempts to measure the default risk in a portfolio by using past as well as future data. In addition, its estimation is based on the key question:, if all delinquent borrowers were to completely default during the period, then how much money would the MFI stand to lose?

From this perspective, Portfolio at risk greater than 30 days provides a *pessimistic estimate* of the default risk in an MFI's portfolio. The portfolio-at-risk more than 30 days captures the accounting convention that loans exceeding 30 days overdue pose an unacceptably high risk of nonpayment.

In general, sustainable institutions can have portfolio at risk greater than 30 days by less than or equal to 2% (Sa Dhan, 2010). However, apart from absolute percentage values, two other factors are important while using portfolio at risk: trends, in terms of decreasing/increasing values as compared to the last (reference) period, as well as the aged values of portfolio at risk.

With regard to trends, a decreasing Portfolio at risk more than 30 days is considered. However, like the loan loss rate, this indicator suffers from several limitations including sudden and disbursement of loans, rescheduling, refinancing, loan write-offs, etc.

Hypothesis: Portfolio at risk more than 30 days ratio is hypothesized to have an inverse relation with financial sustainability.

We present the above discussion in summary table as under;

Table 1: Determinants of financial sustainability, their measure and expected relationship

Determinants	**Proxy (measure)**	**Symbol**	**Expected Effects on Sustainability**
Outreach	Number of active borrowers	NAB	Positive (H:1)
	Deposit size to GDP per capita Ratio	DS	
Capital Structure	Debt to Equity ratio	DER	Negative (H:2)
	Donations to Assets ratio	DN	
Profitability	Profit Margin Ratio	PM	Positive (H:3)
	Real Yield portfolio Ratio	RYP	
Efficiency	Personnel Expense Ratio	PXP	Negative (H:4)
Portfolio Quality	Loan- Loss rate Ratio	LLR	Negative (H:5)
	Portfolio at Risk (> 30 days)	PAR	

4.3 MODEL SPECIFICATION

We have modeled financial sustainability in our study based on three variables;

Financial self sufficiency (FSS)

Return on Assets (ROA) and

Return on Equity (ROE)

$$FSS=\alpha+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\varepsilon$$

$$ROA=\alpha+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\varepsilon$$

$$ROE=\alpha+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\varepsilon$$

X_1 = Outreach, where outreach = Number of active borrowers + Deposit size to GNP per Capita.

X_2 = Capital Structure, where capital structure = Debt to equity ratio + Donations and grants ratio

X_3 = Profitability, where profitability = Profit margins ratio + Real yield on portfolio ratio

X_4 = Efficiency, where efficiency = Personnel expense ratio

X_5 = Portfolio quality, where portfolio quality = Loan loss rate + Portfolio at risk more than 30 days

4.4 BAYESIAN ESTIMATION MODEL FOR FINANCIAL SUSTAINABILITY OF MFIs IN EAST AFRICA

Classical estimation procedure ignores our prior knowledge about the parameters. Classical estimators assume parameters of the model to be fixed, ignoring possible variability in the parameters. Bayesian models have the merit to incorporate the prior knowledge in the model, thus an improvement over the classical estimators. Consider for example we are interested to estimate the consumption function for an economy. The classical estimator will utilize data and the assumed model for the given economy assuming that true parameters are fixed. But it is reasonable to assume that consumption habit of the economy is itself random, described by global consumption behavior plus some individual factor. Bayesian models have the capability to incorporate the prior knowledge in the model as well. In addition, the Bayesian estimation technique has an edge over the Classical which doggedly cling to theory even when the results conflict or contradicts with the established theories (Greene, 2004). Bayesian econometricians formulate the theory, assemble existing evidence on the theory, form beliefs based on existing evidence, gather evidence, combine beliefs with new evidence and revise beliefs regarding the theory.

4.5 DESCRIPTION OF THE BAYESIAN ESTIMATION PROCEDURE

Suppose we have matrix of independent variable X and dependent variable Y. The relationship between the two is described by model:

$$Y = X\beta + \varepsilon$$

Where β is the vector of parameters and ε is the vector of random error, then the Maximum Likelihood (ML) estimate of β is given by

$$\hat{\beta} = (X'X)^{-1} X'Y$$

Under the standard assumptions $\hat{\beta}$ has the following density

$$\hat{\beta} \sim N(\beta, \hat{\sigma}^2 (X'X)^{-1})$$

Where

$$\hat{\sigma}^2 = \frac{(Y - X\hat{\beta})'(Y - X\hat{\beta})}{(T - K)}$$

The Bayesian estimation procedure assumes β to be randomly described by the density

$$\beta \square N(\mu, \Omega)$$

μ and Ω are called priors because they represent our prior knowledge about the parameters.

The posterior model estimate is the weighted average of the prior and data mean and is given by

$$\hat{\beta}_B = E(\beta/\hat{\beta}) = [\frac{1}{\sigma^2}(X'X) + \Omega^{-1}]^{-1}[\sigma^2(X'X)^{-1}\hat{\beta} + \Omega\mu]$$

And the posterior variance is given by,

$$Var\ (\beta/\hat{\beta}) = (\frac{1}{\sigma^2}X'X + \Omega^{-1})^{-1}$$

$\frac{1}{\sigma^2}X'X$ is the inverse of the variance of the data density called the precision of data density and Ω^{-1} is the precision of the priors. The variance of posterior is

$$V(\hat{\beta}_{BAYES}) = (\frac{1}{\sigma^2}X'X + \Omega^{-1})^{-1}$$

So that posterior precision is $(\frac{1}{\sigma^2}X'X + \Omega^{-1})^{-1}$

This is the sum of the prior and the DATA precision. Therefore the Bayesian estimator is more precise than the DATA and the prior.

4.6 DIFFICULTIES WITH BAYESIAN AND THE EMPIRICAL BAYES

There are three major problems with the use of Bayesian in practice. These problems are:

1) The Bayesian models may have unbounded risk, depending on choice of priors. If prior is precise enough, the improvement over Maximum likelihood is substantial but the risk is unbounded. If the prior is less precise, then the improvement over ML is very small.
2) There is the problem of choice of hyper parameters. The classical Bayesian procedure for the choice of hyper parameters is arbitrary and there are no specific rules for choosing priors.
3) Some time conflict between data and prior creates problems for investigators (see Zaman, 1996).

Empirical Bayesian procedure offers solution to problems high lightened above.

