IS MICROFINANCE BREAKING NEW GROUNDS?

A CROSS COUNTRY EMPIRICAL INVESTIGATION OF THE PERFORMANCE OF MICROFINANCE INSTITUTIONS

FARM PRODUCTS
MFI
MICROFINANCE

Afsheen Abrar

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CHAPTER 1
INTRODUCTION

1.1. Introduction

Microfinance institutions (MFIs) came to existence with the promise to provide credit and financial services to low-income entrepreneurs and individuals who do not have access to funds from mainstream banks. These poor clients do not have credit histories and cannot provide collaterals (Banerjee & Duflo, 2007). MFIs finance clients with relatively small loans to encounter emergencies, manage day-to-day consumption needs, and purchase assets (CGAP 2002). In the past few years, more than 700 million people worldwide have gained access to formal financial services through these institutions (World Bank, 2017).

MFIs have been squandering and prospering in many developing countries over the years. Acknowledging their unique features of providing unconventional products and services (credit, deposits, remittances, insurance and entrepreneurial trainings) through innovative mechanism (group lending, small loan sizes and short repayment period) to poor individuals and entrepreneurs, United Nations declared 2005 as the "year of micro-credit". In a subsequent year, Muhammad Yunus, the founder of Grameen Bank, Bangladesh, was awarded the Nobel Peace Prize for his efforts to create economic and social development through microcredit.

Virtually, until now, prior studies on MFIs either focus on the operational aspects of these institutions, e.g. financial performance and social outreach, their legal status, funding mix, interest rate determination, et cetera. The other stance of literature mostly based on impact assessment of household data related to either a specific country or regions, addressing a single dimension: poverty, inequality, households' welfare, or income-generating capacity. Other than this, these studies focus on short term specific goals and ignore the fact that the emergence of MFIs has changed financial landscape of many countries by addressing the poor's needs through ingenious techniques.

The emergence of these institutions brings a ray of hope to many individuals and households, who cannot think of any financial intermediary except informal moneylenders. The means of financial inclusion provided by MFIs change financial development and economic growth of many countries, but only few studies (Ahlin et al., 2011; Ahlin & Jiang, 2008; Imai et al., 2012) discuss the role of MFIs in a macroeconomic context. Similarly, no study discusses how the growth of MFIs filled up the market niche and provided competition to existing market players. Moreover, very few studies (Cull et al., 2014; Donou-Adonsou & Sylwester, 2017) compare these institutions with existing market players, and analyse the top management's role on these institutions' performance (Randoy et al., 2015; Mersland et al., 2019). The primary motivation of this thesis is to analyze microfinance institutions' performance as a response to this gap.

1.2. Thesis Objectives

The main aim of this thesis is to examine the performance of microfinance institutions in the global setting. This thesis examines three key questions: (1) how does the relative share of MFIs affect financial development, economic welfare, and banking efficiency? (2) are microfinance banks different from commercial banks in terms of various performance dimensions? and (3) what is the impact of different CEO attributes on the financial performance of MFIs. In particular, I focus on a few angles that have not been previously explored. I undertake three empirical research projects to analyze MFIs role taking a macroeconomic perspective, their performance as an active market player alongside commercial banks, and the impact of top management attributes on the performance of these institutions. The following paragraphs discuss the detailed objectives of each research project.

Research Project 1

This first project investigates the co-existence of microfinance institutions and commercial banks and analyses the implications of the presence of MFIs on the financial development and economic welfare. Using financial intermediation and finance-growth theories, I examine whether and how MFIs can accelerate financial development and economic welfare at the country level. I also explore whether MFIs alongside commercial banks could increase the efficiency of the whole banking system by putting banks into more competition. Overall, the project aims to provide essential insights into the presence of microfinance institutions at country level.

Research Project 2

This second project empirically analyzes the differences in microfinance banks (MBs) and commercial banks (CBs) in terms of four performance dimensions: efficiency, business model, stability and asset quality in countries where both types of banks co-exist. Using different theories e.g. financial intermediation theory, resource-based theory, agency theory, asymmetric information theory, I try to find answers of the following questions: how different are cost structures of both types of banks? How different are their business models in terms of intermediation capacity, funding structures, and income sources? Which bank type has better liquidity, profitability, and stability? What are the differences in asset quality of both banks in terms of the portfolio at risk, loan loss reserves and loan loss provisions?

Research Project 3

The third project examines the impact of different CEO attributes on the financial performance of MFIs. Based on upper echelon and resource-based theories, this project accentuates that CEO attributes - gender, business education, domain experience, and founding status - are important determinants of the financial performance of MFIs. These CEO attributes are vital in a microfinance setting where most clients are female, and the percentage of female CEOs is higher in MFIs than in traditional firms (Storm et al., 2014). Having a female CEO has the potential to affect the performance of MFIs. Similarly, business education fosters innovation, dynamism, and risk-taking ability, while domain-specific expertise provides a better understanding to deal with organizational problems, and consequently enhancing the performance of MFIs. Finally, the founding status involves emotional attachment with the MFI. This bond enables the CEO to play an extraordinary role in defining the mission and pursuing the firm's activities that can lead to performance differentials. I also analyze the moderating effect of tenure on CEO attributes and financial performance of MFIs as Finkelstein & Hambrick (1990) state that longer tenure exhibits persistent strategies, closely linked to the organizational working industry, and positive organizational performance.

1.3. Objectives of MFIs and Focus of the Thesis

MFIs are social enterprises or hybrid organizations that exist in many countries. These are enterprises with an explicit dual purpose: to promote welfare such as alleviating poverty, reducing inequality, empowering poor - predominantly female, and to do so in a sustainable manner. Therefore, we can say that in these types of social organizations, the objective or the outcome is social welfare, but the process to attain that outcome is sustainability or the input of these institutions. However, in various organizational types, such as non-governmental organization (NGOs), cooperatives, non-banking financial institutions (NBFIs), and banks, the end objective of social welfare is set differently. For example, in the first two types of MFIs (NGOs and cooperatives) the objectives between social welfare and sustainability are in lexicographic order, in which either NGOs or cooperatives have one objective (social welfare) as a priority over the other (sustainability). In this case, the social objective is satisfied first, after which the less critical objective sustainability is satisfied without compromising the first objective.

In terms of the other two types of MFIs (NBFIs and banks), the relationship between social welfare and sustainability is a constraint-type relationship, in which the social objective is maximised so that the value of the other variable acting as a constraint (sustainability) stays within its current range. For example, both NBFIs and banks can achieve higher social welfare by increasing their outreach to a certain number of borrowers. Then these institutions can also attain sustainability within these limits.

In the thesis, my aim is not to focus on how the social welfare and sustainability preferences differ with the different organizational forms of MFIs. Instead, I analyze the role of MFIs taking a macroeconomic perspective. I also examine the performance of microfinance banks as an active market player alongside their peer group (commercial banks). Finally, I study the impact of top management attributes on the financial performance of microfinance institutions. The variables I used in these three empirical studies are according to the objectives explained above. The first project can be considered the one that is very close to the purpose of the existence of these institutions. It highlights their impact on the financial development and economic welfare of countries, thus providing evidence on the societal impact of MFIs. The other two studies analyze the performance of MFIs, not in the context of their mission, but how their presence affects their peer group, and which determinants are essential for their financial sustainability.

1.4. Contributions

The three research projects are undertaken in this thesis to analyze the performance of microfinance institutions in a global setting. Together these research projects contribute to microfinance literature particularly and banking and leadership literature generally in several ways. The first research project contributes to the macroeconomic context by empirically catering both direct and indirect effects through which MFIs affect financial development and economic welfare in a dual financial system where they operate alongside commercial banks. The direct effect is related to economic welfare, and the indirect effect is related to financial development aspects. Additionally, this project sheds light on the cost of intermediation of commercial banks in response to competition from microfinance institutions. The second project is one of the first bank-level explorations of microfinance banks vis a vis commercial banks in countries where both banks simultaneously exist. By comparing both categories of banks on four performance dimensions: efficiency, business models, stability, and asset quality, I provide compelling evidence of dissimilarities between them. The third project fills the gap of scant research on CEO attributes and their impact on the financial performance of MFIs. I try to add new evidence to the debate by supporting the argument that top executives do, in fact, matter and come up with financial differentials.

1.5. Thesis Structure

The remainder of the thesis comprises the following five chapters. Chapter 2 presents a literature review on microfinance, focusing on the emergence of microfinance because of credit market failure, along with recent debates about the hype and hope concerning the performance of microfinance institutions during the 2010-2019 decade. It was a crucial period for MFIs as they transitioned from recession to recovery and transformed as mature institutions with substantial growth potential. In addition, this chapter discusses the different theories used to analyze the performance of microfinance institutions.

Chapter 3 examines the relative role of microfinance institutions towards the financial development and economic welfare. It also analyzes how the presence of microfinance institutions affects the efficiency of commercial banks.

Chapter 4 compares microfinance banks with commercial banks in terms of four performance dimensions. The first is related to cost efficiency comparison. The second dimension is based on business models comprising revenue and funding structures of commercial and microfinance banks. The third dimension compares liquidity, profitability and long-term solvency of both types of banks. Finally, the fourth dimension covers assets quality by comparing loan provisioning, reserves and overdue portfolios of both groups of banks

Chapter 5 analyzes the impact of different CEO attributes on the financial performance of microfinance institutions. Additionally, it examines the moderating impact of tenure on the different CEO attributes and microfinance institutions' financial performance. Finally, chapter 6 concludes the thesis, and discusses limitations and future research directions.

CHAPTER 2
LITERATURE REVIEW ON MICROFINANCE

2.1. Introduction

This chapter[1] focusses on definition, concepts, debates and theories used in this thesis concerning MFIs. Section 2.2 delves into the concept of microfinance institutions[2], including the differences among microcredit, microfinance, and microfinance institutions. Section 2.3 discusses how microfinance institutions arose as a result of credit market failure in developing countries. Since my research focuses on the performance of MFIs in a global context, the findings are very promising, demonstrating that there is still a lot of hope for this industry, as MFIs are the "lender of last resort" for many poor people around the world. However, it is not true that the microfinance sector is immune to downturns. Like all other industries, it has experienced cycles of recession, recovery, and expansion. In Section 2.4, the journey of the microfinance industry over the last decade (2010-2019) is addressed, focusing on both the dark and bright sides (hype and hope) of the industry during this period.

The purpose of studying the performance of MFIs during this particular period (2010-2019) is that MFIs have faced considerable criticism regarding their lending activities, high-interest rates, profit-making, suicidal attempts as a result of over-indebtedness of MFIs clients, and the predatory lending motives of some Indian and Cambodian MFIs. These issues not only harm the image of microfinance particularly in these regions but also internationally highlight it as a curse for the poor. Although the microfinance industry has undergone significant changes because of poor performance and criticisms, numerous regulations have been implemented to regulate the interest rates and practices of MFIs in various parts of the world. Apart from these few bad examples, the microfinance industry has seen many positive changes in the recent decade, that shows how the industry has learned from its mistakes and evolved. Finally, Section 2.5 discusses various theories used in empirical chapters of the thesis.

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[1] This chapter presents a general literature review of the microfinance industry. A project-wise literature review is presented in chapters 3, 4, and 5.

[2] Institute, institution, organization, and firm are interchangeably used in this chapter and throughout the thesis.

2.2. Definition

Historically, microfinance refers only to “microcredit” facilities focused on small loans without collateral for underprivileged people with little or no income. According to Ledgerwood (1999), “Microfinance is generally defined as the provision of financial services to the poor who lack access to conventional financial services”. Microfinance institutions provide financial services to poor households and micro-enterprises, typically neglected by traditional banks. These households are mostly self-employed who do not provide collateral on their loans because they are low-income individuals with inadequate formal paperwork and ownership titles on their assets. Collins et al. (2009) state that microfinance institutions have not been limited to microcredit over the years. MFIs have also begun deposits, insurance, payment facilities, as well as a wider variety of loan products and training facilities as the poor desire more than just microcredit, thus heading towards inclusive finance.

Different researchers (Ledgerwood, 1999; Robbinson, 2001) point out the difference between the microfinance concept and the microfinance providers known as microfinance institutions (MFIs). According to Elahi & Rahman (2006) and Linares-Zegarra & Wilson (2018), it is essential to know who is providing microfinance services as the ownership structure of microfinance institutions ranges from non-governmental organizations (NGOs), cooperatives (COOPs), non-banking financial institutions (NBFIs) to commercial banks (CBs). The primary functions of many MFIs include small-size loan distribution, receiving and monitoring frequents loan repayments, and progressive lending (based on the recovery of previous loans). Microfinance institutions are established on the premise of the double bottom line: welfare and sustainability. Some forms of ownership (NGOs and COOPs) are non-profits institutes and focus more on welfare aspects, while others (banks and NBFIs) are for-profit institutes and focus more on sustainability (Gupta & Mirchandani, 2020; Galema et al., 2012).

Microfinance's growth and creditability have expanded internationally over the years as a measure to counter poverty and socio-economic vulnerability. According to the Microcredit Summit (2015), microfinance is a "miracle tool" in eradicating poverty and targeting four key dimensions: reaching the poorest, empowering women, creating self-sustainable financial institutions and having a positive social effect on the poor.

2.3. The emergence of microfinance institutions as a consequence of credit market failure

A market failure takes place when a competitive market fails to allocate the scarce societal resources optimally to achieve the maximum possible social welfare (Besley, 1994).

Credit market failures are especially frequent in developing countries, where credit is distributed inefficiently to the most disadvantaged and impoverished members of society. Insufficient collaterals, covariant risks, a lack of policies and regulations, underdeveloped institutional networks, and segmented markets are all common explanations for credit market failure. Furthermore, the poor lack assets or entitlement to assets that can be used to obtain loans, and in some situations, insufficient documentation makes it much more difficult for lenders to determine a borrower's creditworthiness (Bhardhan & Udray, 1999). In many rural areas where most poor are associated with agricultural activities, other factors such as borrowers' illiteracy, weather conditions, and commodity price fluctuations have a major impact on the poor's income ability (Ghatak & Guinnane, 1999). Susceptibilities in lending activities are also some of the reasons for credit market failure due to information asymmetries (Stiglitz & Weiss, 1981).

According to Ray (1998), the advent of microfinance institutions provides hope to many poor people in developing countries by addressing credit market failure issues. Some of the characteristics of these organizations are similar to those of traditional lenders, while others are similar to those of informal lenders. The innovative mechanism of "*group lending*" resolves information, transaction, enforcement, and monitoring cost problems associated with lending to the poor. In the group lending process, like-minded poor people form a group on a self-selection basis to get credit and share joint liability for a loan contract. Since the group member chooses peers that have similar financial problems and are well acquainted with one another, the information cost is reduced because the close relation among group members provides more reliable information to MFIs (Ghatak, 2000).

Once the group members have received loans from the MFI, the peer monitoring process begins, in which each group member maintains a close eye on their fellow group member's loan use, thus minimizing the ex-post moral hazard issue (Aghion et al., 1999). This monitoring mechanism further reduces enforcement cost through peer support and peer pressure mechanism, where the former is associated with a group willing to pay excessive fees on behalf of other group members, and the latter is a forced payment from other group members in case of default of one of the group members. According to Besley & Coate (1995), peer support and peer pressure mechanism ensure timely loan repayments while allowing the same community to work together.

Since the advent of revolutionary group mechanism, this lending process has provided a solution to many credit market problems and allowed financial intermediation for the underprivileged. In the real world, however, it is impossible to fully overcome the issues associated with lending contracts, especially if the group members are unwilling to accept liability for any deliberate default by any group member (Ghatak, 2000).

2.4. Recent debates on microfinance’s hype and hope

The following sections discuss both the dark and bright side of microfinance institutions. I first address the dark side of MFIs by analyzing two events that brought global attention towards the microfinance sector and posed concerns about these institutions' performance: Is microfinancing just a hype for the poor? Then I move on to the bright side, demonstrating how MFIs have recovered and grown over the last decade, and suggest that there is still a lot of hope for the poor because of MFIs.

2.4.1. Indian microfinance crisis: Andhra Pradesh borrowers’ suicides

Microfinance activities in the form of self-help groups (SHGs) of poor borrowers started in the early 1980s in the Indian state of Andhra Pradesh and neighbouring states in the southern region of the country. The state government of Andhra Pradesh began funding SHGs through various NGOs involved in microfinance through the establishment of savings accounts and the obtaining of loans from a nearby regional or public bank in 1992, in collaboration with the National Bank for Agriculture and Rural Development (NABRAD) and the World Bank. It is regarded as a linkage between SHGs and banks, and has accelerated the state's microfinance momentum.

These SHGs were made up of 15-19 participants, mostly women borrowers, who worked under the supervision of NGOs in accordance with NABRAD guidelines. SHGs in this group have pooled funds for at least six months and then borrow money from banks on a one- to two-year repayment schedule. The SHG's leader distributes the loan sum among the group's members. To encourage continuous bank lending, NABARD refinances these loans at a lower rate of interest. In 2006, through the participation of 4741 NGOs, 32 million poor borrowers in the form of 2 million SHGs obtained a total loan of $ 2.5 billion US dollars from 545 regional or public banks across 583 districts of India (Chen et al., 2010).

In Andhra Pradesh, this rapid growth in microfinance over the last two decades has allowed many NGOs to transform into commercial microfinance institutions, the most prominent of which are SHARE, BASIX, SKS, and Spandana. Microfinance organizations' transition had a detrimental effect on poor households due to deceptive loan processing methods, usurious interest rates, and over-indebtedness (The Economist, November 6th, 2010). Because of these increasing concerns, the government of Krishna district closed 57 branches of two of the largest MFIs, SHARE and Spandana, in March 2006. However, the first measures taken by the Krishna government were ineffective in resolving the issues.

According to CGAP (2010), the average loan per borrower in Andhra Pradesh is INR 65000, much higher than the national average of INR 7700. Because of the coercive collection practises, many poor borrowers were placed under immense stress, and many borrowers committed suicide in 2010 as a result of the large amount of credit and high-interest rates. In October 2010, the government released the Andhra Pradesh Microfinance Ordinance, which allows all MFIs to register with the government because of borrowers' over-indebtedness and suicide attempts. This ordinance defines standard operating procedures (SOPs) for operations, interest charges, and loan recovery procedures for microfinance institutions. MFIs were directed not to use coercive recovery techniques and not lend multiple loans to the same borrowers. Additionally, MFIs are advised to strictly follow the SOPs; in case of non-compliance, their operations will be halted and they will face serious penalties.

After the implementation of Andhra Pradesh ordinance, the microfinance industry came to a halt. Microfinance lending has been severely harmed, with recovery rates down from 99 to 20% (Ghiyazuddin & Gupta, 2012). MFIs faced a serious liquidity shortage as a result of low interest rates. Poor borrowers were persuaded by state politicians not to repay their loans, and banks stopped lending to MFIs due to expected losses. Because of these unethical practices, many people started to mistrust MFIs and turned to informal networks and moneylenders. Finally, this triggered a reaction in India, forcing the Reserve Bank of India to consider and establish coherent regulations and policies towards microfinance industry.

2.4.2. Cambodian microfinance: A nexus of human rights abuses

The microfinance movement started in Cambodia in the early 1990s, as the country began to recover after the oppressive Khmer Rouge rule. After decades of war, microfinance began to provide poor households with easier access to credit and other financial services in order to start small businesses and purchase farming equipment and instruments. At the end of December 2018, Cambodia became one of the fastest-growing microfinance countries in the world with 2.38 million borrowers and $8 billion in outstanding loans. The average amount of Cambodian microloans was $3370 US dollars at the end of 2017, exceeding the country's per capita GDP of $1384 US dollars (Sinha, 2013).

The rapid growth of microfinance activities in Cambodia is correlated with high-interest rates, the pledging of land titles as collateral, and the targeting of borrowers vulnerable to land losses. Various government agencies and human rights groups have become worried about the rising trend. In response, the Cambodian government-imposed interest rate ceiling in March 2017 to limit microfinance interest rates to 18%, but facts show that this move does not offer relief to borrowers or even delay the growth of loans. In the meantime, the Cambodian Microfinance Association (CMA) and two human rights NGOs: Sahmakum Teang Tnaut (STT) and the Cambodian League for the Promotion and Defense of Human Rights (LICADHO) have intervened to examine the shallow loan growth and over-indebtedness of microfinance clients (Allden, 2009).

