



MICROFINANCE PROFITABILITY

By

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DEDICATION

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ABSTRACT

The main objective of microfinance institutions (MFIs) is to provide financial services to the poor and non-bankable population. Microbanking in Africa however remains a difficult business. Although MFIs may be flourishing in commercial terms, few are profitable. Many MFIs in Africa face major constraints in their pursuit of effectively delivering microfinance services profitably. While MFIs in other regions have consistently reported positive profits, those operating in Africa continue to post negative profits. What explains this disparity?

This thesis seeks to contribute to the current state of knowledge and research on microfinance profitability by investigating the potential determinants of MFIs profitability with a focus on Africa. Further empirical work is carried out to examine: (i) profit persistence and the speed of convergence; (ii) impact of financing choice on microfinance profitability; and (iii) the impact of institutional environment of the host economy where MFI is located on profitability. This thesis is pioneering in using two-step System-Generalized Method of Moments (GMM) estimators in studies of determinants of microfinance profitability which enables us to control for possible endogeneity. The analytical framework uses an unbalanced panel dataset comprising of 210 MFIs across 32 countries operating from 1997 to 2008. We tested the robustness of our models with different specifications which confirmed the general result.

Our main estimations show that MFI profitability is non-negligibly driven by MFI specific factors and the institutional environment of the host country. Specifically, average profitability is higher in MFIs that are efficient, well-capitalized and with scale advantages. A key result is that macroeconomic environment is not significant in explaining microfinance profitability.

We find that a proportionally higher deposit as a percentage of total assets is associated with improved profitability. However, the magnitude of this effect is very sensitive to MFI age. Voluntary deposit mobilization may therefore help MFIs achieve independence from donors and investors, since it provides MFIs with inexpensive and sustainable source of funds for making loans. Consistent with the agency costs hypothesis, our results show that highly leveraged MFIs are more profitable. This may benefit MFIs if higher debt to equity ratio were to increase profitability by a greater margin than the cost of the debt. This calls for the development of

appropriate regulatory policies that enable MFIs to have access to long-term debt to improve their profitability.

Institutional environment of the host economy also plays a major role in MFIs profitability. The study reveals that young MFIs suffer more from political instability and weak enhancement of the rule of law, which is consistent with accumulation of information capital and relationship lending. The quality of contract enforcement and overall political stability in the country could therefore affect the extent of moral hazard that MFIs face when making loans. Results also indicate that corruption makes it harder for MFIs to realize profits, irrespective of MFI age. Corruption may therefore reduce the probability that MFI will invest in a country. This evidence may help guide the sequencing of institutional reforms to promote microfinance development.

Finally, we find evidence of a moderate persistence in profitability. Microfinance industry in Africa is therefore not competitive. This finding is consistent with literature that considers persistence of profitability as a signal of barriers to competition reflecting either impediments to market competition or informational asymmetry.

The evidence gathered in this thesis is important for forming credit market policy that may help deepen the quality and quantity of access to finance particularly by the poor. This research work therefore bridges some knowledge gaps in microfinance profitability by presenting important findings that confirm some theoretical postulations. Questions for further research are discussed in the conclusion.

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CHAPTER ONE

1. INTRODUCTION

1.1 Background

Lack of access to credit is a major obstacle to growth in Africa, where a large majority of households do not have adequate collateral to secure a loan¹. These households rely on both informal-sector and moneylenders where they borrow at usurious interest rates, or are simply denied access to credit and therefore investment. Microfinance institutions (henceforth MFIs) expand the frontier of financial intermediation by providing credit to those who are excluded from formal financial markets.

Microfinance is high on the public policy agenda. It has achieved tremendous success in improving the livelihoods of the poor², through the provision of financial services. Such initiatives are widely sponsored by a variety of organizations including; the World Bank, United Nations, national governments and many charitable non-governmental organizations (NGOs). Their aim is to help the poor cope with risk and take advantage of small income generating opportunities, by employing profit-making banking practices amongst low income communities (Banerjee and Duflo, 2009; Ahlin and Jiang, 2008; Arun and Hulme, 2008; Swain and Varghese 2009; Imai et al. 2010). By alleviating financing constraints, microfinance is able to promote small scale investments from otherwise unrealized market activities while yielding a return on their investment (Hartarska and Nadolnyak 2008b; Hilson and Ackah-Baidoo 2010). Levels of success however vary across MFIs and depending on some factors, some fail and cease to exist while others grow to reach millions of borrowers.

1 Illustrations on this point abound (see, e.g., Demirgüç-Kunt, et al 2007; Beck, et al 2007).

2 According to the Micro credit Summit Campaign, the world's core poor are those who live in the bottom half or those living below their nation's poverty line or any of the 1 billion people living on less than US\$ 1 a day.

Spurred by an accord reached at the Microcredit Summit in February 1997, to reach 100 million of the world’s poorest households with credit by the end of 2005; there is arguably more widespread support for microfinance today than any other single tool for fighting global poverty (Daley-Harris, 2009; Armendáriz and Morduch, 2010). This heralded and much celebrated success has been reflected in outreach. For example, between December 1997 and December 2010 the number of MFIs reporting to the microcredit summit campaign rose from 618 to 3,652. The number of persons who received credit from these institutions rose from 13.5 million to 205 million during the same period (see Table 1.1). Assuming a family of five persons per household, the 137.5 million poorest clients reached by the end of 2010 affected some 687.7 million family members (Maes and Reed, 2012).

Table 1.1: Outreach figures as of December 31, 2010

Number of MFIs reporting (1997–2010)	3,652
Number of MFIs reporting in 2011 only (data from 12/31/10)	609
Percent poorest clients represented by MFIs reporting in 2011	56.5%
Total number of clients (as of 12/31/10)	205,314,502
Total number of women (as of 12/31/10)	153,306,542
Total number of poorest clients (as of 12/31/10)	137,547,441
Total number of poorest women (as of 12/31/10)	113,138,652

Source: (Maes and Reed, 2012).

Through innovative lending technology, MFIs are generating high loan repayment rates on non-collateralized loans in diverse environments that often exceed 95 percent (Cull, Demirgüç-Kunt and Morduch 2007). Translating high repayment rates into profits remains a challenge to most MFIs. Although micro-banking is dominated by NGOs and socially-oriented investors, experts believe only one percent of all NGO-sponsored MFIs are profitable and predict that no more than five percent would ever be (Armendáriz and Morduch, 2010). This argument is however anecdotal and largely based on general consensus than on supporting data and research.

In 1995, the donor community arrived at a consensus that all MFIs should in principle become profitable after seven to ten years of start-up support (Balkenhol, 2007). But given the

diversity of their objectives, ranging from very pronounced poverty focus to commercialization³, the question is whether this is being realized. At the heart of the debate are important disagreements over the nature and scope of potential trade-offs between pursuits of profitability and outreach (Armendáriz and Morduch, 2010). This conflict cannot be resolved by lending technology as two pioneers of joint liability contract namely Grameen Bank and BancoSol have now switched to individual-based models (Cull, Demirgüç-Kunt and Morduch 2007).

Profitability of MFIs particularly across African economies is less understood partly due to inadequate data (Honohan 2004b). But why is it important for MFIs to be profitable? Profitability is an appropriate mechanism for achieving long term viability and sustainability of the microfinance industry. At the micro level, profitability is a prerequisite to a competitive microfinance industry and the cheapest source of capital, without which no firm would attract external capital (Gitman, 2007:65). MFIs profits are also an important source of equity, if profits are reinvested and this may promote financial stability. Moreover, market sources of funding are accessible only to MFIs that have demonstrated that they can turn a profit. By minimizing the probability of financial crisis, impressive profits are vital in reassuring MFI's stakeholders, including investors, borrowers, suppliers and regulators. At the macrolevel, a profitable microfinance industry is better placed to overcome negative shocks and contribute meaningfully to the stability of the overall financial system.

Our motivation for this piece of research emanates from the negative average profit levels amongst Africa⁴ MFIs which are in sharp contrast with other regions (see Table 1.2). What explains this disparity? Are there constraints unique to Africa that hinders MFIs profitability?

3 Commercialization explicitly strives to provide the services intended by charging the real costs of providing microfinance services including margin to cover loan losses with a focus of narrowing the persistent demand-supply gap for sustainable microfinance products and services. Impliedly, MFIs will earn ample profits, and expand as rapidly as profits allow and therefore attract private investors. This is anchored on the premise that commercial businesses can be part of the solution to eliminating poverty.

4 Globally MFIs are classified into five main geographic regions: Africa, Asia, Eastern Europe and Central Asia (ECA), Latin America and the Caribbean (LAC) and Middle East and North Africa (MENA) <http://www.themix.org/>

Despite strong theoretical underpinnings, these questions highlight an important research gap, which deserves an empirical scrutiny. They therefore provide the intellectual framework for the empirical analysis reported in this thesis. This enables us to infer the extent to which both internal and external factors explain MFI profitability. Although Galema, Lensink and Spierdijk (2011), finds that investing in microfinance may be attractive to investors seeking a better risk–return profile, their analysis suggests that investing in MFIs from Africa to a portfolio of international assets is not beneficial for a mean-variance investor. It might also be the case that firms located in economies with less developed financial markets will not only take different quantities of investment, but will also take different kinds of investment that are perhaps safer, short-term and potentially less profitable (Almeida, et al. 2011)

Table 1.2: Overall financial performance (Real values percentage)

Region	Return on Assets				Return on Equity				Profit Margin			
	2005	2006	2007	2008	2005	2006	2007	2008	2005	2006	2007	2008
Africa	-1.2	-0.8	-0.6	-0.7	-4.9	-1.5	0.5	-2.3	-3.9	-2.0	-0.7	-3.7
Asia	0.9	1.2	0.6	1.3	4.4	6.8	5.0	9.6	5.2	7.4	7.1	8.0
ECA	1.4	1.7	1.1	0.3	4.4	6.3	6.2	2.8	8.9	11.7	10.0	4.0
LAC	1.5	2.3	2.1	1.8	5.9	8.9	9.3	7.3	7.8	10.3	10.8	6.9
MENA	2.6	2.4	2.0	2.4	5.8	4.9	7.9	3.5	8.9	9.6	8.1	6.8

Source: The Micro banking Bulletin <http://www.themix.org/publications/microbanking-bulletin> (various issues)
 Africa=Sub-Saharan Africa; Asia=South and East Asia; ECA=Eastern Europe and Central Asia; LAC=Latin America and the Caribbean; MENA=Middle East and North Africa

We are also motivated by the increased investments from commercial players⁵. An important factor attributed to the rapid growth of MFIs in recent years has been the large investment flows. Historically, MFIs were largely funded through donations/grants and government subsidies. In recent years, new sources of funds have emerged that are often described as having a focus on profitability (Ghosh and Tassel, 2011). Between 2004 and 2006, foreign capital investment in both debt and equity tripled to \$4 billion and by 2007, investment had reached \$5.4 billion (Reillie and Forster 2008). Foreign capital investments in microfinance

⁵ A number of conventional banks have begun providing microfinance, since MFIs have demonstrated that it can be a successful and profitable venture. Comportamos in Mexico, Equity and KREP banks in Kenya are three examples of commercial banks that are involved in advancing loans to the poor.

passed the \$10 billion mark in December 2008. At the end of 2009, total assets of the top 10 microfinance investment vehicles (MIVs) reached \$3.6 billion (CGAP 2009a). Could this rapid growth in these investments be driving microfinance profitability?

While a large body of research on financial institutions profitability has been undertaken in the conventional banking industry (see for example Flamini, et al 2009; García-Herrero, et al 2009; Marcucci and Quagliarello 2008; Athanasoglou et al 2008), rigorous empirical evidence on microfinance remains limited, largely due to lack of reliable data. This has led to diverging opinions among scholars and microfinance practitioners. Well-known MFIs are therefore emulated, replicated and funded, even though rigorous evaluation on potential determinants of MFI profitability is rare. Recent developments in theoretical literature on transaction costs, asymmetric information, contracts and banking illustrate the challenges that MFIs must overcome to improve on performance (Becchetti and Conzo 2011; Behr et al 2011; Berger, et al 2011; Garmaise and Natividad, 2010; Gangopadhyay and Lensink 2009). We build on these insightful contributions to uncover factors that explain MFIs profitability across Africa.

1.2 Aims and objectives

Broadly, this thesis seeks to uncover the determinants of microfinance profitability. To achieve this objective, we used an unbalanced panel dataset of MFIs whose time dimension covered twelve years of operation across 32 African countries. We aim at disseminating the findings in order to enhance our understanding of the determinants of MFIs profitability, by contributing towards the existing literature and drawing policy prescriptions. Consistent with this goal, we specifically;

- Undertake and present a comprehensive theoretical and empirical literature survey that explores the current state of knowledge and research in the microfinance industry, with the aim of identifying emerging gaps and formulating questions that need further research.
- Conduct an empirical investigation to discern the potential determinants of microfinance profitability with a focus on Africa economies.
- Carry out an empirical scrutiny to uncover persistence of microfinance profits and the speed of convergence.
- Draw some policy implications and prescriptions on the basis of evidence adduced from both the survey of the literature and the subsequent four empirical chapters.
- Identify promising research ideas which ought to be addressed by future research

1.3 Contribution of the thesis

This thesis is the first study of its kind in the microfinance industry that has used comprehensive estimation techniques based on traditional and new performance indicators in uncovering determinants of microfinance profitability. Specifically;

- Any MFI evaluation that does not take into account factors beyond MFI management (firm specific), if found to robustly and non-negligibly predict MFI profitability is incomplete. Taking into account the context can make the evaluation of MFI profitability more accurate.
- At the policy level, examining factors that influence MFI profitability is important for forming credit market policy that may help deepen the quality and quantity of access to finance particularly by the poor.
- The existence of profit persistence if confirmed may imply that shocks to profitability persist indefinitely and that competitive pressures never erode differences in profitability. If this is

confirmed, it would imply some serious reconsideration of microfinance development policy in Africa.

- This thesis is pioneering in using dynamic system GMM two-step estimation techniques, in studies of determinants of microfinance profitability. This enables us to tackle endogeneity problem that has largely been ignored by the existing literature. It is an unexplored dimension in microfinance literature.
- We draw policy conclusions in every empirical chapter while paying close attention to identified contradictions or inconsistencies, as a result of making comparisons with previous empirical studies. The identified policy implications and prescriptions are further synthesized and summarized in the last chapter of this thesis.

1.4 Data and methodology

This thesis used a dataset that was assembled from four different sources the principal being the MIX Market database⁶. The rest of the data sources are World Development Indicators (WDI), World Governance Indicators, (WDI) and the Heritage Foundation. Detailed description and measurement of variables of interest are discussed in the relevant empirical chapters.

The MIX Market and Micro Banking Bulletin databases are produced by the Microfinance Information Exchange (MIX) covering approximately 2,000 MFIs around the world. This dataset which includes a number of standard financial performance indicators, alongside simplified financial statements is publicly available online at www.mixmarket.org. These data are provided by the MFIs themselves and is supported by audited financial statements or rating reports, which are established by a third party before publication. This is the source of our MFI-

⁶ The Mix Market is a global microfinance platform which provides information about microfinance in diverse ways to various stakeholders. Its aim is to promote investment and information flows within the world of microfinance and donors, as well as to improve reporting standards in the microfinance industry.

specific/institutional level data. Previous studies that have used Mix Market dataset include; Cull, Demirgüç-Kunt and Morduch (2011), Ahlin et al (2011), Arun and Annim (2010), Ayayi and Sene (2010) and Cull, Demirgüç-Kunt and Morduch (2007).

World Development Indicators consists of the primary World Bank collection of development indicators that includes data from 209 countries spanning from 1960 to 2010. WDI is the most accurate development data, with national, regional and global coverage. It is the source of our country level macroeconomic indicators and is publicly available at <http://data.worldbank.org/data-catalog/world-development-indicators>. Previous studies that have used this dataset include Ahlin et al (2011), Cull, Demirgüç-Kunt and Morduch (2011) and Cull, Demirgüç-Kunt and Morduch (2009b)

The World Bank Worldwide Governance Indicators (WGI) reports aggregate and individual governance indicators for 213 economies over the period 1996–2010 for six dimensions of governance that include; voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption. The indicators are a combination of the views of a large number of expert surveys, enterprises, citizens in both industrial and developing countries. The underlying data sources for the aggregate indicators are drawn from a variety of think tanks, international organizations, non-governmental organizations and survey institutes. This is the source of our country level institutional environment proxies that is publicly available at;

<http://info.worldbank.org/governance/wgi/index.asp>. Previous studies that have used this data include Demetriades and Fielding (2011), Ahlin et al (2011), Cull et al (2011), Arun and Annim (2010), Lensink et al (2008).

Our complementary business environment measures are from Heritage Foundation which is publicly available at <http://www.heritage.org/index/>. The core component of Heritage Foundation

data is the Economic Freedom Index which covers 10 freedoms. This ranges from property rights to entrepreneurship and evaluate the economic success of 183 countries. From this index we draw three measures of business environment. Business Freedom (BF) measures the ability to start, operate and close a business and represents the overall burden of regulation as well as the efficiency of government in the regulatory process. Property rights (PR) is a composite Index ranging from 10 (Private property is rarely protected) to 100 (Private property is guaranteed by the government). Freedom from Corruption is a quantitative measure that is derived from Transparency International's Corruption Perceptions Index (CPI). It is the focal measure of corruption levels across 179 countries. Previous studies that have used this dataset include Mersland and Strøm (2009), Hartarska and Nadolnyak (2007).

Although participation to Mix Market is open to all MFIs and aim to boost the number of reporting MFIs, it is incumbent upon each MFI to decide whether to participate. MFIs may choose to report some indicators and conceal others and some years discretionary. Specific or individual MFIs data are confidential and can only be used with the permission of the respective MFIs.

Analyses based on MIX Market data are therefore vulnerable to self-selection bias. MFIs reporting to this source are likely to be different from those not reporting at all. This bias is likely to be large in magnitude, though it is difficult to measure and overcome. Take for instance, Microbanking Bulletin (2010) which shows that 57% percent of the MFIs surveyed by the bulletin were financially sustainable though with a financial revenue/assets ratio of 27% and 10.8 % return on equity. The sample surveyed is however not statistically meaningful since thousands of MFIs were not surveyed (Bauchet and Morduch 2010). To illustrate further on self-selection bias, Cull et al. (2009a) investigate the trade-offs between commercialization of microfinance and social outreach. They utilize MIX Market dataset comprising of 346 institutions. While the data

are of high quality and adjusted to comply with international accounting standards, they concede that the data are skewed towards MFIs that stress more on profitability.

Comparable MFI level data includes that used by for example Mersland, Randøy and Øystein (2011), Mersland and Strøm (2009; 2008). This dataset contains information from risk assessment reports constructed using rating reports made public at the www.ratingfund.org. The data also suffers from sample selection bias since only rated MFIs enter. Another set of data but which is less detailed is that provided by the microcredit summit campaign which covered 3,652 MFIs in its 2011 database, about twice as much as Mix Market.

Data for modelling determinants of MFIs profitability are considered proprietary and are hard to obtain. Our proxies are crude quantity-based indicators of profitability computed and standardised by the Mix Market team. We would have preferred to compute return on assets as net profit before tax as a percentage of total assets, or even net profit before tax as a percentage of total assets plus staff expenses as percentage of total assets to test the expense preference theory consistent with Molyneux and Thornton (1992). We were limited by data availability on this front. To the extent that tax regimes or rates differ across Africa, the indicators might be subject to measurement error. This is likely to bias the outcome of our analysis.

One of the estimation problems we had to contend with was poor quality of the data. For example, despite the breadth of data available through MIX datasets, some variables such as portfolio at risk among the MFIs reporting to MIX and the Heritage Foundation dataset shows little variability. We however acknowledge that cross-country data cannot be made perfectly homogeneous. Thus, given these data constraints, we cannot control for potential survivorship bias but nevertheless account for the implications of this bias in the discussion of the results. All the empirical findings should be viewed in that light and the reader will have to interpret our results with all the caveats in mind.

Despite these shortcomings, we view this data compilation effort and the subsequent empirical analysis as a useful and important first step towards developing more accurate indicators of determinants of microfinance profitability.

At the time of writing this thesis, available data were limited to 210 MFIs as some of the disclosures by MFIs were missing. As more comprehensive disclosures become available, similar research can be undertaken to find out if degrees of freedom affected our result. In addition, the hypotheses tested in the empirical chapters can be re-tested.

The methodology presented in this thesis is purely empirical. Microfinance industry is quite diverse in terms of the charter that established the organizations, with MFIs organized as banks, credit unions, non-governmental organizations (NGOs), or non-bank financial institutions. This diversity makes it difficult to choose appropriate conceptual framework thereby complicating any empirical analysis. The use of cross-country data provides a unique opportunity for this analysis.

Studies on firm performance employ various measures to test the predictions of different exogenous factors. Some of the measures of performance that have been used over the years include financial ratios (Mehran, 1995), stock market return and their volatility (Cole and Mehran, 1998) and also Tobin's q (Zhou, 2001). For the purpose of this study we use return on assets (ROA) and return on equity (ROE) as proxies of MFI performance. The Microfinance Financial Reporting Standards recommends the use of ROA and ROE as measures of profitability rather than financial self-sustenance (FSS) and operational self-sustenance (OSS). It is a financial metric that is well established and understood across the finance spectrum.

We acknowledge that ROA may be biased due to off balance-sheet items. It can however be argued that such activities may be negligible in Africa MFIs. ROE on the other hand disregards the risks associated with high leverage and financial leverage is often determined by

regulation. Thus ROA is more appropriate in Africa microfinance industry since MFI equity is abnormally low (Lafourcade, et al 2006).

We used unbalanced panel data econometrics methodology to shed light on certain important relationships that could help us to better understand the determinants of microfinance profitability. Our panel is unbalanced since not all MFIs have information for every year—some MFIs may have closed as others enter the market. In order to investigate on the determinants of profitability, we started from a basic linear econometric specification. Further empirical work was carried out to examine: (i) profit persistence and the speed of convergence; (ii) impact of financing choice on microfinance profitability; and (iii) impact of institutional environment on microfinance profitability is carried out. This was achieved by use of dynamic two-step System-Generalized Method of Moments (GMM) estimator which is an unexplored dimension in microfinance literature. We additionally test the robustness of our models with different specifications. Detailed methodology is contained in the respective empirical chapters.

1.5 Structure of the thesis

This thesis is structured into seven chapters. The rest of the thesis proceeds as follows. Chapter two reviews comprehensively microfinance literature with a view of identifying the main theoretical and empirical strands in order to isolate what has been done from what needs to be done. The literature is organized along a thematic structure covering different tenets in microfinance that touch on MFIs performance.

Chapter three presents empirical evidence on what explains the negative average profit margins of MFIs in Africa. Due to limited literature on what influences MFIs profitability, this chapter borrows heavily from determinants of profits in the conventional banking industry. A background to the Africa economies and in particular the microfinance landscape is documented in Appendix A. Using a unique dataset of unbalanced panel data of 210 MFIs across 31 Africa economies, we specify an empirical framework to investigate the effect of MFI-specific, country level institutions development and macroeconomic determinants on MFIs profitability. On the basis of empirical findings, we draw policy conclusions and PRIs.

Chapter four builds on the econometric framework developed in the previous chapter to investigate persistence of microfinance profits. Using the same dataset, we specify a dynamic econometric model to investigate persistence of MFIs profitability while controlling for MFI-specific, institutions development, macroeconomic context and industry-specific factors. We interpret the results while at the same time making comparisons and references to previous empirical studies. All our estimations are robust to alternative specifications and analytical methods.

Using the same econometric framework and estimation technique to the previous chapter, chapter five investigates the impact of financing choices on microfinance profitability. The motivation for this chapter stems from the recent trends towards commercialization where

microfinance has become attractive to foreign capital investment while at the same time mobilizing deposits from the public. We estimate a dynamic panel data model using system GMM estimator while controlling for profit persistence, other MFI specific and country level factors. This enables us to probe further the determinants of MFIs profitability arrived at in the previous chapters, while drawing policy conclusions and recommendations.

In chapter six, we use the empirical strategy developed in the previous chapter, to examine the role of host country institutional environment on influencing microfinance profitability. The motivation here emanates from the consistent negative profit margins across Africa as reported in the Microbanking Bulletin (2010), contrary to other regions. We therefore estimate a dynamic panel data model using system GMM estimator while controlling for profit persistence, MFI specific and other country level variables. This enables us to probe further on the determinants of MFIs profitability arrived at in all the previous chapters. We also draw policy conclusions and suggest ideas for further research.

The final chapter concludes this thesis by summarizing the main findings, policy implications and prescriptions while identifying ideas of extending this piece of research work.

CHAPTER TWO

COMPREHENSIVE AND CRITICAL SURVEY OF THE LITERATURE

2.1 Introduction

2.1.1 Background

Microfinance literature, like the institutions themselves, is still nascent. Most results are from theoretical models that rely on abstractions from reality but they nevertheless pose an important challenge. Why does reality look so different? In spite of the euphoric attitude among donors and policy-makers about the impact of microfinance, what explains MFIs profitability is a poorly understood phenomenon. While this may be explained by the relative youthfulness of the programs and the research agenda, taking a step towards a focused literature survey is the goal of this chapter. A vast literature already surveyed by Morduch (1999b), Hartarska and Holtmann (2006) and Hermes and Lensink (2007), are relevant as a departing point. We build on this insightful contribution by reviewing recent research in microfinance so as to isolate the leading theoretical and empirical issues.

2.1.2 Motivation of the review

A large theoretical literature has established conditions under which for instance symmetric group loans do better than individual loans (Vigenina and Kritikos 2004; Rai et al 2004; Gangopadhyay et al 2005; Karlan 2005; Chowdry 2005; Bond and Rai 2008; Carpena et al 2010; Giné et al 2010), which group characteristics lead to higher repayment (Cassar et al 2007; Ahlin and Townsend 2007b; Karlan 2007), or which contracts are optimal (Ahlin and Townsend 2007a; Daripa 2008; Madajewicz 2011). Through these innovative contracts MFIs are generating high

loan repayment rates in diverse environments but which have not translated into profits (Cull, Demirgüç-Kunt and Morduch 2007).

Although these studies do provide invaluable information on innovations in lending technology and organization design, empirical work on MFIs performance over time is scarce largely due to significant data limitations. For instance, evidence on what explains microfinance profitability remains scant and economic theory on lending technology which focuses almost exclusively on joint liability contracts; has largely ignored microfinance profitability. What explains this apparent paradox? Is the theory too stylized to capture the reality of microfinance performance particularly in the developing world where most MFIs conglomerate? Does the experience vary across countries? Why are some MFIs more profitable in some regions than others? What general lessons can we draw from the experience of the last three decades?

2.1.3 Objectives of the review

The purpose of this chapter is to synthesize and distil scholarly and policy lessons emerging from the reviewed studies, in a broader array of topics. This will aid in prompting new promising research ideas. Consistent with this goal, we explored the current state of knowledge and research in the microfinance industry both at theoretical and empirical fronts. To achieve this objective, we; (a) took stock of existing knowledge in microfinance, (b) examined both theoretical and analytical approaches used in microfinance with the aim of identifying the appropriateness of the chosen methodologies, (c) identified contradictions and inconsistencies, both within single articles and as a result of making comparisons between articles from different authors while simultaneously identifying conflicting interpretations of findings, (d) Identified the main strands of theoretical and empirical literature so as to distinguish what has been done from what needs to be done, (e) identified promising research ideas with the aim of laying ground for future research.

To this end we presented a large amount of both theoretical and empirical evidence in parallel from both developing and developed economies.

2.1.4 Methodology/approach

The review focused on gathering both theoretical and empirical evidence to support various themes in microfinance. We reviewed recent innovations on microfinance performance. We related the innovations to theoretical propositions, drawing links to new work in financial intermediation and to randomized control trials where necessary. To achieve the objective of the literature review, we proceeded as follows. We used a broad search strategy by conducting an initial search in 2006/07 and repeated the entire search in 2011 for an update and validation. The survey of peer-reviewed Journals was not restricted by date. For inclusion, articles must have clearly defined research methodology that culminated to objective evidence, as well as a focus on one or more MFIs offering some form of microfinance regardless of the lending technology.

We searched several electronic databases that included but not limited to; EBSCO, EconLit, ScienceDirect, Wiley InterScience, Emerald, Springer, Applied Social Sciences Index and Abstracts (ASSIA) among others. After searching for available literature on the internet, we were able to determine several key words and terms (Microfinance or microcredit or micro-finance or micro-credit or village bank, microbank) that helped define our initial search. Using these search criteria, we identified 600 articles in the electronic databases which included duplicates across databases. We examined the titles of all of the articles identified and selected 400 articles for further review. After removing duplicates, the survey narrowed down to 300 abstracts of peer reviewed articles with 200 of these articles selected for full-text review. We carefully reviewed these articles for information about the study design, outcomes and limitations. We developed a

summary table which helped in identifying the source/author, idea behind the article, methodology used as well as conclusions.

The criterion for selecting studies was based on their potential to provide information relevant to the study theme and the rigorousness of the methodology (that included accuracy and validity of the measurements) of the study design. This involved carefully reading the title and abstract, methodology and conclusion of each article and subsequently developing a review matrix based on the same format. This review has been organized around and related directly to the theme of the thesis contrasting similar ideas/agreements with competing views, clearly identifying areas of controversy/disagreements, inconsistencies, discriminating or synthesizing results into a summary of what is known and unknown/uncertain, point of departure and convergence, logical structure, emerging gaps and formulating questions that need further scrutiny.