The priors in empirical Bayesian are some function of data, so that they are automatically comfortable with data and there is no conflict between data and priors.

4.7 EMPIRICAL ESTIMATION TECHNIQUES

We use the Bayesian estimation procedure to estimate the parameters in the three models earlier mentioned. The Bayesian analysis has several advantages over the classical in small samples. Some of the advantages are described by Berger (1985) are:

1) Contrary to classical estimation, the Bayesian analysis assumes the estimated parameter to be random with some prior density. This property makes Bayesian estimation suitable for panel data where parameters of models are individual to another.

2) Bayesian analysis provides a natural way of combining prior beliefs and information with data. In principle, prior any arbitrary choice of prior information can be combined with data information. In the panel data models, the average of individual parameter estimates[4] can be used as prior.

3) Bayesian estimates are more precise than the classical estimates. This means that the standard errors of Bayesian estimates are small which are helpful in getting more reliable inference.

4) Bayesian estimates provide reliable results for small samples. Contrary to classical estimates, Bayesian estimates do not rely on one asymptotic result.

Due to these desirable properties, Bayesian models are recommended for panel data by various authors including Hsiao and Pesaran (2005), Koop (2000).

The Bayesian estimates are weighted average of classical estimates and the prior information. Let $\hat{\beta}$ be the classical estimate of parameters, this is to say;

$$\hat{\beta} = (X' X)^{-1} X' Y$$

Assume $\hat{\beta} \sim_N (\mu, \Omega)$ this means $\hat{\beta}$ is itself random normal with prior mean μ and prior variance Ω. In this case Bayesian estimates will be:

$$\hat{\beta}_{BAYES} = E(\beta / \hat{\beta})$$

Where;

---

[44] Suppose $\hat{\beta}_i$ is a parameter estimates for the ith cross section and let μ and Ω be the parameters of prior distribution then $\mu = \frac{1}{n}\sum \hat{\beta}_i$ and $\hat{\Omega} = \frac{1}{n}\sum \hat{\beta}_i \hat{\beta}_i'$

$$V(\hat{\beta}_{BAYES}) = (\frac{1}{\sigma^2} X'X + \Omega^{-1})^{-1} \quad 2$$

The study used empirical Bayesian approach to estimate priors following Carrington and Zaman (1994), Rubin (1981), Carter and Rolph (1974), Efron and Morris (1972), Hsiao, Pesaran and Tahmiscioglu (1999) and Koop (2000).

4.6 EMPIRICAL BAYES DESIGN USED IN ANALYSIS

The Empirical Bayesian Estimation procedure is going to utilize Bayesian equations 4 and 5. There were some parameters in those equations that were not readily available given the data base to enable us generate the required regression results. Two options were available in overcoming this:

Firstly, to estimate those parameters separately and thereafter insert them into the two equations. That required a prior utilization of the following methodology in estimates;

It begins by estimating $\hat{\beta}$ in the following manner $\hat{\beta} = (X'X)^{-1} X'Y$ where X is a matrix of the regressors and Y is the matrix of the dependent variable.

It is reasonable to assume that the MFI's actual financial sustainability performance is random with some average performance so that it can be estimated by using MFI's average over the years. The MFI's average performances were recognized as

a reasonable option to estimate priors. The estimation of the priors therefore, can be arrived at as follows;

$$\bar{Y}i = \frac{1}{Ni}\,\Sigma Yit \text{ and } \bar{X}i = \frac{1}{Ni}\,\Sigma Xit$$

Where 'i' is the ith MFI, 'Ni' is the number of data points available for ith and t is the time index.

$$\bar{Y} = \begin{pmatrix} \bar{Y}1 \\ \bar{Y}2 \\ : \\ \bar{Y}n \end{pmatrix} \qquad \bar{X} = \begin{pmatrix} \bar{X}1 \\ \bar{X}2 \\ : \\ \bar{X}n \end{pmatrix}$$

Then,

$\mu = \left(\bar{X}'\bar{X}\right)^{-1}\bar{X}'\bar{Y}$, and $\Omega = \bar{\sigma}^2(\bar{X}'\bar{X})^{-1}$ are the priors to be used in our model. After assembling all the parameters, this is to say, priors, posterior and the Empirical Bayesian estimates are described by Equations 1 and 2.

Secondly, analysts can ease the process by creating a short cut involving programming using any programming language and thereafter use any estimation software like Strata, Ox-metrics and MATLAB. In the current study, we used the short route via MATLAB (See Appendix at the end).

Summary of Testable Hypothesis

Hypothesis 1: Outreach is hypothesized to be positively relationship with financial sustainability of MFIs operating in East Africa during the period 2004 - 2009.

Hypothesis 2: Capital Structure is hypothesized to have an inverse relationship with financial sustainability of MFIs operating in East Africa during the period in question.

Hypothesis 3: Profitability is hypothesized to have a positive relationship with financial sustainability of MFIs under study during the period.

Hypothesis 4: Efficiency is expected to have an inverse relation with financial sustainability of the institution under assessment during the period

Hypothesis 5: Portfolio quality is hypothesized to be inversely related to financial sustainability of MFIs in East Africa during the period 2004 through 2009.

CHAPTER 5

DATA CONSIDERATIONS

This Chapter deals with the nature of data, its source, samples and management techniques. The type of data is secondary in nature, retrieved from online by the author, organized in ratio forms and stored on Excel.

5.1 DATA SOURCES AND PRELIMINARLY DATA ANALYSIS

The main objective of this study is to assess the financial sustainability of MFIs in East Africa. For this purpose, we have extracted the relevant data of MFIs operating in East Africa over the period 2004 to 2009, from the Micro Finance Information Exchange Inc[5]. The details of the data samples are as follows in the various tables below:

[5] Micro Finance Information Exchange Inc. popularly known as Market Mix is a non profit organization based in Washington DC that is committed to providing data on micro financing around the world. It receives data, organizes it and there after, it uploads it online for interested parties to use without restrictions. It groups data according to regions namely Africa, North Africa and Middle East, South Asia, East Asia and the Pacific, Eastern Europe and Central Asia, and Latin America. It has data on several institutions providing micro finance services such as banks, NGOs, Cooperatives, Non Bank Financial Institutions and others, operating in individual countries. Audited balance sheets and income statements and other details of several micro finance institutions are too provided.

