The critical success factors for commercialising microfinance institutions in Africa

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Declaration

By submitting this dissertation electronically, I, Joséphat Mboya Kiweu, declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Joséphat Mboya Kiweu 27 October 2009

Dedication

This work is dedicated firstly to my wife (Cecilia Wambui) and children (Kitonga, Keli na Mwende) who know the pain of being left alone. This is my gift of patience, long-suffering, enduring faith and love to you. You have endured much suffering; share in my happiness now. To God all the glory, for thus far He has brought us together. For my family, I am finally yours again. In order to write this manuscript, I tried to forget everything (including you) and had to take my mind far away from home, to a wonderland and my highest aspirations because I strived to realise this dream. You believed in me as I tried to follow my dream, and now there is nothing more to yearn for.

Secondly, I dedicate this dissertation to the poor in Africa, for they suffer so (Proverbs 14:20). Their plight forced me to search for an alternative financing mechanism. You share the same lot – you hope, wait and dream for a better tomorrow from your Creator (Proverbs 22:2). My wish is that this manuscript will bring relief and cause you to leap for joy. I only trust that you will not make my walk be in vain (Proverbs 20:12-13).

For the poor and needy in Africa, I make public 'the way' in this study, as an alternative to donations. You must now walk this way, but do not forget to watch out for the potholes – for there are plenty in Africa. It was a painstaking job to study microfinance, as it was not visible at all times! But I searched for the seed of good in all adversity, criss-crossing the continent, in thoughts and physically, during the course of this study. And now, such as I have, I give to you Africa (Acts 3:6).

This study is indeed yours as it contains nothing but your true experience: the author became inspired to do the study while in Kenya, wrote the proposal in Tanzania, conceptualised the study in South Africa, wrote some of the chapters in Ethiopia, Uganda, Mali, Kenya, Nigeria and Benin and concluded his last thoughts in Senegal, Dakar. As the author struggled through these writings, he remembered one thing that encouraged and motivated the going, namely that, "success will not lower its standards to us – we must raise our standards to success" (by Rev. Randall R. McBride, jr.). This is what Africa must surely do – raise your standards to success to get out of impoverishment and meet with much money! For money answers all problems (Ecclesiastes 10:19).

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Abstract

Uncertainty of continued donor funding poses a risk to microfinance operations worldwide, and this study explores the circumstances under which African microfinance institutions (MFIs) will consider commercial funding as a viable alternative source of funding. This research aims to identify the factors that are associated with successful access to private capital for pro-poor financial institutions. It examines the suitability of new opportunities for accessing fresh capital by MFIs for development and poverty reduction using commercialisation as an option. In a world awash in private capital, it is vital to harness the power of the private sector to solve key development challenges (World Bank, 2007). As microfinance institutions grow, they increasingly find themselves in need of additional capital to finance expansion of services to cover more poor communities.

The study undertook a cross-country data analysis of 103 microfinance institutions to help provide understanding of the critical success factors that underpin successful access to commercial capital. The study also tested the hypothesis on the viability of commercial finances, and developed and tested a commercialisation success model for tapping commercial funds. The prediction model based on firm-level data from a sample of 21 African countries between 1998 and 2003, aims to minimise chances of failure and act as a screening system by investors as well as a self-assessment tool for MFIs intending to seek commercial capital. On examining the direct and indirect impact of firm-level success factors on commercialisation, the study identified key predictors of success and guidelines for MFI financing's integration with the larger financial system.

The study finds that certain critical success factors (CSFs) define minimum pre-conditions for microfinance institutions considering commercial funding as an alternative source of finance. There is evidence to suggest that the desire to tap into the capital markets and capacity to link with commercial investors is a realisable vision for African MFIs. The research evidence is instructive of widened financing options for MFIs and capacity to relax growth constraint in the industry. Based on the CSFs, the study suggests how MFIs can break free from 'captive' donor funding as a necessary platform for the switch to commercial finance in the industry. However, the findings also suggest the need for MFIs to satisfy the interests and requirements of prospective commercial investors to overcome new challenges.

In particular, the results show that the extent of organisational formalisation and transparency in financial reporting are absolutely essential in drawing commercial lenders to invest in microfinance. In addition the study establishes the reasons why traditional approaches to financing microfinance cannot work any longer. There are some concerns on mission drift; in particular whether the poor gain from commercialisation, and under what circumstances their interests are taken care of in order to preserve the long-term social value of microfinance as a poverty reduction strategy.

The study was carried out based on a rather limited time series data. However, the number of firms and the diversity is considered adequate for the study, as well as sample representation across Africa. The study also used views of 'thought leaders' as the source of information. Other personnel calibre may have had different suggestions. Perceptions were drawn from commercial lenders/investors of microfinance programmes based in Africa. Needless to say, any generalisation of CSFs beyond the African microfinance context should be made with caution.

This study is probably one of the first attempts to explore the possibility of a linkage between microfinance and capital markets and it will be of interest to MFIs, commercial banks, international donors and investment funds with an interest in investing in the microfinance industry. The findings suggest that the speed of increase in financial leverage per country depends as much on the dynamism of the market, as it does on the level of development of the finance sector. The results indicate that commercial investors will be attracted by good financial returns and administrative efficiency (return on assets, cash-flow adequacy and operating expense ratio), transparent reporting and information disclosure and clarity, as well as low inflation levels. Investors will also be looking for larger, regulated and profitable MFIs with a low-risk profile for their investment portfolios.

The study found strong support to the hypothesis that the commercialisation index (CI) is a better measure of successful commercialisation than the LMA (leverage multiplier added), given the variables used. In all cases, compelling evidence shows that the CI has more explanatory power and is an accurate predictor of two-year success in commercialisation as examined by logistic regression. These results suggest that the superior predictive abilities of the CI commercial rating rule could be explored to guide screening efforts for winners, investment decisions and other binary classification investigations. Specifically, the model can be useful in guiding successful commercialisation schemes in Africa because it provides MFIs with a structured approach for achieving sustainable commercial microfinance.

Opsomming

Onsekerheid oor volgehoue skenkerbefondsing is ’n risiko vir mikrofinansieringsinstansies wêreldwyd, en hierdie studie ondersoek die omstandighede waaronder Afrika se mikrofinansieringsinstansies (MFIs) kommersiële befondsing sal oorweeg as ’n lewensvatbare, alternatiewe bron van befondsing. Hierdie navorsing poog om die faktore, wat met die suksesvolle toetrede tot private kapitaal van pro-arm finansiële instellings geassosieer word, te identifiseer. Dit ondersoek die gepastheid van nuwe geleenthede vir MFIs om vars kapitaal te bekom en as ’n opsie te gebruik vir ontwikkeling en die vermindering van armoede deur kommersialisasie. In ’n wêreld met oorvloedige bronne van private kapitaal is dit lewensnoodsaaklik om die krag van die privaatsektor in te span om kern ontwikkelingsuitdagings op te los (World Bank, 2007). Soos mikrofinansieringsinstansies groei, het hulle ’n toenemende behoefte aan addisionele kapitaal ten einde die uitbreiding van dienste te kan finansier en om meer arm gemeenskappe te kan bereik.

Die studie het data komende van 103 mikrofinansieringsinstansies uit verskeie lande ontleed om begrip van die kritiese suksesfaktore (KSFe), wat suksesvolle toegang tot kommersiële kapitaal onderskraag, te verkry. Die studie het ook die hipotese oor die lewensvatbaarheid van kommersiële finansiering getoets, en ’n model vir kommersialisasie-sukses ontwikkel en getoets om kommersiële fondse te bekom. Die voorspellingsmodel, wat gebaseer is op maatskappy-vlak data van ’n groep van 21 Afrika lande tussen 1998 en 2003, poog om die kanse op mislukking te minimeer en te dien as ’n siftingstelsel vir beleggers sowel as ’n selfondersoekmiddel vir MFIs wat beplan om kommersiële kapitaal te bekom. Deur die direkte en indirekte impak van maatskappy-vlak suksesfaktore op kommersialisasie te bestudeer, het die studie sleutelvoorspellers van sukses asook riglyne vir die integrasie van MFI finansiering met die groter finansiële stelsel geïdentifiseer.

Die studie bevind dat sekere KSFe minimum voorvereistes vaslê vir MFIs wat kommersiële befondsing as ’n alternatiewe bron van finansiering oorweeg. Daar is bewyse wat daarop dui dat die begeerte om toegang tot die kapitaalmarkte te verkry en die kapasiteit om met kommersiële beleggers te skakel ’n realiseerbare visie vir Afrika MFIs is. Die navorsing lewer insig wat aanduidend is van breër finansieringsopsies vir MFIs, en wat die beperkinge op groei in die industrie verslap. Gebaseer op die KSFe, stel die studie voor hoe MFIs uit die houvas van skenkerbefondsing kan loskom as ’n nodige stap vir die oorskakeling na kommersiële finansiering in die bedryf. Die bevindings dui egter ook op die behoefte van MFIs om aan die belange en vereistes van moontlike kommersiële beleggers te voldoen ten einde nuwe uitdagings te oorkom.

Die resultate dui spesifiek daarop dat die mate van organisasie-formalisering en die deursigtigheid van finansiële verslagdoening noodsaaklik is om kommersiële uitleners te trek om in mikrofinansiering te belê. Verder bevestig die studie die redes waarom tradisionele benaderings tot die finansiering van mikrofinansiering nie meer kan werk nie. Daar is wel sekere bekommernisse

oor die moontlike kompromittering van missie; in besonder is die vraag of die armes wel baat vind by kommersialisasie, en onder watter omstandighede daar na hulle belange omgesien word ten einde die langtermyn sosiale waarde van mikrofinansiering as ’n strategie vir armoede verligting te behou.

Die studie is uitgevoer gegrond op tydreeksdata wat betreklik beperk is. Die aantal maatskappye en die diversiteit word egter as voldoende beskou vir die studie, asook dat die steekproef verteenwoordigendend was van lande regoor Afrika. Die studie gebruik ook die menings van ‘leierdenkers’ as ’n bron van inligting. Personeel van ’n ander kaliber mag verskillende voorstelle gehad het. Persepsies is verkry van kommersiële uitleners/beleggers van mikrofinansieringsprogramme wat in Afrika gebaseer is. Vanselfsprekend behoort enige veralgemening van die KSFe buite die Afrika mikrofinansieringskonteks met omsigtigheid gedoen word.

Hierdie studie is waarskynlik een van die eerste pogings om die moontlikheid van ’n skakel tussen mikrofinansiering en die kapitaalmarkte te ondersoek en dit sal van waarde wees vir MFIs, kommersiële banke, internasionale skenkers en beleggingsfondse wat in belegging in die mikrofinansieringsbedryf belangstel. Die bevindinge dui daarop dat die spoed waarmee die effek van finansiële hefboom in ‘n land toeneem net soveel afhang van die dinamika van die mark as van die ontwikkelingsvlak van die finansiële sektor. Die bevindinge dui daarop dat kommersiële beleggers aangetrek sal word deur goeie finansiële opbrengste, administratiewe doeltreffendheid (opbrengs op bates, voldoende kontantvloei en die bedryfsuitgawe verhouding), deursigtige verslagdoening en duidelike openbaarmaking van inligting, sowel as lae inflasievlakke. Beleggers gee ook voorkeur aan groter, gereguleerde en winsgewende MFIs met ’n lae risikoprofiel vir hulle beleggingsportefeuljes.

Die studie vind sterk ondersteuning vir die hipotese dat die Kommersialisasie-indeks (CI) ’n beter aanduiding van suksesvolle kommersialisasie is as die *Leverage Multiplier Added* (LMA), gegewe die veranderlikes wat gebruik is. In alle gevalle was daar sterk getuienis dat die CI ’n beter verduideliker is en ’n akkurate voorspeller is van die tweejaartermyn sukses in kommersialisasie soos deur middel van logistiese regressie getoets. Hierdie resultate dui daarop dat die superieure voorspellingsvermoëns van die CI se kommersiële beoordelingsreëls beproef kan word om die sifting van wenners, beleggingsbesluite en ander binêre klassifikasie ondersoeke te lei. Die model kan spesifiek nuttig wees om rigting te gee aan suksesvolle kommersialisasieskemas in Afrika omdat dit MFIs ’n gestruktureerde benadering gee tot die bereiking van volhoubare kommersiële mikrofinansiering.

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List of abbreviations

A	Assets
ADB	Asian Development Bank
CBS	Central Bureau of Statistics
CEOs	chief executive officers
CFA	commercial funding access
CFR	Commercial Financing Rating score
CGAP	Consultative Group to Assist the Poor
CI	commercialisation index
CIDA	Canadian International Development Agency
CIs	commercialised institutions
CR	capital ratio
CSFs	critical success factors
DT	decision trees
E	equity
EM	equity multiplier
EMR	equity multiplier rating
GDP	gross domestic product
GNI	gross nation income
G-R	growth-retrenchment
I	annual inflation
IBF	interest-bearing funds
ICR	internal cash ratio
IFC	International Finance Corporation
IGR	internal growth rate
INAFI	International Network of Alternative Financial Institutions
IPOs	initial public offering (for new equity finance)
KIPRRA	Kenya Institute for Public Policy Research and Analysis
L	liabilities
LMA	leverage multiplier added
LMR	leverage multiplier rating
LR	lending rate
MDGs	millennium development goals
MEP	microfinance experts panel
MEs	micro-enterprises
MFIs	microfinance institutions
MIX	Microfinance Information Exchange

MM	Modigliani and Miller
NB	number of borrowers
NGOs	non-governmental organisation
N-IBF	non-interest-bearing funds
NIP	net interest position
ODA	overseas development aid
OL	opacity level (of information)
OLS	ordinary least squares
OOB	out-of-bag
OSS	operating self-sufficiency
PAR	portfolio at risk
POT	pecking order theory
PPI	preparedness performance index
PRF	probabilistic random forests
PRSP	poverty reduction strategy study
RE	retained earning
RF	random forests
ROA	return on assets
ROE	return on equity
SGR	sustainable growth rate
SMEs	small and micro-enterprises
TAG	total asset growth
UK	United Kingdom
UNDP	United Nation’s Development Programme
UNEP	United Nations Environment Programme Finance Initiative
US	United States (of America)
US$	United States dollar
USAID	United States Agency of International Development
USB	University of Stellenbosch, Business School
WB	World Bank
WOCCU	World Council of Credit Unions
WRI	World Resources Institute
WSBI	World Savings Bank Institute

CHAPTER 1
INTRODUCTION

1.1 INTRODUCTION

Microfinance is the provision of financial services to the poor and low income. A key focus of microfinance is to respond to the demand for borrowing to support self-employment and small enterprise growth (Khandker, 2005). Microfinance as a new concept in finance and development has endeavoured to develop sustainable enterprises since its birth in the 1970s. For several years, microfinance innovations have been replicated from country to country, each time with renewed enthusiasm and innovation leading to international best practices that have benefited our understanding and guided the practice of microfinance-credit (Stauffenberg, 2001; Rhyne, 2001a; Labie, 2001; Manroth, 2001). Given the ongoing developments in microfinance, there is considerable interest for many microfinance institutions (MFIs) in Africa to keep pace with the changing landscape in the industry.

The microfinance initiative started with two objectives: first to provide access to general financial services targeted to economically-active poor and other vulnerable groups in society, and secondly, to provide access to credit for social and economic empowerment. The best-known part of microfinance is the second objective, and in this study it is referred to as microfinance-credit (Labie, 2001; Elahi & Danopoulos, 2004). Microfinance-credit for purposes of this research is defined as small or microloans meant to develop small (can be tiny) enterprises and income-generating activities often run by the low income groups and the poor (CGAP, 2001; Elahi & Danopoulos, 2004). This part of microfinance has been in use over the years and is a main target for funding by international donor agencies, social investors and subsidised state-run credit schemes. MFIs play an intermediary role in mobilising scarce resources and disbursing microloans to micro-enterprises operated by the poor and thereby expand their choices, and reduce the risk they face (Torkestani & Ahadi, 2008).

However, not all 'poor' in society are eligible for microfinance interventions. And besides, poverty is variously defined and exists in several dimensions. Arch (2005) suggests three groups of the world's poor:

i) working poor, earning money, but below liveable wage;
ii) the poor, with no access to basic services, unutilised skills, but often excluded from the economic system; and
iii) the poorest of the poor, destitute or living below US$1 per day representing desperate cases of poverty.

Microfinance interventions address the first and second category, namely low income and economically-active poor. Poverty on the other hand can generally be defined as deprivation of human capabilities or a condition of low income, hunger, vulnerability, exclusion and powerlessness (Arch, 2005).

The bulk of microfinance services are microfinance-credit meant for small and micro-enterprises (SMEs or more specifically micro-enterprises (MEs)) and form the main subject of discussion in this study. SMEs/MEs as the recipients of microfinance-credit refer to that part of the poor society that is economically active – that is, able to run and operate income-generating activities. The active poor adopt a sustainable livelihood by identifying small business opportunities, and pursuing them. Their kind of micro-enterprises are very small or tiny informal income-generating businesses, that are managed and operated by entrepreneurs who derive most of their livelihood from the business (Arch, 2005; McKee, 2001a; CIDA, 1998). Most micro-businesses can employ five to seven or more staff including the owner. Over time, vulnerable groups in society have perfected this art (micro-entrepreneurship), which has now become the engine of development in many developing economies and indeed the heart of microfinance.

The success and replication of microfinance programmes worldwide has enabled a proliferation of MFIs that has overly strained the main funding source (Callaghan, Gonzalez, Maurice & Novak, 2007). It is estimated that there are around half a billion people who own small and micro enterprises and only 10 million have access to credit and other financial services (Arch, 2005; Bystrom, 2007). The high growth rate of the microfinance initiative, particularly in developing countries, has triggered such a high demand for finances that funding levels in the industry have not been able to match (Arch, 2005; Bystrom, 2007; Koveos & Randhawa, 2004; Carlos & Carlos, 2001; KIPRRA, 2001). Cull, Dermirguc-Kunt and Morduch (2007) suggest that 40 to 80 per cent of the population in most developing economies lack access to formal banking services. This is particularly of concern when we consider the decreased availability of traditional donor sources of finance, and the uncertain capacity of MFIs to access alternative funds. This has resulted in the need for alternative funding for microfinance besides traditional donor sources (Emeni, 2008; Carlos & Carlos 2001; KIPPRA, 2001).

Funding is a major constraint in microfinance and slows the growth and expansionist activities of microfinance innovation in many developing economies. This is despite the recognition that microfinance has contributed immensely to the creation of sustainable livelihood in poor societies, and micro-enterprise development. The problem is twofold: Firstly, current financing approaches for MFIs have not emphasised access to commercial capital until recently when grants funding became scarce; and secondly, while donations have made enormous contributions to microfinance development and poverty reduction among the poor, attempts to scale up funding from this traditional source has been an uphill task. However, to keep momentum with improvement and

sustain achievement of the microfinance initiative it now becomes essential to microfinance entrepreneurial activity to focus on attracting commercial finance (Hartungi, 2007; Emeni, 2008; Counts, 2008).

MFIs are currently faced with four sources of funds:

i) own sources including internally generated income;
ii) voluntary savings (group) mobilisation;
iii) borrowed funds (from friends); and
iv) grant support from donors.

Out of these four, grants form the bulk of the supply side of the balance sheet (Jansson, 2003; USAID, 2005). However, subsidies or grants are not available in the quantities necessary to fuel the growing microfinance sector (Cull *et al*., 2008). Commercial sources of funds have on the other hand not been explored fully, yet they can play a greater role in relaxing the funding constraints facing MFIs. Nevertheless, since 2000 there has been a rapid growth in commercial investment by various investor funds that tend to be more commercially oriented. This source of finance is however driven by different considerations than those for donor funding thus making it more interesting to study (Sengupta & Aubuchon, 2008; Arch, 2005).

It is argued that commercial sources are a viable alternative for providing massive long-term resources for growth (Daley-Harris, 2009; Bystrom, 2007; Lewis, 2008). Hence this research aims to suggest that successful commercialisation of microfinance will provide greater funding diversification for development finance. The author therefore looks at critical success factors for tapping into commercial funds to microfinance in Africa and suggests drivers that could unlock investment in this critical area.

It is the objective of this research study to establish the factors necessary to attract commercial capital for MFIs, particularly those based in Africa. The establishment of these factors is important in as far as it helps in financing reformation of the microfinance industry.

The study explores the concept of commercialisation and seeks to answer the question: Have MFIs attracted commercial capital flows as a solution to their financing problem? and if so, What factors were associated with African MFIs that were found to be successful in accessing this kind of capital?

The study also investigates country likelihood of future success with commercial microfinance as an alternative funding strategy; as well as assesses the viability of this potentially important source of funds for MFIs. Given the financial needs of the microfinance sector and its huge growth potential, commercialisation (defined as the funding of an MFI's expansion operations and lending portfolio with commercial finance) has a role to play in the sector’s future development.

This study is significant because MFIs have reached a maturity stage whereby no further growth or meaningful impact can be achieved without access to an alternative limitless source of capital. CGAP (2007) suggests that, to serve massive numbers of the poor with high-quality financial services MFIs have to tap into commercial sources of funding and deposits. MFIs in this study refer to financial intermediaries (of all types regardless of legal status) that have developed a unique focus and proven methodology of providing access to financial services to micro-enterprises (MEs) and the poor in general.

The key concern to MFIs with regard to commercialisation is the risk of inability to succeed in attracting commercial sources of finance. The majority of MFIs lack the management capacity to attract and absorb commercial capital, which often requires complex capital structure decisions (CGAP, 2007; USAID, 2005). The lack of exposure and experience in dealing with commercial markets is also another concern (Daley-Harris, 2009). Another commonly argued barrier is the lack of scale or size to absorb big money and lack of enough profitability (Daley-Harris, 2009; Callaghan, Gonzalez, Maurice & Novak, 2007). While this seems to present a dilemma, the good news is that there is a growing commercial investor interest (both in amount and risk tolerance) in the sector. Statistics show that the sector attracted 59 investment houses and donors acting as lenders/investors in 2005 (USAID, 2005; De Sousa, Frankiewicz, Miamidian, Steeven & King, 2004). This group of new money investors altogether made available 1.7 billion United States dollars (US$) by 2005.

A major motivation in studying commercialisation is also the fact that while investors can be said to be viewing microfinance with interest, a worrying dimension is that commercial investment is focused on regions and high performing MFIs (Daley-Harris, 2009; Cull *et al.*, 2008). Regions or countries regarded as safe destinations attract more commercial finance than others such as Latin America, Eastern Europe and India. A study on commercially-oriented finance revealed that 87 per cent of all available investor funds went to Latin America and Eastern Europe alone (USAID, 2005). It is suggested that Africa and Asian countries do not produce enough signals for commercial investment attraction; yet they have the largest microfinance programmes (Delay-Harris, 2009; Meehen, 2004). The problem for African MFI's ineligibility lies partly in the fact that some institutions mobilise insufficient member savings (particularly in West Africa) while qualifying MFIs continue to receive some donor funds, thus distorting their focus on commercially-oriented finance. This suggests that, Africa has special funding needs – a fact that provided the motivation for the author to investigate the factors that can enable the continent to attract commercial investment.

It is obvious from the above-mentioned facts that a lack of access to continued funding, among other constraints, is the greatest threat in the microfinance industry to date. This threat is even more real for the African region which is considered by investors as unfavourable due to low

returns (Daley-Harris, 2009). This greatly concerns microfinance advocates as much as it worries the MFIs and the beneficiaries of their financial services. International development aid in microfinance is no longer able to meet the huge funding gap of about US$300 billion (Meehan, 2004; Counts, 2008). It is estimated that the sector has an annual growth rate of 15 to 30 per cent and only an insignificant portion of the total demand has been reached (Bystrom, 2007). This clearly presents a huge demand and a big challenge unless private capital is drawn into the sector. MFIs therefore need an alternative and a clear financial planning strategy, so as to remain relevant in reaching a significant population of the poor with financial services.

The main challenge is whether MFIs, given their non-profit background and lingering influence of donor-subsidy-financing, can really attract and absorb commercial capital. Certainly the road map for gaining access to commercial sources requires a demonstration of consistent profitability. It is suggested that commercialisation (elsewhere referred to as access to private capital) of microfinance will pave the way for the entry of private capital which will lead to expansion of constrained funding into the untapped financial markets.

Other challenges have to do with lack of relevant information due to scant and little research guidance in this area. For instance, much of the information available on this subject area is usually informal, non-scientific or simply educated estimates (Callaghan, Gonzalez, Maurice & Novak, 2007). This research study, however, sheds good light on the issues. In this regard, the microfinance capital market is being informed by well-researched information to guide the sector's take-off.

Using both primary and secondary data, the author undertook a comprehensive research study on the subject area of commercialisation for African MFIs. First, the study sought to identify critical success factors (CSFs) from the perspective of commercial lenders. In particular, the results show that the extent of organisational formalisation and transparency in financial reporting are linked. These two factors are identified as absolute essential in making commercial lending decisions by private investors. Other key determinants of credit evaluation decisions are adequacy of cash flows to service commercial loans, good portfolio quality and sound financial management practices (Arvelo, Bell, Novak, Rose & Venugopal, 2008). The top list also includes a reputable board that offers effective governance.

These results lead to a realistic critical success factors (CSF) checklist for self-assessment of an MFI's progress in commercialisation. They provide CEOs of MFIs with valuable guiding principles for attracting the financial markets. A test of consistency between perceptions held by surveyed respondents and what they practiced, found that there is a direct correlation between factors perceived to be important and actual criterion used by lenders to advance loans to MFIs. The CSF

thus identified compare well with the considerations cited as evaluation criteria in real-world industry practice.

Secondly, the study attempted to validate the CSF results using financial variables from 103 African MFIs in 21 countries that have been involved in raising commercial capital since 1998. Based on firm-level data, the results confirm the perceptions of commercial lenders' perspectives. On the whole, the findings suggest the importance of good financial returns and administrative efficiency (ROA, cash-flow adequacy and operating expense ratio), transparent reporting and information disclosure and clarity, as well as inflation levels and lending rates in the country as key requirements of prospective commercial investors in microfinance. This research evidence is instructive of widened financing options for MFIs and capacity to relax growth constraint in the industry.

The cross-country data also helped in the examination of financial leverage per country, and it was found that an increase in financial leverage depends as much on the dynamism of the market as it does on the level of development of the finance sector. Attraction and future access to commercial funding differ across countries in the sample. The results indicate that investors will also be looking for larger, regulated and profitable MFIs with a low risk profile on their loan portfolios. Finally, the study developed and estimated a commercialisation success model for guiding MFIs on how to tap private capital, as well as ways of establishing financing connectivity between viable microfinance investments in Africa and commercial investors. The results contribute to the body of knowledge in development finance and MFI commercialisation schemes in Africa.

The remainder of the dissertation is structured as follows: The next section describes the statement of the problem, research objectives and significance of the study. Chapter 2 examines the existing theoretical and empirical literature in which this study can broadly be placed. In Chapter 3, the data and sample is described and in addition details of the conceptual framework and measurement of the dependent variable. The success model used in the analysis is also presented along with success factor identification techniques. Chapter 4 presents the main empirical tests and findings, and the relative performance of the two-year prediction model of successful commercialisation. Finally, Chapter 5 gives the summary, examines the implications of the findings and suggests some further areas of research into the topic.

1.2 STATEMENT OF PROBLEM

Despite the success of microfinance initiatives in numerous countries worldwide, a significant percentage of the micro-enterprise market has not been reached due to funding problems. The potential market size and funding gap reveals a need in excess of donor funding available for growth in portfolio and expansion of microfinance activities. To exploit this opportunity, as well as

serve a large number of poor households, microfinance institutions will need an alternative source of funding.

While donations have made an enormous contribution to microfinance development, attempts to scale up funding from this traditional source have been an uphill task. It is limited in amount and unavailable for many institutions. The constant challenges that confront practitioners/MFIs every day include how to finance the many microfinance programmes on the ground, how to finance eminent growth and achieve mass outreach and how to respond to competitive pressures on funding and customer demands for loans. With this predicament, the future course for microfinance is at a crossroad!

In an effort to achieve the above desired outcomes and in recognition of declining donor funds; MFIs worldwide are establishing links with formal financial systems, in search for alternative sources of funding. And this no doubt brings commercialisation into the equation to build the bridge. To reach a significant percentage of the micro-enterprise market, this indeed may be the only sure way of making a meaningful contribution to much needed economic growth and poverty reduction.

Commercialisation is increasingly becoming the only viable business option for MFIs to widen their funding base and options. However, this new paradigm shift raises the stakes for microfinance business in Africa in particular. The major concern is whether African MFIs have what it takes to enter this new evolving financing phase? And secondly, whether these institutions can meet the pre-conditions for success and sustainable migration from donor-dependency? Commercial banks have been reluctant to become involved because of the unconventional practices of microfinance: Small loans, doing business with the poor assumed to have no purchasing power, lack of collateral and nil requirement of security for advances and generally a risky lending environment. For the investment community, microfinance does not present a clear investment asset class. Conventional asset classes, for example, do not mix social and profit motives – a key characteristic of microfinance. This creates confusion and yet another problem for microfinance where the heart of its existence becomes its biggest hindrance for attracting new investors.

This presents the questions that are at the centre of this research study:

- What is the password for unlocking private capital resources for economic growth and development for microfinance institutions in Africa?
- Can the funding gap be reduced; and
- Is the financial markets the answer to the financing constraint faced by MFIs?
- Will an understanding of the general characteristics or perspectives and roles of this prospective group of new capital providers in microfinance shed great light and help relax the funding constraint in the sector?

These and other related questions remain to be answered and form the driving force for this study and problem. A related issue on possession of the necessary ingredients to attract private capital is: How do MFIs know that they can succeed in raising commercial capital given the costs involved in doing so? This issue is yet to be addressed.

It is this lack of guidance and scientific information that has led to the search for a measure of success in commercialisation in this study. The development of a prediction model is seen as a quick solution ('temperature gauge') to help in the assessment of an MFI's ability and capacity to succeed in accessing commercial capital, and also serves as an early warning system of the likelihood of the successful avoidance of failure. For investors the model can be used to reduce screening costs and thereby enable quick identification of investable MFIs to avoid unnecessary experimentations.

1.3 RESEARCH OBJECTIVES, QUESTIONS, AND/OR HYPOTHESIS

It is clear, following the above rationalisation that the method of funding microfinance is a problem and poses a threat to the success of microfinance programmes and initiatives. This conclusion is being drawn while microfinance has expanded so much, has strong political support as a development initiative (the Nobel prize for peace in 2006 was given in honor of microfinance), and has raised considerable interest in the private sector in the last ten years. Can a sector that offers so much hope for the future development of micro-enterprise and poverty alleviation be left to die? The bottom line is that the microfinance sector desperately needs financial support from a sustainable financial system for growth and expansion to be able to continue the good work.

The aim of this research study is to provide answers to the financing problem of MFIs, in response to the above call. The study focuses on examining the evolution from donor funding (and support) to alternative financing mechanisms and tries to establish if commercialisation is a viable option. Specifically, the study seeks to:

i) Identify and highlight critical success factors (CSF) for tapping commercial sources of funds and for enabling MFIs to effectively handle the switch to private sources of capital. These factors define minimum pre-conditions under which an MFI can consider commercialisation as a viable alternative source of funding. The main research question here is: What are the CSFs that underpin success in commercialisation of microfinance for African MFIs?

ii) Examine both process and dynamics of commercial microfinance, particularly focusing on efforts made by African MFIs. In theory commercialisation provides a mechanism for accessing alternative leveraged funds. The key question is: How successful has this option been as a financing strategy, and what are the lessons learnt? The examination will help suggest how MFIs can break free from donations.

iii) Shed some light on financing choices of MFIs between 1998 and 2003. The research questions will be: When MFIs need additional finance, how do they make financing decisions? Are there any preferred choices? What financial structure patterns exist, and what financing theory do these seem to support?

iv) Develop a commercialisation success model for tapping commercial funds, validate it and assess its suitability in predicting success in commercialisation.

v) Explore the hypothesis of growth opportunity. It is argued that fast growing firms often use debt to grow. What is supporting growth for African MFIs? The other question to be addressed is: Is the industry in Africa growing and at what speed?

vi) Explore the feasibility of integrating the microfinance sector with the financial markets, with special emphasis on African MFIs. Specifically, to undertake a comparative cross-country analysis of the likelihood of success with commercial microfinance, on the basis of gained access to vast amounts of funding and develop the pathway for such access.

vii) Investigate if commercialisation destroys long-term social value of microfinance initiative. This research tries to answer the question whether 'commercialisation causes mission drift'; that many believe to be true for a long time, but the debate has had no conclusive evidence. It is strongly argued that having concern for the poor is a critical ingredient for microfinance practice and poverty reduction. And the poor are likely to suffer from the effects of commercialisation. Do CEOs sacrifice the social goal of microfinance in the quest for financing? Is commercialisation then good for the poor or does there exist a conflict between the commercial and social objectives of microfinance?

1.4 SIGNIFICANCE OF THE STUDY AND CONTRIBUTION TO KNOWLEDGE

The research findings include: Identification of critical success factors that drive effective commercialisation; revealed feasibility of commercialisation strategy in Africa and the pathway to successfully link with the wider financial markets for microfinance institutions. The empirical findings add to the understanding of financing relationship cementing factors between commercial lenders and MFIs, besides providing insight into factors associated with successful commercialisation of microfinance in Africa. Identified factors will form the springboard for commercialisation success and hence ease the funding problem as the financing alternative base widens. Available knowledge also improves the capacity to commercialise and/or tap and attract private investment funds for MFIs.

The growing scarcity of donor funds and increasing MFI competition for funding has sparked increased interest from the financial markets. However, many MFI managers do not understand the most important factors that drive successful attraction of commercial funding. On the other hand, investors either have no access to investment information or a lack of understanding of the

strength of microfinance. Therefore it was worthwhile to launch an investigation of CSFs for implementation of an alternative source of finance for microfinance.

The development of a prediction model helps to assess an MFI's ability and capacity to succeed in accessing commercial capital, and also serves as an early warning system of the likelihood of successfully avoiding failure. The model provides a framework upon which to build strategies for pro-poor commercialisation. Identification of good investment proposals by investors now becomes easier with an existence of an accurate temperature gauge and an instrument to measure in advance an MFI's capacity to handle commercial microfinance.

Policy makers and donors alike, plus an increasing number of practitioners, now see commercialisation as one of the ways of broadening the financial possibilities available to MFIs, and of leveraging their internal resources (and of course limited donor resources) for meeting growth and development objectives. Commercialisation is inevitable given the insufficiency of donor funding for microfinance development. A main contribution of this study is the proof that this option is indeed feasible. This is because the financial markets can be more dependable in the long run and are capable of offering vast amounts of funding, for mass outreach. With favourable conditions, commercialisation can substantially and sustainably increase the volume and range of financial services for micro-enterprises in Africa.

The capital markets are catching up with the idea of the need for well-researched information to guide microfinance sectors' take-off. This study therefore attempts to offer a comprehensive research investigation on the subject of commercialisation and the much needed successful approaches of attracting commercial capital.

Results of comparative analysis of country likelihood to succeed will be useful as a benchmark for building a competitive environment for performance standards and excellence in commercial microfinance. This will be useful in the sharing of knowledge and practices to avoid pitfalls as the face of commercialisation evolves in each country. The investigation of the financing behaviour of commercialising MFIs in Africa and extent of financial leverage shows whether the MFI has the right balance between debt and capital and how much room is left for debt absorption. This knowledge will guide MFIs in observing the right capital ratios as per their regulatory environment as well as help them in maximising the benefits of debt financing.

Investigations on the impact of commercial microfinance on long-term social value of microfinance indicate limited evidence that MFI size and social variables will play any role in differentiating who will be funded and who do not attract commercial capital. Not surprising, the findings suggest that commercialisation has a tendency to negatively motivate CEOs/managers to sacrifice long-term goals of the microfinance initiative. The study also reveals that concerns on mission drift are real;

in particular that the poor benefit less from commercialisation, and under some circumstances it may actually hurt them.

1.5 MAIN CONCLUSIONS

The microfinance industry has experienced tremendous growth, but current enthusiasm is often tempered by a limitation of development finance. Firstly, because of constrained donor funds, and secondly, because MFIs find it difficult to obtain funding from the larger financial community that views such investment as unattractive and high risk.

There is a growing shortage of donor funds (which is the main traditional source of capital for MFIs) and this study develops effective success strategies that promote alternative funding sources in order not to limit the potential for microfinance in economic development. It is now a reality that microfinance financing models relying and focusing on donor financing have limitations and are not able to reach more poor societies that are in dire need of financial services. This study presents an alternative-financing model for MFIs that would like to explore and leverage on scarce donor funds. The model encourages investment in and development of microfinance, and identifies criteria used by commercial lenders and other capitalists when considering funding of an MFI. The model therefore offers an alternative source of capital to institutions at the cutting edge of enterprise development and commercial market reforms.

The need to satisfy commercial investor funding requirements by microfinance practitioners is increasingly pressing, given the urgency for microfinance objectives of poverty alleviation and development of the small and micro-enterprise sector manned by the poor. This research derives and highlights ten critical success factors (CSF) that enable a realistic checklist for self-assessment of MFIs for attractiveness to investors and progress into a commercialisation strategy. They reflect ten financing goals for microfinance institutions in raising additional funds from commercial fund markets. This pre-screening tool will enable MFI management to realign critical success strategies and tactics to correct identified deficiencies and control for disappointments arising from premature moves for commercial funds drive.

The list of CSFs identifies the following key commercial lenders' criteria:

- Extent of MFI formalisation and transparency in financial reporting;
- Viability of investment in microfinance;
- Microfinance practice; and
- Extent of product delivery innovations.

It is hoped that the transparency afforded by CSFs will help to change the reputation of microfinance to financiers and bring the possibility of a linkage between microfinance and capitalists. The bridge thus created will mean gained access to more financing options, and

industry freedom from donor syndrome and funding trap. This communication breakthrough will finally provide a necessary platform for the switch to commercial finance.

The cross-country data analysis offered research evidence suggesting lack of clarity and scarcity of information on performance as key deterrent to private investors. Other significant predictors for successful commercialisation of microfinance identified include profitability, capacity to repay commercial debt (cash-flow adequacy), fast growth in MFI and inflation. This implies that commercial lenders can know in advance of an MFI's ability and capacity to handle commercial microfinance. These empirical findings add to the understanding of the financing relationship cementing factors between commercial lenders and MFIs, besides providing insight into factors associated with successful commercialisation of microfinance in Africa.

The results indicate the emergence of new finance sources for development and poverty reduction, widened financing options for regulated MFIs and capacity to relax growth constraint in the industry. This study has therefore developed the pathway through which an MFI can become part of the financial landscape and identified the factors that underpin success in commercialising microfinance institutions. The model developed here can be useful within organisations to establish baseline measures for future prediction of success in commercialisation. However, investigations of the impact of commercial microfinance on the long-term social value of microfinance indicate that although commercialisation offers new opportunities for accessing fresh capital, there are some genuine concerns on mission drift, in particular whether the poor gain from commercialisation. It will take serious commitment from an MFI to preserve the long-term social value of microfinance as a poverty reduction strategy.

The developed country prediction models are particularly informative for investors. According to this study, more than half of sample MFIs are enjoying access to commercial finance while obtaining donations. However, the CI predicts Africa as a whole is a continent in transition from donations, but struggling to be successful in commercialisation. North African country MFIs are more likely to be successful in future, followed by East and then West Africa. Each of these groups of countries presents an opportunity for investors and indicates likely destination for commercial funds. These results obviously imply that it is possible to develop a uniform commercial success prediction rule for MFIs in Africa that would give useful information to investors. The model will also be useful in guiding successful commercialisation schemes in Africa in that it provides MFIs with a structured approach for achieving sustainable commercial microfinance.

Although this is the first attempt to model commercialisation, these results suggest the CI commercial rating rule has superior predictive abilities that could be explored to guide screening efforts for winners, investment decisions and other binary classification investigations. This

research found strong support to the hypothesis that 'the CI is a better measure of successful commercialisation than the LMA (leverage multiplier added), given the variables used'.

This research study investigated if there are identifiable financial structure patterns and how changes in total assets have been financed for African MFIs over the sample period. Exploratory results on financing behaviour seem to indicate a pecking order that prioritises donations/retained earnings, savings and use of commercial debt. The results show that about 70 per cent of financing that flows to African MFIs currently come from commercial sources. The equity multiplier indicates that these institutions are now leveraging their own funds three times. That is, every dollar of equity generated US$3.12s from external (commercial) sources in 2003. Thus commercial debt has more claims over MFI assets in Africa! It is now reality that MFIs can and are broadening financing possibilities, and that the main source of financing for microfinance in Africa is commercial capital. These results have implications for development of commercial microfinance in the continent.

The study reveals that the majority of African MFIs could not finance their growth themselves and did not get enough short-term finance for the same, over the sample period of 1998 to 2003. They had to rely on external finance for their growth needs. And, only 37 per cent of the sample (MFIs in eight countries) have the ability to generate sufficient cash flow from performing assets to cover all costs and maintain the value of capital**.** The results indicate that 90 per cent of MFIs on average have had high growth opportunities, fuelling fast growth and a vibrant microfinance business. To finance this fast growth, there was greater use of financial leverage over time that defined a clear trend of commercialisation in Africa. That is, the replacement of donated equity with interest-bearing funds.

CHAPTER 2
LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

For a long time now, the main source of financing for the microfinance sector has been dominated by development aid (non-commercial sources of capital). Understandably, financial markets or private capital has played a minimal role in this poverty focused industry which continues to thrive on finance sources whose allocation is based on development aims as opposed to profit maximisation. However, if the sector is to relax current financing constraint on growth and meet its goal of serving a large portion of the world's poor with much needed financial services, it must develop access to commercial capital as an alternative financing strategy.

Researchers are in agreement that MFIs have the capacity to pave the way for broad access to finance for active poor and low-income societies (Cull *et al*., 2008). Active poor refer to poor people who have the capacity to work and who can undertake activities that generate stable incomes. They are deemed poor because they cannot unleash their capabilities due to one or several deprivations. The term 'poor' in microfinance as used in this study refers to that part of the society or households that earn less than US$1 per day, and are economically active. This definition includes vulnerable groups that may be above the international poverty line, but can slip into poverty, but excludes destitute cases that are at the bottom of the economic pyramid (bottom ten percentages below the poverty line).

There is a significant net demand for financial services by the poor in many parts of the developing world. Arch (2005) suggests that fewer than two per cent of the worlds poor have access to financial services other than traditional money lenders. And out of the 500 million people who own small and micro businesses, only 10 million have access to credit and other financial services. This undoubtedly leaves a large portion of the population not being served with financial service products. The formal banking system has not been able to fill the gap owing to various constraints including the fact that the poorer segment of society is associated with the perception of high risk (Koveos & Randhawa, 2004).

Microfinance institutions (MFIs) have established themselves as the financial intermediaries for the poor. In this regard they have developed and delivered financial services in the low-end market for decades with success. Originally funded primarily by international donors and public agencies, microfinance is generally agreed to be pro-poor, and its role as a policy tool for effective and sustainable poverty reduction is not questionable (Hartungi, 2007; Beck & Fuchs, 2004; Stern, 2001; Beck, Dermirguc-Kunt & Levine, 2004; ADB, 2000; Klasen, 2005). Indeed, poverty alleviation strategy and achievement of millennium development goals (MDGs) in many developing countries

in Africa very much depend on the success of microfinance as a business model and other market-based approaches to poverty reduction and development. The rationale behind this argument is that microfinance aids in improved access and efficient provision of financial products that enable the poor to manage and build their asset base gradually for improved quality of life.