According to both NGOs, more than half of Cambodia's microfinance loans are backed by land titles, which is the riskiest form of credit since the borrowers who use these loans are on the verge of economic collapse. They also said that the Cambodian microfinance sector has already been flooded, with roughly 15-20% of farmers losing their land titles due to loan repayment obligations (Sinha, 2013). In August 2019, SST and LICADHO investigated the reasons of the skyrocketed indebtedness. According to representatives of both the NGOs, more than 2 million people have microfinance loans, and the country's seven largest MFIs made a significant profit of more than $130 million dollars during 2017. The huge profits made by these and other MFIs forced borrowers to take out additional loans to pay off their previous debts. Other human rights abuses include forced agricultural land sales in debt repayment procedures, bonded labour, dislocation caused by debt burdens, and child labour.

The World Bank issued a report in 2017 warning the Cambodian government against unsustainable lending and larger loans, claiming that microfinance loans are dragging borrowers deeper into poverty in Cambodia. Furthermore, two Cambodian NGOs: STT and LICADHO, have appealed to the government and international investors to stop predatory lending practices that allows MFIs and their foreign partners to benefit enormously from poor borrowers. These NGOs also demand that equal laws and guidelines be enforced to protect borrowers who are trapped in loan repayments due to MFIs and their partners' malpractices, such as forced land sales and other human rights violations.

2.4.3. Developments in the microfinance sector in the past decade: A sign of hope

The lessons learned in recent years enable the microfinance sector to enter a period of maturity through the establishment of responsible, ethical and inclusive microfinance (Microfinance Barometer, 2013).

The microfinance industry has faced severe criticism in the last decade due to borrowers' over-indebtedness and some of the microfinance institutions' indulgence in excessive profit-making. According to Reille (2011) the microfinance industry has faced three major challenges in the past decade: abandoned growth of microfinance institutions, excessive profit-making, and lack of regulation.

Following the massive global criticism surge in the early 2010s, stakeholders started to recognize the risks of unregulated microfinance operations. They acknowledged the obvious need for a regulatory mechanism to regulate MFI operation and protect the interests of various beneficiaries. Many major changes were implemented in the aftermath of those bad episodes, and the microfinance sector has since entered a time of professional transformation and institutional strength. Diversification of investment, growth and use of emerging technologies, and the development and delivery of various financial and non-financial services are all factors that have led to this transition.

Various microfinance stakeholders have banded together to create a "Social Performance Task Force" during these introspective years. Many have quickly adopted this idea, and over 3,000 organizations are now working together to encourage responsible microfinance business activities, and as a result Universal Principles of Social Performance Management were published in 2012. Meanwhile, a global "Smart Initiative" has been launched to integrate consumer protection policies into the operations of microfinance institutions. Since then, the sector has faced increased transparency in evaluating social efficiency, ethical and responsible practices, and consumer protection (CGAP, 2014).

According to Microfinance Market Outlook (2017), following many new reforms and initiatives implemented by various stakeholders between 2014 and 2016, the microfinance industry is experiencing a slew of positive developments, including new investment opportunities in the form of pension funds. These funds are usually risk-averse and only invest in industries that have some level of sustainability, thus they reflect the potential of microfinance sector. During the same time span, digital and technological advances such as cashless transactions, process automation, digital fund transfers, and mobile banking were introduced in the microfinance sector, increasing efficiency and extending the reach to a wider audience.

The United Nations introduced a Sustainable Development Goals (SDGs) plan in September 2015, which focuses on 17 dimensions[3] to make the world more sustainable, inclusive, prosperous, and resilient. The United Nations estimated that $5 trillion would be required to achieve the SDGs target by 2030, and that all investors would need to cooperate and mobilize to create a more prosperous world. Since then, the microfinance industry has diversified and started providing financial access to new opportunities such as housing, energy, agriculture, educational funding, and school infrastructure. Aside from financial access, the industry started to focus on other areas such as health, safety, education, and job training (European Microfinance Platform, 2016).

Due to the rapid changes and developments in microfinance sector, there is a sustained growth in lending and clientele from 2013 to 2017. As a result, the microfinance industry announced $124 billion in lending and a 9.5 percent increase in clientele in 2018 (Microfinance Barometer, 2019). These promising signs point to the maturity and involvement of a responsible sector that has learned from its mistakes and is committed to develop and encourage global financial inclusion.

2.4.4. Evaluation of MFIs' performance through randomised control trials

The need for sophisticated program assessment tools has grown as the microfinance industry expands and new lending methods and financial product offerings emerge. To that goal, researchers have started to employ randomised control trials (RCTs) – a methodology developed for use in the medical business – to better study what works and what does not in the fight against global poverty. The evaluations are designed to create real-world laboratories by randomly assigning a group of people – the treatment group – to get a specific financial product and keep a control group to compare results.

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[3] These dimensions include no poverty, zero hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industry innovation and infrastructure, reduced inequalities, sustainable cities and communities, responsible consumption and production, climate action, life below water, life on land, peace justice, and strong institutions.

Many older impact evaluation techniques have been criticised for being susceptible to self-selection bias, which is why randomised trials[4] have become so popular. These assessments could not distinguish whether a given result was due to the financial instrument's impact or to the people who were successful beneficiaries of those instruments. Such bias is considerably more controlled because the groups being compared are allocated randomly in randomised control trials. Instead of asking how receivers of microloans vary from the rest of the population, the population is divided into two groups, one of which receives microloans while the other does not, and then both groups are observed.

Several microfinance programs and products have been evaluated for their positive and negative impact on the people who use them using RCTs. Researchers have looked into microcredit, savings, and microinsurance, among other programs. Under the umbrella of Innovation for Poverty Action (IPA), leading development economists from Harvard, Yale, MIT, and the LSE have measured microfinance program impacts in 40 countries. The influence of microcredit was studied using randomised trial techniques by Dean Karlan, an economics professor at Yale University. He claims that access to microcredit does not boost profits, firm scale, or household spending on average. However, during his research in the Philippines, he discovered what he regards to be a positive "social component" of microfinance: “microloans boost the ability to manage risk, build community bonds, and boost access to informal credit.” As a result, microcredit might work in this context, but not in the way its proponents claim.

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[4] All information is taken from the CGAP report (2011) on "Latest findings from randomized evaluations of microfinance".

In another study, Karlan et al. (2016) looked into the savings of low-income persons in three African countries (Ghana, Malawi, and Uganda). According to their research, while the poor join informal savings organizations, they underutilise formal savings (banks) and spend money hastily. The concept was to develop a ‘commitment’ savings product that would allow depositors to set voluntary savings amounts and deadlines while also taking resources from the family and providing security. The results of the program support that the promotion of these community-based microfinance savings groups leads to an improvement in household business outcomes and women’s empowerment. However, there is no evidence of impacts on average consumption or other livelihoods.

Jonathan Morduch, Professor of Public Policy and Economics at NYU, an impact evaluation expert, has studied the impact of microinsurance. According to his study, “impact evaluations can look at the performance of two different insurance products or the impact of certain product features like marketing methods, price structures, or distribution channels.” Such evaluations allow for optimal operations and client access, resulting in increased sustainability and social effects.

Another proponent of randomised trials is David Roodman, a Research Fellow at the Center for Global Development, who claims that they provide “more trustworthy evidence than microfinance has ever had” to analyze its effects. His recent review of “Randomised test of microcredit in Mongolia” provides an interesting perspective on the “method of randomisation” used in research considering group versus individual microloans.

Despite the massive wave of RCTs and their popularity in assessing microfinance programs and products’ real impact, such tests are not without problems. Policymakers such as Abhijit Banerjee of the Abdul Latif Jameel Poverty Action Laboratory (J-PAL) have remarked that they are more interested in whether a financial instrument works across the country than whether it works in a few communities. In this case, randomised studies may not be as valuable. The author further adds that evaluating the impact of microfinance does not have to be limited to the impact of credit versus no credit. Prospective evaluation, on the other hand, can assist MFIs and policymakers in creating better institutions. A good evaluation may provide financial institutions with prescriptions for conducting their operations and maximise their social impacts and offer funders an assessment of the advantages that accrued from their investment.

2.4.5. Product innovation in MFIs

Innovation in microfinance is critical for increasing the quality, size, and efficiency of financial services for the poor and low-income. Innovations are modifications to goods, service delivery, or processes that create new opportunities for microfinance institutions (MFIs) and the clients they serve to become more productive. In product development, innovation entails providing a diverse range of financial products (e.g., savings, insurance, remittances, and money transfers) that enable poor households to respond to life-cycle events, better manage risk and accumulate needed assets in addition to working capital loans. It also entails a commitment to fair commercial procedures that safeguard consumer rights by avoiding excessive debt and hyper-collateralisation, inadequate interest rate and term transparency, and abusive debt collection tactics. Innovation also includes changes to service delivery, such as adopting new technologies and organizational processes, growing into new markets, and lowering transaction costs. ATMs, smart cards, credit scoring, mobile phones, and biometrics technology are all examples of creative technological applications that can help low-income consumers gain access to money around the world (Seep, 2011).

Gray et al. (2015) state that most MFIs in developing nations are too small regarding clientele and geographic coverage. These MFIs also face various risks, including idiosyncratic, covariant, and individual risks, due to their specialised geographic coverage. Idiosyncratic risk is related to uncertainties and potential problems that are unique to an individual, or a particular group of people or area, on the other hand, natural calamities, such as floods and droughts, are examples of covariant risk. Individual risks include the inability to work or old age problems. A few forward-thinking MFIs have created financial products to handle specialised risks.

Additionally, as MFIs grow and acquire operational scales similar to those attained by Bank Rakyat Indonesia (BRI), the Bangladesh Rural Advancement Committee (BRAC), or the Grameen Bank, there is significant potential to handle covariant risks sustainably. Grameen Bank and BRI, for example, have rescheduled loans to consumers in disaster-affected areas. Because of its vast earnings and corporate conviction that losing a good borrower is also a loss to BRI, BRI did this without the help of the state. In addition, the Grameen Bank has rescheduled loans for flood-affected customers. Members of the Grameen Bank are required to put tiny sums of money into an “emergency fund”. Covariant risks can be addressed in principle by pooling such funds across more significant territories.

Some other MFIs also offer innovative products[5], including precautionary savings and consumer loans, which can help to mitigate health risks indirectly. Village banks, for example, that follow the FINCA model or the concept devised by the French NGO Centre International de Développement et de Recherche (CIDR) raise funds for their members' internal consumption loans. Caja Social in Mexico and BRAC in Bangladesh are two such MFIs that openly give consumption credit. SEWA, an Indian microloan program for impoverished women, permits borrowers to defer repayment while pregnant. The implementation of precautionary savings services can also help to mitigate health risks. This type of service is beneficial to a large number of people. BancoSol in Bolivia and BRI in Indonesia provide savings services to a varied clientele, including the poor, to help them avoid health hazards that occur regularly and require quick attention. In these savings arrangements, the cost and time to withdraw the deposit are modest (CGAP, 2016).

A small number of MFIs provide life insurance to protect against the danger of death or a loss of care as people age. Most contracts, however, cover the borrower's outstanding debt in the event of death. This is the case in Bangladesh, for example, with BRI or ASA. On the other hand, BRAC offers a life insurance policy that pays a certain amount in the event of a member's death. Due to social barriers, women are frequently unable to obtain a loan unless they are married and have a co-signer. MFIs should not engage in such prejudice. Women's bargaining power in the home may be increased by providing them with personal credit lines and savings accounts.

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[5] Most of the information regarding product innovation is taken from CGAP annual reports and SEEP (2011) annual report on "Promoting innovation in microfinance".

Furthermore, private accounts for women will give them a far stronger economic position in the event of a divorce. Microfinance can help the impoverished make money from microenterprises and level out their income and consumption. The first possible effect is the driving force behind today's microfinance movement. However, as the poverty level of MFI consumers rises, the second consequence becomes more critical. MFIs should focus more on credit, savings, and insurance services that can limit risks, mainly if they aim to help the poor (CGAP, 2016).

According to Zeller (2000), lack of access to financial services for income and consumption smoothing can have severe ramifications for one's livelihood. The author performed research in numerous developing nations worldwide with the help of the International Food Policy Research Institute (IFPRI) and highlighted country-specific findings. According to the International Food Policy Research Institute, because of restricted informal coping techniques and financial access in the aftermath of severe floods in Bangladesh, the nutritional health of children in impoverished households suffers substantially. In a similar study conducted in Peru, credit-strapped parents were shown to withdraw their children out of school and place them in income-generating jobs during difficult times. Child labour is a crucial aspect of India's self-insurance policy for poor rural communities.

According to CGAP (2016), most formal credit and savings services are ineffective for consumption smoothing because they are only approved after a long wait, have significant transaction costs, or are solely supplied for productive purposes. Similarly, many commonly found savings products are of little use to those who wish to save due to precautionary motives; for example, some savings deposits may only be withdrawn after a waiting period, or a fixed percentage may be held to secure a loan, as is common in the majority of credit-focused microfinance schemes. Much of the poor's saving behaviour, according to the research, is motivated by the desire to hold precautionary savings to maintain capacity for future consumption smoothing. It is critical to recognise that such savings might take four different forms. First of all, households might keep buffer inventories in the form of assets that may be sold in the event of a temporary income shock. Traditional precautionary saves in more impoverished countries include cattle, food, and money beneath the pillow. These unofficial reserves are vulnerable to inflation, animal disease, and theft.

Second, households may opt not to fully utilise available credit limits to preserve the ability to borrow in "difficult" times. Third, precautionary reserves in the form of human capital can be maintained, such as having more children to meet potential labour shortages in the family due to health concerns or having better-educated children. Finally, investing in personal relationships and membership can result in precautionary savings in the form of social capital, which can be invested in community-based social and other institutions. When temporary income shocks occur, it is reasonable to predict that social capital, like any other kind of capital, will be utilised more intensely in the future.

To summarise, for many years, microfinance groups worldwide have relied on Grameen Bank in Bangladesh or FINCA in Central America to replicate a primary working capital loan. In recent years, it has been evident that simply duplicating products and procedures into widely different socioeconomic situations would fail. Furthermore, it is becoming increasingly clear that the low-income market has a diverse set of financial service needs, many of which can be met successfully. As the microfinance business grows and develops toward a market-led model, the low-income market will require a wide range of financial services. MFIs must adjust their existing products or establish new ones as their clients' demands evolve. However, product development is a time-consuming and resource-intensive process that should not be taken lightly. MFIs must effectively perform systematic product development that meets their clients' needs and is cost-effective. More client-responsive products will reduce drop-outs, attract more new clients, and contribute significantly to the long-term viability of the MFI.

2.4.6. Global and regional growth in the microfinance sector during 2010-2019

Despite a recession in the early 2010s, the microfinance industry expanded annually with a credit portfolio of 11.5 percent. In addition, clientele development is slower, at 7 percent per year, compared to 20 percent between 2000 and 2010. According to global microfinance statistics, the sector represented 139 million borrowers in 2018, compared to just 98 million in 2009. Borrowers collected a total of $124 billion in form of loans from MFIs in 2018, out of which 80 percent of total borrowers being women and 65 percent of total borrowers hailing from rural areas. Although, the cost per borrower has increased dramatically ($68.4 in 2009 to $106.7 in 2018), the operating expense ratio has decreased by 2.7 percentage points. The return on assets and return on equity have increased by 1.3 and 2.9 percentage points, respectively, during the same span (Microfinance Barometer, 2019).

The regional comparison of the microfinance sector reveals some exciting highlights[6]. South Asia (SA) ranks first, with 85.6 million borrowers representing two-thirds of global borrowers and the top three microfinance markets: Bangladesh, India, and Vietnam (Microfinance Market Outlook, 2019). This region concentrated more on the rural population and had the highest annual growth 13.8 percent in borrowers compared to other regions, with 89 percent of borrowers being women. This region ranks second among others with a credit portfolio worth $36.8 billion.

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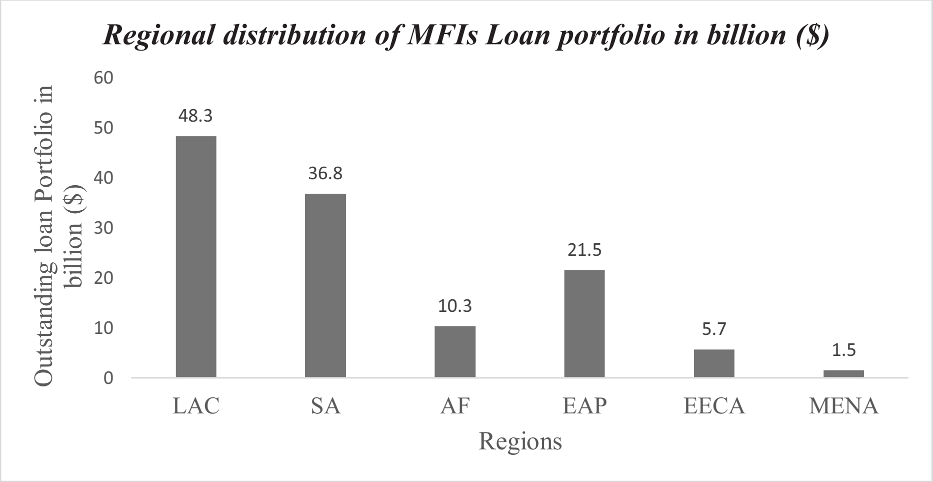
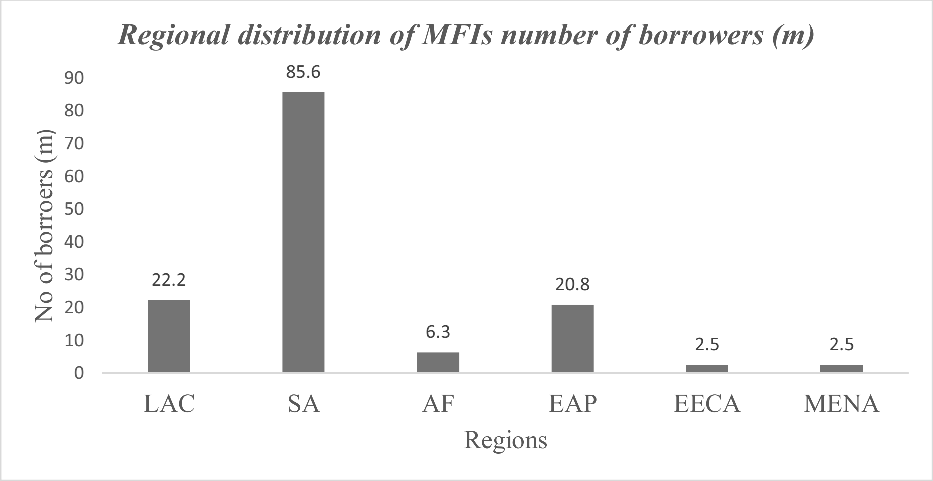
[6] All information and data are taken from Microfinance Information Exchange (MIX Market, 2019), a global source of transparent data on microfinance sector.

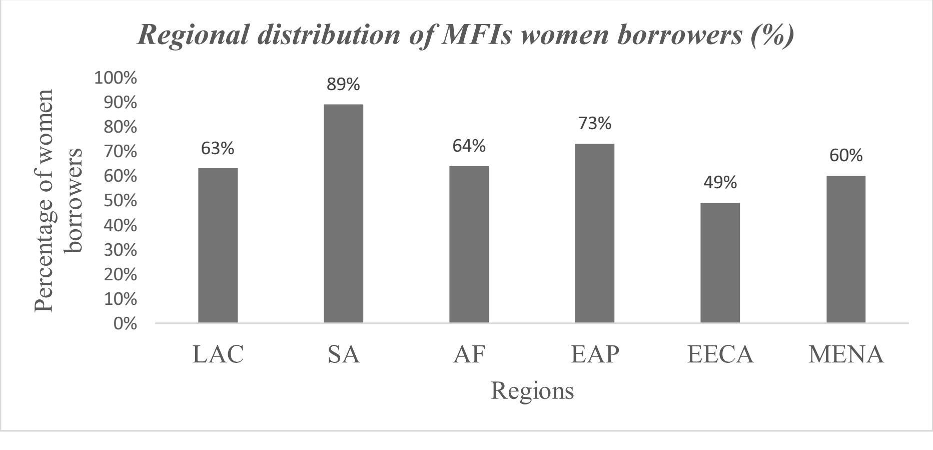


Latin America and the Caribbean (LAC) has the largest outstanding credit portfolio of $48.3 billion, accounting for 44 percent of the total outstanding portfolio in the microfinance sector. In terms of borrowers, this region is second on the list, with 22.2 million borrowers. The focus of the region is mostly on urban areas which account for 76 percent of microfinance clients.