Table 2: Data Sample per year

Years	% Data availability
2004	76.92
2005	80.77
2006	100
2007	100
2008	100
2009	96.15

Table 3: Data Sample per country

Country	**No. of MFIs**	**Percentage**
Kenya	9	34.62
Rwanda	4	15.38
Uganda	8	30.77
Tanzania	5	19.23

Table 4: Data Sample per type of MFI

Type	Number	Data percentage
Banks	4	15.38
Cooperative	3	11.54
NBFI	12	46.15
NGO	7	26.92

Table 5 A: Combined Summary of Data: MFI, type, country and years

Sr.	Name	Type	Country	2004	2005	2006	2007	2008	2009
1	BIMAS	NGO	Kenya	P	P	P	P	P	P
2	ECLOF	NBFI	Kenya	A	A	A	P	P	P
3	EQUITY	Bank	Kenya	P	P	P	P	P	P
4	FAULA	NBFI	Kenya	P	P	P	P	P	P
5	JAMII	NGO	Kenya	A	A	A	P	P	P
6	KADEK	NBFI	Kenya	P	P	P	P	P	P
7	KREP	Bank	Kenya	P	P	P	P	P	P
8	KWFT	NBFI	Kenya	P	P	P	P	P	P
9	SMEP	NBFI	Kenya	P	P	P	P	P	P
10	CFE	COOP	Rwanda	P	P	P	A	P	P

'P' data present; 'A' data not present

Table 5 B: Combined Summary of Data: MFI, type, country and years

Sr.	Name	Type	Country	2004	2005	2006	2007	2008	2009
11	COOPENDU	COOP	Rwanda	P	P	P	P	P	P
12	RML	COOP	Rwanda	A	P	P	P	P	P
13	UOB	NBFI	Rwanda	P	P	P	P	P	P
14	AKIBA	Bank	Tanzania	P	P	P	P	P	P
15	BRAC	NGO	Tanzania	A	A	P	P	P	p
16	FINCA	NGO	Tanzania	P	P	P	P	P	P
17	PRIDE	NGO	Tanzania	P	P	P	P	P	P
18	SEDA	NGO	Tanzania	P	P	P	P	P	A
19	BRAC	NBFI	Uganda	A	A	P	P	P	P
20	CENTINARY	Bank	Uganda	P	P	P	P	P	P
21	EQUITY	NBFI	Uganda	P	A	P	P	A	P
22	FAULA	NBFI	Uganda	P	P	P	P	P	P
23	FINANCE TRUST	NBFI	Uganda	P	P	P	P	P	P
24	FINCA	NBFI	Uganda	P	P	P	P	P	P
25	MED	NGO	Uganda	P	P	P	P	P	P
26	PRIDE	NBFI	Uganda	A	A	A	P	P	P

'P' data present; 'A' data not present

Table 6: Summary of Statistics: Dependent Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
FSS	138	0.92529	0.244783	0.15	1.54
ROA	138	-0.00717	0.066475	-0.21	0.14
ROE	138	0.006087	0.268449	-0.92	0.52

Table 7: Summary of Statistics: Independent Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
NAB	138	13.17787	22.57783	0.104	178.9922
DS	138	0.288623	0.213351	0	1.08
DER	138	3.550072	2.242056	-2.96	9.41
DN	138	11.07078	15.79354	0	66.194
PM	138	-0.1176	0.684973	-4.9357	0.4131
RYP	138	0.279404	0.174496	-0.0351	0.6892
PXP	138	0.202577	0.101119	0.0687	0.4736
LLR	138	0.015086	0.024656	-0.0435	0.0992
PAR	138	0.062582	0.044515	0.0014	0.1819

Table 8: The correlation and covariance

	NAB	DS	DER	DN	PM	RYP	PXP	LLR	PAR
NAB	1								
DS	0.0428	1							
DER	0.1368	0.2341	1						
DN	-0.0187	-0.3019	-0.0984	1					
PM	0.1926	0.2282	0.2626	-0.3308	1				
RYP	-0.2192	-0.2597	0.1076	0.0641	0.0654	1			
PXP	-0.2462	-0.3721	-0.1159	0.2877	-0.2705	0.3883	1		
LLR	-0.1322	-0.0851	0.0421	-0.0805	-0.1737	0.2861	0.1964	1	
PAR	0.105	0.0595	0.0783	-0.1163	-0.1045	-0.2037	-0.2536	0.2276	1

We conclude by saying that the data sample is adequate in proving a reasonable assessment of the financial performance of the institutions under our scope of study during the period .According to the Classical Econometricians, Multicollinearity becomes problematic when two independent variables are highly perfect or perfect linear functions of each other in which case, regression will not be able to differentiate between the two variables and they provide a benchmark of 40% or 0.40 using the Percentage Correlation matrix (PCOR). This Classical benchmark has however been empirically contested by Grewal et al (2004) concluded that Multicollinearity is not so severe until it is greater than 80% or 0.80. In their study, they found that only higher correlations beyond 80%

were capable of producing greater errors in the estimations which invalidate the entire results. In our study we took the conservative Classical position to avoid hassles in the event of having severe Multicollinearity.

CHAPTER 6

EMPIRICAL FINDINGS

This is the central part of the thesis in which the empirical findings are presented and discussed. The Bayesian Regression results focusing on the assessment of financial sustainability of microfinance institutions in East Africa, modeled on financial self sufficiency, return on assets and return on equity and based on the models shown as Equations (1 and 2) of Chapter 4 are presented as under.

6.1 DESCRIPTION OF THE RESULTS

The description follows the table order, highlighting the significance levels and signs of the different variables based on theory and testable hypotheses. We discuss the alternative models separately.

6.1.1 MODEL-1: FINANCIAL SELF SUFFICIENCY (as dependent variable)

The regression results of the model using financial self sufficiency as proxy for financial sustainability are presented in Table 9 below. Out of the selected nine variables in the analysis, eight emerged to be significant with expected signs. Five variables are significant at 1 %, one at 5%, and two at 10% level. The results are discussed below:

(a) Outreach

Outreach had two proxy measures; one for breadth and the other for scope. The number of active clients (NAB) used as measure of the breadth of outreach emerged significant at 1% level with positive sign as expected. Deposit size to GNP (DS), used as measure for scope of the outreach, has the expected positive sign; however it is significant at 5% level.