From a methodological point, we do not discuss the well documented theories at length but rather summarized the main arguments within the literature. We also do not cover some topics, such as microfinance products which have substantial literature on their own (see for instance Brau and Woller 2004 for a comprehensive review). We concentrate on studies that involve direct description and analysis of the main tenets of microfinance performance especially regression studies geared towards understanding the temporal and the cross-sectional differences of MFIs operating in different countries. Additionally, we do not dwell much on research based on case studies. In reviewing the empirical evidence, we summarize the main results and seek to evaluate their policy implications for the industry.

2.1.5 Limitations of the review

Although we undertook to explore vast theoretical and empirical research on microfinance, this chapter is not devoid of any limitations. Three important limitations warrant our mention here. First, owing to time constraints we could not survey all issues under the auspices of microfinance but nevertheless covered most of them. We therefore do not provide an exhaustive account of everything published on microfinance but rather a focus on a particular theme and discuss all the significant scholarly work important to that end. Second, while the evidence that we discuss in this chapter is subject to several measurement problems, theory has moved ahead of evidence and therefore most of the articles reviewed are theoretical propositions with no direct empirical measure. Third, at the time of writing this thesis, the Journal articles available were limited up to and including November 2011 time period. More articles may have been made available after the completion of this thesis and therefore, the conclusion arrived at in this chapter can be re-evaluated.

2.1.6 Structure of the review

The main focus of this review is MFIs financial performance. We begin by a survey of studies touching on financial sustainability which is a tangible parameter that can be measured and monitored continually. In section three, we review and discuss various aspects of microfinance profitability. The final section of this chapter provides a summary and conclusion based on the entire literature survey.

2.2 Microfinance performance

2.2.1 The broader context

Microfinance performance has attracted significant interest in recent years, both from policy makers and in the academia. MFIs face unique challenges because they must achieve a double bottom line—that of providing financial services to the poor (outreach) and covering their costs (sustainability). MFIs are therefore a hybrid but some are also similar to banks because they are regulated or supervised and because they mobilize deposits. This organizational diversity makes any empirical analysis of their performance difficult (Cull, 2009a). In this chapter, we do not survey the extent to which MFIs contribute to social performance and neither we do we review studies on cost-benefit analysis of funds invested by donors or governments which has largely been addressed by Hermes and Lensink (2011). The main focus of this chapter is MFIs financial performance. Recent academic interest on microfinance performance has not been matched by a surge in empirical research. The subject thus remains under-studied.

2.2.2 Financial sustainability

A vast and growing literature posits that for MFIs to achieve full potential they must become financially sustainable (see e.g. Brau and Woller, 2004 for a comprehensive review). Financial sustainability also known as financial self sustenance (FSS) and operational self sustenance (OSS) in this context, is measured as the ability of MFIs to continue operations indefinitely using own resources without seeking donations, grants, or subsidized loans from outside individuals, NGOs, or governments. It should however be noted that sustainability does not imply profitability (Morduch 2005).

The importance of being financially self sufficient can best be illustrated by referring to pioneer institutions. Hollis and Sweetman (1998) for example compare six micro credit

organizations of 19th-century Europe, to identify institutional designs that were a prerequisite to financial sustainability. They established that organizations that relied on charitable funding were more fragile and tended to lose their focus more quickly than those that obtained funds from depositors. Hollis and Sweetman (2001) further show that these MFIs were financially sustainable for more than a century because they adapted to their economic and financial environment. Moreover, the literature survey by Hermes and Lensink (2007) in particular points to the need for further research on the mechanisms that explain MFIs financial outcomes. Most of the existing literature on MFIs performance has nevertheless been constrained by inadequate and unreliable data at the firm level and therefore has resorted to a number of indicators as proxies. It's for this reason that Morduch, (1999b) calls for more quantitative empirical research into MFI performance.

In the existing empirical literature, factors explaining MFI financial sustainability may be categorized into MFI-specific and those external to MFI management (Crabb, 2008). External factors are macroeconomic environment, industry specific such as regulatory conditions, concentration and charter that established the MFIs. Several studies have examined the determinants of MFIs financial sustainability. Using a dataset of 124 MFIs across 49 countries, Cull, Demirgüç-Kunt and Morduch (2007) examine financial performance and outreach in a large comparative study. They use pooled regression to estimate the model

$$FSS = \alpha + \beta_1 Yield_i + \beta_2 Yield_i Xlendingtype_i + \beta_3 Labour\ cost_i + \beta_4 labour\ cost_i Xtype_i + \beta_5 capital\ cost_i + \beta_6 capital\ cost_i Xtype_i + \beta_7 lendingtype_i + \beta_8 MFIAgeSize_i + \beta_9 Busprac_i + \beta_{10} region_i + \varepsilon_i \dots \dots \dots (2.1)$$

Where FSS represents financial self-sufficiency ratio. They find that the impact of various MFI-specific factors on performance depends on an institution's lending methodology. Although they pioneered the use of cross-country, cross-MFI data in statistical tests and provide a new dimension to the existing literature on MFIs performance, their pooled regression model omits

fixed effects, and omitting fixed effects risks omitted variables bias. Rather than estimate different intercepts for each unit and/or time point, pooled regression estimates just a single intercept (Baltagi, 2008). The omitted country-specific intercepts may be correlated with the independent variables (Greene, 2008) and the disturbances may be correlated within groups. This study also fails to control for endogeneity. It is possible that previous levels of FSS may be explaining the current levels.

Using data on 217 MFIs across 101 countries distributed by region and type of MFIs over the period 1998-2006, Ayayi and Sene (2010) estimated a pooled regression model;

$$FSS = \beta_0 + \beta_1 * Par > 30 + \beta_2 * Finrevrat + \beta_3 * Percosrat + \beta_4 * AgeMFI + \beta_5 * Avloanbal + \beta_6 * percwomen + \beta_7 * loanstaff + \beta_8 + borloff + \mu \dots \dots \dots (2.2)$$

Where FSS represents financial self-sufficiency. Their results show that the quality of the loan portfolio is the main determining factor of MFI financial sustainability. They further show that outreach, the age of MFIs and the percentage of women among the clientele do not significantly influence the MFIs' financial sustainability. Consistent with Cull, Demirgüç-Kunt and Morduch (2007) this study suffers from the same methodological weaknesses, thus their results may not be convincing.

Ahlin et al. (2011) also estimated a pooled regression model;

$$Y_{ijt} = \alpha + \beta_m M_{it} + \beta_x X_{jt} + \varepsilon_{ijt} \dots \dots \dots (2.3)$$

Where Y_{ijt} is a year- t operational self-sufficiency (OSS) of MFI i located in country j ; M_{it} is a set of MFI-specific control variables at time t ; and X_{jt} is a set of macroeconomic variables describing country j at time t . Their pooled regression model omits fixed effects, and omitting fixed effects risks omitted variables bias. They too fail to expunge endogeneity.

While Ahlin et al (2011) shows that macroeconomic-context matters for MFI operational sustainability, Cull, Demirgüç-Kunt and Morduch (2007) concludes that MFIs can still expand outreach without compromising financial sustainability. Both studies nevertheless fail to circumvent methodological weaknesses.

Bogan (2009) investigates the impact of existing sources of funding on the efficiency and OSS of MFIs. He finds causal evidence to the effect that an increased use of grants by MFIs decreases OSS. Crabb (2008) models OSS as a function of both firm level and environmental factors. Using MIX dataset from 2000 to 2004 to estimate a fixed-effects panel data model, Crabb finds that portfolio at risk and outreach breadth are significant, with the expected signs. Further evidence on OSS is presented by de Crombrughe, et al (2008) who use regression analysis to study the determinants of self-sustainability of a sample of MFIs in India. They investigate three aspects of sustainability: cost coverage by revenue, repayment of loans and cost-control and conclude that MFIs can cover costs on small and partly uncollateralized loans without necessarily increasing loan size or raising monitoring cost. The use of OSS can however be misleading as it lumps together genuine operating net revenue with transfers.

Hartarska and Nadolnyak (2007) further examine the determinants of MFIs OSS and find positive significant impact from MFI size and capital ratios. Using OSS Makame and Murinde (2007) estimate a linear random effects model where average loan is treated as a proxy for outreach depth and regressed against sustainability exogenous variables proxied by operational efficiency and profitability (measured as return on assets and return on capital employed). We do not find both Crabb (2008) and Makame (2007) OLS empirical results as convincing, since their empirical specification includes return on asset and outreach as exogenous variables without controlling for endogeneity. To the extent that there is likely to be persistence in the MFI

financial outcome variables, endogeneity remains an issue as with previous empirical studies that have employed panel econometrics.

Using Sustainability Dependency Index (SDI), Sustainability Dependency Ratio (SDR) and Efficiency and Subsidy Intensity Index (ESII) techniques to investigate financial sustainability, of Bangladesh Unemployed Rehabilitation Organization (BURO), microfinance institution, Hasan, et al (2009) finds BURO achieved sustainability from 2001 to 2005, but then the trend was reversed between 2006 and 2007. Although computation based on SDI to determine financial sustainability is useful, it nevertheless has some drawbacks. First, the underlying assumption is that a rise in interest rates translates to higher profitability. This, however, need not be the case since higher interest rates could lead to a decline in profitability due to adverse selection and moral hazard effects (Morduch, 1999a; Cull, Demirgüc-Kunt and Morduch 2007).

While financial self-sufficiency (FSS) and operational self-sustenance (OSS) of microfinance institutions are increasingly well researched, little is known about MFIs profitability. MFI could in principle cover operating expenses and not post any profit. Given the increased investments from commercial players, research focused on MFI's profitability may help a growing number of investment funds that target their money towards MFI's, with the aim of earning returns from the investments. Studies whose main focal point is OSS and FSS do not fill this void. Indeed, Cull et al. (2009a) and Guérin, et al (2011), show that profit-maximizing investors would have limited interest in most of the institutions that are focusing on social mission.

2.2.3 Profitability

Although there is a vast literature evaluating MFI success and failure, studies on microfinance profitability are scant. Much of the applied economics literature in this area addresses the social worth of MFIs (see for instance Navajas et al., 2000; Navajas et al., 2003; Bruett, 2005), measuring the impact of village-level microfinance institutions (Kaboski and Townsend, 2005), the impact of microcredit on the poor (Mohindra, et al 2008; Mondal 2009; Brau, Hiatt and Woodworth 2009; Roodman and Morduch 2010), costs and benefits of subsidies (Morduch, 2009a; Armendáriz and Morduch, 2010), correlations for MFIs and commercial banks (Krauss and Ingo, 2009), microfinance and mission drift (Hishigsuren, 2007; Copestake 2007; Armendáriz and Szafarz 2011), impact analysis (Hartarska and Nadolnyak 2008b), efficiency of MFIs (Gutiérrez-Nieto et al, 2007), competition between MFIs and conventional banks (Cull et al 2009b), women and repayment in microfinance (D'Espallier et al 2011), microfinance commercialization (Galema and Lensink 2009), microfinance plus (Lensink, and Mersland, 2009), which microfinance institutions are becoming more cost-effective with time (Caudill, Gropper and Hartarska 2009), and social efficiency in microfinance institutions (Gutiérrez-Nieto et al, 2009).

There are also other closely related studies but whose main focus is on firm level specifics such as management techniques, organizational structure and contract design. These include Coleman and Osei (2008) on the role of governance on outreach and profitability of microfinance institutions; Mersland and Strøm (2009), Arun and Annim (2010) on MFI performance and governance; Hartarska (2009), on the impact of outside control in MFI performance; Hartarska (2005) on the relation between managers' experience and compensation schemes on MFI-performance; Mersland and Strøm (2008) on MFI ownership structure and performance; Cull, Demirgüç-Kunt and Morduch (2007), Mersland and Strøm, (2010), Makame and Murinde,

(2007) on micro-institutional determinants of MFI outreach-sustainability trade off; Cull, et al (2009c) on the performance, regulation-competition and financing trade off and D'Espallier et al (2010) on gender bias and microfinance performance.

There are also a few studies that focus on the determinants of MFI success which are external to the control of the MFI management. Ahlin et al. (2011), for example examine implications of the surrounding macroeconomic context on MFIs operational self-sufficiency and growth of loan portfolio. Similar studies on this front include Vanroose (2008); Gonzalez (2007); Honohan (2004), who have investigated the relationship between MFIs' performance and changes in the macro-environment. Mersland, Randøy and Strøm, (2011) examine the impact of internationalization on microfinance institutions' performance. Hartarska and Nadolnyak, (2008a) investigate the impact of credit rating in facilitating microfinance institutions raise funds. These studies address factors that may explain financial sustainability where the dependent variable is either FFS or OSS. What is clearly lacking from all these studies is a focus on MFI profitability.

2.2.3.1 Profitability and outreach of microfinance institutions

The pioneering theoretical work by Copestake (2007) and Ghosh and Tassel (2008), shows that wealthier clients cost less thus pursuit of outreach should decrease MFI profitability. Empirical evidence adduced so far shows mixed results (for a recent review see Hermes and Lensink 2011). Cull, Demirgüç-Kunt and Morduch (2007) empirically investigate whether there is a trade-off between the depth of outreach and profitability of MFIs. Their results show that MFIs that mainly provide individual loans perform better in terms of profitability, but the fraction of poor borrowers and female borrowers in the loan portfolio is lower than for institutions that mainly

provide group loans. They stress on the importance of institutional design in determining the existence and size of such a trade-off.

The most comprehensive study of sustainability-outreach trade-off is by Hermes, Lensink, and Meesters (2011). Using data for 435 MFIs for the period 1997-2007, they focus on the relationship between cost efficiency as a proxy for sustainability of MFIs and the depth of outreach measured by the average loan balance and percentage of women borrowers. They conclude that outreach is negatively related to sustainability of MFIs. The results remain robustly significant even after taking into account a long list of control variables. This is consistent with Cull et al (2009a) and Hoque, et al (2011), who shows evidence of such trade off from recent commercialization trend in microfinance. Although Olivares-Polanco (2005) use less rigorous techniques and/or smaller datasets, their study also confirms the existence of this trade-off. These findings are however inconsistent with Ayayi and Sene (2010) who after estimating a pooled regression model, show that outreach and the percentage of women among the clientele do not significantly influence the MFIs' financial sustainability. Their findings confirm Cull, Demirgüç-Kunt and Morduch (2007) who shows that MFIs can expand outreach without compromising financially sustainability. Though there is no convergence among these studies, we can deduce that varying outreach has implications on MFI financial outcomes. It is important however to point that the evidence adduced here mostly relate to MFIs sustainability and not profitability. Could outreach therefore explain MFIs profitability?

2.2.3.2 Profitability and microfinance mechanisms

Type of lending contract

MFIs employ a diversity of approaches, such as group lending and individual non-collateralized loans with gradual increase in loan size conditional on repayment (dynamic incentives). However, not all have the same impact on MFI profitable. Table 2.1 provides comparative data for 487 programs surveyed in the Micro-Banking Bulletin (2010). Relative to MFIs using group lending methodologies, those using standard loan contracts tend to (a) serve better off clients as reflected by the average loan size; (b) be more financially stable as proxied by the percentage of their financial costs covered (117 % relative to 105% for group lending MFIs); (c) serve a small percentage of female clients and (d) charge lower interest rates and fees as shown in the real portfolio yield. MFIs employing group lending and village bank models have considerably higher operating expenses relative to loan size. Whereas MFIs using standard loan contract devote 14% of each dollar lent to operational costs, solidarity group lenders devote 23% and village banks 24%. Therefore group lenders and village banks tend to serve poorer clients and face higher operating costs relative to loan size. Intuitively therefore one would expect individual type of lenders to be more profitable. Thus one question that warrants empirical scrutiny is whether the type of loan contract influences profitability of microfinance institutions.

Table 2.1: Comparison of financial indicators by lending methodology (2008 MFI Benchmarks Values)

	Individual	Solidarity groups	Individual/Solidarity	Village banks
	1 borrower	Groups of 3-9 borrowers	A hybrid of both individual and solidarity	10 or more borrowers per group
Observations	181	42	252	50
<i>Scale</i>				
Number of borrowers	10,600	20,695	14,693	33,357
Average loan size	1,633	152	449	223
<i>Outreach</i>				
Average loan size/GNI per capita (%)	49.9	12.8	26.7	12.3
Fraction female (%)	46	96.8	66.7	86
<i>Financial performance</i>				
Return on assets (%)	1.2	-6.2	0.5	0.5
Return on equity (%)	5.4	-14	2.8	2.4
Operational self sufficiency ratio (%)	117.3	110.5	114.6	114.5
Financial self sufficiency ratio (%)	107.6	85	104.6	102.3
Profit margin (%)	6.8	-17.7	4.4	2.3
Portfolio yield (real, %)	16.0	-17.8	18.9	21.9
Portfolio at risk>90 days	1.8	0.8	1.6	0.8
<i>Efficiency</i>				
Operating expenses/loan portfolio	14.2	27.2	22.5	22.7
Cost per borrower (US\$)	229	40	114	92
Number of borrowers/total staff	89	150	114	140
Number of borrowers/loan officer	240	254	257	298

Source: Microbanking Bulletin 2010, Issue 20; <http://www.mixmarket.org/>

Theoretical literature advocates for collateral as a mechanism that mitigates adverse selection (Berger, et al 2011). Although Berger, Frame and Ioannidou (2011), finds that observably riskier borrowers are more likely to pledge collateral, adverse selection occurs because while borrowers know whether their project is of high or low quality, the MFIs management do not. MFI is therefore unable to distinguish between risky and safe borrowers in its pool of loan applicants; if it could, it would charge a high interest rate to the risky borrower and a lower to the safe borrower. This adverse selection therefore is likely to influence MFIs performance.

Gangopadhyay and Lensink (2009), build on previous work on joint liability borrowing to show that unlike standard debt contract, group lending can mitigate this adverse selection. They conclude that by harnessing local information, joint liability lending can improve efficiency and microfinance performance compared to standard debt contracts in the presence of asymmetric information about borrower types. Along the same vein, Bhole and Ogden (2010) show why group lending is feasible for a greater range of opportunity cost of capital than any other form of lending technology. Madajewicz (2011) further demonstrates that borrowers are able to monitor each other when liability is joint, while MFIs monitors borrowers on standard debt contract. Joint liability therefore offers poorer borrowers larger loans with less monitoring effort than would have been exerted by the lender. Less monitoring on the part of the MFI and larger loan sizes is likely to enhance MFI performance. Along the same vein, Becchetti and Conzo (2011) and Jeon and Menicucci (2010) shows that group lending dominates individual lending either by providing more insurance or by saving audit costs. All these merits of group lending therefore have implications on MFIs profitability.

A rebuttal of joint liability is offered by Armendáriz and Morduch (2010) who is quick to point out that group lending technology may not be optimal. They argue that monitoring raises the effort cost for the types who would otherwise adopt low effort, reducing the underlying externality problem. Eijkel, Hermes and Lensink (2011) show that monitoring efforts differ between group members due to free-riding with implications on default rates. This may lead to lower MFIs profitability.

In spite of these theoretical underpinnings on the relative importance of the type of loan contract on enhancing repayment rates, the basic empirical question of whether it matters for MFI profitability has remained unanswered. The pioneering study by Cull, Demirgüç-Kunt and Morduch (2007) provides the first empirical evidence on this front. Using firm level data on 124

MFIs across 49 countries, they explore the patterns of profitability, loan repayment, and cost reduction. They find that institutional design matter substantially. Specifically, MFIs that do not use group-lending methodology to overcome incentive problems experience weaker portfolio quality and lower profitability rates when interest rates are raised substantially. They conclude that in order for the MFIs that employ the standard individual loan contract, to achieve profitability, they would have to invest more heavily in staff costs which is consistent with the economics of information but contrary to the conventional wisdom that profitability is largely a function of minimizing cost. Other studies that have used cross-country data and which corroborates Cull, Demirgüç-Kunt and Morduch (2007) includes Vigenina and Kritikos (2004). On the contrary, Mersland and Strøm, (2009) find that individual loan is never a significant variable in all their regressions which is an indication that financial performance may be achieved with the optimal mix of both individual and group lending. A limitation with these studies is that they fail to control for endogeneity.

Recent approach to overcome endogeneity problem has been the use of field experiments which allows for several lending contracts to be tested simultaneously. Feigenberg, et al (2010) provides the first experimental evidence in this context and finds that group lending is successful in achieving low rates of default without collateral not only because it harnesses existing social capital, but also because it builds new social capital among participants. This finding is consistent with Giné et al (2010), Berhane, et al (2009), Cassar et al (2007) and Abbink et al (2006). On the contrary, and using data from a World Bank survey carried out in Bangladesh during the period 1991-1992, Pellegrina (2011) compare the impact of microfinance programs and other types of credit contracts on household investment in productive activities. She shows that joint liability contract may be less conducive to building up fixed assets due to short regular repayment schedules. Group lending technology may therefore push borrowers more towards short-term

investments with subsequent low returns. Using field experiments, Hisaki (2006) established that joint liability contracts cause serious free-riding problems, inducing strategic default and lowering repayment rates. Joint liability may also induce the borrower's suicide ex post through the stigma associated with default as evidenced in Japan (Chen, Choi and Sawada 2010). The issue of whether type of lending contract is significant in explaining microfinance performance therefore remains contestable.

Repayments schedule

Theory suggests that a more flexible repayment schedule would potentially improve repayment capacity by allowing MFIs to make use of superior monitoring capability of the informal lender in constraining strategic behaviour by the borrower (Jain 1999; Armendáriz and Morduch 2010). Frequent repayment schedules may also help borrowers who have difficulty in holding on to income. On the contrary Jain and Mansuri (2003) shows that although group meetings help in eliciting information on problematic borrowers or projects from their group members, there are transactions costs of making the repayments at weekly meetings of the members at each collection point. These costs are likely to affect MFI performance. Moreover, an optimal lending contract must provide additional repayment incentives to counter borrower run (Bond and Rai 2009).

Does the use of regularly scheduled repayments have an impact of MFI performance through increased default rates? Here the evidence on repayment frequency remains mixed. Pellegrina (2011) shows that using loan contracts with regular repayments may discourage borrowers from investing in projects requiring longer gestation. The evidence adduced by Field and Pande (2008) finds no difference in repayment. One has however to be cautious with the interpretation of their results since they are preliminary, based on small-sized loans and on new

short-term borrowers. McIntosh (2008) extends the Field and Pande result with a study of a Ugandan MFI in which the bank offered its village banks a choice between weekly or bi-weekly repayment. He as well finds no drop in repayment. On the contrary Feigenberg, et al (2010), show that relative to clients who met on a monthly basis during their first loan, those who met weekly are three and a half times less likely to default on their subsequent loan. Empirical evidence therefore remains contestable.

Dynamic incentives

The seminal theoretical work on repayment incentives through refinancing in the context of microfinance was first attributed to Besley and Coate, (1995). In a departure from his earlier work, Chowdhury (2007) allows for endogenous group-formation by using an explicitly dynamic framework where sequential financing and contingent renewal are used concurrently. He posits that dynamic incentive is important critical since, in its absence, the borrowers may collude among themselves. This is not consistent with Chowdhury (2005) where he had postulated that sequential financing enhances the incentive for peer monitoring and may, even in the absence of joint liability, solve the moral hazard problem. Consistent theoretical predictions to Chowdhury (2007), had been advanced in previous studies by Aniket (2004), who extends the time horizon further to analyze sequential group loans and shows that, by temporally separating the decision on peer monitoring and investment, sequential financing makes collusion impossible. Tedeschi (2006) improves on contracts used by MFIs by endogenizing the default penalty, while constraining the MFI to maintain sustainable lending operations. In a similar vein, Jain and Mansuri, (2003) postulate that when a borrower has continual credit needs, access to future loans can provide a strong reason to avoid default on a current loan but who also contend that unless

there is a substantial uncertainty about end date or graduation from one program to the next, dynamic incentives have limited scope on repayments.

Non-contestable evidence on dynamic incentive components of the contract structure are more difficult to show, as most lenders only vary contract terms endogenously, for selected clients (Karlan and Zinman 2009). Relevant studies that have examined dynamic incentives include Giné et al (2010) and Fischer (2010). Both studies found evidence that dynamic incentives have large impact on reducing moral hazard problems with implications on higher MFI performance.

2.2.5.3 Profitability and microfinance regulation

The need for regulation of economic activities is justified in the economic literature as a policy instrument to minimize the effects of market failures (Majone, 1996). While developing a technical guide for microfinance investors, Forster et al (2009) concede that client protection is a key tenet of microfinance. There is therefore a need for sector-specific regulations along with prudential reforms which enables MFIs to mobilise deposits (Arun 2005). Prudential regulation and supervision of MFIs has become increasingly important since several of the largest MFIs now mobilize public deposits and particularly from the relatively poor households (Hartarska and Nadolnyak, 2007). Protection of these deposits is therefore a policy relevant issue. That notwithstanding MFIs regulation raise costs of lending for MFIs and the question is whether this affects profitability (Cull, et al 2009c). Although Seibel (2003) and Guinnane (2002) draw attention to how financial history justifies the need for appropriate legal frameworks in order to support the development of pro-poor financial systems, recent empirical evidence shows mixed results.

Using data from 245 of the world's largest MFIs, Cull et al (2011) test whether MFIs are able to maintain profitability in the face of the additional costs of complying with supervision. Using OLS estimations, they show that profitability declines with supervision. Upon controlling for the non-random assignment of supervision via treatment effects and instrumental variables regressions, they confirm that supervision is not significantly associated with profitability. Consistent with this finding, Tchakoute-Tchuigoua (2010) investigates whether there is a difference in performance by the legal status of MFIs and concludes that the performance of commercial MFIs is better than that of NGOs but only when portfolio quality is used as the proxy of measuring performance. Glass, McKillop and Rasaratnam (2010), shows that 68% of Irish credit unions do not incur an extra opportunity cost in meeting regulatory guidance on bad debt, which perhaps explains their good performance. Thus MFI supervision has no impact on performance. To the extent that other variables included in the regression may partially account for credit risk, this explains the failure of legal status to significantly affect MFI returns. This counter intuitive finding confirm Mersland and Strøm (2009), who establish that regulation does not have a significant impact on financial performance and similarly Hartarska and Nadolnyak (2007) who after controlling for the endogeneity of regulation, find that regulation has no impact on financial performance. This finding is inconsistent with Hartarska (2005). These studies underscore the importance of taking into account the trade-offs and for further empirical scrutiny.

2.2.3.4 Profitability and microfinance competition

Most of this work has focused on interactions between lenders and borrowers, or among the lenders themselves. Competition weakens long-term relationship between the financial intermediary and the client (Petersen and Rajan 1995). To reinforce this argument, Villas-Boas and Schmidt-Mohr (1999) and Navajas et al. (2003) predict that with intense competition most

MFIs would focus on the most profitable customers. Competition exacerbates asymmetric information problems over borrower indebtedness (McIntosh and Wydick 2005). With asymmetric information between competing MFIs, every loan contract therefore yields a lower profit margin to the borrower than under the full information benchmark. This has implications on MFIs profitability as well. With regard to repayment rates, Marquez (2002) observes that competition lowers the screening ability of the incumbent institution, thus increasing the share of low quality borrowers among clients. A rise in default rates leads to lower repayment and the resultant profitability.

Empirical literature on the link between microfinance competition and profitability is scant. Using financial data for socially-motivated MFIs between 2003 and 2006 in developing countries, Hisako (2009) examines the empirical relationship between competition and financial self-sufficiency (FSS). He concludes that competition has no impact on financial self-sufficiency. On the contrary Mersland and Strøm (2009), finds higher competition to lower portfolio yield among MFIs which lowers profitability. Cull et al (2009b) examine whether the presence of conventional banks affects the profitability and outreach of MFIs. Their results on profitability is however insignificant. One of the shortcomings of Cull et al (2009b) is that they use country-level indicators of competition, rather than measures that would reflect firm level competition amongst the MFIs. These findings therefore remain inconclusive.

McIntosh, De Janvry and Sadoulet (2005) estimate a panel fixed-effects regression and linear probability model. They show that more intense competition leads to multiple borrowing and a decline in repayment rates. Although they do not explicitly examine the impact of competition on MFI performance, their study indirectly finds negative impact of increased competition on repayment performance which is consistent with McIntosh and Wydick (2005) theoretical underpinnings. This too has implications on profitability. Vogelgesang (2003)

examines how competition affects loan repayment performance of Caja Los Andes. Her estimation results indicate that competition is related to multiple loan taking and higher levels of borrower indebtedness. We argue that this level of default has negative implications on MFIs profitability. Again, the evidence here remains contestable

2.2.3.5 Profitability and governance of micro finance institutions

Both policy makers and practitioners of microfinance are increasingly stressing on the need for improved corporate governance to enhance MFIs' survival and growth. Indeed, CSFI (2008) report identifies corporate governance as a principal risk facing microfinance. This control mechanism is important because managers and funders are likely to have divergent priorities and missions. MFI managers may for instance focus on fulfilling the objectives of the MFI but they may additionally have preferences for non-pecuniary rewards which subsequently lead to the so called agency problem in the corporate governance literature.

MFIs board has several major stakeholders represented who include donors, equity investors, management and employees and creditors. Some MFIs have included clients on their boards (Mitchell et al., 1997; Campion, 1998). The board controls the managerial power thereby reducing organizational inefficiencies (Andrés-Alonso, et al 2009). Donors or their representatives in the board of directors and other governance bodies can lead to a better control of the opportunistic behaviour of the manager (Hartarska 2005). But the relative power balance or otherwise of these various stakeholders affects MFIs performance (Mersland 2009a). Hence, the traditional board governance may be less effective in not-for-profit MFIs. Donors on the other hand may prefer outreach to sustainability, while private investors prefer profitability. These two stakeholders may put their representatives on the board and influence the direction of manager's effort.