Although microfinance has such a huge potential in poverty alleviation and holds a great promise for the poor, particularly in Africa, its funding approach, sandwiched between donations and a transition to commercial sources, suffers from donor fatigue. A recent Consultative Group to Assist the Poor (CGAP) study (De Sousa-Shields & Frankiewicz, 2004) reveals that the volume of grants and soft loans from bilateral and multilateral donor agencies, defined in this study, within the context of microfinance as "non-official ODA" (overseas development aid) stands at US$2.32 billion. The contribution from commercially oriented and private foreign capital is given as US$1.68 billion. The above figures put the global supply for the sector at about US$4 billion (Meehan, 2004; De Sousa-Shields & Frankiewicz, 2004). Hence the majority of the sector's risk capital has, and continues to come from the development community whose supply has been outstripped by rising demand, now estimated at US$300 billion (Meehan, 2004).

This demand is raised by about 150 to 350 MFIs which are regarded as top performers, out of the possible known 10 000 MFIs worldwide (Arch, 2005). It is argued, that less than 3.5 per cent of all MFI groups represent the only investable group in the conventional sense. However, although this number may seem to be small, microfinance has a reputation that is unequalled in financial services history. The strongest MFIs have reflected profitability and returns that surpass that of their distant cousins in commercial banking (Callaghan *et al.,* 2007). Many MFIs can boast of a return on equity of no less than 15 per cent. This kind of profitability, and the lack of funding in the sector, has stirred great interest among the investment community as well as a source of concern for the promoters of microfinance.

Microcredit in particular requires rapid access to leveraged finance and broadening of strategic choice and growth of programmes. This new direction is essential if MFIs are to sustain their consolidated vision and operations in the foreseeable future. At this stage of rapid growth microfinance needs to identify and emphasise value-maximising strategies. A commercial approach to microfinance has the potential to unleash renewed momentum.

The above-mentioned postulation underscores the need for MFIs to seek to be part of the formal financial system so as to attract funding from abundant commercial sources. With the knowledge and experience built over the years, microfinance has proved its feasibility and value.

An understanding[1] by partners in micro-enterprise development on the changing financing needs of commercialising institutions is required, as the latter evolve, grow and walk consciously on the path to financial independence.

2.2 THE ROLE OF MICROFINANCE IN ECONOMIC DEVELOPMENT

Economic conditions in many developing African countries have continued to deteriorate over time pushing more and more people into deeper poverty levels. The poor in these countries have often been at a disadvantage in accessing basic livelihood services. However, successful implementations of poverty alleviation strategies like micro-enterprise development backed by accessible microcredit have attempted to improve the situation (Koveos & Randhawa, 2004; Cull *et al.*, 2008).

An increasing number of microfinance institutions are initiated by individuals, non-governmental organisations (NGOs), savings and credit cooperatives (credit unions), government and donor agencies and commercial banks moving downmarket. These organisations focus on enterprise development, while others conduct a variety of social welfare activities in addition to supporting small and micro-enterprise (SME) programmes. Microfinance is a unique economic development initiative because it has the ability to contribute directly to people's economic and social progress (WSBI, 2008). It helps change lives through the launch of microbusinesses that provide for poor households and create neighbourhood jobs (Cull *et al.*, 2008).

Microfinance has initiated the belief that little money can be put to work. Indeed, in what has been described as a "revolution in microfinance," a new banking technology has emerged that differs from the traditional non-inclusive banking (UNEP FI, 2007). Success stories[2] are responsible for the widespread view that there exists enough opportunities to justify everybody to go to work (CGAP, 1997; Hattel & Halpern, 2002; McKee, 2001a).

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[1] Future microcredit programming should therefore facilitate and support the commercialisation process as it takes course in each country – albeit at different stages of development.

[2] The micro-enterprise sector in Kenya (about 1.3 million SMEs) contributes about 18 per cent of the country's GDP while employing 2.4 million people according to the baseline survey CBS and K-Rep (1999). Currently, this figure stands at 9 million Kenyans benefiting from microfinance (a growth of 275% in 2.5 years) as reported by the central bank governor (Kenya Daily Nation, 2002). In Guinea 62 per cent of GDP comes from the informal sector; while in the Philippines 55 per cent of the work force is employed in this sector, and in Brazil 82 per cent of all service firms are micro firms (McKee, 2001).

This gives the hope (and encouragement) to the poor in Africa that their efforts to attain some means of livelihood ultimately register progress in economic development[3].

Microfinance seeks to address social and economic exclusion by allowing low income segments of the population to invest and multiply their scarce assets. In particular, microcredit expands access to business finance for the poor who in return increase their income growth. For example, the provision of a small savings mobilisation chance enables the poor to accumulate funds in a secure place over time in order to finance a large anticipated expenditure or borrow a loan. Being a client of an MFI exposes the poor to more financial services, such as remittances, or insurance and enables the building up of a financial history, thus improving access to credit.

The availability of microcredit strengthens the productive assets of the poor by enabling them to invest in productivity – enabling new technologies such as new and better tools, equipment, or fertilisers or to invest in education and health (DFID, 2004; Hartungi, 2007). The provision of microcredit is also an important factor in creation and expansion of small businesses thus generating employment and increasing income. As more and more of the world's poor gain access to microcredit and financial services in general, the more microfinance contributes directly to economic growth and development. Indeed, microfinance is viewed by many as an instrument of development (Koveos & Randhawa, 2004; Cull *et al.*, 2008).

The poor, low-income groups and those excluded from mainstream banking receive financial services from MFIs so that these groups can come out of poverty through increased income and access to more choices with reduced risk, among other things. There seems to be an association between access to microcredit finance and improvement in economic progress of the poor, but the link could be due to other factors. Arch (2005), Koveos and Randhawa (2004) suggest that the interaction between credit markets and microloans generates externalities that offer channels for increasing the efficiency of investments at the household level.

Beck, Demirguc-Kunt and Levine (2004) also point out that financial service development accelerates economic growth by removing constraints to micro-entrepreneurs. Assumedly, microfinance services remove access constraints to credit for the poor and low-income groups who are engaged in micro-enterprises and other microfinance activities. The effect of broadened choices brings about new ways to promote and encourage economic growth. A survey of micro-entrepreneurs served by MFIs indicates that the majority slowly go beyond subsistence and make positive economic profits over time (Zalpalska, Dallas & Denis, 2007).

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[3] See INAFI Africa workshop background study: *A dilemma for Africa's microfinance industry – changing lives by commercialising services* (INAFI Africa, 2003).

However, Cull, Dermirguc-Kunt and Morduch (2007) note that access to financial services alone is not yet proven to increase economic growth or reduce poverty on a large scale, except for Asia. A World Bank research study on the other hand argues that a well-functioning financial system, channels funds to most productive uses thus boosting economic growth, improving opportunities and income distribution, and reducing poverty (World Bank, 2008). Overall a number of research studies agree that although vigorous empirical evidence is scanty, a link exists between microcredit and substantial economic social effects; such as increased employment, reduced hunger and poverty and returns to capital (Cull *et al.*, 2007).

Microfinance credit has been positioned as the key financing option for micro-enterprise development. However the growth of the industry in North America, Asia, and all over Africa, where microfinance enhances small enterprise development, new funding realities are emerging. Microfinance as the main supplier of credit to these small and micro-enterprises (SMEs) is starved for cash. Although the need to provide finance for the economically-active poor is understood, MFIs are not able to support their customers with finances anymore, as their sources have reached limits – both in availability and scale. Demand for credit is arguably more than the supply for micro-enterprise loans (CGAP, 1997; Jansson, 2003).

Existing and new microcredit programmes are growing fast and generating a huge demand for credit funds (MIX, 2006). This indicates that microfinance has come of age as an industry (Malhotra, 1997). This is perhaps one area where enterprise development and growth may have outstripped domestic growth in many Sub-Saharan African countries. Certainly micro-enterprise opportunities present a volume that is more than what traditional donor sources are able to match.

2.2.1 Role of microfinance institutions as financial intermediaries

Financial services are provided in the informal sector by postal savings banks, credit unions or cooperatives, finance companies, microfinance institutions, and a whole range of other informal institutions. Out of all these institutions, microfinance institutions remain focused to serve the needs of the poor and low-income societies. MFIs as providers of key financial services to micro-economy play a major role in helping to allocate scarce resources to micro-investments (Arch, 2005). As such, MFIs provide the role of a financial system for the informal financial sector. They gather surplus funds from economic agents that are socially oriented: like donors, governments, social investors, banks, and small severs and route these resources to small borrowers who have investment opportunities and can use the funds immediately. MFIs' financial system thus serves as an intermediary between savers and borrowers, thereby promoting investment, growth and improvements in poor people's standard of living over time (Zapalska, Dallas & Denis, 2007).

Microfinance services go beyond banking for the poor. They include social intermediation and empowerment, access to a wider range of services besides channels for mobilising savings. Arch

(2005) argues that sound microfinance makes it easier for MFIs to create wealth for poor societies through effective and equitable access to financial services. Hence micro-entrepreneurs who seek to sustain their economic activities through access to microcredit rely on MFIs for funding. Without these financial institutions and the loans they provide many small businesses supporting economic growth will never be in place. This is accentuated by the fact that most of them are unbanked and do not have access to mainstream finance (Pollinger, Outwaite & Cordere-Guzman, 2007).

The market economy at the micro level ensures that MFIs allocate pooled scarce resources from micro-entrepreneurs, low-income groups, small savers and poor individuals. The mechanism is such that resources are transferred to micro-investors with the highest marginal rates of return (Torkestani & Ahadi, 2008). Hasan, Wang and Zhou (2009) highlight the role played by banking institutions in enhancing productivity and better economic outcomes.

At the heart of the idea of MFIs is the belief that poverty can be reduced when recipients of microcredit invest their money in income-generating activities (Hartungi, 2007). Notwithstanding, microfinance recognises that credit is not appropriate for every poor person. Hartungi (2007) in his analyses of success of BRI MFI (of Indonesia) posts that for most destitute, desperate, and those sick or unskilled to work, microfinance can do little for them.

2.2.2 Role of MFIs in poverty alleviation

Microfinance plays an important role in dealing with vulnerabilities faced by the poor in society. It addresses poverty through microcredit and income-generating activities. Microcredit is the act of lending small loans to the poor, micro-entrepreneurs or farmers who are not bankable (Elahi & Danopoulos, 2004). Microcredit operates under the premise that the poor have entrepreneurial possibilities which are unutilised. By providing people with access to microcredit, MFIs give more choices and opportunities to start or grow their businesses, generate and sustain income and begin to build up wealth and exit poverty (Cull *et al*., 2008; Koveos & Randhawa, 2004; WRI, 2007).

Impoverished people, working in very small businesses, can improve their standards of living through the proper use of financial services delivered by MFIs. Many household groups have embraced micro-enterprise lending as a suitable avenue for job creation and economic participation. It is expected through involvement in economic activity by the poor, that poverty income levels should rise up (Copisarow, 2001). Microcredit is therefore a more appropriate tool for making them self-sufficient and helping them move towards mainstream bankability than any other form of support currently offered.

However, microfinance is not only limited to microcredit but covers a broader range of small amount financial products including savings, insurance, money transfer and payment services

(WSBI, 2008). Poor clients use these kinds of financial services to manage emergencies, acquire household assets, improve their homes, smooth consumption and fund social obligations such as education and health (Christen, Lyman, & Rosenberg, 2003; Cull *et al*., 2008). In this regard microfinance plays an important role in fighting multidimensional aspects of poverty. For example, increase of household income leads to other benefits such as increased food security, building of assets and an increased likelihood of educating one's children.

Microfinance is also a means of self-empowerment (Hartungi, 2007). It enables the poor to make changes in their lives when they increase their income and reduce their vulnerability to external stocks like illness and weather. By reducing uncertainty, microfinance encourages the poor to engage in income-generating ventures, thus allowing them to concentrate on productive activities rather than on managing risk. Microfinance has the capacity to create permanent jobs, improve the skills base of low-income groups in society, as well as sustain huge populations in the rural economy (Manroth, 2001; Emeni, 2008; Rhyne, 1998). Mwenda and Muuka (2004) also link poverty eradication to the role microfinance plays in improving rural finance access and economic growth.

It is argued that there is more to credit than simply lending out loans (Arch, 2005). Besides empowering people, microfinance credit is about improving people's lives holistically such that they can control their future economically and socially. Khandker (2005), examining the impact of microfinance on poverty reduction, found that microfinance has positive effects at the household level. And using a sample of African MFIs, Mosley and Rock (2004) also showed that with careful programming, microfinance has the capacity to reduce systematic poverty. Research evidence further suggests that microcredit has played a key role in the battle against poverty in Bangladesh (Zapalska, Dallas & Denis, 2007).

Microfinance helps the poor accumulate usable sums of money thereby expanding their choices, and as a strategy seeks to bring tangible improvements that help sustain impact on poverty reduction (Torkestani & Ahadi, 2008). Prahalad (2004) promotes the idea that commercial businesses such as sustainable MFIs can be part of a solution to eliminating poverty. Microfinance's success in fighting poverty has been recognised by the United Nations or developing economies that now use its innovations in achieving millennium development goal number one; that aims to eradicate extreme poverty and hunger and by extension halve the world's poor by 2015 (Klasen, 2005).

While microfinance has been lauded for attempting to help the poor, it has also been noted that finance alone does not create the development effects that truly lift people out of poverty (Lewis, 2008). For example, for microcredit to thrive it requires both a favorable local market and entrepreneurial skills (Khandker, 2005). Arch (2005) argues that a new set of theories for economic

growth suggests that poverty reduction and growth cannot occur in societies without strong financial institutions. Indeed, a number of researchers and supporters of microfinance concur that, although microcredit has become the most popular approach to address poverty in third world countries, appropriate changes in institutional policies are needed to reach maximum outreach (Elahi & Danopoulos, 2004).

2.2.3 Rethinking the enterprise game

One of the major discoveries in the last decade is the viability of doing business with the poor, and the possibility of achieving this profitably. True success stories have clearly informed us of the potential of microfinance as a profitable if not lucrative business (Christen & Drake, 2001; Sengupta & Aubuchon, 2008). Microfinance responds to the demand for borrowing to support self-employment and small business (Khandker, 2005; Cull *et al.*, 2008). Thus, the strength of microfinance is better seen through microcredit operations – at least for now. Practitioners and funding agencies alike are beginning to look at microfinance as a good business opportunity for developing African countries, especially in harnessing the entrepreneurial talents in these economies (Sengupta & Aubuchon, 2008).

Micro-enterprise and self-employment is the only alternative to employment in most African economies facing high unemployment levels[4]. Due to this, there has been tremendous growth and proliferation of new entrants and cohorts into the micro-enterprise sector (Rhyne, 2001a; Christen, 2000). This has also lead to the expansion of the market for MFIs as many small-income individuals and economically-active poor obtain microloans from MFIs for their ventures. However, the funding environment has in recent years changed, unleashing pressure to unsuspecting MFIs. This has created increased competition for clients and funding (Rhyne, 1998). The worsening funding environment is accentuated by the fact that legislation in many African countries does not allow them to take deposits from the public (a cheaper source of capital), except as in the cooperative movement where member savings are increasingly becoming significant (Microsave Africa, 2002).

It has thus become difficult to survive in the enterprise game without being agile to changing needs and preferences of the customer, as well as constantly being creative. This necessitates MFIs to be creative (not duplicating others), to adopt a different way of thinking and explore a variety of possibilities. An MFI should think in terms of competition and anticipate change, as well as remain relevant in serving the poor and low-income groups. Cull *et al.* (2008) reiterate that microlenders can and should compete shoulder to shoulder with mainstream commercial banks vying for billions of dollars on the global markets.

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[4] See also Manroth (2001) for newly developed economies in Central and Eastern Europe.

Indeed, the rules for credit providers seem to be taking a different turn. Just a few years ago it seemed that anyone in the microcredit business was an attraction to donors. Given global requirements for development finance and donor funding on the decrease, new measures are inevitable (Sengupta & Aubuchon, 2008). Klasen (2005) concludes that donors can assist with pro-poor growth but only when aid and advice is focused on the poorest countries and those with highest poverty impact of policies. As part of the new measures, development agencies have been forced to rationalise their funding strategies to allow for sustained growth of microfinance. Following these observations, the allocation of scarce donor funds is clearly a problem and certainly not at the same old terms.

As a show of change of financing strategy, Callaghan, Gonzalez, Maurice and Novak (2007) reveal that charities are competing with banks for supply of funds. Donors and social investors can therefore expect to get new advice. This expectation is due to the industry shifting focus to attract investment in microfinance. Bystrom (2007) posts that MFIs with assistance of investors are beginning to understand how to tap investment funds, for example through securitisation of microloans. Emeni (2008) notes the importance of microfinance tapping into private debt and equity investments to expand financial services to the poor. This calls for new language and measurement parameters[5] that can predict success to potential investors. Unfortunately increasing participation of commercial actors brings about the challenge of uncertainty regarding the role of donors.

The desire and effort to commercialise comes with:

- The search for new funding grounds suited for the current funding need;
- The need to broaden capital base;
- The need to sustain growth; and
- The necessity to expand both programme funds and portfolio finance.

In addition, MFIs should avoid mission drift by undertaking ethical microfinance that balances profit generation and poverty reduction (Lewis, 2008). This cautious submission comes from the realism that current global trend and paradigm shifts in the microfinance industry are no longer reversible. Judged from early results, there is already widespread adoption of a commercial orientation in the industry (Jansson, 2003). A number of MFIs are increasingly accessing funding from commercial investors (CGAP, 1997) and other private sources. The microfinance sector should and can be able to support its growth and expansion in the foreseeable future by re-thinking new funding initiatives.

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[5] For example creditworthy rating techniques are currently employed to separate viable investments.

2.3 WHY COMMERCIALISE MICROFINANCE NOW?

The history of microfinance is one of progression from the informal sector to formal, unregulated institutions to increasingly regulated organisations that are now integrated in the formal finance sector. The first formal MFIs on the African continent were established in the 1960s in West African countries like Togo, Burkina Faso, Ivory Coast and Benin (UNEP FI, 2007). The majority of these institutions target their outreach to economically-active poor in their locality. To date, the highest concentration of MFIs in Africa can be found in countries with a thriving informal sector, and a strong demand for access to financial services as can be found in Eastern Africa and West Africa. Success factors for growth of MFIs are cited as entrepreneurial capacities, financial assistance, size, legal form and a suitable location (Zapalska, Dallas & Denis, 2007).

The informal nature and lack of sustainable finance pose great challenges in the operations of MFIs globally. MFIs operate in simple structures, use locally available skills such as organised groups and local labour. This orientation results in MFIs having low-quality personnel, weak management and poor record keeping. Consequently, MFIs have a tendency to look forward to donor support to sustain their operations. To attract donations MFIs adopt a duo-mission: poverty alleviation and self-sustainability (Arch, 2005; Dorado & Molz, 2005). Donations, on the other hand, present a chance of no expectation of repayment, which does not foster self-sustenance, which in turn requires a profit orientation. This notwithstanding, it is often argued that the duo-mission poses operational challenges to MFIs (Lewis, 2008; Daley-Harris, 2009). Firstly, because it forces MFIs to operate under an elusion not knowing their true cost of operations until donations are not forthcoming. And secondly, pursuit of a profit orientation, although capable of leading to a sustainable status, often leads to mission drift.

Traditionally, microfinance services were offered by NGOs with donor support for their programmes. Over time this support decreased in the mid-1990s and has been defined by shifts from less reliable provision of subsidised finance to cost-effective and commercial finance backed by sustainable programmes (UNEP FI, 2007; Arch, 2005). To reach high numbers of impoverished poor requires more working capital and loanable funds. Subsidies are not available in the quantities necessary to fuel the growing microfinance sector. This operating environment has orchestrated a financing constraint in the industry leading to the quest for sustainability of MFIs.

For those with an NGO status, it takes a tremendous effort in drive and professionalism to convert into a commercially-driven MFI capable of achieving desired long-term sustainability (Pollinger *et al.*, 2007). To reduce administration cost, most organisations in the microfinance industry employ the group lending method where the cost of administration and lending process is transferred to the group as opposed to being borne by the MFI (Mwenda & Muuka, 2004). And to minimise

operational costs, and move towards sustainability as a best practice, MFIs major on high volumes and greater outreach.

Although debatable, the high interest charges levied by MFIs on their poor clients do not deter them from obtaining services and do not represent high margins either. The poor often value liquidity and access over cost of the service they get from microfinance institutions (Sengupta & Aubuchon, 2008; Daley-Harris, 2009; Counts, 2008; Cull *et al.*, 2008). As would be expected, the cost of offering financial products in small quantities to many clients is a costly exercise. The high interest charges are consequently wiped by high administrative costs experienced in getting services to poor clients often in remote places.

It is suggested that sustainability facilitates the ability to raise capital from a variety of sources and allows MFIs to scale up and reach more poor people (Counts, 2008). Thus profit-seeking MFIs are well positioned to pursue commercial capital and achieve sustainability faster, unlike NGOs that rely on donations. Sengupta and Aubuchon (2008) note that as MFIs grow and serve a wider client base, they outgrow subsidies and begin to demand increased working capital for expanded operations. For example, as testimony to the power of profit, Compartamos in Mexico was reaching 60 000 borrowers as an NGO, but after tapping commercial funds, six years later it was serving 616 000 borrowers (Lewis, 2008; Cull *et al.*, 2008). However, not all MFIs will go to commercial markets for funding. Many MFIs, especially NGOs serving the poor, riskier or start-up MFIs, will continue to receive grants from the donor community due to public support for sound microfinance.

This can be expected because of the social welfare goals of microfinance. Microfinance should, among other things, aim to reduce poverty and balance the power of market forces and service to the poor (Lewis, 2008; Dorado & Molz, 2005). Promoters of microfinance believe that microfinance should have profound positive effects on the welfare of the poor. These effects are said to include promoting gender equity and women empowerment, human dignity, fulfilments of human potential and greater peace (Daley-Harris, 2009; Arch, 2005). However, the debate on pro-poor microfinance versus profitability should not present a choice; rather the two have been proven to co-exist as profitability fuels the over-arching societal objective (Counts, 2008; Daley-Harris, 2009).

2.3.1 MFIs' operations, characteristics and challenges

The broad objectives of microfinance range from poverty alleviation to development of the small and micro-enterprise sector. Microfinance has established itself as a development tool for direct poverty alleviation in developing countries. This is why many poverty reduction strategy studies (PRSP) by most African/Asian governments are centred on creative livelihood strategies powered by microfinance credit interventions. This is especially true for countries where social ties are an

important ingredient to development. Arguably, microfinance offers clear economic growth opportunities in developing economies.

Africa is home to about 4 500 MFIs providing microfinance services to millions of clients. Opportunities to commercialise exist for MFIs growing faster than the average rate of 20 per cent *per annum* (INAFI Africa, 2003). Such growth focused institutions are found in countries where governments have created an enabling environment like the enactment of a microfinance bill in support and/or recognition of the sector's contribution. Examples are: Ethiopia, the first to enact a bill and the one with the largest[6] MFIs on the continent; Uganda; Kenya; Tanzania and West African countries under the Monetary Union UMOA through its Central Bank (BCEAO). In the latter case, the Union remotely regulates about 400 MFIs with a number of them prime candidates for commercialisation.

An increasing number of microfinance institutions have clearly identified their business missions and perfected their product offerings to cater for the growing needs of their target market. The next natural stage for such institutions is to move and attain business competitiveness by gaining access and links to commercial sources of funding. The main growth constraint for MFIs is lack of finance for expansion and successful models of microfinance (Counts, 2008).

As micro-enterprises grow and change, MFIs continue to need capital in different forms. There is therefore a direct relationship between growth and success, and the need for more capital other than grants. Given that more MFIs are establishing themselves as viable businesses, there is an urgent need for a link to the financial system to meet their funding requirements. MFIs can no longer rely on limited donor funds (Sengupta & Aubuchon, 2008). Development experts reiterate that there is "no case for aid money today" (Beynon, 2001). And CGAP (Consultative Group to Assist the Poor) (2002a) observes that financially sustainable MFIs can become a permanent part of the financial system:

"Donors have nowhere near enough funds to meet the global demand for microfinance. But when an MFI becomes sustainable, it is no longer limited to donor funding. It can draw on commercial funding sources to finance massive expansion of its outreach to the poor people" (CGAP, 2002a).

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[6] Ethiopian MFIs have outreach of over 200 000 clients per institution, numbers only close to Asian MFIs. These numbers are largely due to government support to commercially-oriented institutions.

To fund eminent growth[7], MFIs must be admitted to the financial market, which is capable of offering required funding on a continuous basis – without liquidity problems. Access to long-term sources of funds (debt and equity) may be the answer for increased impact in development and profitable business of microfinance. Bystrom (2007) argues that international development aid and philanthropy are not capable of meeting the huge demand for microcredit except if the lending process is commercialised.

To make this strategy feasible, MFIs should demonstrate that they are likely to meet key criterion in attracting commercial finance, in addition to commercial intermediation. Commercial intermediation[8] plays a key role, firstly in assisting unqualified MFIs to gain access to commercial capital and secondly, in helping to change the perception of investors or demystifying the notion that MFIs are an investment risk. MFIs have to fulfil certain business performance conditions and increase their capacity so as to attract alternative fund markets.

It is argued that the time is ripe for promoting[9], graduating and establishing a range of viable financial intermediaries with the right products, processes and systems and acceptable performance standards to be integrated within the formal commercial sector. This leads to an emerging market of commercially-oriented MFIs in Africa. Pioneer institutions in East Africa are K-Rep Bank, Equity Bank, Centenary Bank, National Microfinance Bank and others in the transformation stage. In this new platform, new standards and strategies for going upmarket required funding.

Microfinance has been strongly urged to transit from donor-driven financing to longer-lasting sources of finance (Rhyne, 1998). However, only a handful of MFIs have made progress towards this transition and attraction of commercial funds even through mergers[10] to gain advantage of emerging fund markets. Institutions that go through this transition and transformation process join the ranks of self-financing institutions, referred to in this study as commercialised institutions (CIs).

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[7] The extent to which growth is financed by commercial capital will depend on an enabling local environment and the stage of microfinance development in each country.

[8] Commercial intermediation here is defined as the introduction of 'excelling' MFIs to the commercial markets for acceptance. This happens because, ordinarily they would not qualify.

[9] The World Bank's International Finance Corporation (IFC, 2001) reports that: "… in partnership with others we have helped lead commercialisation of microfinance, enabling microfinance institutions to be financially self-sustaining… often reaching far more poor clients than previous models which rely on donor financing".

[10] Small MFIs could merge to attain a reasonable size and improve marketability. A changed image will pull capitalists to buy into such enterprises ultimately providing necessary funding.

To achieve greater impact on reducing poverty and pursuit of their missions, 12 out of 36 (33%) of INAFI[11] Africa members for example are in the process of transforming so as to gain a commercial[12] orientation. Market-oriented financing is easily achievable when an MFI operates like a business rather than a conduit for donations (Emeni, 2008; Hartungi, 2007). This baseline argument positions commercialisation as a major driver of future financing policy (Pollinger, Outwaite & Cordere-Guzman, 2007).

Commercial MFIs or CIs are likely to be eyed by the wider capital market fraternity[13] (Sengupta & Aubuchon, 2008). Rating agencies have popularised the operations and capabilities of MFIs sending strong signals on the potential of the microfinance industry (Sengupta & Aubuchon, 2008). As a testimony of this development, Morgan Stanley sought to invest in microfinance as an emerging market, but first developed a framework to assess credit risks of MFIs (Arvelo *et al*., 2008). Indeed, key studies have been done that promote the idea of fund markets structuring investment deals with microfinance and also as a way of fostering a global campaign to expose the attractiveness of the industry to inventors (Bystrom, 2007; Arvelo *et al*., 2008). Access and availability of commercial capital is however not in doubt. This World Bank Group statement is worthy noting as an encouragement to the industry "... we're exploring ways to work with microfinance institutions to move towards commercialisation"[14].

This is a pointer to the way forward on future development of microfinance and its practice. Arguably, what is needed to move microfinance intervention beyond its current operational level of growth is to commercialise access to their funding. And this is a major need[15] if microfinance is to continue to serve the world's poorest people (Counts, 2008)

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[11] INAFI is a network of alternative financial institutions with 36 member MFIs in Africa alone. Most of these are spread in West, East and Central Africa.

[12] See INAFI Africa, 2003; *Background study on dilemma for Africa's microfinance industry – changing lives by commercialising services*.

[13]See, http://www.ids.ac.uk/cgap/html/investors.htm, Accessed: 01/03/2002.

[14] Adapted from, (http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0, contents MDK: 200200: Accessed: 09/07/2002).

[15] Providers of funds and policy makers are all agreed on facilitating the process of commercialisation and its expansion, and developmental efforts in poverty alleviation (Hattel & Halpern, 2002; IFC, 2001).

2.3.2 Commercial microfinance rationale

As MFIs evolve they experience changes in funding pattern; from donor dependence to sustainable profitable institutions that are able to attract equity and mobilise deposits (Koveos & Randhawa, 2004). The push behind this change comes from the demand for broad service provision. In particular, microcredit's expansion has raised considerable interest from the financial markets to date. As indicated by Arch (2005), there are over 500 million micro-entrepreneurs globally whose activities are sustained by MFIs (Bystrom, 2007; Zapalska *et al*., 2007). These numbers represent a growing microfinance industry and demand for financial services to the extent that traditional sources of finance for MFIs have proved to be limiting.

It is also estimated that 40 per cent to 80 per cent of the population in most developing countries lack access to formal banking services (Cull *et al*., 2007; World Bank, 2008). Bystrom (2007) reports that, out of a total demand of $50 billion only 4 per cent is met by MFIs. These observations indicate a funding gap which presents an enormous challenge to traditional funders of the industry, but an inviting opportunity to external providers of capital. The widening gap between supply and demand for microfinance funding and the growing market has suddenly caught the attention of many funders.

Commercial sources of finance are promising in volume and availability. It is thus argued that commercial investors can assemble massive quantities of capital for microfinance to best serve hundreds of millions, but microfinance must be an acceptable investment (Daley-Harris, 2009). While commercial capital will widen the pool of funds available to MFIs, it will also demand that MFIs operate with transparency and post positive returns. High profits enable MFIs to attract private investment capital and stop relying on donor subsidies (Lewis, 2008; Sengupta & Aubuchon, 2008; Emeni, 2008). Not only are investors attracted to the promise of high returns, but involvement with microfinance has an added appeal for those who want to be part of the fight against poverty.

Commercial orientation benefits both MFIs and micro-entrepreneurs by providing longer maturities and more diversified funding services such as bonds, initial public offerings (IPOs), venture capital, and collaterised loan or debt obligations (Bystrom, 2007; Emeni, 2008; CCAP, 2007). In their analysis of different funding options, Pollinger, Outhwaite and Cordere-Guzman (2007) concluded that sustainable organisations can handle financial leverage easily because they can generate the means to repay debt.

Callaghan, Gonzalez, Maurice and Novak (2007) argue that top-tier MFIs estimated to be 10 000 receive less than 25 per cent of capital from private capital sources. They suggest that to get more financing from commercial markets, MFIs are required to generate more returns in addition to standard financial data. Microfinance analysts also point out that a significant challenge facing

microfinance is how to serve the growing number of impoverished poor using traditional financial sources (Tulchin, 2004). From this perspective, it is understandable why microfinance institutions are wooing investors and structuring big deals. Indeed, to attract money for their continued poverty alleviation role, MFIs have to play by the rules of global capital markets. Those rules require that MFIs pursue profitability and ultimately full commercial status (Cull *et al.*, 2008; Counts, 2008).

Examples of MFIs that have gone through a process of commercialisation include institutions like BRI in Indonesia, the Grameen Bank, BancoSol, and K-Rep in Kenya (USAID, 2005; INAFI Africa, 2003). Several commercial banks have also downscaled to the microfinance market with examples in Africa such as Equity Bank (Kenya), Centenary Bank (Uganda) and National Microfinance Bank (Tanzania). Institutions emerging from this process form a new market of socially responsible institutions that are financially self-sufficient (hereafter referred to as commercialised institutions (CIs)). CIs generally have the ability to interact, contract and do business with the wider commercial market, while emphasising microfinance clients as their niche market

Collins and Porras (1994: 8-9) have shown that it is possible for visionary companies to embrace change and adapt without compromising their cherished ideals. Change and innovation is important for advancement, but it is also vital for MFIs to cling to the social value of microfinance. Social and economic empowerment to the poor serves as a basic requirement and core service of microfinance to this customer group. A re-innovation of microfinance is therefore an integral component of growth for most institutions in the so-called donor industry. This direction underscores the appropriateness of market reforms, especially in Africa and commercial intermediation of microfinance organisations.

Unfortunately microfinance industry starts from a point of weakness due to investors' negative stereotypes about MFI's risky operations. MFIs are often said to lack professionalism, are small in size, have a weak balance sheet, no regulation, lack good governance and clear ownership, as well as poor investment 'fit' (Tulchin, 2004). But on the contrary, microfinance has defied this perception and attracted private capital from a variety of sources, such as: Citi Group, the United Nations Development Programme (UNDP), United States Agency of International Development (USAID), commercial banks, developing worlds' markets, domestic savings, social investors, and Dexia microcredit fund, and Blueorchard (Arch, 2005; Pollinger *et al.*, 2007; Emeni, 2008; Swanson, 2007; Arvelo *et al.*, 2008). These transactions are living evidence that there is growing strong investor demand for microfinance industry. Arch (2005) also notes that 85 per cent of developing nations' external finance (some of which goes to emerging industries like microfinance) comes from private capital. Hence the debate is not whether microfinance can attract commercial capital, but the factors that determine that attraction.

One important barrier to microfinance success in financial markets is small deal size. As such, transaction costs, due diligence, legal expenses, and custodial arrangements are said to reduce investor returns. Investors are interested in performance and how it relates to their investment. A number of studies indicate that to attract the financial markets to microfinance, licensed and regulated institutions exhibit comparatively high levels of success (Callaghan *et al.*, 2007). An investigation into success factors of MFIs suggests that age, size, legal form, market, ownership and location are critical for tapping capital, good performance and growth (Zapalska *et al.*, 2007).

It is suggested that profits for top tier MFIs are at an appealing stage with some MFIs like Compartamos of Mexico posting comparable returns (50% return on equity (ROE) in 2004) to Citi Group (16% ROE) (Cull *et al.*, 2008). Lewis (2008) also found strong support for the argument that high profits enable MFIs to attract private investment capital (Sengupta & Aubuchon, 2008). Ayayi and Sene (2007) find that financial sustainability is associated with quality portfolio; high interest rates and sound management. At a regional level, a review of commercial investments in microfinance shows that high performance MFIs in Latin America, Eastern Europe and India were more successful in attracting funding unlike Africa (Daley-Harris, 2009). According to the review, Africa suffered from lack of investor attention due to perceived high risk and low-level returns indicating the importance of high returns in attracting commercial capital. The lack of access to finance for African MFIs has led the author to investigate the factors that would enable MFIs in Africa to attract investor funds.

Callaghan, Gonzalez, Maurice and Novak (2007) examine the drive towards commercialisation and conclude that Latin American MFIs are more commercial, Asian MFIs are strong performers followed by Eastern Europe. Their study found that Middle Eastern MFIs rely on equity financing while for Africa standard data was unavailable for comparison. The authors suggest that success for MFIs depends largely on well-trained loan officers, infrastructure development and better trained managers.

UNEP FI (2007) in a survey of commercial microfinance practices across Africa report that, commercial microfinance is a significantly less prominent trend than in Asia and Latin America. The study points out that, Africa attracts a relatively low share of foreign quasi-commercial investment for microfinance – 7 per cent, for example, compared to 28 per cent for Latin America and the Caribbean. The figures for purely commercial investment are predicted to be even lower. According to the report, by 2006, MFIs globally increased commercial funds for their loan portfolios on average by over 70 per cent except for Sub-Saharan Africa.

Confronted with such a situation, MFIs in Africa do not have much of a choice than to make themselves attractive to commercial sources of funding. MFIs in Africa should join the foray of capital markets (including venture capital) like their counterparts in Latin America where

commercialisation has taken root (Jansson, 2003). This includes the struggles involved in attracting commercial funds. In anticipation of strained development finance resources and constrained growth, commercialisation has become a great consideration for many (Hattel & Halpern, 2002).

Currently, external financing is needed to raise growth from current levels. While access to commercial funding is now recognised as the key to long-term survival (NEXUS, 1998: 5; Copisarow, 2001), MFIs have to establish ways of communicating to commercial market sources for additional financing. Hence continued success of the practice of microfinance rests in the commercialisation progress.

Sustainable development in the microfinance sector therefore demands access to permanent and reliable sources of credit finance (Hattel & Halpern, 2002). All other sources seem to have been stretched to the limit of exhaustion, except commercial finance, whose viability is under serious experimentation. This option is believed to have the capacity to rapidly increase the lending levels to the desired scale, as well as fund required growth. The need to close this widening funding gap provides the drive to commercialise access to microcredit finance.

2.3.3 The concept of commercialisation

The word 'commercialisation' is only a recent concept in microfinance. Only in 2007 do we see references and debate on the issue of commercialisation of microfinance or surveys on the subject of commercial microfinance (UNEP FI, 2007; Cull *et al.*, 2008). For example, a UNEP FI (2007) report on more than 30 African MFIs, investors, and other stakeholders surveyed on barriers to microfinance and mechanisms to develop a commercial microfinance approach. Commercial microfinance literature to date reflects insufficient theory documentation and application of commercial microfinance in the industry context. This notwithstanding, the current study attempts to provide a preliminary conceptual and empirical insight on the concept of commercialisation as applied to microfinance.

Christen and Drake (2001) perceive the meaning of the concept of 'commercialisation' as "developing commerce, or managing on a business basis". Poyo and Young (1999: 2) define commercialisation as "the expansion of profit-driven, commercially-oriented financial institutions serving the micro-enterprise market niche". Otero (1997) defines it similarly as "the application of commercial principles to the deployment of financial services to the poor" (Hattel & Halpern, 2002).

All the above definitions have one thing in common: they assume a profit orientation and or a commercial outlook in funding. In addition, a behavioural perspective is implied. This aids in conceiving the evolution process that is involved in commercialisation. This evolution is intended to move the microfinance industry out of the heavily donor dependent arena of subsidised operations

into one in which microfinance institutions transform into a private sector business mode where subsidies are either negligible or non-existent (Kaul & Weitz, 1997; Dunford, 2000).

Cull, Dermirguc-Kunt & Morduch (2008) however argue that commercialisation implies that institutions have the legal possibility of profit sharing to investors. This argument suggests that not-for-profit institutions that cannot distribute profits cannot be said to be commercialised. Hence the drive towards commercialisation according to Cull *et al.* (2008) includes profit-seeking MFIs that have transformed from NGOs. On the contrary Daley-Harris (2009) posts that commercialisation debate should not be reduced to whether an MFI seeks profits or not. Rather the real argument should be on how an MFI balances maximisation of profits and benefits with social improvements in social-economic conditions of its clients.

This study adopts a broader view of commercialisation of microfinance as the outcome of an evolutionary process that banks on consolidated improvements in microfinance practice. This evolution is envisaged to move MFIs from donor-driven grants to a market-driven financing system. As such, a commercial orientation and the decrease of subsidies imply commercialisation. The study underscores commercialisation as the gradual replacement of grant financing with interest-bearing debt. Thus the transition from heavy subsidies to soft loans is taken as a form of weak commercialisation. It is therefore easier to equate the commercialisation process to the increased intake of commercial funding in the balance sheet of an MFI.

A UNEP FI (2007) survey acknowledges that microfinance is evolving from a sector dominated by non-commercial sources of finance, such as development agencies and foundations, to one increasingly attracting private sector or commercial sources of finance. And it is argued that microfinance that is less dependent on subsidised financing could be more market driven and efficient, and will attract further private sector funding (Sengupta & Aubuchon, 2008; Counts, 2008).

In summary, this study conceives the word ‘commercialisation’ to mean either of the following:

- Managing on a business basis;
- Expansion of commercially-oriented microfinance; and/or
- Financing microfinance operations for the poor from commercial sources (Christen & Drake, 2001; Poyo & Young, 1999; Charitonenko, Campion & Fernado, 2004; Hattel & Halpern, 2002; Dunford, 2000; Christen, 2000; ADB 2000; Kiweu & Biekpe, 2009).

This study adopts this comprehensive view of microfinance commercialisation and considers any use of commercial sources as part of the definition.

2.4 AN OVERVIEW OF THE FUNDING ENVIRONMENT AND RELEVANT LITERATURE

2.4.1 Introduction

The literature on microfinance is abundant. However, the majority of the studies tend to be descriptive with thin evidence and tentative research findings due to inadequate data. Early studies in the microfinance sector were faced with the problem of data unavailability for rigorous empirical analysis. Subsequently, a few studies have begun to offer in-depth analysis of specific topics and dimensions even though the existing studies yield inconclusive results on the effects of microfinance on client welfare (Meehan, 2004; Zapalska *et al*., 2007; Mosley & Rock, 2004; Khandker, 2005; Cull *et al*., 2007; Cull *et al*., 2008). These studies have contributed to better understanding of the general issues and emerging trends in microfinance development. The studies and survey cases related to the idea and experience of commercial microfinance are focused on conceptual industry trends rather than on empirical perspectives.

The concern for the search of alternative financing for MFIs was raised in the turn of the 21st century after a survey of leading NGOs in microfinance indicated a decrease in donor support (Carlos & Carlos, 2001; Christen & Drake, 2001; Rhyne, 1998). Otero (1997) acknowledges that commercialisation is inevitably necessary for microfinance to prevail beyond our lifetime (Hattel & Halpern, 2002). McKee (2001b) also states, “Financing growth with commercial debt has become more common in mature microfinance markets”. Certainly the changing landscape in financing microfinance is tending towards the domain of the commercial markets, away from the donor world (Rhyne, 1998; Sengupta & Aubuchon, 2008; Christen & Drake, 2001; CGAP, 2002b; USAID, 2005; Hattel & Halpern, 2002; IFC, 2001).

Microfinance as a poverty-focused industry has long thrived on development aid or donor finance (UNEP FI, 2007). However, to maintain the current level of growth, access to capital sources far beyond traditional supply sources is required (Meehan, 2004; Rhyne, 1998; NEXUS, 1998; Copisarow, 2001). A study conducted by Hartungi (2007), on the success of BRI (of Indonesia) found out that a key factor of the MFI success was the replacement of subsidised credit with loans which apply market interest rates, while still being oriented to low-income groups and small businesses. It is argued (USAID, 2005; Klasen, 2005) that without consistent access to alternative sources of development finance, it is unlikely that the microfinance industry will continue to reach a significant portion of the poor with financial services.

Notwithstanding this observation, a recent survey by CGAP of 144 MFIs from around the world found that over 90 per cent still feel donor funding is the most appropriate form of financing (De Sousa-Shields & Frankiewicz, 2004; De Sousa *et al.,* 2004). Arguably, the largest growth opportunity in the microfinance industry lies in not over-relying on subsidised funding, but in

developing the ability to attract private capital and business links with commercial markets for long-term survival of the microfinance intervention.