Table 9: Results of Modeling Financial Self Sufficiency

Variables	Coefficient	S.E.	t – Stat	P- Value	Significance
CONST	1.082	0.0396	27.3041	0.00	-
NAB	0.0028	0.0004	6.7673	0.00	***
DS	0.1216	0.0486	2.5004	0.01	**
DER	-0.0141	0.0045	-3.1367	0.00	***
DN	-0.0011	0.0007	-1.6879	0.09	*
PM	0.2118	0.0162	13.062	0.00	***
RYP	0.2629	0.0701	3.7527	0.00	***
PXP	-0.8988	0.1315	-6.8341	0.00	***
LLR	-0.8735	0.4393	-1.9885	0.05	*
PAR	-0.3357	0.2308	-1.4543	0.15	-
MR	0.7862				
F	47.0711				

*** 1%, ** 5%, *10%

(b) Capital Structure

We have used two proxy measures for capital structure namely, the debt to equity ratio (DER) and donations to assets ratio (DN). Both the variables have emerged with expected negative signs. However, where the debt-to-equity ratio is significant at 1% level, the donations-to-assets ratio is significant only at 10% level.

(c) Profitability

Two proxies are used to represent profitability, namely the profit margin (PM) and the real yield on portfolio (RYP). Both the variables have positive impacts on financial self sufficiency and highly significant i.e. at 1 % level.

(d) Efficiency

The single handed proxy used to measure efficiency, the ratio of personnel expenses to loan portfolio (PXP), emerged with the expected negative sign and highly significant (at 1% level).

(e) Portfolio Quality

Out of the two proxy measures of portfolio quality used in the study, only one variable; namely the loan loss rate (LLR) is significant at 10% level and carries the expected sign. The second proxy variable; namely the portfolio at risk for more than 30 days (PAR), although negative in sign as the expectations, however is insignificant.

6.1.2 MODEL-2: RETURN ON ASSETS (as dependent variable)

Table 10: Results of Modeling Return on Assets

Var.	Coefficient	SE	t – Stat	P- Value	Significance
CONST	0.0842	0.0149	5.6565	0.00	-
NAB	0.0003	0.0002	1.6026	0.11	-
DS	0.0165	0.0182	0.9070	0.36	-
DER	-0.0037	0.0017	-2.1685	0.03	**
DN	-0.0005	0.0003	-2.1538	0.03	**
PM	0.0144	0.0061	2.3442	0.02	**
RYP	0.1406	0.0263	5.3370	0.00	***
PXP	-0.4875	0.0495	-9.8504	0.00	***
LLR	-0.5266	0.1676	-3.1426	0.00	***
PAR	-0.1824	0.0874	-2.0866	0.04	**
MR	0.5682				
F	16.8466				

***** 1%, ** 5%, * 10%**

The regression results modeled on the return on assets as indicator of financial sustainability are presented in Table 10 above. Out of the nine explanatory variables used in the study, seven have turned out to be significant, with three variables significant at 1 % and four at 5%level. The signs of all the coefficients are consistent with theory. Following is a discussion of the results:

(a) Outreach

Both the proxy measures of outreach, namely the number of active clients (NAB) and Deposit size to GNP per capita ratio (DS), are statistically insignificant, although economically significant since they carry the expected signs.

(b) Capital Structure

Both the measures used to proxy capital structure, namely the debt-to-equity ratio (DER) and donations-to-assets (DN), have emerged to be significant at 5% levels and carry the expected (negative) signs.

(c) Profitability

The two proxies used for profitability, namely the profit margin (PM) and the real yield on portfolio (RYP), carry the expected positive signs and significant at 5% and 1% levels respectively.

(d) Efficiency

Similar to the first model, the proxy used for efficiency; namely the personnel expenses to loan portfolio ratio (PXP), carries negative sign as expected and highly significant at 1% level.

(e) Portfolio Quality

The two variables used to proxy the portfolio quality, namely the loan loss rate (LLR) and portfolio at risk for more than 30 days (PAR) have emerged with expected negative signs and significant at 1% and 5% level respectively.

6.1.3 MODEL-3: RETURN ON EQUITIES (as dependent variable)

The results modeled on Return on Equities used as proxy for the dependent variable (financial sustainability) are presented in Table 11. Out of total nine explanatory variables, seven have emerged significant, five variables significant at 1 % and two variables significant at 5% and 10% level respectively. The results are presented in Table 11 and discussed below:

Table 11: Results of Modeling Return on Equity

Var.	Coefficient	SE	t– Stat	P – Value	Significance
CONST	0.1652	0.0763	2.1665	0.03	-
NAB	0.0023	0.0008	2.8724	0.00	***
DS	0.3539	0.0938	3.7714	0.00	***
DER	-0.0417	0.0086	-4.8554	0.00	***
DN	0.0023	0.0013	-1.8236	0.07	*
PM	0.0128	0.0310	0.4119	0.68	-
RYP	0.5311	0.1346	3.9454	0.00	***
PXP	-1.0754	0.2525	-4.2594	0.00	***
LLR	-1.9523	0.8331	-2.3436	0.02	**
PAR	-0.3027	0.4407	-0.6869	0.49	-
MR	0.3719				
F	7.5805				

*** 1%, ** 5%, *10%

(a) Outreach

The number of active borrowers (NAB) and ratio of deposit size to GDP per capita (DS) employed as proxies for the outreach are relevant in this model, having the expected positive signs and highly significant at 1% levels.

(b) Capital Structure

Both the proxy measures of capital structure namely, the debt-to-equity ratio (DER) and donations-to-assets ratio (DN) have shown their significance at 1% and 10% levels respectively. Both carry the correct (negative) signs as expected.

(c) Profitability

The real yield on portfolio (RYP) was employed in the model as proxy for profitability. The variable is significant at 1% level and carries the correct sign.

(d) Efficiency

Again in this model, the personnel expenses-to-loan portfolio ratio (PXP) was employed to proxy efficiency of the microfinance institutions. The variable is found relevant, carrying the expected negative sign and statistically significant at 1% level.

(e) Portfolio Quality

The proxy variable used for portfolio quality was the loan-loss rate (LLR). This variable is significant at 5% levels and carries negative sign, which is consistent with

theory. The second proxy, namely portfolio at risk for more than 30 days, although having the expected negative sign, is statistically insignificant.

6.1.4 SUMMARY OF RESULTS

In conclusion, the Debt-to-Equity ratio, Donations/grants (capital structure proxy measures), Real Yield on Portfolio (a profitability measure), Personnel Expense-to-Loan Portfolio (measure of efficiency), and Loan-Loss rate (portfolio quality measure) emerged to be relevant in the analysis (significant) across all the three models. The Deposit size-to-GNP per capita provided valuable information on models-1 and 3. Both the Profit Margin and Portfolio at Risk for more than 30 days were vital in models-1 and 2 but silent in model 3. The results generally appear to be robust as the coefficients are generally significant and carry the expected signs. The results are shown in summary form in Table 12 on the following page.