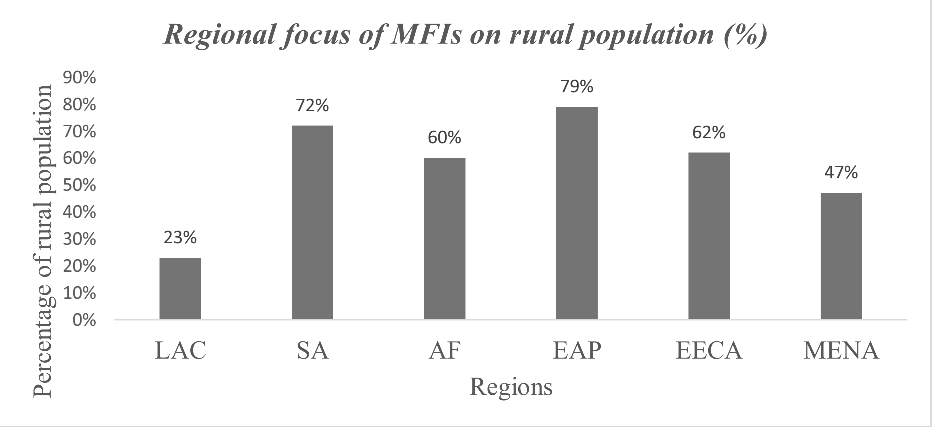
Eastern Europe and Central Asia (EECA) and the Middle East and North America (MENA) are smaller microfinance markets than the two mentioned above. EECA had a $5.7 billion credit portfolio in 2018, while MENA had a $1.5 billion credit portfolio. In these regions, credit portfolios are growing at a slower rate of 1 percent in MENA and 5 percent in EECA, respectively. In 2018, both regions had 2.5 million borrowers, with female borrowers accounting for 49 percent in the EECA and 60 percent in the MENA.



The African microfinance sector is expanding in terms of credit portfolio and clientele. In 2018, the region had $103 billion in total outstanding loans and 6.3 million borrowers, representing a 56 percent rise in loans and a 46 percent increase in borrowers as compared to 2012. In comparison to other regions, the African microfinance sector has the highest cost per borrower and the lowest loan portfolio efficiency. In the African microfinance market, women account for 64 percent of total borrowers, and 60 percent of total loans are allocated to the rural population.



Finally, the East Asia and Pacific (EAP) region has a $21.5 billion credit portfolio and 20.8 million borrowers. Since 2012, these figures indicate a 16 percent increase in credit portfolio size and a 6 percent increase in the number of borrowers. This region puts strong emphasis on female clients and the rural population, with female borrowers accounting for 73 percent of total borrowers and 79 percent of total loans are distributed to the rural population.



2.5. Theories

The performance of microfinance institutions can be examined through various perspective based on standard finance and economics theories. This section briefly explains different theories used in this thesis and how they are applied in the context of MFIs.

2.5.1 Agency theory

Agency theory focuses on the contractual relationships between principal and agent and is widely used in banking, management, and economics literature (Slyke, 2006). The main premise of this relationship is that one party (principal) assigns the task to another party (agent), who will complete the task. In this principal-agent relationship, usually the agent possesses greater and more specific information about the task as to the principal. This leads to the conflict of interest between the principal and the agent. The agent uses this information advantage for self-benefit instead of satisfying the mutual interest of the principal. Eisenhardt (1989) states that in most of principal-agent relationships, generally it is impossible for the principal to know exactly what the agent is doing and whether or not he is acting in the best interest of the principal. The agent's efforts that are not entirely clear to the principal are referred to as "hidden action" (Arrow, 1984). Figure 1 shows the agency theory with the assignment of work from the principal to the agent, and depicts that the main problem of agency theory is related to information asymmetries that may be in form of pre-contractual deceitfulness (adverse selection) or post contractual deceitfulness (moral hazard).

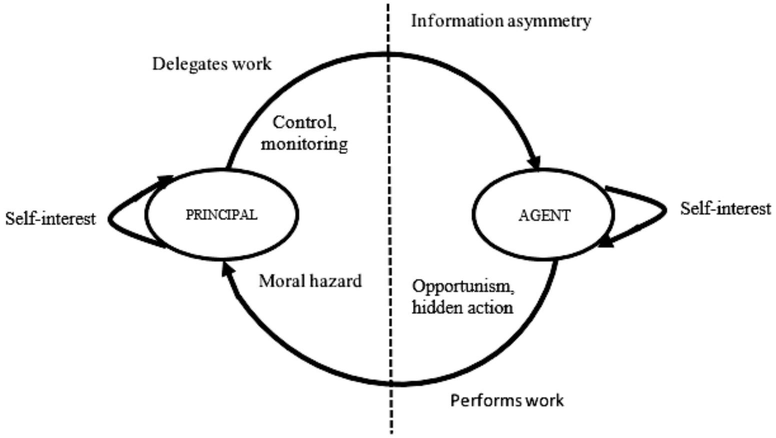

Information asymmetry
Delegates work
Control, monitoring
Self-interest
PRINCIPAL
AGENT
Self-interest
Moral hazard
Opportunism, hidden action
Performs work

Figure 1: Theoretical model of agency theory
(Source: Slyke, 2006)

This theory is applicable in the context of both microfinance institutions and conventional banks as both institutions serve as an agent for their depositors and principal for their borrowers, thus this relationship can affect the portfolio quality of these institutions. Tabak et al. (2012) state that due to the comparatively large scale of operations, access to more external funding opportunities, a broader range of products, and a wider customer base, commercial banks may indulge in risky projects and grant loans to risky borrowers. On the other hand, microfinance institutions have more risky borrowers with unsecured loans or loans without collateral. Additionally, some of the borrowers have opportunistic behaviour that further affects the loan portfolio of MFIs (Christen et al., 2012).

2.5.2 Theory of asymmetric information

A perfect financial market has specific characteristics: every participant can freely enter and exit the market; no individual has control over the price; borrowing conditions are similar for all participants; all participants have complete knowledge about the current and future prices; all financial securities are homogenous, and there is no transactional cost. Stigler (1961), Akerlof (1970) and Spence (1973) develop the theory of asymmetric information based on the concept of an imperfect market concerning the information. These three scholars support the idea that one party is more knowledgeable in any market transaction than the other party, which leads to asymmetric information phenomenon. There is a difference in knowledge processed by the borrowers and the lenders in credit markets, which leads to adverse selection and moral hazard problems (Stiglitz & Weiss, 1981). Like banks and other financial institutions, microfinance institutions most often face both these challenges (Ghatak & Guinnane, 1999; Tchuigoua, 2016).

Adverse selection

Jaffee & Russel (1976) state that adverse selection occurs when the lender chooses risky borrowers based on a lack of adequate knowledge about the borrowers' project or investment. Usually, borrowers have more information regarding taking loans, whereas the lender lacks sufficient information about their projects. Therefore, the lenders may select risky borrowers with low or no capacity to pay back the loans and reject safer borrowers with better repayment potential Devos et al. (2010). Both microfinance institutions and commercial banks often encounter the problem of adverse selection during the lending process. Buera & Kaboski, (2012) state that collateral can be served as a method for overcoming the issue of adverse selection. Berger, Frame, & Ioannidou (2016) further add that banks must pledge secured collateral in case of observably riskier borrowers. According to Tchuigoua (2015), adverse selection occurs because borrowers understand about their project quality and outcome more than the management of microfinance institutions. That is why mostly MFIs are unable to distinguish between risky and safe borrowers in their pool of loan applicants and suffer from adverse selection problems. As a result, MFIs' loan portfolios are likely to suffer due to this incorrect borrowers' selection.

Moral Hazard

Dixit (1987) states that moral hazard happens due to less monitoring on the lender's part due to less or incomplete information about the borrowers. Since the lender cannot assure the viability of the projects undertaken by borrowers, the chances of default arise if borrowers' choice ends up in a complete failure or resulted in a return from the project fall below the expectations. Devos et al. (2010) state that the borrowers' choices are crucial in deciding the project risk's success, failure, and loan repayment. Hence, both the problems of information asymmetries are interlinked, the former is linked with selection and the latter is linked with loan monitoring to ensure repayment. Since both microfinance institutions and commercial banks provide loans to a specific clientele, the quality of the loan portfolio and associated credit risk must be effectively controlled. Navajas et al. (2000) state that as the microfinance industry matures and becomes more competitive, there is a strong need for systematic monitoring and risk management in this industry.

Devos et al. (2010) explain information asymmetry as a process that is dependent on the diverse skills and intellectual levels of the transacting players and is thus treated as an independent construct. Trust, adverse selection, and moral hazard are the dependent notions of information asymmetry.

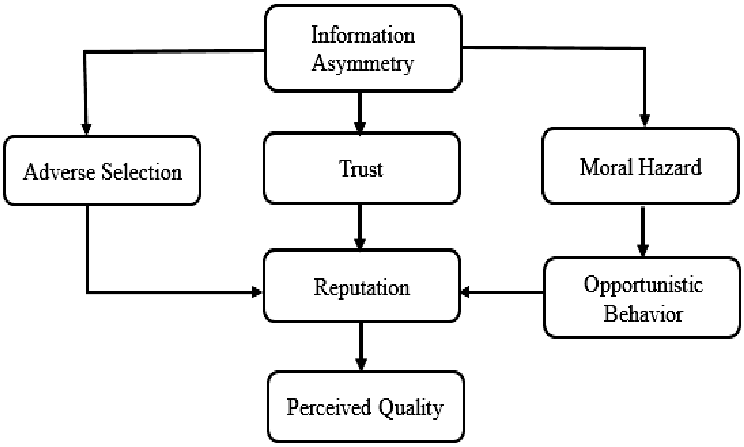


Figure 2: The nomological network of asymmetric information theory
(Source: Devos et al., 2010)

Figure 2 depicts the relation among information asymmetry and its three dependent constructs. The degree to which one party has faith in another in the context of a certain possibility, choice, or collaborative effort is referred to as trust. Trust is related to reputation, "a characteristic or attribute ascribed to one person (or organization) by another person (or organization). Adverse selection is a pre-contractual condition. The term "hidden information" is occasionally used to describe adverse selection in a more practical way. The third dependent construct, moral hazard, is a post-contractual condition that can occur as a result of the seller's dishonesty or inability to provide the true quality of the offering. Although these phrases are more typically used for opportunistic behaviour that can come from moral hazard, hidden action or concealed intention are occasionally used as more practical terminology for moral hazard. Opportunistic behaviour can damage a company's reputation, resulting in a decrease in perceived quality.

Tchuigoua (2015) states that outstanding loans constitute a substantial portion of MFIs' overall assets, so there is a strong need of loan monitoring mechanism to avoid credit risk associated with filthy loan portfolio. The author further adds that MFIs need to monitor the projects of their borrowers at different intervals and must aware of any opportunistic behaviour or uncertainty of repayments associated with the projects. On the other hand, Armendáriz & Morduch (2010) state that MFIs can minimize the risk of moral hazard by offering “dynamic incentive” to their borrowers about repayments of loans that is associated with a motivation to pay the current debt with a promise of getting future loans of larger amounts. This practice also assists MFIs in finding good borrowers while removing bad and opportunistic ones.

2.5.3 Theory of financial intermediation

The theory of financial intermediation was first developed by Gurley & Shaw (1960) in the 20th century. They came up with the idea of “financial intermediaries” to ameliorate lack of information and high transaction cost and apply a certain level of regulation. The main aim of this theory is to solve many of the shortcomings of informational asymmetry theory and agency theory. Sealey & Lindley (1977) state that financial firms do intermediation by taking funds from surplus units and lending them to deficit units. Additionally, these intermediaries improve fund allocation by acquiring and enhancing borrowers’ information.

According to Leland & Pyle (1977), an intermediary has unique information about the assets in which it is going to invest the money. As a result, the intermediary can share the fixed cost of asset assessment among different investors. The trading cost can also be minimized as the intermediary can diversify among different opportunities more easily than individuals. Furthermore, these intermediaries act as "delegated monitors" and closely observe the deployment of their investment, thereby enhancing investors' confidence by using various screening manoeuvres for asymmetric information problems (Diamond, 1984).

Thus, many market imperfections such as information, transaction, enforcement, and monitoring costs are ameliorated through these intermediaries. Werner (2016) emphasises that commercial banks merely perform financial intermediation functions, not different from other financial institutions, by collecting deposits and lending them out. According to Kempson et al. (2004), the presence of various financial institutions such as banks and MFIs offers intermediation services to a large number of people. Boyd & Prescott (1986) and Ramakrishnan & Thakor (1984) suggest that financial intermediaries bridge the gap between the surplus and deficit unit by acquiring information not easily available in the market from surplus and deficit units that would otherwise transact directly.

Over the years, financial intermediation accounts for the changes happening in many countries' financial system due to expansion and emergence of new intermediaries that minimise transaction costs and make information's availability more and cheaper (Dewatripont et al., 2010). This view supports microfinance institutions' emergence as intermediaries involved in facilitating credit delivery to the underprivileged through individual and self-help group mechanisms. Their intermediation to the poor is an attempt to enable them to be part of formal financial systems. In this way, their role as intermediaries is similar to banks involved in credit acquisition and disbursement (Bouman, 1995). Additionally, Mishkin (2007) claims that MFIs provide intermediation by opening branches in remote areas and offering financial products and services tailored to the poor's economic situation. Figure 3 shows how banks and MFIs do intermediation by taking funds from surplus units and lending them to deficit units.

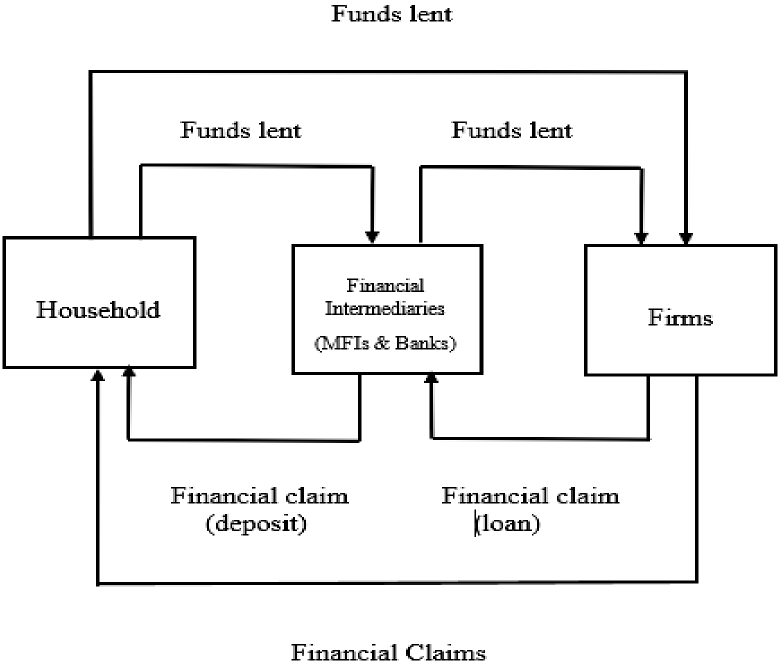

Funds lent
Funds lent
Funds lent
Household
Financial Intermediaries (MFIs & Banks)
Firms
Financial claim (deposit)
Financial claim (loan)
Financial Claims

Figure 3. Theoretical model of financial intermediation
(Source: Buckle & Thompson, 2016)

Domar (1947) and Blume & Sargent (2015) further state that in developing countries, mostly "domestic savings" component is missing that could be generated through international donors and banks who provide funds to intermediaries in developing countries to further channelize them to underprivileged. In traditional banking, deposits typically act as the primary source of further lending. Since all types of MFIs do not engage in the collection of deposits from savers, they can still perform financial intermediation functions and provide financial access to the overlooked segment of the society through the collection of funds from development finance institutions and foreign investors (Reille et al., 2009; Tang et al., 2019).

2.5.4 Theory of finance and growth

Financial development takes place when financial instruments, markets, and intermediaries reduce information, transaction, and enforcement costs and can perform five key functions namely: pooling and mobilization of savings, production of information and resource allocation, resource monitoring and execution of corporate control, diversification and risk management, and facilitation in the exchange of goods and services. Various theorists including Merton (1992), Levine (1997), and Merton & Bodie (2005) support this well-functioning view of the financial system that leads to enhance investment decisions, saving rates and technological innovations, and thus stimulate the long-term economic growth[7] of an economy across time and space. Further, these theorists state that that the composition (bank-based and market-based) of the financial system is of secondary importance. The most important consideration for economic growth is a well-functioning financial system.

According to Levine (1997), there are two channels through which the financial system can influence economic growth: capital accumulation and technological innovation. The former is linked with the ability of the financial system to influence capital formation by either increasing the rate of savings or directing savings to the most productive sectors to fund investment projects, while the latter is linked to the financial system's ability to influence technological innovations by generating new product ideas, processes, and goods. Figure 4 shows how financial intermediaries help to reduce market frictions and promote financial development, which leads to economic growth.

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[7] This endogenous growth model assumes that the financial sector's ability to influence economic growth is affected by a variety of factors such as the efficiency of financial intermediaries, legal, political, monetary, and fiscal environment, financial liberalization, and geographical location of the country (Levine et al.,1998; La Porta et al.,1998).

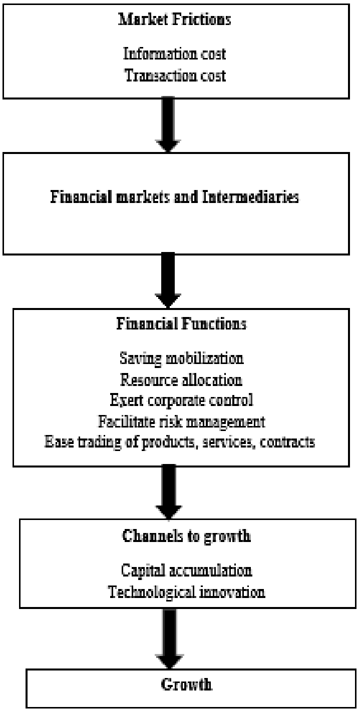
Market Frictions
Information cost
Transaction cost
Financial markets and Intermediaries
Financial Functions
Saving mobilization
Resource allocation
Exert corporate control
Facilitate risk management
Ease trading of products, services, contracts
Channels to growth
Capital accumulation
Technological innovation
Growth

Figure 4. Theoretical model of finance and growth
(Source: Levine, 1997)

The finance-growth theory can be extended to microfinance institutions because they replicate many of the functions of the financial system, resulting in enhanced economic growth along with a social focus. Microfinance institutions emerge as "formal financial intermediaries for the poor" in developing countries because the formal financial system does not cater to the poor (Bouman, 1995). According to Ray (1988), microfinance is an innovation in the financial system of many developing countries that combines certain features of informal moneylenders with those of conventional banks. Armendariz de Aghion & Morduch (2010) further add that by channelling funds to many underprivileged people and financing a larger number of projects with low-interest rates than informal lenders, MFIs improve efficiency.

There are various ways through which MFIs contribute towards financial development and economic growth, such as: moving people from subsistence to self-employment and entrepreneurship (Ahlin & Jiang, 2008), providing a source of employment and income-generation for the poor (Bikbaeva & Gaibnazarova, 2009), facilitating saving mobilization and credit allocation to the most productive projects, along with other financial services such as collateral-free loans, insurance, and money transfer at a lower cost (Maksudova, 2010, Armendariz de Aghion & Morduch, 2010; Reed 2011), increasing economic welfare by reducing income disparities between poor and rich class through consumption and production loans (Buera, et al., 2012), increasing the purchasing power of the people and through the capital formation (Lopatta & Tchikov, 2016), and raising total factor productivity (Donou-Adonsou & Sylwester., 2017). All the aforementioned ways emphasize the important role played by MFIs towards the financial development and economic growth of an economy. However, the effect and magnitude of MFIs' role can be different from conventional players due to their age, type, size, and scope in a particular economy.

2.5.5 Upper echelon theory

Hambrick & Mason (1984) argue that organizational strategies are "reflections of the values and cognitive bases of powerful actors in the organization". Past literature has shown that CEOs are the most influential organizational actors and significantly impact organizations' strategic decisions and choices (Crossland, Zyung, Hiller, & Hambrick, 2014). Figure 5 shows how the upper echelon theory (UET) provides theoretical foundation to examine the relationship between different CEO characteristics and organizational performance outcomes.