A number of studies have emphasised the challenge likely to face MFIs in accessing commercial funds (Callaghan *et al.*, 2007; Counts, 2008; Lewis, 2008; Hattel & Halpern, 2002; ADB, 2000; USAID, 2005; Meehan, 2004). This is expected due to resistance to change, and partly due to the fact that approaches of raising funds from the commercial markets are not well developed. However, the change from traditional approaches in funding (those tied to donations) and transformation process is inevitable if microfinance is to come out of the donor trap. New approaches of raising capital have become important as the sector moves to address current financing constraints (Charitonenko, 2003; USAID, 2005). This paradigm shift in financing will at least achieve two things: enable MFIs to expand their activities to serve larger numbers of the poor; and push MFI managers to engage the mainstream finance system thereby gaining understanding on key drivers of successful attraction of commercial funding.

Pioneers and main promoters of microfinance development admit that the sector must become part of the financial landscape if it is to survive ongoing financing problems. McGillivray (in Hattel & Halpern, 2002) submits that, "there is now largely incontestable consensus that commercialisation is the most 'appropriate' financing strategy for the microfinance sector". This is in contrast with the finding of CGAP (in De Sousa-Shields & Frankiewicz, 2004) and the claim of practitioners, who think the opposite. Clearly, the debate goes on! However, what is not arguable is the fact that the current need for funding can only be met by expanding the funding base of MFIs.

This study addresses the central question of how MFIs can access commercial capital and become part of the larger financial system. The study examines the strategy of commercialisation in general and in particular seeks to contribute to the debate by availing evidence based on African MFIs' experience as well as the extent of integration of MFI financing to the financial markets. It develops the pathway through which an MFI can become part of the financial landscape and investigates the factors that underpin success in commercialising microfinance institutions.

2.4.2 Role of commercial finance in microfinance intermediation

2.4.2.1 Traditional view

The appropriate method of financing microfinance institutions has been a fundamental issue of concern. Proponents of poverty-focused microfinance (Charitonenko, 2003) are of the view that microfinance, as a social product, should not be offered on a for-profit basis. The basis of this argument is that pioneer institutions in the sector did not aim at making a profit – being mostly microfinance NGOs that were favoured by non-commercial capital. This created the unique precedence where funding continued to come from donor sources, until to date – hence the name

donor industry. As a result, allocation of this capital is based on development aims, as opposed to profit maximisation (De Sousa-Shields & Frankiewicz, 2004; Pollinger *et al.*, 2007).

The main concern for unwillingness to adoption of the commercialisation process is understood by international microfinance professionals to be mission drift[16] for an industry mostly driven by a social mission (Lewis, 2008). That is abandoning the plight of the poor by going up-market, or seeking high profits and failing to distribute the same to clients (Christen, 2000; Daley-Harris, 2009; Rhyne, 1998; Dunford, 2000). According to this school of thought, MFIs require loan capital that is not charged on a commercial basis and further argues that embracing commercial practices would hurt their core clients. Hence opponents of commercialisation associate the term to mean changing the course of microfinance, while those in favour of commercial capital intervention argue that this is simply a perception problem.

Supporters of traditional financial approaches argue that there should be more to microfinance than the search for profits (Lewis, 2008; Daley-Harris, 2009). But can the two objectives (profit generation and poverty alleviation) be realised without reneging on the promise of microfinance? The key concern therefore is whether MFIs have the capacity to serve the two masters (Counts, 2008). Critics argue that the two do not go together well, since social concerns of microfinance seem to be opposed to the concern for financial returns. That notwithstanding, a counter argument held by proponents of sustainable microfinance suggests that MFIs have demonstrated combining social service to the poor does not hinder the push for sustainability through profit generation (Lewis, 2008; Bystrom, 2007).

Commercial capital intervention may be unstoppable as it is seen as the way out of the financing constraint currently facing the sector. However, those worried about the negative impacts of commercialisation see this as a way to distort the industry's original focus on poverty alleviation and the social agenda. The issue that needs to be addressed is the relation between new commercial sources for microfinance development and their effect on the provision of microfinance, but not to oppose those exploring and experimenting new approaches. In this study both arguments are treated with equal importance because both are critical to the continued existence and furtherance of the vision of microfinance. However this study underscores the need for an exit strategy, away from captive donor funding that has characterised the industry.

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[16] The conflict on commercialisation and its impact on depth of outreach relates to the trade-off between commercialisation (concern for profit maximisation) and the provision of financial services to the poor and the poorest. Relating to commercialisation studies in Asian countries, Charitonenko *et al.* (2004) show, experience to date indicates that because of the continued existence of a demand supply gap, there has been no negative effects of commercialisation in serving the poor.

2.4.2.2 Commercial view

There is a direct relationship between growth of an organisation and the need for external financing. The higher the rate of asset growth the greater the need for external financing, other things being equal (Upneja & Dalbor, 2001; Zalpalska *et al*., 2007; Vasiliou & Karkazis, 2002). Finance experts argue that any significant growth in portfolio investment must be met with increased sources of finance (Berger, Herring & Szego, 1995; Helwege & Liang, 1996; Berger & Udell, 2001). Proponents of commercialisation then argue that since traditional funding sources of microfinance are unavailable, MFIs should seek for alternative finance sources to scale-up current outreach to the poor (Cull *et al*., 2008; Lewis, 2008).

Carlos and Carlos (2001) state that leading NGOs and MFIs are considering alternative strategies for funding, in the wake of dwindling donor support. Christen and Drake (2001) addressed this issue more candidly through their summary statement that "the drive towards financial self-sufficiency, along with the decreased availability of donor funds, leads microfinance institutions to consider commercialisation as an option for accessing commercial sources of funds". This suggested option for MFIs to explore is a unique solution for building financially sustainable microfinance institutions and mainstream microfinance services. It points to the fact that perhaps other sources of finance could be used to drive forward the agenda of microfinance instead of relying on scarce donor resources.

McKee (2001b) and Charitonenko *et al.* (2004) note that financing growth with commercial debt has become more common in mature microfinance markets, such as Indonesia, Latin America, Bosnia, Uganda, Morocco, Ghana and Sri Lanka. Indeed commercial players are major forces in the microfinance market in a number of countries. Citing the Indonesian experience, Charitonenko *et al.* (2004) state that commercialisation has a positive impact on 'breath' of outreach: "Indonesia is the world's leader in terms of the percentage of microcredit supplied on a commercial basis, and this is estimated to be more than 80 per cent of the industry total".

In support of commercial microfinance, Sukarno (in CGAP, 2001) said commercialisation of microfinance is becoming the order of the day after achieving sustainability, while Christen (2000) in his study of breakthrough MFIs concluded that, "frontier MFIs tend to use commercial approaches[17] to microfinance". The sector is increasingly responding to financial market interests and investor demand. For example, a first rated (securitised obligation loan named BOLD 2007), but second issue in the capital market placed by Morgan Stanley attracted 21 investors (Arvelo *et al*., 2008). Recent studies (Daley-Harris, 2009; CGAP, 2007; Cull *et al*., 2008; Arvelo *et al*.,

[17]It is now established that commercial approaches entail sustainability principles and a market orientation while still fulfilling the aims of microfinance as a pro-poor development agenda.

2008; Meehan, 2004; Charitonenko *et al*., 2004; De Souza *et al*., 2004) show an increasing interest by the commercial markets in financing microfinance. Current portfolio growth in microfinance is heavily contingent upon access to external funding, because of the shift in both allocation for and direction of development finance by donor agencies that have been instrumental in financing microfinance.

Charitonenko *et al.* (2004), in their study of commercialisation in Asia, observed that there is a growing realisation that commercialisation allows MFIs greater opportunity to fulfil their social objectives to the poor with market-driven microfinance products and services. Their study argues, in fact, that commercial MFIs have had a very good record of reaching the poor – in Indonesia and the Philippines, where the commercialisation of microfinance has progressed most. Several examples indicate that commercialisation can lead to an increase in the number of poor and very poor served. This baseline argument points to the fact that the traditional view of microfinance funding is changing, with increased positive trials of commercial microfinance.Economic prosperity for the poor through the microfinance intervention now depends upon capacity of MFIs to access additional capital (Cull *et al*., 2008). It is also evident that donors[18] do not have sufficient resources to inject into the sector due to the huge demand and supply gap – hence the proposal for integration of MFIs to the larger financial system for sustained funding (CGAP, 2002a; Arch, 2005). What is yet to be shown, however, is whether microfinance can become an integrated part of the formal financial system?

Commercialisation in the context of attracting commercial capital is an alternative funding strategy as opposed to waiting on donations. Success in commercialisation determines whether MFIs can survive without donor funding (thus gaining financial independence). Other sources of finance should be encouraged to develop microfinance to enable the industry to make progress towards MDGs, especially for the African continent (United Nations, 2007). Indeed researchers suggest strongly that MFIs should compete with mainstream banks vying for billions of dollars on global markets (Cull *et al*., 2008). The role donor development agencies have played in the development of microfinance so far is not questionable, but continued progress may require that they play a catalytic role in commercialising the sector (De Sousa-Shields & Frankiewicz, 2004).

From the commercial point of view, the practice of commercial microfinance observes the principle of offering financial services to the poor on a sustainable basis, and believes financing should therefore not be tied to donations only. Bystrom (2007) points out that investing in microfinance is also doing well socially since involvement in serving the needs of the poor is an ethical contribution

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[18] The international development community is agreed that additional resources are required to fund microfinance so as to meet millennium development targets.

even if MFIs make profits. In fact, in their study of governance issues in key financial institutions in Bolivia, Dorado and Molz (2005) found that MFIs do combine commercial and social goals very well. In support of co-existence of duo mission in microfinance, Cull *et al.* (2007) analysed a cross-country data consisting of leading MFIs and found little evidence of mission drift versus profit trade-off except for large individual borrowers.

Recent trends towards commercialisation and enthusiasm of the commercial markets in financing microfinance although motivated by the huge funding gap of $300 billion is testimony to the fact that commercialisation is taking root (Meehan, 2004; Cull *et al.*, 2008; Daley-Harris, 2009; Counts, 2008; Lewis, 2008). Perhaps this is due to the revelation that the benefits of microfinance in realising its two bottom lines are real and the two (social and commercial objectives) can co-exist (Counts, 2008). This gives a justification for this study to examine the experience and dynamics of commercial microfinance, as well as the extent of integration of MFI financing to the financial markets.

2.4.2.3 Challenges to commercialisation

Although commercial lenders are willing to increase funding to the sector, to many the decision to finance an MFI is a high risk undertaking (Koveos & Randhawa, 2004). This perception problem poses the challenge of access to commercial capital for a number of MFIs, particularly from Africa. Thus a key hurdle in tapping commercial capital is that MFIs have to be prepared to meet the concerns of the financial markets (some of which are more stereotype than fact based) if private capital is to flow to the sector.

Meehan (2004) observes that the industry is quickly transforming, but its funding approach is still sandwiched between donations and a transition to commercial sources. Donations are said to inhibit or crowd out private capital. In fact, a number of MFIs prefer donations to other forms of capital (De Sousa-Shields & Frankiewicz, 2004). While there is some evolution over time, the donor influence still hangs over the microfinance capital market and for this reason the transition from traditional funding sources to commercial capital has been a struggle for many MFIs. Certainly, an orientation away from subsidised funds is a key requirement for success in accessing market-priced funds, as well as guidance on critical success strategies for tapping into vast capital from the formal financial markets.

There is a strong belief that the microfinance intervention seeks to address social and economic problems of inequality and lack of opportunities. However, it is argued that the idea of social returns required by social investors and donors conflicts with profit mindedness as demanded by capitalists (Counts, 2008; Daley-Harris, 2009; Lewis, 2008). A case in point is given as the Mexican MFI, Compartamos, which raised eyebrows from founders of the microfinance movement citing its kind of microfinance as not acceptable (Cull *et al.*, 2008). Muhammad Yunus and others

(in Cull *et al.*, 2008) pointed out that MFIs should be 'social businesses' but to charge high interest rates that drive high profits means that microfinance has lost its morals. For transforming institutions, the dilemma is how to balance the social mission.

Commercial funding is not optimal, but can be optimised to play a key role in financing fast-growing MFIs. Investors state some of the barriers for increasing the flow of private capital as lack of convincing profitability, weak institutions, and small size of the institutions (Cull *et al.*, 2008; Arch, 2005). For other institutions, there is the fear of risk of financial leverage that comes with high interest debt (Berger *et al.*, 1995). In addition it is argued that the legal form of an MFI or its regulated status is well sought after by investors as it assists in getting standard data for due diligence (Callaghan *et al.*, 2007; Zapalska *et al.,* 2007). Most MFIs operate as informal businesses, while in a number of countries there is no legislation for the microfinance sector. A regulated status means that an institution is allowed to mobilise deposits from the general public, a source of commercial funds. All these factors present a challenge to MFIs and their quest to attract commercial finance.

Commercial lenders or investors find it difficult to create an interest for the costly market of microfinance. The costs are due to information asymmetry for selection of viable institutions: informal nature of the organisations, poor business infrastructure, low efficiency reputation and NGO culture, the cost of loan administration (screening and monitoring), and such efforts (Tulchin, 2004). A great deal of research has focused on these constraints or barriers and other impediments (Hattel & Halpern, 2002; UNEP FI, 2007).

When firms commercialise an innovative business model (new interface), they face two major challenges (Ziamou, 2002): Firstly, to identify how the new innovation can function optimally, and secondly, to effectively communicate with relevant markets to reduce uncertainty about the new innovation's performance. Microfinance has dealt with the first issue quite successfully. However, the second is the biggest challenge because of the need to talk to other capital owners other than the traditional promoters of the industry. As has been argued before, the outcome can determine the success or beginning of problems as lack of funding intensifies due to the growing funding gap.

Despite the encouragement of donors towards commercialisation of microfinance, the results indicate that the sector is still dominated by NGOs that do not thrive on commercial finance (Cull *et al.*, 2008). A study of the global leading MFIs suggests that NGOs, self-help groups and non-bank financial institutions serve over 50 per cent of 94 million borrowers captured by the mix market database (in 2004) and subscribe to donations (Cull *et al.*, 2008). Surprisingly, institutions with the ability to attract commercial capital only served 17 per cent of the 94 million borrowers. Callaghan *et al.* (2007) also found that less than 25 per cent of the capital for the top-tier MFIs comes from private sources. Arch (2005) agrees that it will take time, probably in the medium or

long term for microfinance to easily tap expensive market funds. This is clear evidence that there are issues that stand in the way of attracting new and commercially-oriented capital.

The communication problem remains the main bottleneck to the 'ease of doing business' between the financial markets and MFIs. Although effort has been made to understand the microfinance context through evaluations and appraisals, ratings and lessons learnt studies, there has been very few studies done to reflect the perspective of the financial markets. It is suggested that this is the 'missing connection' to the vast money markets. MFIs need to understand what alternative fund markets require, and therefore attain necessary capacity to engage them. Then the capital flow can begin!

The incoming of commercial lenders will not only provide capital but also provide increased transparency, promotion of commercial loans in microfinance, enhanced credibility and a positive signal to other fund providers, as well as MFI reputation intermediation (Black & Gilson, 1998). Hence a major role for commercial finance is to establish and build a refinancing capability for profitable operations of microfinance. This will lead to commercial finance becoming a key financing consideration and could be the final switch for the relationship of MFI funding with the larger formal financial system.

2.5 GROWTH AND FINANCING

Financing for growth and development of the microfinance sector has been through donor finance and retained earnings and, in a limited manner, through savings deposits. These two financing sources have dominated the scene until lately when donors declared they no longer have enough funding to carry through the development of the sector due to financing limitations (CGAP, 2002a; Cull *et al*., 2008). Consequently, MFIs have to search for growth capital outside the donor community.

The growth of a firm is sometimes related to the manner of financing and therefore financial structure. It has been established that as a company consolidates its products and delivery processes in the marketplace, it becomes a candidate for external funding (Jeng & Wells, 2000). Consequently, as MFIs grow and expand, their need for external funding increases by the day. Emeni (2008) indicates that for MFIs to grow their institutions, they will have to rely on international capital markets rather than donated capital.

Financial market literature also suggests that commercial banks play a key financing role in the early stages of growth, and capital markets come into force in the later stages of development (Zapalska *et al*., 2007; Berger & Udell, 2001). Indeed, Lewis (2008) argues that for MFIs to grow faster, they will require commercial funding to come through for each one of them. He cites the

example of Compartamos in Mexico which grew its clientele more than ten times in six years by accessing commercial capital (Cull *et al.*, 2008).

In general, firms either grow fast, slowly or they do not grow. The growth rate is related to the form of financing – internal or external – according to experts (Vasilou & Karkazis, 2002; Upneja & Dalbor, 2001). Most firms however have limited access to growth funds. If growth of total assets is at a normal pace, this can mostly be achieved through retained earnings or internal sources (Helwege & Liang, 1996). However, when there is higher asset growth than what can be supported internally, this calls for external financing. In most cases firms have limited access to growth funds, because of financing constraints or other reasons.

Literature suggests that as MFIs grow and become significant players in financial intermediation for the poor, they acquire increased debt capacity that often leads to higher profitability and growth (Upneja & Dalbor, 2001; Vasiliou & Karkazis, 2002; Ozkan, 2001). This underlines the demand for external resources and the need thereby to balance growth needs (total asset growth percentage with equity). The maximum growth rate achievable without external finance[19] is measured by sustainable growth, estimated by ROE in the asset model (Vasiliou & Karkazis, 2002). An increase in assets must be financed from either external funds, or internally generated funds (Gibson, 2002). Thus, as suggested by Watson and Wilson (2002), growth rate of assets can be demonstrated by the following equation:

$$A = 1 + E \qquad \text{...(2.1)}$$

Where A is defined as asset growth (total asset growth %, TAG, or impact of total financing, I = internal resources (mainly equity and retained earnings) and E = external financing (savings and or borrowings) (Hendricks & Singhal, 2001). An increase in (I) or (E) determines the growth rate of (A)**.** A firm's potential to grow relative to demand size of the market, is dependent on its ability to finance operations from retained earnings – estimated by ROE or net income divided by average equity (Demirguc-Kunt & Maksimovic, 1998).

[19] Or with limited external financing (Demirguc-Kunt & Maksimovic, 1998).

Holding (E) constant, the maximum growth rate that can be sustained using internal finance depends on growth rate of ROE. This growth rate is called sustainable growth rate (SGR) or internal growth rate (IGR) and is given by the expression:

$$IGR = \frac{(ROA*b)}{(1-ROA*b)} \ \ at\ time\ t-1 \qquad ...(2.2)$$

Where b is the retention rate (i.e. the proportion of net income retained by the firm), and ROA is return on assets.

That is, growth in $A = IGR + E$ ...(2.3)

Balanced growth occurs if an MFI grows its (A) at the same speed as ROE or IGR. It therefore follows that if (A) grows faster than IGR or ROE,, then (E) must be pushing that growth. That is, to burst balanced growth rate, a firm will have obtained external funds for the purpose. Access to external funds will enable the firm to grow beyond internal capacity and thus position an organisation for faster growth. If there has been a higher asset growth that is not supported internally, the question often asked is, how was the growth financed? The asset growth model therefore suggests a strong positive relationship between fast growth and external financing. The above argument can simply be expressed as (see Demirguc-Kunt & Maksimovic, 1998; Vasilou & Karkazis, 2002):

Total asset growth % $\mathrm{TAG} > \mathrm{ROE}$ ...(2.4)

In other words, the faster the growth of assets, the more i(E) is needed. Commercial banks particularly must know their IGR maximum, because of capital ratio requirements. Their TAG must not exceed ROE/IGR else they distort the capital ratio and violate Basle-accord rules (Harris & Raviv, 1990; Hendricks & Singhal, 2001). Upneja and Dalbor (2001) argue that following the growth opportunity hypothesis, rapidly growing firms often want to use debt. Vasiliou and Karkazis (2002) also suggest that firms can grow faster than the maximum constrained growth as defined above. This has the implication that fast growth as measured by a firm's asset base, pushes an MFI to seek external financing. Consequently, the asset growth model suggests a strong relationship between fast growth and external financing.

Using the balance sheet identity: $\mathrm{A} = \mathrm{L} + \mathrm{E}$ ...(2.5)

Where (A) = total assets, (L) = total leverage and (E) = total equity. It can be demonstrated that growth in (L) or (E) drives growth in (A) and must be financed from one of the two sources. To assess how firms grow and at what speed (fast or balanced); it is worth looking at the two types of maximum constrained growth rates, using the asset growth model. The asset growth model defines constraint growth as, "The maximum annual increase in assets attainable by maintaining a

constant ratio of assets" (Demirguc-Kunt & Maksimovic, 1998; Vasilou & Karkazis, 2002; Upneja & Dalbor, 2001).

The above definition assumes debt acquisition, no dividend payment and that an MFI obtains enough short-term debt, as long as the financial structure is not altered (Demirguc-Kunt & Maksimovic, 1998). This is referred to as sustainable growth rate (SGR) and approximated as:

$$SGR = \frac{ROE}{1-ROE} \quad at\ time\ t \qquad ...(2.6)$$

The conditions for this fast growth are that there should be no equity issues (IPOs) nor any increase of leverage that distorts debt ratios. That is, the annual increase in assets attainable by maintaining a constant ratio of assets – debt with no dividend payment should only be possible by obtaining enough short-term debt, as long as the financial structure is not altered. Obviously faster growth than SGR presents a financing problem which forces an organisation to depend on external finance to relax the financing constraint.

The above growth hypothesis thus argues that fast growing firms often use debt to grow (Upneja & Dalbor, 2001). The theoretical model (Demirguc-Kunt & Maksimovic, 1998) states that when total asset growth (TAG) is related to inflation, it indicates whether there are opportunities for growth of an industry or a firm. In the same way, a relationship between growth in retained earning (ROE), and inflation would suggest a firm is financially healthy and able to generate sufficient cash flow to maintain the cost of capital. On the other hand, if ROE exceeds the lending rate, often measured by 90-day treasury bill rates, it indicates that an institution is able to not only capitalise equity, but also post returns that cover the cost of commercial debt rate.

From a banking perspective, the biggest asset (often prescribed to be 70%-80% for an effective structure) in the balance sheet of any financial institution is the loan portfolio (Mosley & Rock, 2004; WOCCU, 2003). Growth of portfolio as the main asset therefore leads to demand for external finance. It is not surprising then that finance experts submit that for microfinance institutions to grow faster and serve more poor clients, their need for commercial funds will increase (Lewis, 2008).

Ozkan (2001), Harris and Raviv (1990) concur that expected bankruptcy costs for high-growth firms are high. And for this reason bank regulators are typically concerned about the growth rate of assets and deposits of financial institutions (Kolari, Glennon, Shin, & Caputo, 2002). Hence this theory suggests that for high-growth firms like MFIs, there is need to balance the demand for commercial funding and financial distress. Particularly now that most MFIs are not subject to regulation, increased intake of debt can cause instability in the financial system should failure occur. Lewis (2008) also posts, in relation to the social objective of microfinance; MFIs must balance the power of capital markets when funding faster growth to avoid exploiting the poor.

Indeed, Pollinger *et al.* (2007) declare that financial leverage is only possible if an organisation is able to generate profits to repay the cost of debt.

2.6 BUSINESS FINANCING THEORY AND MARKETS

It is noted that as organisations grow and develop, their capital structure patterns change significantly (Cull *et al.*, 2008; Koveos & Randhawa, 2004). MFIs have had rapid growth in recent past, fueled by access to commercial funds (Lewis, 2008). As they grow and become significant players in the financial services market; they begin to diversify their sources of finance. In fact, CGAP (2007) notes that greater funding diversification makes decisions on capital structure complex for MFIs. Capital structure generally means the proportionate relationship between different forms of financing but it can be distinguished from financial structure – accounting-wise (Helwege & Liang, 1996; Watson & Wilson, 2002; Gibson, 2002).

The financial claims to the entire assets side of the balance sheet define the financial structure of a firm and all items constitute sources of finance. Capital structure, on the other hand, refers to the way net assets are financed, thus excluding some financing options (Watson & Wilson, 2002). Capital structure is generally used to convey the proportionate relationship between different forms of financing (Helwege & Liang, 1996). Thus for most of the discussions on capital structure, they refer to the dichotomy between debt and equity financing options. It is thus more appropriate to talk in terms of financial structure for MFIs, as short-term debt and savings finance form significant parts of the assets of these financial service organisations. Part of this study looks at the pattern followed by MFIs in financing their operations.

To explain financing behaviour of firms, researchers have examined the capital structure (Graham & Harvey, 2001; Shyam-Sunders & Myers, 1999; Gibson, 2002). The examination of changes in the structure over time aids in understanding how organisations make their financing decisions and choices between different sources of finance. Each type of finance has an associated cost, some direct and others indirect. Consequently, the mix and composition of financing types is very important to firms, including MFIs.

Researchers have advanced two competing modern finance theories which seek to explain how firms make financing decisions: static trade-off model and pecking order model (Watson & Wilson, 2002; Harris & Raviv, 1996; Shyam-Sunders & Myers, 1999; Myers & Majluf, 1984; Chen, 2004; Graham & Harvey, 2001). Each model provides certain propositions for factors that determine capital or financial structure. These determinants are the centre of investigations done by researchers to try and find support for either of the models. The two main models are offshoots of seminal theories of capital structure of Modigliani and Miller (MM) propositions (Berger *et al.,* 1995).

The trade-off theory looks at the capital structure and broadly recognises two main choices of capital: debt or equity (Ozkan, 2001; Helwege & Liang, 1996; Chen, 2004). This model suggests that there exists an optimum capital structure and this is where the balance (trade-off) lies between the tax shield of debt and increasing agency-financial distress costs associated with high debt levels. This assumption further implies that the debt versus equity financing decision is related to tax effects and firm value or cost of capital. Debates still abound on this theory as models' explanatory power has been weak (Watson & Wilson, 2002; Chen, 2004; Upneja & Dalbor, 2001). Tests executed to prove or disprove this model have generated key factors associated with this type of financing theory, which have provided the hypothesis tested in this study.

For example, Helwege and Liang (1996) find that the more profitable firms use less leverage (debt), while Upneja and Dalbor (2001) find support for the association between firms and use of debt. On the other hand, Chen (2004) found that Chinese firms seem to follow a new pecking order. CGAP (2007) found that MFI managers base decisions on financing options purely on price. This lack of consideration for other factors affects flexibility and long-term solvency of MFIs.

While evidence for the trade-off theory is mixed, researchers testing the pecking order theory and associated asymmetric information theory for small firms have been able to link it to changing patterns in firms' financing decisions (Helwege & Liang, 1996). Under this theory, it is proposed that firms prefer internal finance sources (equity and/or retained earnings); and when these sources are limited, then, external finance is sought. The riskiness of the firm determines the type of finance preferred. If additional external funds have to be acquired, the pecking order theory dictates that debt or loan would be preferred rather than raising equity. Going by this explanation, proponents of this theory suggest that over time this process leads to the financial structure of firms.

The pecking order theory (POT) was developed by Myers (Myers & Majluf, 1984) as an alternative model, and looks at preferences for broad sources of finance and the pattern it follows over time. This model pays attention to finer details (first retained earnings, and if not sufficient, safe debt, next risky debt, and finally under duress, equity finance) on sources of finance, and emphasises an order where internal sources (mainly retained earnings or own capital) are preferred before external capital is sourced (Watson & Wilson, 2002). The model states specifically, that firms finance activities with retained earnings when it is feasible to do so. But when retained earnings are not adequate, debt is used and only in extreme cases will firms issue new equity finance (Shyam-Sunders & Myers, 1999; Graham & Harvey, 2001).

The pecking order thus identifies Myers' (1984) alternative model to financing choices (Graham & Harvey, 2001; Frank & Goyal, 2002; Watson & Wilson, 2002). In summary, the model states that the financing order is the observed pattern of management's decision for choice of source of

finance over time. The model thus produces management's preferences for broad sources of finance and the pattern it follows. Latest evidence suggests that this pecking order behaviour in financing is what leads to the financial structures we see in balance sheets of organisations (Watson & Wilson, 2002; Chen, 2004; Gibson, 2002; Harris & Raviv, 1998).

There is strong support of the pecking order theory among small firms (Gibson, 2001; Berger & Udell, 1998). The theory suggests that firms would first be financed from their own capital and retained earnings, and as they grow and begin to require external capital, debt acquisition will follow. The pattern dictates that all forms of debt would be exhausted before equity financing is employed. As it were, this pattern of financing is what determines the financial structure particularly for small firms. This financing pattern is very closely linked to that of MFIs, whose evolution moves from owner's capital, retained earning and donor quasi-equity, soft loans, securitised debt, commercial finance and equity financing. Microfinance seems to have exhausted the internal options for its financing and now it is starting to demand external finance. Based on this proposition, it is argued that debt financing (commercial finance) is a natural consequence of the POT (Cull *et al*., 2008, Counts, 2008).

It is to be observed that, to date, evidence regarding relative explanatory power of the trade-off and pecking order theories are neither here nor there; and that studies in this area still continue the search for the truth (Watson & Wilson, 2002). The intriguing question is: Why all this interest in financial/capital structure? The reason for all this effort is that debt can hurt! Hence better understanding of how firms make financing decisions and the motivation for those decisions will result in guiding principles that avoid financial distress costs associated with high debt levels. More recently, however, the focus is on what causes changes in a firm's financial structure over time (Watson & Wilson, 2002).

Koveos and Randhawa (2004) disclose that, as MFIs evolve, their funding patterns change from donor dependency, to commercial capital and from equity to mobilisation of deposits. Investigations by other researchers suggest that most investors do not require a financial return and only a minimal dividend on equity investing (CGAP, 2007). Based on this analogy, the trade-off is only between debt and equity where the financing decision is biased on cost considerations. Consequently the financial structure is not clear and is difficult to predict. In sharp contrast, Pollinger *et al.* (2007) state that for MFIs, the pecking order swings from donations or grants that have no repayment expectations to subsidised funding and when this is not available, savings deposits and funding from the open market which is very expensive.

The pecking order theory recognises that investors do not have the same information with firm managers and can only make interpretations (Shyam-Sunders & Myers, 1995). That is, investors usually face problems with information when making investment decisions; while managers try to

minimise costs and maximise value (they have a common interest with shareholders) against new investors. This assertion implies that MFI managers are key in wooing investors depending on the signals they generate from their organisations. For example, managers would decide to undertake ratings when they know the financials are good, and submit funding proposals to donor agencies when they have social impacts to show.

Although evidence regarding relative explanatory power of the trade-off and pecking order theories are not conclusive, a number of studies focusing on what causes changes in a firm's financial structure over time (Watson & Wilson, 2002; Chen, 1999) seem to associate the POT with SMEs, where MFIs fit in (Berger & Udell, 1998). A major contention of the POT is that asymmetry (imperfections) of information provision for financing decisions gives rise to pecking order preferences. Specifically, it is argued that small firms have no reputation, and financial leverage is highly sensitive to information production. Other propositions linked to POT are that debt financing is positively associated to profitable firms, high-growth firms, to big size and to the low-risk profile of lending institutions (Upneja & Dalbor, 2001; Vasilou & Karkazis, 2002; Barrios & Blanco, 2003; Konish & Yasuda, 2003; Ozkan, 2001; Demirguc-Kunt & Maksimovic, 1998).

In summary, few studies provide evidence on how MFIs make finance choices – reasons include information opacity and general data problems at small firms (Gibson, 2002; Cull *et al.*, 2008; Zapalska *et al*., 2007; Daley-Harris, 2009; Berger & Udell, 1998). Researchers have attempted to explain and understand capital structure decisions made by managers in a variety of industries, using different approaches (Graham & Harvey, 2001; Frank & Goyal, 2002; Harris & Raviv, 1998; Ozkan, 2001; Helwege & Liang, 1996; Chen, 2004; Watson & Wilson, 2002).

Since days of Modigliani and Miller (MM) models in 1958, two approaches were used: Valuation and income related to firm value and capital structure (Helwege & Liang, 1996). The income approach relates more to this study because it looks at the motive for use of debt and the desire to increase return on equity.

This study's operational definition for debt finance is the total funds raised from all interest-bearing debt contracts, including savings deposits, bank overdrafts and guarantees, short- and long-term debt financing etc., as long as such investment funds offer a commercial proposition. This source of funding has not been accessible for MFIs and is the main subject of investigation in this study. As a result of failure to access commercial funding, the microfinance industry entered into a problem, which this study simply refers to as 'funding trap'. For a long time, MFIs have been limited to donor funding but in the last decade, this source has come under serious deprivation (CGAP, 2002a; Callaghan *et al*., 2007; Counts, 2008; Bystrom, 2007; Sengupta & Aubuchon, 2008; Lewis, 2008). It is suggested this situation is not sustainable; since it is limiting and leads to a funding

trap! The donors cannot meet the global demand for microfinance and this raises a serious question: Where does this leave the future of microfinance, particularly in Africa?

MFI CEOs are under tremendous pressure to augment the needed funding for continued lending in microfinance. The reason for this pressure is because of the issue that is raised in this study, namely, microfinance institutions have difficulties going to the financial markets. This is an emerging industry and as such, many fail to meet the conditions while some of the criteria imposed by commercial lenders are not clear to the institutions. This study seeks to provide evidence on the influence of hypothesised variables on commercial financing decisions of African MFIs. That is, key driving forces behind commercial capital flows. The research also suggests how MFIs can break free from this funding trap with regards to options on making financial decisions and possibly insight into developing an exit strategy from captive donor funding.

2.7 CRITICAL SUCCESS APPROACH: EXPLORATORY FACTOR ANALYSIS

In this section a review of critical success factor approach is undertaken with a view to understanding the interaction of success factor groupings and for data refinement. Factor analysis was specifically used to screen predetermined factors from a data set of related variables for new dimensions and for purposes of data reduction. Critical success approach is an accepted method for corporate strategic planning that helps in obtaining principle components from a set of data (Chen, 1999). This method is based on the technique of factor analysis that aims to identify factor structures present in a set of variables (Child, 1970). By running factor analysis tests, one is able to identify a small number of factors (with minimum loss of information) that represent relationships among a set of interrelated variables (Sureshchandar, Ranjendran & Anantharaman, 2002).

Rochart (in Chen, 1999) first defined the concept of critical success factors in 1979 as the “limited number of areas in which results, if they are satisfactory, will ensure competitive performance for the organisation”. Boynton and Zmud (in Chen, 1999) also defined critical success factors (CSF) in 1984 as the “few things that must go well to ensure success for the manager or an organisation”. These authors emphasise the fact that CSFs highlight key performance requirements for achieving success in a defined strategic direction. This method enables the researcher to describe a group of reliable measures from a large set of variables where attention must be focused and where things must go right.

The general purpose of factor analysis is to summarise information requirements and unearth underlying factors that illustrate relationships among a set of interrelated items. Factor analysis uses principal component extraction method on raw data (Hartungi, 2007; Antony, Leung & Knowles, 2002; Mazzarol, 1998; Goosen, 2002; Child, 1970; Chen, 1999). In the exploration process, factor analysis brings out the relationships between variables involved through a rotational process called varimax. A varimax matrix indicates if there are common factor structures

by use of values called factor loadings that usually present variable relationships and provide basis for data interpretation (Hopkinson & Pujari, 1999). As per this analysis, only identified factors having Eigenvalues greater than 1 are considered significant (Harman, 1976; Child, 1970; Chen, 1999) and suitable for extraction.

For example, in an attempt to find the CSFs for total quality management in Hong Kong industries, Antony, Leung and Knowles (2002) identified seven CSFs (from 72 questionnaire items) that gave high factor loadings (that is factor loadings > 0.55) to indicate their importance. The seven CSFs were extracted from a list of 38 items that met the criteria for extraction.

Chen (1999) derived four CSFs in the banking industry:

i) Ability of bank operation management;
ii) Ability of bank marketing;
iii) Ability of developing bank trademarks; and
iv) Ability of financial market management.

Using factor analysis of the CSFs for educational institutions that seek to market themselves internationally, Mazzarol (1998) managed to identify four underlying dimensions. And in a consideration of credit criteria used for evaluating mortgage loans, Liu and Lee (1997) identified eight important components and named six as follows:

i) Market price of collateral;
ii) Loan to value ratio;
iii) Borrower education level;
iv) Marital status;
v) Sex; and
vi) Terms of the mortgage.

In understanding success factors for microfinance institutions in developing countries, Hartungi (2007) used the critical success method. Specifically critical success factor analysis was carried in BRI (of Indonesia) to identify factors that have contributed to its success as a leading MFI in Asia. The findings indicated that successful MFIs replace subsidised credit products with those which apply market interest rates while being oriented to low-income groups and small businesses. Another measure of success was identified as the attraction of clients that use loans for productive activities. Rungasamy, Antony, and Ghosh (2002) also analysed a set of twelve factors using factor analysis approach on a statistical process control of United Kingdom (UK) small and medium enterprises.

The study findings revealed the order of importance as follows:

- Management commitments;
- Process prioritisation;
- Control charting; and
- Teamwork.

CSF identification helps management take steps to improve potential for success. They provide management with a measure (rating tool) on which improvement efforts can be focused. In the context of current study, the CSF approach is used to measure the relative importance of key considerations for commercial lending for further investigations and statistical validation. The relevance of the CSF approach is seen in its ability to aid preliminary screening of factors that enable MFI to pursue commercial microfinance with ease. Given the identification of factors that matter for success in commercialisation, MFIs could be guided in their internal capacity and sense of preparedness. Management is therefore better informed on the likelihood of success, as well as areas where it must direct its efforts to win the financial markets.

CHAPTER 3
DATA AND RESEARCH METHODOLOGY

3.1 INTRODUCTION

This study has two main parts: I and II. Part I is an exploratory study for evaluating commercial lending factors on their relative importance to commercialisation. Factor analysis was used to analyse the data for critical success factors. Some of the identified lending factors are subsequently subjected to further analysis as part of the 33 variables investigated in Part II. A further objective of factor analysis test in Part I was data reduction due to large number of items. For the larger part, the raw data used was obtained from the author's detailed analysis of the work of various authors in prescription and conception of potential success factors augmented by additional factors obtained from case studies by microfinance experts (Cull *et al.*, 2008; UNEP FI, 2007; Zapalska *et al.*, 2007; Arch, 2005; Counts, 2008; Sengupta & Aubuchon, 2008; Emeni, 2008; Lewis, 2008; Callaghan *et al.*, 2007). The data for this analysis is detailed first in Section 3.2 and the statistical methods applied for each set of data together with theoretical justification. The factor identification process, research methods used and tests carried are also given. In addition, the resultant data that forms input to Part II is also outlined.

Part II is an empirical study that shows rigorous tests on the significance of success factors identified from Part I with respect to commercialisation. This part is presented from Section 3.3 and uses statistical tests like logistic regression analysis, estimation methods and modelling procedures. The main tests here are aimed at further understanding of the dimensions important for attraction of commercial funding for MFIs, as well as refining and validating the results obtained from earlier processes. This part of the study uses data from two sources, namely: secondary data and input data from Part I.

3.2 PART I: POPULATION AND SAMPLING

The following paragraphs describe sources of data, purposes and the tests undertaken using each piece of data in Part I. The sampling frame is also explained, as well as the data collection instruments.

The first phase of Part I was taken as pilot research and used perceptions and experiences of people involved in commercial microfinance in the industry worldwide (Thiagarajan & Zairi, 1998). The target group was drawn from informed international players committed to promoting commercialisation and/ or those responsible for lending decisions.

The population was defined as proponents of commercialisation and interested commercial actors in microfinance. The panel of experts list was drawn largely from 117 participants of a conference on challenges to microfinance commercialisation convened at the World Bank in June 2001 and investors list (CGAP, 2002c). The objective was to get agreement (clarify importance) on the comprehensive set of factors and practices that are believed by the wider microfinance fraternity/academics and industry experts to have an impact on access to commercial funds.

Simple stratified random sampling was applied on a broad-based group of industry 'experts' representative of proponents of commercial microfinance, from operational regions in Africa, Asia, the Americas and Europe. From each region a number of experts were randomly selected. The sampling process was augmented with the author's scan to ensure industry coverage. This group formed the respondents of the survey instrument. The respondents of the 53-item questionnaire included:

- Lenders or fund providers;
- Microfinance technical advisors;
- Donors and national government agencies that provide funding to MFIs;
- Advisors and consultants in microfinance;
- Social investors;
- Rating agencies; and
- Bankers involved in lending to microfinance.

3.2.1 Part I: Survey design and success factor determination

The literature provided an applicable list of potential success factors in the context of the microfinance and money lending industry. A critical aspect in the evolution of a fundamental theory in any management concept is the development of good measures that enable the researcher to obtain valid and reliable estimates of the domain of interest (Sureshchandar *et al*., 2002). The development process began by first substantiating adequate representation of the constructs; with the aim of identifying relevant interventions (valid factors) that are vital for success in commercial lending. Based on a comprehensive study of economic literature, finance and banking theory, the factor items were assembled.

A pilot questionnaire was designed to measure the individual's perceptions of the relative importance of a set of possible factor considerations for commercial lending. The initial questionnaire was presented to academics and other microfinance reviewers for refinement on construct and face validity (Kelsey & Bond, 2001; Goosen, 2002; Sureshchandar *et al*., 2002). This group was used as a control group to confirm validity of the content for the list of 53 potential success factors. This exploratory approach was intended to ensure a complete list of commercial lending practice criterion dimensions. A final list of 53 potential success factors of MFI access to

commercial funding was collectively identified. As expected, these factors are quantitative in nature although some are represented in the 33 quantitative variables used in Part II of the study. A sample of the questionnaire identified as MEP (Microfinance Experts Panel) can be found in Appendix E.

3.2.2 Part I: Survey framework and approach

The Microfinance Experts Panel (MEP) 2002 survey document consisted of three parts:

i) Part one contained 53 potential success factors;

ii) Part two consisted of question number 54 meant to test the completeness of the dimensions of commercial microfinance.

iii) In recognition of the disparity of evaluation criteria, Part three (question 55) sought to find the respondents' experience of the five most important considerations in lending practice.

In the MEP 2002 questionnaire, the 'experts' were asked to indicate the importance of each of the 53 potential success items on a Likert scale of 1 to 4, ranging from ‘Not important’ to ‘Very important’ respectively. A rating of ‘0’ on the scale provided for non-response or ‘No Opinion’ which was also a measure of item inappropriateness/validity of the item. The Likert measurement examined the respondent's perception and experience of each item's importance rating to commercial lending decision.

The survey used a personal contact approach in collecting the views of informant respondents (Sureshchandar *et al.*, 2002). That is, respondents were personally contacted and the survey explained to them in detail. An attached letter solicited and exalted the recipients to participate in the study. The internet was used as the method of gathering data, especially the email facility. This method was chosen because of the advantage of sending the survey document to a large number of respondents spread across the globe simultaneously and cheaply.

A total of 117 emails were sent to MEP experts in 17 countries that formed the operational base of the respondents. An attached official letter (see Appendix F) introduced and explained the purpose of the study (Chen, 1999). The respondents were asked to contact the author for any clarification, and indicate their consent for participation. From these 117 contacts, a total sample of 44 respondents committed to participate in the survey after periodic follow-ups. Securing agreement to participate was not easy. The MEP 2002 survey document was sent to the 44 experts in the sample, with clear instructions. A final usable sample of 36 replies was returned representing a 30.7 per cent response rate.

3.2.3 Part I: Factor analysis

Factor analysis method was employed to identify factors that contribute to success in commercialisation for MFIs in Africa (Hartungi, 2007; Zapalska *et al*., 2007). Factor analysis aims to summarise information requirements and unearth underlying factors that illustrate relationships among a set of interrelated items. This statistical approach was selected because of its ability to identify a small number of factors that are critically linked to the domain of interest and to group similar structures together. That is, it helps to understand interrelationships of factor items as represented by factor loadings (Zhang, Waszink & Wijngaard, 2000; Lekkos, 2001; Sureshchandar *et al*., 2002). Besides, it is also easy to use and interpret.