Empirical evidence on the impact of corporate governance on MFIs performance is scant and consistency in findings within and across studies is rare. Hartarska (2009) uses a database of 108 MFIs operating in over 30 countries and analyzes their performance by adopting an empirical approach usually employed in cross-country banking research on the impact of market forces and regulation on performance. MFI performance is measured by sustainability and modelled as a function of regulatory status, external audit and microfinance rating while at the same time controlling for MFI and country-specific characteristics. The author finds that some rating agencies may play a disciplining role which subsequently affects performance.

To explore the effect of traditional governance mechanisms such as board composition and size, managerial incentives, ownership type, and regulation, Mersland and Strøm (2009) use a global dataset including 278 rated MFIs from 60 countries examine the relationship between firm performance and corporate governance in microfinance institutions (MFI) using a self-constructed global dataset; Mersland and Strøm (2008) investigates whether the transformation of non-government organisations type of MFIs is superior to shareholder owned MFIs in performance; Coleman and Osei, (2008) utilizes a panel of 52 MFIs and examine how selected governance indicators impact on performance measures of outreach and profitability in microfinance institutions (MFIs); Hartarska (2005) uses different datasets spanning 46 to 144 observations from East European MFIs. Although these studies conclude that governance matters, they have difficulties in identifying significant governance influence. They call for better data and the study of alternative governance mechanisms in order to better understand the effect of corporate governance in the microfinance sector. Another drawback in these studies is that they do not in their analysis adequately take into account the fact that most MFIs do not intend to be shareholder owned, have multiple goals, and do not have an inherent profit motive. Additionally, MFIs differ from regular corporate entities in that they encounter horizontal agency

problems between themselves and their clients while at the same time donor-funded MFIs face agency costs in their relationships with donors (Adams and Mehran, 2003). Further research is therefore necessary to reconcile the reported evidence.

2.2.3.6 Profitability and financing choice

While there is a vast literature on the optimal capital structure of corporate firms, the application of the Modigliani and Miller (1958) theorem and other corporate finance theorems to microfinance institutions is not straight-forward. Modigliani and Miller theorem posits that financing decisions do not matter in a world without taxes, transaction costs, or other market imperfections. They argue that a firm cannot change the total value of its securities by splitting its cash flows into different streams and therefore value is determined by its real assets. Thus, capital structure does not matter as long as the firm's decisions are endogenously determined.

There have been no systematic empirical studies for a large group of MFIs that provide robust evidence of how variations in funding affect MFIs profitability. Much of the existing empirical work places the evolution of MFI funding sources within the realm of institutional life cycle theory⁷ of MFI development (Helms, 2006). Using data on outreach and default rate as the dependent variables, Kyereboah-Coleman (2007) investigate the impact of capital structure on the performance of microfinance institutions by estimating a random and fixed effects linear model. Here no attempt has been made to control for reverse causality from performance to capital structure (endogeneity) or to employ a variant of other capital structure measures such as gearing, deposits and portfolio-asset ratio that may explain performance

⁷ According to this framework of analysis, most MFIs start out as NGOs with a social mission, funding operations with grants and concessional loans from donors and international financial institutions that effectively serve as the primary sources of risk capital for the microfinance sector. Thus, literature on microfinance devotes considerable attention to this process of "NGO transformation" as a life cycle model outlining the evolution of a microfinance institution with different stages of funding

MFIs have two broad funding options beyond debt which include deposits (if regulation allows) and equity (commercialization). Several key trends have emerged; the tendency towards increased leveraging of capital⁸, the rise in mobilizing public deposits as more MFIs get regulated and a shift away from subsidized donor funds towards commercial funding⁹ (Armendáriz and Morduch, 2010; Hartarska and Nadolnyak 2008a). These changes mark a general shift towards capital structures typical of traditional banks.

Commercially-funded MFIs respond to the profit incentive, working to increase revenues while minimizing expenses so that they can have revenues sufficient to cover all operating expenses including cost of capital (Cull et al, 2009a). MFIs with access to donor funds may not respond to these pressures to operate efficiently or may deliberately choose outreach over profitability by serving poorer or rural clients with higher delivery costs (Armendáriz and Morduch, 2010). A higher cost of external funds may force the MFI to raise the interest rate it charges its borrowers, with implications on profitability. Cheap external funding may however attract an inefficient MFI, which relies on the implicit subsidy to cover its high operating costs (Ghosh and Tassel 2011). Studies that would provide empirical evidence on this policy relevant issue are however lacking.

⁸ For example, non-profit foundations now have an average leverage of 4.5 times the value of their equity compared to about 1.3 times their equity (see Farrington and Abrams 2002)

⁹ Commercialized microfinance institutions have a profile distinct from others, earning higher profits by making larger loans at lower cost per dollar lent (Cull, et al, 2009b).

2.2.3.7 Profitability and country institutional context

This section aims at addressing microfinance profitability and institutional context by drawing on insights from institutional theory (e.g., North, 1990). Pande and Urdu (2005) contest the notion of “agency” embodied in North’s definition of institutions by arguing that institutions are often not “designed” and even when they are, their operation may be different to what was originally intended. Along the same vein, Casson, Giusta and Kambhampati (2010) contends that North’s “moral and ethical behavioural norms” are often embodied in informal institutions like religion and caste that determine the quality and sustainability of formal institutions like schools, labour markets, and the rules and regulations governing economic activity. Practices and rules as well as the public agencies and moral environment which sustain trust are determined at least in part, if not largely, by the cultural endowment of societies as they have developed over their particular histories (Platteau, 1994).

Existing literature on institutions is limited in two ways: first, institutions are seen in very broad terms as relating to certain political or economic rules of behaviour (e.g., protection against expropriation risk or government anti-diversion policies (Acemoglu et al., 2001) or country’s openness (Hall and Jones, 1999) or bureaucratic efficiency (Mauro, 1995). Second, it’s more aligned towards the effect of institutions on growth. Thus, most of the existing studies are concerned with the impact on GDP per capita (Acemoglu and Johnson, 2005; Acemoglu, Johnson, and Robinson, 2002; Acemoglu et al., 2001; Aghion et al., 2005) or output per worker (Clague, et al, 1999; Hall and Jones, 1999).

Evidence so far shows that the present and anticipated institutional context influences risks and returns associated with investment in a specific location (Xu, 2010). Thus, good governance is a prerequisite to secure property rights, enforcement of contracts and for the provision of

adequate public goods and the control of public “bads.” Without this assurance, citizenry lose the incentive to save and invest (Dixit, 2009).

Although a well functioning government is known to influence the performance of the financial sector, there is little evidence linking well-functioning institutions to financial intermediaries’ outcomes. Kauffman et al (2009) for example, show that if citizen’ perceptions regarding the inefficiency of both the commercial and criminal justice system are corrupt; they are unlikely to seek their services.

Most of the existing empirical literature on institutions development focuses on the impact of economic growth by referring to three different environmental aspects: physical endowments, culture and institutions which are often interrelated and difficult to disentangle¹⁰. The empirical evidence is unequivocal that institutions matter for growth. Williamson, (2009) shows that formal institutions are only successful when embedded in informal constraints. Berggren, (2008) demonstrates that secure property rights, rule of law and light regulatory burden particularly that geared towards contracting appear to robustly promote growth and prosperity. Jerzmanowski (2006), evidence points towards favourable and sustained growth regimes emanating from sound economic institutions. Rodrik (2005; 2008), William (2008), Williamson, (2000), Hausmann et al (2005), Acemoglu, et al (2001), finds a positive and significant effect of institutions on growth accelerations. Acemoglu (2006), demonstrate that distortionary policies, economic crises, and slow economic growth are due to the weakness of political institutions. Gwartney et al (2006), shows that countries with high quality institutions are able to attract more private investment. Glaeser et al (2004), Rodrik, et al (2004), Durnev et al. (2003), find that property rights, shareholder rights, stock market transparency and capital account openness contribute to efficient

¹⁰ The impact of culture, religion and endowments has been extensively documented in literature. Examples include empirical studies of the relationship between endowments and economic development , between culture and a country’s legal system (Acemoglu et al., 2001) and between culture and governance (La Porta et al., 1998)

capital allocation and economic growth. These studies show that good institutions matter in fostering economic growth and financial development. What is clearly lacking from the literature is the impact of country-specific institutions on microfinance profitability.

Hartarska and Nadolnyak (2007) examine the determinants of MFIs operational self sufficiency and find no significant impact from per capita income or any measures of economic freedom and property rights. Consistent findings are also documented by Hartarska (2009) who examine the effects of external governance mechanisms on MFIs' performance, and conclude that regulatory involvement and financial statement transparency do not impact on performance, while some but not all rating agencies may play a disciplining role. This evidence is also confirmed by Arun and Annim (2010) who investigate the effect of external governance structure and functioning on the outreach and financial objectives of MFIs. Contrary to corporate governance studies, external governance indicators fail to cause changes in the profitability of MFIs. On the contrary Ahlin et al (2011) do not find MFI operational self-sufficiency (OSS) to be significantly influenced by governance measures. Similar inconsistent findings were arrived at by Cull et al (2009b) who controls for the same governance indicators for the period 1996-2006. Additionally Crabb (2008) models OSS as a function of both firm level and environmental context and shows that MFIs operate primarily in countries with a relatively low degree of overall economic freedom and that government intervention in the economy can reduce their sustainability. These estimation results therefore remain inconclusive.

One major shortcoming with these previous studies is that they do not attempt to control for endogeneity. Moreover these studies focus on Operational Self Sufficiency but which can be misleading since it lumps together genuine operating net revenue with transfers. It is for this reason that Microfinance Financial Reporting Standards recommends the use of ROA and ROE as measures of profitability rather than financial self-sustenance (FSS) and operational self-

sustenance (OSS). Table 2.2 attempts to reconcile the seemingly inconclusive findings on MFI profitability by summarizing the main findings emerging from the reviewed section on microfinance performance.

Table 2.2: Summary of empirical studies and direction of impact.

Variable	Return on assets	Operational self sustainability	Financial self sustainability
Size	Arun and Annim (2010), Insignificant	Mersland and Strøm (2009). +	Cull, et al (2011). Insignificant
	Cull, et al (2011). Insignificant	Hartarska and Nadolnyak (2007). +	Cull, et al (2009b). Insignificant
	Cull, et al (2009b). +	Cull, Demirgüç-Kunt, Morduch (2007). +	Cull, Demirgüç-Kunt, Morduch (2007). +
	Mersland and Strøm (2009). +	Hartarska, (2005). Insignificant	
	Hartarska (2009) +		
	Coleman and Osei (2008) +		
	Cull, Demirgüç-Kunt, Morduch (2007). +		
	Hartarska, (2005). Insignificant		
Efficiency	Arun and Annim (2010), -	D’Espallier et al (2010) -	Cull, et al (2011). -
	Cull, et al (2011). -		Cull, et al (2011). -
	D’Espallier et al (2010) -		
	Cull, et al (2009b). -		
Age (yrs)	Arun and Annim (2010), +	Ahlin et al (2011) +	
	D’Espallier et al (2010) Insignificant	D’Espallier et al (2010) Insignificant	Cull, et al (2011). Insignificant
	Cull, et al (2009b). -	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, et al (2009b). Insignificant
	Cull, et al (2011). Insignificant	Hartarska and Nadolnyak (2007). +	
	Cull, Demirgüç-Kunt, Morduch (2007).	Hartarska, (2005). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007).

	+		+
	Hartarska, (2005). Insignificant	Mersland and Strøm (2009). -	
	Mersland and Strøm (2009). Insignificant		
	Hartarska (2009) +		
	Coleman and Osei (2008) -		
Competition	Mersland and Strøm (2009). Insignificant	Hartarska and Nadolnyak (2007). Insignificant	
		Mersland and Strøm (2009). Insignificant	
Capital	Hartarska (2009) Insignificant	Hartarska and Nadolnyak (2007). +	
Portfolio at risk	Arun and Annim (2010), -	Mersland and Strøm (2009). +	
	Mersland and Strøm (2009). Insignificant		
	Hartarska (2009) Insignificant		
Village banking lending contract	Cull, et al (2011). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, et al (2011). +
	Cull, et al (2009b). Insignificant		Cull, et al (2009b). +
	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant		Cull, Demirgüç-Kunt, Morduch (2007). Insignificant
Solidarity group lending	Cull, et al (2011). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, et al (2011). Insignificant
	Cull, et al (2009b). Insignificant		Cull, et al (2009b). Insignificant
	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant		Cull, Demirgüç-Kunt, Morduch (2007). Insignificant
Individual loan contracts	Mersland and Strøm (2009). Insignificant	Mersland and Strøm (2009). Insignificant	
Regulated	Arun and Annim (2010), +	Mersland and Strøm (2009). Insignificant	Cull, et al (2011). Insignificant
	Tchakoute-Tchuigoua (2010) Insignificant	Hartarska and Nadolnyak (2007). Insignificant	

	Mersland and Strøm (2009). Insignificant		
Outreach depth (Average loan size) ¹¹	Arun and Annim (2010), -	Ahlin et al (2011) +	
	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant
Portfolio to assets ratio	Cull, Demirgüç-Kunt, Morduch (2007). +	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). +
	Coleman and Osei (2008) +		
For-profit legal status	Tchakoute-Tchuigoua (2011) Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant
	Tchakoute-Tchuigoua (2010) +		
	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant		
Board size	Mersland and Strøm (2009). Insignificant	Mersland and Strøm (2009). Insignificant	
	Coleman and Osei (2008) +		
Board independence	Coleman and Osei (2008) +		
Property rights	Arun and Annim (2010), Insignificant	Hartarska and Nadolnyak (2007). Insignificant	
Voice and Accountability	Arun and Annim (2010) -		
Enforcement of Contract	Arun and Annim (2010) +		
Credit Information	Arun and Annim (2010) Insignificant		
Economic freedom		Hartarska and Nadolnyak (2007). Insignificant	
Informal sector size	Hartarska (2009) Insignificant	Hartarska and Nadolnyak (2007). +	
Private credit/GDP		Ahlin et al (2011) Insignificant	
Inflation	Cull, et al (2009b). Insignificant	Hartarska and Nadolnyak (2007). +	Cull, et al (2009b). Insignificant
	Hartarska, (2005). Insignificant	Hartarska, (2005). -	
GDP	Cull, et al (2009b). +	Ahlin et al (2011) Insignificant	Cull, et al (2009b). +

¹¹ Average Loan Balance per Borrower/GNI per Capita

		Hartarska and Nadolnyak (2007). Insignificant	
Rural population (% , 1990)	Cull, et al (2009b). Insignificant		Cull, et al (2009b). Insignificant
Rural population growth (%)	Cull, et al (2009b). Insignificant		Cull, et al (2009b). Insignificant
KKM ¹² index	Cull, et al (2009b). Insignificant		Cull, et al (2009b). Insignificant
Eastern Europe and Central Asia region	Cull, et al (2009b). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). +	Cull, et al (2009b). Insignificant
	Cull, Demirgüç-Kunt, Morduch (2007). +		Cull, Demirgüç-Kunt, Morduch (2007). Insignificant
Africa	Cull, et al (2009b). Insignificant		Cull, et al (2009b). Insignificant
	Cull, Demirgüç-Kunt, Morduch (2007). +	Cull, Demirgüç-Kunt, Morduch (2007). +	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant
South Asia	Cull, et al (2009b). –	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, et al (2009c). –
	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant		Cull, Demirgüç-Kunt, Morduch (2007). Insignificant
East Asia and Pacific	Cull, et al (2009b). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, et al (2009b). Insignificant
	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant		Cull, Demirgüç-Kunt, Morduch (2007). Insignificant
Middle-East and North Africa	Cull, et al (2009b). Insignificant	Cull, Demirgüç-Kunt, Morduch (2007). Insignificant	Cull, et al (2009b). Insignificant
	Cull, Demirgüç-Kunt, Morduch (2007). +		Cull, Demirgüç-Kunt, Morduch (2007). Insignificant

¹² KKM is the Kaufmann, Kraay, Mastruzzi index of institutional development

2.2.4 Conclusion

The main purpose of this chapter was to survey existing theoretical and empirical literature with a focus on microfinance performance. Microfinance literature has a strong focus on the peculiarities of microfinance which differ significantly with those of traditional banking (Armendáriz and Morduch 2010). These peculiarities include but are not limited to the type of lending technologies employed to overcome incentive problems in lending to informal business and poor households (e.g. Stiglitz 1990), and second microfinance has a social mission of alleviating poverty on borrowers (Banerjee et al 2009). It is against this backdrop that there has been a long debate on the question of whether MFIs can be financially sustainable (Morduch, 1999b; Hermes and Lensink 2007; Balkenhol, 2007).

Empirical studies have explored the determinants of MFIs sustainability, including the type of loan contracts used, the institutional ownership, institutions' age, loan size, gender of clients, governance, regulation and capital structure of institutions, as well as country level macroeconomic and institutional context (Cull, Demirgüç- Kunt and Morduch 2007; Bogan 2009; Mersland and Strom 2009; Ayayi and Sene 2010; Cull, et al 2011; Ahlin et al 2011). To some extent, MFIs can achieve sustainability while serving the poor (Hermes and Lensink 2011). However, and as elucidated in Hermes and Lensink, (2007), the question on the determinants of MFI profitability remain unanswered. MFIs could in principle be financially sustainable but not profitable. This question is therefore very relevant given the increased investments from commercial players that target their money towards MFIs, with the aim of earning returns from the investments. Profit-maximizing investors would have limited interest in most of the institutions that focus on social mission (Cull et al 2009a; Guérin, et al 2011). Moreover, measures of sustainability differ between studies and are sometimes rather *ad hoc*, making comparisons difficult.

Although literature on the impact of outreach on financial performance is not extensive and is largely anecdotal, there is a strong evidence of a trade-off. Empirical evidence adduced so far shows that outreach does compromise financial sustainability (Cull, Demirgüç-Kunt and Morduch 2007; Hermes, Lensink, and Meesters 2011). This evidence is relevant for policy makers, since putting emphasis on poverty reduction comes at a price, which may be a reduction on the scope for financial sustainability. This trade-off is relevant for commercial investors, especially those who aim for socially responsible investments. It is however important to note that the evidence adduced here mostly relate to financial sustainability and not MFI profitability. Thus the question on whether outreach explains MFIs profitability remains un-answered, which calls for further empirical research with theoretical and empirically sound underpinnings.

Our literature survey points to unresolved issues on the impact of regulation on microfinance profitability. Although Seibel (2003) and Guinnane (2002) draw attention to how financial history justifies the need for appropriate legal frameworks in order to support the development of pro-poor financial systems, recent empirical evidence shows mixed results. Contrary to the arguments offered by proponents of regulating MFIs (see for example Arun 2005), the innovation provided by (Cull et al., 2011; Tchakoute-Tchuigoua 2010; Mersland and Strøm (2009), shows that regulation is not significantly associated with MFI profitability. This finding is inconsistent with Hartarska (2005). The policy implication is that MFIs' transformation into regulated financial institutions may not lead to profitability. But to the extent that other variables included in the regression may partially account for credit risk, this explains the failure of legal status to significantly affect MFI returns. These studies underscore the importance of taking into account the trade-offs and for further empirical scrutiny.

Our literature survey shows that evidence on the link between microfinance competition and profitability is scant and mixed. The finding by Hisako (2009) is unequivocal that

competition does not worsen financial self-sufficiency which confirms McIntosh, De Janvry and Sadoulet (2005). This is consistent with McIntosh and Wydick (2005) theoretical underpinnings. Mersland and Strøm (2009), on the contrary finds higher competition to lower portfolio yield among MFIs which lowers profitability. Although, Cull et al (2009b) findings on profitability are insignificant, their study focus on country-level indicators of competition, rather than measures that would reflect firm level competition amongst the MFIs. Though these findings remain inconclusive, their focus is also on OSS rather than profitability.

Turning to the impact of governance on MFI profitability; empirical evidence on MFIs performance is scant and consistency in findings within and across studies is rare. The innovation by Hartarska (2009) who adopt an empirical approach usually employed in cross-country banking research finds that some rating agencies may play a disciplining role which subsequently affects performance. Although Mersland and Strøm (2008; 2009), Coleman and Osei, (2008), Hartarska (2005) conclude that governance matters on MFIs performance, they have difficulties in identifying significant governance influence. Another drawback in these studies is that they do not in their analysis adequately take into account the fact that most MFIs do not intend to be shareholder owned, have multiple goals, and do not have an inherent profit motive. Additionally, MFIs differ from regular corporate entities in that they encounter horizontal agency problems between themselves and their clients while at the same time donor-funded MFIs face agency costs in their relationships with donors (Adams and Mehran, 2003). Further research is therefore necessary to reconcile the reported evidence and with a focus on profitability rather than sustainability.

While there is a vast literature on the optimal capital structure of corporate firms, the application of the Modigliani and Miller (1958) theorem and other corporate finance theorems to microfinance institutions is not straight-forward. There have been no systematic empirical studies

for a large group of MFIs that would provide robust evidence of how variations in funding affect MFIs profitability. MFIs with access to donor funds may not operate efficiently or may deliberately choose outreach over profitability (Armendáriz and Morduch, 2010). Cheap external funding may attract an inefficient MFI, which relies on the implicit subsidy to cover its high operating costs (Ghosh and Tassel 2011) and this has implications on profitability as well. Studies that would provide empirical evidence on this policy relevant issue are however lacking.

Theoretical contributions on contract design in combination with randomized control trials continue to be important tools to determine the ingredients of microfinance's performance. In spite of these theoretical underpinnings on the importance of the type of loan contract, the basic empirical question of whether it matters for MFI profitability has remained unanswered. The innovation provided by Cull, Demirgüç-Kunt and Morduch (2007) shows that institutional design matter substantially. Specifically, MFIs that do not use group-lending methodology to overcome incentive problems experience weaker portfolio quality and lower profitability rates. On the contrary, Mersland and Strøm, (2009) find that individual loan contract is never a significant variable in all their regressions. We do not find estimation results from these studies as convincing since they do not control for endogeneity. Studies that have used field experiments to circumvent endogeneity report mixed findings. Though Feigenberg, et al (2010), Giné et al (2010), Berhane, et al (2009), finds joint liability contract to improve on MFI performance, inconsistent findings are documented by Pellegrina (2011), Chen, Choi and Sawada (2010). These studies do not therefore provide answers to the policy relevant question of whether the type of debt contract influences profitability of microfinance institutions.

CHAPTER THREE

WHAT EXPLAINS THE LOW PROFITABILITY OF MICROFINANCE

INSTITUTIONS IN AFRICA¹³?

3.1 Introduction

In spite of many MFIs realizing high loan repayment rates, few are profitable to date. In Table 1.2 (see chapter one), we reported that MFIs in Africa have on average consistently reported negative profits compared to other regions. For a poverty intervention as widespread as microfinance, with over five billion dollars invested each year (CGAP 2009a; Forster and Reillie, 2008) and an estimated 205 million clients worldwide (Maes and Reed, 2012), there is surprisingly little rigorous evidence of the determinants of microfinance profitability. This is due to inadequate and unreliable data (Honohan 2004b).

This study has two goals. One is to clearly identify, on the basis of empirical evidence and in a single static equation framework, significant determinants of MFIs' profitability. To achieve this objective, we used an unbalanced panel dataset of Africa MFIs over the period 1997-2007. This chapter draws from economic theory to assess the role of determinants of profitability and then evaluates a corpus of relevant evidence. We primarily use several exogenous variables to control for a wide array of MFI specific, institutional and country level differences that might confound the inferences which we draw upon.

The second goal is to investigate whether MFIs seek to maximize profits or whether they are pursuing additional objectives as well. Managerial objectives may vary systemically with for example MFI size. Of relevance also is the need for risk management in the microfinance sector

¹³ A previous version of this chapter was presented at the 8th Infiti Conference on International Finance, June 14-15, 2010, Trinity College, Dublin; West Midlands Regional Doctoral Colloquium (Aston and Birmingham Business Schools) held on 17th June 2010; 6th Portuguese Finance Network to be held at the Azores, July 1-3, 2010, and EBES 2010 Conference-Athens, Greece October 28-30, 2010. I acknowledge the inputs of the conference participants.

which is inherent in the nature of their business. The standard profit analysis assumes explicitly or implicitly, that firms face market-priced risk which does not vary with production decisions. This simplification undermines the model's usefulness when applied to an industry such as microfinance where risk and risk-related phenomena including moral hazard plays an important role in the intermediation process.

Much of the applied economics literature in this area addresses the social worth of microfinance organizations (e.g., Bruett, 2005; Navajas et al., 2003; Navajas et al., 2000), measuring for example; the impact of village-level microfinance institutions (Menkhoff and Rungkruxsivorn 2011; Kaboski and Townsend, 2005), the impact of microcredit on the poor (Karlan and Zinman 2010; Brau, Roodman and Morduch 2010; Hiatt and Woodworth 2009; Kaboski and Townsend 2010; Dupas and Robinson 2009; Mohindra, et al 2008), costs and benefits of subsidies (Armendáriz and Morduch, 2010), correlations for MFIs and commercial banks (Krauss and Ingo, 2009), microfinance and mission drift (Armendáriz and Szafarz 2011; Hishigsuren, 2007; Copestake 2007), impact analysis (Hartarska and Nadolnyak 2008b), efficiency of MFIs (Gutiérrez-Nieto et al, 2010, 2009, 2007; Caudill, Gropper and Hartarska 2009), competition between MFIs and traditional banks (Cull et al 2009b, c), women and repayment in microfinance (D'Espallier et al 2011), microfinance commercialization (Montgomery and Weiss 2011; Galema and Lensink 2009), microfinance plus (Lensink, and Mersland, 2009), outreach-sustainability trade off (Hermes and Lensink 2011; Cull, Demirgüç-Kunt and Morduch (2007) and studies that examine the relationship between MFI performance and corporate governance (Mersland and Strøm, 2009). There has however, been limited up-to-date scholarly research detailing factors that explain microfinance profitability.

It is against this background that this study raises several key research questions: (1) Documented evidence shows that self sufficient MFIs have more clients, assets, mobilize

deposits and have diversified credit lines (Aschcroft, 2008; Balkenhol, 2007). Could it be that failure to become profitable is due to lack of scale economies? (2) MFIs are subject to significantly higher transaction costs than conventional retail banks both in absolute and relative terms. These expenses include cost of funds for on-lending, the loan loss, and administrative¹⁴ costs (Cull et al 2009a). What evidence exists to the effect that efficient management of expenses affect MFI investment and hence profitability? (3) Theory suggests that increased exposure to credit risk is normally associated with decreased bank profitability (see e.g. Cooper et al., 2003). Does this also hold true for the microfinance industry? (4) Does age of the MFI or learning effects matter in explaining MFIs profitability? (5) Well-capitalized banks are regarded to be less risky. Is this also true for the MFIs? (6) Literature shows that funding constraints have hindered the expansion of microfinance activities. Does gearing ratio have an important implication on MFIs profitability? (7) To what extent are discrepancies in MFIs' profitability due to variations in macroeconomic environment which is not under the control of MFI management? (8) Do ingredients of growth such as better institutions make microfinance more profitable? The joint analysis of these eight issues is important if we want to provide answers to more articulated questions on microfinance performance.

This study makes four main contributions to policy and existing literature. (1) It is timely, in view of the current emphasis on the role of finance in economic growth. (2) Understanding determinants of MFI's profitability may help a growing number of investment funds that target their money towards MFI's, with the aim of earning returns from the investments. (3) Any microfinance evaluation that does not take into account external factors, if they are found to robustly and non-negligibly predict MFI profitability would be incomplete. (4) At the policy

¹⁴ This includes identifying and screening clients, processing loan applications, disbursing payments, collecting repayments, and following up on non-repayment

level, examining factors that impact on MFI profits is important for forming credit market policy that may help deepen the quantity and quality of access to finance by the poor.

Although vast similar studies on firm-specific and macroeconomic determinants of conventional banking performance have been conducted in; Japan (Liu and Wilson 2010), Italy (Marcucci and Quagliariello 2008), Greece (Athanasoglou et al., 2008; Kosmidou 2008; Spathis et al. 2002), China (Hsiu-Ling et al 2007), European Union (Pasiourasa and Kosmidou 2007; Carbo, 2007; Goddard, et al. 2004b; Molyneux and Thornton 1992), United Kingdom (Kosmidou et al., 2006), Cross country (Laeven and Majoni 2003; Bikker and Hu 2002; Demirgüç-Kunt and Huizingha 1999), South Eastern European Region (Athanasoglou et al., 2006), Nigeria (Beck et al., 2005), Malaysia (Guru, et al., 2002) and the United States of America (Angbazo, 1997; Neeley and Wheelock 1997; Berger, 1995; Boyd and Runkle 1993), their empirical results are difficult to generalize in microfinance. It is therefore far from a fore-drawn conclusion that what holds true for the traditional banking sector will also hold for MFI's. Thus, we lack sufficient empirical analyses in this field.

The remainder of this chapter is organized as follows. Section 2 provides a background of the existing literature, relating banking profitability to its determinants as well as distinguishing between single and cross-country studies while, drawing on both theoretical and empirical work. Section 3 describes conceptual framework and the model specification. In Section 4, we provide detailed description of data, which include measurements of our variable of interest. Section 5 discusses econometric methodology. Section 6 presents the empirical results and findings. Conclusions and some policy suggestions are offered in the final section by pointing out some unresolved issues, undiscovered territory and the future of microfinance in Africa.