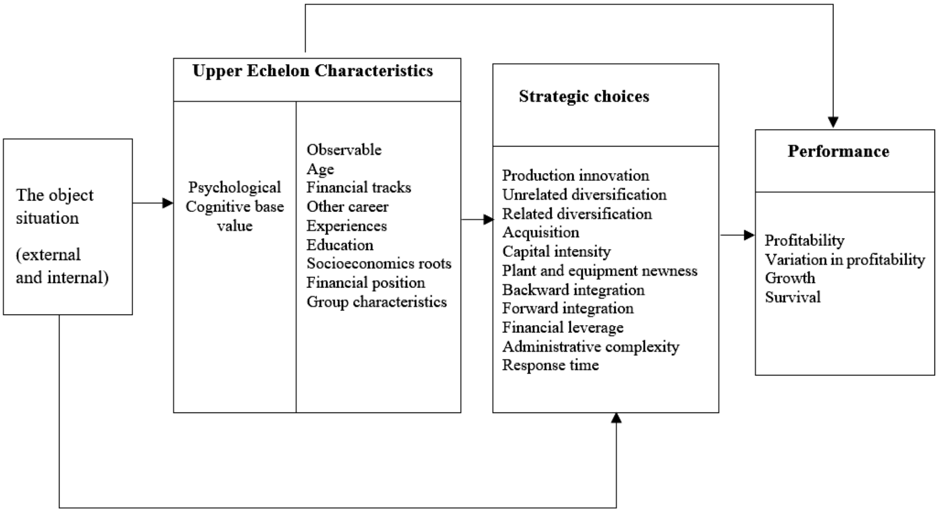
Upper Echelon Characteristics
The object situation
(external and internal)
Psychological Cognitive base value
Observable
Age
Financial tracks
Other career
Experiences
Education
Socioeconomics roots
Financial position
Group characteristics
Strategic choices
Production innovation
Unrelated diversification
Related diversification
Acquisition
Capital intensity
Plant and equipment newness
Backward integration
Forward integration
Financial leverage
Administrative complexity
Response time
Performance
Profitability
Variation in profitability
Growth
Survival

Figure 5. Upper echelons perspective of organizations
(Source: Hambrick & Mason, 1984)

According to UET, CEOs vary significantly in values, attitudes, talents, abilities, and behaviour, resulting the performance of their organizations to differ significantly (Hambrick & Mason, 1984). The main idea is based on the fact that the more complicated decision requires more relevant personal traits of the decision-maker. UET recognises that top executives have bounded rationality. Their decisions are based on the cognitive, social, and physiological orientation that affects their strategic choices and organizational performance. Although it is difficult to quantify human values and cognitions (Pfeffer, 1983), various demographic and other observable characteristics of CEOs such as age, gender, ethnicity, background, knowledge, experience, expertise, tenure, can often be used as proxies to analyze organizational strategies, processes, and performance.

Like other organizations, UET is very relevant to the microfinance context, as CEOs are considered the most influential individuals with considerable managerial discretions (Galema et al., 2012). Since microfinance institutions are typical organizations aiming to pursue financial objectives and the social mission, in these institutions, some characteristics of CEOs like gender are fundamental as the majority of the clients are female. Therefore, female CEOs can better penetrate the female clientele market and provide tailor-made products and services that can enhance the outreach and the financial performance of these institutions (Storm et al., 2014). Some other CEO characteristics, such as relevant knowledge and experience about MFIs services and operations, enable these institutions' CEOs to design relevant strategies and make choices that result in better outreach and sustainability (Pascal et al. 2017). Furthermore, founding status is another very significant attribute of CEOs in MFIs, as this status indicates a unique emotional connection between CEOs and MFIs and has implications on the performance of these institutions (Randoy et al., 2015).

2.5.6 Resource-based theory

The resource-based theory (RBT) is one of the most influential theories, explaining why some firms consistently perform better than others. This theory assumes that when firms have VRIO: valuable, rare, inimitable, and organised resources, they can gain a competitive advantage (Barney, 1991). The firms' resources can be classified as tangible (land, labour, capital, equipment) and intangible (knowledge, skills, capabilities, intellectual capital, human capital, expertise). Following the emergence of RBT in the 1980s, intangible resources are more focused as they are considered more significant resources for a firm (Drucker, 1992). Figure 6 explains that RBV is a model that sees resources as key to superior firm performance. If a resource exhibits VRIO attributes (valuable, rare, inimitable, and organised to capture value), the resource enables the firm to gain and sustain competitive advantage.

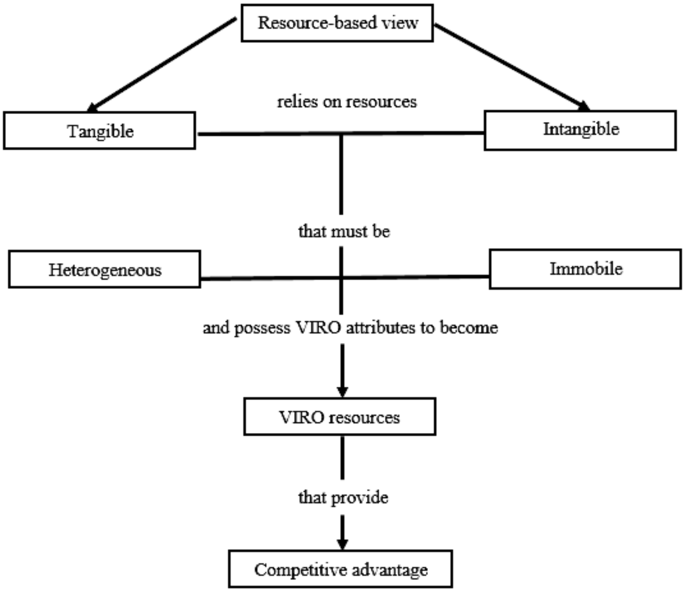
Resource-based view
relies on resources
Tangible
Intangible
that must be
Heterogeneous
Immobile
and possess VIRO attributes to become
VIRO resources
that provide
Competitive advantage

Figure 6. Theoretical model of resource-based view
(Source: Jurevicius, 2013)

Various prior studies attempt to research RBT’s implications by examining how the company’s various resources will influence its efficiency and performance (Godfrey & Hill, 1995; Barnett, et al. 1994). This theory can be applied to microfinance institutions’ performance in the context of top management attributes as RBT states that the top executives who become the most valuable resources for their firms are associated with higher organizational outcomes and returns. Bergh (2001) points out that top executives are valuable resources for the firms as these top executives possess unique, non-transferable, and idiosyncratic knowledge, expertise, and skills about the history, culture, structure, market potential, and relationship network of the company that can enhance the organizational performance.

2.6. Conclusion

This chapter discusses the definitions, concepts, debates, and theories related to MFIs employed in this thesis. It covers a general overview of the microfinance sector since its emergence and focused on the microfinance sector's journey during the last decade (2010-2019). The microfinance sector has faced considerable criticisms regarding their lending activities, high interest rates, profit-making, suicidal attempts due to over-indebtedness of their clients, and the predatory lending motives of some Indian and Cambodian MFIs. As a result, the microfinance sector has undergone significant changes. Numerous regulations have been implemented to regulate interest rates and practices of MFIs in various parts of the world. Apart from these few bad examples, the microfinance industry has seen many positive changes in the recent decade, which shows how the industry has learned from its mistakes and evolved.

I also discuss in this chapter a few standard theories that are subsequently used in the empirical chapters of the thesis. For example, financial intermediation and finance-growth theories are discussed in chapter 3 to examine whether and how MFIs can accelerate financial development and economic growth, and reduce income inequality and poverty at the country level. Further, theories such as agency theory, asymmetric information theory along with intermediation, and resource-based theories are discussed in chapter 4 to examine the differences in performance between microfinance banks and commercial banks. Finally, upper echelon and resource-based theories are discussed in chapter 5. These theories provide the basis that accentuates that different CEO attributes such as gender, business education, domain experience, and founding status are important determinants of the financial performance of MFIs.

CHAPTER 3
FINANCIAL DEVELOPMENT, ECONOMIC WELFARE, AND BANKING EFFICIENCY: THE IMPACT OF MICROFINANCE INSTITUTIONS[8]

3.1. Introduction

Financial systems not only mobilize savings and ease exchange but also play an important role in producing and disseminating information, allocating and monitoring resources, and managing and diversifying risks. Furthermore, well-functioning financial systems reduce information and transaction costs that generate a favourable effect on savings and investment decisions, the pace of technological innovation, and ultimately per capita income and growth rates (Beck et al., 2000; Levine, 2005). Financial institutions typically constitute the core of a financial system and enhance economic efficiency and growth by helping to allocate capital to its best uses (Levine, 1997).

Historically traditional commercial banks (CBs) dominated the market as the only viable intermediary both in developed and emerging economies. Throughout the past several decades microfinance institutions (MFIs), first started in the developing world, slowly established themselves as a significant part of financial intermediation everywhere. According to the International Monetary Fund (IMF), economic growth in the 20 most important microfinance markets has increased from 4.4% to 4.8% in 2015, whereas the global microfinance market has achieved a growth of 15-20% in 2015. Asia has been displaying the strongest growth momentum in which the most impressive development is the revival of India’s microfinance market.[9]

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[8] This chapter is a revised version of the paper: Abrar, A., Hasan, I., & Kabir, R. (2021). Finance-growth nexus and banking efficiency: The impact of microfinance institutions. *Journal of Economics and Business*, 114, 105975.

Prior studies have examined a variety of issues associated with microfinance institutions, such as outreach and efficiency (Hermes et al., 2009), household access (Honohan, 2008), informal lending (Islam et al., 2015), empowerment (Ganle et al., 2015), scale economies (Hartarska et al., 2013), business models (Bos & Millone, 2015), efficiency (Servin et al., 2012), competition (Ly & Mason, 2012), governance (Mersland & Strom, 2009), female leadership (Strom et al., 2014), financial performance (Cull et al., 2007), and macroeconomic performance (Ahlin et al., 2011).

A few studies analyze how the performance of MFIs is affected by the level of financial development of countries where these institutions operate. Hermes et al. (2018) state that countries with well-developed financial markets create an environment in which microfinance institutions can thrive and improve their efficiency, hence increasing their ability to contribute to financial inclusion. On the other hand, Vanroose & D’Espallier (2013) analyze how the development of host country's traditional financial sector affects the performance of MFIs in terms of outreach and profitability. Their results suggest that MFIs serve more clients and are more profitable where traditional financial sector development is low. However, in a well-developed financial system, MFIs give smaller size loans and focus more on poor borrowers, thus supporting the market failure hypothesis. Cull et al. (2014) examine the effects of commercial and microfinance banks’ penetration in 38 developing countries and its impact on microfinance banks' outreach and profitability. Their findings indicate that competition from commercial banks enables microfinance banks to concentrate more on poorer clients and expand their outreach by providing women with financial inclusiveness. However, the commercial banks' penetration does not enhance the profitability of microfinance banks. All these studies analyze how the presence of traditional financial systems and their development affect the financial performance, outreach, efficiency, and inclusiveness of MFIs rather than how the financial development and economic welfare of a particular country are affected by the presence of MFIs together with traditional commercial banks.

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[9] According to Microfinance Market Outlook (2015) report, in 2011 market commentators predicted the end of India’s microfinance market. At that moment there was a strong wave regarding the ban of microloans by the Andhra Pradesh government because of suicides among over-indebted clients of some large microfinance institutions. However, after the 2014 election, there was a massive foreign investment in the microfinance sector.

The objective of this study is to close this gap in the literature by tracing the role and impact of MFIs alongside CBs. We investigate whether and how the presence of microfinance institutions in a dual financial system affects the overall financial development (intermediation e.g., deposit growth and lending activities) and economic welfare (economic growth, income inequality, and poverty) in different countries around the world. Additionally, we inquire whether the competition from MFIs disciplines the commercial banks and pushes them to become more efficient. We answer these questions by analyzing a sample of 35 countries around the world where both CBs and MFIs operate during a time-period of 14 years (2001-2014).

This study contributes to the extant literature on microfinance specifically and banking literature generally in two ways. First, it analyzes the role of microfinance institutions from finance and growth perspective. MFIs have changed the financial system of many countries by introducing a dual system in which both microfinance and conventional institutions operate. Also due to rapid growth, microfinance industry nowadays is able to attract private funding, take deposits, and get access to financial markets (Krauss & Walter, 2009). The presence of MFIs is considered as a new pillar, which has two effects on the financial development and economic welfare. The direct plausible effect is increasing the welfare of society by reducing poverty, income inequality and providing them more entrepreneurial activities that ultimately enhance the economic growth of a country. On the other hand, the indirect effect of microfinance is to increase fund mobilization and credit allocation through financial deepening (Maksudova, 2010). We[10] empirically cater to both these effects in this study. To the best of our knowledge, this is the first comprehensive study to focus on the co-existence of microfinance with commercial banks and its contribution towards financial development and economic welfare of countries.[11]

Secondly, this study examines whether microfinance institutions can discipline conventional banks. The presence of MFIs most likely brings more competition to CBs and affects the cost of intermediation. To date, no study has yet examined this relationship between microfinance institutions and the efficiency of commercial banks.

The rest of the chapter is organized as follows. Section 3.2 presents a literature review and develops the hypotheses. Section 3.3 discusses econometric model specifications and provides information about the data and variables. Section 3.4 reports our main findings. Finally, Section 3.5 concludes the chapter.

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[10] Since the three empirical chapters (3, 4, and 5) represent ideas and collaboration with others, I prefer to use the expression we in these chapters.

[11] Donou-Adonsou & Sylwester (2017) study a single dimension by analyzing the effect of commercial banks and microfinance loans on economic growth.

3.2. Literature Review and Hypotheses

We first explore the relationship between the presence of MFIs and financial development. Then we study the relationship between the presence of MFIs and economic welfare in terms of economic growth, income inequality, and poverty alleviation and put forward several testable hypotheses. Finally, we develop the hypothesis on banking efficiency.

3.2.1 Financial Development

Poor people around the world do not have access to financial products and services because they either cannot provide the collateral against loans or are unable to bear the interest and transaction costs associated with them (CGAP, 2009).[12] They get the supply of financial services mainly from informal markets or lenders. A number of studies highlight that poor people prefer collateral free small size financial products and services that are customized to fulfil their basic needs such as the purchase of land, cattle, seeds or sewing machines, etc. (Ledgerwood, 2013). According to Honohan (2008), in most developing countries people have relatively low access to financial institutions and products that provide considerable potential for microfinance to shift lenders and borrowers from informal to formal markets. Beck et al. (2007) argue that in developing countries, conventional banks normally avoid poor households because they need different financial services.

Microfinance institutions started to play a complementary role to conventional banks in intermediating financial resources and thus contributing towards financial sector development.

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[12] The Consultative Group to Assist the Poor is a global partnership of more than 30 leading organizations that seek to advance financial inclusion. CGAP combines a pragmatic approach to responsible market development with an evidence-based advocacy platform to increase access to the financial services the poor need to improve their lives.

Moreover, by providing credit facilities, microfinance institutions increase the income and asset base of low-income people, enabling them to become prospective customers of conventional banks (Barr, 2005). MFIs may also act as a substitute to CBs by absorbing some of the lenders and borrowers of conventional banks and offering them the same financial services such as saving deposits, collateral-free loans, insurance, and money transfer facilities at a lower cost (Armendáriz & Morduch, 2010). The nature of these interactions as complementary vs substitution between MFIs and CBs positively affects savings mobilization and funds allocation, and thereby increases the financial development of a country. Therefore, we formulate our first hypothesis as:

H1: In a dual financial system, a positive relationship exists between the share of MFIs and financial development.

3.2.2 Economic Growth

Beck et al. (2000) argue that the financial development of a country may not affect directly the poor class. Rather it promotes the aggregate economic growth by helping the poorest in a disproportionately better way. To quote the authors: “the more abundant private credit creates a rising tide that lifts all boats, but a bigger lift to the poorest ones” (page 32). According to Maksudova (2010), MFIs contribute towards aggregate economic welfare of an economy by not only reducing poverty and income inequality but also providing various income generating opportunities to low income people. Lopatta & Tchikov (2016) state that MFIs increase growth in two ways: directly by increasing the purchasing power of the people and indirectly through accumulation of capital and employment. Banto & Monsia (2021) examine an imbalanced panel of 76 developing countries from 1999 to 2016 and conclude that despite their small size, MFIs performance contribute to economic development even when banking sector performance is considered.

Bikbaeva & Gaibnazarova (2009) state that microfinance is an effective source in providing employment opportunities and increasing the number of domestic firms and additional jobs. Their study shows that MFIs in Uzbekistan together serve around 70,000 clients, who further create jobs for additional 200,000 people. In this way, MFIs directly contribute towards the aggregate economic growth. Buera et al. (2012) and Donou-Adonsou & Sylwester (2017) find that MFIs increase economic growth by raising total factor productivity. Therefore, our second hypothesis is:

> *H2: In a dual financial system, a positive relationship exists between the share of MFIs and economic growth.*

3.2.3 Income Inequality

Jalilian & Kirkpatrick (2002) state that financial development facilitates microcredit process for poor and vulnerable people of the society by increasing their assets and productivity, thus reducing poverty and income inequality. They highlight “pro-poor growth” that is when the incomes of the poor grow at a higher rate than the incomes of non-poor, and point out that microfinance programs disproportionately benefit the poor by providing them small collateral-free loans compared to more wealthy people.

Ahlin & Jiang (2008) develop a model in which they categorize three types of activities: subsistence, self-employment, and entrepreneurship. They argue that microfinance loans provide poor class an incentive to use the amount of loan for income-generating activities, allowing them to move from subsistence to self-employment. When there is a substantial increase in self-employment share, entrepreneurs need to attract these workers by paying them market wages equal to their self-employment earnings. This channel raises the income levels at the bottom of the pyramid.

Hermes (2014) examines the role of microfinance on poverty reduction in developing countries. His findings confirm that participation in microfinance programs provides poor people the opportunity to increase their income levels, thus reducing the income gap between rich and poor classes. Kai & Hamori (2009) also analyze the relationship between microfinance and income inequality, and observe a negative association.

Beck et al. (2007) state that a more developed financial sector provides more financial services related to deposits, credit, insurance and money transfers, which disproportionately benefit the poor as they generally lack such facilities. The inclusion of poor into the financial system reduces their credit problems, and provides them investment opportunities in income generating activities. Thus, we expect microfinance institutions to provide more financial opportunities and increase the overall financial base of the economy leading to a reduction of income inequality. Therefore, our third hypothesis is:

> *H3: In a dual financial system, a negative relationship exists between the share of MFIs and income inequality.*

3.2.4 Poverty Alleviation

In order to generate more profits, commercial banks usually try to expand their networks and branches in capital-oriented areas or larger cities. They do not focus on areas with low income or low population density. Their approach ignores the poor class having limited access to financial services and products. Ayyagari et al. (2008) point out that lack of access to finance enhances poverty in the society. Microfinance brings the solution to limited access to finance by focusing exclusively on poor class living in low income and rural areas, and providing financial services and products to poor at affordable rates (Armendáriz & Morduch, 2010). Burgess & Pande (2005) observe a reduction of 60% in rural poverty in India during 1977-

1990 when the government of India initiated a policy regarding the opening of banks in areas where previously commercial banks did not operate.

Morduch (2000) mentions the “welfarist school” of thought according to which the introduction of MFIs increases the capacity to help poor people by offering low interest, small size collateral free loans, and services to poor clients. MFIs thus contribute more to social and development activities, and reduces the poverty level. We thus formulate our fourth hypothesis as:

> *H4: In a dual financial system, a negative relationship exists between the share of MFIs and poverty.*

3.2.5 Efficiency of Commercial Banks

The second element of our investigation is to find out whether microfinance institutions can discipline commercial banks that are traditionally known to focus on corporate as well as personal and consumer banking (De la Torre et al., 2008). The growth of MFIs in targeting and reaching the middle class and poor by mobilizing deposit and loan delivery is crowding out commercial banks and reducing their share in total financial assets of a country (The Banker, February 2005). Both types of institutions have started competitive interactions between them and begun to shape their products and target segments accordingly (Cull et al., 2009).