A key objective in undertaking factor analysis in this study was to reduce the set of variables to a smaller number by summarising the information contained in the number of original items/predictors with minimum loss of information (Child, 1970; Chen, 1999; Hopkinson & Pujari, 1999; Jain, 2001; Nunes, 2002; Liu & Lee, 1997). The basic assumption is that each variable can be expressed as a linear combination of hidden factors that affect the variable and possibly other variables (Jain, 2001). The other objective was to avoid both the problem of multi-collinearity among explanatory variables and the possibility of some variables masking others. The author had a feeling that the variables were too many in the analysis and therefore without finding a way of focusing on the critical ones, strategic fit in the model could be lost.

Given that the 53 success factors of commercial lending were pre-determined by the author it was necessary as a first step to, firstly, reduce the factors items to only those that are important for further investigation in subsequent tests and validation using other methods, and secondly, to use this analysis to identify suitable dimensions for commercial lending (Lekkos, 2001). In the former case, factor analysis was then used as the method of identifying the best proxies to be included as part of the 33 variables (used in Part II of the study) in developing a prediction model.

Factor analysis uses principal component extraction method on raw data (Hartungi, 2007; Antony, Leung & Knowles, 2002; Mazzarol, 1998; Goosen, 2002; Child, 1970; Chen, 1999). In the exploration process, factor analysis brings out the relationships between variables involved through a rotational process called varimax. A varimax matrix indicates if there are common factor structures by use of values called factor loadings that usually present variable relationships, strength of correlation between variables and provide basis for data interpretation. This method uses Eigenvalues to determine importance or suitability of data for factor extraction, the closer this value is to 1.00. However, only factors having Eigenvalues greater than 1 are considered significant for factoring (Harman, 1976; Lekkos, 2001; Mazzarol; 1998; Goosen, 2002; Child, 1970; Chen, 1999).

Factor items must relate to each other for an appropriate factor model. Where the correlation is too small (as shown by factor loadings <0.55), it is unlikely that the items have some property in common. Hence such items are not grouped together. The procedure is able to indentify suitable factor models that meet the criterion of more than one Eigenvalue, as per Kaiser's criterion (Antony *et al*., 2002; Mazzarol, 1998; Lekkos, 2001; Chen, 1999; Nunes, 2002). CSF approach helped to understand the importance attached to the set of evaluation criteria used by industry players.

Under factor analysis method, the interpretation of factor loadings within a model is crucial and proceeds as follows:

- Absolute factor loadings greater than 0.3 are considered significant;
- Loadings of 0.4 as important;
- If loadings are 0.5, 0.6 or greater, they are considered very good and significant (Antony *et al*., 2002; Goosen, 2002; Zhang *et al*., 2000; Hopkinson & Pujari, 1999).

High factor loadings suggest that the variables or items are critical and indeed such variables are best choice representatives of the corresponding factor (Antony *et al*., 2002; Mazzarol, 1998; Lekkos, 2001; Chen, 1999; Nunes, 2002). The higher the value of the loading the better, and indeed these items provide the flavour of the factor and in naming of the factor dimension in the selection process. Results of the analysis are presented in Chapter four.

3.3 PART II: DATA AND VARIABLE DESCRIPTION

This section introduces data used in Part II of the study and the statistical methods used for analysis. The data set represents largely the global microfinance industry statistics, covering 435 MFIs, 68 investors and 112 partners as at the time of this study. Its made available by the microfinance information database (Microfinance Information eXchange, MIX) and accessed at http://www.mixmarket.org (Cull et al., 2008).

The MIX MARKET™ is the world's largest microfinance database containing outreach and impact data, financial data and audited financial statements in addition to country relevant macro-economic and social development indicators (Cull et al., 2008; Cull et al., 2007). Part II of the study therefore used cross-country data of 103 African MFIs sampled from the MIX MARKET™ web-based database. See list of sample MFIs in Appendix D.

This database is particularly interesting to the study because it consists of firms that are keen in wooing investors. It gives an opportunity to post information necessary to lenders and other social investors, themselves in search for investment MFIs. In this sense it is seen as a way of exposing the microfinance sector to would-be commercial lenders so that the latter can play a more active role in the sector's development (CGAP, 1997; CGAP, 2002c). The argument is that potential investors do not have sufficient information to make lending decisions and MFIs are not aware of

potential development partners besides their main donors, yet they need to entice other players in the industry with capacity to offer vast amounts of finance (Hattel & Halpern, 2002; McKee, 2001a).

3.3.1 Part II: Data collection and sample description

In this section, the data collection procedures for Part II of the study and sample formation is described. The sampling frame consists of the total population of African MFIs posting data on the MIX between 1998 to the end of the calendar year 2003. This constituted 188 African firms. Following Ozkan (2001), Peyer and Shivdasani (2001), Hendricks and Singhal (2001), and Laittinen (2002) the sampling criterion for firm inclusion in the model was defined as those MFIs with consecutive three-year financial data between 1998 and 2003. This definition resulted in a final sample of 103 MFIs and 309 observations after dropping firms with missing observations or those with non-continuous data series (Hasan, Wang & Zhou, 2009). This represented 55 per cent of total population of all 188 Africa firms drawn from 21 countries.

3.3.2 Part II: Measuring success in commercialisation: conceptualisation of the dependent variables

The measure of success in commercialisation was one of the challenges of this study. However, getting a uniform measure was necessary, firstly, to use it as a prediction rating rule in commercial success, and secondly, to use it as a useful information guide for investors in assessing MFI viability in Africa (Hartungi, 2007). This study explored two measures of the likelihood of success in commercialisation at two levels, constructed in the following manner:

3.3.3 Level I: Measure of success: leverage multiplier added

Success in Level 1 was measured by a single cardinal measure for gauging the probability of success in tapping the commercial markets. This measure was defined as equity multiplier (EM) which is the basic ratio of total assets to equity (sometimes called capital ratio). It represents the amount of assets supported by each shilling of equity/capital. A typical MFI balance sheet, as shown below in Formula 3.1, usually contains four major financing items to the asset side (Jansson, 2003). Item 4 is negligible in most MFI balance sheets while item 1 is just emerging as a source of capital (Jansson, 2003; Christen, 2000; Carlos & Carlos, 2001; Cull et al., 2008). This item may include a portion of non-interest-paying liabilities such as soft loans and guaranteed debt instruments that are difficult to isolate. Using the traditional balance sheet equation, total assets are financed by either equity (items 2 and 3 below) or liabilities (items 1 and 4 in the box below).

1. INTEREST PAYING LIABILITIES **Short-term liabilities** **Client liabilities** **Long- term debt** **2. DONATIONS (QUASI-EQUITY)** **3. OWNERS' EQUITY** **Share capital** **Retained earnings** **4. OTHER LIABILITIES**	=	**TOTAL ASSETS**

...(3.1)

This leads to the second formulation:

$$ASSETS\ (A) = LIABILITIES(L) + EQUITY(E) \quad ...(3.2)$$

According to the asset growth model (Upneja & Dalbor, 2001; Watson & Wilson, 2002), an increase in (A) must be financed by some source, (L) or (E). The equity multiplier (EM) is expressed as total assets (A) divided by total equity (E).

$$EM = A/E \quad ...(3.3)$$

This ratio is the inverse of the capital ratio used by banks to evaluate financial distress and capital adequacy (Demirguc-Kunt & Maksimovic, 1998; Pille & Paradi, 2002; Metwally, 1997; Ozkan, 2001). An increase in EM indicates a higher level of commercial financing (L) or debt financing (Cull *et al.*, 2008). When this ratio is 2:1, it represents 50 per cent of financing by interest paying liabilities (debt). The ratio therefore indicates the degree of financial leverage or, as elsewhere defined as intake of interest-bearing debt (Pollinger *et al.*, 2007; Hartungi, 2007). If an MFI has no debt (L tends to zero), the EM is equal to [1], and it rises as more debt is taken into the balance sheet (Cull *et al.*, 2008: 11). This study defines the increase in financial leverage over time as LMA (leverage multiplier added) formulated as follows:

$$\text{EM Rating}\ (t+1) - \text{EM Rating}\ (t) \geq \text{LMA} \quad ...(3.4)$$

The equity multiplier rating (EMR) is by itself a summary measure of how successful an MFI has managed to attract commercial financing. This indicates commercialisation in progress as the higher the LMA, the greater the effort in commercialisation (defined as access to commercial funding or increase in L relative to E) all other things being equal. This measure however represents a 'weak form' of commercialisation as it may include collaterised debt or soft loans that are not at fully market rates (Bystrom, 2007). Commercial interest rates are difficult to determine in practice because they depend on where the market sets the rates, particularly in a cross-country study (Cull et al., 2008).

LMA is maximised if EMR increases from one period to the next. Success in commercialisation was measured by demonstrated increase of LMAt+1 compared to the pervious period. Thus, the relative change in LMA rating for two consecutive years over the three years' time interval between 1998 and 2003 was used to classify sample MFIs into successful and less successful in commercialisation (Hendricks & Singhal, 2001; Jain, 2001). Increase in relative LMA in year 1 and 2, rather than over the three-year interval, was used in order to control chance events. Success defined this way captures a working commercial financing strategy rather than erratic movements that result from business cycles (Laittinen, 2002).

Those MFIs that demonstrated an increase in LMA rating in both period [1] and period [2] were classified in the model as successful and coded '1', while those that showed a decline in relative LMA were grouped as less successful and coded '0'. This measure of success used for the binary classification of the sample resulted in 55 successful and 48 less successful MFIs.

3.3.4 Level II: Measure of success: commercialisation index

This section reports an alternative measure of success and discusses the specifications and motivation for the choice of financial ratios that form the measure. This success measure bears the form of a composite index, named Commercialisation Index or CI. It is a ranked measure of success estimated as a factor of several financial performance measures integrated together (Neely, Bourne & Kennerley, 2000). The performance measures seek to convey relevant dimensions of sustainable commercial microfinance from the viewpoint of a potential investor. The index aggregates 9 performance indices - $\rho_{1\text{-}9}$ and 15 measurement criteria - M_{1-15} weighted on a scale of -12 to 12 centered at zero. The following are the indices:

Access to commercial funding; (equity multiplier rating $[EMR] - m_1$), ρi_1

Sustainable growth rate $[SGR]$; (return on equity $[ROE] - m_2$) (total asset growth % $[TAG] - m_3$), (return on assets $[ROA] - m_4$), ρi_2

Service quality, (number of borrowers $[NB] - m_5$), ρi_3

Quality of portfolio (control for rapid growth); (portfolio at risk $[PAR] - m_6$), ρi_4

Earning potential and long term viability of the MFI; (net interest position $[NIP] - m_7$), (return on equity $[ROE] - m_2$), (inflation $[i] - m_8$), (commercial lending rate $[lR] - m_9$), ρi_5

Country level of economic growth; $[GDP - r] - m_{10}$, (Growth retrenchment $[G - R] - m_{11}$), ρi_6

Cash-flow adequacy; (internal cash ratio $[ICR]-m_{12}$), *(o*perating self-sufficiency $[OSS\ ]-m_{13}$), ρi_7

Financial distress and mortality risk; (capital ratio $[CR]-m_{14}$), ρi_8

Financial reporting transparency/standard; (information opacity/disclosure level $[OL]-m_{15}$), ρi_9

Table 3.1 lists performance criteria variables, their definitions and selected references as reviewed from literature. The performance measure m_1 indicates effective access to commercial funding, while the set of measures m_2—m_4, m_7 *and* m_{13}, were converted into ratios that reflected the earning potential of an MFI. All the other measures are either close relatives of cash-flow generation and/or support environment for strong financial performance. The purpose of measurement criteria is also indicated, capturing investors' attitude towards risk and expectations for returns. Details of how index scores were derived using these 15 performance measures ($m_{1\text{-}15}$) are found in Appendix B.

Table 3.1: Summary of financial variables and investor criterion: CI financial ratio variable description and predicted relationship with commercialisation

Variable (m) definitions	Measure	Theoretical relationship, support
M1 – Equity multiplier rating (EMR)	Financial leverage, access to commercial funds	+Ve; (Kolari *et al*., 2002; Peyer & Shivdasani, 2001; Cull *et al*., 2008; Vasiliou & Karkaziz, 2002)
M2 – Return on Equity (ROE)	Profitability for shareholders and proxy for sustainable growth, and relative high growth potential	+Ve; (Demirguc-kunt & Maksimovic, 1998; Harris & Raviv, 1990; Vasiliou & Karkaziz, 2002; Hassan & Marton, 2003; Ozkan 2001)
M3 – Total Asset Growth (TAG)	Total funding gap and requirement. Portfolio investment proxy	± Ve; (Watson & Wilson, 2002; Vasiliou & Karkaziz, 2002; Upneja &Dalbor, 2001; Gibson, 2002; Demirguc-kunt & Maksimovic, 1998; Hendricks & Singhal, 2001; Watson & Wilson, 2002; Konish & Yasunda, 2003)
M4 – Return on Assets (ROA)	Overall profitability of MFI	+Ve ; (Kolari *et al*., 2002; Hussain & Hoque, 2002; Hassan & Marton, 2003; Demirguc-Kunt & Maksimovic, 1998; Ozkan, 2001; Cull *et al*., 2008; Vasiliou & Karkaziz, 2002)
M5 – Number of Borrowers (NB)	Defines size, is sign of growth and good service quality. Proxy for effective demand	+Ve; (WOCCU, 2003; Cull *et al*., 2008; Lewis, 2008)
M6 – Portfolio at Risk (PAR)	Asset quality and riskiness of portfolio (loan default level) and/or measure of riskiness of MFI	-Ve; (Jacobson & Roszbach, 2003; Barrios & Blanco, 2003; WOCCU, 2003; Pille & Parade, 2002; Clarence, 2001; MIX, 2006)
M7 – Net Interest Position (NIP)	Earning potential	+Ve ; (Hussain & Hoque ,2002; Hartungi, 2007;
M8 – Annual Inflation (I)	Benchmark for high earning potential and good financial health. Adequate equity capitalisation if ROE> i	+Ve; (Demirguc-Kunt & Maksimovic ,1998)
M9 – Commercial lending Rate (LR)	Benchmark for wealth creation and repayment capacity if ROE> LR	+Ve; (Demirguc-Kunt & Maksimovic, 1998 Hartungi, 2007; Counts, 2008)
M10 – Gross domestic product (GDP)	Macro-economic expansion and level of development, control for country differences	+Ve; (Jeng & Wells, 2000; Laittinen, 2002; Demirguc-Kunt & Maksimovic, 1998)
M11 – Growth – Retrenchment (G-R)	Portfolio investment over time	+Ve; (Mosley & Rock, 2004)
M12 – Internal Cash Ratio (ICR)	Liquidity and cash-flow adequacy	+Ve; (Laittinen, 2002; Kang & Long, 2001; Metwally, 1997; Peyer & Shivdasani, 2001; Hasan & Marton, 2003; Berger *et al*., 1995)
M13 – Operating self-sufficiency (OSS)	Cost coverage from operating income	+Ve; (Hussain & Hoque, 2002; Cull *et al*., 2008; Ozkan, 2001; MIX, 2006)
M14 – Capital ratio (CR)	Financial distress, mortality risk and capital adequacy.	-Ve; (Laittinen, 2002; Demirguc-Kunt & Maksimovic, 1998; Pille &Parade, 2002, Metwally, 1997; Ozkan, 2001; Berger *et al*., 1995; Hassan & Marton, 2003; Konish & Yasunda, 2003; Barrios & Blanco, 2003; WOCCU, 2003)
M15 – Opacity level (OL)	Level of information disclosure and transparency	+Ve; (Berger *et al*., 1995; Myers & Majluf ,1984; Demirguc-Kunt & Maksimovic, 1998; Watson & Wilson, 2002; MIX, 2006)

Notation:

+ ve means the variable is predicted to have a positive relationship with commercialisation

- ve, on the other hand, means the variable is predicted to have a negative relationship with commercialisation

$\pm$ ve means the variable can have either positive or negative effects on commercialisation.

In the whole, most of the variables used in the index are suggested to have a positive relationship with successfully managed organisations. Most of the variables proxy for bank performance indicators that explain long-term viability and support for spectacular financial results, including profitability and financial distress (m_2, m_4, m_7 *and* m_{13}), capitalisation (m_{14}), credit risk (m_6), liquidity (m_{12}), financial leverage ($_{m1}$), macro-economic factors (m_8, m_9, *and* m_{10}), sustainable growth (m_3, m_5 *and* m_{11}) and information disclosure (m_{15}).

While the potential attractiveness of these factors to any investor is generally understood, the empirical evidence of their relationship to financial leverage is less conclusive; and particularly scanty for microfinance institutions. Size is indirectly measured by total assets growth (m_3) and logarithm number of borrowers (m_5) (Zapalska *et al.*, 2007; Arch, 2005). Return on assets (m_4) and equity (m_2) are net income relative to assets and equity respectively. Operating self-sufficiency (m_{13}) represents ability of the MFI to generate sufficient earnings to cover all operational costs (Cull *et al.*, 2008). A growth retrenchment measure (m_{11}) was also constructed by taking the mean percentage growth investment in loan portfolio over three years as a ratio of total assets to capture the fact that change in portfolio is associated with funding.

The GDP growth measure (m_{10}) was used to convey favourability of economic environment for MFIs to thrive, as well as to account for country differences. The net interest position (NIP -m_7) is the difference between earning assets and interest paying liabilities and estimates the proportion of earning assets supported by cost-free money (Pollinger *et al.*, 2007). In NIP analysis (typical banking asset/liability management concept), a positive NIP means that the MFI is reducing some portion of cost of funding and therefore has increased ability to acquire debt. NIP therefore measures ability to save on cost of funding and indicates long-term potential to make profits while incorporating the risk (interest cost) associated with earning assets that incur interest costs.

The earning potential of an MFI is maximised by maximising NIP. The capacity to earn income is determined by how effectively performing assets are managed to yield more revenue, and how well, on the other hand, the cost of interest-paying liabilities are managed. The lower the interest expense on the two main classes of liability for MFIs (savings deposit and borrowings), the lower the cost of funding and assuming good management of other costs, the more is the likelihood of increased profitability. The level of information disclosure (m_{15}) often needed by investors to make decisions is measured using the MixMarket 5-level diamond scale for transparent financial reporting, and increased disclosure standards. These proxies are fairly standard measures of bank

conditions and microfinance industry structure factors that regulators, investors, and other interested parties monitor over time in performance evaluations.

By definition, MFIs, of which most have a NGO orientation, lack clear ownership and ability to attract capital (Zapalska *et al.*, 2007). In most countries, these financial intermediaries do not also have the authority to mobilise savings which is a major source of cheap capital for on-lending. Interested investors are typically drawn to these institutions by their demonstrated viability. This underscores the presence of many variables in the index that relate to earning capacity of MFIs.

3.3.5 Level II: Measure of success: construction of the CI

The CI variables used emphasise bank traditional performance measures as well as non-financial factors such as transparent information reporting, customer satisfaction, sustainable growth and productivity (active clients), portfolio quality, and benchmarking critical performance to ensure good financial health of commercialising MFIs. This was due to the revelation that non-financial measures are better predictors of a firm's long-run performance, and they help managers monitor and assess their firm's progress towards strategic goals and objectives (Hussain, & Hoque, 2002).

The nine performance indices, as composed by the 15 financial variables, reflect dimensions of interest to potential lenders and investors. These dimensions combined into the composite index were used in gauging the probability of success in tapping the financial markets. The performance indices were transformed into a single commercial financing rating score (CFR score) that is sensitive to differences in performance of an MFI with respect to its attractiveness to commercial lenders. The purpose of this process was to capture the complexity that goes into determining commercial viability of an MFI given diversity of success factors across countries in Africa. This single score defined as an index includes various effects of successful commercialisation and ability to attract commercial capital.

The index is constructed through a scoring process of the 15 criterion measures -$m_{1\text{-}15}$ (financial ratio variables) grouped in the nine indices (see Appendix B for details). The CI consists of both a weight and a CFR component for each of the nine performance indices (Hendricks & Singhal, 2001; Laittinen, 2002). The measures taken together are intended to pay attention to and/or control the conditions specified by each of the performance indices. These conditions ensure sufficient success for good performance of a microfinance institution, and thereby attraction of commercial funding. However, intake of commercial capital needs to be controlled since heavy debt load can hurt an organisation. High leverage affects the probability of its default, as large amounts of debt increases the MFI's interest charges and poses strain on cash flow (Barrios & Blanco, 2003; Berger *et al.*, 1995). The index thus has inbuilt internal measures to ward off potential risk of high indebtedness.

The index was modeled using time series data of three years (between 1998-2003). It uses two years' (for example 2002-2003) data for the development of the measure of future success and one prior-year's (say 2001) financial information for predicting a two-year success in commercialisation (Laittinen, 2002; Pille & Paradi, 2002; Kolari *et al.*, 2002). The CI is therefore a measure of future success in commercialisation, and is an indicator of future access to commercial financing opportunities measured in commercial financing rating scores (CFR). The CI balances access to leveraged financing with critical performance in microfinance business. The index defines degree of commercial orientation and informs management of the likelihood of success should the MFI decide to seek commercial funding. The index values are obtained by the following formula for CFR scores:

$$\mathrm{CI}ij\ (index\ 2002-2003) = \sum_{i=1}^{n}(CFR\ Scores)p^{1-9}\,M_j \qquad \text{...(3.5)}$$

That is; $[p_{i1},\ p_{i2,}\ p_{i3},\ p_{i4},\ p_{i5},\ p_{i6},\ p_{i7},p_{i8},\ p_{i9}]M_j$

Where CI_{ij} = Index of successful commercialisation for the (p_i) with performance indices for the m_j the criteria measure. The nine financial performance measures in the index are equally weighted except for the LMR measure (p_{i1}) of effective access to funding, which has a higher weighting of 4 CFRs. Also, weights for the years 2002 and 2003 are the same, each with a weight of 1. The index assesses each MFI in the sample if the needed measurement criteria (critical performance for tapping commercial funding) for the performance indices have been met. If the *m*-criteria have been met, an increased attractiveness is identified by a simple addition procedure[20]. Finally, the two-year successful commercialisation prediction index is obtained by summing up the resulting CFR scores for the nine performance indices.

The CIij index scores are measured in CFR and scales from 0 to 25, whereby the maximum possible scores are 25. Higher CFR scores indicate likelihood of successful commercialisation. The median score (M) under this scale is 13 CFR scores and this is the critical value for the binary classification. The index was also conceptualised as a linear function of cumulative CFR scores for performance indices 1 to 9 minus the median; to arrive at normalised $CIij\ Index$. This was specified as

$$CI-index = \sum_{i=1}^{9} CFR(p_i)m_j\ - M \qquad \text{...(3.6)}$$

The median score was then normalised to zero to get a better visualisation of the binary classification, so that if index exceeds zero, an MFI is classified as successful. The index therefore

[20] Application of the scoring procedure can be found in Appendix B.

reflects the ease with which an MFI can tap capital from the wider financial market system, while maintaining performance sufficient for business excellence in microfinance. Thinking of the model index this way facilitated a more clear interpretation and exposition of the outcomes of the CI prediction index. Assuming a normal distribution of CFR scores, the classification can be illustrated as in Figure 3.1 below

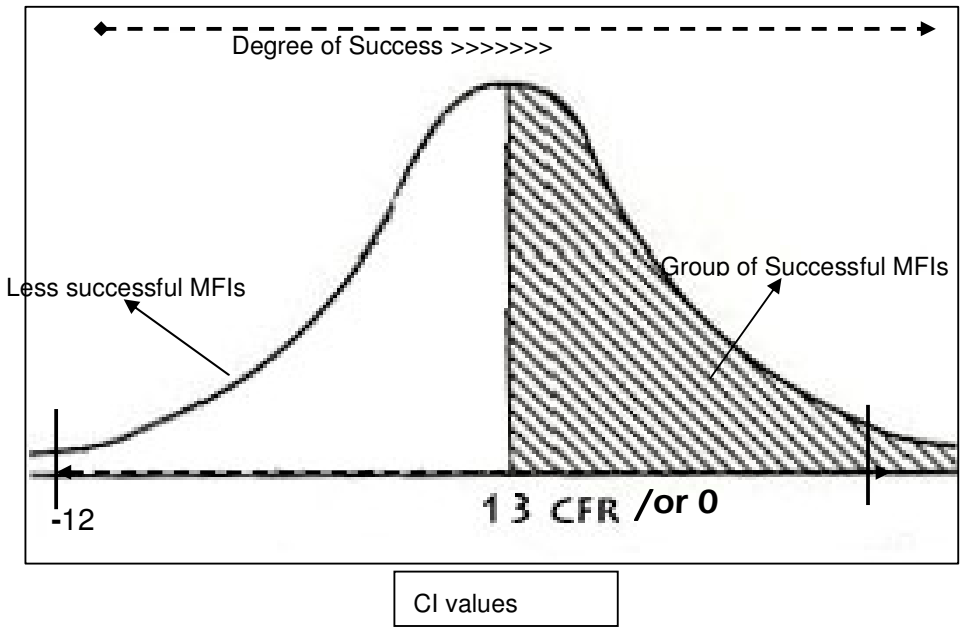

Figure 3.1: Classification on CI scale

The CI measure of success defined as above was used to segment the sample MFIs into categories of successful and less successful. Classification was based on the index values (or CFR scores), with the cut-off being the critical value of 0 or median score of 13 CFRs. The sample comprises 103 MFIs across Africa that had completed three-year time series financial data between 1998 and 2003.

For each MFI in the sample, both Total CFR scores and CI values were generated. Higher scores indicate a higher likelihood of success while lower scores indicate high dependence on donations. CFR scores centred at the median show that, if the index exceeds zero, the MFI has high probability of success with access to commercial funding and in adapting a commercialisation strategy. The binary classification indicates those classified as successful coded as '1', while those scoring less than 13 CFRs (or index values < 0) grouped as less successful and were coded '0'**.** The binary classification for this measure of success resulted in 45 successful and 58 less successful MFIs.

3.3.5.1 Estimating the rating rule

The firms in the entire sample were classified into two groups for the two measures of success as explained above. As per the procedure in logistic modeling, the dependent variable, successful commercialisation, was converted into a dichotomous variable comprising those institutions more successful coded (1) and those that were less successful coded (0) for both two sets of success measures (Liu & Lee, 1997; Kennedy, 2001; Laittinen, 2002). Estimation of the binary variables (LMA and CI) was according to maximum likelihood. Future success in commercialisation, as measured for two years, was predicted by prior year one (2001) data using logistic regression analysis. Thus, if effective, the CI and the LMA will provide a useful commercial rating tool for preliminary screening of potential successful commercial MFIs.

The purposes of this logistic analysis was to estimate the conditional probability that an MFI belongs to the category of commercialising institutions, identify significant predictors, and to test the effectiveness of the models in classifying the sample of 103 firms. The choice of this statistical analysis was because the data set contained binary variables and it is said to be suitable where data is not normally distributed as opposed to conventional discriminant analysis (Laittinen, 2002; Kolari *et al.*, 2002; Kennedy, 1998). It also allows for tests of overall fit of a model.

In the logistic classification model, the variable (y) refers to MFIs that are successful in commercialisation, and the probability of being successful is estimated by $prob(less\ successful\ or\ y = 1)$. This in turn implies that the probability of an MFI belonging to the less successful category is:

$$Prob(less\ successful\ or\ y = 0) = Prob(1 - P(y = 1))$$

The logic of discriminant analysis is formulated by the linear rating rule, namely classifying an MFI with characteristics given by the explanatory variables ($x_1, \ldots, x_n$) to category y equals 1 or 0, if the conditions are met. The logistic regression model estimated by the method of maximum likelihood can be formulated as follows (Laittinen, 2002, Kolari *et al.*, 2002, Kennedy, 1998):

$$P(y = 1) = \frac{1}{1+e^{-z}}$$

where: $Z = b_0 + b_1x_1 + b_2x_2 + \ldots + b_nx_n$

y = the dichotomous dependent variable, successful commercialisation

$\mathrm{P(y = 1)} =$ the conditional probability of an MFI being classified as successful or less successful

Xn = are the independent variables from 2001

b_o = an intercept term

b_n = the parameters for the logistic regression coefficients for predictor variables ($x_{1,\ \ldots\ldots}, x_n$)

e = the quantity 2.1828+, the base of natural logarithms

3.4 PART II: INDEPENDENT VARIABLE DESCRIPTION AND MEASURES

Part II of the research used a set of 33 explanatory variables ($x_{1,\ \ldots\ldots}, x_n$) that were selected based on literature review (see description of variables and references in Table 3.2). The choice was made on the basis of having been used in prior studies and therefore suggested to have significant impact on financing choices. A second motivating factor was that reasonable measures (or proxies) were readily available in the database used. This research also intends to provide an exploratory analysis of investor attraction factors for the unique industry of microfinance. In-depth analysis was carried out to determine significant drivers of commercial funding among the 33 predictors.

Table 3.2 provides a description of the independent variables used in the logit analysis and how they are labelled or their notation. These variables are largely quantitative and some are proxies for the 53 qualitative factors in Part I. The list of predictor variables ($x_{1,\ \ldots\ldots}, x_{33}$) can generally be categorised into firm level financial parameters and non-financial performance indicators.

Table 3.2: Independent variables description and formulae

Predictor variables used in this study	Notes, notation used in analysis
X_1	Number of years since started operations (maturity, AGE)
X_2	MFI supervision by the National Central Bank (regulation, d_REGUL)
X_3	Registration form (legal structure, d_LFORM: fi, ngo, coop, bank)
X_4	Portfolio investment overtime or divesture (growth-retrenchment, d_GRPOST)
X_5	Profit margin (sustainability level, PROFIT)
X_6	Efficiency in operations (operating efficiency, OEXPR)
X_7	Earning potential of performing assets, cost saving ability (Earning Asset Ratio, EAR)
X_8	Number of borrowers (active clients – size, BORROWERS)
X_9	Portfolio size (dollar amount, SIZEGPF)
X_{10}	Information disclosure and level of opacity (information asymmetry, d_INFOTPR)
X_{11}	Asset quality and default risk (portfolio at risk, PAR)
X_{12}	Asset structure (net loans to total assets, ASETSTRUC)
X_{13}	Level of indebtedness, risk profile of MFI (debt equity ratio, GEARING)
X_{14}	Poverty outreach (average loan size in dollars, LONSIZE)
X_{15}	Poverty lending focus, depth of outreach (average loan size per GNI, DEPTHRCH)
X_{16}	Level of richness of country of operation (GNI per capita, GNI)
X_{17}	Economic stage of the country of operation (GDP growth %, GDP)
X_{18}	Pricing efficiency, economic cost of capital (annual inflation rate, INFLA)
X_{19}	Cost of funds/capital (market lending rates and/or 90 day treasury bills rates, LEDGRTE)
X_{20}	Size of equity, investor safety (equity to total asset %, EQBASE)
X_{21}	Level of savings on financing costs, increased earning potential (EAR*interest rates, COSTSAV)
X_{22}	Access to donations or quasi-equity (main source of funding, d_DONOR)
X_{23}	Number of personnel, total staff level (size, PERSONEL)
X_{24}	Asset base (total assets, size, TASSETS)
X_{25}	Capacity to generate cash flow from performing assets (retained earnings/G Portfolio, EARNSUFF)
X_{26}	Operating self-sufficiency, (operating/operating/expenses, OSS)
X_{27}	Return on assets (net income/total assets, ROA)
X_{28}	Return of equity (net income/equity, ROE)
X_{29}	High earning potential, maintaining equity base(ROE>= inflation, d_FINHEALTH)
X_{30}	Maximising shareholder value, capacity to repay costly debt (ROE>=lending rates, d_RPMTCAP)
X_{31}	Fast growing MFI (TAG>=ROE, d_FASTGRO)
X_{32}	High growth prospects, enabling environment (TAG>=inflation, d_HGOP)
X_{33}	Relative access to commercial funds (d_LMR/CFR)
The prefix "*d_*" refers to the fact that the variable was operationalised as a dummy number or character.	

The set consists of three types of independent variables:

i) It includes financial sustainability factors and all the familiar traditional banking indicators of sound banking practice and safety in lending. It is often said that sustainability is the cornerstone of sound microfinance (CGAP, 2002a).

ii) The other type of variable reflects the microfinance industry's critical performance indicators and benchmarks.

iii) Macro-economic factors are included to mitigate the differences between countries and control for both observable and unobservable time effects (Laittinen, 2002; Demirguc-Kunt & Maksimovic, 1998).

Unobservable characteristics that have impacts on an MFI's performance would vary across MFIs and over time, but macro-economic variables are assumed to be the same for all institutions in a particular country at a given point in time.

These variables cover the familiar lending criteria used by investors in making investment choices. Specifically, investigation is made for financing decision models for African MFIs (Arch, 2005; Koveos & Randhawa, 2004). Given the skepticism of investors for the African region, the study examines what it would take to finance MFIs from the capital markets. Note that the study employs industry level investors' perspective approach and stresses basic performance indicators of sound microfinance (Ayayi & Sene, 2007).

The variables OSS, ROA and PROFIT measure the profitability level of the MFI while sustainability and earning capacity are measured by EAR, COSTSAV, ROE, EARNSUFF, FINHEALTH and RPMTCAP (Hussain & Hoque, 2002; Ozkan, 2001; Kolari *et al.*, 2002; Hassan & Marton, 2003; Cull *et al.*, 2008; Demirguc-Kunt & Maksimovic, 1998; Pille & Paradi, 2002; Vasiliou & Karkaziz, 2002; Clarence, 2001; Harris & Raviv, 1990). The long-term earning potential (EAR) is defined as the difference between earnings assets and interest bearing liabilities (net interest position) divided by total earning assets for the MFI.

The net interest position is a general measure of good management of earning assets to generate cash flow and the control for interest-bearing liabilities to save financing costs (Hussain & Hoque, 2002). Ability to save on financing costs (COSTSAV) is measured by the proportion of cost of funds saved defined as commercial lending rates multiplied by the EAR ratio. The higher the proportion of EAR, the more earning assets contribute to the spread and hence profitability increases. By increasing the EAR %, an MFI can maximise the potential to save cost of funds, other things being equal.

The earning sufficiency (EARNSUFF) is a measure of cash-flow adequacy or ability to raise retained earnings from earning assets that can be available for paying high interest commercial loans. This measure is defined as retained earnings (profits at t_{-1}) divided by total earning assets

(Laittinen, 2002; Kang & Long, 2001; Metwally, 1997; Peyer & Shivdasani, 2001; Hassan & Marton, 2003; Berger *et al*., 1995). The ability to generate sufficient liquidity for an MFI is important in meeting withdrawable requirements of client savings, maturing debt obligations and, most importantly, by financing loan requests without delay.

Ability to capitalise equity base is measured by FINHEALTH. This measure indicates if the MFI is earning sufficient income to cover direct operating costs, loan provision allowance and financial costs while still maintaining the real value of its credit portfolio. If ROE = annual inflation rate, the institution is simply maintaining capital in real terms and not capitalising profits. But if ROE > inflation rate, the institution is generating a surplus or cash flow higher than the economic cost of capital, measured by the annual inflation rate (Demirguc-Kunt & Maksimovic, 1998).

This measure indicates that an MFI is likely to replace donations and soft loans with private equity or market rate of debt. The real measure as to whether an institution is able to replace its financing with commercial loans is proxied by comparing if ROE > lending rates (measured by Treasury bill rates for 90 days). This is reflected by the measure RPMTCAP in our analysis. If this condition is satisfied an MFI, it will not only rule out capital erosion, but also ensure maximisation of shareholder value and wealth creation for the poor.

The stage of MFI development, growth and size is measured by the number of borrowers (BORROWERS), asset base (TASSETS), total personnel employed (PERSONEL), and gross loan portfolio (SIZEGPF) (Hendricks & Singhal, 2001; Cull *et al*., 2007; Konish & Yasuda, 2003). It is argued that larger banks have better access to capital markets since they are more flexible in coping with unexpected liquidity shortfalls. Sustainable growth is defined by the conditional measure TAG = > ROE for fast growth (FASTGRO). This measure estimates whether the MFI is growing fast or not. As per the literature on the asset growth model (Watson & Wilson, 2002; Pille & Paradi, 2002; Vasiliou & Karkaziz, 2002; Upneja & Dalbor, 2001; Gibson, 2002; Demirguc-Kunt & Maksimovic, 1998; Watson & Wilson, 2002; Konish & Yasunda, 2003), fast-growing firms are known to demand the use of debt. The growth potential of the MFI in the country of operation is measured by HGOP approximated by the variable TAG > inflation rate. Growth retrenchment posture measure (GRPOST*)* is defined as the mean percentage growth investment in loan portfolio over three years as a ratio of total assets to capture that change in the portfolio is associated with funding (Mosley & Rock, 2004; Cull *et al*., 2008; Daley-Harris, 2009). This variable indicates whether the MFI has been growing or retrenching its portfolio in the last three years.

Macro-economic factors were included to neutralise differences in sample countries and control for both observable and unobservable time effects (Hasan, Wang & Zhou, 2009: 114; Demirguc-Kunt & Maksimovic, 1998; Jeng & Wells, 2000; Laittinen, 2002). These were represented by inflation

rate (INFLA), which captures inefficiencies in pricing, market lending rates[21] or 90-days Treasury bill rates (LEDRTE) that benchmarked cost of commercial funds, while the level of economic development in the country was conveyed by the percentage in gross domestic product (GDP) (Pollinger *et al.*, 2007; Counts, 2008). Client ability to engage in economic activity and income levels in the country was reflected by gross nation income (GNI) *per capita* (MIX, 2006).

Firm level metrics were measured by several performance indicators: the level of leverage was measured by the debt equity ratio (GEARING); poverty lending focus was conveyed by the average loan size (LONSIZE) for each MFI; and institutional age and maturity level was measured by the number of years since an MFI started operating (AGE) (MIX, 2006; Zapalska *et al.*, 2007; CGAP, 2007; Arch, 2005). Researchers suggest that the level of debt is related to financing choice, and that age is associated with financial leverage (Kang & Long, 2001; Myers & Majluf, 1984; Metwally, 1997; Peyer & Shivdasani, 2001; Watson & Wilson, 2002; Jean, 2004; Hassan & Marton, 2003; Jeng & Wells, 2000). It is argued that investors look for a track record and institutions that are profitable and mature (Upneja & Dalbor, 2001; Emeni, 2008; Gibson, 2002; Helwege & Liang, 1996; Jeng & Wells, 2000).

Institutional form or operational structure is represented by the variable LFORM while regulatory status is assessed by the dichotomous variable REGUL (Zapalska *et al.*, 2007; Cull *et al.*, 2008; Callaghan *et al.*, 2007; Pille & Paradi, 2002; Kolari, *et al.* 2002; Ozkan, 2001; Harris & Rajiv, 1990; WOCCU, 2003). In Africa MFIs are registered to operate either as banks coded (BANK =1), financial intermediaries coded as (FI=2), non-governmental organisations coded as (NGO=3) or as cooperative/credit unions coded as (COOP=4) (MIX, 2006; Cull *et al.*, 2008). The equity base (EQBASE) is computed by measuring the three-year average of total owner's equity to total assets. The variable (DONOR) assessed the MFI's main funding source, if it was donations or grants or otherwise for other sources, such as savings, loans or share capital. The extent of information transparency and access (INFOTPR) was measured by MixMarket diamond scale scored 1 to 5 for the level of information disclosure (MIX, 2006; Emeni, 2008; Callaghan *et al.*, 2007). This industry indicator represents the ease with which an investor can access MFI information in order to make a financing decision. It is a measure of information opacity given that the microfinance industry, being informal[22], lacks adequate information for making investment decisions, particularly in the

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[21] If an MFI can turn a yield that exceeds the market rate of debt, it means that it has the ability to pay commercial loans. Such a capacity in earning power implies the institution not only maintains the value of equity, but it is also creating value for the shareholders.

[22] Reporting standards in microfinance are very poor due to lack of clear ownership and emphasis on transparent operations. Globally, in many countries the industry is not regulated and operates more in the informal sector where there is lack of professional management and governance structures.

Africa region (Berger *et al*., 1995; Myers & Majluf, 1984; Demirguc-Kunt & Maksimovic, 1998; Watson & Wilson, 2002; Upneja & Dalbor, 2001).

Asset structure and effectiveness (ASETSTRUC) is measured by taking the gross loan portfolio as a percentage of total assets (Gibson, 2002; Helwege & Liang 1996; Jeng & Wells, 2000). Portfolio risk and performing asset quality was measured by (PAR) defined as the ratio of provision for loan losses to total gross loan portfolio. PAR is said to be negatively associated with commercial leverage (Jacobson & Roszbach, 2003; Barrios & Blanco, 2003; Ayayi & Sene, 2007; Arvelo *et al*., 2008; WOCCU, 2003, Pille & Parade, 2002; Clarence, 2001). Operational and administrative efficiency (OEXPR) of the MFI was measured by the ratio of operating expenses to average outstanding gross loan portfolio (MIX, 2006). This measure reflects the overall cost (including cost of funds, loan loss provision and administrative expenses) of administering one outstanding shilling/dollar and is an indicator of the efficiency of lending operations. The depth of reach (DEPTHRCH) is measured by the average loan size in dollars divided by the GNI *per capita* in each country (MIX, 2006; Cull *et al*., 2007).

Lastly, relative access to commercial funds was conveyed by the variable LMR where CI was the dependent variable and CFR scores in the case of LMA. Thus there were in all 33 explanatory variables ($x_1, \ldots\ldots, x_{33}$) used in the logistic analysis to predict MFI likelihood of future binary success in commercialisation.

3.5 PART II: MODELING SUCCESS IN COMMERCIALISATION

3.5.1 Part II: Introduction to logistic regression analysis

This section introduces the statistical tests and methods used in examining the effectiveness of the 33 variables in predicting future success in commercialisation of African MFIs, and investigating a predictive model for successful commercialisation. The main statistical tests undertaken in this section employed a variety of logistic regression techniques. Logistic regression techniques are based on the method of maximum likelihood (Kennedy, 1998: 239: Laittinen, 2001; Mazzarol, 1998). In particular, this method tries to estimate the value of a dependent variable (observed value) via a chance mechanism. That is, the model estimates the conditional probability that the dependent variable is either one or the other, depending on the case at hand (see model in Section 3.5.1.3 below). For example, as per the procedure in logistic modeling, the dependent variable, LMA or CI representing ‘successful commercialisation’ was converted into a dichotomous variable comprising those institutions ‘more successful’ and coded (1) and those that are ‘less successful’ coded (0).

The different estimation methods used try to model a logit equation estimator, and include random forests, factor logistic regression, and stepwise logistic regression analysis. The rationale for this is, these methods have varying levels of effectiveness, computational accuracy and handle different conditions of the data, especially as in cases where there is existence of a small sample, large number of variables, and varying ability to withstand sensitivity to noise while maintaining accuracy. However, the common denominator for all the techniques applied in the analysis is that they all have capacity to handle a binary classification problem and/ or fit a prediction model (Pille & Paradi, 2002; Kolari *et al.*, 2002; Konish & Yasuda, 2003). Hence the uses of the 'term' logit, as it were, trying to logically predict the outcome of a chance event.

The other reason for use of different estimation methods with varying strength is in order to obtain robust results on the predictive ability (goodness of fit) of the explanatory variables and sub-models. This was also done so as to validate or benchmark results of low performing techniques and of course to evaluate which of the models is a better predictor of commercialisation. For example, it was necessary to assess which of the two measures of success investigated; the LMA and CI, is a better performer with respect to accurate prediction of success in commercialisation. Several authors point out the importance of benchmarking results to assure the development of a solid model as is the aim in this study (Pille & Paradi, 2002; Lekkos, 2001; Kolari *et al.*, 2002; Konish & Yasuda, 2003).