3.2. Review of the background literature

Owing to limited literature on microfinance performance, this sub-section borrows heavily from the banking literature, since MFIs offer banking services to the poor. Existing literature defines profitability of a financial intermediary as the return on assets (ROA) or the return on equity (ROE). This is measured and/or expressed as a function of internal and external factors. Internal factors are those influenced by management decisions or within the control of firm management. Such factors include firm size, capital adequacy, credit risk provisioning, and efficiency in the management of operating expenses. The external determinants include macroeconomic and industry-specific factors which reflect the economic, legal and business orientation within the context where the financial institution operates. A number of explanatory variables have been proposed for both categories depending on the nature and purpose of each study.

There is no convergence on the empirical evidence on firm size. Significant predictions of theories are not supported, and interesting regularities in the data are not predicted, thus anecdotal explanations abound. Sufian and Habibullah (2009) examine the determinants of the profitability of the Chinese banking sector during the post-reform period of 2000-2005 and conclude that the impacts on bank profitability depend on the bank types. During the period under study, they find size to lower city commercial banks profitability. Along the same vein Hsiu-Ling et al (2007) investigate the main determinants of the bank profitability in China. They find that the more assets a bank has, the worse will be its return on assets (ROA). Both studies render support for the diseconomies of scale. Consistent with this finding, Pasiourasa and Kosmidou (2007), find diseconomies for larger banks which apply to both domestic and foreign banks. The negative coefficient indicates that in both cases, larger (smaller) banks tend to earn lower (higher) profits and gives credence to previous studies which include (Kosmidou et al., 2006; Bikker and Hu

2002; Demirgüç-Kunt and Huizingha 1999; Boyd and Runkle 1993) that found either economies of scale and scope for smaller banks or diseconomies for larger financial institutions.

Contrasting findings confirming economies of scale are evident. Using a self-constructed global dataset on MFIs collected from third-party rating agencies, Mersland and Strøm, (2009) examine the relationship between MFI performance and corporate governance while controlling for MFI size. Using random effects panel data estimations they find that financial performance improves with firm size. These findings are consistent with Cull, Demirgüç-Kunt, and Morduch (2007). In the banking industry Kosmidou (2008) use total assets of the bank to control for size and similarly find a positive impact on profitability which confirms Athanasoglou et al (2006), Beck et al. (2005), Naceur and Goaid (2001), Spathis et al. (2002), Altunbas et al. (2001), Berger and Humphrey, (1997), who similarly find large banks to be more profitable, consistent with the predictions of modern intermediation theory.

There has been an extensive literature on efficiency in the management of operating expenses and firm performance. Sufian and Habibullah (2009) investigate the determinants of the profitability of the Chinese banking sector and find inefficiency in operating expenses management to impact negatively on bank profits. This confirms Athanasoglou, et al (2008) who applies a GMM technique to a panel of Greek banks covering the period 1985-2001 and similarly finds operating expenses to significantly impact negatively on bank profitability. They are however quick to point out that the negative effect means that there is a lack of competence in expenses management since banks pass part of increased cost to customers. Consistent findings have been documented by Kosmidou (2008) who examine the determinants of performance of Greek banks during the period of EU financial integration (1990-2002), Pasiourasa and Kosmidou (2007), Athanasoglou et al (2006) and Kosmidou, et al (2005). Previous evidence on the same include Guru et al. (2002) Bourke (1989) and Molyneux and Thornton (1992). Similar

estimation results have been reported in microfinance literature. Cull, Demirgüç-Kunt, and Morduch (2007) conclude that the impact of costs on profitability of MFIs depends on an institution's lending methodology. Contrasting findings are evident. Hollis and Sweetman, (2007) investigate the impact of capital structure on non-interest operating costs using data on Irish loan funds¹⁵. They find that higher net income is associated with higher salaries and other non-interest costs. Indeed, higher capital-deposit ratios led to higher operational costs even after controlling for net income. These findings suggest that depositors could assist in controlling operational costs in MFIs.

The issue of whether firm's age matter has generated large amounts of empirical research. In the banking industry and contrary to theoretical predictions, Hsiu-Ling et al (2007) establish that the longer a bank has been in existence, the worse the return on assets (ROA). Similarly, Beck et al (2005) shows that older institutions perform worse which imply that the new entrants into the market are better able to pursue new profit opportunities. Moreover, newer institutions appear to enjoy more autonomy in their decision-making, and are more willing to innovate. Inconsistent findings in microfinance have been documented by Cull, Demirgüç-Kunt, and Morduch (2007) who concludes that an institution's age is significant and positively linked to financial performance. Clearly the evidence remains inconclusive and contestable.

Both theoretical and empirical studies show that capital adequacy is important in determining bank profitability. Sufian and Habibullah (2009), find capital to have a positive impact on bank profitability in China. This confirms Athanasoglou, et al. (2008, 2006) and Kosmidou (2008) who also finds a positive and significant effect of capital on bank profitability, reflecting the sound financial condition of banks. Boubakri, et al. (2005) examine the post-privatization performance of 81 banks from 22 developing countries and establish a similar

¹⁵ Rather than being financed by equity-holders these community based organizations were financed by deposits and capital which comprised of donations and accumulated profits and which created problems of managerial moral hazard.

result. Consistent previous findings include Goddard, et al. (2004b), Naceur and Goaid (2001), Molyneux and Thornton (1992), Berger, (1995) and Demirgüç-Kunt and Huizinga, (1999).

Empirical evidence on the impact of quality of loan portfolio on profitability is mixed. Mersland and Strøm (2009) do not find credit risk to be a significant determinant of performance. On the contrary, Athanasoglou, et al. (2008) finds credit risk to be negatively and significantly related to bank profitability which confirms previous findings by Athanasoglou et al (2006). Additionally, Kasimodio (2008) evidence a negative and statistically significant impact of loan loss reserves to loans on profitability, which implies that financial institutions can reduce the variability of reported income by making higher provisions than necessary when credit quality and net income are high, during favourable economic conditions. This finding lends support to Boubakri, et al (2005), who using the past due loans to total loans ratio, and a measure of interest rate risk that is equal to short term assets minus short term liabilities over total assets arrives at the same conclusion. Few studies evidence a positive relationship between credit risk and performance. Sufian and Habibullah (2009) findings suggest that credit risk has positive impacts on the state owned commercial banks and joint stock commercial profits which is consistent with Anghazo (1997). Evidence from microfinance is lacking.

Financial institutions performance is sensitive to prevailing macroeconomic conditions. Using a panel of Italian banks, Marcucci and Quagliariello (2008) finds that loan loss provisions and bad debts increase during economic growth slump. Laeven and Majoni (2003) provide similar evidence in a cross-country comparison. Athanasoglou, et al. (2008), similarly find a positive impact on bank profitability in the Greek banking industry which confirms Athanasoglou et al (2006) and Beck and Hesse (2006). Kasimodiou (2008) find growth of GDP to have a significant and positive impact on profitability, consistent with Kosmidou et al. (2005), while inflation has a significant negative impact. Athanasoglou, et al. (2008), find inflation and cyclical

output to affect the performance of the banking sector negatively, while Hsiu-Ling et al (2007) conclude that per capita GDP has a positive impact. Pasiourasa and Kosmidou (2007) find inflation to be positively related to domestic banks, implying that during the period of their study the levels of inflation were anticipated by domestic banks¹⁶. The results about the impact of per capita incomes on domestic banks profitability are consistent with those of Kosmidou et al. (2005), Kosmidou (2008). Other similar previous findings include Neeley and Wheelock (1997) who explore the profitability of a sample of commercial banks in the US over the 1980-1995 periods.

Empirical evidence suggests that better institutional environment will have a positive impact on net interest margins (see for example William and Levine, 2003). MFIs operating in countries with better protection of property rights are also able to reach more borrowers (Hartarska and Nadolnyak, 2007). Existing empirical studies on corruption shows a negative impact on performance. In Uganda, for instance, bribes increase companies' operating cost by about 8 per cent (Ng, 2006). Gelos and Wei (2006), show that endemic corruption is associated with lower investment from international funds. They also find that during financial crises, international funds flee corrupt economies by a greater amount than their transparent counterparts.

Even though these studies show that it's possible to conduct a meaningful analysis of MFI profitability, there is no single study that provides definitive proof for any claim in microfinance profitability. Moreover some issues are not dealt with sufficiently. First, a vast amount of the literature has examined determinants of profitability at the bank level. Second, in most of the literature, the econometric methodology is not adequately described. To conclude therefore, our

¹⁶ This gave the banks the opportunity to adjust the interest rates accordingly and consequently earn higher profits. With regard to foreign banks, inflation triggered a higher increase in costs than revenues as the negative relationship between inflation and foreign banks profits shows. These mixed results can be attributed to different levels of country-specific macroeconomic conditions and expectations concerning inflation rate between domestic and foreign banks.

review of banking literature shows that there is only limited empirical evidence on some of the issues under consideration and scant in microfinance. The few studies available within the realm of microfinance remain anecdotal and contestable.

Our study aims at going beyond the existing empirical analyses in two important ways. First, while focusing on Africa, we use a substantially larger dataset, containing information for a large number of MFIs over a longer period of time than any of the previous studies in this field. Secondly, we incorporate variables that capture issues that have not been examined before. In particular, we factor in credit risk and factors external to MFIs management. In order to do this, we formulate a profit function and apply static analysis to determine the impact of various exogenous variables on MFI profitability.

Table 3.1: Summary of empirical findings and direction of impact.

		Banks (dependent variable ROA)							
Banks specific	Size	Flamini et al (2009) +	Sufian and Habibullah (2009) -	Athanasoglou, et al (2008)- Insignificant	Kosmidou (2008) +	Hsiu-Ling et al (2007) -	Pasiourasa and Kosmidou (2007) -	Kosmidou et al., (2006) -	Athanasoglou et al (2006) +
	Efficiency	Flamini et al (2009) -	Sufian and Habibullah (2009) -	Athanasoglou, et al (2008) -	Kosmidou (2008) -	Pasiourasa and Kosmidou (2007) -	Athanasoglou et al (2006) -	Kosmidou, et al (2005) -	Guru et al. (2002) -
	Age (yrs)	Hsiu-Ling et al (2007) -	Beck et al (2005) -						
	Labour Productivity	Athanasoglou, et al. (2008) +							
	Capital	Flamini et al (2009) +	Sufian and Habibullah (2009) +	Athanasoglou, et al (2008) +	Kosmidou (2008) +	Athanasoglou et al (2006) +	Boubakri, et al. (2005) +	Naceur and Goaid (2001) +	Demirgüç-Kunt and Huizinga, (1999) +
	Credit risk	Flamini et al (2009) +	Sufian and Habibullah (2009) -	Athanasoglou, et al (2008)- Insignificant	Kosmidou (2008) +	Athanasoglou et al (2006) +	Boubakri, et al (2005) -	Anghazo (1997) +	
	Activity mix ¹⁷	Flamini et al (2009) +							
Industry specific	Concentration	Flamini et al (2009) Insignificant	Athanasoglou, et al. (2008) Insignificant						
	Charter /ownership	Athanasoglou, et al. (2008) Insignificant							
Macroeconomic environment	Inflation	Flamini et al (2009) +	Kasimodiu (2008) -	Athanasoglou, et al. (2008) -	Athanasoglou et al (2006) -	Pasiourasa and Kosmidou (2007) +			
	Per Capita Income	Flamini et al (2009) Insignificant	Sufian and Habibullah (2009) +	Marcucci and Quagliariello (2008) +	Kasimodiu (2008) +	Hsiu-Ling et al (2007) +	Pasiourasa and Kosmidou (2007) +	Kosmidou et al. (2005) +	Laeven and Majoni (2003). +

¹⁷ The ratio of net interest revenues over other operating income.

	Business cycle	Flamini et al (2009) +	Athanasoglou, et al. (2008) +						
MFIs									
MFI specific	Size	Cull et al (2011) Insignificant	Mersland and Strøm, (2009) +	Cull et al (2007) +					
	Efficiency	Cull et al (2011) Negative	Cull et al. (2007) Negative						
	Age (yrs)	Cull et al (2011) Insignificant	Cull et al (2007) +	Mersland and Strøm, (2009), Insignificant					
	Credit risk	Mersland and Strøm, (2009), Insignificant							
	Lending methodology	Cull et al (2011) Insignificant	Mersland and Strøm, (2009), Insignificant	Cull et al (2007) Insignifiant					
	Regulated	Cull et al (2011) Negative	Mersland and Strøm, (2009), Insignificant						
	Outreach (Average loan size) ¹⁸	Cull et al (2007) Insignifiant							

¹⁸ Average Loan Balance per Borrower/GNI per Capita

3.3. Modelling profitability: an application to microfinance

3.3.1 Conceptual framework

Microfinance sector is very diverse in terms of industrial organizational, with MFIs organized as credit cooperatives/unions, non-governmental organizations (NGOs), banks and non-bank financial institutions. This diversity makes it difficult to choose appropriate conceptual framework thereby complicating the analysis. For example, the overall equation linking labour and capital inputs into profits still proves difficult to master (Cull, Demirgüç-Kunt and Morduch 2007).

3.3.1.1 Design of the model

Microfinance industry is characterized by a different production function to that of conventional profit seeking retail banks or any other corporate entity. MFI is a unique type of a financial institution with risk and return characteristics different from that of traditional banks. While retail profit seeking banks loans are characterized by large sizes, large markets, long maturities, microfinance receivables are uncollateralized and with a short term maturity. Moreover, MFIs also have a double bottom line mission of reducing poverty while at the same time maximizing firm value. It is therefore plausible that there are additional factors that impact on MFI profitability in addition to bank level specifics such as measures of outreach.

To empirically ascertain significant determinants of microfinance profitability in Africa, a multivariate linear regression model has been predicted. While we have not specified any test to support using the linear function, it is evident that the linear functional form is widely used in the literature and produces good results; see for example Mersland and Strøm, (2009), Marcucci and Quagliariello (2008), Athanasoglou et al (2006; 2008), Kasimodiu (2008), Kosmidou et al. (2005), Hsiu-Ling et al (2007), Pasiourasa and Kosmidou (2007), Goddard et al. (2004a) Demirgüç-Kunt and Huizinga (2000), Bourke (1989), and Molyneux and Thornton (1992), who

use linear models to estimate the impact of various factors that may impact on financial institution profitability.

3.3.1.2 Functional form of the equation

In an effort to develop an empirical model, we recognize that it is important to follow the principle of parsimony and try to find the simplest model that best fits our data. In order to design an appropriate regression model, it is imperative that we begin with a base specification which rely on theory and then add or drop variables based on adjusted R² and t-statistics. To frame our empirical analysis, the subsequent regression analysis starts from the following basic linear equation¹⁹:

$$\Pi_{ict} = \alpha + \sum_{j=1}^J \beta_j X_{ict}^j + \sum_{m=1}^M \beta_m X_{ct}^m + \sum_{n=1}^N \beta_n X_{ct}^n + \varepsilon_{itc} \dots \dots \dots (3.1)$$

Where Π_{ict} is the profitability of MFI i located in country c , at time t , with $i=1, \dots, N$, $t=1, \dots, T$; $c=1, \dots, C$; α is the regression constant, X_{ict}^j is a vector of MFI-specific characteristics (j) of MFI i in country c during the period t which vary across time and MFIs; X_{ct}^m is a vector of macroeconomic variables (m) in country c during the period t ; X_{ct}^n is a vector of institutional development indicators (n) in country c during the period t and $\varepsilon_{itc} = \nu_i + \mu_{itc}$ is the disturbance, with ν_i the unobserved MFI-specific effect/heterogeneity across MFIs, which could be very large given the differences in corporate governance and μ_{itc} the idiosyncratic error. This is a one-way error component regression model²⁰, where $\nu_i \sim IIN(0, \sigma_\nu^2)$ and independent of $\mu_{it} \sim IIN(0, \sigma_\mu^2)$.

19 This linearity assumption is however not binding. Bourke (1989), for instance suggests that any functional form of bank profitability is qualitatively analogous to the linear.

20 The work horse for unbalanced panel data applications is the one-way error component regression model (see Baltagi and Song 2006)

Due to the significant differences that exist across Africa microfinance industry, we test for potential cross-country effects. Additionally, it is possible that, within the eleven years time frame of our analysis, certain developments might have taken place and therefore time effects may be present in the error component of the model. We contend that failure to account for these two effects is likely to bias our estimates. We test for country and time effects by including time and country specific dummies, respectively, in equation (3.1). The econometric model is therefore expanded as follows,

$$\Pi_{ict} = \alpha + \sum_{j=1}^J \beta_j X_{ict}^j + \sum_{m=1}^M \beta_m X_{ct}^m + \sum_{n=1}^N \beta_n X_{ct}^n + D_{c-1} + \varepsilon_{itc} \dots \dots \dots (3.2)$$

Where D denotes the country-specific dummy variables and $\varepsilon_{ict} = \nu_i + \gamma_t + \mu_{ict}$ is the disturbance; γ_t is the unobservable time effects, ν_i is the unobserved complete set of individual MFI-specific effect and which controls for all cross-sectional (or ‘between MFIs’), and μ_{ict} is the idiosyncratic error. We test for country and time hypotheses separately as well as jointly, by $H_0: \gamma_2 = \gamma_3 = \dots = \gamma_T = 0$ and present the results in Table 2 of Appendix B. The Lagrange Multiplier (LM) tests show that for Africa microfinance industry, both country and time specific dummy variables are insignificant. We experimented with many country dummies and it turned out that none was significant. We therefore neither included year-specific dummy variables nor country specific dummies. Hence, we proceeded with the estimation of the following specification,

$$\Pi_{ict} = \alpha + \sum_{j=1}^J \beta_j X_{ict}^j + \sum_{m=1}^M \beta_m X_{ct}^m + \sum_{n=1}^N \beta_n X_{ct}^n + \varepsilon_{itc} \dots \dots \dots (3.3)$$

In our analysis it is important to delineate various concepts both at MFI-specific, institutional and at macroeconomic levels. It is not easy to design a single model that completely

describes MFI performance. We therefore test different specifications of the baseline model in order to avoid the risk of mis-specifying the functional form of the relationship.

3.3.1.3 MFI-specific determinants

These can be classified into either intangible or tangible. Intangible MFI-specific factors are hard to account for. A good example is the quality of managerial decisions which is closely related to corporate governance. For the purpose of this chapter, we consider tangible factors.

We use the variable *size* to capture economies or diseconomies of scale in the market. Seminal work on modern intermediation theory focusing on the role of financial intermediaries when borrowers and lenders are asymmetrically informed include Diamond (1984), Ramakrishnan and Thakor (1984), Boyd and Prescott (1986), Williamson (1986) and subsequently Allen (1990). This body of theory predicts economies of scale in the financial intermediation process. If larger MFIs have a greater control of the domestic market, and operate in a non-competitive environment, lending rates may remain high while deposit rates for larger institutions remain lower because they are perceived to be safer. Thus larger MFIs may enjoy higher profits. This implies therefore that, large size may result in economies of scale that will reduce the cost of gathering and processing information. Put differently, a large financial institution can contract with a large number of borrowers which results in diversification which hitherto reduces the *ex ante* expected cost of overcoming information asymmetries²¹. This results in cost savings which are realized whether or not failure actually occurs²². Empirical evidence is

21 In many of these models it is assumed that borrowers, but not lenders, costlessly observe investment return realizations. Uncertainty about return realizations is undesirable and bad (failure) realizations trigger costly information production. However, if a large number of investments are made by a single financial intermediary, pooled risk is reduced or eliminated, and so is the frequency of costly failure states.

22 Modern intermediation theory therefore makes two related predictions about size of the financial intermediary-large financial institutions are less likely to fail and are more cost efficient than small firms. The counter argument is that size could have a negative impact when banks become extremely large-due to bureaucratic and other reasons exhibiting a non linear relationship between size and performance.

mixed (see Table 3.1). We therefore predict an indeterminate relationship between size and profitability of a microfinance institution.

Age is introduced in the model to capture learning effects. A vast amount of research considers older firms to be more experienced and can therefore enjoy higher performance (see for example Lumpkin, et al, 2001). Rebuttals suggests that older firms are prone to inertia, are more bureaucratic and are less receptive to entrepreneurial orientation; thus, they are unlikely to have the flexibility to make rapid adjustments to changing circumstances which cause poor performance and decline (Dunne and Hughes 1994; Boeker 1997; Szulanski 1996; Park, and Luo 2001).

An excessively high *capital-assets* ratio (CAP) could signify that MFI is operating over-cautiously and ignoring profitable investment opportunities. On the contrary, the cost of insurance against bankruptcy may be high for a MFI with a low capital-assets ratio, suggesting a positive relationship between the capital-assets ratio and performance (Berger, 1995). First, capital can be considered a cushion to raise the share of risky assets, such as loans. Even if regulatory capital represents a binding restriction on MFIs, and is perceived as a cost, we nevertheless expect a positive relationship since MFIs may pass some of the regulatory cost to their clients. Second, any firm with sufficient capital borrows less to support a given level of assets. Empirical evidence supporting this argument includes García-Herrero et al. (2009), Kosmidou (2008), Athanasoglou, et al. (2008), Athanasoglou et al (2006), Boubakri, et al. (2005). We therefore predict a positive association between level of capitalization and MFI profitability.

Closely related to capital is the *gearing ratio* which merely defines the source of business finance to boost financial performance. High proportion of fixed interest capital to equity would imply that MFIs are highly geared and therefore risks becoming insolvent. It may also imply that MFIs may be able to better deal with moral hazard and adverse selection, enhancing their ability

to deal with risk (Kyereboah-Coleman 2007). We therefore postulate a positive relationship between gearing ratio and profitability.

The arguments in the literature with respect to *credit risk* are well known. Poor asset quality should reduce profitability in as far as it limits the MFIs's pool of loanable resources. Changes in credit risk may also reflect changes in the health of MFI's loan portfolio which may affect the performance of the institution (see Derban, Binner and Mullineux 2005; Cooper et al., 2003; Demirgüç-Kunt and Huizinga 2000). Consistent with theory, Miller and Noulas (1997) postulate that the more the risk exposure or the higher the accumulation of outstanding loans and therefore lower the profitability. We thus expect a negative relationship between portfolio at risk and MFI profitability.

Efficiency in expenses management should ensure a more effective use of MFIs loanable resources, which may enhance profitability. Higher ratios of operating expenses to gross loan portfolio imply a less efficient management. Empirical evidence points to the fact that providing microfinance is a costly business perhaps due to high transaction and information costs (Hermes and Lensink, 2007; Gonzalez, 2007). Because the administrative costs per dollar lent are much higher for small loans than for large ones; to maintain the same level of profitability, the interest rates necessary to cover all costs including costs of funds and loan losses are much higher for MFI loans than for conventional bank loans (de Mel et. al., 2009b; Cull, McKenzie and Woodruff 2007). Efficiency may also be influenced by corporate governance as evidenced by Mersland and Strøm, (2009), Mersland (2009a) and Gutiérrez-Nieto, et al (2009). Thus, cost decisions of MFI management are instrumental in influencing the performance. We therefore predict a negative association between inefficiency and profitability.

3.3.1.4 Macroeconomic environment

A sound investment climate requires sufficient macroeconomic stability before microeconomic policies can gain much grip. Credit risk, for example, is influenced by economic growth, which affects the borrower's repayment ability and the value of collateral. Whether *inflation* affects financial institution's profitability will largely depend on whether inflation expectations are anticipated²³ or otherwise (Revell, 1979). An unanticipated inflation lowers real rates of return for an MFI, and may cause it to react by building conservatively large inflation premia into interest rates. Similarly, inflation may impact on MFI's cost of funds. Borrowers' incentives for delay and default can also be affected. Ahlin et al (2011) finds that MFIs cover costs better when macroeconomic growth is higher, partly due to lower default rates and operating costs. They find that MFIs appear to cope reasonably well with inflation, by raising rates. Krauss and Ingo (2009) find a significant exposure of MFI performance to changes in the Gross Domestic Product while Gonzalez (2007) concludes that macroeconomic developments do not influence MFIs in a significant manner. This evidence remains contestable.

3.3.1.5 Institutions development

Corruption, when endemic and deeply rooted, has significant adverse effects on an economy. Corruption destroys firms by promoting bad management, significantly raising the costs of doing business, increasing the risk and uncertainties of doing business; discouraging and reducing investment in general and in particular capital investment (Ng, 2006). Rent seeking distorts the allocation of talent away from entrepreneurship and innovation, thereby reducing growth (Aidt, 2003). Competing arguments for corruption has been advocated by Ehrlich and Lui (1999) who

²³ Put differently, the impact depends on whether MFIs' wages and other operating expenses increase at a faster rate than inflation. When inflation rate is fully anticipated the financial intermediary can appropriately adjust interest rates in order to increase their revenues faster than the costs and realize higher profits. However when unanticipated the financial intermediary may be slow in adjusting the interest rates, which results in a faster increase in costs than revenues with consequences of a negative impact on profitability.

point out, that corruption by itself need not impose a net social cost since it involves transfer payments from bribe payers to bureaucrats. Moreover, bribes can ameliorate the deadweight cost of government intervention by directing scarce resources towards higher bidders (Lui, 1985). Seminal theoretical work suggests that corruption might enhance commerce, by reducing transaction cost and lowers the cost of capital (see Lui, 1985; Kaufmann and Wei, 1999). We therefore postulate a negative relationship between corruption and return on MFI investments.

The owner of a property right to an asset can decide upon its use, to receive the income from it and can transfer or exchange the asset, i.e. he has the control rights to the asset and has the right to the residual returns, as long as he obeys legal and social norms (Jansson 2008). The regulator may for example, put constraints on prices which can affect the strategy of the firm particularly if the prices were calculated as a sum of costs plus a fair rate of return (Kim, and Mahoney 2005). The more certain the legal protection of property, the better the investment climate. Similarly, the higher the probability of government expropriation of property, the worse the investment climate²⁴ (World Bank 2005). We therefore postulate a positive relationship between strong property rights and MFI performance.

²⁴ In an environment in which property rights are insecure, opportunism is possible, and the identification of new business opportunities is costly. There is then no incentive to be cost efficient as the price covers costs.

3.4. Data set, description and measurement

Data description

Given the abundance of theories and predictions, it is natural to turn to data in an attempt to disentangle and assess predicted effects. We use unbalanced dataset in this chapter. Incomplete panels are more likely to be the norm in typical MFI performance empirical settings since some MFIs may have started recording data later than others, while others may have stopped recording data altogether. Additionally some MFIs may have dropped out of the market while new entrants may have emerged over the sample period observed (Baltagi and Song 2006).

This chapter examines the profitability of 210 MFIs across 31 developing economies in Sub-Saharan Africa for the period 1997-2007 based on their financial accounts. These spans across four different regions that include West (81), East (63), Central (23) and South Africa (43) totalling 2,310 observations (see Tables 9 and 10 in Appendix B for sample representation and country distribution). The dataset was assembled from three sources the principal being the MIX Market database, World Development Indicators (WDI) and the Heritage Foundation

It is a publicly available website that contains information on more than 1800 MFIs, more than 100 investors (e.g. Calvert Foundation), and nearly 200 partners (umbrella organizations that facilitate multiple MFIs' operations)²⁵. MixMarket groups MFI's into five categories—one through five-stars, based on amount and reliability of information reported. We restricted our dataset to include only three-five star MFIs whose data is reasonably reliable. Rather than taking MFIs statement of performance at face value, these data have been adjusted to account for subsidies which render the data valuable.

Our initial sample comprised of 295 MFIs all of which had three diamond rating and above. 85 MFIs were eliminated notably due to substantial missing information on one or more of the key variables. With regard to MFI types, the breakdown is as follows: 9 "credit unions", 10

²⁵ This information is taken from the mixmarket.org website during June/July 2010

“banks”, 39 “non-bank financial institutions” and 52 “non-governmental organizations (NGO)”s. We exclude rural banks category because it does not have enough observations to provide significant within-category variation. Finally, we restrict the sample to MFI’s whose fiscal year corresponds to the calendar year, for comparability with the annual country-level macroeconomic and institutional data. All results should be viewed in this light.

We merge the MFI level dataset with country-level data from the World Development Indicators (WDI) and institutional development indices from the Heritage Foundation. From WDI we obtain annual rate of inflation and real GNI per capita levels expressed in current U.S. dollars, for each of the countries and years corresponding to MFI’s in the dataset. These are our focal measures of the macroeconomic environment, property rights and corruption indices.

Definition and Measurement of the variables

Given that the MFI data are collected from MIX Market, we use the MIX Market definitions of key variables. *Capital (CAP)* is the ratio of equity capital to total assets²⁶. *Gearing ratio (GR)* defines the MFI capital structure which is measured by the ratio of debt and debt-like instruments to capitalization namely Short Term Debt + Long Term Debt divided by total shareholders' equity or simply the Debt/Equity ratio.

To capture the relationship between MFI *size (S)* and profitability while also accounting for potential nonlinearities-due to possible diseconomies of scale as MFIs become too big, we use the logarithm of real MFIs’ total assets in period t for each MFI. The squared size (S^2) captures the possible non-linear relationship. If coefficient of the squared size variable turns out to be negative but statistically non-significant, this would provide evidence that MFIs in Africa enjoy enough market power to be able to pass costs on to clients. We observe that since the dependent variable

²⁶ While Basel II addresses fewer concepts than the Standards in terms of direct application to MFI financial management, internal controls, and management reporting, it does outline three “pillars” that are relevant to microfinance

in the models (ROA) were deflated by total assets it would be appropriate to log total assets before including it in the models. We denote age (Ag) by the number of years MFI has been in operation in order to capture learning effect in MFI performance.