Table 12: Summary of Results, Impact of Determinants

Dependent	Variable	→	FSS (Model-1)		ROA (Model-2)		ROE (Model-3)	
Explanatory	Proxy	Sign Expected	Sign Model	Significance	Sign Model	Significance	Sign Model	Significance
Outreach	NAB	+ ive	+ ive	***	+ ive	....	+ ive	***
	DS	+ ive	+ ive	**	+ ive	....	+ ive	***
Capital Structure	DER	- ive	- ive	***	- ive	**	- ive	***
	DN	- ive	- ive	**	- ive	**	- ive	*
Profitability	PM	+ ive	+ ive	***	+ ive	**	+ ive	....
	RYP	+ ive	+ ive	***	+ ive	***	+ ive	***
Efficiency	PXP	- ive	- ive	***	- ive	***	- ive	***
Portfolio Quality	LLR	- ive	- ive	**	- ive	***	- ive	**
	PAR	- ive	- ive	*	- ive	**	- ive	....

Significance levels: *** 1%, ** 5%, *10%

6.2 DISCUSSIONS OF THE RESULTS

6.2.1 MODEL-1: FINANCIAL SELF SUFFICIENCY

Which we discuss the results based on financial self sufficiency, the facts presented in chapter 4 needs to be revisited. From the concepts presented therein, financial self sufficiency measures the ability of an MFI to raise sufficient revenue that

can cover all its costs including the cost of capital. In other words, the MFI concerned aught to be self sufficient and sustaining in the long run without reliance on donations and subsidies. Next, we discuss different determinants of self sufficiency as revealed by the models.

a. Outreach

The number of active borrowers is statistically significant and has an estimated coefficient of 0.0028, which implies that the total number of active clients is pushing these institutions to the goals of self sufficiency and increasing their financial sustainability levels at an average rate of 0.28%. The findings establish a positive role of outreach as measured by breadth of the financial sustainability. The findings are consistent with *Hypothesis 1* that predicted a positive relationship between outreach and financial sustainability. These are in line with the practices of MFIs having significant outreach and who usually tend to increase their gross income and profitability through increases in the number and volume of clients. Our results are consistent with the findings of Cow (2006) who found the number of active borrowers (10,000 and above) contribute significantly to the financial sustainability of MFIs. The results have also consistency with the findings of Christen et al. 1995; Otero and Rhyne 1994; who have concluded in different studies that outreach and financial sustainability were complementary to each other, since the scale of outreach reduces costs on the average. Possible explanation for the result could be the tradition of group lending in force in the region or mission drift (many rich clients being increasingly served by MFIs globally).

To capture the new trend of deposit-taking by the MFIs in the region, this study has deviated from many of the traditional studies on micro financing that have analyzed credit portfolios only in the scope of outreach, which have used the *deposits size to GNP per capita* in the analysis. As already stated, this innovation was intended to find the role of savings mobilization in the financial performance of these institutions. This proxy variable has the estimated coefficient of 0.1216. In simple terms, the outreach (measured in scope) is responsible for financially sustaining these institutions at an approximate rate of 12.16%. This result is also in line with *Hypothesis-1* in the model that creates a favorable bondage between outreach and financial sustainability. The reason is obvious; there is always a trickle down effect of sufficient deposits more in case of micro financing. While discussing capital structure theories in chapter 5, we pinpointed two broad types of deposit accounts; compulsory and voluntary. The balances on compulsory accounts are used freely by the organizations, while those on voluntary accounts are also used in furthering outreach and hence financial sustainability although at some cost. Aside from that, there is a tendency of assigning both loan and deposit tasks to same officers, thereby reducing the average costs, henceforth enhancing sustainability.

b. ***Capital structure***:

The first proxy of capital structure, *debt- to- equity ratio* is negative as per our expectations, with a coefficient of - 0.0141. This suggests that capital structure with more debt is reducing the speed of Micro finance institutions to become self sufficient overtime and achieve financial sustainability at an estimated rate of 1.41%. The second proxy

measures *donation to assets* is statistically significant and carries negative sign as expected. Its coefficient is approximated at -0.0011, indicating that capital structure as measured by donations will be hindering the self sufficiency of MFIs operating in East Africa during the period and reducing speed towards their financial sustainability at an estimated rate of 0.11%. These findings are consistent with testable *Hypothesis-2* with regards to the role of capital structure in financial sustainability. The findings provide evidence that external sources of financing are being employed by Micro finance institutions in the course of operations. However, external sources have costs associated with them; for instance, debt has periodical interest payment obligations, financial distress; equity has periodic dividend pay out while donations and concessional loans have the fulfillment of attached conditions. These findings are consistent with those arrived at by Bogan et al, (2007) and Bogan (2008), which established a negative relation between financial sustainability on one hand and debt-to-equity ratio plus donations our findings are also in line with those of Bablis G. Felix *(2000) a*nd Sharma (2008), as also with the capital structure theories advocated by the trade-off and the pecking order, which emphasize that external financing reduce value of the firms.

c. Profitability:

The proxy variable *profit margin,* with its coefficient estimated at 0.2118 implies that profitability is contributing significantly to the self sufficiency and playing a positive role in the financial sustainability of the institutions in question on average at 21.18%. The second proxy for profitability, *real yield on portfolio* with its coefficient

estimates at 0.2629, gives the indication that sustainability of profitability is important towards financial sustainability of the institutions to the extent of 26.29%. These findings support *Hypothesis-3* in this study that assumes a positive relationship between profitability and financial sustainability of institutions. Obviously, profits play a significant role in making an entity self sufficient and financially stable in the long – run. The findings of this study with regards to the role of profitability are consistent with the results of Smith (1998) and Cull et al (2007). In general, the operations of MFIs in the region under study during the period 2004-2009 were profitable. These institutions had exceptional abilities in the financial sector than other players (Walker, 1881), they designed several new products and invented new credit delivery techniques (Clark, 1891, Schumpeter (1938), although, the micro finance industry is risky (Hawley, 1893), however the firms have managed to handle uncertainties in their operations (Knight, 1950).

d. Efficiency:

The *personnel expense to loan portfolio ratio* as proxy for efficiency gives an estimated coefficient of -0.8988 and this finding establishes the fact that efficiency has an inverse relationship with financial sustainability as predicted in *Hypothesis-4*. This finding reveals the fact that the costs involved in providing micro credit by these institutions has an inverse impact on sustainability to the extent of 89.88%. This finding supports the conclusions made by Ledgerwood (1998) in which she noted that personnel expenses contribute about 80% of operating costs in MFIs.

e. Portfolio quality

The first measure of portfolio quality, the *Loan loss rate ratio* carries a negative sign as per our expectations in *Hypothesis-5*. Its coefficient entered the regression model with a value of around -0.8735 which implies that portfolio quality negatively influences the self sufficiency and financial sustainability of the institutions at an estimated rate of 87.35%. The result is an indication of the large losses incurred by these institutions during the period of study. This formed the basis of our research problem discussed in Chapter 1. Well, as the losses were substantial during the period, but the institutions remained profitable as per the earlier findings, which seems contradicting. Possible explanations are the facts that these losses were offset by the mandatory microfinance insurance funds and the risk premium usually included in calculating the rate of interest. As a prudent measure, all loans disbursed are insured and the insurance policy premium fixed at 2% is paid for by the clients from their own sources. There is a risk-premium ranging from 1% to 2% added on the estimated lending interest rate as a prudent policy too. These factors neutralize the adverse impact of loan losses in the study in a way that makes them achieve self sufficiency. The *portfolio at risk more than 30 days ratio,* the second proxy for portfolio quality has a coefficient of -0.3357 as expected under *Hypothesis-5* stating an inverse relation with financial sustainability. This finding implies that Portfolio quality was making the institutions under assessment financially unsustainable at an approximated rate of 33.57%. The finding is evidence of the presence of delinquency problem in the loan portfolios advanced by the institutions during the period. Delinquency does block the funds that would otherwise be re-invested to generate

profits but does not necessary imply losses, since recovery is sometimes in the pipe line and a matter of days, it becomes a big issue if recovery is costly, or when only a portion is recovered or when nothing is recovered at all and hence written off. The write-off in this case is done on the loan loss provision account, which is always created for that purpose. The self sufficiency and financial sustainability attained by MFIs as evidenced by other factors in the study can be attributed to the eventual success in recovery.

6.2.2 MODEL-2: RETURN ON ASSETS

The ability of an institution to utilize its assets significantly enhances its chances of endurance. Return on assets is therefore an important ingredient in understanding the extent to which MFIs are utilizing their loan portfolio efficiently in generating profits and achieving sustainability levels.

a. Outreach

The *number of active borrower's ratio* as proxy for outreach is statistically insignificant. This implies that breadth of outreach is irrelevant in configuring the level of returns on assets and hence financial sustainability. In other words, the total number of borrowers is few as assets of these MFIs to produce sufficiency return worth. Same is the case with the second proxy measure of outreach *deposit size to GNP per capita.* The coefficient for this variable is economically significant by virtue of its positive sign but statistically insignificant. This implies that outreach, as measured by scope has little role in the achievement of financial sustainability of the institutions under study with regards

to return on assets. The reasoning could be that deposit mobilization was insufficient during the period and thus had no significant impact on asset returns. Part of the problem is the strict prudent requirement that prohibits NGOs and other institutions not to mobilize deposits from the public like commercial banks. For an MFI to collect/ mobilize deposits, it must have sufficient reserves with the Central bank in the country concerned and must have additional security to guarantee client deposits among others. Some of these requirements make it impossible for a reasonable number of institutions to venture into deposit mobilization.

b. Capital structure

Debt to equity ratio and *donation to assets ratio* used as proxies for capital structure are both significant in the second model. The *debt to equity ratio* has an approximated coefficient of - 0.0037, suggesting an inverse relationship between capital structure and financial sustainability. The finding implies that capital structure is curtailing proper utilization of assets and thus reduces financial sustainability at an estimated rate of 0.37%. This finding supports the finding in model-1. To have a return on assets significant in achieving financial sustainability, the costs of capital involved with regards to debt-to-equity were small as compared to the ones in model-1 (1.41% in model-1 versus 0.37% in model-2).

The second variable *donation to assets ratio* has an estimated coefficient of - 0.0005, which implies that this variable has a negative bearing on financial sustainability of the MFIs. As already mentioned, donations, like any other external source of funding,

has certain costs associated with it, particularly interest on concessional loans. There is ample evidence that concessional loans were advanced to the institutions during the period under study, which affected not only their self sufficiency but also the returns on assets. A reasonable return on assets demands that capital can be raised internally or externally. The significance of donations is an indication that external funding was employed by the MFIs, an observation noted in model-1.

c. Profitability

The first proxy measure of profitability *profit margin ratio* has an approximated coefficient of 0.0144 in model-2, suggesting that profitability has a positive role in the financial sustainability averaged at 1.44%. The second proxy, *real yield on portfolio ratio* has an estimated coefficient of 0.1406 implying that MFIs, which can generate sufficient return on assets, can ensure their financial sustainability at estimated rate of 14.06%. Obviously, the higher the profit margin an institution achieves, the higher its return on assets and hence financial sustainability. These findings, regarding the role of profitability on financial sustainability as measured by return on assets, reinforce the earlier results from model-1.

d. Efficiency

Personnel expense to loan portfolio ratio used as proxy for profitability turned out with an estimated coefficient of -0.4875. The result suggest, that in an effort to have return on assets significant enough to sustain these institutions, they have to utilize human resource of which they had to compensate and the compensation was at an

estimated rate of 48.75 percent. This finding is parallel to the finding in the first model and quite satisfactory.

e. Portfolio quality

Loan loss rate as proxy for portfolio quality emerged with an approximated coefficient of -0.5266 in this model suggesting that portfolio quality negatively affects the financial sustainability (as measured by return on assets) approximately by 52.66%. This finding reinforces the suspicion noted under model-1 above regarding presence of losses during the period. However the losses estimated in model-1 were greater than in model-2 (87.35% versus 52.66%).

The second proxy, *portfolio at risk more than 30 days ratio* emerged with coefficient -0.1824 in this model, implying that portfolio quality remains weak that negatively affects financial sustainability at an estimated rate of 18.24%. This finding also proves the presence of delinquency in the portfolio during the period under study.