3.5.1.1 Random forests techniques

Initially, a logistic model estimated by the method of maximum likelihood on the rating rule was fitted. Noise in the process indicated that the model was too large to fit and would produce inaccurate results. This resulted in the use of statistical models for data mining and inference and prediction that do not have a problem with overfitting. The random forests (RF) technique provided a useful tool for tackling this data analysis problem (Breiman, 2001a). Two types of random forests techniques are employed to analyse the data: random forests for binary classification and random forests for identification of important variables that meet the criteria of significant predictors of success. The random forests test of importance relates to the 33 quantitative variables, but also confirming importance of identified critical success factors from the list of 53 qualitative factors.

Thus random forests technique was used firstly, to identify important variables, and secondly, as a binary classification tool. In the latter case, independent tests performed helped identify significant predictors of success, where data mining ability of random forests technique was used to avoid problem of masking of related variables and also to reduce the data in the first run, for subsequent tests using other regression methods. It is suggested, that for accurate analysis where the variables are many, random forests technique has the capacity to isolate the most important variables by minimising correction between classifiers (Breiman, 2001b). It is also suggested, as a

way of getting around a multicollinearity problem (related variables), random forests is a more effective method because no assumptions of independence of the predictors are made. Besides being computationally effective, the method is proven not to overfit, and is less sensitive to noisy data compared to convectional logistic regression and discriminant analysis methods (Lariviere & Van den Poel, 2004). The method also offers possibilities for explanation and visualisation of its output.

Random forests method uses single classification trees where many trees are grown to form a forest, and each tree predictor in the forest depends on the value of some random vector (Breiman & Cutler, 2003). After a large number of trees are generated, they vote for the most popular class, and this is what is called random forests. Breiman (2001a) defines a random forest as a classifier consisting of a collection of tree-structured classifiers {h $(x,0_k)$, k=1,…} where the $\{0_k\}$ are independent identically distributed random vectors, k represents growth of trees from 1 to a large number K and x represents input vectors where each tree casts a unit vote for the most popular class at input x. see more on random forest tree construction on Appendix C.

To perform a classification an input vector is stationed down on each of the trees in the forest. Each tree then gives a classification, which as it were constitutes the tree's 'vote' for that class. These votes are combined to make the overall prediction for the forest. The forest chooses the classification having the most votes (over all the trees in the forest). By this process the model estimates the variables that are important in the classification. If the values of the importance score from tree to tree are independent, then the standard error can be computed by a standard computation, that is, divide the raw score by its standard error to get a z-score, and assign a significance level to the z-score assuming normality.

Random forests (RF) are an effective tool in prediction and sometimes better than state-of-the-art methods in classification and regression. Research has shown that RF models can be used to score the data and generate highly accurate predictions, also because of their ability to deal with covariates measured at different measurement levels – including nominal variables (Lariviere & Van den Poel, 2004). Injecting the right kind of randomness makes them accurate classifiers and regressors. The theoretical underpinnings of the random forests techniques are established by Breiman and Cutler (2003) (Breiman, 1999). However, to understand the use and application of RF, further information about how they are computed is useful.

In the context of classification, random forests can be said to be a combination of tree predictors, where each tree in the forest depends on the value of some random vector θk. θk's consist of integers between 1 and M, where M is the training set size. As per the procedure in random forests, data is usually split into two sets: one, a training set which is used to mimic the characteristics or relationships within a dataset and learn model attributes. And the second data

set, called test set, is used to validate the performance of the model built on the training set. As such random forests construct a series of tree-based learners. Each base learner receives a different training set of n instances which are drawn independently with replacement from the learning set of n instances (Robnik, 2004). This kind of random sampling is called bootstrap replication. In this way the subsequent base learners receive effectively different learning sets and gradually focus on the most problematic instances.

RF is part of decision trees (DT) technique, and has become very popular in classification problems due to ease of use and interpretability (Lariviere & Van den Poel, 2004). Decision trees are used to predict the membership of cases defined by the categorical dependent variables (Liou, 2008). In doing the classification, each 'branch node' of the tree partitions the data into two or more groups. The procedure continues until the bottom level is reached, a point which defines the final category. This classification trees technique has the ability to derive rules for classification from the data, including the cut-off. For all RF cases the classification matrix for the test set is the key to evaluating how well the model did the classifications.

Random Forests build a collection (ensemble of 'CART') of tree classification predictors in a process which generates a sequence of trees, one from each bootstrapped sample, known as bagging. In addition to using bagging, each node of the trees only considers a small subset of features for the split, which enables the algorithm to build classifiers for high dimensional data very quickly. The accuracy of these predictors is due to the minimisation of the correlation between the classifiers, while maximising the strength. Strength is a measure of the ability of a tree to classify data points correctly. More specifically, the creation of an ensemble of trees followed by a vote for the most popular class, labeled forests (Breiman, 2001a; Breiman, 1999), and is the result of DT optimisation.

This study made use of the random forests as proposed by Breiman (2001a), using the strategy of a random selection of a sub-set of *m* predictors to grow each tree, where each tree is grown on a bootstrap sample of the training set. This number, *m*, is used to split the nodes and is much smaller than the total number of variables available for analysis. It is suggested that if the number of variables are very large, as in this study, forests can be run once with all the variables, then run again using only the most important variables from the first run. Based on this understanding, the initial importance of the results of RF are used to identify significant drivers of successful commercialisation for further investigation using logistic regression.

Random forests are constructed in the following four steps (Koulis, 2003; Breiman, 2001a):

At step k a tree is grown using a training set and random vector $\emptyset_{k,}$ ...(3.7)

This results in a classifier $h(x, \emptyset_k)$) ...(3.8)

where x is an input vector.

A large number of trees are then generated, $k = 1_{;\ \ldots\ldots,} \mathrm{K}$ ...(3.9)

(usually K >= 100).

After a large number of trees have been generated, they all vote for the most popular class. The random forest then classifies x by taking the most popular voted class from all the tree predictors in the forest $(\ h(x, \emptyset_k),\ k = 1_{;\ \ldots\ldots,} K)$ ...(3.10)

This study therefore introduces the probabilistic random forests (PRF) classification tests in the analysis, which gives estimates of the probability of classification for each data point, without detailed probability distribution assumptions or resorting to density modeling (Breitenbach, Nielsen & Grudic, 2004). A PRF model delivers both classification and misclassification estimates that probably produce good results in classification – less so in regression analysis, for all future predictions. Thus, PRF was useful in assessing the two-year commercialisation prediction model. As suggested, (Breitenbach *et al*., 2004; Lariviere & Van den Poel, 2004) by using this probability estimate, it is possible to assess how well the learned hypothesis models the data.

3.5.1.2 Factor analytic regression

The general purpose of factor analytic procedure was to summarise the information in the original 33 predictors with minimum loss and also to gain a strategic fit in the model, as some variables could mask others. The other objective was to reduce the set of variables and use critical success factor scores in estimating a maximum likelihood logit model with successful commercialisation as a dependent variable. The basic assumption is that each variable can be expressed as a linear combination of hidden factors that affect the variable and possibly other variables (Jain, 2001). The identified factors represent linear combinations of all underlying variables and are constructed in such a way that they have maximum variance (Lekkos, 2001).

Out of the 33 data variables in Part II (see Table 3.2) of the study, only 22 were subjected to a principal component analysis procedure to extract the most likely explanatory factors. It was not sensible to execute a factor analysis over nominal variables (yes or no and binary variables), so these were excluded together with the variable on age.

To avoid both the problem of multicollinearity among explanatory variables and the possibility of too many variables in the analysis, a factor analysis was performed on all the variables, similar to that suggested by Jain (2001) and Liu and Lee (1997). Some of the variables were derived from related ratios, and it was necessary to observe the indirect effects in the model. The explanatory variables also appeared too many for direct logistic regression; therefore an attempt was made to reduce the data set by creating an entirely new set of variables.

To create an entirely new set of variables for subsequent analysis, composite factor scores are computed to represent each of the factors. The factor scores are then used as the raw data to represent the independent variables in logit analyses. The technique for handling above two problems was identified as factor analytic regression that works through a principal component process (Liu & Lee, 1997; Lekkos, 2001)**.** This kind of analysis is useful in testing the indirect effect of success or predictor factors on successful commercialisation of sample firms. The approach is used to factor scores as independent variables in estimating a maximum likelihood logit model with successful commercialisation as dependent variable.

The other motivation for using factor analyses in Part II of the analysis was to gain value on perfect grouping because determining the functional form of the relationships was difficult. All the analysis methods ran both the LMA and CI binary variable as the dependent variable. Evaluation of the models in predicting success, or on overall success classification accuracy and goodness of fit, was performed as per procedure for each technique as presented in section 3.5.1.4.

3.5.1.3 Estimating the logistic regression model

Logistic regression is a non-linear method of modeling for dichotomous dependent variables (Liou, 2008). That is, the classifying variable, usually known as a binary variable, can only have two defined outcomes. In the present study these are category (y) equals (1) or (0). Logistic regression or logit analysis is therefore considered suitable for this study because of the existence of binary or dichotomous dependent variables (Mazzarol, 1998). Besides ability to perform binary classification, the method allows for tests of overall fit of a model, and takes all variables, of all constructs simultaneously in assessing satisfaction with test requirements. In a review of prediction methods, both data modern and traditional techniques, logistic regression (also classified as a data mining algorithm) was ranked second to popular neural networks in terms of prediction accuracy among 32 classification cases (Liou, 2008).

The purposes of logit analysis in this study were to estimate the conditional probability that a firm belongs to either classification (successful or not successful in commercialisation), to identify significant predictors of success or lack of it, and test the effectiveness of fitted models in classifying the sample of 103 firms ((Liu & Lee, 1997; Liou, 2008; Kennedy, 1998; Laittinen, 2002). The logistic procedure estimates the coefficients of a probabilistic model involving a set of

independent variables that best predict the value of the dependent variable. A positive coefficient increases the probability, while a negative value decreases the predicted probability of the outcome being in either of the two dependent categories (Mazzarol, 1998). Variables with larger coefficients are more useful in identifying success cases.

In the current study, two measures of success are investigated, the LMA and CI dependent variables both representing the likelihood of success with commercialisation. The analysis examined the effectiveness of a list of 33 possible predictor variables (see Table 3.2) for future success in commercialisation of African MFIs. Future success in commercialisation is measured for two years and predicted by prior year one (2001) data under the analysis (Laittinen, 2002 Lekkos, 2001). Fitted models were investigated or assessed on their ability through measures of goodness of fit.

Liu and Lee (1997) point out that logistic regression fits well, particularly when the data are not normally distributed and when many independent variables are binary in nature. As suggested earlier, it was necessary to consider more prediction models investigating the binary-classification problem, especially to enable comparison of observed goodness-of-fit indices based on conventional prediction models. This was considered useful in obtaining robust results for the predictive ability of the explanatory variables and sub-models (Liou, 2008; Lekkos, 2001), and also to investigate whether other prediction techniques using classification trees (such as random forests) perform better, particularly when performance is low, as it is indicative that there is more room for improvement (Lariviere & Van den Poel, 2004).

Due to the small size of the sample and the need to preserve a degree of freedom, the logistic analysis applied stepwise logistic regression procedures to all the data, and also to a sub-set of the most important variables identified in the original run in random forests (Laittinen, 2002). Another motivation to perform a stepwise logistic regression analysis was to isolate variables with significant variables to be used in further tests due to the fact that the number of explanatory regressors was considered many (Refer to Table 3.2). This makes it easy to interpret the results and assess predictive power of significant variables (Liou, 2008). Besides investigating the binary classification problem and identifying best predictors, a variety of statistical tests or sub-models were investigated in order to check robustness, control for the effects of associated variables that mask others, benchmark RF results and use the results to develop a better prediction model (Konish & Yasuda, 2003; Pille & Paradi, 2002; Liou, 2008; Kolari *et al.*, 2002).

The logistic model was estimated by the method of maximum likelihood for all regression techniques. A maximum likelihood method as a conditional probability model is usually used to find the model that best distinguishes the two groups in the expected outcomes. The logic of the

analysis is formulated by the linear rating rule, namely classify an MFI with characteristics given by the explanatory variables $(x1,\ldots,xn)$ to category y equals (1) or (0) if the conditions are met.

The generalised form of a logistic regression model for the case of a single dichotomous dependent variable, and multiple independent variables can be expressed as follows (Liou, 2008: 653; Mazzarol, 1998: 170; Laittinen, 2002: 880):

$$P(y=1)=\frac{1}{1+\mathrm{e}^{-\mathrm{z}}}$$

where: $Z=\beta_0+\beta_1x_1+\ \beta_2x_2+\ldots\beta_nx_n$

y = the dichotomous dependent variable, successful commercialisation and is measured by either $CI\ index$ and LMA

$\mathrm{P}(\mathrm{y}=1)=$ the conditional probability of an MFI being classified as successful or less successful.

X_n = are the independent variables or predictors from 2001 (the 33 variables, see Table 3)

β_0 = is an intercept term

β_n = the parameters for the logistic regression coefficients for predictor variables ()

e = the quantity 2.1828+, the base of natural logarithms $x_{1,\ \ldots\ldots},x_n$

For the case of a multivariate logistic regression model, the above expression can be specified as:

$$In[\pi/(1-\pi)]=\varphi+\beta_1x_1+\ldots+\beta_{nX_n}+\mu$$

Where π = probability that the value of the dichotomous dependent variable, y, equals 1

$x_{1,\ \ldots\ldots},x_n$ = independent variables

$\emptyset$ = constant

$\beta_1,\ldots,\beta_n$ = coefficients

u = stochastic disturbance term representing that part of $ln[\pi/(1-\pi)]$ which is unexplained by the independent variables. It is noted that the left hand side of the equation is not the dependent variable, y, itself; but the so-called ‘log odds’ or ‘logit’ of y. It is usually recommended that dichotomous independent variables are treated as if they are continuous.

3.5.1.4 Model evaluation criterion

The multivariate models are evaluated to assess their predictive performance based on the explanatory variables on the total sample of 103 cases. Furthermore performance of the models is benchmarked for each of the two dependent variables, the LMA and CI. The predictive ability of the models was evaluated based on the following measures:

i) Model fitting

That is the ability to fit a model for the explanatory variables. There is no universally accepted goodness of fit measure (pseudo-R^2) for logit models (Kennedy, 1998). Researchers use a variety of measures, depending on the method of analysis. One method of assessing the goodness of fit for logistic models is to examine the –2LL measure (Mazzarol, 1998). If a model fits perfectly, then the value for –2LL will be 0. The R square (Nagelkerke) percentage value also gives an idea of the goodness of fit. The classification accuracy of the model is also based on the Lanchenbruch cross validation method, or the coefficient of concordance (Jain, 2001; Laittinen, 2002). In both cases, the higher the percentage, the better the model fitting and this is considered important for the generalisation of the results. The cut-off critical probability value for all models is 0.05.

ii) Ability to classify firms accurately

Researchers (Jain, 2001; Laittinen, 2002; Mazzarol, 1998), use this criterion to evaluate how well the model classifies the data. For this study this is a key test of the performance of the classification model fitted. In level I, we measure percentage of correct classification of successful commercialisation, and in level II the overall accuracy classification. This involves a comparison of the observed number of cases for each state of the dependent variable with the predicted number of each state as derived from the model. In our prediction models, this represents the number of y=1, and y=0 values correctly predicted based on observed P(y = 1 or 0). Level I is said to be a weak measure for evaluating performance of logit models (Kennedy, 1998) since it appears too naive. It can, however, be improved by using Morison's proportional chance criterion (Jain, 2001) benchmark of 62.5 per cent. A stronger test along these lines is the overall per cent of correct classifications, or sum of number fractions of zeros (0) correctly predicted plus the faction of ones (1) correctly predicted. Both measures were applied.

iii) Weighted efficiency

This measure was used to overcome some of the problems associated with the overall classification rate which can be misleading when the two groups that are classified (Jain, 2001) have significantly different proportions. In this case it was not a big problem, as the binary response values were close; 48 for success cases, and 55 for less successful firms. This criterion is defined as the weighted average of overall correct classification rate, percentage of successful correct classifications, and the ratio of the number of correctly identified successful cases to the

total number of MFIs predicted as successful (this includes misclassification due to type 1 error – classifying firms as successful when actually they are not). The closer this value is to 100 per cent, the more effective the model is in predicting success.

The other measure applied to judge the models was splitting the data into two sets – a training set and a test set. This applied to random forests and some form of logistic regression (Statsoft, 2005). The test set was used to validate how well the model did the classification.

3.6 ORDINARY LEAST SQUARES (OLS) TESTS

This section examines some aspects of the empirical literature on financing decisions and patterns of financing for small firms. Specifically, the study used the basic ordinary least squares (OLS) test to construct a model of how firms finance changes in total assets. As mentioned earlier, two models are usually tested: Firstly, static trade-off which assumes there are only two types of finance: equity and debt (Watson & Wilson, 2002). And secondly, the pecking order model which states that there are more finer distinctions of equity and debt such as quasi-equity (or donations), retained earnings, and for debt; savings, commercial debt and creditors (other liabilities).

OLS is used in the present study because of its popularity in studies that have looked at the empirical evidence of whether firms follow a pecking order in financing decisions or static trade-off (Shyam-Sunder & Myers, 1999; Helwege & Liang, 1996; Watson & Wilson, 2002). As per static trade-off model, a firm's total asset growth rate from period to period is caused by changes in the different categories of finance. Thus,

$$Total\ Asset\ (TA) = Equity(E) + Debt(D) + Other\ Liabilities(OL) \quad \text{...(3.11)}$$

Under OLS tests, changes in relative proportions of debt, equity and other liabilities were estimated based on the model in equation (3.12).

$$\frac{TA_{it} - TA_{it-1}}{TA_{it-1}} = \sum \propto_i + \beta 1(\Delta E_{it}) + \beta 2(\Delta D_{it}) + \beta 3(\Delta OL_{it}) + \mu_{it} \quad \text{...(3.12)}$$

Where $\sum \propto_i$ = a vector of fixed effects representing MFI i's annual change in equity, debt and other liabilities, and β are estimated beta regression coefficients for each source of finance. The Coefficient estimates β1=β2 if proportionate change in the required finance is exactly matched. The left hand side of equation (3.12) represents change in total assets or growth from one period to the other where it is assumed that changes in assets are driven by changes in the different components of finance. Again, under the pecking order, it would be expected that the coefficient on the change in the variable attached to it, say debt, indicated as (ΔD_{it}) in time t for MFI i is greater than change in variable equity (ΔE_{it}) if debt is a more preferred choice.

That is, $\beta 2 > \beta 1$ with reference to equation (3.12) indicates the preferred ranking of finance (Watson & Wilson, 2001). μ_{it} =is an error term while ΔOL_{it} represents annual changes in other liabilities.

Equation (3.12) can be further augmented or decomposed into the diversified sources of finance for both debt and equity. Substituting these claims on assets in the model gives the following:

$$\frac{TA_{it}-TA_{it-1}}{TA_{it-1}} = \sum \propto_i + \beta 1(\Delta OE_{it}) + \beta 2(\Delta QE_{it}) + \beta 3(\Delta RE_{it}) + \beta 4(\Delta SA_{it}) + \beta 5(\Delta D1_{it}) + \beta 6(\Delta D2_{it}) + \beta 7(\Delta D3_{it}) + \beta 8(\Delta OL_{it}) + \mu_{it} \quad \text{...(3.13)}$$

Where (ΔQE_{it}) = period changes or growth in quasi-equity (donations) of MFI i over time period t, $(\Delta RE_{it}) =$ period changes in retained earnings, and (ΔSA_{it})= period changes in clients savings, $(\Delta D1_{it})$=period changes in debt with higher subsidy that $(\Delta D2_{it})$ and $(\Delta D3_{it})$ and the rest are defined as in equation (3.12) above. Empirical estimates on OLS tests were performed using equation (3.13) which includes all the financing sources for total assets of most MFIs. Running regression of the above model produces probability values such that if they are significant at 10.5 or 1%, they indicate the variable as a common form of financing.

3.7 SUMMARY AND CONCLUSION

In summary, in order to meet the objectives of this study, several research methods were used and data was collected. In Part I of the study, data was collected via a questionnaire mailed containing 55 questions in total. The method used for gathering data was the internet. This method was chosen due to the advantage that the designed questionnaire could be sent to a large number of people within a limited time. The questionnaire instrument was emailed to 117 microfinance experts spread across the globe. The data was principally analysed through factor analysis procedures and mean scores.

In Part II of the study, secondary data was assembled from MixMarket web-based database. Financial and other data was collected on 33 variables for three years. To address research questions and issues, several statistical methods were employed. Two statistical tests were particularly used for data reduction purposes; factor analysis and random forests where resulting outcome formed input data in subsequent procedures in binary classification. Due to the presence of binary variables in the data, logistic regression was considered an appropriate method of solving the classification problem. Under logit regression, a number of estimation methods and techniques were applied so as to obtain robust results, to benchmark results, validate fitted models and to control for diversity of conditions inherent in the data such as sample size and number of variables. Lastly, ordinary least squares tests were also performed to ascertain the most common forms of financing as well as financing patterns for MFIs over the five-year period from 1998 to 2003.

CHAPTER 4
EMPIRICAL RESULTS, FINDINGS AND DISCUSSIONS

4.1 INTRODUCTION

This chapter presents results of both Parts I and II analyses as outlined in Chapter 3. Part I results are presented first, followed by Part II findings. In Part I, factor analysis results using a set of 53 success items (qualitative in nature) are presented including mean score importance rating.

With regard to Part II of the study, results of preliminary test on the data set of 33 explanatory variables, some of which are proxies of the 53 qualitative items mentioned above, are reported first. These findings helped to further understand the relative importance of identified critical success factors in Part I albeit in their quantitative form (see section 3.2.3 and 3.4). Mainly, random forests technique results ranking important variables that indicate which variables have the strongest impact on the dependent variables of investigation are presented.

The rest of the chapter is devoted to a presentation of Part II research findings of a sample of 103 MFIs taken from the MixMarket database for microfinance institutions. In this part of the study the author attempts to better understand the two measures of successful commercialisation: leverage multiplier added (LMA) and commersialisation index (CI) and how they are impacted by the 33 success factors. Results of a test of difference that investigates whether the two measures of success are significantly different are also shown (Lariviere & Van den Poel, 2004). By means of random forests techniques for binary classification, factor analytic regression and stepwise logit analysis the broad set of explanatory variables are investigated, including microfinance-related performance indicators, macro-economic factors and some typical banking performance variables. Furthermore, results are benchmarked with the performance of initial random forest and factor analysis tests on relative importance of success factors with respect to the two dependent variables.

4.2 PART I: DESCRIPTION OF FINDINGS

A preliminary analysis performed to determine how the respondents rated the 53 factor items indicates that a number of factors are important. The importance rating of individual items is listed in Table 4.1. The mean scores of the Likert ratings were computed first, after which individual mean values were used as an indicator of the item's importance, without regard to other items (Chen, 1999; Rungasamy *et al.*, 2002; Mazzarol, 1998). A factor item with the highest mean score is considered as the most important factor.

Table 4.1: Results of mean score importance rating

Count	Qn	Success item	Mean rating
1	3	Availability of relevant information	3.75
2	4	Portfolio quality	3.72
3	8	Proper record keeping and adequacy of financial reporting system	3.69
4	20	Sound financial management practices	3.61
5	23	Availability of audited accounts	3.56
6	12	Availability of appropriate and experienced management team	3.53
7	1	MFIs potential and growth prospects	3.50
8	6	Extent of business risk in the institution	3.50
9	18	Financial sustainability level (profitability track record)	3.50
10	27	Extent to which MFI is a formal organisation	3.43
11	40	Adequacy of cash flows to service commercial loans	3.36
12	22	Reputable board and good/effective governance	3.31
13	45	Total cost of borrowed funds, i.e. repayment burden and other costs	3.19
14	9	Reputation risk of institution in previous borrowing	3.17
15	5	Returns achievable from investing in microfinance opportunities	3.14
16	31	Adequacy of MFI's system of borrower selection criteria	3.08
17	38	Lender’s strategy and financing policy	3.08
18	13	A formal business plan for marketing MFI’s business strategy	3.06
19	53	Supportive legal mechanisms for settlement of claims	3.00
20	43	Exposure to commercial sources of funds and networking advantage	2.89
21	52	Availability of appropriate financial instruments	2.92
22	47	Availability of wholesale (funds) or other financing arrangements	2.92
23	26	An appropriate debt-equity ratio	2.90
24	28	Cost of making loans to MFIs, i.e. screening, administration costs	2.86
25	48	Stable macro-economic environment	2.86
26	51	Financial sector liberalisation, including supportive banking reforms	2.86
27	29	Ability to meet customer demand with appropriate products	2.81
28	24	An orientation towards private sector approach to microlending	2.83
29	25	Purpose of funds	2.75
30	36	Degree of MFI’s operational autonomy from external influences	2.78
31	35	Strong capital base (equity for leveraging risky funds)	2.78
32	19	Legal personality status	2.72
33	50	Availability of investment funds targeting MFIs	2.67
34	2	Size of MFIs	2.67
35	10	Supervision and regulatory status	2.58
36	14	Total number of clients	2.56
37	30	MFI’s stage of development	2.58
38	41	Years of existence, i.e. long track record.	2.58
39	11	MFI’s lending methodology	2.50

Count	Qn	Success item	Mean rating
40	49	Extent of development of financial markets.	2.56
41	15	Credit rating score	2.47
42	32	Ownership; including mix and composition of stakeholders	2.50
43	44	Inadequate supply of subsidised finance to the MFIs	2.47
44	46	Lack of sufficient retained earnings	2.39
45	21	Extent of MFI's openness and acceptance of intrusion by investors	2.42
46	34	Lender's exposure and appreciation of microfinance operations	2.33
47	7	Possession of adequate (type) collateral	2.36
48	37	Type of institution, e.g. bank, NGO, limited company, credit union	2.33
49	17	Extent of product and delivery innovations, technologies pursued	2.31
50	16	Extent to which ethical image, social responsibility drives decision	2.19
51	33	Location of MFI's business	2.22
52	42	Unused debt capacity	2.17
53	39	MFI's commitment to poverty lending strategy	2.03

The mean rating scores of the 53 factor items give a good indication of what commercial lenders require to make decisions and more importantly how they prioritise among important considerations. The summaries of the descriptive statistics given in Table 4.1 show the following key considerations in a lending decision as the top five success factors with a mean ranging from 3.56 to 3.75:

i) Availability of relevant information;
ii) Specific requirements for portfolio quality;
iii) Proper record keeping and adequacy of financial reporting system;
iv) Sound financial management practices; and
v) Availability of audited accounts.

In summary, the findings suggest organisational factors are of greater concern to commercial lenders than performance issues (except for the need to keep a quality loan book). The results point to the lack of information and transparency in MFIs regarded as important by lenders as opposed to the cost of screening and lending small loans (see item no. 24 and 13) often cited as a barrier (Bystrom, 2007; Elahi & Danopoulos, 2004; UNEP FI, 2007; Sengupta & Aubuchon, 2008; Counts, 2008). In sharp contrast CGAP (2007) suggests that most MFIs base their financing decisions primarily on price, rather than a consideration of all factors that affect the cost of lending. The results are however consistent with the findings of Ayayi and Sene (2007) that highlight high quality portfolio and sound management practices as important determinants of profitable microfinance. Emeni (2008) and Callaghan *et al.* (2007) agree on the importance of availability of transparent and standard financial data for MFIs to get additional finance from commercial markets.

From this list, over 30 success factors were rated below 3.00, that is, below the important score, thus showing about 20 as applicable for credit evaluation. Interestingly, the ranking shows that focus of serving the poor, size of the MFI and location have little interest to commercial lenders (Cull *et al.*, 2008). This is contradictory to the suggestion of experts in the industry that a grown up MFI attracts commercial capital better due to size of the transaction, that certain regions attract funding more than others, and that an MFI's social orientation has an added appeal to investors (Bystrom, 2007; Zapalska *et al.*, 2007; Sengupta & Aubuchon, 2008). On the other hand, Lewis (2008) reveals that MFIs that focus on non-financial services are not attractive to investors.

Table 4.2 shows the number of countries in each region, and corresponding respondents who participated in the study. The findings indicate majority (61%) of the respondents were linked to microfinance programmes in Africa. This ultimately makes their views more representative of Africa than the rest of the world.

Table 4.2: Distribution of respondents among operational regions

	Country / Region				
Respondents	**Africa**	**Americas**	**Asia**	**Europe**	**Total**
Number of countries	8	3	3	3	17
Number of respondents	22	7	4	3	36
% of respondents	61	20	11	8	100

The analysis of the responses on the questionnaire also showed that the highest number of respondents (about 40%) was lenders and social investors. The percentages of the respondents' areas of expertise are shown in Figure 4.1.

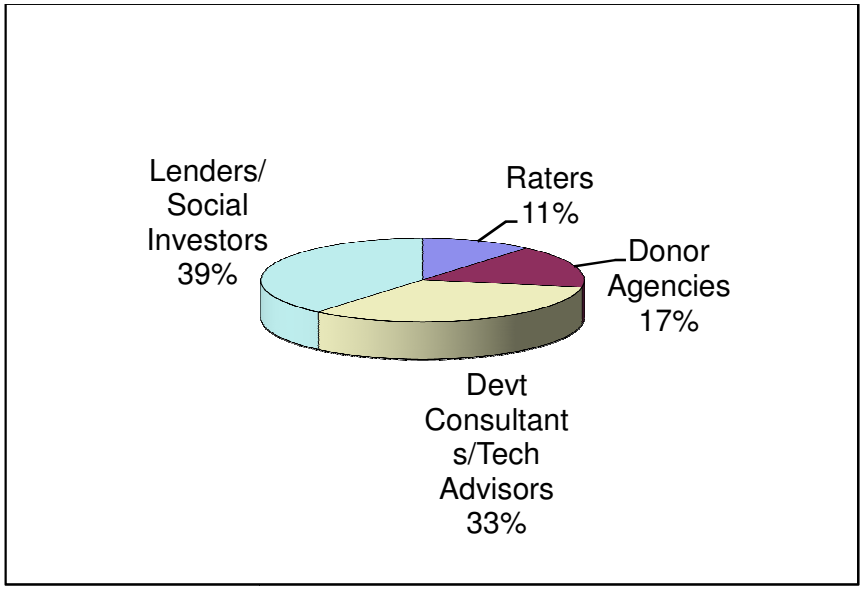

Figure 4.1: Respondents' areas of expertise

4.2.1 Part I: Factor analysis, interpretation of results

Factor analysis was performed on the 53 success items in Part I of the study that represented factors used by commercial lenders in evaluating lending decisions. The item analysis resulted in extraction of ten factor solutions that met Kaiser's criteria of more than one Eigenvalue (Mazzarol, 1998; Lekkos, 2001, Goosen, 2002). The ten factors constituted 42 out of the 53 success items that were suitable for factoring, thus omitting 11 success items that did not meet the test of significance (Antony *et al.*, 2002; Zhang *et al.*, 2000; Hopkinson & Pujari, 1999). Table 4.3 shows ten factors that accounted for 85 per cent of variance in the data.

Table 4.3: Number of factors and Eigenvalues

Value	Eigenvalues extraction: principal components			
	Eigenvalue	**% total variance**	**Cumulative Eigenvalue**	**Cumulative %**
1	10.6060	20.0113	10.6060	20.0113
2	5.8376	11.0144	16.4436	31.0257
3	5.5444	10.4611	21.9880	41.4869
4	4.6669	8.8055	26.6550	50.2924
5	4.0684	7.6764	30.7235	57.9689
6	3.7413	7.0591	34.4648	65.0280
7	3.5189	6.6394	37.9837	71.6675
8	2.7766	5.2390	40.7604	76.9065
9	2.3994	4.5272	43.1599	81.4337
10	1.9467	3.6730	45.1066	85.1067

The ten factors address, and relate to, issues of concern on which this research is based. This is indicative that there is a strong relationship (as shown by factor loadings >0.55) among the grouping of the 42 factors. It is suggested that where the correlation is too small it is unlikely that the items have some property in common.

Factor labeling could be subjective, although it is noted that success items with the largest values provide the flavour of the factor for labelling purposes (Nunes, 2002). In the current study however, an analysis of the loaded variables provided clarity on the factor label as some of the variables 'hanging together' provided conceptual meaning to the factors. High value loaded factor items thus indicated the factor structure and were used for labelling or naming the factors in this study (Child, 1970; Chen, 1999; Hopkinson & Pujari, 1999; Jain, 2001; Nunes, 2002). A full list of all success items in the questionnaire instrument are shown in Appendix E for ease of interpretation. A description of identified critical success factors (CSFs) for accessing commercial funding, including dimensions constituted in each CSF follows in Table 4.4 as well as in Appendix A.

Factor 1 collects five success items that deal with issues related to the ability of MFIs' formalised operational structures to produce reliable and transparent financial information (Zapalska *et al.*, 2007). Commercial lenders' decision to fund microfinance is met with uncertainty and lack of relevant information. Factor 1 captures the relevance and soundness of information obtainable from the MFI for informed decision making (Cull *et al.*, 2008; Bystrom, 2007). Arch (2005) states that MFIs operate in a highly informal and unregulated status and stresses the need for strong institutions for effective access of bank finance. The key to this is the question of accountability of the reporting structures of the MFI. This factor was labelled as *Extent of formalisation and transparency in financial reporting*.

Factor 2 was loaded onto by three items that referred to the assessment of business risk and creditworthiness of an MFI. Capitalists would like to know how viable an MFI is as an investment destination for their funds. Factor 2 was named *Viability of investment in microfinance*. Arvelo *et al.* (2008) emphasise the concern of investors in assessing credit risk of MFIs. Koveos and Randhawa (2004) also note that most banks view MFIs as high credit risk while Arch (2005) suggests that to attract commercial finance, MFIs have to be convincing that they are profitable businesses. Indeed, Sengupta and Aubuchon (2008) reveal that microfinance is being seen by many professional investors as a profitable investment opportunity.

Factor 3 includes six items that focus on microfinance outreach innovations. This factor captures the core service of microfinance innovation and practice. It was named *Microfinance practice and extent of product delivery innovations*.

Table 4.4: Results of rotated factor matrix

Success Item/ Variable (Var.)	Mean score	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Total
Question 27	3.43	0.89										1
Question 40	3.36	0.78										1
Question 4	3.72	0.68										1
Question 23	3.56	0.60										1
Question 3	3.75	0.59										1
Question 5	3.14		0.90									1
Question 15	2.47		0.70									1
Question 45	3.19		0.68									1
Question 17	2.31			0.83								1
Question 14	2.56			0.79								1
Question 50	2.67			0.78								1
Question 34*	2.33			0.64	0.56							2
Question 33	2.22			0.57								1
Question 16	2.19			0.57								1
Question 32	2.50				0.83							1
Question 30	2.58				0.74							1
Question 36*	2.78				0.72		0.60					2
Question 9	3.17				0.66							1
Question 38	3.08				0.58							1
Question 18	3.50				0.58							1
Question 49	2.56					0.91						1
Question 51	2.86					0.77						1
Question 48	2.86					0.69						1
Question 52	2.92					0.66						1
Question 2	2.67					(0.58)						1
Question 20	3.61						0.86					1
Question 22	3.31						0.73					1
Question 19	2.72						0.66					1
Question 8	3.69						0.64					1
Question 43	2.89						0.64					1
Question 29	2.81						0.62					1
Question 12	3.53						0.62					1
Question 7	2.36							(0.92)				1
Question 28	2.86							0.70				1
Question 44	2.47								0.78			1
Question 13	3.06								0.76			1
Question 46	2.39								0.66			1
Question 39	2.03								0.57			1
Question 25	2.75									0.84		1

Success Item/ Variable (Var.)	Mean score	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Total
Question 10	2.58									0.68		1
Question 21	2.42										0.84	1
Question 41	2.58										0.73	1
Expl. Variance		20%	11%	10%	9%	8%	7%	7%	5%	5%	4%	85%
Number of success items		5	3	6	7	5	8	2	4	2	2	*42
*Total scaled down by two items which loaded onto two factors, i.e. Qn 34 and 36												

Factor 4 consists of seven items relating to MFI operational maturity, i.e. credibility and ownership structure. Daley-Harris (2009) concurs and notes that Africa as a region is considered high risk by investors seeking high level returns. In support of importance of perception of investors, Dorado and Molz (2005) cite reputation of directors as an important attribute of success of an MFI in attracting funding. Accordingly, this factor was labelled *Operational reputation and stage of development.*

Factor 5 was loaded by five items that are essential for support and a thriving business of microfinance. These items represent external environment factors conducive for the practice of microfinance:

i) Liberalised financial sector;
ii) Stable macro-economic environment;
iii) Supportive banking reforms;
iv) Financial instruments tailored to microfinance to enable financiers to make contractual agreements with MFIs and;
v) Size of microfinance institution.

Factor 5 can be named *Extent of financial market reform and enabling environment.* A number of researchers are agreed on the need for regulation of microfinance and innovative financial instruments such as securitisation of microloans that can sell in the capital markets (Bystrom, 2007; Cull *et al.*, 2008; Arch, 2005; Zapalska *et al.*, 2007; CGAP, 2007).

Factor 6 contains the highest number of items that loaded onto it. This critical factor consists of statements, which relate to the management of the microfinance business and its effective leadership. For this reason we labelled this factor *Sound financial management and good governance*. In a review of MFI operations, Koveos and Randhawa (2004) acknowledge the importance of good financial management for institutions to be able to attract equity and mobilise deposits. Ayayi and Sene (2007) also find support for sound management of an MFI as a determinant of financial sustainability.

Factor 7 loaded only two items. The two micro-loan items refer explicitly to the key strength of microfinance lending. They reflect the fact that micro-lending is not constrained by lack of collateral or high interest rates. And although the loans are expensive, this does not deter lending as other loan default guarantee mechanisms work better in microfinance. The higher factor loading on adequate collateral (the key item) is negative, indicating these loans are meant to be unsecured. Therefore, factor seven is titled *Secure loan default risk*. Bystrom (2007) argues that although MFIs charge high interest rates, their clients generate high returns to the extent that they can pay for their loans. And in their submission Cull *et al.* (2008) and Counts (2008) point out high interest rates do not make the poor poorer; because access to finance makes them much better off economically than without the loan.

Factor 8 contains four items relating to sources of funding and fund raising methods. We label this factor *Sparse and limited donor funds* and regard it as indicative of the fact that MFIs need to be capital starved to seek alternative funds (Jain, 2001). An MFI must have a financing need (necessity for cash) beyond current donor fund flows – this provides the required drive to seek capital from alternative sources. Availability of easy (cheap) money, however, impairs MFIs' initiatives for accessing commercial funding (Emeni, 2008; Pollinger *et al.*, 2007; Cull *et al.*, 2008).

Factor 9 collects only two items: supervision and regulatory status, and purpose for funds. This latent factor can be labelled *Transformation for funding access*. It summarises the notion and industry perception that a regulated status makes an MFI better suited to tap fund markets (Zapalska *et al.*, 2007; Arch, 2005). The idea of regulation and its benefits has been a key reason for MFIs' quest for transformation to conventional legal forms. In many countries an institution cannot be allowed to take deposits (a cheap source of funding for MFI), unless it is regulated.

Finally, *Factor 10* contains two success items relating to managerial ownership retention. This factor refers to the idea that only mature organisations may have the willingness to invite outsiders to share in the ownership and development of their institution's growth. The findings suggest that MFIs that accept the change to open their institutions to outsider capitalists are likely to be more successful in accessing growth funds, all other things being equal (CGAP, 2007; Counts, 2008; Emeni, 2008). This factor is named *Commitment to privatisation and shareholding exposure*.

4.3 PART II: EMPIRICAL RESULTS

The next paragraphs present empirical evidence on investigations of variables and their relationship with commercialisation success measure. First, the sample data of 103 MFIs used in the study is presented by means of some descriptive statistics. Next, test results of the relationship between the two dependent variables are presented. Results of the relative importance of each of the 33 explanatory variables with respect to the two dependent variables under investigation follow, where random forests method is used. More findings on the investigation of importance of

explanatory variables are reported using data reduction technique of factor logit analysis. Finally, results of various models employing logistic regression tests are reported that examine in detail the most critical factors for tapping commercial capital. In addition, the prediction accuracies of the various models are reported.

Part II of the study made use of data from MixMarket organisation to assess which of the 33 variables are better predictors of commercial success in terms of their explanatory power. The data set contains financial information of a large portion of the microfinance industry worldwide (Cull *et al.*, 2007; Cull *et al.*, 2008). Thus, the MIX database offers comparable data across countries. The 103 MFIs in the sample come from 21 countries in Africa that have institutions providing data to MixMarket. A limitation of the data set is that not all MFIs are represented since participation in the database is voluntary. However, the data set affords cross-country analysis that provides substantial variation in institutional size, location and type of institution.

Panel A and B of Table 4.5 provide some insight on the distribution of institutions by observations per year, by country and number of countries in each region where the sample of 103 MFIs was drawn. Panel A shows that the last three years have seen more reporting in the MixMarket database, with an average of 10 per cent of missing observations. Financial statement data for 2002 to 2003 or later years was used for building the future measure of success in commercialisation while success was predicted by financial statement information from the year 2001 or prior one year using logistic regression analysis. Most of the financial ratios were constructed from the raw balance sheet information. Details on choice of variables are shown on variable description section.

Table 4.5: Distribution of institutions and observations by country and year

Panel A: The number of institutions in each year

Year	Number of observations
1998	4
1999	10
2000	23
2001	99
2002	93
2003	80
Total	**309**

Panel B: Distribution of institutions by country and region

African region countries represented in sample						
Country/Region	**North & Sahelian**	**West**	**East & Central**	**Southern**	**TOTAL**	**No. of MFIs**
Ivory Coast		1			1	1
Mozambique				1	1	1
Rwanda			1		1	1
Tunisia	1				1	1
Ghana		1			1	2
Mali	1				1	3
Senegal		1			1	3
Zimbabwe				1	1	3
Congo DRC			1		1	4
Morocco	1				1	4
Nigeria		1			1	4
South Africa				1	1	4
Egypt	1				1	5
Tanzania			1		1	5
Togo		1			1	5
Benin		1			1	7
Kenya			1		1	7
Cameroon		1			1	8
Madagascar				1	1	9
Ethiopia			1		1	11
Uganda			1		1	15
TOTAL	**4**	**7**	**6**	**4**	**21**	**103**
COUNTRIES	**12**	**12**	**15**	**11**	**50**	
Region % cover	**33%**	**58%**	**40%**	**36%**	**42%**	
Sample MFIs	**13**	**30**	**43**	**17**	**103**	

In general, panel B data shows that West African countries have more visibility in the MIX database. There are, however, more countries from the Central and East African region that are involved in microfinance activity. Uganda, in particular, donated a large proportion of MFIs to the sample, perhaps a reflection of an organised reporting structure at the country level. It is to be noted, until recently, lack of comparable data hampered attempts to study the determinants of financing constraints for MFIs in a cross-country context. Overall, 70 per cent of firms in the sample are from either West or Eastern Africa.

4.3.1 Part II: Dependent variable rank correlation results

The purpose of testing the relationship between the two measures of success in commercialisation, 'LMA' and the 'CI' was to find out whether they are actually different or correlated. The dependent variable rank correlation results are shown in Table 4.6 and indicate that the two measures chosen to represent success are different, but measuring the same phenomena. The correlation result of 44.4 per cent indicates nothing significant, but a crude relationship between the CI and an increase in financial leverage (LMA).