The credit risk exposure (CR) is measured by the sum of the level of loans past due 30 days or more and still accruing interest namely Portfolio at Risk (PAR-30). In robustness tests we include further measures of credit risk by estimating various econometric specifications for three additional different explanatory variables; the write-off ratio (WOR) which is the value of loans written off during the year as uncollectible, as a percentage of average gross loan portfolio over the year²⁷. An additional measure of credit risk is the Risk Coverage Ratio (RC) which is measured as the Adjusted Impairment Loss Allowance/PAR>30 Days and finally Loan Loss Reserve Ratio (LLR). This is measured as the ratio of loan loss reserves to gross loans or simply put as Loan loss reserve/Value of loans outstanding. It is an indicator of how much of the gross loan portfolio has been provided for but not charged off. It is important to note that only WOR and LLR are measures of default, while PAR is a measure of risk of default.

Efficiency (EFF) in the management of operating expenses: The total MFI costs (net of interest payments) can be split into operating and other expenses (such as taxes, depreciation etc). We regard operating expenses as the only direct outcome of MFI management. We thus measure efficiency in expenses management by the ratio of Adjusted Operating Expense/Adjusted Average Gross Loan Portfolio and in robustness tests, we use Cost per Borrower (CB).

We use two proxies for the macroeconomic environment; inflation and real GNI per capita growth. We use growth of GNI per capita²⁸ at current US Dollars (GNI) to control for different levels of economic development in each country and year. Arguably, this is the most informative single indicator of progress in economic development, while inflation expectation is measured at

²⁷ It's a form of serious default involving final non-repayment, measured as the value of loans written-off/Adjusted Average Gross Loan Portfolio.

²⁸ Baltagi and Song 2006) a number of macroeconomic variables (such as GDP, the unemployment rate and interest rate differentials).

time $t-1$ annual % change of the GDP deflator at market prices for each country where the MFI is located for each year.

This study has also factored in the impact on performance by institutions development. *Property rights* (PR) Index ranges from 10 where private property is rarely protected to 100 where private property is guaranteed. Put differently, it measures the extent to which a country's laws protect private property and the extent to which government enforces those laws. *Freedom from corruption* is a quantitative measure that is derived from Transparency International's Corruption Perceptions Index (CPI). This measures the level of corruption in 179 countries. It is based on a 10-point scale where a score of 10 indicates little corruption and a score of 0 indicates a corrupt government.

Dependent variables

MFI performance studies rely on accounting and profit or cost efficiency indicators based on the efficiency and productivity analysis. In the present study, we use accounting-based profitability indicators. The dependent variable is Return on Assets which is a measure of *ex-post* MFI profits. In order to test the robustness of our results we also use Return on Equity (ROE).

(a) Return on Assets (%) = adjusted net operating income-taxes/adjusted average total assets

(b) Return on Equity (%) = adjusted net operating income-taxes/adjusted average total equity

These two variables make it possible for us to compare data across countries and through time. ROA reflects the ability of MFIs' management to generate profits from MFIs assets, although it may be biased due to off balance-sheet activities. It can however be argued that such activities may be negligible in Africa MFIs, while the risk associated with leverage is likely to be substantial. This is despite the institutional innovations that MFIs embrace in order to compensate for informational asymmetries. ROE captures the return on shareholders equity. MFIs with lower leverage/higher equity reports higher ROA and lower ROE. Since an analysis of ROE disregards

the risks associated with high leverage and financial leverage is often determined by regulation, ROA emerges as our key ratio for the evaluation of MFI profitability. Moreover, ROA is more appropriate since MFI equity in Africa is abnormally low (Lafourcade, et al 2006) and ROA is a more comprehensive measure of profitability. It is also widely used in the literature, which allows comparison with previous studies. Debt/equity levels also differ considerably between MFIs. The variables of interest, source of data and the predicted coefficient signs are summarized in Table 3.2

Table 3.2: Summary of variables and measurement

Variable	Notation	Measure	Predicted effect	Source of data
Dependent variable				
Return on assets	ROA	Net profits after taxes/Assets		The MIX
Return on equity	ROE	Net profits after tax/Equity		
Determinants				
<i>MFI-specific</i>				
Capital	CAP	Equity/Assets	Positive	The MIX
Credit risk				
Portfolio at Risk	PAR-30	Outstanding balance, portfolio overdue > 30 Days + renegotiated portfolio/Adjusted Gross Loan Portfolio	Negative	The MIX
Write off Ratio	WOR	Value of loans written-off/Adjusted Average Gross Loan Portfolio		
Loan Loss Reserve Ratio	LLR	Loan loss reserve/Value of loans outstanding		
Risk Coverage Ratio	RC	Adjusted Impairment Loss Allowance/PAR > 30 Days		
Operational efficiency				
Efficiency	EFF	Adjusted Operating Expense/Adjusted Average Gross Loan Portfolio	Negative	The MIX
Cost per Borrower	CB	Adjusted Operating Expense/Adjusted Average Number of Active Borrowers.		
Other factors				
Loan size ²⁹	LS	Adjusted Average Loan Balance per Borrower/GNI per Capita	Positive	
Gearing	GR	Debt/equity ratio	Negative	
Log Age	Ag	Log of Age of the MFI in years	Indeterminate	
Log Age ²	Ag ²	Log of Age ² of the MFI in years	Indeterminate	
Log Size	S	Log of total assets and (total assets) ² in period <i>t</i>	Indeterminate	
Log Size ²	S ²	Log of total assets ² in period <i>t</i>	Indeterminate	
<i>Institutional development</i>				

²⁹ This is also a proxy for depth of outreach

Property rights	PR	Composite Index ranging from 10 (Private property is rarely protected) to 100 (Private property is guaranteed by the government)	Positive	Heritage Foundation
Freedom from corruption	COR	Composite Index 10-point scale Corruption Perceptions Index (CPI) in which a score of 100 indicates very little corruption and a score of 0 indicates a very corrupt government		
<i>Macroeconomic environment</i>				
Inflation Expectations	INF	Annual % change of the GDP deflator in period $t-1$	Indeterminate	World Bank (WDI)
Per capita Income	GNI	GNI per capita, Atlas method (current US\$)	Positive	

3.5. Empirical methodology

3.5.1 Estimation and testing procedures

The parameters of model (3.3) are estimated using unbalanced panel data regression. This is because it contains MFIs entering or leaving the market during the sample period which is more likely to be the case in cross country's MFIs profitability studies. To avoid the possibility of obtaining spurious correlations, we have ensured that all the variables incorporated into the empirical model are clearly established in the literature, to impact on bank profitability. That notwithstanding, our dataset suffers from several problems that dictate the choice of estimation procedure. First, we cannot assume homoskedastic errors. Since most of the exogenous variables are time variant though constant across MFIs, the estimated model may be prone to heteroscedasticity where the residual variance differs across time periods.

In order to investigate whether there is evidence of heteroscedasticity in the residual variance, based on Breusch-Pagan test we calculate the Lagrange multiplier (LM) and compare the relevant statistic of the model with the critical chi-square value $\chi^2_{0.005,10} = 25.182$. Values below this would reject the null hypothesis of heteroscedastic residual variance. We thus estimate

model (3.3) using White's transformation³⁰ to control cross-section heteroscedasticity of the variables. Second, outliers can also bias regression slopes (Baltagi 2008). To check for outliers, we exclude observations that have both extremely high residuals and high leverage³¹ on the regression results. To the extent that these problems are present and not corrected, the analysis of panel data may actually produce incorrect analytic results thereby placing the validity of the inferences drawn from this particular study at stake (Baltagi 2008; Certo and Semadeni 2006).

Empirical work on determinants of MFI's profitability can also suffer from two sources of inconsistency: omitted variables and endogeneity problem. Combining cross-section and time-series data is useful for three main reasons. First, since MFIs profitability may vary over time, it is necessary to use panel methodology because the time-series dimension of our variables of interest provides a wealth of information ignored in cross-sectional studies. Second, the use of panel data increases the sample size and the degree of freedom, which is particularly important when a relatively large number of regressors are used. Third, panel data takes into consideration potential endogeneity of the regressors, while at the same time controlling for firm-specific effects which cross-section regressions fails to take into account (Baltagi, 2008). If it appears then that there is correlation between the MFI and/or time effects and the exogenous variables, then and in order to solve for the endogeneity problem, the MFI and time effects should be estimated as dummy variables.

Advantages of panel over time series data include the possibility that underlying microeconomic dynamics may be confounded by aggregation biases, while the scope that panel data offers to examine heterogeneity in adjustment dynamics between different types of firms is immense. Although, these advantages can be realized with repeated cross-section, panel data

30 The use of a White heteroskedasticity consistent covariance estimator with ordinary least squares estimation in fixed effects models can yield standard errors robust to unequal variance along the predicted line (Greene, 2008; Wooldridge, 2002). Such standard errors are able to account for contemporaneous correlation, heteroskedasticity, and autocorrelation when the data set contains at least 15 time periods.

31 The leverage of an observation is a multivariate measure of the distance of its X values from the means in the sample.

allows more of the variation in the micro data to be used in construction of parameter estimates as well as allowing the use of relatively simple econometric techniques (Baltagi, 2008). Estimation bias is therefore lower with panel data estimation than would have been the case with either time-series or cross-sectional data, while multicollinearity is less of a problem. Moreover, panel data circumvents errors in model specification, with improved efficiency of estimation.

If we were to undertake regression analysis on the panel data using the ordinary least squares (OLS) method, we would have ignored the differences between MFIs, and this would have made it impossible to determine the direction of error, giving rise to heterogeneity bias. We therefore felt that the use of fixed effects and random effects model would be more appropriate. Previous studies that have used least squares methods of either FE or RE models include Bourke (1989), Naceur and Goaid (2001), Molyneux and Thornton (1992), Demirgüç-Kunt and Huizinga (1999), Hsiu-Ling et al (2007), Pasiourasa and Kosmidou (2007) and Flamini et al (2009).

For the purpose of estimation and testing we proceeded as follows. First, we test for non-stationarity using the Fisher test which is based on combining the *p-values* of the test-statistic for a unit root in each MFI³². Based on the *p-values* of individual unit root tests, Fisher's test assumes that all series are non-stationary under the null hypothesis against the alternative (Greene 2008). Maddala and Wu (1999) contend that not only does this test perform better than other tests for unit roots in panel data, but it also has the advantage that it does not require a balanced panel, as most tests do. Depending on the outcome of the panel unit root test, we estimate the model excluding the non-stationary variables, especially if the excluded variables do not affect the model's performance.

³² The most disseminated results were developed by Levin and Lin (1993) and Im, Pesaran and Shin (2003) while surveys on the topic appear in Banerjee (1999) and Maddala and Wu (1999).

The second issue we have to contend with is the choice between a Fixed Effect (FE) and a Random Effect model (RE). Under a FE model the ν_i 's are considered fixed parameters to be estimated. Here we transform the dependent and explanatory variables and then apply OLS to the transformed data to obtain the within estimator. FE model transforms the estimating equation so as to get rid of the fixed effects (Baltagi, 2008). Under a RE model the ν_i 's are assumed to be random and the estimation method is generalized least squares (GLS). GLS uses cross-section weights for every observed MFI i at time t , and the true variance components, in order to produce a matrix-weighted average of the within and the between which is obtained by regressing the cross section averages across time estimators (Baltagi, 2008; Greene, 2008). We perform the traditional Hausman test (Hausman, 1978) which is identical asymptotically to the Wooldridge (2002) test where we first estimate the fixed effects model, save the coefficients and compare them with the results of the random affects model. In the event that we obtain Hausman test value which is larger than the critical chi-square, then the FE estimator is the appropriate choice (Hausman, 1978).

There is strong evidence that our specification follows a FE model as the Hausman test indicates. The relevant F-statistic is significant at the 1% level ($F(181, 486) = 4.47$). Fixed effects approach is further reinforced by the absence of significant heteroscedasticity in the residuals from our estimated model. Therefore, under the null hypothesis, the two estimates differ systematically as indicated by the p -values in Table 3.3. This means that the coefficients of interest are statistically different in the two estimations; hence we reject the random effects solution both on substantive and statistical grounds.

Table 3.3: Hausman fixed random specification test

ROA	Notation	Coefficients		
		Fixed Effects (b)	Random Effects (B)	Difference (b-B)
Log age	Ag	-0.0127	-0.0042	-0.0086
Log size	S	0.0243	0.0111	0.0132
Capital	CAP	0.0614	0.0472	0.0142
Gearing ratio	GR	0.0137	0.0167	-0.0030
Portfolio at risk	PAR	-0.0106	-0.0112	0.0006
Efficiency	EFF	-0.1372	-0.0969	-0.0403
Loan size	LS	0.0021	0.0031	-0.0009
GNI per capita	GNI	-0.0127	0.0003	0.0011
Inflation expectations	INF	0.0243	0.0002	0.0017
Property rights	PR	0.0014	-0.0042	-0.0086
Freedom from corruption	COR	0.0019	0.0111	0.0132

Test: Ho: difference in coefficients not systematic $\chi^2(10) = (b-B)[S^{-1}](b-B)$, $S = (S_{fe} - S_{re}) = 71.90$
 $Prob > \chi^2 = 0.0000$

Finally, we performed sensitivity tests in order to develop robust empirical results for the empirical model. Accordingly, if the coefficients are not sensitive to the inclusion of different variables, then the variables of interest can robustly affect the dependent variable. We estimate the same linear specification both with and without the macroeconomic control variables and institutional factors. The joint impact of these additional variables is assessed by the improvement in the overall explanatory power of the model. Only the robust results of the empirical model are presented in this chapter.

3.5.2 Univariate analysis

Table 3.4 presents descriptive statistics. There is a wide variation in performance across MFIs. The means and standard deviation for ROA and ROE are all within the expected range but the minimum and maximum values suggest a wide range for each variable. It is evident from the summary statistics that there is a clear difference among MFIs. The standard deviations of most variables are quite large. Consistent with Balkenhol (2007), most MFIs in Africa post negative average returns on assets. ROA varies from 32% to negative 86%. Similarly, ROE varies from over 100% to negative 86%, prompting the use of robust regression methods as a check on

robustness to outliers. For the whole region the average period ROA stands at -0.1 per cent, while the average ROE is 0.1 per cent which perhaps is an indication that MFIs in Africa earn lower average financial revenues, which is consistent with low profitability as reported in Table 1.2 (see also Figure 2 and Table 9 in Appendix A for a global comparison). The operational inefficiency is also quite high at 43%. Indeed relative to other regions, the average cost per borrower among Africa MFIs is \$ 72, which is higher than MFIs in other global regions (Lafourcade, et al 2006).

Table 3.4: Descriptive and summary statistics

Variable	Notation	Obs	Mean	Median	Standard Deviation	Minimum	Maximum
Return on assets	ROA	1058	-0.0128	0.000	0.0950	-0.8660	0.3240
Return on equity	ROE	899	0.0140	0.000	0.2202	-0.8630	1.0760
Age	AG	1143	9.2	8	6.2	0	40
Capital	CAP	1145	0.3800	0.3258	0.3428	-1.366	1.000
Gearing	GR	953	0.6906	1.182	1.5811	0	9.09
Efficiency	EFF	899	0.4395	0.305	0.5739	0	12.25
Log of cost per borrower	CB	884	4.2749	4.299	1.1758	0.6931	8.9569
Portfolio at Risk	PAR	1145	0.0655	0.028	0.1103	0	1.05
Write off Ratio	WOR	1129	1.2343	0.00	2.7280	-1.32	20.59
Loan Loss Reserve ratio	LLR	906	0.9618	0.025	1.6369	0	16.49
Risk Coverage Ratio	RC	1111	0.5962	0.385	0.8356	0	9.64
Loan size	LS	1143	0.9617	0.468	1.6369	0	16.49
Log Size	S	1140	14.485	14.36	1.9620	7.102	20.54
Lagged Inflation rate	INF	2066	0.0346	0.000	0.0628	-0.1390	0.3820
Per capita income	GNI	906	0.0854	0.087	0.0938	-0.1880	0.2930
Property rights	PR	2211	39.47	30.00	12.78	10	70
Freedom from corruption	COR	2211	25.66	26.0	11.42	7	57

This Table presents the summary statistics. A detailed description of the definition and sources of the variables is given in Table 3.2.

We anticipate that our regression may give us the coefficients that best describe the dataset, but the independent variables may not have a good *p-value* if multicollinearity is present. We therefore perform correlation test to investigate whether there is perfect linear combination among variables. Table 3.5 shows that most of the correlations among variables of interest are significant although the level of correlation is very low. Our primary concern though is whether multicollinearity is strong enough to invalidate the simultaneous inclusion of the explanatory variables in regressions. We contend that multicollinearity could only be a problem if the correlation coefficient is above 0.70 (Baltagi 2008; Kennedy 2008), which is not the case with our variables. Moreover, since panel data estimation gives more degrees of freedom, the multicollinearity problem is further reduced (Hsiao, 2003).

With the exception of operating efficiency which is significantly correlated with cost per borrower (0.59) all other pair wise correlations between the regressors are less than 0.50. Most notably, profitability measures (ROA, ROE) are significantly positively correlated, but not perfect (at 0.65). Interestingly, age, MFI size, gearing ratio, operating efficiency, and credit risk are significantly correlated with performance which is an indication that profitable MFIs tend to be large and older, rely more on debt financing and are more efficient. Age in particular may have nothing to do with learning effect but rather survivorship bias which is exemplified by retaining successful borrowers instead of graduating them into mainstream banks. This would in essence release capital that could be borrowed by other households. Dropouts or survivorship bias may also imply that borrowers leave because they are doing so well or they are in trouble (Armendáriz and Morduch, 2010). It is likely that those who remain behind have the positive attributes of survivors, while the new borrowers have yet to be tested. Variables that proxies the quality of the institutions are not significantly correlated with return on assets. We do not detect any significant bivariate correlations relating the macroeconomic environment and MFI performance.

The significant correlation between performance and gearing ratio is an indication that perhaps more debt relative to equity is used to finance microfinance activities and that long term borrowings impact positively on profitability by accelerating MFIs growth than it would have been without debt financing. Whereas these summary statistics presented in both Tables 3.4 and 3.5 give us a clue of what might influence profitability of MFIs, a more precise investigation of the determinants of MFI profitability and the relative contribution of each factor can only be uncovered by using multivariate panel regression techniques. Panel regression analysis allows us to investigate the strength of these correlations after controlling for other relevant covariates.

Table 3.5: Correlation matrix

	ROA	ROE	AG	S	CAP	GR	EFF	CB	PAR	LLR	RC	WOR	LS	INF	GNI	PR	COR
ROA	1.000 1058																
ROE	.653** 992	1.000 995															
AG	.095** 1055	.120** 992	1.000 1143														
S	.121** 1056	.171** 993	.360** 1141	1.000* 1144													
CAP	-.016 1058	-.155** 995	-.166** 1142	-.112** 1143	1.000 1145												
GR	.130** 876	.200** 849	.163** 950	.153** 952	-.461** 952	1.000 953											
EFF	-.312** 865	-.134** 804	-.065* 897	.008 899	.062 899	-.211** 754	1.000 899										
CB	-.066* 853	.070* 792	.075* 889	.127** 891	-.178** 891	.043 744	.589** 871	1.000 891									
PAR	-.075** 1057	-.059 994	.060* 1141	.005 1142	-.081** 1143	-.004 951	.032 898	-.008 890	1.000 1145								
LLR	-.073* 1057	-.070* 994	.064* 1142	.022 1143	-.019 1144	-.021 952	.230** 899	.209** 891	.362** 1144	1.000 1146							
RC	-.048 1027	-.031 965	-.008 1108	-.005 1109	.023 1110	-.015 921	.097** 873	-.007 865	-.059* 1110	.039 1110	1.000 1111						
WOR	-.129** 1044	-.093** 982	.101** 1125	.015 1126	-.097** 1127	.013 940	.152** 886	.031 875	.147** 1128	.002 1128	.008 1094	1.000 1129					
LS	0.108* 1091	0.119* 1086	0.106* 1144	0.003 1145	0.117* 1146	0.097* 954	-0.098 898	0.227* 890	-0.026 1146	-0.043 1146	-0.075* 1112	0.014 1130	1.000 1147				
INF	.044 1033	.073* 973	.075** 1109	-.033 1110	.067* 1111	.005 923	.102** 876	-.027 869	.114** 1111	.062* 1111	.093** 1078	.090** 1096	-.040 1147	1.000 2066			
GNI	.042 865	.053 807	.092** 904	.045 904	-.044 906	.078* 756	-.054 858	.024 847	.078* 905	.035 906	.018 881	.069* 892	-.025 938	.240** 897	1.000 906		
PR	-.013 1021	.013 961	-.036 1104	.064* 1105	.028 1106	-.011 922	.053 880	.059 865	-.026 1106	.043 1107	-.020 1073	-.037 1093	0.038 1106	-.046* 1978	-.127** 880	1.000 2211	
COR	-.025 1021	.044 961	-.046 1104	.079** 1105	-.057 1106	-.115** 922	.041 880	.065 865	-.034 1106	-.011 1107	-.009 1073	.027 1093	0.043 1106	.017 1978	-.090** 880	.391** 2211	1.000 2211

** Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed). Figures beneath are the observations (N)

Where ROA=Return on Assets; ROE=Return on Equity; AG= Age of the MFI; S= Size; CAP= Capital; GR= Gearing ratio; EFF= Operating efficiency; CB= Cost per borrower; PAR=Portfolio at Risk; LLR= Loan loss reserve; RC= Risk cover; WOR= Write off ratio; INF= Lagged Inflation; GNI= Growth of per capita income; PR=Property rights index; COR= Freedom from corruption index

3.5.3 Multivariate regression analysis

Having summarised the correlates of profitability, the next set of regressions explores the relationship between exogenous factors and MFI profitability. We make further considerations regarding the approach to estimations. Using a dataset with potential measurement error due to poor accounting standards that is common among developing countries and multiple observations from the same MFI, error terms may not be identically and independently distributed (IID). In particular, MFI-specific errors may be correlated and measurement error which is likely to be higher for some of the MFIs could be driving our regression results. Another problem with our analysis is that we have assumed that ROA values were completely independent from one MFI to the other. This is unlikely to be true since ROA within MFI are likely to be similar to one another. To find out how the extent of the variability within MFI versus the extent between MFIs, we compute an intra-class correlation which is One-way Analysis of Variance that works only with first and second moments of the data and thus will not bias estimate between and within variance components, regardless of the distribution of the data. Table 3.6 shows an intra-class correlation of 0.33 which is minimal. We proceed with our estimation allowing for differences in the variance and standard errors due to intra-group correlation³³.

³³ Although the coefficient estimates and standard errors are the same for the `xtreg`, `fe` and `.areg` approach in stata, we use the latter for our estimation. The advantage with `.areg` approach is that it allows for differences in the average level of across MFIs in addition to adjusting the standard errors taking into account the specific intra-group correlation. `Areg` procedure, involves estimating coefficients for each of the covariates plus each dummy variable for MFI groups while in the `xtreg`, `fe` procedure the R2 reported is obtained by only fitting a mean deviated model where the effects of the groups are assumed to be fixed. So, all of the effects for the groups are simply subtracted out of the model and no attempt is made to quantify their overall effect on the fit of the model leading to low R squared and standard errors due to larger degrees of freedom for errors. It is for this reason that the calculation of the R2 is different.

Table 3.6: One-way Analysis of Variance for roa: ROA

Number of obs=1058

R-squared=0.46

Source	SS	df	MS	F	Prob > F
Between idfirm	4.3905	209	0.0210	3.46	0.0000
Within idfirm	5.1433	848	0.0061		
Total	9.5338047	1057	0.0090		

Intra-class Correlation	Asy. S.E.	[95% Conf. Interval]	
0.3286	0.0351	0.2599	0.39728

Estimated SD of idfirm effect	0.0545
Estimated SD within idfirm	0.0779
Est. reliability of idfirm mean	0.7113
(Evaluated at n=5.03)	

We introduce a quadratic term for the MFI size and age in the profitability equations, to capture non-linear effects of diseconomies of scale as firms become large and learning effect. The quadratic form can generate inverted U-shaped patterns consistent with the prediction that when non linear effects become severe, then overall profitability eventually falls as both size and age rise.

3.6. Empirical results and discussion

The estimated equations appear to fit the panel reasonably well as indicated by the R-squared values which have fairly stable coefficients among the alternative models. Table 3.7 reports results from our basic specification using ROA as the profitability measure. The estimations based on ROE produce inferior results (see Table 5 in Appendix B) as suggested by the coefficients estimates and hence they are not reported or discussed here. The performance based on the ROE specification may be related to the explanation given in Section 3.4.2. The third specification of Table 3.7 gives our preferred model. A comparison of the first and second model specification allows us to distinguish between non-linear effects and the robustness of the MFI-specific factors to the inclusion of macroeconomic and institutional quality variables (see the discussion in Section 3). Although model 1 shows both age and size

and their corresponding non-linear effects, they were nevertheless estimated separately due to multicollinearity.

Interesting results appear in both significant and non-significant findings. The overall Wald statistic shows rejection of the hypothesis that all coefficients are equal to zero in all specifications. We comment on all regressions together. The overall explanatory power (measured by adjusted R^2) for both models is relatively high, and is not associated with high correlation among some of the trended variables (e.g. INF and GNI). Dropping either of these variables does not make much difference to the overall results or the explanatory power. On the other hand, reasonably high explanatory power has also been reported on banks profitability studies e.g. by Kosmidou (2008), Hsiu-Ling et al (2007), Pasiourasa and Kosmidou (2007). One would have expected much higher values for the adjusted R^2 . One potential explanation for the not so high values is the use of accounting data. Performance proxied by accounting earnings, are backward-looking and tend to be smoothed relative to the underlying value of the firm. Accountants spread cost and revenue over multiple periods and this minimizes the sensitivity to market movements or regression coefficients and market-risk (R^2) for our profitability indicators. This is because market impacts are not directly reflected in yearly accounting results. In addition to the missing variables, the poor quality of the accounting data creates variation that cannot be explained by the model, which subsequently slightly lowers the R^2 values in our results.

A casual inspection of the dependent variable using a simple run-sequence plot shows that it is stationary having removed the outliers. We also removed outliers on the explanatory variables. Independent cross section data on the panel adds information and this leads to a stronger overall signal than that of the pure time series, depending on whether there exists or not a serial correlation in the time series component. Since both N and T are least squares estimator consistent, the asymptotic bias of the within estimator vanishes to zero as $T \rightarrow \infty$ (Phillips and Moon 1999).

Table 3.7: Estimation Results Using Fixed Effects-within (dependent variable: ROA)

Variant model specifications with robust standard errors				
Variable	Notation	1	2	3
Intercept		-0.4113*** (-3.92)	-0.4588*** (-4.11)	-0.5912*** (-4.64)
Log Size	S	0.0169* (1.85)	0.0237*** (2.53)	0.0243*** (2.57)
Log Size ²	S ²	0.0084 (0.065)		
Log Age	AG	0.0091 (0.41)	-0.0209 (-0.90)	-0.0127 (-0.53)
Log Age ²	AG ²	0.0046 (0.41)		
Capital	CAP	0.0619*** (2.66)	0.0645*** (3.13)	0.0614*** (2.95)
Gearing	GR	0.0104 (0.95)	0.0144 (1.53)	0.0137 (1.45)
Efficiency	EFF	-0.1314*** (-12.24)	-0.1350*** (-10.03)	-0.1372*** (-10.57)
Portfolio at risk	PAR	-0.0105*** (-2.46)	-0.0112** (-2.40)	-0.0106*** (-2.35)
Loan size	LS	0.0021 (0.46)	0.0013 (0.29)	0.0013 (0.29)
Inflation expectations	INF		0.0660 (1.07)	0.0582 (0.93)
Per capita incomes	GNI		-0.0123 (-0.31)	-0.0087 (-0.21)
Property rights	PR			0.0014*** (2.27)
Freedom from corruption	COR			0.0019*** (3.33)
R ²		0.80	0.82	0.83
No of obs.		508	485	476

This Table presents regression with robust standard errors results conducted to determine the determinants of profitability for Africa MFIs. Estimations were performed using fixed effects estimation. T-Statistics are in parentheses and significance at the 10%, 5%, and 1% level is denoted by *, ** and *** respectively. A detailed description of the definition and sources of the variables is given in Table 3.2

Based on a panel data set of 210 microfinance institutions, what inferences can we draw from the regression coefficients? We find that capital adequacy has robust and significant positive association with MFI profitability. This is depicted by the relatively high coefficient of the equity to assets ratio across the specifications. This effect remains so even after the inclusion of the external factors. Intuitively, this is an indication that well capitalized MFIs are more flexible in dealing with problems arising from unexpected losses and are confronted with a reduced cost of funding or lower external funding. It may also suggest that MFIs may be capital constrained. Weak capitalisation has hampered MFI performance in Africa where loan portfolios has been increasing by over a billion dollars a year while provision of enough funding to the institutions remains a major challenge (Lafourcade, et al 2006). Compared with

the banks' average capital adequacy ratio of approximately 0.13, MFIs are much less capitalized, since it's more difficult to leverage the risky microfinance loan portfolios (Conning, 1999). This result is consistent with the banking literature as evidenced by Sufian and Habibullah (2009), Kosmidou et al (2008), Athanasoglou, et al. (2008), Boubakri, et al. (2005), Naceur and Goaid (2001), Demirgüç-Kunt and Huizinga, (1999), and comprehensively discussed in Berger (1995). This evidence is however inconsistent with Goddard et al (2010) who in the traditional banking industry, finds lower profitability for banks that are highly capitalised.