6.2.3 MODEL-3: RETURN ON EQUITY

Equity is an important factor in the accounts of financial institutions. It determines the pace of growth and direction of performance and henceforth the financial survival or otherwise in the long run. As before, we have used the same explanatory variables and different proxies for them in the analysis.

a. Outreach

The first outreach (breadth) variable; the *number of active clients ratio* is significant with an approximated coefficient of 0.0023 in model-3, which suggests that outreach has been supporting the financial sustainability of MFIs in the region at an estimated rate of 0.23 percent. The second proxy variable *deposit size to GNP per capita ratio* emerged with an estimated coefficient of 0.3539, implying that the scope of outreach has been helpful towards attainment of financial sustainability in the range of 35.39 percent impact. These findings fully support the findings in model-1 and reinforce the role of breadth of outreach in model-2. Best practices in microfinance industry suggest that additional client base is essential in realizing sufficient returns on equity and thereby in achievement of financial sustainability. The role of an effective, efficient and successful deposit mobilization in raising the return on equity is clearly established in this finding.

b. Capital structure

An inverse relationship is established between financial sustainability and capital structure in model-3. *Debt to equity ratio* and *donation to assets ratio* have their coefficients of -0.0417 and -0.0023 respectively. The findings suggest that capital structure as measured by these proxies negatively affected the financial sustainability of the institutions in question at an estimated rate of 4.17% as measured by *debt to equity ratio* and 0.23% as measured by *donation to assets ratio*. The findings are identical to those established in models-1 and 2 in the current study. It further provides a clue that

part of capital structure was generated externally which obliged these institutions to pay for it. In a way, external funding was essential in the attainment of a return on equity and therefore in the processes of achieving financial sustainability.

c. Profitability

Real yield on portfolio ratio appeared with an estimated coefficient of 0.0023, reflecting the positive role of profitability in the MFIs concerned and hence their financial sustainability in the long run. The result suggests that profitability as measured by real yield on portfolio is relevant in an effort to raise the value of equity. The role played by this variable is similar to the one played by it in models-1 and 2.

Profit margin, the second proxy for profitability, though positive as predicted and therefore economically significant, turned out statistically insignificant. Earlier findings reached to in this study have provided a clue regarding the insignificant relation between profit margin and return on assets. In all the models, a substantial use of debt funding is evident. According to the trade-off theory of capital structure discussed in chapter-3, an increased use of debt reduces the value of equity, therefore, the capital structure dominated by debts to such an extent that the value of equity is reduced considerably and thus profit margin gradually vanishes.

d. Efficiency

Personnel expense to loan portfolio ratio has the estimated significant coefficients of -1.0754 in this model. Personnel expenses play a prominent role in loan delivery and therefore their proper enumeration is essential in the efficient delivery and

hence adding value to the equity base of an institution. However, the cost of personnel should be within manageable brackets for the sake of efficiency and thereby financial sustainability to be enhanced. The very high proportion of -107.54 percent suggests that personnel expenses as a percentage of loan portfolios were growing beyond the red signal, reducing the value of equity and impeding financial sustainability. This result presents evidence that efficiency has been a problem of the institutions in the East African region.

e. Portfolio quality

Loan loss rate ratio used as proxy for portfolio quality emerged with an estimated coefficient -1.9523. The *loan loss rate ratio* represents the bad loans that have actually been written off during the period, (in our case between 2004 and 2009). It implies that whatever provision was made during the period for loan impairment, the said amount has actually been drawn and risk loans settled. Thus, both provisions worked in reducing the returns on equity and in slowing down the process of achieving financial sustainability. This suggests in other words that the quality of portfolio was poor.

Portfolio at risk for more than 30 days ratio had turned insignificant in the model of financial sustainability based on return on equity. Though the sign is negative as per theory, the statistical insignificancy implies that the volume of delinquent loans remained insufficient in determining return on equity. In other words, it played no impact on equity and hence financial sustainability. This result is different from the findings reached to in models-1 and 2.

CHAPTER 7

CONCLUSIONS

This is the final chapter presenting the main conclusions, suggestions and a way forward in the research topic.

7.1 SUMMARY OF RESULTS

The results from the preceding Chapter are interesting but not surprising. In all the three models, outreach, capital structure, profitability, efficiency and portfolio quality played the predicted roles in influencing the financial sustainability of micro finance institutions in East Africa during the period 2004 through 2009. The two proxy measures of outreach for both breadth and scope established a positive role between outreach and financial sustainability in models 1 and 3. No role of outreach was established in model-2, in other words, it was neutral. Capital structure as measured by both *debt to equity ratio* and donation ratios established a negative role in influencing financial sustainability across all the three models. The influence of profitability (as measured by profit margin and real yield on portfolio) on financial sustainability was established to be positive in models-1 and 2. However, profitability played no significant role in model-3 in determining financial sustainability of MFIs in East Africa during the period under investigation. A negative relationship was established between efficiency and financial sustainability across all the three models in the study as expected. Finally, portfolio quality established a negative relationship with financial sustainability in micro

financing. In a nutshell, almost all the Hypotheses claimed could stand empirically testing and the institutions under investigation proved to be financially sustainable in the long run. The major driving forces in this regards are the significant number of active clients and an emerging financial resource mobilization program in the form of deposits, debts and donations that supported their operations likewise the higher interest rates, commissions plus other revenues generated ensured their profits. Loan losses, defaults and delinquent remain a challenge in their operations.

7.2 SUGGESTIONS

The suggestions are directed at four players in micro-financing industry; namely the policy makers (governments), the donors, the MFIs and the clients. From a general perspective, MFIs should increase efficiency by controlling operating costs, cost of funds, and the cost of bad debts; they ought to increase outreach, reduce interest and increase services.

7.2.1 THE POLICY MAKERS

The government as policy makers should play a leading role in promoting micro finance industry. From the findings, we recommend the policy makers should:

1) Develop a friendly environment that encourages small lending, by making borrowing cheaper and processing faster, thereby expanding on breadth and scope of outreach.

2) Enhance financial literacy across the poor masses so that they are attracted towards microfinance programs.
3) They should formulate appropriate rules and regulations so as to facilitate MFIs to easily mobilize deposits from clients. Existing prudent regulations prevents most MFIs to mobilize savings from the public which limits their opportunities of cheaper funds for lending and limits their services.
4) They should create an ideal atmosphere to attract donors in micro financing, for donations play a positive role in poverty eradication.
5) Enhance the grants and other forms of donations advanced to the micro finance institutions. However in doing so, there should be a precondition of strong evidence of financial sustainability.
6) Launch technical assistance programs that will help these institutions to develop appropriate products and credit delivery methodology to make micro credits profitable.
7) Develop the infrastructure to strengthen the capacity of MFIs in tracking and extracting outstanding funds from defaulters, which will improve the quality in portfolios.