Table 4.6: Relationship between CI and LMA

	Marked cells have counts >10. Chi-square test p=.10813		
CI	**LMA 0**	**LMA 1**	**Row totals**
0	23	35	58
Row %	39.66%	60.34%	
1	25	20	45
Row %	55.56%	44.44%	
Totals	**48**	**55**	**103**

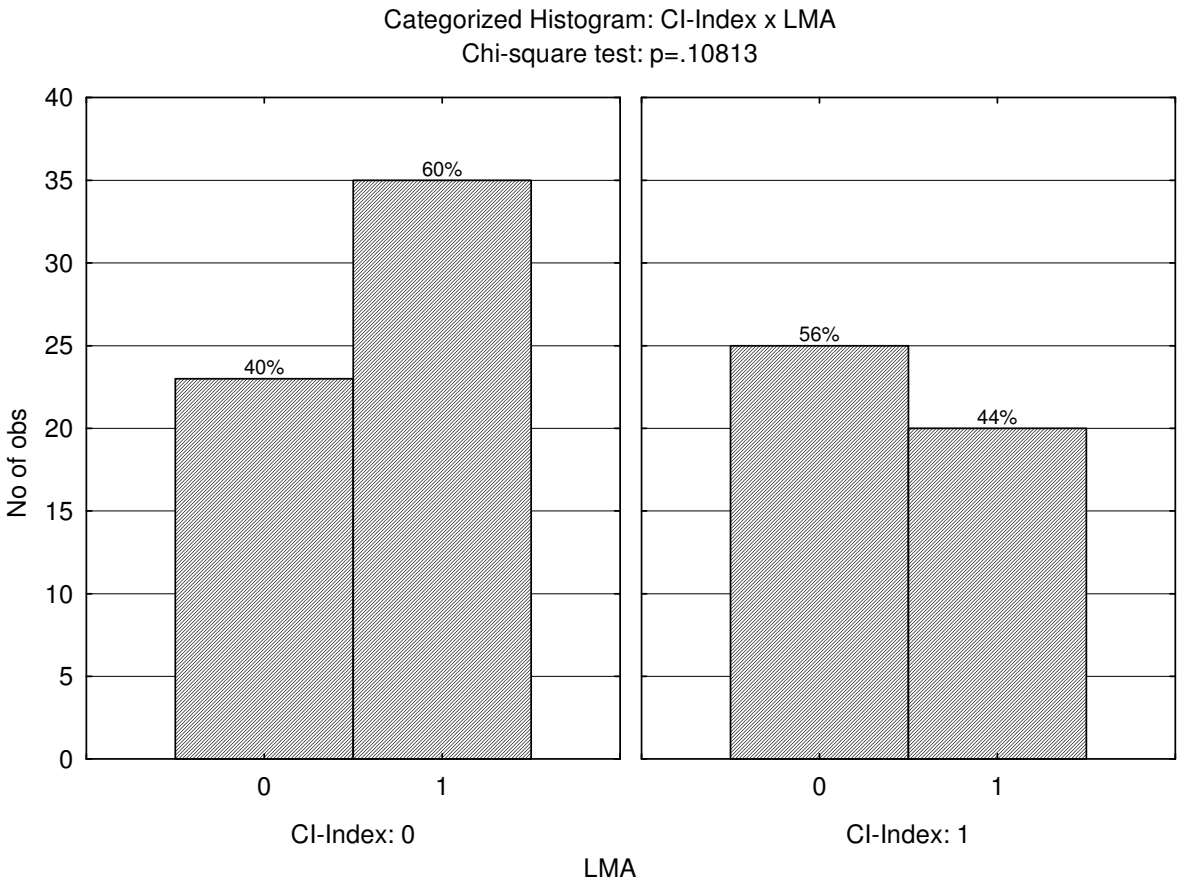

Figure 4.2: Chi-square test results between CI and LMA

This result is not surprising, given that the CI is not only a measure of increase in financial leverage, but also of success in commercial microfinance (Refer to CI modelling in the Appendix B). The binary classification for the LMA can only be used to give a naive measure of success without the combination of critical factors necessary for successful commercial microfinance.

This supports the conjecture that successful commercialisation is more than just gaining access to commercial funding. A separate analysis found significant differences in the nature and magnitude of predictor variables used for the success measures. Hence, the use of the two dependent variables in determining which one is a better predictor of successful commercialisation. Further investigations were performed on the CI to examine its effectiveness in predicting future success of sample firms.

4.3.2 Part II: Relative importance indices for explanatory variables

The next paragraphs present the findings of the relative importance of each of the 33 explanatory variables in Part II with respect to successful commercialisation. As stated in the methodological section, a welcome feature of the random forests techniques are the importance measures for explanatory variables. Random forests scores the importance of the variables in terms of the ones that have the greatest impact on the dependent variable of investigation. Thus, the most important one (the one used the most for the splits of the classification trees) is scored as 100 and the rest are scored relative to the most important one. Table 4.7 reports these importance indices with regard to one of the dependent variable of the study, namely the CI. The seven most important variables are graphed in Figure 4.3.

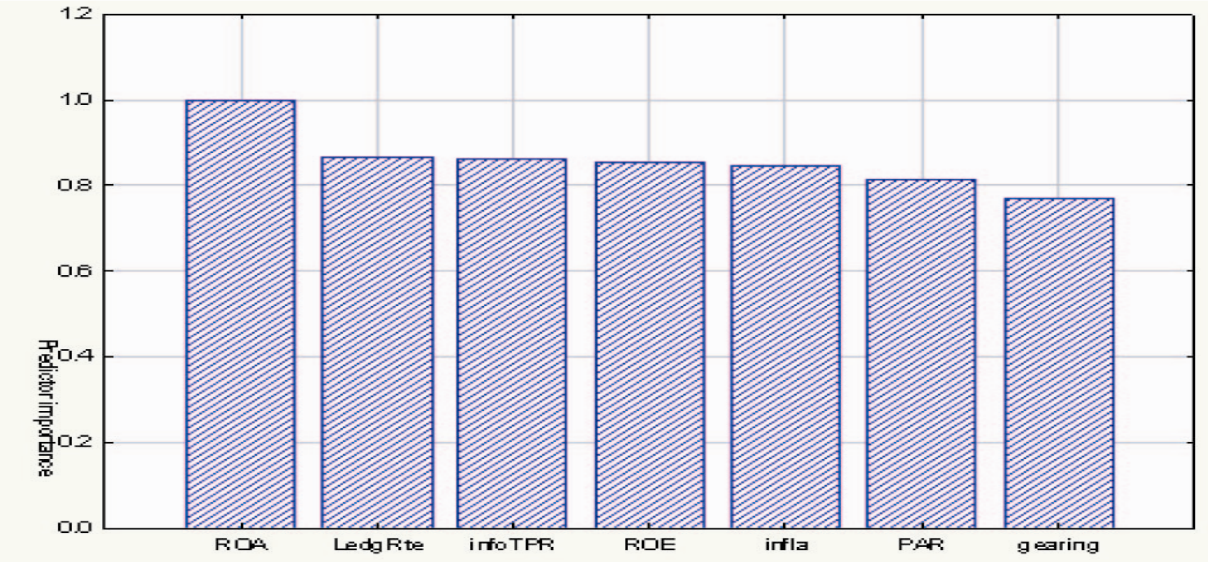

Figure 4.3: Top seven variables

It is clear from Figure 4.3 that, the variable ROA came out as most important, followed by lending rates and information transparency. These variables reflect the need to demonstrate profitability in order to attract commercial capital. This finding is interesting, but not surprising; commercial investors are interested in financial returns more than anything else.

The five most important variables are indicative of the importance of good financial returns (ROA and ROE) looked for by investors, but also concerns for the cost of funds (Cull *et al.*, 2008; Counts, 2008; Bystrom, 2008; Lewis, 2008; Sengupta & Aubuchon, 2008; Ayayi & Sene, 2007). The findings indicate that the model was able to single out information transparency as a key predictor of success in commercialisation. This is a very important finding, given the scarcity of information provision for making investment decisions in Africa. This result confirms the observations of factor analysis with regard to the influence of information on investor decisions. Table 4.7's full listing also

underscores the importance of the risk profile, quality of asset (PAR) and ability to absorb new capital (level of indebtedness) for MFIs that would be successful in accessing commercial funding.

Table 4.7: Importance scores for CI

	Predictor importance (CI data)	
Variable	**Variable rank**	**Importance**
ROA	100	1.000
LedgRte	87	0.8699
infoTPR	86	0.8639
ROE	86	0.8550
infla	84	0.8439
PAR	81	0.8141
gearing	77	0.7705
profit	72	0.7216
DepthRch	70	0.6959
GDP	68	0.6812
LonSize	65	0.6536
log(sizeGPF)	64	0.6434
personel	61	0.6112
age	61	0.6107
EAR	60	0.6040
AsetStruc	60	0.6019
log(tassets)	60	0.5994
OExpR	59	0.5889
log(borrowers)	58	0.5764
Eqbase	58	0.5761
RpmtCap	58	0.5750
EarnSuff	56	0.5584
costSav	55	0.5510
OSS	48	0.4844
Lform	46	0.4590
GNI	33	0.3322
LMR	32	0.3212
regul	26	0.2551
HGOp	24	0.2388
finHealth	23	0.2317
FastGro	16	0.1567
Donor	15	0.1543
GRpost	14	0.1425

While random forests analysis provides a clear understanding of the explanatory variables that have a strong impact on the dependent variables under study, the directions of these impacts are still unknown. Therefore further analysis is necessary to explore the direction of the most important predictors.

4.3.3 Part II: More investigation on significance of explanatory variables

Further investigations were carried on the 33 independent variables to determine their impact on success measures. It was decided to reduce the data set of the 33 variables to only those that were most critical in predicting success with the two dependent variables. As reported through the random forests results, only a few variables were selected as important indicating possibilities that a number of the variables were relatively highly correlated among each other. To explore the relationships among the variables, factor analytic procedure was used; firstly, to find the CSF common structures for use in subsequent analysis by use of composite factor scores computed to represent each of the factors, and secondly, to provide insight into which of the factors are important for attraction of private finance. For the former scenario, factor scores created were then used as raw data to represent the independent variables in logit analyses. The results of 22 variables[23] subjected to a principal component analysis procedure are presented in the next paragraphs.

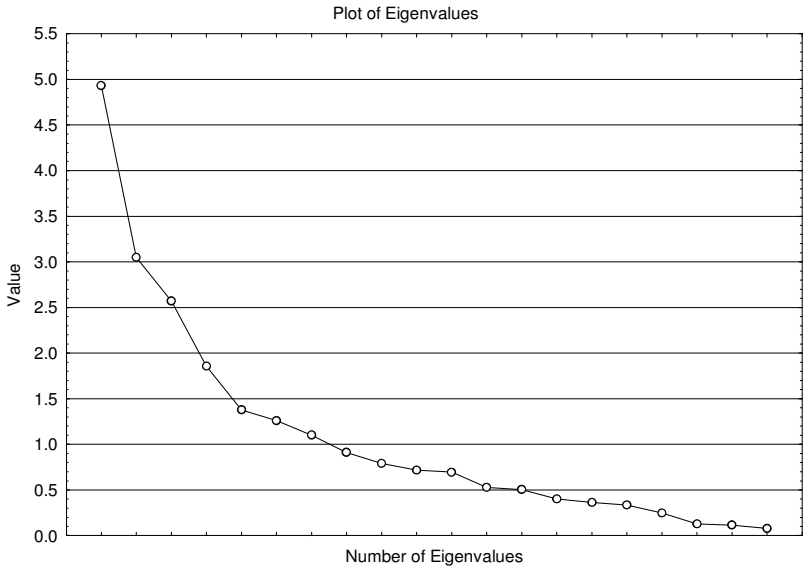

Figure 4.4: Factor solution scree diagram

[23] The following were excluded since they were binary variables: Age, Regul, Lform, GRpost, Donor, FinHealth, RpmtCap, FastGro, HGOp, InfoTPR.

The factor analysis resulted in five factor solution as per the scree plot in Figure 4.4.

The five factor solution was extracted based on Eigenvalues greater than 1 (criteria per Kaiser's rule) thus reducing the 22 explanatory variables into only five variables under various combination procedures for each factor as shown in Table 4.8.

Table 4.8: Rotated factor matrix of numeric indicators

	LMA					CI				
Variable	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
Profit	0.60									
OExpR	0.78					-0.81				
EAR			0.96					-0.93		
Borrowers		0.79								-0.65
SizeGPF		0.88					0.91			
PAR			-0.62				0.64			
AsetStruc			0.60					-0.66		
Gearing									-0.64	
LonSize					0.72					
DepthRch					0.52					
GNI							0.57			
GDP				-0.76					0.64	
Infla				0.83					-0.80	
LedgRte				0.68						0.63
Eqbase			0.58					-0.68		
CostSav			0.88					-0.85		
Personel		0.78					0.52			-0.59
Tassets		0.90					0.93			
EarnSuff	0.92					0.90				
OSS	0.81					0.72				
ROA	0.89					0.78				
ROE	0.72					0.66				
Per cent of variance	22.4%	13.9%	11.7%	8.4%	6.3%	18.8%	13.2%	12.3%	8.2%	6.6%

The five-factor solution accounted for 63 per cent and 59 per cent of the variance for CI and LMA rating respectively. Factor 1 accounted for 22 per cent for LMA and 18 per cent for CI. Only value loadings greater than 0.50 were used to interpret the factors. The LMA shows stronger performance than CI given variance explanation for identified factors.

The *first factor* for both dependent variables can be named 'profitability model' because it is loaded with commercial viability performance indicators. For the LMA, six variables are loaded onto this factor. It underscores the importance of financial sustainability and cash-flow generation in attracting commercial capital (Ayayi & Sene, 2007; Emeni, 2008; Lewis, 2008). The three most important critical success factors are earning sufficiency in terms of cash-flow adequacy, ROA, and operating efficiency. This factor suggests that more profitable MFIs are likely to attract commercial capital and be successful in commercialisation, given that all other variables are equal.

The *second factor* is about size, and represents the growth and outreach model. Four factors are selected for the LMA variable, while for the five CI factors are loaded. Important indicators of size include total assets, gross portfolio amount, number of borrowers and number of personnel. This suggests that larger MFIs, measured by asset base, are likely to be successful in commercialisation.

The *third factor* can be named 'cost saving model'. Five factors are loaded and include earning asset ratio, ability to obtain cheap finance and save on cost of funds, maintaining high portfolio quality and effective asset structure.

The *fourth factor,* macro-environment model, captures macro-economic variables. The most important variables include the level of inflation, economic development and cost of money in the country. Variables that load onto the *fifth factor* include the loan size and depth of reach which are associated with social mission or poverty lending in microfinance. It is very clear from the LMA[24] factor loading that larger loan sizes are associated with commercialisation. This finding suggests that commercialising MFIs are associated with mission drift. That is, MFIs likely to be successful do not lend to the poor in their society. In contrast, Cull *et al.* (2008) find no evidence that commercialisation causes mission drift.

In summary, it is concluded that the five CSFs seem to stress importance of high profit returns, efficiency in operations hence capacity to minimise costs and supportive economic conditions. It is also indicative that, mature MFIs are more attractive to investors as well as those that keep to the promise of helping the poor by avoiding mission drift (Pollinger *et al.*, 2007; Lewis, 2008; Counts, 2008).

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[24] The LMA factor analysis seems to be better than CI in grouping relevant variables. It also explains more variance.

4.3.4 Part II: Logit analysis results

This section presents results of a set of logistic regressions that control for multicollinearity; firm and data characteristics that may help explain the significant predictors of success. In addition to the variables used in the previous tests, these regressions include interactions of dummy variables with LMA and the CI that allow for analysis of direct effect of success factors on successful commercialisation of sample institutions.

4.4.1 Factor analytic logit model

In the next paragraphs it is reported stepwise logistic regression carried out on the full set of 33 variables as follows: the reduced data set of five CSF factors emerging from the factor analysis process above were transformed into factor scores and used in the analysis along with the common variables data set excluded earlier (see section 4.3.3) to construct success classification models. Although the five factors on their own give an indication of important considerations in lending decisions, the direction of influence on commercialisation is not known. It was also necessary to understand more with regards to their interaction and measure their effectiveness as predictors of success in commercialisation. The results for the null hypothesis (LMA, CI =0) based on factor analytic logit estimation are reported in Table 4.9.

For the CI, the final logistic model fitted does not include the size, macro-economic, or asset quality variables. However, the estimation method allowed for testing the overall fit of the model, that is, how well all the predictors of all the constructs, taken simultaneously, satisfy the criteria validity requirement. To evaluate this overall goodness-of-fit, several measures were considered. The Pearson goodness-of-fit test and the deviance test shows that the fitted model seems to be fitting well with p-values 0.5758 and 0.3988 for the null hypothesis. The value for the -2 LL measure indicate the model is a good predictor. The performance of the model is also satisfactory, given a high coefficient of concordance of 82.2 per cent. The percentages of predicted probabilities and observed responses mean that 82.2 per cent of observations are classified as originally identified, while 17.4 per cent are discordant with 0.4 per cent ties. This is indicative of a high predictive accuracy of the factor analytic model; particularly with CI as the binary variable.

Table 4.9 reveals the importance of repayment capacity for commercial loans (Rpmt cap), existence of growth opportunities (FastGro) and underlying critical success factors in FACTOR 1. Five profitability indicators are selected in FACTOR 1, with most influential being earning sufficiency of the portfolio or liquidity (EarnSuff), operating efficiency and return on assets (ROA). The negative coefficient for FACTOR 1 (profitability model) means that an MFI has a high probability of failure to succeed in commercialisation (low CI value) if its ability to earn profit on earning assets is low. As expected, low or no growth opportunity in the country of operation diminishes chances of success in commercialisation (Zapalska *et al.*, 2007; Cull *et al.*, 2008). This

result is interesting as it confirms other research findings that fast growing firms need external finance (Upneja & Dalbor, 2001). The findings also emphasise the fact that commercial funds are costly and an MFI needs to have the ability to raise sufficient return to repay costly debt as well as maximise shareholder value.

Table 4.9: Factor analytic logit models (step-wise analysis, three allowed) for total sample

Explanatory variable	**Coefficient estimates: CI**	**p- Values: CI**
Intercept	1.7150	0.0332
FACTOR 1	-0.9727	0.0228
FastGro (No)	1.8014	0.0194
RpmtCap ('0)	0.8149	0.0038
-2 log likelihood, constant only = 141.143		
-2 log likelihood, full model = 101.972		
Goodness of fit test, Pearson		p value = 0.5758
Goodness of fit test, Deviance		p value = 0.3988
Coefficient of concordance		82.2%
Contingency coefficient, original verses logistic fit classification, c = 0.824		
F- to-enter significant level = 5%		
LMA: (step-wise analysis, 8 allowed respectively)	**Coefficient estimates:**	**p- Values:**
Intercept	0.0278	0.9337
FACTOR 2	0.9068	0.0163
FACTOR 5	0.7193	0.0145
Finhealth ('0)	0.5336	0.1011
GRpost (G)	0.5068	0.0470
Lform (bank)	1.0977	0.0484
Lform (Coop)	0.7304	0.0938
Lform (FI)	-0.3834	0.0077
Regul (No)	0.7569	0.0147
-2 log likelihood, constant only = 142.312		
-2 log likelihood, full model = 118.088		
Goodness of fit test, Pearson		p value = 0.2006
Goodness of fit test, Deviance		p value = 0.0471
Coefficient of concordance		76.1%
Contingency coefficient, original verses logistic fit classification, c = 0.762		
F- to-enter significant level = 0.2		

The LMA measure of simple increase of leverage singles out the legal form of an institution as important in attracting investors. It emerges that being an NGO-MFI is positively associated with access to capital unlike institutions that are banks, financial institutions or co-operatives. As can rightly be predicted, being under the supervision of the National Central Bank (regulated) is important in accessing commercial capital. Regulated institutions are seen by investors as safer (less risky) than unregulated ones as confirmed in other studies (Zapalska *et al.*, 2007; Torkenstani & Ahadi, 2008).

FACTOR 5 (social mission model) is significant with a positive coefficient. It settles the long-term debate as to whether commercialisation causes mission drift in microfinance. It is clear from the results that commercialising MFIs will have larger loan sizes and low depth of reach which is not consistent with serving the poor. This confirms that mission drift will arise especially as the hunt for private capital intensifies with degree of commercialisation (Lewis, 2008).

Finally, the results support the conjecture that larger MFIs are successful in attracting commercial investors. The size of the organisation says something about absorption capacity given small loan sizes in the microfinance industry are said to be costly to administer (Emeni, 2008; Daley-Harris, 2009; Bystrom, 2007). Investors will therefore be looking at larger and profitable MFIs for their investment portfolios.

4.4.2 Binary logistic regression results

This section commences by presenting results of classification of the most important variable (return on assets (ROA)) identified using random forests technique. As a test of strength, this variable was used to classify the 103 MFIs included in the sample. For the classification test, the binary classification estimates an MFI's likelihood to succeed in commercialisation, category given by $y = 0$ while the likelihood not to succeed is given by category, y =1. Figure 4.5 reports on the test set results.

Figure 4.5: Most important variable: ROA

Using random forests method, the results reveal that this variable on its own could provide most of the classification in exclusion of the 33 independent variables. This result is based on a random split of the data into two parts; training set (60%) and a test set (40%). The model was built on the training set and then tested on the test set. Using a cut-off value of 0.005 (derived from the training data) ROA was able to classify 78 per cent of the 0's correctly and 70 per cent of the 1's correctly. This indicates the influence of ROA or profitability on commercialisation. The implication of this result is that, to predict commercialisation it enough to use ROA as the key measure of success. For MFIs, it means that investors are concerned by profitability more than any other performance measure.

The importance of high returns has also been emphasised by a number of authors (Cull *et al.*, 2008; Counts, 2008; Lewis, 2008; UNEP FI, 2007; Ayayi & Sene, 2007). In a review of commercial investment by Daley-Harris (2009) it is revealed that investors focused on high performing MFIs in deciding where to put their money. Callaghan *et al.* (2007) also suggest that to get more financing from commercial markets, more returns is required in addition to regulation, transparent and standard financial data. As if to conclude the matter on what counts to attract private capital, Lewis (2008) clearly states that commercial investors have a legal and fiduciary obligation to evaluate only financial returns.

Analysis results and further evaluation based on random forests on the full model (all 33 explanatory variables) are reported in Table 4.10. Data split is maintained as above, that is, training set was 60 per cent and test set 40 per cent. Only the classification matrix for the test results is shown.

Table 4.10: Random forests performance results

	Dependent variable (CI)		Predicted cases (test set)		
		Actual cases	**1's**	**0's**	
Successful	**1's**	20	16	4	**80%**
Less successful	**0's**	23	6	17	**74%**
Total cases		**43**	**22**	**21**	
Overall correct classification					**77%**
Weighted efficiency					**76%**

There were 43 cases in the test sample, and when the random forests test was applied to this set, of the 20 (1s), 16 (80%) were classified correctly. The overall correct classification is 77 per cent, which is higher than the 62.5 per cent obtained by Morrison's chance criterion (Jain, 2001). The percentage of successful MFIs correctly identified is 16 and the weighted efficiency of the full model is 76 per cent. Thus the overall model seems to fit well with high prediction accuracy. These results indicate that the variables used in the prediction are significantly related to commercialisation.

With regard to the most important predictors in the model, the top seven are as highlighted in Figure 4.3. These variables relate to profitability, macro-economic factors and institutional risk profile. This means that an MFI has a probability of success if its ability to earn profits on assets and equity is high and the quality of its portfolio is high, but the institution must exist in low cost and low inflation economies. It is observed that these findings reveal significance of other variables besides ROA, which can be an indication that perhaps ROA masks other variables.

The rest of the of the results presented in the next sections represent further modeling of the relationship between the full set of independent variables and the two binary success measures. In addition, results of sub-analysis of different sub-models performed to investigate the relationship between a cluster of variables representing important hypotheses and commercialisation are also reported. These hypotheses represent some of the issues of concern to this study: for example, the relationship between commercialisation and sustainability of microfinance, mission drift, or outreach-growth model. For all the tests logistic regression modelling was used to determine the mapping between the predictor variables and the two successful binary commercialisation measures.

Table 4.11 presents LMA estimated at statistically significant factors associated with commercialisation for the entire sample, by step-wise regression. The estimation for the CI failed because of too many variables. For the LMA, the estimation terminated at iteration number 7. The cut-off value was 0.500. The probability modeled was LMA = 1. The final model included eight significant variables.

Table 4.11: Binary logistic regression results: LMA modeling

Explanatory variables	ß estimates	Wald	*p*- values
REGUL (*Yes*)	1.884	4.028	0.045**
LFORM	0. 000	4.799	0.187
G-RPOST (G)	-1.498	3.602	0.058*
EAR	-0.020	1.754	0.185
BORROWER	0.000	1.937	0.164
PAR	0.104	2.939	0.086*
GEAING	0.001	2.650	0.104
LEDGRTE	0.081	2.182	0.140
EQBASE	0.072	4.472	0.034**
PERSONEL	-0.009	3.777	0.052*
EARNSUFF	0.063	3.183	0.074*
OSS	-0.049	5.221	0.022**
FINHEALT	5.401	8.859	0.003***
CFR	0.213	1.652	0.199
Constant	0.091	0.001	0.981
Notes: *** Very significant, *p*<1%*;* ** *p*<5%; * *p*<10%			
Goodness-of-fit		-2 log likelihood	84.137
Explanatory power		R Square	57.6%

Classification table for overall goodness-of-fit				
LMA observed cases		**LMA predicted cases**		
		0's	**1's**	**Percentage correct %**
0's	48	36	12	75.0
1's	55	8	47	85.5
TOTAL	**103**	**44**	**59**	
Overall correct classification				**80.6%**
Weighted efficiency				**81.9%**

The results show that one variable (financial health or earning potential) is particularly significant at the 0.01 level, while three others (operating self-sufficiency, regulatory status and size of equity) are significant at the 0.05 level. This is not surprising, as it suggests that investors are currently worried about the financial health of investing in institutions, as to whether they earn enough to capitalise their equity base and whether the equity base provides enough safety. A further safety aspect investors are keen on, is whether the MFI is regulated by the Central Bank or not (Callaghan *et al.*, 2007). The coefficient for the operating self-sufficiency (OSS) indicator is negative, perhaps showing bad estimation or that investors do not really care about this measure of profitability. This is reasonable as OSS is a weak profit indicator that only indicates that an MFI manages to cover operating costs (Cull *et al.*, 2007; Cull *et al.*, 2008).

The fitting of the model (R-square) shows that predictor variables can explain 58 per cent of successful predictions. However, the binary classification which gives the overall goodness-of-fit for the model was able to classify successful commercialisation correctly at a rate of 86 per cent. The weighted efficiency is 82 per cent while the overall correct classification for the model is 81 per cent. The performance of the estimated logit model is very satisfactory, taking into account the high accuracy predictions it can afford.

The next modelling involves further tests on the prediction power of a model obtained from preliminary analysis by the author. This model included 15 interaction variables thought to improve the strategic fit of the models. The results of this reduced data set model are presented in Table 4.12 for both LMA and CI.

Table 4.12: Binary logistic regression results: 15 select variables

	CI		LMA	
Explanatory var.	**ß-estimates**	***p*-values**	**ß-estimates**	***p*-values**
LFORM (NGO)	–	0.828	0.000	0.188
LFORM (FI)	-0.882	0.402	0.310	0.674
LFORM (Bank)	-0.140	0.902	-0.438	0.594
LFORM (Coop)	-0.596	0.620	1.295	0.137
OEXPR	0.000	0.995	0.012	0.273
EAR	0.007	0.207	0.001	0.692
INFOTPR	1.528	0.002***	-0.065	0.814
PAR	-0.034	0.269	0.071	0.033**
ASETSTRU	-0.023	0.199	0.006	0.744
GDP	-0.018	0.880	-0.062	0.546
EARNSUFF	0.019	0.492	0.024	0.177
OSS	-0. 017	0.188	-0.024	0.048**
ROA	0.093	0.041**	0.027	0.349
ROE	-0.019	0.052*	0.001	0.856
FINHEALT	1.118	0.3141	0.818	0029**
RPMTCAP	2.192	0.007***	-0.486	0.475
FASTGRO (`1)	-4.571	0.207	0.141	0.899
HGOP (`1)	-7.689	0.740	-0. 359	0.747
Constant	-2.764	0.218	1.538	0.349

Notes: *** Very significant, p<1%; ** p<5%; * p<10%

-2 log likelihood	70.623	118.751
R Square	66.5%	27.3%
Overall correct classification	83.5%	66.0%
Weighted efficiency	82.4%	66.5%

Classification table for overall goodness-of-fit				
CI observed cases		**CI predicted cases**		
		0's	**1's**	**Percentage correct %**
0's	58	48	10	82.8
1's	45	7	38	84.4
TOTAL	**103**	**55**	**48**	
LMA observed cases		**LMA predicted cases**		
		0's	**1's**	**Percentage correct %**
0´s	48	33	15	68.8
1´s	55	20	35	63.6
TOTAL	**103**	**53**	**50**	

The results of the CI show that four variables in particular are significant, of which two are very significant. The model singled out information disclosure and repayment capacity for commercial loans as the most effective considerations for investments in African MFIs. The next important considerations are return on assets and equity. The percentage of successful MFIs correctly identified is 84.4 per cent, and the overall correct classification is 83.5 per cent, while the weighted efficiency is equally high at 82.4 per cent. The -2 log likelihood measure shows an improvement from the full model by LMA, posting a value of 70.623. The CI has more explanatory power at the rate of 67 per cent. Overall, the model fits very well and suggests that information opacity and earning potential are good predictors of commercialisation as suggested by other authors (Callaghan *et al.*, 2007; UNEP FI, 2007; Cull *et al.*, 2008; Counts, 2008; Ayayi & Sene, 2007; Lewis, 2008; Emeni, 2008; Sengupta & Aubuchon, 2008).

The LMA reduced model seems to have lost its sting with explanatory power dropping to 27 per cent. However, the model is very consistent as it still manages to identify financial health of institutions, operating self-sufficiency and portfolio quality as the most important predictors of current access to commercial funds. It is very clear that investors are looking beyond the ability to cover operating costs, and would place emphasis on earning capacity that is sufficient enough to offer a return on investment. Pollinger *et al.* (2007) in support states that financial leverage is more easily attained by organisations that generate the means to repay debt.

In particular, the CI suggests that investors will be attracted by wealth creators. That is, MFIs with the ability of not only covering economic costs (inflation) and maintaining value for equity in real terms, but also with the capacity of replacing soft loans with loans charged at market interest rates. In a study of the success of MFIs in developing countries, Hartungi (2007) reveals that a key determinant is the ability to replace subsidised credit products with those at market rate. As per this model maturity does not matter, nor is size relevant, to be successful in commercialisation. The reduced model seems to suggest that MFIs have a high chance to succeed in commercialisation

(high rating) if they are highly profitable (OSS, ROA, ROE, FINHEALT, RPMTCAP), and if they are able to maintain a high portfolio quality (PAR) and portray good financial reporting behaviour (INFOTPR – information asymmetry).

Another model using a reduced data set was tested for created five-factor scores consisting of a rather scientific grouping of 22 financial variables and the remainder of the nominal variables from the 33 explanatory variables (see section 4.3.3) that, upon analysis, were found to have significant differences. This was also motivated by the fact that these variables were closely correlated. However, the analysis was performed through a process of first training the model.

Under this modelling procedure the data was split into training (70%) and test sample (30%) sets. The F-to-enter and F-to-delete significance levels were developed (by default) as 0.05 for CI, while it was necessary to drop these to 0.2 for the LMA fitted model. The model begins with a prior probability of 0.05 that an MFI would belong to each of the two categories (successful or less successful) and, based on the discriminate function, calculates the revised membership probabilities. The application of the model to the test data set gives an independent goodness-of-fit measure and helps to evaluate how well the model executed the classifications. The probability modelled is CI and LMA=0, and the results are reported in Table 4.13. These results should be interpreted together with Table 4.14 which summarises variables loaded to significant variables included in the model.

Table 4.13: Binary logistic regression results: full data set

	CI		**LMA**	
Explanatory var.	**ß-estimates**	***p*-values**	**ß-estimates**	***p*-values**
Intercept	1.7150	3.32%	0.0278	0.9337
FACTOR 1	-0.9727	2.28**		
FastGro (*NO*)	1.8014	1.94**		
RpmtCap *(`0*)	0.8149	0.38***		
FACTOR 2			0.9068	1.63%**
FACTOR 5			0.7193	1.45**
FinHealth (‘0)			0.5336	10.11
Grpost (G)			0.5068	4.70**
Lform (Bank)			1.0977	4.84**
Lform (Coop)			0.7304	9.38*
Lform (FI)			-1.3834	0.77***
Regul (No)			0.7569	1.47**

Notes: *** Very significant, *p*<1%*;* ** *p*<5%; * *p*<10%

-2 log likelihood	= 109.972	118.088
Pearson goodness-of-fit test, *p* value	= 0.5758	0.2006
Deviance test, *p* value	= 0.3988	0.0471
Coefficient of concordance	= 82.2%	76.1%
Contingency coefficient, c	= 0.824	0.762
F-to-enter significant level	= 0.05	0.2

The most significant variables in the CI logistic model are repayment capacity for commercial loans (Rpmt cap), growth opportunities (FastGro) and underlying critical success factors in FACTOR 1 (Refer Table 4.14 for loading predictors). Factor 1 indicates that to attract commercial capital in future, profitability and ability to earn sufficient cash flow is important. This result is interesting, as it confirms other research findings that profitable and fast growing MFIs need external finance (Emeni, 2008; Zapalska *et al.*, 2007; Upneja & Dalbor, 2001) that may have to be sourced from the capital markets. This underscores the necessity for this category of MFIs to link with the wider financial system for continued funding (CGAP, 2007; UNEP FI, 2007).

From the LMA perspective, that is current access to commercial funding, the results seem to suggest that lack of access to commercial capital is closely associated to unregulated MFIs, and institutions not registered as NGOs, but bear other legal status like co-operatives, financial institutions or banks. Contrary to popular belief, NGOs have a particular attractiveness to new investors especially when they achieve the two bottom-lines (Counts, 2008). This is understandable because these are the pioneers of microfinance and most social investors look for excelling NGOs that have mastered the art of microfinance. Indeed some researchers attest to the fact that funding profitable microfinance has an added appeal particularly for those institutions that help bring social change in poor societies (Bystrom, 2007; Dorado & Molz, 2005; Elahi & Danopoulos, 2004; Lewis, 2008).

Table 4.14: Summary factor solution: variables

Model Var.	Profit	OExpR	Earn Suff	OSS	ROA	ROE	Borrowers	SizeGPF	Personnel	Tassets	LonSize	Depth Rch
Factor 1	0.60	0.78	0.92	0.81	0.89	0.72						
Factor 2							0.79	0.88	0.78	0.90		
Factor 5											0.72	0.52

The LMA model fields in two critical success factors – FACTOR 2 representing the growth model and FACTOR 5 representing the social mission model. FACTOR 2 includes dimensions emphasising the importance of size in commercialisation (Daley-Harris, 2009). However, the effects of size on the logit are positive. This suggests that although size has been a consideration in accessing commercial funding for MFIs in Africa, small firms have benefited more from investors than bigger MFIs. There is also the growth retrenchment posture included in the model, pointing to the same idea that MFIs accessing commercial funding to date have had declining portfolio investments. The reasons for this may not be clear, but it is conceivable that perhaps emerging small and promising MFIs are the target here.

Finally, the results support the conjecture that commercialisation is associated with bigger loan sizes. This result confirms the fears of microfinance traditionalists who strongly believe that the microfinance intervention should seek to address social economic problems of inequality and lack of opportunities. In this case, commercialising MFIs seem not to target their financial services at the poor who only borrow small size loans. The social value[25] to the poor is the biggest contribution of microfinance innovation to the world (Bystrom, 2007; Elahi & Danopoulos, 2004). To abandon this agenda is like a betrayal to the poor for any organisation purporting to engage in microfinance. However, this raises the question whether the MFIs that are going upmarket for funding are doing ethical microfinance? Or if they are engaged in a new kind of microfinance (Cull *et al*., 2008)? Lewis (2008) adds to this dilemma by questioning whether microfinance can serve two masters: poverty alleviation and profit generation.

In summary, assuming that the funding constraint holds the key to continued intervention and growth of the microfinance activity, and the fact that available options are in pursuit of a commercialisation strategy; then successful commercialisation is important for MFIs to remain relevant. These findings therefore suggest that future players in microfinance will be fast growing (not necessarily big) and profitable MFIs that are regulated.

4.4.2.1 Evaluating predictive performance of the classification models

It is clear from previous findings (Table 4.12 and 4.13) that the index provides better prediction accuracies compared to the LMA logistic regression model. For all cases of binary classification tests, it is observed a significant and better performance in favour of the CI (Refer to the -2 log likelihood indicator in Table 4.12: it is lower for the CI, the Pearson goodness-of-fit test and deviance in Table 4.13 show better fitting of the model with higher p-values). The coefficient of concordance or per cent of correct classifications for the LMA is moderate at 76 per cent, while for

[25] Microfinance aims to achieve social empowerment for its clients – uplifting the standards of living for the poor, through income/employment generation.

the CI this goodness-of-fit rating is very high at 82 per cent. The overall prediction accuracy also is 82.4 per cent (versus 76.2 per cent for LMA). This statistically means that on the basis of the CI, we can evaluate information in 2001 (prior year) by this logistic rule and correctly classify 82 MFIs out of 100 into successful or less successful for the following later years (2002 to 2003).

4.4.2.2 Sub-analysis logit models

More results of sub-models and validation tests[26] for the predictive ability in both LMA and CI are reported in the following paragraphs. It shows findings of six sub-models, covering all 33 variable described as:

i) Sustainability model which groups the following variables: Profit, EAR, CostSav, EarnSuff, OSS, ROA,ROE, finhealth, Rpmtcap.;
ii) Outreach growth model – this groups the following variables: Grpost, borrowers, sizeGPF, personel, Tassets, fastgro, HGOp;
iii) Macro-economic model that groups: GNI, GDP, infla, LedgRte, donor;
iv) Firm model group's variables: Tassets, Eqbase, gearing, infoTPR, Lform, regul, lonsize, EAR, age;
v) Efficiency model groups: OexpR, PAR, AsetStruc, CostSav; and
vi) Social model groups: GNI, lonSize, depthRch.

These test were motivated by the need to observe the interaction between grouped variables with the depended variables under investigation. Another objective was to assess the possibility of a better predictive model and the validation of the most effective predictors as the variable composition is varied (Liou, 2008).

Table 4.15 reports the results of the sub-models. The first model (Financial SUSTAINABILITY) includes only one significant variable (ROE) related to the probability of future CI prediction. The overall correct classification is 77 per cent, with a weighted efficiency of 74 per cent. The percentage of correctly classified successful predictions is 60 per cent, which is below the 62.5 per cent obtained by Morrison's chance criteria (Jain, 2001). For the LMA, the *P*-values indicate that the model is not significant and none of the sustainability variables is significantly related to successful commercialisation. All the predicted classification cases show percentages below Morrison's chance standard measure. Thus the SUSTAINABILITY variables are poor predictors of current access to commercial funding as per the LMA.

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[26] The sample data was split into two: 60% training and 40% for the test set. The results are for the test set only.

The overall OUTREACH/growth and MACROECONOMIC models are not significant under the CI future success measure. However, on the basis of the LMA, the overall OUTREACH model is not significant, but shows a weak relationship with successful commercialisation. The *P*-values are significant at the <10% level whereby two of the variables are significantly associated with successful commercialisation. The predictive ability of the model exceeds the rate predicted by chance criteria. The two considerations for accessing funding are number of borrowers and the size of the outstanding portfolio in dollars. The rest of the models under the LMA success measure show low predictive ability.

One model stands out under the CI with improved classification over the SUSTAINABILITY model. The FIRM model is significant and indicates an overall classification accuracy of 79 per cent, correct classification of 80 per cent and a weighted efficiency of 78 per cent. This demonstrates the importance of financial information disclosure for future access to commercial capital.

The following sub-models are based on the general intuition of the author for all of the 33 variables, and not on any scientific grouping procedure. However, after analysing various results, strategic groupings were established and subjected to logistic regression using two techniques. The sub-analysis results of the emerging four models are: best fit, common variables, critical success factor, and social misfit model. A comparative analysis was performed whose intention was to identify the most important and outperforming prediction model as per evaluation criterion set in this study. As such, the evidence is reported in the summary performance, Table 4.16 below.

Table 4.15: Cluster sub-model analysis results

odel.	Sig.Y /N Cl	ROE	Info TPR	Ass Struc	Correct classi %	Overall Classif %	Weighted efficiency %	Sig. Y/N LMA	Borrowers	O/S Port.	Regulation	Correct classification %	Overall classification %
bility	Y	3.7%			60%	77%	74%	N				21%	42%
	N				25	53	43	N	9.5%	6.5%		71%	65
c	N				30	53	44	N				72	53
	Y		7.6%		80	79	78	Y			6.3%	36	49
y	Y			6.8%	60	63	61	N				12	37
	N				0	51	17	N				64	53

Table 4.16: Cluster sub-model analysis results: four select models

odel	Model Fit- Y/N Cl	ROA %	Info TPR %	Fast Gro %	Rpmt Cap %	Infla-tion %	Lon Size	Correct classification %	Overall classifica %	Coeffi. concord. %	Model Fit- Y/N LMA	Factor 2 %
	Y	1.5	0.0	1.6	0.0	4.5		85.71	87.1	89.8		
var	Y		0.0	0.9	0.0			78.57	90.32	80.7	N	
	N										N	5.6
	N						8.6			59.4	N	

A training data set of 70 per cent split was used to fit the four models which were then applied to the test set data for validation. Some of test results for the sub-models were not impressive. Notwithstanding, the best fit model is worthy mentioning. Two variables were found very significant: capacity to earn sufficient profits and create wealthy for the poor (RpmtCap); and information opacity and adherence to professional disclosure standards. The final model fits very well with a coefficient of concordance of about 90 per cent. The overall classification for future access to commercial capital stands at 87 per cent and indicates that these variables have great influence on the successful commercialisation of microfinance. This model captures inflation rate as the only significant and relevant macro-economic predictor of commercialisation.

Another procedure was also performed with no split of the data under the modelling tests for the sub-models. The tests target common (nominal) variables alone. These variables represented variables that were other a formulation or nominal variable that were proxies of a certain phenomena. For example, the variable LFORM represents the legal form of the institution and has four dimensions: NGO, bank, co-operative or financial institution. FASGRO represents fast growth which was obtained by formulae and took the form of (1) for true or (0) for otherwise. The results of the sub-model analysis are shown in Table 4.17.