As predicted by Miller and Noulas (1997) and subsequently by Cooper et al., (2003), credit risk measured by the sum of the level of loans past due 30 days or more (PAR>30) and still accruing interest is negatively and significantly related to MFI profitability. This study therefore finds evidence to support the conjecture that increased exposure to credit risk is normally associated with lower MFI profitability. This finding is consistent with CSFI (2009) which identified credit risk as the biggest risk faced by the MFIs globally. It also confirms Athanasoglou, et al. (2008), Kosmidou et al (2008), and Boubakri, et al. (2005) in the banking literature but contrary to Sufian and Habibullah (2009) who evidence a positive link between credit risk and profitability in China. As a robustness check, we carried out additional regressions using alternative specifications. Specifically, we re-run the regressions using three other measures of credit risk that include write-off ratio (WOR), risk cover (RC) and loan loss reserve ratio (LLR) which all turned out to be insignificant³⁴. Intuitively, under some circumstances, self-financing could be used to mitigate adverse selection related problems (Amitrajeet and Beladi, 2010).

³⁴ It is however worth noting that whereas portfolio at risk (PAR) is a measure of risk of default, write-off ratio (WOR) and loan loss reserve ratio (LLR) are measures of actual default. Given dynamic incentives that MFIs clients have to repay their loans in order to secure additional loans and the effectiveness of loans collections by the MFIs staff, it is conceivable that most late loans will be paid at some point. This perhaps explains why whereas PAR coefficient is significant, WOR and LLR are insignificant.

The significant result for MFI size across all regressions where the relationship is linear³⁵ confirms the economies of scale hypothesis in the microfinance intermediation process. This basic result does not change even with the inclusion of external factors. In microfinance literature, these findings confirm Cull, Demirgüç-Kunt, and Morduch (2007). It is also consistent with Mersland and Strøm, (2009), Kosmidou (2008), Athanasoglou et al (2006) and Beck et al (2005) but is inconsistent with Sufian and Habibullah (2009), Hsiu-Ling et al (2007), Pasiourasa and Kosmidou (2007), Kosmidou et al (2006), Bikker and Hu (2002), Demergüç-Kunt and Huizingha (1999) in the banking industry. It can therefore be argued that failure to become profitable in microfinance is partly due to lack of scale economies. Our finding suggests that MFIs may have to institute a dual objective of profit maximization while presumably pursuing a managerial goal of firm size maximisation. It could also imply that profitable MFIs in Africa have a greater control of the domestic market, and therefore lending rates may remain high while deposit rates remain lower since larger MFIs may be perceived to be safer. This high interest rate spread translates to and sustains higher profits margins.

We cannot confirm Cull, Demirgüç-Kunt, and Morduch (2007) and the general literature that performance of MFI improves with age. We find insignificant results in all cases, suggesting that the length of time a MFI has been in operation doesn't count towards profitability. The theoretical foundation that new entrants into the market are better able to pursue new profit opportunities which translate to higher profits is not supported here. Our findings do not confirm Hsiu-Ling et al (2007) and Beck et al (2005) who found a negative and significant relationship between age and performance in the banking literature. We also do not detect significant non-linear effect of age on MFI outcomes, or any reflection of a learning curve on performance.

We find inefficiency in the management of operating expenses to significantly decrease MFI profitability. As a robustness check, we carried out additional regressions using Cost per

³⁵ We do not find support for non-linear effects as the square of MFI assets is similarly positive and significant

Borrower (CB), which yields similar results. This finding is consistent with Cull, Demirgüç-Kunt, and Morduch (2007) amongst a sample of MFIs and Sufian and Habibullah (2009), Kosmidou (2008), Athanasoglou, et al (2008), Pasiourasa and Kosmidou (2007), Athanasoglou et al (2006), Kosmidou, et al (2005), Guru et al. (2002) in traditional banking. This perhaps reflects problems in corporate governance³⁶ as evidenced by Mersland and Strøm (2009) who concludes that better corporate governance is a key factor for enhancing the viability of the microfinance industry. This is consistent with Chhaochharia and Laeven (2009) who concludes that improvements in corporate governance impacts positively on firm value.

Guided by stakeholder and agency theories, Mersland (2009a) similarly draws a historical parallel found in savings banks to present corporate governance lessons for MFIs. His findings show that the survival of savings banks was largely due to monitoring by bank associations, depositors, donors, and local communities. In addition, cross-subsidization by the wealthier customers helped the banks to become financially stable. Further evidence by Bourke (1989), and Molyneux and Thornton (1992) point to a positive relationship between quality management and profitability of European banks. This inefficiency in cost management could also signal lack of competitive market.

The insignificant gearing ratio suggests that most profitable MFIs neither finance their operations with debt instruments nor equity. They may therefore be relying on deposit mobilization. Indeed and to draw the link or otherwise, existing evidence shows that whereas globally most MFIs rely heavily on donations and retained earnings to fund their activities, Africa MFIs fund only 25 percent of their assets with equity. 72 percent of the source of their liabilities is deposits which is significantly higher than MFIs in other regions (Lafourcade, et al 2006). Although the impact of gearing ratio warrants further research, it is important to

³⁶ To explore the effect of traditional governance mechanisms such as board composition and size, managerial incentives, ownership type, and regulation, Mersland and Strøm (2009) use a global dataset including 278 rated MFIs from 60 countries while Hartarska (2005) uses different datasets spanning 46 to 144 observations from East European MFIs. Both studies have difficulties in identifying significant governance influence though both conclude that governance matters, but the traditional governance mechanisms seem to matter less in MFIs.

point out that when attempting to identify variations in profitability arising from gearing ratio, it is important not to do so in a vacuum. If, for instance, long term borrowings negatively affected profitability but enable MFIs to expand their outreach such that they can loan to more poor people, then that effect should be considered when developing normative implications from the analysis. This conjecture, however, cannot be the entire explanation, because MFIs differ with respect to mission/objectives.

Contrary to Cull, Demirgüç-Kunt, and Morduch (2007), our results show that the average loan size variable is not significantly linked to MFIs profitability. Even after controlling for other covariates, MFIs that make smaller loans are not less profitable on average. The hypothesis that expanding loan sizes thereby making relatively large loans to fewer customers is likely to be more efficient than making large numbers of small loans to improve profitability by lowering average costs is not supported here.

After controlling for MFI specific characteristics, we find no evidence suggesting a statistically significant relationship between changes in macroeconomic variables (GNI per capita growth and inflation) and profitability of MFIs which is contrary to Ahlin and Lin (2011) and Liu and Wilson (2010) in the banking sector. Indeed, Zaidi, et al (2009) show that inflation has not had a damaging effect on microfinance clients in the first nine months of 2008 when it rose to 25 percent in Pakistan and predicts that it is not likely to have an effect in the subsequent months. This is may be an indication of the high resilience of MFI on local macroeconomic conditions. Intuitively, it could also imply that microfinance relies on a poor macro economy to thrive. To draw the link, Hartarska and Nadolnyak (2007) use index of the size of the informal market developed by the Heritage Foundation and conclude that the size of the informal market has a positive effect on microfinance performance. Specifically, an MFI operating in a country with an index of 3, such as South Africa, would have 8% lower operational sustainability than MFI in a country with an index of 4 such as Mozambique. We however caution that this conjecture needs to be corroborated by further research.

Proxies for quality of institutions are both positive and significant as predicted by theory. This suggests that freedom from corruption would enhance greater profitability since corruption may distort the allocation of talent away from entrepreneurship and innovation, thereby significantly increasing costs of doing business. This eventually stifles MFI growth by increasing the risk and uncertainties which is consistent with (Aidt 2003; Ng 2006). The positive and significant coefficient of property rights is consistent with Kim, and Mahoney (2005). This suggests that the more certain the legal protection of property, the better the investment climate or the higher the probability of government expropriation of property, the worse the investment climate. To conclude therefore the quality of institutions are prerequisites if MFIs are to achieve profitability.

3.6.1 Robustness checks

To confirm the main results, a robustness check was performed by running the same set of regressions for a smaller data set of 1,260 observations over a reduced period of six years (2002-2007). As shown in Table 6 (Appendix B), using a significantly reduced unbalanced sample does not fundamentally change the picture. The significance and the relative magnitude of influence of the MFI- specific and macroeconomic variables used in previous regressions are preserved.

3.7. Conclusions, policy implications and prescription

This chapter is a first attempt to study profitability of the microfinance industry in Africa. We specified an empirical framework to investigate the effect of MFI-specific, quality of institutions and macroeconomic determinants of profitability of MFIs in Africa. An unbalanced panel dataset of 210 MFIs operating across 31 countries during 1997-2007 periods provided the basis for the econometric analysis.

The impact of MFI-specific variables is in line with theoretical expectations, with notable exception of MFI age and gearing ratio which are insignificant. Our empirical findings are robust to alternative specifications. Although some of the findings are well known in the banking literature, they are nevertheless new in microfinance industry. Interesting estimation results are obtained, which shows that successful MFIs are most often larger, well-capitalized and that increased exposure to credit risk lowers profitability. While the usual caveat about drawing strong policy conclusions from cross-country analysis applies, the findings in this study do have a clear set of policy implications for policymakers in the microfinance industry. We suggest the following five points.

First, efficiency in delivering microfinance is an important determinant of profitability and therefore MFIs have much to gain if they improve on their managerial practices. Efficient cost management is a prerequisite to profitability since this sector may not have reached the maturity level required to link quality effects emanating from increased spending to higher MFI profits. One potential solution to reducing transactional costs is through the use of mobile phone micro-banking. Safaricom's *M-Pesa* service in Kenya currently transfers an average of KSh150 million (US\$2m) a day mostly in small amounts averaging KSh3, 800 (US\$50) per transaction.³⁷ A major drawback would however be technological innovations in Africa which pose particular challenges because mobile phone usage has lower penetration than in the developing countries. The new technologies such as mobile banking and

³⁷ See Microfinance Insights Vol. 9, Nov/Dec 2008 at <https://www.microfinanceinsights.com/index.asp>. accessed on Jan 2009

branchless micro-banking may also pose a major threat to the data privacy of MFI consumers (CGAP, 2009b).

Guided by stakeholder and agency theories on corporate governance, our findings suggests that MFIs may be able to effectively use local depositors as in the case of Irish loan funds (see Hollis, and Sweetman, 2007) not just for funding, but also because of the important financial discipline that depositors can impose on the management. Our findings suggest that MFIs may improve on performance by switching to lower frequency repayment schedules and save dramatically on the transaction costs of instalment collection. This policy implication may only hold if the risk composition of borrowers is not made worse by a more flexible repayment schedule. There are also issues of borrower runs to contend with (Bond and Rai 2009), though evidence to date points on the contrary (Field and Pande 2008; McIntosh 2010). This study could be extended by exploring the role of “managerial capital”, on MFI management which is distinct from human capital in line with Bruhn, Karlan, and Schoar (2010).

Second, the positive and highly significant capital variable coefficient is a clear indication that microfinance industry may be capital constrained. Therefore, at the MFI level, profitability can be realized by reinforcement of MFIs capitalization through national regulation programs and by reducing the proportion of non-interest bearing assets to the benefit of MFI loans.

Third, the evidence of positive and significant MFI size is an indication that MFIs may have to institute a dual objective of profit maximization while presumably pursuing a managerial goal of firm size maximisation. It could be the case that MFI with lower repayment and a larger client base is more profitable. One of the most important questions underlying MFI policy is which size optimizes MFI profitability. Smaller MFIs in particular are at a disadvantage, struggling to cover the industry’s high operational costs and diversify their products in order to compete with larger microfinance providers. That notwithstanding,

governments and funders/donors face a challenge; although scale economies are important for profitability, local markets in Africa do not always allow such scale economies.

Fourth, evidence on credit risk is consistent with our hypothesis. This calls for improvements in information capital. Better screening processes may enable MFIs to mitigate adverse selection problems. Most countries in Africa however lack credit reference bureaus or unique identification that would help minimise loan defaults (Janvry, McIntosh and Sadoulet 2010). While some of the developing countries such as El Salvador have established reasonably well-functioning centralized risk-management structures, where nearly instantaneous credit checks are possible (McIntosh and Wydick 2005), the same lacks in Africa. But even with credit reference bureaus, lenders must still have to make a decision on whether to approve loans and on what terms (Karlan and Zinman 2009).

These findings have therefore responded to the primary aims and objectives of our study and made a contribution to the existing literature. Overall, these empirical results provide evidence that the MFIs profitability is shaped by MFI-specific factors and quality of institutions that are not the direct result of MFIs's managerial decisions.

CHAPTER FOUR

DO MICROFINANCE PROFITS CONVERGE? EVIDENCE FROM A DYNAMIC PANEL ANALYSIS³⁸

4.1 Introduction

Microfinance competition has been transformed over the past two decades by forces such as regulation, increased commercialization of microfinance, technological changes and competition from the formal financial sector (Cull et al 2009c). MFIs operate in product and geographical markets that significantly differ from those that existed two decades ago. These developments have implications on MFIs profitability. Theoretical literature has established that intense competition leads to the poorest borrowers dropping out of the microfinance market (see e.g. McIntosh and Wydick 2005). Additionally, competition undermines the dynamic incentives at the root of microfinance loan contracts (Guttman 2008; Chowdhury 2007). To a large extent, competition has gone under-studied in microfinance due to lack of data, regarding the performance of microfinance institutions. Recent improvements in the data enabled us to undertake this analysis.

Our primary goal in this chapter is to test for the persistence of profits by combining a new dataset on the performance of microfinance providers with industry specific, macroeconomic indicators and location specific factors. This will enable us to offer evidence on whether microfinance industry in Africa is competitive by employing alternative method in the empirical analysis. Pertinent questions concern whether one observes convergence to the mean, moderate/high persistence or explosive paths.

To achieve this objective, we use a system GMM dynamic model to test the hypothesis that entry and exit are sufficiently free to eliminate any supernormal profits quickly, so that MFI profit rates converge rapidly towards their long-run equilibrium values. The alternative

³⁸ A previous version of this chapter was presented at the 1st World Finance Conference, in Viana do Castelo (Portugal). I acknowledge the inputs of the conference participants.

hypothesis is that the structural characteristics of microfinance industry in particular countries, specialist knowledge or regulatory advantages enjoyed by incumbent MFIs, renders entry into these regions sufficiently costly. We argue that the slower is the speed of adjustment, the longer is the period over which supernormal profits may persist, and the greater is the extent of the potential departure from the competitive ideal.

To date, academic research on microfinance competition is limited to; whether the presence of conventional banks affects the profitability and outreach of microfinance institutions (Cull, et al 2009b), whether microfinance competition worsens outreach and financial self-sufficiency (Hisako 2009), whether microfinance competition lowers interest rates (Porteous 2006), whether competition affects the incumbent village bank's ability to attract new clients (De Janvry and Sadoulet, 2005), whether competition affects the effort and lending decisions of the incumbent, the effects of competition on deposit growth, loan portfolio composition, repayment rates, and other effort (Park, Brandt, and Giles 2003). These studies do not answer the research question "are microfinance profits persistent?" because; (i) their focus is not MFI profitability and (ii) they employ static analytical framework which are only relevant when identifying causal relationships between variables when markets are in equilibrium (Geroski, 1990). Cross-sectional data usually does not contain sufficient information on which to base reliable policy decisions to promote competitive outcomes. Moreover, any abnormal profit realized in one period may disappear in the subsequent period which renders intervention by government unnecessary.

This chapter is similar to the previous in two ways. First, although the study employs a different estimation technique, the two studies nevertheless have employed the analysis of panel data methodology. Second, we use the same unbalanced dataset ranging from 1997 to 2007. That notwithstanding, this study differs from the previous chapter in that although the main focus is persistence of MFI profits, it offers more robust estimates as we introduce a new set of control variables; location/regional variable as a measure of the diverse environments in

which MFIs operate and regulatory policy variable. In particular, we seek to establish whether the conclusions and policy recommendations arrived at in the previous chapter differ significantly when we consider more control variables. This enables us to probe further evidence on the determinants of MFI profitability. Variations in regional or location factors may contribute to the growth in loan portfolios differently. Additionally, costs associated with regulation are likely to be higher for MFIs because of their small scale (Cull, et al 2011). Regulation may also lead to a mission drift if the regulatory requirements such as capital adequacy divert resources away from serving the core poor to better-off borrowers in order to improve on capital requirements. Regulation may also curtail innovation in lending mechanisms that has been the driving force behind MFIs' performance (Hartarska and Nadolnyak, 2007).

We thus seek to answer two principal research questions (i) Are microfinance profits persistent in Africa? (ii) Does the level of persistence converge to the mean, or do we observe explosive paths? While the competitive environment hypothesis predicts that profit differentials across firms should disappear in the long run, the empirical evidence tends to give little support to this theory. Answers to these questions are important empirically as well as from a policy perspective for the evolving microfinance sector in Africa. To date, there has been relatively little discussion, at least within academic circles, and almost no empirical analysis of persistence of MFIs profits. To address these issues, we combine high-quality data for 210 leading MFIs from Africa.

This study makes four contributions both to policy and literature as follows; (i) So far there is no empirical evidence on whether MFI predicted to earn a high long-run profit rate would in fact earn a high profit rate in subsequent periods. Previous studies examine the convergence of profitability to a long-run mean value, either for industries or for the economy as a whole; but the evidence for the microfinance sector is clearly lacking. We are convinced that the issue under investigation is highly relevant because if profits persistence is only a

short-term phenomenon among the MFIs, then its anti-competitive implication would be limited. (ii) This study is pioneering in using dynamic GMM estimators, two-step estimation method, in studies of determinants of microfinance profitability. (iii) Profits are also an important source for equity. If reinvested, this should lead to more stable MFIs which could promote financial stability in the microfinance sector. (iv) At the policy level, the existence of profit persistence may imply that shocks to profitability persist indefinitely and that competitive pressures never erode differences in profitability.

The rest of this chapter is organized as follows. Section 2 provides a brief literature review on persistence of firm profits. Section 3 describes the model specification. In Section 4, we provide description of data, which include measurements of our variable of interest. Section 5 discusses econometric methodology. Section 6 presents the empirical results and findings. Finally, a seventh section spells out some concluding remarks and policy suggestions.

4.2. Previous literature

Theoretical underpinnings

In a perfectly competitive market, no firm would be able to earn a profit rate above the competitive return³⁹. Thus the hypothesis tested in the profit persistence literature is that entry and exit is sufficiently free to eliminate any supernormal profits whatever their cause, and that all firms' economic profit tends to converge to the same long-run average rate (Berger et al., 2000; Singh 2003; Cuaresma and Gschwandtner, 2008). The puzzling question however is why do some firms consistently report supernormal profits? Theoretical literature shows that some firms may be more innovative or endowed with advantages that give them an edge over the others, which prevent imitation or block entry. These unique endowments include firm characteristics such as size, market share, advertising and research and development

³⁹ The basic premise of microeconomic theory is that a firm's economic profits should converge to zero in competitive markets or to a level that is just sufficient to provide a normal risk-adjusted return on capital.

expenditures. Thus, along this line of argument, it is innovation competition that leads to persistence in profits rather than price competition. Consequently, abnormal profit may tend to persist from year to year, and differences in average profit rates may be sustained indefinitely⁴⁰ (Galbreath and Galvin 2008). Indeed, financial institutions profits show a tendency to persist over time, reflecting either impediments to market competition or informational asymmetry (Berger et al., 2000).

Another competing argument considers persistence in levels of profitability to be a reflection of sensitivity to regional or macroeconomic shocks (see Berger et al., 2000). To the extent that regional shocks are serially correlated *ex post*, firms in a region subjected to positive shocks will tend to remain in the high end of profitability, provided that entry into these regions is sufficiently costly. Similarly, firms in a region subjected to negative shocks would tend to remain in the low end of profitability levels, provided that regional exit is sufficiently costly. Arguably, if it is sufficiently costly for firms to adjust their risk-return profiles in response to changing macroeconomic conditions, firms with high risk or pro-cyclical returns may perform consistently in the high end of the profitability levels during protracted economic expansions and perform consistently in the low end during protracted downturns (Singh 2003).

Cubbin and Geroski (1987) observe that considerable heterogeneities exist within most industries. They also find that firms in highly concentrated industries adjust much more slowly toward long-run equilibrium profit rates. Other studies that have examined differences between firms persistence of profit and the speed of convergence include Geroski and Jacquemin, (1988) and McGahan and Porter, (1999).

⁴⁰ Theoretical literature also suggests that profit persistence among firms involve interesting questions such as; what are their sources; why don't competitive forces make them vanish; and what their consequences are for industrial growth and dynamics. The distribution of profits in the future depends on the impact of the forces of competition over time on the present state, which is itself the outcome of similar previous forces. Since profit persistence reflects existence of impediments to competition that generates market power in output market and informational opacity which generates market power in the input markets, the argument that firms in concentrated markets might have some degree of market power and use it to manipulate prices in their favour both in the short and long run is intuitively plausible. Such firms could act to accelerate or retard the rate at which prices adjust to supply and demand shocks, affecting the speed of adjustment when equilibrium shifts (Gonzalo and Hachiya 2008).

MFIs differ in many respects, such as lending methodology. Cultural factors which are time invariant may also influence the direction of one lending type over another in a country or region, and it could be these social factors that are ultimately driving profitability rather than lending methodology. Having reviewed different strands in theoretical literature, it is clear that an appropriate empirical framework of the persistence of profits that controls for determinants of MFI profitability should capture several potential linkages.

A review of empirical evidence

Since the seminal work of Mueller (1977, 1986), there is a growing empirical literature focused on the persistence of firm profits. Mueller (1977), points that the average firm's profit comprises both permanent and short-run components, which converge over time. However, the direction of such effect is unclear; thus so far it is not possible to determine profit persistence in the microfinance sector *a priori*.

Most of the existing empirical literature on persistence of profit is based on manufacturing data, with only a handful of studies investigating persistence of profit in banking. The pioneering contribution by Mueller (1977), and subsequent Mueller (1986) used a stochastic approach, modelling profitability as a first order autoregressive (AR (1)) process⁴¹. Glen and Singh (2003) test profitability persistence in seven leading developing countries and conclude that both short and long-term persistence of firm profit rates for the developing economies are lower than those for advanced economies which he attributes to lower sunk cost to enter markets, faster growth rates of firms, weaker role of governmental regulations, and the existence of many large business groups. This is however inconsistent with theoretical predictions since it implies there is a higher level of competition in emerging

⁴¹ He concluded that there is significant variability in the speed with which profits adjust to their firm-specific permanent value across different sectors and countries. Moreover, difference in convergence patterns might be associated with steady flow of resources through the persistence of both higher market power and profits above or below average levels over time. The potential influence of initial profit rates (See e.g. Mueller, 1990; Goddard and Wilson, 1999) has also been the subject of research

markets, but the findings confirm Waring (1996) and Geroski and Jacquemin (1988) on a sample of industrial firms in three European countries.

Consistent with theoretical postulation that innovations play the outmost key role in profit persistence, (Cefis, 2003) finds that firms that are persistent innovators and earn above-average profits have a high propensity to continue doing both while earning above normal profits which corroborates previous findings by (Mueller 1990). However, extra profit due to innovations can only be temporary, vanishing when competitors start to imitate the products or processes of the innovative leading firm.

What does the evidence in the financial sector show? A recent wave of studies in the banking sector has emerged consistently showing that the sector is not perfectly competitive. Using a dynamic panel model, Goddard, et al (2010) investigates the convergence of bank profitability in eight European Union member countries, between 1992 and 2007. Their results show evidence of persistence of excess profit from one year to the next, which was lower in 1999-2007 than it was in 1992-98 in all the eight countries. Their findings are consistent with Flamini et al (2009) who in a cross-country study for Sub-Saharan Africa, finds modest persistence. Athanasoglou, et al. (2008) applies a dynamic panel data model to study the performance of Greek banks over the period 1985-2001 and find profit persistence. This result confirms those reported in Carbo and Fernandez (2007) who document persistence in bank spreads in Europe. Goddard, et al. (2004a) shows persistence of profit to be higher for savings and co-operative banks than for commercial banks whose profit levels tend to adjust fairly fast to their average level which corroborates Yurtoglu (2004) among Turkish banks. On the contrary Goddard, et al. (2004b) finds in both sets of their estimations that there are quite large differences between countries in the magnitudes of the persistence coefficients. On a similar vein Berger et al. (2000) conclude that profit converges to its long-run average value more slowly in U.S. banking than in manufacturing, and market power plays a significant role in enabling abnormal profit to persist. On the contrary, Bektas, (2007) uses the panel data

method to test for unit roots of profitability for 28 surviving banks in Turkey between 1989 and 2003 and their persistence. He concludes that persistence of profits does not exist in the long run. One of the central conclusions in the literature is that rivalry alone does not therefore erase persistent asymmetries among firms.

Turning to regulatory policies as a control variable, Cull, et al⁴² (2011) finds supervision to be negatively associated with profitability which confirms previous findings by Hartarska (2005). This is however inconsistent with Mersland and Strøm (2009), who using an endogenous equations approach establish that regulation does not have a significant impact on financial performance. Hartarska and Nadolnyak (2007) similarly find that regulation does no matter on financial performance, after controlling for the endogeneity of regulation. Barth et al, (2008; 2004) similiary finds cross-country evidence that regulation has no impact on the performance of conventional banks. Clearly this issue remains contestable.

Table 4.1: Summary of profit persistence studies

Author	Country	Sample period	Observation per firm	Speed of adjustment
Muller (1990)	US	1950-1972	23	0.183
Cubbin and Geroski (1987)	UK	1948-1977	30	0.482
Geroski and Jacquemin, (1988)	UK	1947-1977	29	0.488
	France	1965-1982	18	0.412
	Germany	1961-1981	21	0.410
Waring (1996)	US	1970-1989	20	0.540
Goddard and Wilson, (1999)	UK	1972-1991	20	0.590
Berger et al (2000)	US banks	1969-1997	29	0.900
Maruyama and Odagiri (2002)	Japan	1964-1982	19	0.639
		1983-1997	15	0.597
Glen and Sign (2003)	Emerging countries	1980-1994	10	0.01-0.42
Ces (2003)	UK-with patent	1978-1991	14	0.187
	UK-no patent	1978-1991	14	0.813
Goddard, et al. (2004a)	EU-Savings banks	1992-1998	7	0.299
	EU-Commercial banks	1992-1998	7	-0.149*
Goddard, et al. (2004b)	EU-Banks	1992-1998	7	0.260
Yurtoglu (2004)	Turkish banks	1985-1998	14	0.430
Bektas, E (2007).	Turkish banks	1989-2003	15	0.030
Galbreath and Galvin	Japan	1991-2001	11	0.560

42 Investigates implications and trade-offs of regulation for the world's largest MFIs, by examining impact on profitability and outreach to small-scale borrowers and women, drawing on a financial data of 245 MFIs from the MIX database that allows for within-country variation regarding MFI regulation and supervision.

(2008).				
Athanasoglou, et al. (2008)	European banks	1995-2001	7	0.350
Flamini et al (2009)	Sub-Sahara Africa	1998-2006	Cross country	0.210
Goddard, et al. (2010)	European banks	1992-2007	Cross country	0.333

*Insignificant

Table 4.1 shows that the empirical evidence to date focuses on a relatively small number of countries, and identifies positive autocorrelation in firm profit rates observed over time. The persistence of firm profit is driven by firm-specific, industry-specific and macroeconomic context. Moreover, literature lacks formal verification of the persistence on microfinance profitability, which might be relevant for the constantly evolving microfinance industry. The main objective of this chapter is therefore to fill this gap in the existing literature. This study therefore formulates a dynamic model of the determinants of MFI profitability, while controlling for other factors that are expected to influence profitability.

4.3. Design of the model

The persistence of profit approach is based on empirical investigation of the dynamics of firm level profit. Much of the existing literature is based on the structure conduct performance paradigm which is based on the static, cross-sectional methodology. An alternative to conduct-based measure of competition uses *H-statistic* and reports evidence of monopolistic competition (Carbo et al. 2009; Goddard and Wilson, 2009). There is no certainty that conduct or performance measures observed at any point in time represent equilibrium values. For example, an empirical association between high concentration and high profitability that is the standard in structure conduct performance models may simply appear by chance, from observations taken during a period when the relevant market is in a state of disequilibrium (Goddard and Wilson, 2009).

Rather than the standard linear regression model adopted in the previous chapter, and to infer the speed at which abnormal profits above or below the normal tend to dissipate, we develop a dynamic model which enables us to derive the rate of adjustment that is most

consistent with the observed panel data⁴³. We therefore augment model (3.3) in the previous chapter to a dynamic specification (4.1).

We also control for other factors that may explain MFI profitability. Due to country specific differences that exist in the Africa microfinance sector, we test for potential location effects. We contend that even within the same continent, location specific variations may have an impact on MFI profitability⁴⁴. Additionally, we note that, given the large time frame of our dataset and the developments that might have taken place in the Africa microfinance sector during the sample period, it is possible that time effects are present in the error component of the model. Failure to account for these two effects might bias the estimates in unknown magnitudes and directions. We test for these effects by augmenting model (4.1) to include regional dummies for West, East, South and Central Africa. We further augment the model with industry-specific factors such as the type of the charter that has established the MFIs and regulatory environment. From an economics point of view, the main difference between for-profit and not-for-profit status is the ability to distribute profits (Glaeser and Shleifer 2001). If not-for-profits earn revenues greater than costs, they reinvest it back into the firm to further social missions. On the contrary, for-profit institutions have a leeway on what they can do with after-tax profits.