With regard to the expansion and diversity of microfinance institutions, commercial banks have started targeting those at the upper treads of low-income markets. In particular, the best clients from microfinance banks are now able to signal their creditworthiness to mainstream commercial banks. Moreover, since these clients now generate financial information, commercial banks do not need to rely on "soft information" in their analysis of customers' creditworthiness (Berger & Udell, 2006). As a result, the prospect for interaction and direct competition increases sharply. Increasing competition from microfinance institutions is exerting strong pressure on commercial banks to improve their earnings by controlling operating costs. Therefore, we formulate the following hypothesis:

> *H5: In a dual financial system, a positive relationship exists between the share of MFIs and the efficiency of traditional commercial banks.*

3.3. Empirical Method and Data

3.3.1 Financial development and Economic welfare

We employ the following pooled OLS regression model:

$$FEW_{j,t} = \alpha_0 + \beta MS_{j,t-1} + \theta_L \sum Z_{j,t-1} + \lambda_t + \epsilon_{j,t} \qquad (1)$$

Where subscripts j and t represent countries and time dimensions, respectively. $FEW_{j,t}$ is one of our measure of financial development and economic welfare in country j and in year t. $MS_{j,t}$ represents the main variable of interest, microfinance institution share (*MFI_Share*) in country j and year t. Z is a L x 1 vector of time varying macro-economic controls, λ_t represent the time effects, and $\epsilon_{j,t}$ is an error term. The relative share of microfinance institutions in a country is calculated in two alternate ways: the percentage of assets (gross loans) of microfinance institutions as a fraction of the total assets (gross loans) of all financial institutions (MFIs and CBs) in a country.[13] The definition of these and all other variables used in the study are mentioned in Table 3.1. To control for the endogeneity problem between the share of MFIs and a country's financial development and economic welfare, we use one year lagged values of the explanatory and control variables. We also conduct a robustness analysis to control for individual unobservable heterogeneity across countries. Therefore, we follow Abedifar et al. (2016) and estimate the model with country fixed effects.

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[13] Other alternatives to calculate the share of microfinance institutions could have been to divide by total sales and total employees. Lack of data does not allow us to use these two alternatives.

Following Levine et al. (2000) and Abedifar et al. (2016), we measure financial development through two proxies: deposit mobilization and private credit. The former is estimated as total deposits held by commercial banks as a percentage of gross domestic product (*Bank Deposits*), and the latter is measured by private credit as a percentage of the gross domestic product (*Private Credit*). According to Ahlin et al. (2011), private credit is the most common measure to gauge the overall level of financial depth of a country.

The economic welfare caters three dimensions including economic growth, income inequality and poverty. Economic growth is captured by the annual growth rate of GDP per capita based on purchasing power parity method (*Growth*). We follow Beck et al. (2007) and use three proxies to measure inequality: the Gini index (*Gini*), income share held at the highest decile (*Income_highest*), and income share at the lowest decile (*Income_lowest*). To estimate poverty - the last dimension of economic welfare, we use two proxies: the percentage of people who live on less than $1.90 a day (*Poverty gap*), and the percentage of people who live below the rural poverty line (*Poverty headcount*).

We use various macroeconomic factors such as inflation rate, interest rate, trade openness, economic freedom index and unemployment rate as control variables. Inflation has a significant effect on financial development and economic welfare (Rousseau & Wachtel, 2002). We take the annual growth rate of the GDP deflator as a proxy for *Inflation*. We take into consideration the deposit interest rate paid by banks on demand, time or saving deposits (*Interest rate*). According to the “financial repressionists” school, represented largely by McKinnon (1973) and Shaw (1973), interest rate plays an important role in financial development by motivating savers to shift their savings from unproductive real assets to financial assets. They believe that the positive substitution effect dominates the negative income effect in developing countries. On the other hand, the followers of the “financial structuralists” school led by Goldsmith (1969) argue that financial intermediation affects savings directly and positively quite apart from the effects of interest rate.

Trade activities in a country might also affect finance and growth. Therefore, we consider trade openness (*Trade*) in our analysis. It represents the ratio of the sum of exports and imports to GDP. We expect that economic freedom plays an important role as it allows individuals to protect their human and financial resources and prospers without government interventions. Therefore, we include Economic Freedom Index (*EFI*) calculated by the Heritage foundation in our model. This index ranks countries on the basis of rule of law, property rights, tax and other regulations. Finally, we control for the percentage of the total labour force who are without work and actively seeking for job (*Unemployment*) because prior studies indicate an inverse relationship between unemployment and financial development and growth. According to Wasmer & Weil (2004) and Ernst (2019), financial development and economic growth are an indication of lower job destruction as investment in more productive channels creates new job opportunities.

We conduct a unit root[14] test for each variable individually and find that some of the variables such as private credit, income at highest decile, poverty headcount ratio and interest rates are not stationary. Therefore, we use first differences of these variables.

3.3.2 Efficiency of Commercial Banks

The following regression model is estimated using the fixed effect estimation technique to test the relationship between the share of MFIs and the efficiency of commercial banks.

$$E_{i,t} = \alpha_i + \beta MS_{j,t-1}, + \gamma_k \sum X_{i,t-1} + \theta_L \sum Z_{j,t-1} + \lambda_t + \epsilon_{i,t} \qquad (2)$$

The subscripts i, t, j denote individual banks, time dimension, and countries, respectively. $E_{i,t}$ is our measure of efficiency of commercial bank i at time t. $MS_{j,t}$ represents the share of microfinance institutions (*MFI_Share*) in country j and year t, X is K x 1 vector of time varying bank level controls, Z is a L x 1 vector of time varying country level controls, λ_t represent the time effects, and $\epsilon_{j,t}$ is an error term.

We estimate efficiency of commercial banks by calculating two alternate measures: overhead costs as a percentage of total assets and as a percentage of total revenues (Beck et al., 2013).[15] In this regression model, we use two sets of control variables: bank-specific factors to capture bank level variations and country specific factors to capture country level variations. The first set of variables includes bank level differences in terms of size, capital, credit risk, and concentration. Differences in the efficiency level across banks can occur due to differences in the size of banks. Larger banks can get more advantage from scale economies and diversification (Hughes et al., 2001). They may face competitive pressure as they have larger clients and relatively easier access to the capital market. They may also use different technologies and business models for their operations. We estimate bank size by using the logarithm of total assets of commercial banks (*Size*). Equity capital is controlled for because an increase in equity can lower moral-hazard problems and increase banks' monitoring incentives (Berger et al., 1995). Banks may involve in more risk-taking activities when there is an increase in equity capital. Equity capital is measured as a percentage of total assets (*Capital*).

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[14] We apply the Im, Pesaran & Shin (IPS) unit root test with null hypothesis of unit root. Because most of the panel data unit root tests only support balanced data, these are not applicable in our case. The IPS test we apply is based on Dicky-Fuller procedure and is commonly used in case of unbalanced panel data.

[15] Overhead costs, also known as operating or non-interest expenses, include employee salaries and benefits, expenses on premises and fixed assets, legal fees, amortization, and impairment losses on intangible assets.

We control for credit risk because non-performing loans are unlikely to make a bank efficient in its operations (Berger & DeYoung, 1997). We use the ratio of non-performing loans to gross loans (*Credit Risk*). The last bank-specific control variable we use is concentration. The relationship between banking concentration and efficiency is unclear a priori. In a more concentrated market, banks have less incentive to enhance their efficiency as argued by the "Quiet Life" hypothesis (Hicks, 1935). On the other hand, efficient banks capture more market share, which may lead to greater market concentration, as posited by the "Efficient Structure" hypothesis (Demsetz, 1973). Banking concentration is proxied by Hirschman-Herfindahl index, estimated as the sum of the squared market share of each bank in the country. This index ranges from 0 to 100, where higher values indicate more concentration.

The second set of control variables comprises of country level controls. We control for the wage rate[16] in the country. According to Efficiency Wage Theory, higher wages lead to more labour productivity, as employees feel more steadfast and committed towards their work. Several studies consider an increase in wages as a double-edged sword: it not only increases the labour cost of the company but also enhances labour productivity in particular and overall firm productivity in general (Gupta & Shaw, 2014; Draca et al., 2011). Riley & Bondibene (2016) also report that an increase in the national minimum wage increases the labour cost of companies that is offset by increased labour productivity through a decrease in labour turnover and an increase in labour training, motivation, and skill. Thus, the increased cost effects are mitigated against overall productivity benefits. Since banks belong to labour-intensive industry, we expect that an increase in wage level can increase overhead (operating expenses) of banks that can be offset against associated productivity benefits.

We use inflation as another control variable in our analysis. According to Huybens & Smith (1998), an inflationary trend negatively affects the performance of banks via a decline in the real rate of return. Credit rationing becomes more severe when inflation rises. Banks also make fewer loans; resource allocation becomes less efficient. We control for interest rate because of its impact on performance, efficiency and risk-taking of banks (Rajan, 2006; Delis & Kouretas, 2011). When interest rates are low, banks have a greater risk-taking desire. On the other hand, high-interest rates can negatively affect the ability of borrowers to repay their loans (Jarrow & Turnbull, 2000). Finally, we control for trade liberalization because it not only provides diversification opportunities to banks but also increases competition, which allows banks to reduce their operating costs (Ashraf, 2018).

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[16] According to the International Labour Organization (ILO), compensation of employees is a concept defined in the United Nations System of National Accounts 2008 as the total remuneration, in cash or in-kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period. The compensation of employees has two main components: (a) wages and salaries payable in cash or in-kind; and (b) social insurance contributions payable by employers, which include contributions to social security schemes, actual social contributions to other employment-related social insurance schemes, and imputed social contributions to other employment-related social insurance schemes.

3.3.3 Data

We start with countries where microfinance institutions and commercial banks simultaneously exist during 2001-2014. Data on MFIs are collected from the Mix Market - the largest source for publicly available data on MFIs. The source of commercial bank data is Bankscope. We collect country-level data from the World Bank website and the data for the Economic Freedom Index from the Heritage Foundation. We find almost negligible share of MFIs in comparison to commercial banks, specifically in case of Middle Eastern countries. Because of the availability and consistency of data, we consider countries that have at least 10% share of MFIs and five years of data. We thus compile a sample of 35 countries in which microfinance institutions and commercial banks co-exist. The list of countries with the number of MFIs and CBs are presented in the Appendix 3.1.

The MFIs are classified into five regions across the world: East Asia and Pacific, Eastern Europe and Central Asia, Latin America and Caribbean, Africa and South Asia.[17] The sample includes different types of microfinance institutions including banks, cooperatives/credit unions, village banks, non-banking financial institutions and non-governmental organizations. We deliberately focus on all types of microfinance institutions because some cooperatives, non-governmental organizations, and non-banking financial institutions in Latin American countries have far greater assets at their disposal in comparison to assets of banks in some other regions.[18] Moreover, most of these MFIs perform the function of financial intermediation by providing credit facilities to poor households, and thus generate competition with conventional banks.

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[17] We exclude the Middle East and North America region because most MFIs in this region have negligible operations.

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[18] For example, the average amount of assets of NGO Fomentamos in Colombia is 1060 million dollars, NBFI Financiera Edificar in Peru is 1700 million dollars, and COOP COAC Jardin Azuayo in Ecuador is 460 million dollars during 2001-2014, compared to Banks Kompanion in Kyrgyzstan, FMFB in Tajikistan, ACBA in Armenia, and Equity in Uganda.

Table 3.1. Variable Definitions

Variable	Definition
Share of Microfinance Institutions	
MFI_Share–TA (%)	Total assets of microfinance institutions in a country divided by the combined total assets of microfinance institutions and conventional banks in the country
MFI_Share–GL (%)	Total gross loans of microfinance institutions in a country divided by the combined total gross loans of microfinance institutions and conventional banks in the country
Financial development and Economic welfare	
Bank deposits (%)	Commercial bank deposits as percentage of GDP
Private credit (%)	Private credit as percentage of GDP
Growth (%)	Annual growth rate of GDP per capita.
Gini (%)	The Gini coefficient used as a measure of income inequality
Income_highest (%)	Percentage share of income that accrues to subgroups of population indicated by the highest decile (10%)
Income_lowest (%)	Percentage share of income that accrues to subgroups of population indicated by the lowest decile (10%)
Poverty gap (%)	The intensity of poverty at the international poverty line
Poverty headcount (%)	Percentage of rural population below the rural poverty line
Country-Level Factors	
Inflation (%)	Annual inflation rate measured by GDP deflator
Interest rate (%)	Interest rate paid by banks on saving deposits
Trade (%)	Sum of a country’s exports and imports as a percentage of GDP
Economic Freedom Index	Index measuring the degree of freedom prevailing in a country
Unemployment (%)	Unemployed people as a percentage of total labour force
Wage rate (%)	Compensation of employees as a percentage of total expenses
Bank-Level Factors	
Cost to assets ratio (%)	Overhead cost as percentage of total assets
Cost to income ratio (%)	Overhead cost as percentage of total revenues
Size	Natural logarithm of total assets
Capital (%)	Equity capital divided by total assets
Credit risk (%)	Non-performing loans divided by gross loans
Concentration	Hirschman-Herfindahl index calculated by summing the squared market share of each bank

Data sources for above variables include Bankscope, Mix market, World development indicators, Heritage foundation and International labour organization.

3.4. Results

3.4.1. Descriptive Statistics

Table 3.2 reports the descriptive statistics of all variables used in the study. We eliminate outliers using winsorization at 2.5th and 97.5th percentiles. The main independent variable *MFI_Share–TA* has a mean value of 49.0%. The lowest quartile of countries has lower than 39.0% share of MFIs whereas the highest quartile has a share greater than 71.4%. In our sample, Azerbaijan and Dominican Republic have minimum values of 20% whereas Ecuador and Nicaragua have a maximum share of 91% and 93%, respectively.[19] The alternative proxy, *MFI_Share–GL*, has a mean value of 41.3% with minimum of 10% and maximum of 75%.

Financial development measures are captured by *Bank deposits* and *Private credit*. These variables represent on average 35.3% and 30.3% of GDP of the countries in the sample. These percentages are very close to the values of 35.19% and 28.90% reported by Abedifar et al. (2016) and Ahlin et al. (2011). The variable economic growth (*growth*) has an average value of 5.7%. The inequality measures include Gini Index, Income share at the highest 10% and Income share at the lowest 10% deciles. The mean value of *Gini* is 42.4% which is very much similar to 42.05% reported by Donou-Adonsou & Sylwester (2016). The mean values of *Income_highest* and *Income_lowest* are 33.2% and 2.2%, respectively. The two poverty variables, *Poverty gap* and *Poverty headcount* have mean values of 8.7% and 13.8%, respectively. Donou-Adonsou & Sylwester (2016) report average values of 5.22% for *Poverty*

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[19] High shares of MFI in Ecuador and Nicaragua are also reported by Inter-American Development Bank (IDB, 2014). According to IDB, there is a tremendous growth in microcredit and micro enterprises in Latin America and Caribbean, specifically after "No Pago" (NO Payment) movement in Nicaragua. In Latin America and Caribbean region, there are more than 1000 microfinance institutions, with a total gross loan portfolio of more than $40 billion, serving more than 22 million customers. FAMA, a company in Nicaragua is the first ever company in the history of microfinance to issue $4 million as commercial paper to increase microfinance loan portfolio. Before FAMA, two banks in Nicaragua already issued bonds to expand micro credit portfolio.

gap and 14.30% for *Poverty headcount* ratio. The set of country level control variables includes *Inflation*, *Interest rate*, *Trade* and *Unemployment rate*. These variables have mean values of 7.3%, 6.3%, 9.1%, and 7.6%, respectively. The mean score of *Economic Freedom Index* of sample countries is 59 points on a scale of 0 to 100. To control for the prevailing wage structure of the local labour market, we use one additional country-level control: *Wage rate*. The variable has a mean value of 46.7% in sample countries.

To measure the efficiency of commercial banks, we consider two alternate measures. We observe that the *Cost to Assets ratio* has a mean value of 6.20% in our sample, whereas the *Cost to Income ratio* has a mean of 68.3%. As bank-level controls we include size, equity capital, credit risk, and concentration. The commercial banks in our sample have average total assets of $1.63 billion, with $13 million as the minimum and $11.1 billion as the maximum value. We use the natural log of total assets of commercial banks as a proxy for *Size*. *Capital* measured as the ratio of equity to total assets has a mean of 18.4%. *Credit risk* is estimated as the fraction of impaired loans to gross loans. It has an average of 7.9%. We find that banking concentration (*Concentration*) has an average of 60.3% for countries in our sample.

Table 3.2. Descriptive Statistics

Variable	N	Mean	S.D.	Min	P25	P50	P75	Max
Share of Microfinance Institutions								
MFI_Share–TA (%)	487	0.490	0.274	0.204	0.390	0.546	0.714	0.930
MFI_Share–GL (%)	487	0.413	0.196	0.100	0.236	0.426	0.584	0.750
Financial development & Economic welfare								
Bank deposits (%)	485	0.353	0.203	0.089	0.195	0.326	0.458	0.825
Private credit (%)	485	0.303	0.173	0.071	0.159	0.276	0.403	0.722
Growth (%)	487	0.057	0.030	-0.009	0.029	0.048	0.070	0.174
Gini (%)	329	0.424	0.094	0.286	0.328	0.429	0.510	0.568
Income_highest	329	0.332	0.071	0.232	0.261	0.333	0.393	0.451
Income_lowest	329	0.022	0.010	0.007	0.012	0.019	0.032	0.039
Poverty gap (%)	321	0.087	0.081	0.002	0.023	0.061	0.136	0.290
Poverty headcount (%)	151	0.138	0.149	0.009	0.045	0.078	0.148	0.512
Country-Level Factors								
Inflation (%)	443	0.073	0.054	0.005	0.033	0.060	0.095	0.245
Interest rate (%)	439	0.063	0.038	0.014	0.033	0.057	0.087	0.149
Trade (%)	472	0.091	0.057	0.027	0.480	0.723	0.930	1.641
Economic Freedom Index	474	59.74	5.86	48.9	55.6	59.55	64.0	70.4
Unemployment (%)	473	0.076	0.051	0.011	0.038	0.065	0.103	0.192
Wage rate (%)	372	0.467	0.085	0.313	0.403	0.462	0.537	0.602
Bank-Level Factors								
Cost to assets ratio (%)	5421	0.062	0.046	0.013	0.028	0.048	0.080	0.189
Cost to income ratio (%)	5520	0.683	0.258	0.314	0.499	0.640	0.806	1.349
Size ($m)	5520	1630	2860	13	103	371	1490	11100
Capital (%)	5220	0.184	0.137	0.055	0.104	0.162	0.241	0.633
Credit risk (%)	5281	0.079	0.098	0.002	0.017	0.039	0.098	0.388
Concentration (%)	5500	0.603	0.155	0.391	0.471	0.570	0.712	0.942

3.4.2. Correlation Matrix

Table 3.3 provides the correlation matrix of all variables used in the study. We find high correlation only among the variables used as alternative proxies (*MFI_Share–TA* and *MFI_Share–GL*; *Gini, Income_highest and Income_lowest*; *Poverty gap and Poverty headcount*). We find that the two proxies of share of MFIs are significantly positively related with both financial development variables (*Bank deposits* and *Private credit*) and significant negative correlation with *Poverty gap*. We observe that most of the correlations among explanatory and control variables are low. To test for potential multicollinearity, we calculate variance inflation factors (VIF) and find that the highest value of VIF statistic is 2.7, that is much below the threshold of 10 (Verbeek, 2012). This low value indicates that multicollinearity among the regressors is not likely to be problematic in our regression analysis.

Table 3.3. Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
MFI_share–TA (1)	1															
MFI_share–GL (2)	0.992***	1														
Bank deposits (3)	0.228*	0.237*	1													
Private credit (4)	0.245*	0.250*	0.903***	1												
Growth (5)	0.049	0.052	0.059	0.022	1											
Gini (6)	-0.110	-0.115	-0.155	-0.250***	-0.108	1										
Income_highest (7)	-0.127	-0.132	-0.149	-0.270***	-0.116	0.991***	1									
Income_lowest (8)	0.061	0.068	0.149	-0.292***	-0.085	0.971***	0.936***	1								
Poverty gap (9)	-0.284**	-0.278**	-0.173	-0.281**	-0.152	0.384***	0.362***	0.373***	1							
Poverty HCR (10)	-0.067	-0.087	-0.028	-0.043	-0.113	0.362***	0.346***	0.331***	0.732***	1						
Inflation (11)	0.168	0.182	-0.322***	-0.258**	-0.262**	0.171	0.162	0.178	0.008	0.031	1					
Interest rate (12)	0.088	0.101	-0.225*	-0.184	-0.062	0.121	0.096	0.155	0.075	0.0781	0.179	1				
Trade (13)	0.182	0.200*	0.130	0.196*	0.077	-0.298***	-0.264***	-0.548***	-0.033	-0.047	-0.256**	-0.322***	1			
EFI (14)	0.127	0.146	0.112	0.101	0.097	-0.139	-0.131	-0.158	-0.258**	-0.161	-0.156	-0.042	0.078	1		
Unemployment (15)	-0.122	-0.132	-0.135	-0.035	-0.047	0.281***	0.275***	0.257***	0.242***	0.202*	0.147	0.033	-0.225*	-0.234***	1	
Wage rate (16)	0.058	0.059	0.294***	0.274***	0.160	0.248***	-0.265***	-0.219***	-0.295***	-0.148	-0.206*	0.239***	0.113	-0.037	-0.060	1

The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

3.4.3. Impact of MFIs on Financial Development

The regression results of two proxies for financial development (*Bank deposits* and *Private credit*) on our main independent variable, the relative share of microfinance institutions (*MFI_Share–TA)*, are reported in Table 3.4. We estimate OLS regressions and present the results in Columns (1) to (4). The fixed effects estimation results are presented in Columns (5) to (8). The results suggest that the share of MFIs has a strong positive association with financial development variables. Estimates from Columns (1) and (5) show that an additional percentage point of MFI share leads to an increase in bank deposits by 0.07 and 0.12 percentage points, respectively. A difference in *MFI_Share–TA* equal to the interquartile range (0.324 percentage points) is associated with a 0.022 percentage point higher bank deposits, which is about 8% of the IQR of bank deposits in OLS regression and 14% in FE estimation.[20] In the same way, we find that an additional percentage point of MFI share is associated with 0.11 and 0.16 percentage points higher private credit in OLS and FE regressions (Columns 2 and 6). The IQR of *MFI_Share–TA* is associated with an increase in private credit equal to 14% in OLS regression (Column 2) and 21% in FE estimation (Column 6).