Table 4.17: Binary logistic regression results: common variables

	CI		LMA	
Explanatory var.	**ß-estimates**	***p*-values**	**ß-estimates**	***p*-values**
LFORM (NGO)			0.000	0. 037**
LFORM (Coop)			2.228	0.015**
REGUL (Yes)			1.192	0.041**
GRPOST (1)			-0.909	0.076*
INFOTPR	1.080	0.004***		
RPMTCAP	2.101	0.004***		
FASTGRO (`1)	-3.545	0.030**		
Constant	-4.112	0.030 **		

Notes: *** Very significant, *p*<1%*;* ** *p*<5%; * *p*<10%

-2 log likelihood	88.821	124.537
R Square	53.4%	21.2%
Correct classification	77.8%	80.0 %
Overall correct classification	80.6%	68.9%
Weighted efficiency	78.7%	72.2%

Under the common variables analysis, the model correctly classified 35 (or 44 out of 55 for the LMA) out of the possible 45 as successful commercialisers, for an overall accuracy percentage of 80.6 per cent and 68.9 per cent respectively for the CI and LMA. The most significant variables identified are information provision and transparency, repayment capacity, regulation and for the legal statute a cooperative or NGO are more likely to attract commercial funds. These variables therefore play a key role in predicting successful commercialisation. This result confirms findings of previous models that highlighted information transparency, ability to generate high profits as well as the status of regulation (Cull *et al*., 2008). In addition, it is observed that the organisational forms NGO or cooperative; give an MFI a better chance of being successful in commercial microfinance. This finding could be because of the fact that these two forms of organisations form the majority of traditional MFIs in the African context (UNEP FI, 2007; Mwenda & Muuka, 2004; Arch, 2005).

Table 4.18 reports results of the five CSFs obtained from previous tests by means of factor analysis.

Table 4.18: Binary logistic regression results: CSF sub-model

	CI		**LMA**	
Explanatory var.	**ß-estimates**	***p*-values**	**ß-estimates**	***p*-values**
FACTOR 1	1.615	0.001***		
FACTOR 3	0.738	0.055*		
FACTOR 4	-0.708	0.058*		
FACTOR 2			-0.593	0.056*
FACTOR 5			-0.436	0.063*
Constant	-0.587	0.028 **	0.116	0.577

Notes: *** Very significant, $p<1\%$; ** $p<5\%$; * $p<10\%$

-2 log likelihood	110.468	133.317
R Square	34.5%	11.2%
Correct classification	64.4%	72.7%
Overall correct classification	70.9%	60.2%
Weighted efficiency	67.6%	64.5%

Using the critical success factor solution derived from 22 of the financial variables under test, we conducted the same discriminate analysis, which resulted in overall correct classification percentage of 70.9 and 60.2 for CI and LMA respectively. FACTOR 1 variable is the only one that is significant and contains dimensions related to profitability under the factor analysis. Results indicate the importance of profitability variables in attracting financial markets.

The results of the social model are not shown because the model was not significant due to poor classification ability. It suggests that social factors are not good predictors of successful commercialisation. The best-fit model was modelled under a different procedure for logistic regression for the CI only, so as to validate some variables. The results are shown in Table 4.19.

Table 4.19: Binary logistic regression results: best-fit sub-model

	CI	
Explanatory variables	**ß estimates**	***p*- values**
INFOTPR	1.509	0.001***
INFLA	0.009	0.074*
OSS	-0.019	0.081*
FASTGRO (1)	-4.934	0.059*
RPMTCAP (1)	2.500	0.001***
Constant	-4.613	0.008 ***

Notes: *** Very significant, *p*<1%*;* ** *p*<5%; * *p*<10%

-2 log likelihood	77.899
R Square	61.5%
Correct classification	77.8 %
Overall correct classification	80.6%
Weighted efficiency	78.7%

Ä The best-fit model provided 80.6 per cent overall prediction accuracy, with weighted efficiency of about 79 per cent.

The best-fit model singles out both repayment capacity and information opacity as the most significant variables that matter in predicting commercialisation. The model indicates possibility of a high chance of success in predicting likelihood of success for African microfinance institutions. In conclusion, the sub-analysis allowed separately for control of the effects of association of variables that mask and cloud the visibility of others.

4.4.3 Conclusion

In analysing binary classification with LMA and CI dependent variables a number of tests were done ranging from factor analysis, to random forests data mining techniques to logit regression analysis. The analysis reported varying degrees of model estimation; where insight was also gained on the significant factors of commercialisation. Although prediction accuracy was high when all explanatory variables were used, the best-fit variables alone were considerably more successful in predicting future success in commercialisation, with 90 per cent coefficient of concordance (or

87 per cent classification accuracy) compared to just 82 per cent goodness-of-fit for best model with full data set. The analysis identified key determinants of the high degree of accuracy predictions as:

- Information transparency;
- Repayment capacity;
- ROA;
- Fast growth; and, in some cases
- Inflation.

Social variables were on the other hand better predictors of less successful commercialisation. The CI showed a stronger performance than the LMA (most LMA models could not fit and showed a poor correlation with the variables used). Notwithstanding, the influence of the legislation form of the MFI, regulatory status and growth variables was high among the models that fitted well for the LMA. This suggests that current access to commercial funding is highly dependent on these factors.

It is clear from the full data set analysis that random forests provide just as good prediction accuracies as logistic regression models. For all the logistic regression techniques and for each of the sub-analysis, the findings suggest that some of the estimations were better than others in performance with regard to their ability to predict successful commercialisation in the context of African MFIs.

4.5 COUNTRY MODEL PREDICTIONS

4.5.1 Introduction

Having identified the success factors for accessing commercial funding, the following question arises: Are MFIs in Africa able to meet the conditions set by the indicators of success? That is LMA and CI as examined in this study. The author sought to answer this question by checking the status of sample MFIs with regard to relative degrees of access to commercial capital. The trend in the region and what institutions are relying on for their growth needs is also reported. Using logistic results, country classifications were also constructed for success in commercialisation under the CI predictions given insight that this is a better predictor of success. The next section therefore answers these and more questions relating to the major issue of whether commercialisation is taking route in Africa, and gives the degree of commercial access across firms, countries and regions in the continent.

4.5.2 Studying the evolution of commercial funding patterns across countries in Africa:

In this section, the research extends the concept of commercialisation to the investigation of country likelihood of future success to commercial microfinance as an alternative funding strategy in order to maximise the modelling of reality. The focus was on efforts made by African MFIs in tapping the financial markets in comparison to waiting on donations. The examination looks at different stages of access with initial starting point set at zero, where all financing is taken as equity (including quasi-equity or donations in different proportions) (Cull *et al.*, 2008). Included in the examination are different sources of finance and the role they play in relaxing the financing constraint on growth of MFIs in Africa. The examination looked at dynamics of commercial microfinance in the region in general, following estimation procedures suggested by Demirguc-Kunt and Maksimovic (1998).

The proportion of financing in each MFI per country for the last three years is reported first: Yr1, Yr2, and Yr3 within the sample period 1998 to 2003. As suggested in literature assets are financed from some source (Upneja & Dalbor, 2001) and the main asset for MFIs is the loan portfolio. The formulation therefore assumes two finance sources for the portfolio: equity (including quasi-equity or donations) and interest-bearing funds/debt. Interest-bearing debt includes all funds whose interest is not zero (Cull *et al.*, 2008). It is noted that this may include soft debt or subsidised loans, a fact that requires careful interpretation of the level of commercialisation as evidenced by a review of borrowings below market rates (Cull *et al.*, 2008). The main interest however is the portion of portfolio financed by equity and donations in this study which is fairly estimated as below. Performance results on proportion financed by equity or largely by donations per country are shown in Table 4.20 and the estimated three-year leverage ratios for the sample of 21 countries.

Table 4.20: Proportion of portfolio supported by donations (quasi-equity financing) over sample period (1998 to 2003)

I	II	III	IV	V
Country	**Yr 1**	**Yr 2**	**Yr 3**	**Leverage ratio**
All Africa	57%	52%	52%	48%
Benin	43%	57%	43%	57%
Cameroon	38%	13%	25%	75%
Congo DRC	25%	0%	0%	100%
Egypt	80%	40%	40%	60%
Ethiopia	64%	73%	64%	36%
Ghana	50%	100%	100%	0%
Ivory Coast	0%	0%	0%	100%
Kenya	71%	71%	57%	43%
Madagascar	33%	33%	22%	78%
Mali	33%	33%	67%	33%
Morocco	100%	100%	100%	0%
Mozambique	100%	0%	0%	100%
Nigeria	75%	100%	75%	25%
Rwanda	100%	100%	100%	0%
Senegal	67%	67%	67%	33%
South Africa	50%	50%	50%	50%
Tanzania	100%	100%	80%	20%
Togo	20%	20%	40%	60%
Tunisia	100%	100%	100%	0%
Uganda	60%	40%	53%	47%
Zimbabwe	67%	67%	100%	0%

Notes: IBF = Interest-bearing funds or all forms of debt plus savings deposits whereas, N-IBF = Non-interest-bearing funds; Equity from owners plus donations and retained earnings. Leverage ratio= 1-N-IBF based on year 3 estimate. The computation for each column 2, 3 and 4 is as follows: For each MFI, the relative proportions of the two types of financing were calculated each year and consequently the mean annual proportions per country after Demirguc-Kunt and Maksimovic (1998).

In terms of the relative proportions of the different types of financing, Table 4.20 indicates an almost equal proportion between IBF (interest-bearing funds, all forms of debt plus savings deposits) and N-IBF (donations plus share capital and retained earnings) for MFIs in Africa. This result means that by and large, quasi-equity (donations) plays an important financing role (Cull *et al.*, 2008; Pollinger, *et al.*, 2007; Arch, 2005). This notwithstanding, a transition is taking place as indicated by the trend, albeit short.

There is greater use of IBFs over time. Columns II to IV provide an estimate of the trend over three years and define commercialisation efforts or an indication of strategic direction per sample country. For example, three years ago, 57 per cent of the portfolio in sample Africa, MFIs were being financed by donations, internal resources and share capital. This has continued to decrease over time and now stands at 52 per cent. This reflects a gradual replacement of donations and equity capital with commercial capital (Hartungi, 2007). Different countries across Africa have different choices of finance type and/or practice. Some have a reverse trend while others are moving away from donations.

While it is true that most MFIs tend to rely on donations, the importance of this source of finance seems to be declining. Clear examples of increased attraction for interest-bearing debt (commercial capital) include: Egypt, Kenya, Madagascar and Tanzania. From a country perspective, this is where the strategy of commercialisation in Africa is taking route. The results are also consistent with what is happening in those counties, for example, the first microfinance bank in Africa was started in Kenya in 1999! Subsequently, in 2005 the first MFI to issue a bond was in Kenya. Countries with high levels of non-interest-bearing finance sources include Ethiopia, Morocco, Nigeria and Senegal. It is to be noted that in Africa, Ethiopia was the first country to enact a microfinance regulatory bill in1996. As expected, equity financing plays a key role.

Column V of Table 4.20 indicates the estimated proportion (All Africa, 48%) of portfolio financed by commercial funds over the sample period. Not surprisingly, sample MFIs generally obtain as much funding from donors as from commercial sources. The results are reflective of two things: that some MFIs have been more successful in commercialisation, or some countries have better enabling environment for commercialisation to thrive than others across the continent. This development in Africa, as per these results, is comparable with the larger trend of the industry as obtained in studies of funding patterns in Latin America (Jansson, 2003). Jansson (2003) reports in a study (transforming institutions) of 97 MFIs in 14 countries that regulated institutions tend to rely less on subsidised funds and more on savings deposits (Pollinger, *et al*., 2007; Callaghan, *et al*., 2007). He notes that financial leverage generally increased after transformation, and if funding is accessible in the country, the leverage of institutions will increase rapidly.

It has been noted that MFIs are generally assumed to have difficulty obtaining commercial funds due to barriers like high risk reputation, lack of information (opacity) for evaluation of investment proposals, as well as a weak NGO background as financial service providers (UNEP FI, 2007; CGAP, 2007; Cull *et al*., 2008; Daley-Harris, 2009). This is indicative of the results, although the limitations of the data series are acknowledged. However, these results show that the speed of

increase in financial leverage per country depends much on the dynamism of the market[27] and level of development of the finance sector. Judging from the estimated leverage ratio and observed trend, it is indicative that the next important finance source for microfinance in Africa is commercial funds. This source of finance is therefore likely to play a major role in relaxing the financing constraint on growth of MFIs in Africa.

4.5.3 Where are the next portfolio investments in microfinance likely to be found?

In this section the study explores the likelihood of success with commercialisation based on our measures of success: leverage multiplier added and CI rating. Table 4.21 summarises the degree to which MFIs in a country are likely to succeed in commercialisation and also the current access levels to private capital. Higher percentages indicate higher proportion of MFIs likely to succeed in the country or status of commercial capital access, while low values show higher dependency on donations.

Column II of Table 4.21 reveals that only MFIs in ten countries are not able to access commercial funding based on a threshold of commercial funding access status as given by the LMA ratio of greater than 0.5. Among the ten countries, five are noteworthy. Egypt and Tunisia show low access because in these countries microfinance thrives on government subsidies or donations. For Rwanda, Ivory Coast and Mozambique the effect of war has resulted in a weak industry and therefore less interest by investors or absence of a well-functioning banking/financial sector. On the other hand, scores of 0.6 to 1.0 indicate MFIs in the country have good access to commercial capital to expand their loan portfolios. The results show that the sample just passes the 50 per cent mark (Africa overall 0.53) to suggest that most MFIs in the continent in our estimate can attract, and are tapping, commercial capital. This status ranking confirms that Africa as a continent has just started the transition to private capital and is indeed breaking away from donations, or traditional approaches of financing microfinance (Charitonenko *et al*., 2004; Sengupta & Aubuchon, 2008; Callaghan *et al*., 2007).

Meehan (2004) highlights four large pioneering capital access deals involving MFIs and the capital markets. The investigation notes that investors are beginning to see microfinance for the poor as an investment opportunity; even though entry is slow. Bystrom (2007) also notes that lately MFIs are begging to know how to attract investment funds for their growth with the assistance of

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[27] In some countries, such as Ivory Coast, Rwanda, Democratic Republic of Congo and Mozambique, the results reflect more on the low development of the finance sector. In some cases, the stated percentages may reflect a dysfunctional economy or industry while in other countries it shows government subsidies or market distortion. This is the case in Tunisia, Morocco and Zimbabwe.

investors on how to structure the transactions. This is particularly so because leading MFIs that would have shown the way, are still courting with donors. Notwithstanding, it is clear from the results that the desire to tap the capital markets and capacity to link with commercial investors is a realisable vision[28] (Arch, 2005).

Table 4.21: Commercial access status and likelihood of success ranking

I	II	III	IV
Country	**Commercial funding access status**	**Country**	**Degree of success likelihood**
Nigeria	1.00	Tunisia	100%
Senegal	1.00	Morocco	100%
South Africa	0.75	Uganda	73%
Benin	0.71	Kenya	71%
Madagascar	0.67	Senegal	67%
Zimbabwe	0.67	Benin	57%
Ethiopia	0.64	Ethiopia	55%
Kenya	0.57	Nigeria	50%
All Africa	0.53	Congo DRC	50%
Congo DRC	0.50	All Africa	44%
Ghana	0.50	Tanzania	40%
Morocco	0.50	Mali	33%
Uganda	0.47	South Africa	25%
Tanzania	0.40	Cameroon	25%
Togo	0.40	Togo	20%
Mali	0.33	Madagascar	11%
Cameroon	0.25	Zimbabwe	0%
Egypt	-	Rwanda	0%
Ivory Coast	-	Mozambique	0%
Mozambique	-	Ivory Coast	0%
Rwanda	-	Ghana	0%
Tunisia	-	Egypt	0%

Notes: Column II is computed by applying the LMA measure on all MFIs in the sample. For each country, the mean score was obtained and expressed as a ratio after Demirguc-Kunt and Maksimovic (1998).The benchmark is set at 0.5. For column VI MFI CFR scores were obtained based on CI calculations. A dummy variable was formed for each MFI taking the value of (1) for likelihood success and (0) for otherwise. For each country, the proportion of MFIs having (1)s was computed over the sample period.

[28] Indeed Meehan (2004) predicts that in the next decade, MFIs would be financing themselves exclusively with commercial sources of finance.

Column IV of Table 4.21 presents an index measure of proportion of MFIs accessing commercial funding across countries in Africa and access increases with higher index values. This ranking of country attraction of commercial capital reflects the status and/or probability of firms likely to succeed in commercial microfinance. The critical value for likelihood of success is set as 50 per cent, where it is assumed the ranking of commercial success predicts an MFI/country as successful when a percentage higher than 50 per cent is obtained. Thus, less than half (40%) of MFIs in Tanzania have access to the capital markets and therefore adopted a commercialisation strategy for funding their portfolio. Results show that more than half of the countries in our sample will struggle (44% likelihood degrees of success) to be successful in commercialisation.

These findings indicate 12 countries are likely to have difficulties in attracting commercial funds. Although many factors can contribute to this, it is suggested that some of reasons could be due to lack of developed financial sector, policies pursued by microfinance especially where subsidy forms part of the funding culture, underdevelopment of the microfinance sector meaning that MFIs are not mature and grown to attract private capital. For example, in Egypt MFIs operate under heavy subsidies from the government and other donors, while for Rwanda and Mozambique we have young MFIs. The results could be skewed by nature of firms whose data was considered, particularly for countries like South Africa, Cameron and Ghana. However, results for Morocco and Uganda and Senegal indicate an enabling environment for promotion of commercial microfinance.

Extending the analysis to regions in Africa, the results of LMA rating and CI are compared and reveal regions where successful commercialisation is taking place or will take place. As per the findings in Figure 4.6, the LMA rating result is reflective of current status, rather than a prediction of what is likely to happen as in the index. It is a temperature gauge, giving the status of commercial funding access (CFA). It also shows that two regions, West and Southern Africa particularly, are experiencing greater access to commercial capital. On the other hand Figure 4.7 provides a prediction of which countries will achieve success in attracting commercial investors in the coming years. It is interesting to note that, in contrast to the LMA, the CI distinctively shows the shift of future use of commercial debt to Northern countries and the Eastern region of Africa consistent with findings in Tables 4.20 and 4.21.

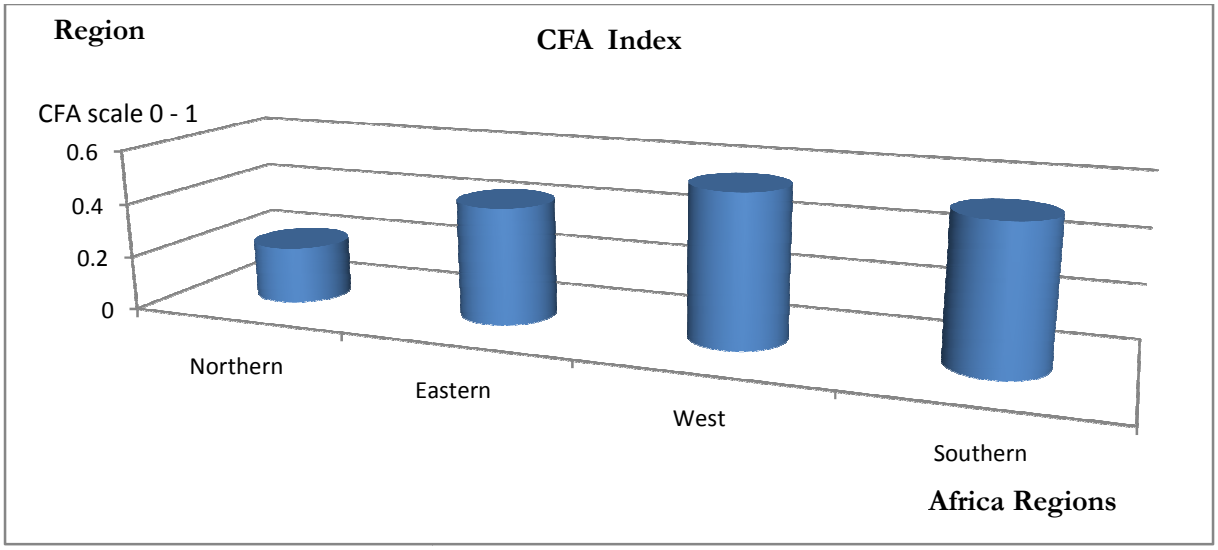

Figure 4.6: Africa regional commercial funding access

Current attraction and future access to commercial funding differ across countries in the sample. Broadly speaking, the findings conform to current commercialisation trends in the microfinance industry (Meehan, 2004; Daley-Harris, 2009; CGAP, 2007; Jansson, 2003; USAID, 2005 and Charitonenko *et al.*, 2004) where most countries and MFIs have embraced commercialisation as an alternative source of finance. Cull *et al.* (2008) notes that profits for top end MFIs nonetheless have started to be at an appealing level to commercial investors.

Inspection of Column IV of Table 4.21 shows that nine countries will most likely succeed in commercialisation largely from West Africa, East and North. Some of the nine countries likely to experience greater access in commercial capital have high proportions of 60 to 100 per cent of MFIs likely to be successful in commercialisation for reasons explained under Table 4.21. Overall, the results suggest that less than half of the countries are likely to be successful with commercialisation in the future.

The results of this part of the study have been confirmed by various authors. For example, a review of commercial investments in microfinance reveals that investors are focused in Latin America, Eastern Europe and Asia leaving Africa out as unfavourable at the moment (Daley-Harris, 2009). Callaghan *et al.* (2007) in their study of MFIs on the road to capital markets find that, although the estimated two per cent of top tier MFIs (10 000) have good quality portfolios, they only attract 25 per cent of their funding from commercial sources. And Pollinger *et al.* (2007) express concern over the slow intake of leveraged funds by MFIs from open fund markets.

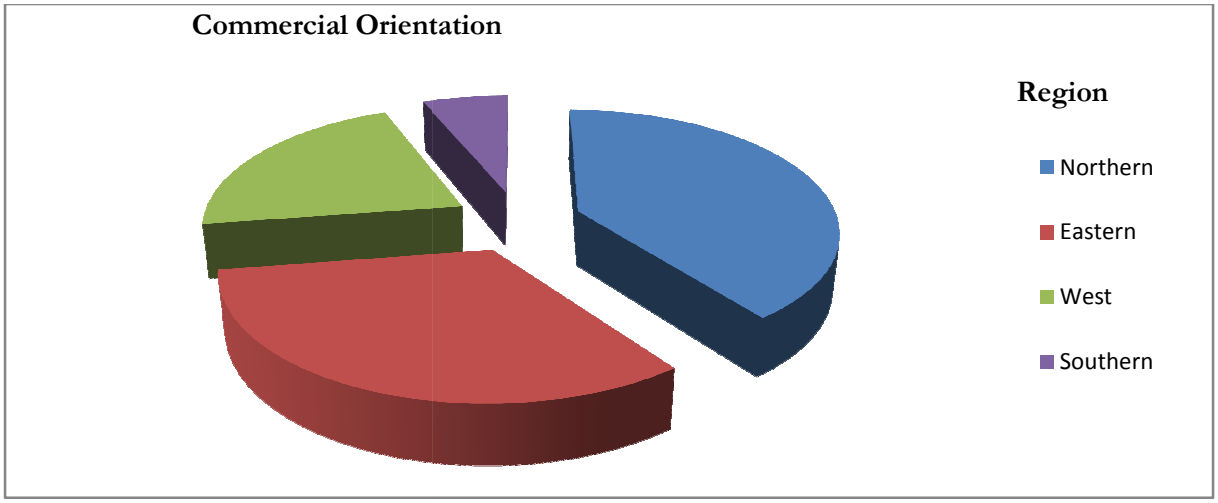

Figure 4.7: Africa regional likelihood of success

By comparing the results across Column II and IV in Table 4.21, it is possible to obtain an indication of relative importance of commercial capital in relaxing financing constraint for MFIs in Africa. Thus, for example, in the case of Ghana, 50 per cent of MFIs have access to commercial capital over the sample period, but the model predicts that in the coming years none of these MFIs will gain access to commercial debt. This suggests that for Ghana, the way to go is not commercialisation, given the criteria for accessing private capital. In Kenya, 57 per cent of MFIs have access, and a higher proportion (71%) of these MFIs will most likely succeed in obtaining commercial capital. For such a country the results suggest that commercialisation will play a major role in meeting the funding gap. This argument is consistent with suggestions by Cull *et al.* (2008) that not all MFIs will have to take the path of commercialisation.

Although African MFIs are candidates for external funding, the success for such an intervention needs a platform. Whereas commercialisation seems to play a vital role currently in relaxing financing constraint in Africa, the results suggest that most MFIs in sample countries will have limited success in future because of inability to meet the requisite conditions of access. However, country success will be dependent on market development. This contention is consistent with observations made by McKee (2001b) and Charitonenko *et al.* (2004), who noted that financing growth with commercial debt is more common in mature microfinance markets.

4.5.4 Country classifications and commercial prediction model

This section attempts to compare the CI prediction rating rule accuracy with logit regression probability estimates so as to gauge its usefulness in generating accurate predictions for successful commercialisation (Liou, 2008). It helps in validating the CI as it is suggested to be a better predictor of success. Using results of one of the logistic model estimates for each MFI in the sample, country classifications for success in commercialisation were constructed under the CI

predictions. The predicted probabilities for each MFI in each country were used to estimate the classification accuracy per country under the procedure explained in section 4.5.2 (Breitenbach *et al.*, 2004). Table 4.22 summarises the overall classification accuracy, and misclassification (type I and II errors[29]) for the entire sample for each country.

Table 4.22: Rate of correct classification of country prediction models

I	II	III	IV
Misclassification			**Overall correct**
Country	**Error I**	**Error II**	**Classification**
Zimbabwe	0%	0%	100%
South Africa	0%	0%	100%
Senegal	0%	0%	100%
Rwanda	0%	0%	100%
Nigeria	0%	0%	100%
Mozambique	0%	0%	100%
Mali	0%	0%	100%
Ivory Coast	0%	0%	100%
Ghana	0%	0%	100%
Madagascar	0%	11%	89%
Benin	14%	0%	86%
Egypt	20%	0%	80%
All	8%	16%	77%
Morocco	0%	25%	75%
Cameroon	25%	0%	75%
Uganda	0%	27%	73%
Ethiopia	0%	36%	64%
Togo	20%	20%	60%
Tanzania	20%	20%	60%
Kenya	14%	29%	57%
Congo DRC	25%	25%	50%
Tunisia	0%	100%	0%

Notes: Column II is computed by comparing logit model classification results with CI rating as base and computing the average proportion of type I error misclassifications, if MFI result is successful when its not, while column II (type II error) is when an MFI is predicted by the logit model as less successful when it is actually successful as per CI results. Column IV computes the net at zero error or where both model and CI agree.

[29] Type **I** error occurs when the model misclassifies an MFI as successful when its not, while type **II** error is when an MFI is predicted as less successful when it is actually successful as per original classification.

The overall logit model gives the lowest classification accuracy (below 62.5%) in Democratic Republic of Congo, Kenya, Tanzania and Togo (see Column IV). This suggests that in these countries the application of the CI commercial rating rule leads to the greatest errors when selecting target MFIs for funding. The highest classification accuracy, over 80 per cent, will be found in Egypt, Ghana, Mali, South Africa and even Senegal. The model, when applied to the total sample of all countries (see row 'All'), gives a fairly good accuracy rate of prediction for the continent. This result concurs with other findings, for examples as in Liou (2008) where comparison of statistical method's predictive ability found logit models to be just as good as reknown superior neural networks. The present study thus suggests, in most (indeed more than half) of the countries a reliable commercial prediction model is easy to develop within the country for MFIs practicing microfinance and the same would give fairly accurate prediction of occurrence of success.

4.6 FINANCING CHOICE INVESTIGATION AND MODELS OF FINANCING BEHAVIOUR FOR AFRICAN MFIS

4.6.1 Introduction

Given the knowledge that MFIs in Africa are able to, and have indeed accessed commercial capital (as per the above results), it is now feasible to investigate their financing decision patterns using financial statement data. The question of how organisations make financing decisions has been an important research subject for a long time (Upneja & Dalbor, 2001). However, it is still a puzzle because of the complexity of the decisions owing to the considerations highlighted by examination of qualitative factors in previous parts of this study (CGAP, 2007). For instance, MFI managers worry about many financing issues: the cost of finance, choice of the source of finance, reputation of their institutions in attracting required funding, the proportion they will need, and the composition of different forms of finance given attached conditions. This is besides having the concern for meeting the necessary conditions for tapping private sources of capital.

4.6.2 Understanding financial structure of African MFIs

This study investigates whether there are identifiable financial structure patterns and how changes in total assets have been financed for African MFIs over the sample period 1998 to 2003. This is examined through use of the cross-country sample data of 103 MFIs drawn from 21 countries. The limitation of the data series is acknowledged. The data base could only allow three years' data. However, the number of firms and diversity is considered adequate for the study, given sample representation. This section presents results on: type of additional finance accessed by MFIs, preferred choices among the different sources of finance as per the trend, and the financial structure patterns that currently exist, including financing theory that these seem to support.

Table 4.23 presents the results based on a 'common-size' part of the balance sheet for sample MFIs. This kind of procedure is used when one intents to compare balance sheet information across organisations operating in differing environments. In the analysis all balance sheet figures are expressed as a percentage of total assets to allow comparison and analysis of the proportions that different items take out of total assets (Demirguc-Kunt & Maksimovic, 1998). This follows the definition of a balance equation: Assets = Liabilities + Equity. The analysis in the present study thus looks at one side of the balance sheet, i.e. liabilities and equity side or the supply side of the balance sheet (Jansson, 2003). The aggregate values of each financing source are expressed as a percentage of total assets across MFIs in the sample for three years so as to obtain the trend. Data allowed identification of four separate funding sources for the African sample: savings, debt, equity and retained earnings.

Table 4.23: Common-size part of balance sheet for African MFIs

Year 1 to 3 Observations, N = 103			
	Year 1	**Year 2**	**Year 3**
SOURCES OF FINANCE	**% of assets**	**% of assets**	**% of assets**
Commercial finance sources			
Savings	46%	42%	39%
Debt finance, loans	19%	24%	29%
Equity finance sources			
Share capital, grants and other equity	32%	31%	30%
Retained earnings	2%	1%	2%
B/sheet summary totals			
Commercial finance	65%	67%	68%
Equity finance	35%	33%	32%
TOTAL ASSETS	**100%**	**100%**	**100%**
Funding sources			
Internal sources	35%	33%	32%
External sources	65%	67%	68%
	100%	**100%**	**100%**
Equity multiplier (growth >9%)	2.86	2.99	3.13

Notes: This table presents aggregate financial structure for sample African MFIs. Data was obtained from MixMarket database for three consecutive years for period 1998 to 2003 for 103 institutions. For each year, audited balance sheet amounts of different financing items were aggregated for the sample under a common format. Subtotals were then expressed as a per cent of total assets.

On average, debt for African MFIs stands at about 70 per cent of total funding for total assets as measured at year 3 in the sample period from 1998 to 2003. This is a slight improvement from two years before, when the debt level was only 65 per cent. Savings[30] remain the single most dominant funding source for MFIs, accounting for 40 per cent (2003), which is a decrease from previous years. This is followed by equity finance as the second dominant source of capital. Of great interest is the fact that equity finance sources, which is composed of mainly grants and donated equity capitalised by MFIs, is slowly disappearing from the balance sheet.

The greatest increase in asset funding (replacing equity) comes from debt finance which has witnessed an increase of 53 per cent in the last two years shown. This is further proof that external sources of funding are quickly becoming important to MFIs. These findings concur with previous results and other research findings that MFIs are currently attracting commercial finance (Cull *et al.*, 2008; Pollinger *et al.*, 2007; Sengupta & Aubuchon, 2008; Lewis, 2008; CGAP, 2007; Arvelo *et al.*, 2008). Bystrom (2007) and Counts (2008) and Callaghan *et al.* 92007) all attest to the proof that MFIs across the globe are beginning to attract private capital, particularly for the top-tier category. Hudon, (2008) reports that high returns enabled Compartamos, a member of the ACCION network in Mexico to receive an A+ rating from Standard and Poors' rating agency leading to a financing of US$10 million extra funds. Arvelo *et al.* (2008) also reveals that a Morgan Stanley investment vehicle, "BOLD 2007-1 and BOLD 2006-1" convinced the market of the appetite for microfinance investments in raising the CGAP estimated US$5 billion needed debt finance by the industry.

Table 4.23 also indicates the equity multiplier has been increasing overtime, slowly. This is a measure of commercial borrowing by MFIs and an indicator of financial leverage. Overall, the equity multiplier grew by less than ten per cent over the last two years shown. The results show that sample institutions are leveraging their own funds more than three times. That is, for every dollar of equity generated, US$3.12 are being generated from external (commercial) sources in the third year. Thus commercial debt has more claims over MFIs' assets in Africa as per the proportion of 68 per cent. Although the increase two years before is small (4.6%), it nevertheless indicates clearly, that there is increased capacity and access to commercial funding by MFIs in Africa. Perhaps this small percentage increase explains why there are no major financing deals posted by African MFIs (Daley-Harris, 2009).

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[30] This includes both voluntary and forced savings as these are not easily distinguishable in an audited balance sheet

To highlight how critical the African inability problem is, it is reported that 1 400 parliamentarians have sent letters to the World Bank lobbying for a share of commercial investments in microfinance due to the discrimination they are receiving against other regions (Daley-Harris, 2009). The same report purports that commercial investors are in a rush to pick the best investable portfolios, which happen to be outside the continent. Hence, although there are broad ranges of financing sources available, Africa's participation is marginal.

4.6.2.1 Growth and financing

In this section the relationship between organisational growth parameters and financing is explored. The results try to answer whether the industry in Africa is growing and at what speed? In general, firms either grow fast, slowly or do not grow at all (Upneja & Dalbor, 2001). This section reports on the relationship between total asset growth (TAG) and inflation, where if the former is greater, it indicates existence of opportunity for growth in economy; the relationship between return on equity (ROE) and inflation where if ROE is greater indicates financial health, that cash flows cover cost of capital and; lastly, the relationship between ROE and lending rate, or 90-day treasury bill rates, where if ROE is greater, means that an MFI is capitalising profits and generating enough profits to cover cost of debt.

Table 4.24 shows each country's proportion of firms that experienced the following within the sample period: high growth opportunities (Column II), those that are financially healthy (that are capitalising their equity and maintaining its real value (Column III)), and those MFIs with the capacity to repay commercial debt (Column IV).

Table 4.24: Growth opportunities and MFI capacity to generate profits

I	II	III	IV
	High growth opportunities	Financial health	Repayment cap
Country	**TAG>inflation**	**ROE>inflation**	**ROE>lending rate**
All firms	90%	37%	20%
Benin	86%	71%	71%
Cameroon	100%	50%	13%
Congo DRC	75%	0%	25%
Egypt	60%	40%	0%
Ethiopia	91%	18%	18%
Ghana	100%	0%	0%
Ivory Coast	100%	0%	0%
Kenya	100%	57%	29%
Madagascar	100%	0%	0%
Mali	100%	33%	33%
Morocco	100%	75%	0%
Mozambique	100%	0%	0%
Nigeria	100%	50%	25%
Rwanda	100%	0%	0%
Senegal	100%	67%	67%
South Africa	100%	50%	25%
Tanzania	100%	40%	0%
Togo	60%	20%	20%
Tunisia	100%	0%	0%
Uganda	100%	53%	27%
Zimbabwe	0%	0%	0%

Notes: Column II is constructed by computing total assets for each MFI in the country, and comparing with inflation rates. If TAG is greater a value of (1) was assigned and (0) for otherwise. Total scores of all (1)s were calculated and average score for the country taken. For each country, the proportion of institutions whose mean annual growth rates of total assets exceeds the means of the country's inflation rate were computed as stated by Demirguc-Kunt and Maksimovic (1998). The same procedure was adopted for Column III for ROE and Column IV for ROE against lending rates in the respective countries.

The results of Table 4.24 indicate that 90 per cent of MFIs, on average, have had high growth opportunities, meaning a vibrant microfinance business in the continent. Except for Zimbabwe, Togo, Egypt, Democratic Republic of Congo, Benin and Ethiopia, where there are relatively few opportunities for fast growth, all the other countries indicate a conducive environment for microfinance to thrive. Only 37 per cent of the sample has the ability to generate sufficient cash

flow from performing assets to cover all costs and maintain the value of capital. This indicates low profitability levels, mainly affected by low growth in retained earnings. The results of Morocco, Benin and Senegal indicate high proportions of MFIs in those countries where high returns are obtainable. On the other hand, MFIs in Kenya, Nigeria and Cameron give examples of MFIs in the sample that are average.

These findings could be reflective of high cost of funds or inefficiencies inherent in the country. Looking at the results in Column IV of Table 4.24, except for two countries, Benin and Senegal, MFIs in other parts of Africa have do not seem to have the ability to finance costly debt. This has implications for growth of microfinance, and explains why there is cautiousness in employing leverage. This could also be reflective of high lending rates applicable in most countries in Africa. This would mean that, MFIs have to generate high profits or charge high interest rates to their poor clients to be able to cover the cost of borrowing.

Table 4.25 tests if there are any differences in externally financed growth across countries practicing microfinance in the sample. The analysis of the response data reveals how countries requiring additional funding financed their growth. The Table (4.25) reports estimate proportions of institutions that grow faster than estimated internal and external financing sources (Demirgunc-Kunt & Maksimovic, 1998).

Table 4.25: Proportion of MFIs that exceed their maximum growth rates

I	II	III	IV	V
Country	IG Rate	Finance (RE)	SG Rate	Finance (Limited leverage)
Africa sample	93%	7%	91%	2%
Benin	100%	0%	100%	0%
Cameroon	100%	0%	100%	0%
Congo DRC	75%	25%	75%	0%
Egypt	60%	40%	80%	-20%
Ethiopia	100%	0%	100%	0%
Ghana	100%	0%	100%	0%
Ivory Coast	100%	0%	100%	0%
Kenya	100%	0%	100%	0%
Madagascar	100%	0%	100%	0%
Mali	100%	0%	100%	0%
Morocco	100%	0%	100%	0%
Mozambique	100%	0%	100%	0%
Nigeria	100%	0%	75%	25%
Rwanda	100%	0%	100%	0%
Senegal	100%	0%	100%	0%
South/Africa	100%	0%	75%	25%
Tanzania	100%	0%	100%	0%
Togo	60%	40%	60%	0%
Tunisia	100%	0%	100%	0%
Uganda	100%	0%	93%	7%
Zimbabwe	33%	67%	33%	0%

Notes: Column II computes the proportion of MFIs whose mean annual growth rates of total assets exceeds the means of their maximum constrained growth rates as stated by Demirguc-Kunt and Maksimovic (1998). Column IV computes the proportion of MFIs growing faster their maximum growth rate compatible with the maintenance of financial leverage ratios and reliance on retained earnings. Column III is calculated as 100% less Column II while the same procedure was adopted for Column V as net of Column IV.

The second column (Table 4.25) provides an estimate proportion of institutions that grow faster than the estimated maximum internal growth rate (IGR) compatible with an MFI relying on internal financing (and maintains dividend payout at (0)). The results indicate that 93 per cent of all Africa MFIs required some form of external financing over the sample period (1998 to 2003), and only seven per cent were able to grow with internal sources (see Column III). That is, they depended on retained earnings to infuse their equity capital. Further, it is observed that of these MFIs, only two per cent (see Column V) had the ability to finance their growth using short-term debt, soft loans without leveraging and having to change their debt equity ratios. Consequently, over 90 per cent of MFIs were faced with a rather limited amount of funding given their high growth opportunities and had to accept more financial leverage.

The situation is different for each county, as can been seen from the table, but with a very similar story. Exceptional countries are Zimbabwe, Togo, Egypt and Congo, where supply of capital does not seem to depend on external financing, but largely rely on retained earnings to infuse their equity capital. However, this may also reflect lack of access to short-term funds to exploit growth opportunities. Although a firm may desire to finance fast growth internally, it is not optimal to do so! It might also mean absence of a functioning banking sector, economy or lending policy. Thus, only a few countries depend on internal finance in relaxing financing constraints on the growth of MFIs.

However, in countries such as South Africa, Nigeria and Uganda the use of short-term borrowings is relatively more important for growth, perhaps more practical. The results of these countries are quite revealing and instructive at the same time. South Africa and Nigeria are the two biggest economies in Africa and they probably have more developed financial markets, while Uganda has a well-functioning microfinance regulatory environment. Egypt, on the other hand, is the only country where MFIs are virtually funded by donations. As expected, the majority of African MFIs could not self-finance their growth (from retained profits), and did not get enough short-term finance for the same. These results reflect the difficulties of MFIs in these countries in attracting commercial capital as indicated by the low percentages in Column V. At the same time it could mean lack of enabling environment in addition to lack of policy direction on commercialisation. The findings concur with the small participation of most African MFIs in the financial markets as pointed out earlier.

The source of funds used in relaxing financing constraint has implications on capital structure theories. The institutions do not seem to be able to keep up with maintaining a target debt ratio, as per the predictions of the static trade-off theory. A probable explanation could also be that in many of these countries, there is no regulation which would enforce compliance on capital asset ratio, for example. Results suggest MFIs either pursue a financing proposition based on what is available or their capacity to absorb debt is limited.

In conclusion, the results indicate that, in relaxing financing constraints inherent in the industry, the majority of MFIs make use of internal resources. There is little evidence for use of external sources of capital as indicated by the small percentage (2%) of MFIs capable of using short-term or such debt that allows them to maintain debt-equity ratios (Demirgunc-Kunt & Maksimovic, 1998). This points to similar findings in earlier tests that show that Africa as a continent is struggling with the transition from donations to commercial capital. A number of factors could be standing in the way of the continent's attraction of private capital, such as crowding away commercial capital, young industry and the continents image with regard to risk. Nonetheless, it is clear that the main source of growth for MFIs is internal funds with very minimal use of debt finance.

4.6.2.2 Financing pattern investigations using regression analysis

This section reports on results of test of regression of various sources of finance with total assets as the dependent variable. The analysis in this section is however restricted to a simple econometric procedure due to the short time series of the data. The intention is to investigate using a stronger statistical method than the percentage of proportions in section 4.6.2.1, if there are identifiable financial structure patterns as well as the effects of MFI financial behaviour on changes in total assets over the sample period 1998 to 2003. In the tests, use is made of the financing choices established in Table 4.23: namely, changes in types of debt and equity including quasi-equity (or donations), savings, and other liabilities over varying number of years after Shyam-sunders and Myers (1999) and Watson and Wilson (2001). For the dependent variable, total assets is used in the ordinary least squared (OLS) regression presented in Table 4.26 and Table 4.27.

Table 4.26: Ordinary Least Squares regression results

Dependent variable: Total Asset Growth			
Independent variables	**Coefficient**	**T-Statistic**	**P-Values**
Intercept		(4.7737)	0.0000***
Equity 3	0.1692	(1.8179)	0.0722
Equity 2	0.4522	(4.7271)	0.0000***
Equity 1	-0.0814	(-1.1600)	0.249
Debt 3	0.2299	(2.5093)	0.0138**
Debt2	0.1986	(2.3348)	0.0216**
Debt 1	0.2231	(2.9889)	0.0035***
Adjusted R2-squared 0.62474 **R2 –Squared** 0.64726 **F- Statistic** 28.748 *** Significant level at 1%			
** Significant level at 5%			
*Significant level at 10%			

Notes: Table 4.26 presents the summary statistics of the variables used in the OLS regression of total assets on Equity and Debt. Equity 1, 2 and 3 are estimated at MFI level, based on debt equity proportions of the balance sheet over three years using input from Table 4.23. The same approach applies for Debt 1, 2 and 3. Independent variables are defined as follows: Equity 1 represents change in relative proportions of aggregate total equity between year 2 and 1; Equity 2 represents relative change in year 3 and 2 while Equity 3 represents relative change between year 3 and 1. The same procedure was used to compute Debt 1, 2 and 3. Dependent variable is measured by total asset growth for 3 years. All values are derived from MFI audited balance sheets consecutive data series over the sample period 1998 to 2003.