In order to avoid over-identification problems, and to control for the overall institutional development on MFI profitability, we replicate the two time-variant exogenous variables from Heritage Foundation in the empirical specifications that were used in the previous chapter. We also include all the variables described in the previous chapter to control for important influences on MFI profitability. Thus, to examine profit persistence, while

43 One may however be tempted to ask the question why we have to undertake cross-country study rather than country specific. We argue that including several countries in this study is important as it enable us understand the impact of the different location advantages, regulatory restrictions on MFI growth, institutions development and macroeconomic environments on MFI profitability which we control for before we draw any conclusions. By undertaking a cross-country analysis, it is possible to narrow the range of factors. In view of the findings, we are able to draw some policy implications that may be useful to MFI management, policy makers and shareholders in the Africa economies.

44 Undocumented regional differences, such as prices, infrastructure, or cultural attributes, may influence the demand for and use of credit.

controlling for other covariates in a rather simplified way, the econometric model is expanded as follows:

$$\Pi_{ict} = \alpha + \eta\Pi_{ict-1} + \sum_{j=1}^J \beta_j X_{ict}^j + \sum_{m=1}^M \beta_m X_{ct}^m + \sum_{n=1}^N \beta_n X_{ct}^n + \sum_{l=1}^L \beta_l X_{ct}^l + \delta D_r + \varepsilon_{ict} \dots \dots \dots (4.1)$$

More formally, Π_{ict} is the profitability of MFI i located in country c , at time t , with $i=1, \dots, N$, $t=1, \dots, T$; α is the regression constant, X_{ict}^j is a vector of MFI-specific characteristics (j) of MFI i in country c during the period t ; X_{ct}^m is a vector of macroeconomic country-specific variables (m) in country c during the period t ; X_{ct}^n is a vector of institutional development indicators (n) in country c during the period t ; X_{ct}^l refers to industry-specific factors (l) and $\varepsilon_{ict} = \nu_i + \gamma_t + \mu_{ict}$ is the disturbance; γ_t is the unobservable time effects, ν_i is the unobserved complete set of individual MFI-specific effect which controls for all cross-sectional (or ‘between MFIs’), and μ_{ict} is the idiosyncratic error. Augmenting the model with unobservable time effects modifies the specification into an unbalanced two-way error component model. D is a binary for the location-specific dummy variables. η, β, δ are the coefficients to be estimated.

Π_{ict-1} is the one-period lagged profitability and η is the speed of adjustment to equilibrium which gives us some information about the structure of the market. A value of η between 0 and 1 implies that any shock to profits will persist but will nevertheless return to their normal level. In competitive firms, we expect this to occur quickly, while in less competitive industries we might anticipate high persistence and a value of η , closer to 1. If η lies between 0 and -1, then profits revert to normal in an oscillating manner. This might occur in periods of rapid change in the structure of the microfinance sector which can cause MFI profitability to become highly volatile.

4.4 Data and measurement

Data description

This study analyses profit persistence of the microfinance industry in Africa economies, using the same data set and measurements as the previous chapter. This comprises 210 MFIs across 31 developing economies in Africa for the period 1997-2007 with 2,310 observations. Persistence of profits is evaluated by using the net income after tax to total assets (ROA) as a profit measure. In order to avoid duplication we shall not dwell into a detailed discussion about the same. Reference should be made to previous chapter on a formal discussion of the conceptual framework, data and measurement of the variables.

Industry specific factors are characteristics that are unique to the microfinance sector. In order to control for the differences in profitability arising from the charter that establishes the MFIs, we use (i) *Prof* as a dummy variable indicating MFIs formal profit status⁴⁵ (equal to one if the organization is for-profit). Again, the markers are drawn from MIX data set. MFIs with not-for-profit charters tend to have objectives and funding arrangements that are different from those of more commercially-oriented MFIs (such as banks or credit unions). Not-for-profit MFIs place more emphasis on outreach while at the same time relying relatively more on donated funds to subsidize those efforts (Cull, et al, 2009a). (ii) *Region* is a dummy variable for each of the four regions in Africa to capture location impacts. The nature and composition of microfinance business may be such that certain locations are favoured while others are avoided. (iii) *REG* is a binary variable indicating regulation status equal to one if regulated and zero otherwise⁴⁶. Table 4.2 lists the variables used to proxy profitability and its determinants (including notation and the predicted effect of the determinants according to the literature).

45 More of the objectives of commercial microfinance is discussed by Robinson (2001).

46 To the extent that reserve requirements are not remunerated or remunerated at less-than market rates, MFI regulation may impose a burden on these institutions. Moreover, regulation of MFIs may lead to a mission drift if the regulatory requirements such as capital adequacy divert resources away from serving the poor to serving better off borrowers in order to improve capital adequacy ratios with implications on profitability.

Table 4.2: Summary of variables and measurement

Variable	Notation	Measure	Predicted effect	Source of data
<i>Dependent variable</i>				
Profitability	ROA	Net profits after taxes/Assets		The MIX
<i>Control variables</i>				
<i>MFI-specific</i>				
Capital	CAP	Equity/Assets	Positive	The MIX
<i>Credit risk</i>				
Portfolio at Risk	PAR-30	Outstanding balance, portfolio overdue > 30 Days + renegotiated portfolio/Adjusted Gross Loan Portfolio	Negative	The MIX
Write off Ratio	WOR	Value of loans written-off/Adjusted Average Gross Loan Portfolio		
Loan Loss Reserve Ratio	LLR	Loan loss reserve/Value of loans outstanding		
Risk Coverage Ratio	RC	Adjusted Impairment Loss Allowance/PAR > 30 Days		
<i>Other factors</i>				
Efficiency	Eff	Adjusted Operating Expense/Adjusted Average Gross Loan Portfolio	Negative	The MIX
Gearing	GR	Debt/equity ratio	Negative	The MIX
Age	Ag	Age of the MFI in years	Indeterminate	
Size	S	Log of total assets	Indeterminate	
Loan size	LS	Adjusted Average Loan Balance per Borrower/GNI per Capita	Positive	
<i>Industry-specific</i>				
For-profit dummy	Prof	Dummy variable equal to one for profit and zero otherwise	Indeterminate	The MIX
Regulated	REG	Dummy variable equal to one for regulated and zero otherwise	Indeterminate	
Region	WA	Dummy variable equal to 1 for West Africa and 0 otherwise	Indeterminate	The MIX
	CA	Dummy variable equal to 1 for Central Africa and 0 otherwise		
	SA	Dummy variable equal to 1 for South Africa and 0 otherwise		
	EA	Dummy variable equal to 1 for East Africa and 0 otherwise		
<i>Institutional development</i>				
Property rights	PR	Composite Index ranging from 10 (Private property is rarely protected) to 100 (Private property is guaranteed by the government)	Positive	Heritage Foundation
Freedom from corruption	COR	Composite Index 10-point scale Corruption Perceptions Index (CPI) in which a score of 100 indicates very little corruption and a score of 0 indicates a very corrupt government		
<i>Macroeconomic environment</i>				
Inflation expectations	INF	Previous annual % change of the GDP deflator	Indeterminate	World Bank (WDI)
Per capita Income	GNI	GNI per capita, Atlas method (current US\$)	Positive	

4.5. Empirical methodology

4.5.1 Estimation and testing

We begin this section by first estimating and testing for the time effects. Consistent with the previous chapter, we tested the joint significance of the unobservable time effects by the $H_0: \gamma_2 = \gamma_3 = \dots \gamma_T = 0$ at the 95% confidence level. We experimented with many year dummies and it turns out that none of the time dummies is significant. The fact that the year dummy variables are insignificant suggests that there may be no additional aggregate macroeconomic effects influencing MFI returns in Africa other than those we have explicitly controlled for in the estimation model. Since Lagrange Multiplier (LM) tests show that time effect is not significant, we proceed with the estimation of the following model;

$$\Pi_{ict} = \alpha + \eta\Pi_{ict-1} + \sum_{j=1}^J \beta_j X_{ict}^j + \sum_{m=1}^M \beta_m X_{ct}^m + \sum_{n=1}^N \beta_n X_{ct}^n + \sum_{l=1}^L \beta_l X_{ct}^l + \delta D_r + \varepsilon_{ict} \dots \dots \dots (4.2)$$

$$\varepsilon_{ict} = \nu_i + \mu_{ict}$$

Static panel estimates, as do the OLS models, omit dynamics causing the problem of dynamic panel bias and as such do not allow us to study the dynamics of adjustment (Baltagi, 2008). Omitted dynamics means that such models are misspecified, because they omit the entire history of the right-hand-side variables (Greene, 2008).

When estimating equation (4.2), several econometric problems may arise. First is endogeneity: more profitable MFIs may be able to increase their equity more easily by retaining profits. They could also pay more for marketing their products and increase their size, which in turn may affect profitability. However, the causality could also run in the opposite direction, as more profitable MFIs may hire more personnel (as per the expense preference theorem), reducing their operational efficiency.

The dynamic structure of our model makes the OLS estimator biased upwards⁴⁷ and inconsistent, since the lagged level of profitability is correlated with the error term. The

⁴⁷ The estimation methods based on the OLS principle are vulnerable to the omitted variable bias if some important determinants of MFI profitability are not included among the regressors.

within transformation does not solve the problem, because of a downward bias (Nickel, 1981) and inconsistency. We tackle these problems by moving beyond the methodology currently in use in the empirical literature of bank profitability of mainly fixed or random effects⁴⁸.

A possible solution on the endogeneity problem is represented by the Generalized Method of Moments (GMM) technique. GMM developed by Hansen (1982), and the first-differenced GMM estimators for the AR (1) panel data that was later developed by Arellano and Bond (1991) provides a convenient framework for obtaining asymptotically efficient estimators in this context. GMM estimators are designed for datasets that has many panels and few periods and gives consistent estimates under the assumption that there is no autocorrelation in the idiosyncratic errors and the explanatory variables are weakly exogenous. The identifying assumption that there is no serial correlation in the idiosyncratic errors ε_{it} can also be validated by testing for no second order serial correlation in the first-differenced residuals. Negative first order serial correlation is expected in the first-differenced residuals if the idiosyncratic errors ε_{it} are serially uncorrelated while positive serial correlation is expected in the levels residuals (Bond and Windmeijer, 2002).

With a fixed number of years panel and a substantial number of observations, Arellano and Bond (1991) suggests estimating equation (4.2) with GMM in first-differences, by first differencing the initial equation, which removes the time invariant ν_i . This renders the equation estimable by instrumental variables as;

$$\pi_{it} - \pi_{it-1} = \alpha_i(\pi_{it-1} - \pi_{it-2}) + \beta(x_{it} - x_{it-1}) + \nu(\nu_i - \nu_i) + (\mu_{it} - \mu_{it-1}) \dots \dots \dots (4.3)$$

Arellano and Bond estimator has however been criticized when applied to panels with very small T , on the premise that under such conditions this estimator is inefficient if the instruments used are weak (Arellano and Bover 1995; Blundell and Bover 1998; Phillips and Donggyu 2007). Blundell and Bond (1998) for example shows that when η approaches 1, so

48 Recent studies in the banking literature that use fixed or random effects include for example Flamini et al (2009); Sufian and Habibullah (2009), Kosmidou (2008), Hsiu-Ling et al (2007)

that the dependent variable follows a path close to a random walk, the differenced-GMM (Arellano and Bond, 1991) has poor finite sample properties, and it's downwards biased, especially when T is small. Therefore, Blundell and Bond (1998) proposed the System-GMM which is derived from the estimation of a system of two simultaneous equations, one in levels (with lagged first differences as instruments) and the other in first differences (with lagged levels as instruments). In multivariate dynamic panel models like ours, System-GMM estimator is shown to perform better than the differenced-GMM when series are persistent (η close to unity) and there is a dramatic reduction in the finite sample bias due to the exploitation of additional moment conditions (Blundell and Bond 2000).

We thus resort to the system GMM⁴⁹ since there is a gain in efficiency, and the instrument set is valid. The system GMM estimator also controls for unobserved heterogeneity. Moreover, it's more suited to estimate MFI profitability equations in our empirical framework, than the first-differenced GMM estimator used by some previous authors (see for example Flamini et al, 2009). MFIs profitability outcomes may be highly persistent so their lagged levels might be very weak instruments for the first differenced equations. We instrument for all regressors except for those which are clearly exogenous.

We are also confronted with the choice of using one-step or two-step estimation. The one-step estimator assumes homoscedastic errors while the two-step estimator uses the first-step errors to construct heteroscedasticity-consistent standard errors which imply that the one-step estimators are less efficient than the two-step estimators even in the presence of homoscedastic error terms (Arellano and Hahn, 2007). Although two-step estimators are asymptotically more efficient, they present standard errors estimates that are severely downward biased. However, it is possible to solve this problem using the finite-sample

49 There are two types of GMM estimators that have been frequently used. The first one is the first-difference GMM estimator, developed by Arellano and Bond (1991), which uses first-differenced equations with suitable lagged levels as instruments. The second one is the system GMM estimator, developed by Arellano and Bover (1995) and Blundell and Bond (1998), which augments the former by addition of equations in levels with lagged first-differences as instruments. The system GMM estimator uses the levels equation (e.g. equation 4.1) to obtain a system of two equations: one differenced and one in levels. By adding the second equation, additional instruments can be obtained. Thus the variables in levels in the second equation are instrumented with their own first differences.

correction to the two-step covariance matrix derived by Bond and Windmeijer (2002), which can make two-step robust GMM estimates more efficient than one-step robust ones, especially for system GMM (Roodman, 2009).

The last challenge is the risk of omitted variables. To that end, we follow a general to specific strategy by estimating an equation with all possible regressors according to the existing literature and Africa specific characteristics (see Appendix A). We, then, test through a Wald test the joint hypothesis that the coefficients of the variables that are not significant individually are equal to zero. If not rejected, we re-estimate the model only with the controls which were significant in the general regression. Otherwise, we test a less restrictive hypothesis but still trying to reduce the number of non-significant regressors to the maximum extent possible. We stop reducing the number of regressors when we can reject that the remaining set of coefficients of the control variables is equal to zero. The coefficients obtained in this way are even more efficient as the number of regressors is reduced to the minimum.

Finally, to confirm the validity of the instruments, we perform Hansen's or Sargan test of over-identifying restrictions, which is asymptotically distributed as $\chi^2(k)$ where k denotes the number of over-identifying restrictions and a test of serial correlation among the residuals. We test whether Arellano-Bond orthogonality conditions are fulfilled. If there is no autocorrelation in the levels equation, then the error term in the first-difference equation has negative first-order autocorrelation and zero second order autocorrelation (Baltagi 2008). If we reject the hypothesis that there is zero second order autocorrelation in the residuals of the first-difference equation, then we also reject the hypothesis that the error term in the levels equation is not autocorrelated which indicates that the Arellano-Bond orthogonality conditions are not valid no matter the number of lags used as instruments.

In order to design a suitable model, one key issue remains to be dealt with. We should confirm whether capital is better modelled as an endogenous variable or as a predetermined

variable. It may be the case that the profits earned are fully or partially reinvested which may lead to higher capital. In this case, we would predict a positive causation from profits to capital and based on these considerations, model capital as a predetermined variable rather than strictly exogenous variable. Although Athanasoglou, et al (2008) finds a positive and significant effect of capital on bank profitability, Berger (2005) finds positive causation in both direction between capital and profitability. Based on this argument, we test this hypothesis by re-running model (4.2) and treating capital as a predetermined variable. The Sargan test for over-identifying restrictions shows that our specification is well modelled, with a significantly higher *p-value* based on the hypothesis that capital is predetermined⁵⁰ (see Table 4 in Appendix B).

To probe further on the capital-profits association, we conduct Granger causality tests. This enables us to examine how each variable affects future changes in the other variable. We are aware that Granger-causation cannot establish causality in a theoretical sense; it is not a test for strict exogeneity and may be misleading if, for example, the processes determining the variables of interest involve expectations and that it only reflects historical correlations which does not necessarily imply economic causation. We nevertheless believe that this enables us to infer the link between capital and profits. We report our simple Granger causality test in Table 5 (Appendix B).

One limitation of using GMM estimator is that the differencing removes any time invariant explanatory variable along with the panel level effect, which does not allow us to introduce the main policy control variables of interest for regulatory status, diversity in regional distribution and for profit status into our main estimation. We would encounter the same effect by estimating a linear model with fixed effects (FE), since this doesn't allows us to control for factors which differ across MFIs but are constant through time and which we

⁵⁰ When capital is assumed to be endogenous variable, the *p-value* for this hypothesis is 0.00. In contrast, when capital is assumed to be exogenous, the *p-value* is 0.18, implying that the instruments used are acceptable.

cannot measure directly known as unobserved MFI heterogeneity⁵¹. A random effect model seems to be the natural choice. We therefore re-estimate model 4.2 in a linear fashion by assuming random effects (RE).

4.5.2 Univariate analysis

Tables 4.3 and 4.4 present summary statistics. When descriptive statistics are broken down by region, we observe some interesting regional differences. All the regions report an average negative profitability. Although West Africa has the oldest MFIs on average, the region has the highest number of MFIs reporting average loan default rate and the most inefficient on the management of operational expenses. This may partly be explained by the fact that MFIs in some West Africa economies face interest rate ceilings, such as the West African Monetary Union usury law that caps MFI interest rates at 27 percent and bank interest rates at 18 percent (Lafourcade, et al 2006). Although South Africa region has the highest capital adequacy ratio, it also reports the lowest return on assets (at an average of -2.5%) while Central Africa has the most mature MFIs based on age. East Africa has the largest MFIs in terms of average assets. It also offers the smallest loan size. Perhaps this explains why the region has a higher depth of outreach than other regions. The region dominates in terms of outreach with 52 percent of all savers and 45 percent of all borrowers in Africa (Lafourcade, et al 2006). With respect to gearing ratio, MFIs from Central Africa region use more of debt relative to equity in terms of choice of financing compared to other regions. There seems to be no regional patterns with respect to macroeconomic variables in the raw data.

51 In micro-econometrics the unobserved firm heterogeneity means unobserved firm characteristics such as corporate governance and firm structure. Time variant explanatory variables, however, may be correlated with this unobserved firm heterogeneity. Managers may for instance opt to work for unregulated MFIs depending on their preferences for autonomy in decision making, desire and ability to implement microfinance innovations and therefore MFI regulation may limit the manager's ability to innovate. The significant heterogeneity of MFIs suggests that corporate governance may be correlated with MFI characteristics including regulatory status.

Table 4.3 Regional/location descriptive and summary statistics

		South Africa						Central Africa					
Variable	Notation	Obs	Mean	Median	Std Dev	Min	Max	Obs	Mean	Median	Std Dev	Min	Max
Return on assets	ROA	194	-0.025	0.00	0.103	-0.458	0.226	113	-0.007	0.00	0.082	-0.342	0.195
Age	AG	223	7.543	7	4.104	3	28	121	9.612	8	8.186	3.00	40
Capital	CAP	222	0.465	0.51	0.495	-1.366	1.000	121	0.313	0.235	0.244	-0.024	1.000
Gearing	GR	196	1.231	0.63	1.486	0.000	9.090	91	2.325	2.382	1.595	0.000	5.650
Efficiency	EFF	163	0.776	0.59	0.643	0.080	4.150	87	0.293	0.235	0.315	0.000	2.580
Portfolio at Risk	PAR	223	0.103	0.04	0.156	0.000	1.050	121	0.081	0.03	0.109	0.000	0.500
Log Size	S	223	14.488	14.46	1.549	9.720	19.756	121	13.862	13.81	2.156	7.268	18.802
Loan size	LS	224	1.1085	0.541	1.604	0.000	9.038	89	1.267	0.632	2.403	0.00	16.48
Lagged Inflation rate	INF	404	0.045	0.00	0.063	-0.006	0.340	252	0.026	0.000	0.056	-0.139	0.299
Per capita income	GNI	165	0.073	0.06	0.106	-0.188	0.289	92	0.076	0.083	0.079	-0.167	0.242

This Table presents the summary statistics. A detailed description of the definition and sources of the variables is given in Table 4.2.

Table 4.4 Regional/location descriptive and summary statistics

Variable	Notation	East Africa						West Africa					
		Obs	Mean	Median	Std Dev	Min	Max	Obs	Mean	Median	Std Dev	Min	Max
Return on assets	ROA	353	-0.015	0.00	0.099	-0.866	0.324	442	-0.0064	0.00	0.0886	-0.409	0.100
Age	AG	382	9.199	7	6.807	3	33	437	9.78	9	5.78	3	31
Capital	CAP	382	0.410	0.37	0.292	-1.140	0.994	431	0.318	0.27	0.303	-0.983	1.000
Gearing	GR	328	1.603	1.151	1.479	0.000	6.100	353	2.082	1.597	1.921	0.000	11.000
Efficiency	EFF	307	0.434	0.34	0.736	0.000	12.250	379	2.211	0.230	11.149	0.000	121.000
Portfolio at Risk	PAR	381	0.050	0.022	0.077	0.000	0.790	452	0.719	0.027	0.585	0.000	0.748
Log Size	S	377	14.793	14.51	1.929	8.412	20.541	421	14.299	14.36	2.433	7.102	19.063
Loan size	LS	429	1.007	0.523	1.88	0.000	15.05	450	1.025	0.318	1.864	0.00	15.05
Lagged Inflation rate	INF	627	0.032	0.000	0.049	-0.058	0.219	795	0.041	0.000	0.118	-0.139	2.3
Per capita income	GNI	310	0.077	0.10	0.092	-0.106	0.273	351	0.138	0.096	0.231	-0.125	0.434

This Table presents the summary statistics. A detailed description of the definition and sources of the variables is given in Table 4.2.

We present a correlation test matrix in Table 4.5. Although most correlation coefficients among variables of interest are low, they are nevertheless significant but not perfectly linear. Most notably, regulation status, credit risk measure, efficiency, age, size, gearing ratio are all significantly correlated with profitability measure which is perhaps an indication that MFIs with higher ROA are those that are regulated, larger in size, older, efficient and with lower loan default rates. Age may reflect survivor bias but it is also positively and significantly correlated with size, gearing and regulation, an indication that as MFIs matures, they also become larger, use more of debt in their financing options and become regulated over time. The significant correlation between ROA and gearing ratio implies that higher debt relative to equity may be driving profitability. Interestingly none of the quality of institutions indices or regional dummy variables are significantly correlated with profitability. Both security of property rights and freedom from corruption are nevertheless significantly and positively related with Central and South Africa dummies but not collinear. To uncover the impact that these summary statistics may have on MFIs profitability requires rigorous econometric analysis which we pursue in the next section.

Table 4.5 Correlations Matrix

	ROA	AG	S	CAP	GR	EFF	PAR	LS	INF	GNI	PROF	WA	SA	EA	CA	REG	PR	COR
ROA	1.000 1058																	
AG	.095** 1055	1.000 1143																
S	.121** 1056	.360** 1141	1.000 1144															
CAP	-.016 1058	-.166** 1142	-.112** 1143	1.000 1145														
GR	.130** 876	.163** 950	.153** 952	-.461** 952	1.000 953													
EFF	-.312** 865	-.065* 897	.008 899	.062 899	-.211** 754	1.000 899												
PAR	-.075** 1057	.060* 1141	.005 1142	-.081** 1143	-.004 951	.032 898	1.000 1145											
LS	.123** 1055	.108** 1139	.003 1140	-.116** 1141	.096** 949	-.098** 897	-.026 1142	1.000 1143										
INF	.044 1033	.075** 1109	-.033 1110	.067* 1111	.005 923	.102** 876	.114** 1111	-.062* 1109	1.000 2066									
GNI	.042 865	.092** 904	.045 904	-.044 906	.078* 756	-.054 858	.078* 905	-.006 904	.240** 897	1.000 906								
PROF	-.061 1058	.022 1143	.045 1144	.045 1145	-.147 953	.080 899	.045 1145	-.168 1143	.081 2066	.013 906	1.000 2310							
WA	.054 1058	.077** 1143	-.041 1144	-.117** 1145	.097** 953	-.178** 899	-.067* 1145	.031 1143	-.003 2066	.096* 906	.123** 2310	1.000 2310						
SA	-.057 1058	-.128** 1143	-.018 1144	.121** 1145	-.145** 953	.276** 899	.166** 1145	.044 1143	.083** 2066	-.064* 906	.030 2310	-.402** 2310	1.000 2310					
EA	-.019 1058	.004 1143	.079** 1144	.062* 1145	-.040 953	-.007 899	-.102** 1145	-.096** 1143	-.025 2066	-.063 906	-.079** 2310	-.519** 2310	-.332** 2310	1.000 2310				
CA	.018 1058	.041 1143	-.038 1144	-.071* 1145	.118** 953	-.059 899	.052 1145	.043 1143	-.060** 2066	.031 906	-.115** 2310	-.279** 2310	-.175** 2310	-.230** 2310	1.000 2310			
REG	.134** 1051	.131** 1135	.116** 1136	-.202** 1137	.144** 945	-.166** 892	-.026 1137	.142** 1135	-.040 2056	.006 899	-.219** 2299	.109** 2299	-.072** 2299	-.104** 2299	.077** 2299	1.000 2299		
PR	.202 58	.514** 66	-.101 66	.113 65	-.491** 52	.159 56	-.129 66	0.038 66	.002 113	-.168 54	-.038 132	0.80 132	.453** 132	-.290** 132	-.301** 132	-.179* 132	1.000 132	
COR	-.148 58	.235 66	-.031 66	-.156 65	-.438** 52	.365** 56	.045 66	-0.043 65	-0.92 113	-2.04 54	.098 132	.119 132	.344** 132	-.114 132	-.499** 132	-.284** 132	.562** 132	1.000 132

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed). Figures beneath are the observations (N)

4.5.3 Multivariate regression analysis

Having examined the correlations which present an insight into how variables are related, we proceed to estimate a dynamic panel regression analysis which overcomes the multicollinearity between return on assets (ROA) and the previous return and which allows us to investigate the strength of these correlations. The estimation models encompass explanatory variables defined in Table 4.2.

4.6. Empirical results and discussions

Table 4.6 reports the results from our basic specification (4.2). The estimated model fits the panel data reasonably well, having fairly stable coefficients, while the Wald-test indicates fine goodness of fit since the overall test statistic shows rejection of the hypothesis that all coefficients are equal to zero (rejects the null hypothesis of joint insignificance of parameters). Although the estimated equation indicates the presence of negative first-order autocorrelation, this does not imply that the estimates are inconsistent. Inconsistency would only hold if the second order autocorrelation was present but this is rejected by the test for AR (2) errors (Arellano and Bond, 1991). The value test for the second order autocorrelation implies that the moment conditions of the model are valid.

4.6.1 Persistence of profit and speed of convergence

The final column of Table 4.6 gives the preferred model. In all the regressions, the speed of adjustment coefficient η (the lagged profitability measure) is positive and significant. The coefficient on the lagged dependent variable is about 0.3 and significantly greater than zero. The departure from perfect competition is however marginal—profits tend to adjust fairly fast to their average level. This implies that there is some moderate persistence in microfinance profitability in Africa. It is plausible that if there is a shock to profitability level in the current

year, about 30% of the effect will persist into the following year. Intuitively, microfinance industry in Africa is not competitive.

The theoretical proposition tested in the profit persistence literature that entry and exit is sufficiently free to eliminate any supernormal profits whatever their cause, and that all firms' economic profit tends to converge to the same long-run average rate (see Berger et al., 2000; Singh 2003; Cuaresma and Gschwandtner, 2008) is not supported here. Our findings signal barriers to competition reflecting either impediments to market competition or informational asymmetry (Berger et al., 2000). It may also indicate the existence of market power in the industry (Goddard and Wilson, 2009). All these factors may encourage and intensify competition or slow/accelerate the convergence process. Because microfinance industry in Africa is not competitive, the application of dynamic incentives at the root of microfinance loan contracts as postulated by Guttman (2008) and Chowdhury (2007) may not be undermined. The role of the state should thus be to foster competition in the microfinance industry. Government policies that prioritise MFIs stability over competition may have a tendency to introduce new barriers to competition by insulating incumbent MFIs from rivalry.

Comparable evidence amongst the MFIs is scant. Cull, et al (2009b) for example examines competition between conventional banks and MFIs and how this impacts on MFIs profitability and outreach of MFIs. They find that the effect of competition on MFI profitability appears weak. Hisako (2009) investigates whether microfinance competition worsens outreach and financial self-sufficiency. He finds that competition does not worsen financial self-sufficiency (FSS) and therefore does not raise subsidy dependence. Porteous (2006) examines whether microfinance competition lowers interest rates. McIntosh, De Janvry and Sadoulet (2005) examine whether competition affects the incumbent village bank's ability to attract new clients while Park, Brandt, and Giles (2003), investigates whether competition affects the effort and lending decisions of the incumbent. These studies do not answer the research question as to whether microfinance profits are persistent ostensibly

because; (i) their focus is not on MFI profitability and (ii) their empirical framework does not control for endogeneity on performance using a dynamic panel econometrics; they employ static analytical framework which is nevertheless useful only in identifying causal relationships between key variables when markets are in equilibrium (Geroski, 1990).

In the conventional banking industry, a similar weak evidence of profit persistence was found for the conventional European banks by Goddard, et al (2010; 2004), amongst retail banks in Africa by Flamini et al (2009) and for the Greek banks by Athanasoglou, et al. (2008). It is however far from a forewarn conclusion that what holds true for large, traditional banks as a whole will also hold true for MFI's.