As an alternative proxy, we use the share of MFIs based on total gross loans (*MFI_Share–GL*). Columns (3) and (7) show an additional percentage point of *MFI_Share–GL* increases bank deposits by 0.09 and 0.11 percentage points in OLS and FE regressions respectively.

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[20] Calculated as the share of MFIs Inter Quartile Range (IQR) multiplied by its coefficient divided by bank deposit IQR (0.324 * 0.051)/0.263. We use IQR instead of S.D as it is less sensitive to outliers.

The IQR of *MFI_Share–GL* explains 12% (15%) through OLS (FE) of the IQR in bank deposits and 34% (19%) of the IQR in private credit respectively. We find consistent results in Columns (4) and (8). We also regress two other proxies of financial development variable (financial system deposits and liquid liabilities)[21] against the MFI share variable. As we obtain very similar findings, we do not tabulate these results here. All these findings provide support for the first hypothesis.

As for control variables, *Inflation* has a significant negative association with bank deposits in both OLS and FE estimations. The results suggest negative association between *Interest rate* and both proxies of financial development is significant only in FE regressions and it is contrary to the "financial repressionists" school, represented largely by McKinnon (1973) and Shaw (1973) and supports the belief that income effect dominates the substitution effects in developing countries.

Trade has a significantly positive association with bank deposits and *Private credit* in OLS estimations only. Columns (1) to (8) indicate that Economic Freedom Index (*EFI*) has a significant positive association with both financial development variables. This finding indicates that countries with a relatively low level of regulation and a higher level of trade openness experience higher financial development, and is in line with that of Hafer (2013) and Baier et al. (2012). Finally, the results suggest a significant inverse association between unemployment and both financial development variables.

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[21] Financial system deposits include the sum of all deposits in the financial system of a country divided by its GDP. Liquid liabilities include currency plus demand and interest-bearing liabilities of banks and non-banking financial intermediaries divided by GDP.

Table 3.4. Impact of Microfinance Institutions on Financial Development

This table presents the results of pooled ordinary least square (OLS) and fixed effect (FE) regressions of Financial Development variables on *MFI Share* and control variables. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See table 3.1 for variable definitions

	Ordinary least squares regressions				**Fixed effects regression**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bank deposits	Private Credit	Bank deposits	Private Credit	Bank deposits	Private credit	Bank deposits	Private credit
MFI_ Share TA $_{t-1}$	0.07^{*}	0.11^{**}			0.12^{**}	0.16^{***}		
	(2.15)	(3.27)			(2.76)	(3.72)		
MFI_ Share_ GL $_{t-1}$			0.09^{*}	0.24^{***}			0.11^{*}	0.14^{***}
			(2.20)	(4.97)			(2.54)	(3.32)
Inflation $_{t-1}$	-0.14	-0.07	-0.61^{***}	-0.31	-0.44^{***}	-0.39^{**}	-0.33^{**}	-0.26^{*}
	(-1.32)	(-0.65)	(-3.85)	(-1.69)	(-3.74)	(-3.25)	(-3.24)	(-2.56)
Interest rate $_{t-1}$	-0.01	-0.21	0.02	-0.08	-0.57^{***}	-0.79^{***}	-0.59^{***}	-0.72^{***}
	(-0.06)	(-1.59)	(0.09)	(-0.35)	(-3.75)	(-5.11)	(-4.17)	(-5.12)
Trade $_{t-1}$	0.33^{*}	0.20	0.12	0.31^{*}	0.16	0.33	-0.05	0.09
	(2.32)	(1.36)	(1.00)	(2.11)	(0.94)	(1.85)	(-0.35)	(0.60)
EFI $_{t-1}$	0.01^{***}	0.01^{***}	0.01^{***}	0.01^{***}	0.02^{***}	0.01^{***}	0.01^{***}	0.01^{***}
	(8.79)	(7.02)	(4.19)	(5.96)	(9.54)	(8.16)	(9.03)	(7.57)
Unemployment $_{t-1}$	-0.11	-0.06	-0.39^{*}	-0.65^{**}	-0.67^{*}	-0.87^{**}	-0.35	-0.51^{*}
	(-0.51)	(-0.26)	(-2.19)	(-3.11)	(-2.56)	(-3.24)	(-1.42)	(-2.04)
Constant	-0.41^{***}	-0.34^{***}	-0.07	-0.29^{**}	-0.51^{***}	-0.44^{***}	-0.45^{***}	-0.36^{***}
	(-5.24)	(-4.24)	(-0.77)	(-2.83)	(-5.09)	(-4.33)	(-4.59)	(-3.69)
Observations	289	289	289	289	289	289	289	289
Adjusted R^2	0.243	0.321	0.280	0.337	0.293	0.341	0.303	0.361
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	35	35	35	35	35	35	35	35

3.4.4. Impact of MFIs on Economic Welfare

Table 3.5 (Panel A) shows the OLS regression results of economic welfare analysis (Growth, Income inequality, and Poverty). In Columns (1) and (7), we regress GDP growth rate and find an insignificant association between *MFI_Share–TA* and *MFI_Share–GL* on growth and inconsistent with the findings of Banto & Monsia (2021). Columns 2 to 4 show the income inequality analysis. The results also suggest a strong negative association between *MFI_Share–TA* and inequality variables. An additional percentage point increase in *MFI_Share–TA* is associated with a decrease of 0.07 and 0.06 percentage points in Gini and Income at highest decile respectively. In terms of IQR of *MFI_Share–TA* is associated with a decline in the Gini index and Income at the highest decile equal to 12% and 15% in Columns (2) and (3).

Columns (8) and (9) show that an additional percentage point of MFI share based on gross loan is associated with reductions of 0.07 and 0.06 in Gini and Income at highest decile. The IQR in *MFI_Share–GL* explains a reduction of 13% and 16% in the IQR of both inequality variables respectively. The negative relationship between the share of MFIs and inequality proxies is consistent with the third hypothesis. In comparing the highest and lowest inequality deciles, the only strong association between MFI_share and *Income_highest* indicates that microfinance helps to reduce the accumulation of wealth in the hands of the richest segment of the country, to whom the majority of the income of the society accrues.

In Columns (5) and (6), the results suggest a negative association between share of MFIs and both poverty variables. An additional percentage point of *MFI_Share–TA* is associated with lowering the poverty gap (headcount) by 0.34(0.12) percentage points. Quantitatively, the IQR of *MFI_Share–TA* explains a decline of 97% and 38% in the IQRs of *Poverty gap* and *Poverty* *headcount* respectively. We find similar results in Columns (11) and (12) when we regress the two poverty variables against *MFI_Share–GL*. The negative relationship between MFIs and poverty level provides support for the fourth hypothesis that MFIs play a significant role in poverty reduction.

Table 3.5 (Panel B) shows the economic welfare analysis using the fixed effects estimations. The results are similar to those obtained in Panel A. We do not find statistically significant results in case of *MFI_Share–TA (MFI_Share–GL)* on GDP growth in Columns (1) and (7). The second hypothesis regarding economic growth is therefore not supported. All other results are qualitatively similar as to Table 3.5 (Panel A) and support our third and fourth hypotheses.

Among the control variables, the results suggest a significant positive association between inflation and poverty, in both OLS and FE regressions. This result is similar to that reported by Albanesi (2007) who states that the poor are more vulnerable to inflation because they normally hold more cash as a portion of their entire purchases. They suffer greater losses from inflation than the rich class. Interest rate has a significant positive association with income inequality suggesting that contractionary monetary policy shocks can reduce inequality.

Our findings also suggest a significant positive relationship between interest rate and poverty measures. Kang et al. (2013) explain two reasons of this positive association. Firstly, the majority of poor are "debtors". An increase in interest rate is an additional burden that reduces their borrowing capacities and that leads to more poverty gap. Secondly, an increase in interest rate increases the cost of current consumption, reducing the purchasing power of poor and causing severe poverty. *Trade* and *EFI* have an insignificant association with economic growth. On the other hand, these variables have a significant negative association with income inequality and poverty variables, indicating that more trade and economic freedom lead to an increase in the economic welfare of the people.

Table 3.5. Impact of Microfinance Institutions on Economic Welfare

Panel A: Ordinary least squares regressions

This table presents the results of pooled ordinary least squares (OLS) regressions of Economic Welfare variables on *MFI share* and control variables. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See Table 3.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	GDP growth	GINI index	Income highest	Income lowest	Poverty gap	Poverty headcount	GDP growth	GINI index	Income Highest	Income lowest	Poverty gap	Poverty headcount
MFI_ Share–TA $_{t-1}$	0.02	-0.07*	-0.06**	0.00	-0.34***	-0.12*						
	(1.44)	(-2.54)	(-3.06)	(1.06)	(-4.79)	(-2.20)						
MFI_ Share–GL $_{t-1}$							0.02	-0.07**	-0.06**	0.00	-0.30***	-0.16*
							(1.67)	(-2.70)	(-3.17)	(1.28)	(-3.81)	(-2.48)
Inflation $_{t-1}$	-0.03	-0.08	-0.02	0.02	0.89*	-0.15	-0.00	0.01	0.02	0.01	0.72*	0.11
	(-0.85)	(-0.55)	(-0.20)	(1.00)	(2.46)	(-0.56)	(-0.14)	(0.06)	(0.24)	(0.43)	(2.15)	(0.39)
Interest rate $_{t-1}$	-0.03	0.33*	0.26*	0.03	0.53	-0.13	-0.02	0.34**	0.29**	0.03	0.10	0.27
	(-0.64)	(2.24)	(2.33)	(1.89)	(1.34)	(-0.45)	(-0.50)	(2.64)	(2.91)	(1.75)	(0.26)	(0.92)
Trade $_{t-1}$	0.02	-0.22***	-0.30***	-0.06***	0.06	-0.13	0.02	-0.25***	-0.36***	-0.06***	0.04	-0.29
	(0.65)	(-5.94)	(-5.47)	(-6.85)	(0.28)	(-0.91)	(0.63)	(-6.80)	(-6.35)	(-7.41)	(0.17)	(-1.68)
EFI $_{t-1}$	0.00	-0.00*	-0.00**	-0.00	0.00	-0.00	0.00	-0.00**	-0.00***	-0.00*	0.00	-0.00
	(1.57)	(-2.59)	(-3.16)	(-1.59)	(1.42)	(-0.12)	(1.91)	(-2.92)	(-3.41)	(-2.16)	(0.46)	(-1.33)
Unemployment $_{t-1}$	-0.16***	0.30***	0.37***	0.06***	2.44***	0.01	-0.11**	0.32***	0.39***	0.06***	2.18***	0.05
	(-3.87)	(4.80)	(5.00)	(3.86)	(7.48)	(1.09)	(-2.85)	(4.86)	(4.99)	(4.01)	(6.16)	(1.71)
Constant	0.03	0.37***	0.27***	0.02**	0.26	0.88***	0.06**	0.36***	0.26***	0.03***	0.21	0.85***
	(1.63)	(5.50)	(5.18)	(3.08)	(1.43)	(6.22)	(3.00)	(6.36)	(6.02)	(3.89)	(1.12)	(5.41)
Observations	257	165	165	165	163	96	257	165	165	165	163	96
Adjusted R^2	0.291	0.296	0.307	0.289	0.331	0.360	0.268	0.305	0.278	0.282	0.351	0.372
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	No	No	No	No	No	No	No	No	No	No	No	No
No of countries	35	35	35	35	21	16	35	35	35	35	21	16

Panel B: Fixed effects regressions

This table presents the results of fixed effects regressions (FE) regressions of Economic Welfare variables on *MFI share* and control variables. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See Table 3.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	GDP growth	GINI index	Income highest	Income lowest	Poverty gap	Poverty headcount	GDP growth	GINI index	Income highest	Income lowest	Poverty gap	Poverty headcount
MFI_ Share–TA $_{t-1}$	0.02	-0.07*	-0.06**	0.00	-0.13**	-0.08**						
	(1.41)	(-2.29)	(-2.77)	(0.98)	(-2.70)	(-3.18)						
MFI_ Share–GL $_{t-1}$							0.02	-0.07*	-0.07**	0.00	-0.08**	-0.14**
							(1.28)	(-2.48)	(-2.93)	(1.14)	(-2.66)	(-2.72)
Inflation $_{t-1}$	-0.03	-0.08	-0.02	0.02	0.41***	0.08	0.01	-0.06	-0.01	0.01	0.07	0.37***
	(-1.73)	(-1.44)	(-0.17)	(0.76)	(3.77)	(1.31)	(0.15)	(-0.40)	(-0.10)	(0.78)	(1.12)	(3.52)
Interest rate $_{t-1}$	-0.03	0.33*	0.26*	-0.03	0.36*	0.17	0.02	0.34*	0.27*	-0.03	0.15	0.31*
	(-0.62)	(2.23)	(2.31)	(-1.88)	(2.53)	(1.99)	(0.52)	(2.39)	(2.46)	(-1.94)	(1.58)	(2.27)
Trade $_{t-1}$	0.02	-0.18***	-0.24***	0.06***	-0.01	-0.18	0.02	-0.19***	-0.26***	0.06***	-0.14	0.03
	(0.60)	(-5.88)	(-5.37)	(7.14)	(-0.03)	(-1.62)	(0.82)	(-6.33)	(-5.72)	(7.56)	(-1.23)	(0.12)
EFI $_{t-1}$	0.00	-0.02**	-0.04***	-0.01	0.02	-0.00*	0.00	-0.01***	-0.04***	-0.01*	-0.05**	0.00
	(1.59)	(-3.08)	(-3.73)	(-1.75)	(0.34)	(-2.64)	(1.40)	(-3.58)	(-4.23)	(-2.28)	(-2.86)	(0.18)
Unemployment $_{t-1}$	-0.16***	0.28***	0.34***	0.06***	1.45***	0.36*	-0.09**	0.29***	0.37***	0.05***	0.42*	1.48***
	(-3.94)	(5.08)	(5.33)	(4.02)	(4.54)	(2.25)	(-2.68)	(4.97)	(5.27)	(3.92)	(2.12)	(4.62)
Constant	0.03	0.37***	0.27***	0.02**	0.20	0.04	0.04*	0.25***	0.03***	0.12***	0.00	0.20
	(1.61)	(5.97)	(5.77)	(2.99)	(1.60)	(0.65)	(2.13)	(6.04)	(3.94)	(5.34)	(0.01)	(1.61)
Observations	257	165	165	165	163	96	257	165	165	165	163	96
Adjusted R^2	0.272	0.296	0.247	0.286	0.366	0.391	0.268	0.282	0.234	0.241	0.381	0.402
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	35	35	35	35	21	16	35	35	35	35	21	16

3.4.5. Robustness Analysis

To check the robustness of our results, we analyze a larger sample of 45 countries by reducing the selection criterion of the share of MFIs to at least 7% (instead of previously used 10%). These results are qualitatively similar, and therefore, are not presented in a separate table. We further test whether the results are robust to different sub-samples of countries. We first split the full sample based on the income level of countries, as one would expect that MFIs are more active in developing and lower-income countries. Second, we divide countries into low and high inflation categories because an inflationary environment puts an adverse effect on the economy such as less capital accumulation and investments and an increase in unemployment. We expect that during an inflationary period, the real values of loans tend to fall and microfinance institutions may not be able to contribute towards finance and growth (Goldsmith, 1969; King & Levine, 1993; Huybens & Smith, 1998, Beck et al*.,* 2000). Finally, we investigate whether our findings remain robust when we exclude the period of global financial crisis (2007-2008) from our analysis. We analyze two sub-samples: the pre-financial crisis period (2001-2006) and the period excluding the financial crisis to examine the relationship between the share of MFIs and financial development and economic welfare variables.

Impact of microfinance in low-income countries

In Table 3.6 (Panel A), we examine the relationship between the share of MFIs on financial development and economic welfare in low-income countries. We divide the sample on the basis of the median GDP per capita ($2093). Countries with GDP below the median are categorized as low-income countries. In Columns (1) and (2), we regress bank deposits and private credit against the share of MFIs, set of control variables, year, and country dummies. The results suggest a significant positive association between MFI share with both proxies of dependent variables. In Column (3), we observe a significant association between *MFI_share–TA* and GDP growth rate. The results presented in Columns (4) to (6) suggest significant negative association between the share of MFIs and income inequality variables. Finally, in Columns (7) and (8), the results suggest a significant negative association between the share of MFIs and both poverty variables. Overall, in the sample of low-income countries, we find statistical support for the first, third and fourth hypotheses.

Impact of microfinance in high inflation countries

We identify the sub-sample of high inflation countries by dividing the full sample based on the median value of inflation rate. We perform the same analysis as before and present the results in Table 3.6 (Panel B). We observe a significant positive association between the share of MFIs with bank deposits and private credit (Columns 1 and 2) and a significantly negative association with inequality and poverty variables (Columns 6, 7 and 8). Overall, in the sample of high inflation countries, we find support for the first, third, and fourth hypotheses.

Impact of microfinance before the financial crisis period

The regression results of the sample covering the pre-crisis period (2001–2006) are presented in Panel C of Table 3.6. In Columns (1) and (2), the results support the first hypothesis that MFIs play an important role in increasing financial development. We also find support for our second hypothesis. An additional percentage point increase in the share of MFIs is associated with 0.04 percentage points higher economic growth (Column 3). This positive association between share of MFIs and economic growth in the pre-crisis period suggest that although MFIs increase economic growth this effect is very small in magnitude and may be offset by cyclical fluctuations. The results presented in Columns (4) and (5) suggest a significant negative association between the share of MFI and income inequality variables. Overall, during the pre-crisis period, we find support for the first three hypotheses.

Impact of microfinance in the period excluding financial crisis

In order to gauge the impact of MFIs in the absence of financial crisis, we exclude the years 2007 and 2008 from our analysis. Table 3.6 (Panel D) presents the results. The results suggest a significant positive association between MFI share and financial development (Columns 1 and 2) and a significant negative association with income inequality (Columns 4 and 5). Finally, in Columns (7) and (8), the results suggest a significant negative association between the share of MFIs and poverty variables. The analysis excluding the financial crisis period shows support for the first, third and fourth hypotheses.

Overall, in the sub-sample analysis, we find that the presence of MFIs plays an important role in increasing financial development, reducing income inequality and poverty, whereas for economic growth, we find mixed results.