Table 4.26 shows regression estimates detailing the relative influence of each of the financing components in relation to overall changes in asset financing. It indicates that the need for growth in total assets (additional resources) was largely met by internal resources first, for the whole sample. In Column IV, Equity 2 is significant at 1% level and positively correlated with growth in total assets. The model shows that, besides this variable, all other significant and influencing finance sources relate to debt. Column II shows the pattern of the coefficients represented by the beta values (see beta values (β) explanation in section 3.6) in terms of relative size: Equity 2 coefficient is the largest, followed by changes in Debt 3, followed closely by Debt 1 and Debt 2 and thereafter by Equity 3. Finally, the least coefficient is given by period changes in Equity 1 which is negatively associated with changes in total assets and is not significant at all. It appears that this source made no contribution on growth in total assets over the sample period although Equity 3 contributed significantly. This coefficient's pattern suggests the preference for distinctive sources of

finance, namely; equity sources are more preferred first and second debt. This is consistent with the prescriptions of the pecking order with regard to explanations on financing choices.

A closer look at the T-statistic in brackets for the model gives further inference on prioritisation over the different sources of finance broadly between debt and equity, with higher values indicating more preferred sources and more explanatory power to growth in assets, while the ranking provides insight into the pattern. The adjusted R^2 result show that changes in both equity and debt components account for 62.5% of the total asset growth over the period. This represents one of the best choice models fitted after many trial models not presented here were found to be un-impressive.

Inspection of the results indicates that all proportions of debt are significant and associated with the change in total assets, but come second after the most influential component of equity. This point to the fact that the most preferred financing source is equity, perhaps donations (also referred to as quasi-equity) and MFI contributed capital before external sources of finance start being in demand. It is to be noted that Equity 3 is significant and after all debt sources, perhaps representing higher earnings being recouped to finance growth. A number of authors have suggested these patterns that, MFIs facing financial deficit in their early years resort to donations and savings from friends before attracting debt finance (Zapalska *et al*., 2007; Pollinger *et al*., 2007; Cull *et al*., 2008).

The results are therefore indicative that MFIs finance growth in assets first with internal sources which include donations, own capital and social contributions since these components are not distinguished at this level. Thereafter, faster growth requires external debt finance as is the case in the present study supplemented by profits. It indicates that fast growing MFIs are profitable with a likelihood of attracting debt finance. This reflects the importance of interest-bearing debt sources of capital after exhausting quasi-equity and/or retained earnings. The implications of these findings are that, in general, fast-growing African MFIs are likely to seek finance from commercial sources.

Table 4.27: Ordinary Least Squares regression results: various finance sources

Dependent variable: Total Asset Growth			
Independent Variables	**Coefficient**	**T-Statistic**	**Prob.**
Savings	0.11	(3.377048)	0.0000***
Equity 1	-0.01	(-0.200854)	0.8400
Equity 2	0.58	(5.724035)	0.0000***
Equity 3	0.08	(1.340338)	0.1800
Debt 1	0.15	(2.699892)	0.0100**
Debt 2	0.06	(1.415058)	0.1600
Debt 3	0.08	(2.85025)	0.0100**
Other Liabilities	0.00	(0.768275)	0.4400
C	0.27	(3.414229)	0.0000***
R-squared	0.6800	**Adjusted R2-squared**	0.65000
Prob (F-statistic)	0	*** Significant level at 1%,	
F-statistic	24.3469	** Significant level at 5%,	
Durbin-Watson stat	2.457045	* Significant level at 10%,	

Notes: Table 4.27 presents OLS regression of total assets on various sources of Equity and Debt. The definitions of variables are as in Table 4.26 for Equity 1, 2, 3 and Debt 1, 2 and 3. In addition two more sources of finance are added to the model, savings and other liabilities. All values are derived from MFI audited balance sheets consecutive data series over the sample period 1998 to 2003.

The model estimated in Table 4.26 did not distinguish between different types of debt and equity. Table 4.27 distinguishes between three types of debt: i.e. savings, different forms of interest-bearing debt (Debt 1, 2, 3); and other liabilities representing short term obligations due to minority groups. Theses additional variables were included to capture the pattern of financing among different sources of debt financing.

As can be seen from Table 4.27, the adjusted R^2 squared which gives the explanatory power of the model shows a marginal increase from 62.5% to 65.0% (compare Adjusted R^2 in Table 4.26) with inclusion of more sources. The model produces slightly stronger results in terms of adjusted R^2 but mixed results with regard to the relative size of statistical significance of independent variable coefficients *vis-à-vis* Table 4.26. The coefficient estimates, however, are able to explain significantly higher proportions of the variance in the dependent variable. For example, period changes in Equity 2 can explain 58% of the variance in asset growth as opposed to 45% in Table 4.26. On the other hand, explanatory power of Debt 3 is reduced to 8% from 22.9% probably due to split of savings which are able to explain 11% of changes in assets.

The pattern of coefficients nonetheless confirms the previous results, but also suggest a new pecking order within debt finance sources. Thus, equity (including donations), retained earnings are more preferred first, and then some form of debt, savings and then more debt. The distortion of the pattern as obtained in Table 4.26 could be because of errors in separation of the data or because the debt variables are highly correlated. Though, once again, this finding could equally reflect supply-side constraints (Watson & Wilson, 2001; Helwege & Liang, 1996; Shyam-Sunders & Myers, 1999).

In conclusion, the pattern followed by MFIs in financing asset growth over the last three years tested under the OLS regression estimates seems to have moved from equity sources to savings to debt as per the significant levels and T-statistic. Indeed this pattern is more understandable and best describes the financing pattern that obtains from MFI financing behaviour (cf results of Table 4.23). It is indicative that the shift is from own sources of finance, and/or donations first, before these funds are augmented by forced savings from clients and then debt (including all forms of liabilities). This has the implication that once internal sources are exhausted, the financing order seems to seek savings next, before debt finance is requested finally as part of external finance. Overall, these basic figures suggest a pattern consistent with pecking order theory predictions, that, internal sources are more preferred than external sources of finance and among debt sources, safer debt is more preferred.

4.7 SUMMARY RESULTS

This section is concluded by summarising the insights provided by the research findings in Chapter 4. There are several similarities between the results of qualitative tests performed in Part I and quantitative analysis largely carried through multivariate regression modelling in Part II. First, Part I revealed critical success factors as:

- Transparency in financial reporting;
- Sound financial management including good governance; and
- Quality portfolio (Ayayi & Sene, 2007).

The identification of these factors fulfilled the first objective of the study and was a pointer to solutions to the study problem. This result is in line with importance factors highlighted by random forests analysis that included:

- ROA;
- Lending rate;
- Information transparency;
- ROE;
- Inflation;
- Portfolio at risk measure; and

- Gearing.

Both these statistical tests report factors related to high profitability and ability to cover cost of capital, quality of the loan book, information transparency, and sound financial management.

In Part II of the study, classification models were used in an attempt to determine the predictive accuracy of a number of hypothesised combinations of quantitative variables. The analysis reported varying degrees of model estimation checks; where insight was also gained on the significant factors of commercialisation. In terms of overall accuracy, both logistic regression and random forests are able to correctly classify successful MFIs. In particular, the best model under logistic regression was able to classify successful MFIs as per the CI commercialisation measure with 87% classification accuracy or 90% coefficient of concordance. The average accuracy of the full set of 33 variables is lower than that of strategic fit obtained through data reduction techniques that included random forests and factor analysis. The observed classification accuracy of 82% goodness-of-fit for best model with full data set implies that either some variables were masking others or a number of variables included were irrelevant in explaining success in commercialisation.

The above proposition was certified by random forests results of a single variable predictor, ROA that alone could classify 78% of successful MFIs correctly. Overall, the analysis identified key determinants of the high degree of accuracy predictions as:

- Information transparency;
- Repayment capacity;
- ROA;
- Fast growth; and, in some cases
- Inflation (Counts, 2008; Cull *et al*., 2008; Sengupta & Aubuchon, 2008; Lewis, 2008).

These results are quite qualitatively the same as those reported in Part I of the study. It was also found that social variables were better predictors of less successful commercialisation. Of the two measures of commercialisation used as dependent variables, the CI, however, showed a stronger performance than the LMA in terms of correctly identifying MFIs likely to succeed in commercialisation in the future. Notwithstanding, the influence of the legislation form of the MFI, regulatory status and growth variables were high among the models that fitted well for the LMA.

The suggestion of the CI as a good predictor was tested based on country predictions of likelihood of success with commercialisation. As revealed in Table 4.22, the findings are quite consistent of the accuracy of predictions (over 80% correct, compared to robust regression classification models) of the CI on its own, after controlling for misclassification errors.

With regard to financing behaviour of MFIs in the 103 sample, the most common source of financing in the sample was equity in early years of microfinance development; while in the later years, debt financing become most critical in financing growth. As Table 4.25 shows, the majority of MFIs, though faced with high growth opportunities, did not obtain external financing over the sample period. A clear financing pattern is evident from Table 4.29 and Table 4.30: First, finance is obtained from own capital and donations (or quasi-equity); secondly from client savings and if MFIs need additional funds, the choice is simply commercial debt (Helwege & Liang, 1996). This pattern, however, could reflect constraints rather than preferences.

To be noted also is the fact that, reliance on external financing represents varying degrees of interest component where the sequence of financing moves from heavily subsidised debt, to safer debt through guarantees to full commercial debt. This finding is consistent with similar empirical studies looking at sequential financing decisions of firms over time. Such studies (Helwege & Liang, 1996; Shyam-Sunders & Myers, 1999; Watson & Wilson, 2001) have established that firms always prefer internal to external financing. And if debt financing is required, safer debt is preferred. These particular results therefore provide some evidence in favour of the pecking order theory for microfinance institutions (Helwege & Liang, 1996; Shyam-Sunders & Myers, 1999; Watson & Wilson, 2001; Zapalska *et al*., 2007; Pollinger *et al*., 2007; Cull *et al*., 2008).

CHAPTER 5
SUMMARY AND CONCLUSIONS

5.1 INTRODUCTION

The aim of this dissertation was among other things, to highlight important factors that underpin success in commercialising microfinance institutions in Africa. As such, research questions formulated in Chapter 1 sought to explore the factors associated with successful attraction of commercial finance. Other purposes of the current study were to investigate whether African MFIs have been successful in securing additional growth capital, and to explore how they make financing choices among available finance sources. Lastly, it was the objective of this study to develop a commercialisation success model, and assess its suitability in predicting success.

This study undertook to respond to the above issues in two parts: Part I used qualitative data while Part II largely made use of quantitative data and several robust tests. The following paragraphs offer the overall highlights of the findings from each part.

5.2 SUMMARY PART I FINDINGS

Using factor analysis in Part I to ascertain the most important factors, this research derived ten critical success factors (CSFs) for raising additional funds from commercial fund markets. The first three in order of priority are:

- Extent of formalisation and transparency in financial reporting;
- Sound financial management and good governance; and
- Operational reputation and stage of development.

These findings reflect financing goals for microfinance institutions fulfil the first objective of the study. It is indicative from all the CSFs identified that MFIs must attain certain performance conditions designed to woo prospective sources of development finance. These findings offer a solid foundation for a winning strategy in the scramble for funds from financial markets. The results confirm the importance of transitional factors influencing the success or failure of the switch to commercial sources of funding.

Analysis and interpretation of the results enabled identification of critical and absolutely essential evaluation criteria that a MFI should meet to successfully access commercial funds. These considerations explain the MFI success path clearly, as well as the implications for managerial direction. The selection of an investment partnership in microfinance at the moment is a one-way matching problem. The investor/lender incurs considerable risk and resources to carefully evaluate a suitable organisation to invest in. On the contrary, MFIs play a minimum role in the decision process because the course of action to take and the manner of preparation is, to say the least, far

from clear. Thus, these CSFs will make it possible for individual MFIs to study their situation and take note of their assessed scores with regards to CSF requirements.

The CSF approach is an important mechanism for assessing the risk of funding microfinance prospects. CSFs equip lenders and potential capitalists with a powerful decision-making tool, especially in indicating the positive outlook of a MFI's long-term viability. Transparency afforded by CSFs will help to change the reputation of microfinance to financiers. The possibility of a linkage (between microfinance and capitalists) will mean gained access and industry freedom from donor syndrome and precedence.

The identified success factors are not equally important. The first factor, extent of formalisation and transparency in financial reporting, contains success items that are highly rated in importance by participants in the study. The same results were confirmed by a random forests test that assesses the most important factors among a set of interrelated variable items. The analysis revealed that lenders consider the most important factors to include:

- Return on their investments;
- Lending rate;
- Inflation;
- Management capacity;
- Portfolio quality;
- Governance issues; and
- Adequacy of financial information (Ayayi & Sene, 2007).

On the whole, the results of Part I underscore the need for MFIs to improve on professionalism, sound financial management, as well as practices that reduce high cost of operations for MFIs. In addition, the findings broadly confirm wide-spread information opacity in the industry. Thus, ability to refine the reporting system and avail information to support informed decisions is a key achievement for success. Both factor analysis and random forests statistical tests were also used to filter data for use for further testing in Part II. This was viewed as necessary so as to capture and reveal any multivariate interrelationships among the variables identified as significant contributors to commercialisation success. These variables were used in part II analysis to further explore the structure of the data, and explain relationships among several difficult-to-interpret, correlated variables.

5.3 SUMMARY PART II FINDINGS

This part of the study carried out several tests using cross-country data of 103 microfinance institutions. The research sought to find factors associated with success in tapping commercial funds and also addressed the following concerns:

- Why do some MFIs access funding, while others do not?
- What are the requirements for success in connecting to the financial markets for funding?
- What financing patterns are followed by MFI as they seek additional funding?

To help answer these questions, the influence of 33 variables on successful attraction of commercial finance was sought so as to determine the significant predictors of success with commercialisation. The quantitative assessment of the impact of the 33 variables on successful commercialisation of microfinance fulfilled most of the remaining objectives of the study while addressing above key research questions.

In summary, the findings identify key determinants of high degree of accuracy predictions as:

- Information transparency;
- Repayment capacity;
- ROA;
- Fast growth; and, in some cases
- Inflation (Counts, 2008; Cull *et al.*, 2008; Sengupta & Aubuchon, 2008; Lewis, 2008).

These results are resoundingly consistent and confirm some of the factors identified in Part I as true. That is, these factors are indicative of the importance of good financial returns and administrative efficiency (ROA, cash-flow adequacy and operating expense ratio), transparent reporting and information disclosure. And there are investor concerns for cost of funds (lending rates), as well as inflation levels in the recipient country of investment. Large MFIs with big loan sizes are much more likely to be attractive to financiers seeking high returns. The listing also underscores the importance of the risk profile; quality of asset (PAR), and ability to absorb new capital (level of indebtedness) for MFIs that would be successful in accessing commercial funding.

Other key factors identified for enabling access to commercial funding include: regulatory status, as well as whether an institution is registered as a NGO. As expected, existence of growth opportunities was highlighted as an important factor. Incidentally, the results showed that it is irrelevant whether the main funding base is donations or not. This means MFIs can have multiple sources of funding, including donor funds and still be attractive to investors.

The research findings support previous studies that have looked at the funding evolution of microfinance institutions (Jansson, 2003). The results have important implications for investors, as well as MFIs seeking growth capital. Regulated MFIs pursuing commercialisation schemes in Africa need to show good financial performance metrics, a sizeable amount of assets (big balance sheet), and quality loan-book. Growth prospects and an enabling environment will also be more beneficial to commercial investors. Conversely, small, slow-growth and unprofitable MFIs offering small loan sizes do not appear to access significant amounts of capital from commercial sources. Such institutions are probably better off seeking donor development funds.

Besides exploring the information requirements for commercial investors in determining investment priorities, one of the major contentions in microfinance debates, the mission drift theory was tested in the sub-analysis (CGAP, 2000; Rhyne, 1998; Dunford, 2000; Beck *et al*., 2004). That is, commercialisation leads to the abandonment of the plight of the poor to serve the interest of the rich in search for more profits. By this argument it is suggested that commercialisation destroys the long-term social value of microfinance as a development strategy and poverty reduction tool. There was therefore the need to confirm or reject the fears of sceptics. The investigation of the effects of commercial microfinance on long-term social value of microfinance reveals that CEOs make financing decisions, not in the interest of the poor, but for institutional sustainability. It is plausible then to say that commercialisation motivates MFI CEOs to sacrifice long-term goals of the microfinance initiative. In that respect, commercialisation might not be good for the poor. That is, the poor are unnecessarily hurt by MFI actions.

Two measures of success were used as dependent variables: namely leverage multiplier added (LMA) and commercialisation index (CI). Besides using different model specifications for binary classification of successful and less successful institutions, the analysis sought to assess the strength of the two measures in the classification process. Of the two measures of commercialisation, the research found strong support to the hypothesis that the CI is a better measure of successful commercialisation than the LMA, given the variables used. However, this is in terms of correctly identifying MFIs likely to succeed in commercialisation in the future. Specifically, the influence of the legislation form of the MFI, regulatory status and growth variables was high among the models that fitted well for the LMA.

It would appear that the integration of various factors composing the index was useful in giving the index its sting. In all cases, the CI analysis outperformed the LMA using the same predictor variables and firms. Although this is the first attempt to model commercialisation, these results suggest the CI's commercial rating rule has superior predictive abilities that could be explored to guide screening efforts for winners, investment decisions and other binary classification investigations. These results obviously imply that it is possible to develop a uniform commercial

success prediction rule for MFIs in Africa that would provide useful information to investors. The model will also be useful in guiding successful commercialisation schemes in Africa in that, it provides MFIs with a structured approach for achieving sustainable commercial microfinance.

With regard to several estimations done to gauge robustness of fitted models, both logistic regression and random forests are able to correctly classify successful MFIs. The use of various techniques and sub-analysis helped in providing rigour and added improvements to the results in terms of accuracy in identifying key predictors of success by benchmarking the random forests data mining results, against those obtained by logistic and linear regression models. The best logistic model had a satisfactory goodness-of-fit (coefficient of concordance) and overall classification accuracy of 90% and 87% respectively.

Logistic model estimates for each MFI in the model were used to construct country classifications for success in commercialisation under the CI predictions. The highest classification accuracy of over 80% was found in Egypt, Ghana, Mali, South Africa and even Senegal. These results obviously imply that it is possible to develop a uniform commercial success prediction rule for MFIs in Africa that would provide useful information to investors. The model can also be useful in guiding successful commercialisation schemes in Africa because it provides MFIs with a structured approach for achieving sustainable commercial microfinance.

This study made a preliminary attempt at empirically testing the financing pattern of sample MFIs. The examination of the relative size of the estimated coefficients on various equity and debt variables in a regression model tried to explain how growth in assets had been financed. The pattern of coefficients was found to be consistent with the pecking order model predictions. The results established the MFI pecking order to be: firstly, own capital and donations (or quasi-equity), secondly, client savings and if MFIs need additional funds commercial debt would be raised (Helwege & Liang, 1996; Shyam-Sunders & Myers, 1999; Watson & Wilson, 2001; Zapalska *et al*., 2007; Pollinger *et al*., 2007; Cull *et al*., 2008).

5.4 INFERENCES, LIMITATIONS AND FUTURE RESEARCH AGENDA

The primary focus of Part I of the study was to showcase the factors commercial lenders/investors believe are crucial for effective loan contracts with MFIs. The findings suggest three most important considerations for lending evaluation:

- The concern for transparency in financial reporting;
- Sound financial management and good governance; and
- Previous borrowing reputation.

For MFIs adopting commercial microfinance, necessary pre-screening strategies can guarantee a good performance on meeting requirements and satisfying commercial lenders' concerns.

Introducing a preparedness performance index (PPI) of attractiveness, with respect to each CSF, would be an appropriate benchmarking tool. A modified survey instrument can be used to measure the level of preparedness (attractiveness) for MFIs in need of external financing. The self-assessment tool would seek to establish the extent to which organisations fulfil/comply with identified success requirements for funding access. The rating would give a preparedness score for each success item on a particular CSF strategy, which can be used as a basis to prioritise areas for improvement action. An institution performing to the full extent of CSFs would be a good candidate for commercial funding.

The limitations of this study should be acknowledged. In Part I, the views of thought leaders were taken as the source of the information. Although this approach has merit, given the aim of the study, other personnel calibre may have had different suggestions. Most of the participants were drawn from programmes in Africa. Perceptions drawn from a balanced sample may have generated significantly different experiences. Interpretation of the findings could be limited to the context of dominant respondents. A larger sample was obviously desirable.

However data set from MFIs confirmed the criticality of the CSF, as established in Part I of the study. Further research is, however, needed to fully explore the nature of these CSFs. Needless to say, this part of the study is limited to the identification of key factors of success and any generalisation of our CSFs beyond the microfinance context should be made with caution.

Part II of the research examined how African MFIs made financing decisions using a cross-country sample data of 103 MFIs over the period 1998 to 2003, drawn from 21 countries. A major limitation on the study here was the size of the sample data. It would have been more enlightening if a longer time series data were available and a larger sample of institutions could be used. The MIX MARKET ™ global, web-based microfinance information database could only allow three years' consecutive time series data. In the final sample data, firms with missing observations or those with non-continuous data series for three years, had to be dropped. However, the number of firms and the diversity is considered adequate for the study, also given sample representation across Africa.

The other limitation was on the secondary data; the difficulty in splitting into discrete financing sources due to the way it was submitted led to fewer variables than would have been desired for analysis of financing patterns. Literature on similar studies on commercialisation of microfinance was also scarce.

5.5 OVERALL SUMMARY CONCLUSIONS

This study has developed the pathway through which a MFI can become part of the financial landscape and identified the factors that underpin success in commercialising microfinance institutions. It is suggested that the model developed here can be useful within organisations to establish baseline measures for future success in commercialisation. It can also be helpful for investors when they want to simply check an MFI's status, relative to the level of access to commercial funding and whether an institution possesses key performance requirements in microfinance. Among organisations, the prediction model can provide a useful industry profile and relative ranking in terms of adoption of the strategy of commercialisation.

A practical significance of this research was to show empirical results of the test hypothesis of the variables which will influence access to commercial capital and integration to the financial markets in the next two years. It was observed that information transparency, cash-flow adequacy (ROA) and capacity to repay commercial debt, fast growth and inflation were significant and accurate predictors of two-year success in commercialisation by logistic regression. Two prediction models with banking and microfinance performance indicators were developed, tested and validated. The results showed compelling evidence that the CI model is a useful tool in predicting future success in commercialisation in microfinance.

In modeling the various relationships of the 33 predictors with success in commercialisation, various hypotheses, in the form of sub-models were considered. These sub-models represented possible synergy effects of various variables or interactions. The findings support the hypothesis that, a MFI's mission and its overall sustainability (profitability and liquidity) strategy, growth prospects coupled with adequate disclosure of financial reports is associated with successful commercialisation. Association among economic and social variables will play a minimal role in differentiating who gets funded and who does not attract commercial capital. The results suggest that investors and funding agencies will value superior earnings on invested capital in the microfinance industry and prefer MFIs that operate in an environment which supports growth opportunities and low inflation trends.

The results also shed light on the central issue and debate regarding whether MFIs in Africa can survive without donor funding (financial dependence). According to this study, more than half of sample MFIs are enjoying access to commercial finance, while obtaining donations. However, the CI predicts Africa, as a whole, as a continent in transition from donations, but struggling to be successful in commercialisation. The country prediction models are particularly informative for investors. The CI predicts that for countries with high accuracy of prediction, adoption of market orientation will likely lead to sustained good performance and attraction of much needed capital for growth. In particular, North African country MFIs are more likely to be successful, followed by East

and then West Africa. Each of these groups of countries presents an opportunity for investors and indicates likely destinations for commercial funds.

Although this research finds support for the conflict between commercial and social objectives of microfinance, sound financing decisions in the microfinance sector is ultimately a critical ingredient for poverty reduction, long-term social value of microfinance development and economic growth. The poor will also suffer from the effects of bad financial management and from donor financial dependency, even when commercial microfinance or sound institutional growth decisions are not emphasised. Assuming that the funding constraint holds the key to continued intervention and growth of the microfinance activity, and that available options are in pursuit of a commercialisation strategy, successful commercialisation is important for MFIs to remain relevant.

In further studies on similar prediction models, it is recommended that the focus should be on the amount of data and a longer series for empirical analysis. Only time series data of three years was available, thus permitting data for only one year to be used in predicting two-year success of the MFIs. Notwithstanding, in the current study sufficient insight is gained for good suggestions on how to effectively tap and benefit from commercialisation strategies in order to optimise the flow of capital for credit provision to millions of impoverished households in Africa and the world.

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APPENDIX A
LIST OF THE 42 FACTORED SUCCESS ITEMS

The success (MEP 2002 survey) items are arranged in descending order of factor loadings, with first item being one with highest loading.

Factor 1: Extent of formalisation and transparency in financial reporting [5 items]

Question 27	Extent to which an MFI is a formal organisation
Question 40	Adequacy of cash flows to service commercial loans
Question 4	Portfolio quality
Question 23	Availability of audited accounts
Question 3	Availability of relevant information

Factor 2: Viability of investment in microfinance [3 items]

Question 5	Returns achievable from investing in microfinance opportunities
Question 15	Credit rating score
Question 45	Total cost of borrowed funds, i.e. repayment burden and other costs

Factor 3: Microfinance practice and extent of product delivery innovations [6 items]

Question 17	Extent of product and delivery innovations, technologies pursued
Question 14	Total number of clients
Question 50	Extent to which ethical image, social responsibility drives decision
Question 34*	Lender's exposure and appreciation of microfinance operations
Question 33	Location of MFI's business
Question 16	Extent to which ethical image, social responsibility drives decision

* Means double loading

Factor 4: Operational reputation and stage of development [7 items]

Question 32	Ownership; including mix and composition of stakeholders
Question 30	MFI's stage of development
Question 36*	Degree of MFI's operational autonomy from external influences
Question 9	Reputation risk of institution in previous borrowing
Question 38	Lender's strategy and financing policy
Question 18	Financial sustainability level (profitability track record)
Question 34*	Lender's exposure and appreciation of microfinance operations

Factor 5: Extent of financial market reform and enabling environment [5 items]

Question 49	Extent of development of financial markets.
Question 51	Financial sector liberalisation, including supportive banking reforms
Question 48	Stable macro-economic environment
Question 52	Availability of appropriate financial instruments
Question 2	Size of MFIs

Factor 6: Sound financial management and good governance [8 items]

Question 20	Sound financial management practices
Question 22	Reputable board and good/effective governance
Question 19	Legal personality status
Question 8	Proper record keeping and adequacy of financial reporting system
Question 43	Exposure to commercial sources of funds and networking advantage
Question 29	Ability to meet customer demand with appropriate products
Question 12	Availability of appropriate and experienced management team
Question 36*	Degree of MFIs operational autonomy from external influences

Factor 7: Secure loan default risk [2 items]

Question 7	Possession of adequate (type) collateral
Question 28	Cost of making loans to MFIs, i.e. screening, administration costs

Factor 8: Sparse and limited donor funds [4 items]

Question 44	Inadequate supply of subsidised finance to the MFIs
Question 13	A formal business plan for marketing MFIs business strategy
Question 46	Lack of sufficient retained earnings
Question 39	MFI's commitment to poverty lending strategy

Factor 9: Transformation for funding access [2 items]

Question 25	Purpose of funds
Question 10	Supervision and regulatory status

Factor 10: Commitment to privatisation and shareholding exposure [2 items]

Question 21	Extent of MFI’s openness and acceptance of intrusion by investors
Question 41	Years of existence, i.e. long track record.

APPENDIX B

CFR-SCORES GENERATION FOR CI

Performance Indices (P i) (Definition)	**P i-indices CFR Scoring criteria and Response values; Performance indices criterion (if tests) application (Commercialisation index modelling)**	**INDEX Results Commutation from CFR Scores (Initial setting is CI – Index = 0 CFR scores)**
Access to commercial funding (P_i)$_1$	If LMR for 2003>2, score 2, else 0 for 2002>2, score 1,else 0 for 2003>2002, score 1, else 0 **Max = 4**	Total for the index = Index + 4 CFR- Scores = 4
Sustainable growth(P_i)$_2$	If asset growth >ROE, score 1, else 0 >ROA, score 1, else 0 >inflation, score 1, else 0 **Max =3**	Total for the index = Index + 3 CFR- Scores = 7
Client service quality(P_i)$_3$	If client growth for 2003>20% p.a., score 1, else 0 for 2002>20% p.a., score 1, else 0 for 2003>2002, score 1, else 0 **Max = 3**	Total for the index = Index + 3 CFR- Scores = 10
Portfolio quality (P_i)$_4$	If PAR, 90 days for 2003<5% p.a., score 1, else 0 for 2002<5% p.a., score 1, else 0 for 2003>2002, score 1, else 0 **Max = 3**	Total for the index = Index + 3 CFR- Scores = 13
Earning potential (P_i)$_5$	If NIP for 2003 is +ve, score 1, else 0 Mean ROE >inflation 3 yr avg, score 1, else 0 Mean ROE>Lending rate, score 1, else 0 **Max = 3**	Total for the index = Index + 3 CFR- Scores = 16
Macroeconomic expansion (P_i)$_6$	If GDP % change for 2003>2 ranks, score 1, else 0 for 2002>2 ranks, score 1, else 0 Growth retrenchment: for G, score 1, else 0 **Max = 3**	Total for the index = Index + 3 CFR- Scores = 19
Cash flow adequacy (P_i)$_7$	If internal cash ratio for 2003>5%, score 1, else 0 for 2002>5%, score 1, else 0 OSS>100%2003, score 1, else 0 **Max = 3**	Total for the index = Index + 3 CFR- Scores = 22
Financial distress and mortality risk control (P_i)$_8$	If capital ratio for 2003>2%, score 1, else 0 for 2002>2%, score 1, else 0 for 2003>2002, score 1, else 0 **Max = 3**	Total for the index = Index + 3 CFR- Scores = 25
Information opacity/financial disclosure standards (P_i)$_9$	If financial reporting & information disclosure <Level 4, Score (-3) or else, 0 **Max = 0**	Total for the index = Index +0 Maximum Index sum = 25 CFR- Scores Max = 3
MFI Grand CI Score = Summation of CFR scores for (P_i) $_{1-9}$ **CI Values = CFR** (P_i) $_{1-9}$ - **M**edian		

Note: For each MFI in the sample, both Total CFR scores and CI values were generated. The sample comprises 103 MFIs across Africa that had a complete three-year time series financial data between 1998 and 2003.

APPENDIX C
RANDOM FOREST TREE CONSTRUCTION

Random forests construct a series of tree-based learners. Each base learner receives different training set of *n* instances. From this training set, data (current tree) are drawn independently with replacement from the learning set of *n* instances and about one-third[31] of the cases are left out of the sample (Robnik, 2004). The sampling method used here is called bootstrap replication. This out-of-bag (OOB) data is used to obtain a running unbiased[32] estimate of the classification error as trees are added to the forest. Forests give results competitive with boosting and adaptive bagging, yet do not progressively change the training set. Their accuracy indicates that they act to reduce bias.

As the random forests become larger they always converge, and the law of large numbers shows that the generalisation error has a limiting value so that random forests do not over-fit the data. The selection process is such that the more variables are selected, the bigger the forest and the more the out-of-bag error estimate converge to a lower bound. This is what affords random forests great accuracy in classification. The build-up process is like a 'blank box' but can be visualised as follows:

For instance, let *M* be fixed and $M < 33$ variables in the model. The out-of-bag estimation is given as in the following figures from 2 to 7 random input selections of variables. The out-of- bag data is also the source of data for internal estimates of strength and correlation and/or variable[33] importance. After each tree is built, all of the data are run down the trees. At the end of the run, the proximities[34] are normalised by dividing by the number of trees.

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[31] During the construction of bootstrap replication, there is on average $1/e$=36.8% of instances not taking part in construction of the tree. Constant e ~ 2.718 stands for the base of the natural logarithms.

[32] In random forests, there is no need for cross-validation or a separate test set to obtain an unbiased estimate of the test set error. It is estimated internally, during the run.

[33] Random forests have the advantage of offering an experimental method for detecting variable interactions.

[34] Proximities are used in replacing missing data, locating outliers, and producing illuminating low-dimensional views of the data.

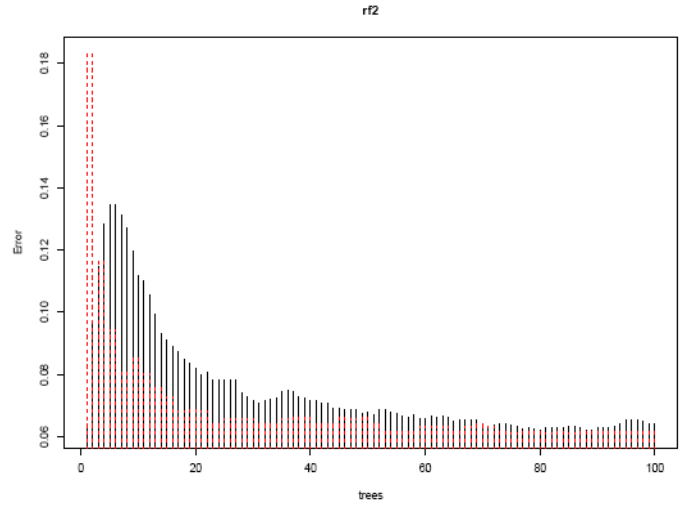

Figure C.1: Out-of-bag error as forest gets larger, *M* = 2

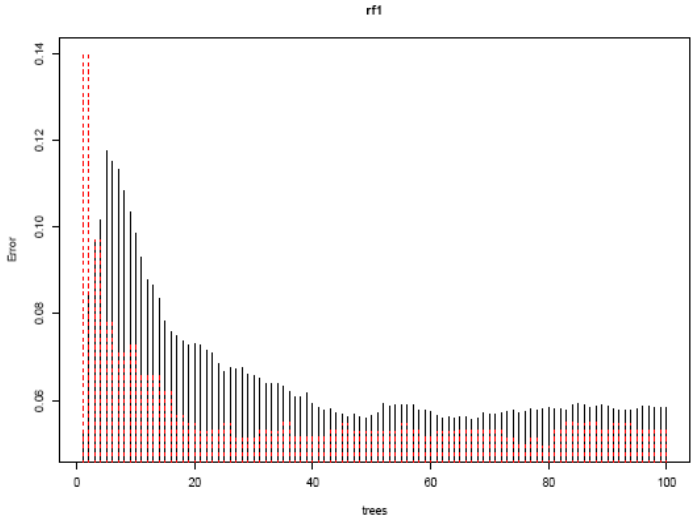

Figure C.2: Out-of-bag error as forest gets larger, *M* = 7

Here is an outline of the algorithm used to construct a decision tree forest:

Assume the full data set consists of *N* observations.

Take a random sample of *N* observations from the data set with replacement (this is called 'bagging'). Some observations will be selected more than once, and others will not be selected. On average, about 2/3 of the rows will be selected by the sampling. The remaining 1/3 of the rows are

called the ‘out-of-bag (OOB)’ rows. A new random selection of rows is performed for each tree constructed.

Using the rows selected in step 1, construct a decision tree. Build the tree to the maximum size, and do not prune it. As the tree is built, allow only a subset of the total set of predictor variables to be considered as possible splitters for each node. Select the set of predictors to be considered as a random subset of the total set of available predictors. For example, if there are ten predictors, choose a random five as candidate splitters. Perform a new random selection for each split. Some predictors (possibly the best one) will not be considered for each split, but a predictor excluded from one split may be used for another split in the same tree.

Repeat steps 1 and 2 a large number of times constructing a forest of trees.

To ‘score’ a row, run the row through each tree in the forest and record the predicted value (i.e., terminal node) that the row ends up in (just as you would score using a single-tree model). For a regression analysis, compute the average score predicted by all of the trees. For a classification analysis, use the predicted categories for each tree as ‘votes’ for the best category, and use the category with the most votes as the predicted category for the row.

APPENDIX D

LIST OF SAMPLE MFIs AND REPRESENTATIVE COUNTRIES

No.	MFI	Country
1	ABA	Egypt
2	ACEP	Senegal
3	ACEP - CM	Morocco
4	ACSI	Ethiopia
5	ADEFI	Madagascar
6	Al Amana	Morocco
7	AMSSF/MC	Cameroon
8	ASBA	Egypt
9	ASDEB	Togo
10	AVFS	Ethiopia
11	Beehive EDC	South Africa
12	BG	Ethiopia
13	CAPPED	Congo DRC
14	CCA	Cameroon
15	CDS	Cameroon
16	CERIDAA	Benin
17	CERUDEB	Uganda
18	CMF	Uganda
19	CMMB	Benin
20	COOPEC	Congo DRC
21	CRAN	Ghana

No.	MFI	Country
22	CRENDA	Tunisia
23	CSFS	Zimbabwe
24	DBACD	Egypt
25	DEC	Nigeria
26	EBS	Kenya
27	Ekukhanyeni	South Africa
28	ESED	Egypt
29	Eshet	Ethiopia
30	FADU	Nigeria
31	FAM	Congo DRC
32	Faulu - KEN	Kenya
33	Faulu - UGA	Uganda
34	FCC	Mozambique
35	FDEA	Senegal
36	FECECAM	Benin
37	Finca - TAN	Tanzania
38	Finca - UGA	Uganda
39	FOCCAS	Uganda
40	FONDEP	Morocco
41	FUCEC Togo	Togo
42	Gasha	Ethiopia
43	GECEFIC	Cameroon
44	ISSIA	Uganda

No.	MFI	Country
45	Kafo	Mali
46	K-Rep	Kenya
47	KSCS	Uganda
48	KSF	Ghana
49	KVT	Uganda
50	KWFT	Kenya
51	LAPO	Nigeria
52	MC²	Cameroon
53	MDB	Benin
54	Med-net	Uganda
55	MFSC	Uganda
56	MICROFUND	Togo
57	MIFED	Cameroon
58	MMDCT	Uganda
59	MUFFA	Cameroon
60	Nyesigiso	Mali
61	OCSSC	Ethiopia
62	OPIC-TOGO	Togo
63	Otiv Alaotra	Madagascar
64	Otiv Diana	Madagascar
65	Otiv Sambava	Madagascar
66	Otiv Tana	Madagascar
67	O.Toamasina	Madagascar

No.	MFI	Country
68	PADME	Benin
69	PAMECAS	Senegal
70	PAPME	Benin
71	PEACE	Ethiopia
72	Pharma-crédit	Congo DRC
73	PRIDE	Uganda
74	PRIDE - TAN	Tanzania
75	PTF	Tanzania
76	RCMEC	Ivory Coast
77	RUSCA	Uganda
78	SBACD	Egypt
79	SEAP	Nigeria
80	Seawatch	Zimbabwe
81	SEDA	Tanzania
82	SEF-SA	South Africa
83	SEF-TZ	Tanzania
84	SFPI	Ethiopia
85	Sidama	Ethiopia
86	SIPEM	Madagascar
87	SMEP	Kenya
88	SOS women	Cameroon
89	Sunlink	Kenya
90	SY	Mali

No.	MFI	Country
91	TEBA	South Africa
92	TIAVO	Madagascar
93	UMU	Uganda
94	UNICECAM	Madagascar
95	Urwego	Rwanda
96	UWFT	Uganda
97	Vita Finance	Benin
98	WAGES	Togo
99	Wasasa	Ethiopia
100	Weec	Kenya
101	Wisdom	Ethiopia
102	Zakoura	Morocco
103	Zambuko	Zimbabwe

APPENDIX E
MEP2002 QUESTIONNAIRE

University of Stellenbosch Business School Research on MFI Access to Commercial funding: Outlook Survey

This is a questionnaire about issues that come up as important considerations in a commercial lending decision. Each statement features a factor considered important in attracting commercial finance for microfinance operations. Statements also include demand factors that influence MFIs to seek access to commercial funding.

Please indicate the relative importance of each factor in the context of financing a microfinance business. Indicate your importance score on a scale from one to five:

1= Not important, **2**= Sometimes important, **3**= Important, and **4**= very important). Use a score of **0** for No Opinion. Thank you in advance for your time and responses.

To what extent are these factors important in determining access to commercial finance?	Importance Score
Lender perspective	
1. MFI potential and growth prospects	
2. Size of MFI	
3. Availability of relevant information	
4. Portfolio quality	
5. Returns achievable from investing in microfinance opportunities	
6. Extent of business risk in the institution	
7. Possession of adequate (type) collateral	
8. Proper record keeping and adequacy of financial reporting system	
9. Reputation risk of institution in previous borrowing	
10. Supervision and regulatory status	
11 MFI's lending methodology	
12. Availability of appropriate and experienced management team	
13. A formal business plan for marketing MFI business strategy	
14. Total number of clients	
15. Credit rating score	
16. Extent to which ethical image, social responsibility role of lender drives decision to lend	
17. Extent of product and delivery innovations, technologies pursued	

18. Financial sustainability level (profitability track record)	
19. Legal personality status	
20. Sound financial management practices	
21. Extent of MFI's openness and acceptance of intrusion by investors	
22. Reputable board and good/effective governance	
23. Availability of audited accounts	
24 An orientation towards private sector approach to microlending	
25. Purpose of funds	
26. An appropriate debt-equity ratio	
27. Extent to which MFI is a formal organisation; i.e. an appropriate and accountable operating structure	
28. Cost of making loans to MFIs i.e. screening, administration costs and monitoring business risk	
29. Ability to meet customer demand with appropriate products and services – business reputation and competitive hedge	
30. MFI's stage of development	
31. Adequacy of MFI's system of borrower selection criteria**;** including good debt management practices	
32. Ownership; including mix and composition of stakeholders	
33. Location of MFI business	
34. Lender's exposure and appreciation of microfinance operations as the economic activity of borrower	
35. Strong capital base (Equity for leveraging risky funds)	
36. Degree of MFI's operational autonomy from external influences	
37. Type of institution e.g. bank, NGO, limited company, credit union (cooperative) etc.	
38. Lender's strategy and financing policy.	
39. MFI's commitment to poverty lending strategy (including target market)	
40. Adequacy of cash flows to service commercial loans	
41. Years of existence i.e. long track record.	
42. Unused debt capacity	
43. Exposure to commercial sources of funds and networking advantage, including ability to target appropriate instruments	
44. Inadequate supply of subsidised finance to the MFI	
45 Total cost of borrowed funds i.e. repayment burden and other underwriting requirements	

In your experience, which are the five(5) most important considerations by commercial lenders; in financing an MFI	
46. Lack of sufficient retained earnings	
47. Availability of wholesale (funds) financing arrangements and/or 'apex institutions'; e.g. guarantee schemes	
48. Stable macro-economic environment	
49. Extent of development of financial markets.	
50. Availability of investment funds targeting MFIs	
51. Financial sector liberalisation, including supportive banking sector reforms	
52. Availability (by financial markets) of appropriate financial instruments for MFIs.	
53. Supportive legal mechanisms for settlement of claims and enforcement of business contracts	
In your opinion, what other considerations are clearly missing in this list.	

Thank you for your time.

Please email this document as an attachment or fax it to +27 21 918 4262.

APPENDIX F
OFFICIAL INTRODUCTION LETTER

Dear Sir / Madam

ACCESS TO COMMERCIAL FUNDING and OUTLOOK SURVEY

This is to certify that this research is part of an academic project by the University of Stellenbosch Business School, Republic of South Africa. It is a study in the area of microfinance and access to commercial funding efforts.

We would like to obtain your expert opinion which is greatly appreciated. Thank you for your help in accepting our nomination of you, among many 'thought leaders' in microfinance.

Sincerely,

Professor and Director