7.2.2 THE DONORS

Donors should be generous and persistent in supporting these financial entities as a matter of priority. To help MFIs achieve financial sustainability while at the same time reaching out the poor masses, donors should:

1) Provide interest free loans on a continuous basis to the MFIs for them to be in position to help the poorest of the poor in terms of financial and social intermediation.
2) Offer concessional loans to support on-going micro credit programs aimed at reducing the heavy reliance of MFIs on commercial sources at market rates of interests.
3) Make efforts to reduce the tendency of providing in-kind donations that renders such donations worthless for the MFIs. In particular, donations like expensive expatriate personnel and inappropriate equipment should be avoided.
4) Concentrate on building capacity of MFIs in areas of credit policy formulation and management to ensure efficiency in operations and achievement of good quality portfolio.

7.2.3 THE MICRO FINANCE INSTITUTIONS

In order to achieve financial sustainability, the MFIs need to scale up outreach, diversify funding sources, consolidate current profit levels and improve on both efficiency and portfolio quality. Specifically:

1) With regards to outreach, these institutions should mobilize deposits from clients to diversify their capital structure, make efforts not only to expand their client base but also to diversify their operations to achieve substantial levels of financial sustainability.

2) Debt funding should be the last resort and other cheaper sources should be sought. Furthermore, they should build capacity to attract long term lower cost funds.
3) Given the significance of profit levels as evidenced in the analysis, a reasonable portion of the same should be plowed back as retained earning, which is the best form of capital as discussed in Chapter 3. They should only seek for donations that can aid them in building their capacity and in expanding their operations.
4) To consolidate their profitability and to continue making head ways in profit earnings, the current product pricing policy should be maintained. After all emphasis should be put on efficiency to properly manage costs during the course of operations.
5) Should endeavor to understand how clients use funds to better design products that are marketable.
6) To achieve efficiency in operations, the Micro finance institutions should reduce personnel expense by linking payment of loan officers to their performance and differentiating the costs of financial and non financial services.
7) Finally, something has to be done on managing the quality in the portfolio. Proper credit policy should be put in place to control loan losses resulting from default and delinquency. Emphasis should be placed on pre-credit screening of potential clients' character and post credit monitoring of clients.

7.2.4 MICRO FINANCE CLIENTS

Significant improvements in the lives of the poor are possible as a result of continued access to micro-credit, which can be realized only if financially sustainable institutions functioning in the economy. With this in the minds of MFI clients, they should concentrate on the following points:

1) The clients should not default on the loans. They ought to make a commitment to pay back the loans as per the agreed upon terms. This will help the institutions to remain financially sound for continued financial delivery.
2) In to the above commitment, they should have to pay back the installments in time as well. This will not only help the institutions concerned but also earn a good reputation and credibility for them in future.
3) Use loans for productive purposes that will generate sufficient revenues and enable them repay the loans and above all improve their living standards.
4) They should use MFI's funding to build up their asset base to be in position to graduate for commercial bank loans that are cheaper.
5) The clients should be dedicated to their businesses to enable them to expand. They should learn basic accounting to understand how the business is performing, cultivate a culture of saving and manage to resolve issues coming across the business. Their ignorance of fundamentals of business may lead to misappropriation of funds.

institution rather than concealing and evading. Possibly, they may officially seek for rescheduling of repayments, seeking refinancing and any other assistance that can enable them to come out of their plight.

7.3 THE DIRECTION FOR FURTHER RESEARCH

The micro finance industry is quickly expanding and the micro credit programs are flourishing day by day. Researchers in this area should concentrate on the following points in particular:

1) Follow up research on financial sustainability could aim at employing outreach, capital structure, efficiency and portfolio quality as explanatory variables to establish as to how each of these factors reacts with one another. There are many components in each of these variables that can produce different results when used as proxy measure.
2) Productivity and institutional characteristics are also good factors in the operations of MFIs. Attempts should be made in future to incorporate them in the analysis to document their role in financial sustainability.
3) Future researchers in this direction ought to, make efforts to expand on the data set so as to analyze the role of the different types of MFIs such as banks, cooperatives, NGOs and non blank financial institutions. Possibly, each type of MFI has different factors influencing their financial sustainability which we might be ignoring in the current study due to limitations created by the data.

APPENDIX

PROGRAM USED IN SOLVING EMPIRICAL BAYESIAN EQUESTIONS 1 AND 2.

```
load X
load Y
load Xbar
load Ybar
Y1=Y(:,1);
T=size(X,1);
K=size(X,2);
T2=size(Xbar,1);
K2=size(Xbar,2);
% this file is to compute empirical baY1es estimator for Koire Twaha
Bhat_ML=inv(X'*X)*X'*Y1;
% Bhat: the classical maximum likelihood estimator
sigmahat_ML=((Y1-X*Bhat_ML)'*(Y1-X*Bhat_ML))/(T-K);
mu_hat=inv(Xbar'*Xbar)*Xbar'*Ybar;
sigmahat_prior=((Ybar-Xbar*mu_hat)'*(Ybar-Xbar*mu_hat))/(T2-K2);
data_var=sigmahat_ML*inv(X'*X);
prior_var=sigmahat_prior*inv(Xbar'*Xbar);
data_prec=inv(data_var);
prior_prec=inv(prior_var);
bhat_baY1es=inv(data_prec+prior_prec)*(data_prec*Bhat_ML+prior_prec*mu_hat);
% beta_hat_baY1es: posterior estimate of coefficients
```

```
var_bhat_baY1es=inv(data_prec+prior_prec);

se_data=sqrt(diag(data_var));

se_baY1es=sqrt(diag(var_bhat_baY1es));

t_ols=Bhat_ML./se_data;

t_bayes=bhat_baY1es./se_baY1es;

results1=[Bhat_ML se_data t_ols bhat_baY1es se_baY1es t_bayes]

Yhat=X*bhat_baY1es;

er=Y-Yhat;

er2=Y-mean(Y);

TSS=er2'*er2;

RSS=er'*er;

MR=(TSS-RSS)/TSS

F=((TSS-RSS)/(K))/(RSS/(T-K)
```

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