Sub-sample Analysis:

Table 3.6. Impact of Microfinance Institutions on Financial Development and Economic Welfare

Panel A: Low income countries

This table presents the regression results for Financial Development and Economic Welfare in low income countries. We split the sample into two groups on the basis of median value of GDP of countries; the countries below the median value are classified as low-income countries. We regress the dependent variables on *MFI share* and control variables. We employ the fixed-effect technique for estimation. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See Table 3.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bank deposits	Private credit	GDP growth	GINI index	Income highest	Income lowest	Poverty gap	Poverty headcount
MFI_ Share–TA $_{t-1}$	0.26***	0.26***	0.02	-0.17*	-0.02*	0.09	-0.52*	-0.34*
	(4.36)	(4.07)	(1.83)	(-2.28)	(-2.38)	(1.77)	(-2.78)	(-2.72)
Inflation $_{t-1}$	0.37	0.26	0.03	-0.16	0.01	-0.16	0.30	0.55
	(1.50)	(1.07)	(0.40)	(-0.91)	(0.41)	(-1.27)	(0.65)	(1.19)
Interest rate $_{t-1}$	0.95***	0.79***	0.11	-0.09	0.01	-0.06	-1.56**	-1.83***
	(4.27)	(3.68)	(1.22)	(-0.46)	(0.23)	(-0.42)	(-4.42)	(-5.56)
Trade $_{t-1}$	0.05	0.04	-0.01	-0.00	0.00	-0.00	-0.04	0.06
	(1.22)	(1.08)	(-0.48)	(-0.11)	(0.26)	(-0.03)	(-0.28)	(0.66)
EFI $_{t-1}$	0.01**	0.01	0.00	0.00	-0.00	0.00*	-0.00	0.01
	(3.12)	(1.60)	(1.93)	(1.60)	(-0.60)	(2.11)	(-0.24)	(1.40)
Unemployment $_{t-1}$	-2.69***	-2.43***	-0.29*	2.12***	0.23**	0.06	0.04	0.16***
	(-6.47)	(-6.19)	(-2.42)	(4.04)	(3.12)	(1.27)	(1.03)	(4.66)
Constant	-0.31	-0.20	0.11*	0.19	0.04	0.13	0.35	0.05
	(-1.97)	(-1.18)	(2.57)	(1.26)	(1.85)	(1.24)	(0.79)	(0.12)
Observations	132	132	132	86	86	83	86	53
Adjusted R^2	0.242	0.296	0.242	0.273	0.255	0.282	0.342	0.398
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	18	18	18	15	15	15	12	11

Panel B: High inflation countries

This table presents the regression results for Financial Development and Economic Welfare in high inflation countries. We split the sample into two groups on the basis of median inflation rate of countries. The countries above the median value are classified as high inflation countries. We regress the dependent variables on *MFI share* and control variables. We employ the fixed-effect technique for estimation. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See Table 3.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bank deposits	Private credit	GDP growth	GINI index	Income highest	Income lowest	Poverty gap	Poverty headcount
MFI_ Share–TA $_{t-1}$	0.20*	0.22**	0.02	0.01	-0.00	-0.01*	-0.31***	-0.27*
	(2.42)	(2.77)	(0.63)	(0.47)	(-0.08)	(-2.40)	(-3.90)	(-2.45)
Inflation $_{t-1}$	-0.43*	-0.33	0.01	0.11	0.12*	-0.01	0.61***	0.73**
	(-2.34)	(-1.85)	(0.19)	(1.64)	(2.00)	(-1.03)	(4.37)	(3.35)
Interest rate $_{t-1}$	-0.44*	-0.66**	0.02	0.11	0.09	-0.01	0.36*	0.17
	(-2.15)	(-3.33)	(0.31)	(1.79)	(1.71)	(-1.48)	(2.12)	(0.55)
Trade $_{t-1}$	2.81***	2.44***	0.25	-0.39	-0.42*	-0.01	-1.21*	-1.60*
	(4.93)	(4.32)	(1.31)	(-1.97)	(-2.43)	(-0.35)	(-2.23)	(-2.20)
EFI $_{t-1}$	0.01**	0.01*	-0.00*	0.00**	0.00*	-0.00**	-0.00	-0.00
	(2.63)	(2.18)	(-2.36)	(2.68)	(2.29)	(-2.94)	(-1.56)	(-0.81)
Unemployment $_{t-1}$	-0.82*	-1.50***	-0.19	0.41***	0.32**	-0.03**	1.81***	1.95**
	(-2.23)	(-4.16)	(-1.50)	(3.80)	(3.35)	(-2.74)	(4.50)	(2.88)
Constant	0.15	0.23	0.18**	0.26***	0.20***	0.04***	0.32*	0.39
	(0.80)	(1.22)	(2.72)	(4.75)	(4.15)	(6.68)	(2.09)	(1.68)
Observations	176	176	176	119	119	119	120	59
Adjusted R^2	0286	0.330	0.271	0.253	0.249	0.262	0.324	0.351
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	20	20	20	20	20	20	19	13

Panel C: Pre-financial crisis period

This table presents the regression results for Financial Development and Economic Welfare in the pre-financial crisis period (2001 to 2006). We regress the dependent variables on MFI share and control variables. We employ the fixed-effect technique for estimation. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See Table 3.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bank deposits	Private credit	GDP growth	GINI index	Income highest	Income lowest	Poverty gap	Poverty headcount
MFI_ Share–TA $_{t-1}$	0.12***	0.11**	0.04*	-0.32**	-0.01*	0.01	-0.16	-0.01
	(3.81)	(3.28)	(2.31)	(-3.28)	(-1.99)	(1.03)	(-1.70)	(-1.80)
Inflation $_{t-1}$	-0.00	0.01	-0.06	0.38*	0.04	0.03*	-0.41	-0.00
	(-0.03)	(0.09)	(-1.46)	(2.23)	(0.56)	(2.45)	(-1.50)	(-0.03)
Interest rate $_{t-1}$	-0.04	-0.04	-0.02	0.04	0.00	-0.01	-0.07*	-0.04
	(-0.42)	(-0.37)	(-0.39)	(0.18)	(0.04)	(-0.14)	(-2.50)	(-0.42)
Trade $_{t-1}$	0.21*	0.05	0.14**	0.03	-0.13*	0.11	-0.98	-0.21*
	(2.06)	(0.44)	(2.63)	(0.09)	(-2.16)	(1.48)	(-1.73)	(-2.06)
EFI $_{t-1}$	0.01***	0.01***	-0.01	-0.01*	0.00	0.00	-0.01*	0.01***
	(5.71)	(5.30)	(-1.96)	(-2.13)	(0.65)	(0.72)	(-2.00)	(5.71)
Unemployment $_{t-1}$	-0.45*	-0.55*	-0.07	1.45	0.22	0.17	-1.26	0.45*
	(-2.06)	(-2.48)	(-0.61)	(1.66)	(1.25)	(1.08)	(-1.05)	(2.06)
Constant	-0.06	0.02	0.14***	0.91***	0.40***	0.31***	0.90	-0.06
	(-0.90)	(0.27)	(3.62)	(3.64)	(7.25)	(6.50)	(2.45)	(-0.90)
Observations	105	105	93	69	69	69	65	42
Adjusted R^2	0.294	0.304	0.284	0.282	0.289	0.231	0.349	0.382
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	35	35	35	33	33	33	30	28

Panel D: Excluding the financial crisis period

This table presents the results for Financial Development and Economic Welfare in absence of financial crisis period. We exclude the period 2007-2008 from our analysis. We regress the dependent variables on the relative share of *MFIs* and control variables. We employ the fixed-effect technique for estimation. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See Table 3.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bank deposits	Private credit	GDP growth	GINI index	Income highest	Income lowest	Poverty gap	Poverty headcount
MFI_ Share–TA $_{t-1}$	0.14***	0.33***	0.01	-0.07*	-0.07**	0.00	-0.18***	-0.12*
	(3.52)	(4.57)	(1.42)	(-2.36)	(-2.91)	(1.00)	(-3.14)	(-2.45)
Inflation $_{t-1}$	0.18	-0.92*	-0.07	-0.02	0.04	0.01	-1.31**	0.07
	(0.86)	(-2.05)	(-1.39)	(-0.08)	(0.27)	(0.53)	(-3.29)	(0.31)
Interest rate $_{t-1}$	0.15	0.53	0.06	0.38*	0.31*	-0.04	-0.40	-0.14
	(0.63)	(0.93)	(1.05)	(2.39)	(2.50)	(-1.93)	(-0.71)	(-0.44)
Trade $_{t-1}$	0.53***	0.04	0.04	-0.47***	-0.33***	0.06***	0.10	0.04
	(3.73)	(0.22)	(1.14)	(-6.09)	(-5.45)	(7.33)	(0.43)	(0.26)
EFI $_{t-1}$	0.01***	0.01**	-0.00	0.00***	0.00***	-0.00*	0.01**	0.02
	(6.67)	(3.02)	(-0.71)	(4.01)	(4.75)	(-2.25)	(2.94)	(0.68)
Unemployment $_{t-1}$	-0.22	-1.85***	0.08	0.65***	0.51***	0.06***	2.56***	2.08***
	(-1.02)	(-5.66)	(1.68)	(5.12)	(5.30)	(3.95)	(7.82)	(9.07)
Constant	-0.52***	-0.21	0.03	0.35***	0.25***	0.02***	-0.05	0.63***
	(-5.00)	(-1.94)	(1.73)	(6.70)	(6.43)	(3.59)	(-0.47)	(5.70)
Observations	235	235	197	117	117	117	88	64
Adjusted R^2	0.291	0.327	0.219	0.308	0.294	0.279	0.372	0.390
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	35	35	35	34	34	34	33	32

3.4.6. Non-linear impact of MFI on financial development and economic welfare

In our baseline and sub-sample analysis, we find support for all hypotheses in terms of linear relationships. Wagner & Winkler (2013) observe a non-linear U-shaped relationship of MFI size and MFI age with real credit growth during the crisis period. We also examine the possibility of a non-linear relationship between our main variable of interest *MFI_share* and different variables of financial development and economic welfare.

The results of Table 3.7 show that out of four dimensions (financial development, economic growth, income inequality, and poverty), a non-linear relationship is present only in case of income inequality variables: *Gini Index* and *Income_highest*. The estimated coefficients of MFI_share–TA squared in Columns (4) and (5) are positive and statistically significant. The result suggest that the presence of MFIs reduces income inequality up to a certain level, after which the effect reverses. In our analysis, this threshold point for both variables of inequality is 0.65.[22] It indicates that the presence of MFIs reduces income inequality only up to a point, beyond which income disparity rises. Thus, our results show that the "*beneficial-to-detrimental pattern*" applies to the presence of MFIs. It means that the plausible effect of microfinancing on the income distribution of sample countries is not the same. Based on this threshold point of inequality, we find nine of the sample countries are above this point, whereas 26 are below this point. The rising impact of MFIs presence on inequality in some of the sample countries could be attributed to various reasons including the heterogeneous nature of financial systems and financial markets, political instability, weak legal and regulatory frameworks. Normally, in developing countries, availability and ease of credit, for example, may result in financial vulnerabilities, and indicate a lack of regulatory framework.

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[22] We also examine the non-linear impact of MFI_share–GL variable and find similar results (the effect exists only in the case of income inequality). We do not report these results for the sake of brevity.

Unfortunately, policy efforts to improve equality have resulted in a lot of instability in the past. When banks and credit card companies aggressively increased consumer credit (credit cards, automobile loans, and personal loans) to lower-income and underserved households in 2004–2006, several emerging markets suffered financial crises. Many households were unable to repay their loans, causing instability of the financial system. The microcredit crisis in Andhra Pradesh, India, in 2010 is one example of a lack of regulatory regulation that allows for excessive lending to the poor, resulting in significant inequities and debt (Brei et al, 2018).

Table 3.7. Non-linear Impact of Microfinance Institutions on Financial Development and Economic Welfare

This table presents the regression results of a non-linear relationship between our main variable of interest MFI_share and different dimensions of finance and growth. We regress the dependent variables on *MFI_share–TA squared* and control variables. We employ the fixed-effect technique for estimation. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See Table 3.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bank deposits	Private credit	GDP growth	GINI index	Income highest	Income lowest	Poverty gap	Poverty headcount
MFI_ Share–TA $_{t-1}$	0.12^{*}	0.16^{**}	0.01	-0.22^{***}	-0.03	-0.00	-0.08^{*}	-0.08^{**}
	(2.47)	(3.26)	(0.51)	(-4.02)	(-1.91)	(-0.84)	(-2.37)	(-2.97)
MFI_ Share– TA $_{t-1}{}^{2}$	-0.12	-0.17	0.04	0.69^{**}	0.19^{*}	-0.01	0.17	0.04
	(-0.57)	(-0.81)	(0.56)	(3.30)	(2.57)	(-0.86)	(1.30)	(0.37)
Inflation $_{t-1}$	-0.33^{**}	-0.27^{**}	-0.03	0.38^{***}	0.07	-0.01^{***}	0.09	0.05
	(-3.27)	(-2.62)	(-0.72)	(3.77)	(1.96)	(-3.43)	(1.44)	(0.93)
Interest rate $_{t-1}$	-0.58^{***}	-0.72^{***}	-0.07	0.32^{*}	0.10^{*}	-0.01^{*}	0.30^{**}	0.14
	(-4.17)	(-5.11)	(-1.47)	(2.39)	(2.31)	(-2.15)	(2.92)	(1.76)
Trade $_{t-1}$	0.05	0.09	0.01	0.11	-0.14^{**}	0.02^{***}	-0.08	-0.17
	(0.35)	(0.59)	(0.10)	(0.47)	(-3.10)	(3.35)	(-0.66)	(-1.54)
EFI $_{t-1}$	0.01^{***}	0.01^{***}	-0.00^{***}	-0.00	0.00^{**}	-0.00	0.00^{**}	0.00^{*}
	(9.01)	(7.60)	(-4.48)	(-0.07)	(2.74)	(-1.96)	(2.76)	(2.55)
Unemployment $_{t-1}$	-0.35	-0.50^{*}	0.07	1.52^{***}	0.17^{*}	-0.00	0.37	0.38^{*}
	(-1.39)	(-2.00)	(0.84)	(4.89)	(2.23)	(-0.35)	(1.99)	(2.37)
Constant	-0.40^{***}	-0.31^{**}	0.20^{***}	0.13	0.23^{***}	0.03^{***}	-0.05	-0.01
	(-4.24)	(-3.19)	(5.98)	(1.13)	(7.54)	(8.06)	(-0.79)	(-0.22)
Observations	289	289	257	165	165	165	163	96
Adjusted R^2	0.282	0.301	0.250	0.261	0.274	0.279	0.321	0.346
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	35	35	35	35	35	35	21	16

3.4.7. Microfinance Institutions and the Efficiency of Commercial Banks

We now examine whether the presence of microfinance institutions affects the efficiency of commercial banks. Table 3.8 (Panel A) reports the estimation results when we use *Cost to assets ratio* as a proxy for the efficiency of commercial banks. The results suggest that the share of MFIs has a significant negative association with the cost to assets ratio of commercial banks. The results are robust and consistent when we include each bank-level control variable separately (Columns 2 - 4) or all variables together (Column 6) in regressions. We also consider country-level controls including wage rate, inflation, interest rate, trade, and EFI in order to check the robustness of the impact on efficiency. Once again, the estimated coefficient of MFI_Share-TA is negative and statistically significant (Column 7). Including all bank and country level control variables in one regression (Column 8), we continue to find a significant negative association between MFI_Share-TA and the cost to assets ratio indicating increasing efficiency of commercial banks.

We use *Cost to income ratio* as an alternative proxy of the efficiency of commercial banks, and present the results in Panel B of Table 3.8. We find consistent and robust results with respect to the relative share of MFIs. Overall, the regression results indicate that in a dual financial system where microfinance institutions operate together with commercial banks, MFIs reduce the operating cost of commercial banks by imposing more competition, thus enhancing their efficiency. We find support for the fifth hypothesis.

Panels A and B of Table 3.8 show that almost all control variables exhibit the expected relationship. The variable *Size* has a significant negative association with cost ratio. This indicates that larger size banks have lower cost ratio, most probably because of scale economies and diversification. We introduce *Capital ratio* as a second control variable and find a significant positive association with cost ratio. The result shows that banks with more equity in their capital experience an increase in their operating cost. The finding might indicate that these banks are engaged in more risk-taking activities. *Credit risk* has a significant positive association with cost ratio, suggesting that more nonperforming loans lead to a decline in the efficiency of commercial banks. *Banking concentration* has a negative association with the cost to assets ratio only (Panel A). The result supports the "Efficient Structure" hypothesis proposed by Demsetz (1973) suggesting that efficient banks reduce their operating costs that enhance their profitability and enable them to gain more market share thereby increasing market concentration.

Our results suggest a positive association between *Wage rate* and cost ratio of commercial banks. Although wage rate increases the cost of banks, it also increases the productivity of the employees and reduces their turnover. The productivity gain eventually outweighs the increased cost burden of the banks, which is in line with Gupta & Shaw (2014) and Draca et al. (2011). The significant positive coefficients of two country level controls (*Inflation* and *Interest rate*) indicate that increase in inflation and interest rate also increase the cost ratio of banks. The other country control variables *Trade* and *EFI* have statistically insignificant association with cost ratio.

Table 3.8. Impact of Microfinance Institutions on the Efficiency of Commercial Banks

Panel A: Cost to assets ratio analysis

This table present fixed effects regression results for the efficiency of commercial banks. We regress cost to assets ratio on the relative share of *MFIs* and control variables. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See Table 3.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MFI_ Share–TA $_{t-1}$	-0.03***	-0.02***	-0.03***	-0.03***	-0.02**	-0.04***	-0.03*	-0.02***
	(-5.66)	(-4.82)	(-5.26)	(-5.40)	(-3.21)	(-7.12)	(-1.99)	(-3.38)
Size $_{t-1}$	-0.01***					-0.01***		-0.02***
	(-9.26)					(-7.58)		(-6.47)
Capital $_{t-1}$		0.03***				-0.00		-0.01
		(4.68)				(-0.08)		(-0.67)
Credit risk $_{t-1}$			0.03***			0.04***		0.01
			(4.44)			(5.24)		(1.42)
Concentration $_{t-1}$				-0.02***		-0.02**		-0.02
				(-4.18)		(-2.69)		(-0.44)
Wage rate $_{t-1}$					0.11***		0.09***	0.07***
					(8.98)		(6.84)	(5.29)
Inflation $_{t-1}$							0.03	0.03*
							(0.84)	(2.43)
Interest rate $_{t-1}$							0.06***	0.03**
							(5.01)	(2.81)
Trade $_{t-1}$							-0.04	-0.01
							(-1.09)	(-0.29)
EFI $_{t-1}$							0.03	0.00
							(1.03)	(0.08)
Constant	0.29***	0.08***	0.08***	0.10***	0.02**	0.33***	0.02*	0.47***
	(18.26)	(23.36)	(22.86)	(21.95)	(3.22)	(16.54)	(2.42)	(16.30)
Observations	4470	4269	4493	4548	4620	4421	4320	4240
Adjusted R^2	0.261	0.147	0.110	0.091	0.181	0.189	0.110	0.192
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of Banks	951	951	788	847	795	781	786	640

Panel B: Cost to income ratio analysis

This table present fixed effects regression results for the efficiency of commercial banks. We regress cost to income ratio on the relative share of *MFIs* and control variables. The robust t-statistics are reported in parentheses and standard errors are clustered at country level. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. See Table 3.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MFI_ Share–TA $_{t-1}$	-0.10^{**}	-0.11^{***}	-0.06^{*}	-0.11^{**}	-0.18^{***}	-0.13^{***}	-0.21^{*}	-0.17^{*}
	(-2.85)	(-3.39)	(-2.41)	(-3.18)	(-4.36)	(-3.41)	(-2.33)	(-1.98)
Size $_{t-1}$	-0.01^{***}					-0.01^{*}		-0.00
	(-4.01)					(-2.47)		(-0.73)
Capital $_{t-1}$		-0.02				-0.06		-0.12
		(-0.38)				(-0.86)		(-1.44)
Credit risk $_{t-1}$			0.61^{***}			0.59^{***}		0.50^{***}
			(12.24)			(11.14)		(7.39)
Concentration $_{t-1}$				0.01		0.10^{*}		-0.06
				(0.17)		(2.49)		(-1.12)
Wage rate $_{t-1}$					0.32^{***}		0.07^{*}	0.02
					(3.80)		(2.23)	(0.24)
Inflation $_{t-1}$							0.01	0.19
							(0.11)	(1.95)
Interest rate $_{t-1}$							-0.00	0.22
							(-0.02)	(0.68)
Trade $_{t-1}$							-0.18	-0.35
							(-0.67)	(-1.13)
EFI $_{t-1}$							-0.07	-0.08
							(-0.34)	(-0.37)
Constant	1.02^{***}	0.74^{***}	0.65^{***}	0.72^{***}	0.92^{***}	0.84^{***}	0.85^{***}	0.82^{***}
	(13.64)	(32.19)	(33.30)	(22.88)	(17.59)	(9.03)	(15.49)	(6.36)
Observations	4279	4108	4349	4420	4671	4327	4293	3996
Adjusted R^2	0.233	0.131	0.123	0.092	0.199	0.209	0.108	0.207
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of Banks	946	942	785	830	795	786	640	640

3.5. Conclusions

Microfinance has become popular in many countries, and the dual financial system, in which both microfinance institutions and conventional banks share the same market, has now emerged. MFIs act differently from CBs in many ways. Specifically, they are not engaged in speculative activities. They usually tend to be more risk-averse, and invest in the real economy by focusing mostly on less privileged populations. This paper investigates the co-existence of microfinance institutions and conventional banks and analyzes the implications of MFIs on the financial development and economic welfare variables. We examine whether and how MFIs can accelerate financial development, economic growth, and reduce income inequality and poverty at the country level. We also explore whether the existence of MFIs alongside CBs could increase the efficiency of the whole banking system by putting banks into more competition. Our sample consists of 35 countries that have a dual financial system over the period 2001 to 2014.