4.6.2 Control variables-further analysis

Table 4.6 shows that the significance and the relative magnitude of influence of the MFI-specific, macroeconomic and quality of institutions measures, evidenced in the previous chapter are preserved with notable exception of security of property rights, which is positive but insignificant. Property rights finding is counter-intuitive and should be investigated further. Macroeconomic context is similarly insignificant. However, as financial systems develop and the ongoing reform process in Africa ends, both the current and future rates of economic growth are likely to have an enhanced impact on MFI profitability. Consistent with the previous chapter, MFI age is not significantly associated with MFI profitability. Contrary to the previous chapter, we find evidence that gives credence to the hypothesis that firms which use more of debt financing are more profitable. The difference in results with this chapter is due to a major methodological update, including retroactive revisions and updating of the MIX market database. Our findings imply that MFIs that are more leveraged are also more profitable.

Results show that efficient MFIs are more profitable. Consistent with previous chapter and with much of the previous banking literature (see e.g. Goddard et al 2010, Athanasoglou,

et al 2008), efficiency appears to be a more important determinant of MFI profitability. Similarly size and credit risk are significant in explaining microfinance profitability which reinforces our findings in the previous chapter. Freedom from corruption is also significant suggesting a higher implicit cost of doing business.

Table 4.6: Two-step system GMM estimation results (dependent variable: ROA)

Variable	Notation	Variant of model specifications	
		1	2
Lagged ROA	Π_{t-1}	0.2499*** (9.22)	0.3169*** (10.63)
Log size	S	0.0090*** (3.35)	0.0060*** (3.54)
Log age	AG	-0.0001 (-0.14)	-0.0117 (-0.80)
Capital	CAP	0.0507** (2.22)	0.0750*** (2.79)
Gearing	GR	0.0716*** (2.98)	0.1163*** (3.60)
Efficiency	EFF	-0.1863*** (-6.17)	-0.2234*** (-9.70)
Portfolio at risk	PAR	-0.0327* (-1.79)	-0.0096** (-1.94)
Loan size	LS	0.0008 (0.94)	
Inflation expectations	INF		0.0457 (1.32)
Per capita incomes	GNI		-0.0067 (0.70)
Property rights	PR		0.0405 (1.51)
Freedom from corruption	COR		0.0019*** (2.77)
Wald-test		$\chi^2(7) = 169.97$ Prob>chi2=0.96	$\chi^2(11) = 173.06$ Prob>chi2=0.96
Sargan-test ^a		$\chi^2(44) = 28.39$ Prob>chi2=0.97	$\chi^2(44) = 21.62$ Prob>chi2=0.99
AR(1) ^b		$z = -2.98$ p-value = 0.00	$z = -2.79$ p-value = 0.00
AR(2) ^c		$z = 1.58$ P-value = 0.85	$z = -1.77$ P-value = 0.97

This table presents the results from regressions conducted to determine the determinants of MFI profitability in Africa. For the definition of the variables see Table 4.2

Estimations were performed using GMM estimation. T-Statistics are in parentheses and significance at the 10%, 5%, and 1% level is noted by *, ** and *** respectively.

The Wald test is a test of the null hypothesis that the coefficients in the given equation are all zero (Greene, 2008). A low value indicates null hypothesis rejection.

^a Test for over-identifying restrictions in GMM dynamic model estimation.

^b Arellano-Bond test that average autocovariance in residuals of order 1 is 0. (H0: no autocorrelation).

^c Arellano-Bond test that average autocovariance in residuals of order 2 is 0. (H0: no autocorrelation).

To gain a deeper insight into the processes affecting MFI profitability while controlling for time invariant factors, we run a random effects (RE) model with complete set of controls, including dummies for location, regulation and charter status. We are aware that FE model is

inappropriate since it would remove the time-invariant variables of interest. It is therefore not surprising that the Hausman (1978) specification test rejects the null hypothesis that the coefficients between RE and FE are not systematic and the Breusch and Pagan Lagrangian Multiplier (LM) test similarly confirms the presence of individual effects which provides evidence in favour of the FE model. We take cognizance of the fact that while the presence of unobserved panel effects correlated with the explanatory variables in the regression may bias the result; we try to overcome this bias by including a full set of location dummies.

On the basis of evidence adduced in Table 4.7, we do not find empirical support for the hypothesis that institutions formally constituted as NGO's are less profitable. As elucidated in the data section (see previous chapter), to be attractive investment opportunities, most MFIs reporting to MIXmarket strive to run their operations very efficiently and pay close attention, among other variables, to profitability of their operations. This finding is consistent with Cull, Demirgüç-Kunt and Morduch (2007) who finds the for-profit dummy insignificant in all their regressions. It also confirms Hartarska and Nadolnyak (2007) who shows that the variable NGO is not significant in their profitability regression. This however does not support the theoretical proposition by Besley and Ghatak (2005) who predict that non-profit status alone can positively affect performance as donors would be more willing to support MFIs that are NGOs because the non-profit status guarantees permanency of the MFI social mission. Consistent with our findings is Tchakoute-Tchuigoua (2011) who while investigating the existence of a difference in performance amongst MFIs in Sub-Saharan Africa according to their legal status, does not find significant difference in profitability between for profit and NGOs.

We find no evidence to confirm the hypothesis of a positive link between regulation and MFI profitability, contrary to the arguments offered by proponents of regulating MFIs (see for example McGuire and Conroy, 2000; Steel and Andah, 2003). This counter intuitive finding confirms Mersland and Strøm (2009), who establish that regulation does not have a

significant impact on financial performance and Hartarska and Nadolnyak (2007) who after controlling for the endogeneity of regulation, find that regulation has no impact on financial performance. Previous findings consistent with these results include Barth et al, (2004) who find cross-country evidence that regulation has no impact on the performance of conventional banks but inconsistent with Cull, et al (2011) and Hartarska (2005) who find supervision to be negatively associated with profitability. Clearly this issue deserves further empirical scrutiny.

We also find that location or regional factor is also not significant in explaining MFI profitability, suggesting that MFIs' profitability is mainly driven by local conditions. This is contrary to Cull, Demirgüç-Kunt and Morduch (2007) who found MFIs from Eastern Europe and Central Asia and those from Sub-Saharan Africa outperformed those from other regions in terms of return on assets. As the microfinance industry aims at greater geographic diversification, our results indicate that profitability is not sensitive to location or regional distributional factors which reinforces the correlations in Table 4.5

Table 4.7: Random-effects GLS regression results (dependent variable: ROA)

Variable	Notation	Model specification
Intercept	α_{it}	
Log Size	S	0.0100*** (2.49)
Log Age	AG	-0.0056 (-0.49)
Capital	CAP	0.0453** (2.22)
Gearing	GR	0.0168* (1.76)
Efficiency	EFF	-0.1001*** (-12.42)
Portfolio at risk	PAR	-0.0107*** (-2.88)
Inflation expectations	INF	0.1329** (2.35)
Loan size	LS	0.0035 (0.92)
Per capita incomes	GNI	-0.0005 (-0.01)
Property rights	PR	0.0002 (0.37)
Freedom from corruption	COR	0.0002 (0.29)
For profit	PROF	0.0038 (0.23)
Regulated	REG	0.0056 (0.30)
West Africa	WA	0.0521

		(0.78)
South Africa	SA	0.0732 (1.07)
East Africa	EA	0.0505 (0.75)
Central Africa	CA	0.0390 (0.66)
R ²		0.40
No of obs.		471
Wald test		chi2(16)= 247.97 Prob>chi2= 0.0000
Breusch and Pagan Lagrangian multiplier test		chi2(1)= 71.63 Prob>chi2=0.0000 H0:Var(u _i)=0
Hausman specification test		chi2(11) = 73.06 Prob>chi2 = 0.0000 Ho: difference in coefficients not systematic

This Table presents the results from regressions conducted to determine the determinants of profitability for Africa MFIs. Estimations were performed using GLS estimation. T-Statistics are in parentheses and significance at the 10%, 5%, and 1% level is noted by *, ** and *** respectively. For the definition of the variables see Table 4.2

Further region/location analysis

Studies of the location of services by commercial banks find that they generally favour economically well-endowed areas/regions to boost their profit margins. Is this the case with MFIs as well? To probe further on the location impacts on MFIs profitability, we split the sample of MFIs into four sub-samples, based on the regional distribution and estimate a fixed effect model for each sub-sample. This will allow us to compare the results with the summary statistics on Tables 4.3 and 4.4. The results show that economies of scale do not matter with respect to MFI profitability in South Africa region. It appears MFIs in this region are more constrained by capital. Although loan size is not significant in explaining profitability in other regions, it is crucial in West Africa. Cost inefficiency is more of a problem in East Africa than other regions perhaps because of the higher outreach as shown in Table 4.4.

Table 4.8: Estimation Results Using Fixed Effects-within (location effects)

Variant model specifications with robust standard errors					
Variable	Notation	WA	SA	CA	EA
Intercept		-0.1221 (-2.13)	0.2550 (0.75)	-0.5312 (-1.90)	-0.4128 (-2.10)
Log Size	S	0.0099 (2.52)	0.0145 (0.60)	0.0386 (1.97)	0.0353 (2.41)
Log Age	AG	-0.0004 (-0.25)	-0.0065 (-0.89)	-0.0036 (-0.42)	-0.0123 (-0.39)
Capital	CAP	0.0026 (0.10)	0.0509 (2.45)	0.4182 (2.70)	0.1893 (5.36)
Gearing	GR	0.0058 (2.40)	0.0188 (1.12)	0.0032 (0.21)	0.0148 (2.64)
Efficiency	EFF	-0.1828 (-7.43)	-0.1410 (-5.43)	-0.4722 (-4.81)	-0.3245 (-11.32)
Portfolio at risk	PAR	-0.0157 (-0.34)	-0.0158 (-0.21)	-0.1215 (-1.91)	-0.1520 (1.97)
Loan size	LS	0.0095 (2.50)	-0.0035 (-0.69)	0.0026 (0.23)	-0.0046 (-0.38)
Inflation expectations	INF	-0.0011 (-0.01)	0.2949 (1.47)	0.0544 (0.33)	0.0330 (0.27)
Per capita incomes	GNI	-0.0500 (-1.00)	-0.0206 (-0.28)	0.1340 (1.42)	0.1252 (1.56)
R ²		0.28	0.44	0.79	0.61
No of obs.		269	105	40	229

This Table presents regression with robust standard errors results conducted to determine the determinants of profitability for Africa MFIs. Estimations were performed using fixed effects estimation. T-Statistics are in parentheses and significance at the 10%, 5%, and 1% level is denoted by *, ** and *** respectively. A detailed description of the definition and sources of the variables is given in Table 4.2

4.6.3 Robustness checks

To confirm the main results, a robustness check is performed by running the same set of regressions for a smaller data set of 1,260 observations over a reduced period of six years (2002-2007). Using a significantly reduced unbalanced sample does not fundamentally alter the results. Table 4.9 shows that the significance and the relative magnitude of influence of all variables of interest are preserved. Therefore, while controlling operating expenditure remains the most important task for MFIs, credit risk, capital adequacy and scale economies play a significant role in determining MFI profitability.

Table 4.9: Random-effects GLS regression results (dependent variable: ROA)

Variable	Notation	Model specification
Log Size	S	0.0113*** (2.84)
Log Age	AG	-0.0104 (-0.89)
Capital	CAP	0.0508*** (2.46)
Gearing	GR	0.0198** (2.10)
Efficiency	EFF	-0.0951*** (-11.87)
Portfolio at risk	PAR	-0.0102*** (-2.56)
Loan size	LS	0.0031 (0.92)
Inflation expectations	INF	0.1668*** (2.89)
For profit	PROF	0.0105 (0.66)
Regulated	REG	-0.0005 (-0.02)
West Africa	WA	0.0487 (0.74)
South Africa	SA	0.0717 (1.08)
East Africa	EA	0.0494 (0.75)
Central Africa	CA	0.0449 (0.75)
R ²		0.39
No of obs.		444
Wald test		chi2(14)= 229.25 Prob>chi2= 0.0000
Breusch and Pagan Lagrangian multiplier test		chi2(1)=58.64 Prob>chi2= 0.0000 H0:Var(u _i)=0
Hausman specification test		chi2(9) = 35.97 Prob>chi2 = 0.0000 Ho: difference in coefficients not systematic

This Table presents the results from regressions conducted to determine the determinants of profitability for Africa MFIs. Estimations were performed using GLS estimation. T-Statistics are in parentheses and significance at the 10%, 5%, and 1% level is noted by *, ** and *** respectively. For the definition of the variables see Table 4.2

4.7. Conclusions, policy implications and prescriptions

In this chapter, we specified a dynamic empirical framework to investigate persistence of microfinance profits in Africa. Novel features of this chapter are the analysis of the effect of previous levels of MFI profits and additional time invariant control variables on profitability by use of an appropriate econometric methodology. All the estimated models are robust across various specifications while the results obtained in the previous chapter on the control variables are confirmed. This makes our findings more reliable and credible. The study identifies a series of new findings and policy implications.

First, although competition is effective in eliminating excess profit, our results suggest that this is not happening within microfinance industry in Africa. Therefore successful MFIs with advantages which enable them to earn supernormal profits can be expected to take measures to try and maintain those advantages in the future. This calls for some serious reconsideration of microfinance policy in Africa. Government regulations faced by MFIs are often ambiguous and opaque in most of the Africa countries which makes it difficult as well as labour intensive to create financial stable MFIs (see Lafourcade, et al 2006). Policymakers should therefore strive to remove MFI entry barriers as well as other obstacles to competition and similarly lower regulatory costs. Competition may support profitability of MFIs if the benefits of agglomeration effects and a stronger regulatory environment outweigh negative spillovers.

In order to maintain a competitive environment, policy makers will need to concentrate not only on capital adequacy, but also on competition in product markets. That notwithstanding, few issues remain unresolved. For example, competition for deposits imposes a cost that has to be borne under increased microfinance competition, and its role should be analyzed in a dynamic framework that allows for the development of customer relationships. Also, MFI's ability to raise funds may be correlated with depositors' or

investors' expectations concerning profitability, so that MFIs that are perceived as being profitable should find it easier to raise funds as well as entering new markets.

Second, although this chapter upholds the findings from the previous chapter on the control variables, there are interesting new findings. Efficient MFIs in the management of operating expenses are more profitable. Further research should therefore be undertaken to uncover how technology can optimally be used to enhance operational efficiency, and what partnerships are required to scale up technological solutions. Since one of the primary obstacles to an MFI's ability to adopt mobile banking is the lack of adequate back office systems, any scaling up of mobile and cell phone banking will need to take into account the management information systems and operational challenges that MFIs face in Africa and how best to address these issues. There is however need for more understanding on corporate governance in MFIs which may be a contributory factor on cost inefficiency.

Third, we find that regional distribution of MFIs or location effects matters. The nature of microfinance products and technology, and the constellation of incentives within MFIs may be such that certain locations are systematically favoured while others are avoided. Clearly more comprehensive data collection and more research are needed to better understand what factors drive the differences and the impact on profits.

Fourth, we find that capital is important in explaining MFI profitability which gives credence to an appropriate policy of imposing higher capital requirement to strengthen and stabilize microfinance sector in Africa. Our findings regarding equity therefore calls for a policy that advocates for better access to capital sources including savings mobilization.

Fifth, successful MFIs appear to be larger and therefore one can conclude that failure to become profitable is partly due to the lack of scale economies. Consequences of failure to achieve scale of economies may be manifested in reduced financial intermediation.

Sixth, while freedom from corruption is a significant factor in explaining MFI profits, we do not obtain conclusive results as to whether security of property rights influences MFI

profitability. We find that regulation of MFIs is not significant in explaining MFI profitability. Though these results are intuitive from an economic perspective, it remains an open question whether the benefits of supervision in terms of better protection of depositors' funds improves MFI profitability. Perhaps studies of past pro-poor banking systems such as the Irish loan funds, savings banks and cooperatives, which once operated in uncompetitive and unregulated markets similar to MFIs can yield new empirical knowledge for today.

Given the important role that the microfinance sector plays in the expansion of the private sector, future research on the persistence of MFI profits should focus on country-specific studies that will provide country-level policy conclusions. The model put forward in this study can easily be expanded to include a persistence parameter that account for asymmetric profits and profit persistence dynamics or regime shifts in the autoregressive parameter governing the autocorrelation in profit rates. Put differently, future research should seek to answer research questions such as; to what extent is the estimated speed of adjustment for MFIs reporting negative profits different from that of positive profits and the impact of lending technology and the type of contract on profit persistence. Another possible extension could be the examination of differences in the determinants of profitability between small and large or high-profits and low-profits MFIs. These are important considerations for microfinance development in Africa.

CHAPTER FIVE

MICROFINANCE PROFITABILITY: DOES THE FINANCING CHOICE MATTER?⁵²

5.1 Introduction

A profitable microfinance industry is vital in maintaining the stability of the micro-banking system⁵³. Low profitability weakens the capacity of MFIs to absorb negative shocks, which subsequently affect solvency. Profitability reflects how MFIs are run given the environment in which they operate, which should epitomize their efficiency, risk management capabilities, competitive strategies, quality of management and levels of capitalization.

Why is financing choice important for MFIs profitability? Financing choice raises particularly important research and policy questions regarding the microfinance industry. Microfinance industry promotes small scale investments that generates sufficient revenues from otherwise unrealized market activities while yielding a return on the investment. Agency costs may be particularly large in this industry because MFIs hold private information on their loan clients. In addition, MFIs access to grant funding and other safety net protections may increase incentives for risk shifting or lax risk management, potentially increasing the agency costs of outside debt.

Financing choice involves a trade off between risk and return to maximize shareholder wealth (Berger and Udell, 2006). The objective of an optimal financing choice for any firm is therefore to have a mix of debt, preferred stock, and common equity that will maximize shareholders wealth. A higher leverage can boost the rate of return on equity during prosperity. On the contrary, a higher leverage may raise the risk on the part of the firm's

52 A previous version of this chapter was presented at the Annual Canadian Economics Association Conference held at University of Ottawa 2nd-5th June, 2011. I acknowledge the inputs of the conference participants.

53 Measured by return on assets (ROA), MFIs are on average more profitable than conventional banks in their respective countries. This does not imply that MFIs are more profitable than conventional banks. Rather, it is a pointer that microfinance industry has not yet matured in most countries where providers' profits have not yet been squeezed down. Measured by return on the equity (ROE), MFIs are on average less profitable than banks, perhaps because MFIs are not yet as fully leveraged as banks. Contrary to conventional banks, MFIs fund their assets with more of their own capital and less of deposits.

earnings stream. Moreover, the presence of debt may exert pressure on MFI management to ensure profitability in order to honour such debt obligations. Although debt as a homogeneous source of MFI funds is a powerful theoretical construct, this chapter goes beyond the leverage decision and investigates other dimensions of MFIs funding choice. Even with respect to debt, the nature of debt and its incentive properties can differ according to, for instance, maturity and to the providers.

Table 5.1 shows that MFIs have two broad funding options beyond debt which include deposits (if regulation allows), and equity. Deposits may be a cheaper option than debt or equity if volume and terms leverage potential market demand. It is also evident from Table 5.1 that MFIs in Africa rely more on savings to finance their activities. Indeed existing evidence shows that whereas globally most MFIs rely heavily on donations and retained earnings to fund their activities, 72 percent of Africa MFIs fund their activities with deposits which are significantly higher relative to other regions (Lafourcade, et al 2006).

Table 5.1: Financing Structure

		Debt to equity			Deposits to loans			Deposits to total assets			Portfolio to assets		
Units		(%)			(%)			(%)			(%)		
Year		2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008
Age ⁵⁴	New (1-4 yrs)	2.5	3.4	2.9	4.0	6.2	0.0	2.7	3.7	0.0	76.4	71.2	77.9
	Young (5-8 yrs)	1.8	2.7	3.1	0.0	1.1	4.8	0.0	1.0	2.1	81.7	80.6	74.4
	Mature (over 8 yrs)	2.9	3.2	3.4	10.1	6.2	1.4	4.9	4.6	3.3	78.1	79.4	79.3
Charter Type	Bank	1.2	1.7	1.9	69.3	64.0	66.3	41.6	41.4	51.0	67.3	68.0	71.6
	Credit Union	3.9	4.6	4.4	79.8	80.8	71.9	61.7	62.1	61.0	80.6	78.6	78.8
	NBFI	2.7	3.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	80.4	81.0	81.4
	NGO	1.3	1.7	2.0	0.0	0.0	0.0	0.0	0.0	0.0	80.6	80.9	80.7
Methodology	Individual	3.7	4.2	4.0	20.4	16.9	31.0	9.5	9.7	20.8	80.5	82.2	83.0
	Individual / Solidarity	1.9	2.5	2.9	0.6	0.7	0.4	0.1	0.4	0.3	79.9	79.1	77.5
	Solidarity	1.7	2.4	2.8	19.8	19.0	20.4	11.3	13.9	13.9	67.6	70.4	72.7
	Village Banking	2.0	2.2	2.6	0.0	0.0	0.0	0.0	0.0	0.0	77.2	79.1	79.7

54 Microbanking Bulletin classify MFIs into three categories (new, young, and mature) based on the maturity of their microfinance operations. This is calculated as the difference between the year they started their microfinance operations and the year of data submitted by the institutions.

Profit Status	Profit	4.1	4.3	4.3	21.1	26.8	21.5	16.1	11.9	17.2	73.0	71.9	71.5
	Not for Profit	1.7	2.1	2.5	0.0	0.0	0.0	0.0	0.0	0.0	80.8	80.9	81.0
Region	Africa	2.3	2.5	2.7	54.4	51.2	49.1	31.2	34.0	34.9	66.7	66.5	67.3
	Asia	4.5	1.4	4.9	23.3	23.5	24.2	11.2	14.8	11.7	74.0	71.0	73.5
	ECA	1.8	2.7	2.9	0.0	0.0	0.0	0.0	0.0	0.0	87.2	86.7	89.1
	LAC	2.5	2.6	3.2	0.0	0.0	0.0	0.0	0.0	0.0	80.5	81.2	82.2
	MENA	0.6	0.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	82.1	81.0	82.0

Source: MicroBanking Bulletin, September 2010 (Issue No. 20).

Mature MFIs are more likely to have been licensed to mobilize deposits and therefore may have a higher deposit to assets, deposit to loans, and loans-assets ratio, *ceteris paribus* (see Table 5.1). It is also evident that mature MFIs have higher debt-equity composition perhaps because as firms mature they become known to the market, which enables them to expand their access to capital. Put differently, as MFIs get older, the weight of external financial sources steadily decreases while the equity steadily becomes a more important source of finance. Additionally, mature MFIs may have lower debt ratios as they accumulate deposits and/or plough back into lending the retained profits. It also appears that NGO type of MFIs rely more on debt financing relative to other type of MFIs, perhaps because many are not regulated (see Table 10, Appendix B) to mobilize deposits. Table 5.2 provides details of the characteristics of both international and domestic MFI funding instruments.

Voluntary deposits⁵⁵ are a source of inexpensive and sustainable source of funds for MFI lending but, deposits may require widespread branching and other expenses with implications on MFI profitability. MFIs with access to donor funds may not respond to funding pressures to operate efficiently or may deliberately choose outreach over profitability by serving poorer or rural clients with higher delivery costs (Armendáriz and Morduch, 2010). The shift from donor dependence to sourcing funding from capital markets also raises fundamental questions regarding the role of funding instruments with obvious implications on MFIs profitability.

⁵⁵ In this study the term deposits is applicable to any type of instrument used by MFIs to mobilize deposits and is not restricted to any particular type of instrument, such as time deposits or savings accounts.

Table 5.2. Alternative sources of funding instruments

Instrument	Investor	Strengths	When/How to Use
<i>International</i>			
Policy Support	Donors	Helps government make sound decisions and take a constructive role.	When specialized expertise is needed
Technical Assistance	Donors	Builds much-needed human capacity.	Needs to be market-based and client-responsive. Best for donors that can work directly with private sector.
Grants	Donors	Helps build equity that can later be leveraged.	When commercial sources unavailable, avoid distorting markets with money perceived as “too easy”.
<i>Loans</i>			
Concessional	Donors	Source of cheap funds.	Its important to avoid foreign exchange risk when in hard currency. If commercial alternatives exist, avoid distorting domestic markets and reducing incentives to mobilize deposits.
Commercial	Donors, IFIs ⁵⁶ , Private Funds	Source of funds for cash-strapped financial institutions. Focus on efficient microfinance operations.	For mature institutions. If commercial alternatives exist, avoid distorting domestic markets and reducing incentives to mobilize deposits.
Quasi-equity ⁵⁷	Donors, IFIs	Source of funds for financial institution.	Same as concessional debt but only relevant to mature MFIs
Equity Investment	Private Funds, IFIs	Contributes equity that can be leveraged on domestic	Applicable to mature, formal institutions that sell shares. Avoid crowding out local investors.
<i>Domestic</i>			
Savings	Individual Savers	Independence from external funding low cost over time.	This only applies to regulated MFIs as some MFIs may need support to develop products and systems to lower costs and manage growth of deposits.
<i>Loans</i>			
Concessional	Apexes ⁵⁸ , Govt. Credit Schemes	Apexes, if well-designed and administered, can help develop retail MFIs.	If commercial alternatives exist, avoid distorting develop retail MFIs.
Commercial	Commercial Banks	Integrates MFIs into mainstream (although it may not include longer-term financing required for some activities, for example agriculture).	For mature institutions. Initial incentives or partnerships might be needed to jump-start funding between commercial banks and specialized MFIs.
Bonds	Local Investors	Allows financial institutions to tap into domestic capital markets.	Requires sufficiently developed secondary market; markets; dependent on local shocks. May require initial incentives to get started in some markets.

⁵⁶ Subordinated debt at a subsidized interest rate that can be converted to equity. Usually medium- to long-term loans designed to be repaid from profits.

⁵⁷ Publicly-owned international finance institutions that are involved in microfinance. Includes bilateral institutions such as the U.S. Overseas Private Investment Corporation and its counterparts.

⁵⁸ Government sponsored agencies that function as wholesale market institutions, channelling funds to smaller MFIs

<i>Equity</i>			
Direct Investments	Local Investors	Builds an equity base that can be leveraged on domestic market.	This only applies to licensed MFIs. Avoid mission drift because of stockholder demands by balancing socially and profit-oriented owners.
Stock Market	Local Investors	Allows financial institutions to tap into domestic capital markets.	Only licensed financial institutions are eligible to sell shares on the market. Avoid mission drift because of diluted ownership and stockholder demands.

Source: Helms (2006)

Most of the existing literature on the impact of capital structure on firm performance has dealt on large and listed firms within developed economies. Although several research questions remain unresolved in the banking industry, due to banks being informational opaque, (Berger and Bonaccorsi di Patti, 2006), it similarly remains so for the microfinance industry where information asymmetry is also severe. Bogan (2009) investigates the impact of existing sources of funding on the efficiency and financial sustainability of MFIs. He finds causal evidence to the effect that more use of grants by MFIs decreases OSS. What is missing in the literature is a focus on profitability while controlling for endogeneity and other country and firm level covariates.

Since the seminal contribution by Modigliani and Miller (1958), several subsequent studies⁵⁹ show that a firm with high leverage tends to have a capital structure that translates into a better performance. The basic MM principles are applicable to financial intermediaries, but only after taking into consideration the fundamental differences in how financial institutions and other type of corporations operate (Cebenoyan and Strahan 2004). This has motivated researchers to examine the impact of capital structure on performance; though the main focus has been on the non-financial firms.

Empirical evidence on the agency costs hypothesis in the banking and finance literature is mixed and remains contestable (see Titman, 2000 and Myers, 2001 for reviews). In some cases negative relationships are found, but opposite results have similarly been documented. The lack of non-contestable evidence may partly be explained by the difficulty in defining a measure of performance that is close to the theoretical definition of agency costs. The mixed results in the previous research may also be due to the possibility of reverse causation from performance to capital structure. If for instance MFI profitability affects the choice of financing, then failure to take this reverse causality into account may result in simultaneous-equations bias (Berger and Bonaccorsi di Patti, 2006).

⁵⁹ There is a vast amount of literature with respect to the optimal capital structure of corporate firms (See for example, Faulkender and Petersen 2006; Harris and Raviv 1991)

Using a sample of French manufacturing companies, Margaritis and Psillaki (2010) investigate the linkage among capital structure, ownership structure, and corporate performance. They find evidence supporting the theoretical predictions of the Jensen and Meckling (1976) hypothesis; that higher leverage is associated with improved efficiency over the entire range of observed data. An analysis from listed firms in Tehran Stock Exchange, by Arbabiyan and Safari (2009) found short-term and total debts to be positively related to profitability (ROE) and a negative relation between long-term debts and profitability. While focusing on the link between capital structure and profitability on small and medium enterprises (SMEs) in Ghana, Abor (2005) shows that short-term debt ratio is positively correlated with return on equity. This confirms Hadlock and James (2002) who find that banks with high leverage report high level of profitability and Michaelas et al. (1999) who similarly found a positive impact on performance.

On the contrary, several studies reveal a negative relation between capital structure and performance. Using the ratio of profit before interest, tax and depreciation to total assets and ratio of cash flows to total assets as profitability proxies, and two leverage measures, including ratio of total borrowing to asset and ratio of total liability to sum total of liability and equity, Chakraborty (2010) finds a negative relation. This confirms Huang and Song (2006) among Chinese firms. The negative influence of profitability on leverage should however become stronger as firm size increases. This is consistent with Caesar and Holmes (2003), Chiang et al. (2002), who document a negative relationship between profitability and both long-term and short-term debt. Other studies that find high levels of debt in the capital structure to decrease firm's profitability include Gleason et al (2000), Hirota (1999), Krishnan and Moyer (1997), Rajan and Zingales (1995). With mixed evidence in the literature, it is clear that financing choice and profitability is an important research agenda.

The main goal of this study therefore is to investigate the role that individual funding instruments play in influencing MFI profitability. To achieve this objective, we employ