We observe a significant positive impact of the relative share of MFIs on financial development whether it is in terms of financial intermediation as measured by bank deposits or the allocation of credit as measured by private credit. We also find support for increased economic growth in the sub-sample analysis (the pre-crisis period). In case of income inequality, we observe a strong negative association between share of MFIs and both inequality variables: Gini index and income of people at the highest decile. The results of poverty - the last dimension analyzed in this chapter - show a significant negative impact of MFIs.

In analyzing the link between the presence of microfinance institutions and the efficiency of commercial banks, we observe that there is a negative association between the share of MFIs and cost structure of commercial banks. The result suggests that when conventional banks operate alongside microfinance institutions, they are more cost-effective. MFIs increase the efficiency of commercial banks and discipline them by subjecting them to more competition.

We conduct various robustness checks. In particular, we use different proxies of independent and dependent variables. We compute the share of microfinance institutions on gross loan basis instead of total assets. We estimate regression results using OLS and fixed effects methods. In addition, we split up our sample according to low-income countries, high inflation countries and financial crisis period. In general, the earlier presented results remain unchanged in these robustness checks.

Overall, the results of the study provide important insights about microfinance institutions and their role in enhancing financial development and economic welfare, reducing income inequality, poverty, and inefficiency of commercial banks. Our findings have important policy implications for regulators and practitioners. Microfinancing not only changes the market structure of the financial sector by increasing financial intermediation, but also delivers competition to commercial banks that enhances their cost-efficiency. The fact that MFIs spur economic development, increases credit allocation and reduces poverty necessitates that policymakers start taking measures to integrate microfinancing into the mainstream financial system of a country. MFIs should be tapped to those areas where they have a market niche or where commercial banks are unable to cater to low-income borrowers. In addition, MFIs could be more involved with start-ups and small-scale industries- as such activities have the potential to increase economic growth.

In the end, we note that our results need to be interpreted with caution, as these can be idiosyncratic to the sample countries and period. Future studies can examine a broader set of countries and regions. Additionally, comparing different categories of microfinance institutions can provide new insights.

Appendix 3.1.

List of countries and the number of microfinance institutions (MFIs) and commercial banks (CBs)

No	Countries	No of MFIs	No of CBs
1	Albania	10	13
2	Argentina	16	50
3	Armenia	12	15
4	Azerbaijan	24	29
5	Bolivia	28	16
6	Brazil	32	90
7	Bulgaria	26	21
8	Cambodia	22	28
9	Chile	7	25
10	Colombia	23	21
11	Costa Rica	15	19
12	Dominican Republic	14	55
13	Ecuador	50	55
14	El Salvador	16	18
15	Georgia	12	22
16	Honduras	23	30
17	Kazakhstan	22	39
18	Kyrgyzstan	27	15
19	Macedonia	5	18
20	Mexico	55	65
21	Moldova	5	15
22	Mongolia	10	11
23	Montenegro	5	10
24	Nicaragua	27	14
25	Niger	10	8
26	Pakistan	21	30
27	Paraguay	10	30
28	Peru	65	35
29	Philippines	75	60
30	Serbia	5	35
31	Sri Lanka	16	35
32	Tajikistan	32	10
33	Uganda	15	23
34	Vietnam	30	54
35	Zambia	5	18
	Total	770	1032

CHAPTER 4
WHAT MAKES THE DIFFERENCE? A COMPARATIVE ANALYSIS OF MICROFINANCE AND COMMERCIAL BANKS

4.1. Introduction

Financial stability of an economy is mainly related to the financial stability and resilience of financial institutions. Financial institutions in a country can be considered as stable if they perform three key functions simultaneously: allocate efficient resources from surplus to deficit units of the economy; respond and manage financial risks; and absorb financial and real economic surprises and shocks as and when they occur (Berger et al., 1993). The existence of different types of financial institutions such as commercial banks, microfinance banks, and Islamic banks have changed the structure of the financial sector over the years. These different types of financial institutions tend to lower the search and transaction cost by providing a large array of financial products with varying risk and pricing structures.

A well-functioning and smooth-operating financial institution not only fulfils the needs of investors and borrowers but also contributes towards the stability of the financial system. Previously, commercial banks (CBs) were the only active players not just in developed financial markets but also in most developing countries. Since the arrival of the microfinance industry in the early 1970s and its growth and spread over the past decades, the whole landscape of financial markets has changed around the world. The idea of microfinance is warmly accepted by many emerging countries and over the period the demand for microcredit and other financial services offered by these institutions is huge. Currently, the growth rate of microfinance institutions (MFIs) is more than 30% from the previous decades that is almost three times higher than banks in Western markets (Mersland & Strom, 2012). De Koker &

Jentzsch (2013) state that high demand for the microfinance industry reflects that still a great number of people do not have the availability of financial resources in their surroundings.

A few studies compare these two types of institutions: MFIs and CBs. For example, Isern & Porteous (2005) point out that commercial banks have a potential competitive advantage over MFIs in terms of infrastructure, capital access, and strong consumer brands. Using World Bank survey data, Pellegrina (2011) analyzes the impact of credit on households' investment in farming and non-farming activities in Bangladesh. She compares the different sources of credit (microfinance, informal and banks) and finds that microfinance credit is more likely to be invested in non-farming activities, whereas credit from informal sources and banks are invested in farming activities.

Wagner (2012) compares the performance of MFIs and CBs before and after the collapse of Lehman Brothers in 2008 in developing countries and finds that although MFIs and CBs have structural differences during crises, these institutes display similarities. In another study, Donou-Adonsou & Sylwester (2016) compare banks and MFIs. Their findings support commercial banks' role in reducing poverty as compared to MFIs. Cull et al. (2014)[23] examine the effects of commercial and microfinance banks' penetration in 38 developing countries and its impact on microfinance banks' outreach and profitability. Their findings indicate that competition from commercial banks enables microfinance banks (MBs) to concentrate more on poorer clients and extend their outreach by providing women with financial inclusiveness. However, the commercial banks' penetration does not enhance the profitability of microfinance banks.

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[23] Cull et al. (2014) is the only study so far that compares microfinance and commercial banks; other comparative studies normally compare microfinance institutions with commercial banks.

Despite these few comparative studies, there is little academic evidence on the overall performance of both types of banks. It is difficult to assess which category is better than the other in terms of operating efficiency, market focus, profitability, portfolio quality, and solvency. This paper tries to bridge the gap by analyzing the various performance dimensions of microfinance banks vis a vis commercial banks. Both of these are for-profit organizations and can be benchmarked against one another. Because all types of MFIs are not for profit (for example, NGOs and cooperatives are primarily not for profit organizations and focus more on welfare aspects), this study focuses solely on for-profit MFIs: microfinance banks, which conduct their operations similar to commercial banks but with the added obligation of focusing on the poor and welfare aspects.

Using a sample of countries, where microfinance and conventional banks co-exist, we analyze how different are microfinance and conventional banks in terms of four performance dimensions: efficiency, business orientation, stability, and asset quality. These dimensions are important indicators of success of any financial institution (Wagner, 2012).

We use a sample of microfinance and commercial banks in 60 countries from 2001 to 2014 to assess the variations between both banks. The sample of countries in which the two banks co-exist allows us to control for unobserved time-varying country-specific effects, thereby recognizing such variations more clearly than when comparing banks from different countries.

Overall, we find MBs are inefficient than CBs, displaying higher cost structures. In terms of business model, we find MBs intermediate more of their deposit base, rely more on non-deposit funding, and generate higher fee income as compared to their counterparts. Additionally, we find MBs are more stable due to higher capitalization and liquidity at their disposal. However, these institutions have poor asset quality as evident from a high number of non-performing loans, loan loss reserves, and loan loss provisions. In sub-sample analysis, we find that the variations between MBs and CBs are noticeable for smaller microfinance banks. Moreover, we find significant cross-regional variations, with the differences in efficiency, intermediation, liquidity, stability, and assets quality are mainly driven by African and Latin American MBs. In addition, we find that these variations are to some extent attributed to the differences in market share of MBs in different countries that display a different level of complexity, development, and competitive behaviour. Finally, we find that there is not much difference between the performance of MBs and CBs during the crisis period.

Our paper contributes to the growing literature of microfinance specifically and commercial banking generally. There are relatively few studies on cost and revenue efficiencies of microfinance institutions. The available studies only capture how efficiency impacts the financial performance and outreach of microfinance institutions (Hartarska, Shen, & Mersland, 2013; Hermes, Lensink, & Meesters, 2011). However, no study makes a comparison of conventional banks alongside microfinance banks[24] on multiple performance dimensions (efficiency, business orientation, stability, and asset quality). To the best of our knowledge, this is one of the first bank-level exploration of microfinance banks and conventional banks.

We believe that such a comparison is particularly important as both banks have different objectives, business orientation, and clientele. Both groups of banks have different approaches towards risk and return as MBs have a dual mission of providing financial products along with the concept of social welfare. Therefore, it is natural to wonder if these differences translate into differences in the overall performance of these banks. Capturing various performance dimensions enables us to get a clear picture of the overall performance of MBs versus CBs. Other than catering performance differences between both groups of banks, this study considers different countries and regions, where microfinance and conventional banks simultaneously exist. The anecdotal evidence shows that there are substantial performance differentials across regions, sizes, and markets. We also gauge whether the performance of both the groups remains the same or changes during the crisis period. Thus, we try to provide compelling evidence of dissimilarities between both bank types by exploring various performance dimensions across different sizes, regions, market share, and during the crisis period.

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[24] The main objective of comparing microfinance banks with commercial banks rather than microfinance institutions is to create comparability between the different performance dimensions. The analogy is possible and makes sense in the case of microfinance banks, as these institutions are comparatively larger, supervised by banking authorities, have more funding available, and often take deposits, which are not possible in terms of other types: NGOs and cooperatives.

The remainder of the chapter is organized as follows. Section 4.2 presents the hypotheses. Section 4.3 presents data and methodology. Section 4.4 presents results and Section 4.5 concludes the chapter.

4.2. Hypotheses development

The success of financial institutions depends on various factors, such as the composition of assets, liabilities, profits, expenses, and the clientele they serve. This research includes comparing the four distinct performance dimensions of MBs and CBs. We address each dimension separately and in depth.

4.2.1. Efficiency

Efficiency is the degree at which banks are able to convert their resources economically into maximum possible output. Berger, Hunter, & Timme (1993) state that if banks are efficient, then there is improved profitability, greater intermediation of funds, better prices and service quality for consumers. This also leads to the stability of the banks, if some of the efficiency savings are applied towards improving capital buffers that absorb risk. However, the converse applies to inefficient intermediaries, where substantial losses are sustained. Consequently, the efficiency of banks improves the overall economy which affects the welfare of the society as a whole.

MBs are comparatively new player in the financial markets. Providing credit facilities to poor households in remote areas is a costly endeavour. Additionally, transaction and information costs are high among microfinance institutions (Hermes & Lensink, 2011; Gonzalez, 2007). Over the period, microfinance institutions also start expanding their outreach and operations in new geographical locations. According to Conning (1999) and Yimga (2018), rapid expansion and efficiency are conflicting strategies; the expansion may increase costs of MFIs, thus hurt their efficiency.

Some prior studies focus on the efficiency of MBs. According to Caudill et al. (2013), deposits taking microfinance institutions (banks, rural banks) are more cost-efficient. The author state that microfinance banks not only offer credit but also savings facilities along with payment transfer, insurance, and long-term housing loan products. Others focus on how MFIs increase their efficiency through scope and scale economies. Scope economies are related to operational efficiency gain through related diversification, whereas scale economies can be obtained by increasing the size of activities. Hartarska et al. (2010) point out that economies of scope might arise when MFIs extend both loans and mobilize savings whereas Zamore (2018) states that by focusing on non-lending activities, MFIs can increase their scale, which ultimately increases their revenues.

Conventional banks enjoy several advantages over microfinance banks. For example, conventional banks have very long history and experience, generate fee income and commission other than interest which is a major source of their revenues, do not share loss with clients and ask for guaranteed collaterals in most transactions, enjoy huge capital, spread widely, have much more developed technologies as compared to microfinance banks (Cull et al., 2007). On the other hand, because of small loan sizes and operations in remote locations, the operational and administrative costs are higher for MBs. Additionally, the young age of MBs as compared to CBs is another reason for the increase in cost. These high costs might result in lower efficiency of MBs compared to CBs. Therefore, our first hypothesis is

H(1): Microfinance banks have higher cost structures compared to conventional banks.

4.2.2. Business Models

Business models describe how banks generate funding and profits, which customers they serve, and which distribution channels they use. Mergaerts & Vennet (2016) report that the business model reflects the banks' long-term outlook and strategic choices in terms of assets, income, and financing frameworks, as these choices are long-term, stable, and have long-term effects on bank performance. This suggests that to understand the impact of business model choices, the differences between banks are more important than changes over time within banks.

According to Gonzalez et al. (2015), the business model of MFIs is based on “delivering more value at less cost” that is providing products and services to the poor population living in rural areas or outskirts of urban regions. It is different from that of commercial banks. MFIs mostly lend to (and possibly take deposits from) the poor through individual and group lending. A comparison of MBs and CBs reveals several differences, in terms of average loan sizes, cost and income components, funding structures, and products and services offered.

MBs are independent of donors and can take deposits from customers. Delgado et al. (2014) state that MBs have economies of scope when they take deposits, whereas Hartarska et al. (2010) state that savings deposits are a cheaper source of funding for MBs. Another study by Abakaeva & Glisovi-Mezieres (2009) also provides evidence that small deposits from low-income clients still provide microfinance institutions with a stable source of funding. Beck et al. (2013) state that "intermediation activity" takes place when banks lend out of their deposits base. Since both CBs and MBs take deposits and further advance them, therefore it is important to know which group is associated with higher intermediation of funds.

MBs are able to generate non-interest income through insurance and money transfer facilities to poor people around the world. Although these institutions are active in non-lending activities, their major source of revenue is interest yield (CGAP, 2005). Conventional banks generate non-interest revenues more than interest revenues from non-lending, trading, and investment banking activities. Therefore, it is important to know the proportional share of non-interest income for both groups.

Similarly, the retail and wholesale funding (non-deposit funding) available to these groups must be understood. Wholesale funding is different from the retail (traditional) source of financing that would be used by commercial banks. Traditionally, banks use core demand deposits as a source of funds, and they are an inexpensive source of financing (Roengpitya et al., 2014). Although wholesale funding is a catch-all term, it applies primarily to federal funds, foreign deposits, and brokered deposits. Some also include borrowings in the public debt market in the concept of wholesale funding.

Now many MBs can attract commercial funding from Development Financial Institutions (DFIs) and international banks. Also, more than 100 international funds are investing in microfinance banks (Frank et al., 2008; Reille et al., 2009). The reliance on market funding may be the same or different for both bank groups. Since most of the MBs are not involved in trading activities as compared to conventional banks and focus more on lending and lending-like activities, we expect that MBs have less income from non-lending activities. Because MBs have a smaller deposit base than commercial banks, they have less intermediation and rely more on wholesale funding than CBs. Therefore, our second hypothesis is

H2(a): Microfinance banks have lower fee income and intermediation compared to commercial banks.

H2(b): Microfinance banks have higher non-deposit funding compared to commercial banks.

4.2.3. Stability

Stability is the resilience of financial systems in times of stress or imbalances that arise exogenously or as a result of significant adverse and unforeseen events (Han & Melecky, 2017). Other than external factors, legal form, urge for profit, deposit-taking, and monitoring by a regulator are also main factors affecting the stability of financial institutions.

MFIs are exposed to a low level of liquidity risk as they give loans of small sizes for a relatively shorter period (Wagner &Winkler, 2013). MFIs are also able to receive long-term funds from DFIs on concessional rates and usually not have severe credit obligations that can damage their liquidity position as to commercial banks, as they were drawn down by borrowers after the financial crisis (Cornett et al., 2011). Lutzenkirchen & Weistroffer (2012) state that microfinance banks are likely to face liquidity problems as they increase their funding from deposits.

Unlike commercial banks, the microfinance industry is not completely regulated. Regulators can often ignore the industry as it may only play a small role in the overall financial sector. Among other forms, micro banks are mostly regulated and monitored by external parties. Due to this monitoring MBs take fewer risks than other legal forms e.g. NGOs and cooperatives (Galema et al., 2012).

There are mixed results concerning the stability of the microfinance industry. Some studies increasingly support that microfinance has become more crisis-prone. Di Bella (2011) shows that during the crisis years 2008 and 2009, MFIs performance is significantly correlated with domestic and international financial and economic conditions, contradicting earlier evidence. Wagner (2012) finds that post-financial crisis characteristics exhibit similar patterns for both types of financial institutions: microfinance banks and commercial banks. Gonzalez (2010) provides evidence that the increase in MFIs vulnerability largely reflects the experience of those MFIs that have diverted by gradually turning to consumer credit from the original target group of (informal) microbusinesses.

On the other hand, most of the MBs are able to sustain their capital base during the financial crisis period due to the maintenance of high loss reserves at their disposal. These reserves provide a cushion against loan delinquency and decreasing profits after 2009. These reserves also help MBs in covering their ultimate losses without impairing their equity levels. Generally, solvency is not a concern as most microfinance institutions specifically MBs remain very well capitalized, with median equity levels not deviated from the nearly static range of 18-20% of total assets established in mid-2007 (Reille et al., 2010).

Due to external availability of funds, regulated status, and fewer liquidity problems, MBs are better capitalized and solvency might not be a problem for these banks as compared to their counterparts. Therefore, our third hypothesis is

H(3): Microfinance banks are more stable compared to conventional banks.

4.2.4. Asset Quality

Asset quality refers to the quality of the assets (loans) of a financial institution based on the likelihood that a given loan will repay the principal and interest on time. Low asset quality denotes that the institution must make provisions for eventual losses (CGAP, 2005). Banking stability is dependent on the quality of the assets maintained by banks. Barr et al. (1994) state that poor asset quality is the main cause of a bank's failure.

According to Salas & Saurina (2002), the lending policies of a bank mirror its risk appetite which further depends on its mission and institutional structure. Tabak et al. (2012) state that larger banks have more access to external funding, enjoy economies of scale with a more diversified group of products and borrowers. Although their "too big to fail" philosophy might create moral hazard drive to take excessive risks. Breuer (2006) states that a bank's problem loans are due to a principal-agent conflict of interest. He notes that the bank serves as an agent for depositors and for borrowers, the bank plays the role of principal. Such parties have a conviction of self-interest that results in conflicts of interest between them. Ultimately, because of these conflicts, the bank can take measures that are contrary to its obligations, thus giving rise to problematic loans. Similar to conventional banks, MBs also provide loans to a vast majority of poor, therefore the quality of the loan portfolio and related credit risk has to be managed effectively. Navajas et al. (2000) state that as the microfinance industry matures and becomes more competitive, there is a strong need for systematic risk management in this industry.

Theoretical literature supports the use of collateral as a tool to alleviate adverse selection problem (Buera & Kaboski, 2012). Berger, Frame & Ioannidou (2016) find that collateral is more likely to be pledged by observably riskier borrowers. Tchuigoua (2015) states that adverse selection arises because borrowers know whether their project is of high or low quality, but the management of MBs does not. Therefore, in their pool of loan applicants, MBs are unable to discriminate between risky and safe borrowers; if they did, they would charge a high interest rate for risky borrowers and a lower rate for safe borrowers. Consequently, this negative option is likely to affect the loan portfolio of MBs.

Christen et al. (2012) point out some other factors associated with poor loan portfolios in MFIs. These factors include unsecured and less diversified loans along with highly volatile portfolios associated with frequent repayments, short duration, and contagion effects among borrowers in the same location. Zamore et al. (2019), using a large global sample of MFIs, find that MFIs with a large number of branches increase credit risk, as evidenced by higher nonperforming loans, write-offs, and loan loss provisions. In comparison to shareholder-owned MFIs, this finding is more prominent among non-shareholder MFIs such as NGOs and cooperatives. Tchuigoua (2015) states that outstanding loans constitute a substantial portion of MFIs' overall assets, so a higher filthy credit portfolio raises the probability of default for MFIs.

The poor loan portfolio, moral hazard and adverse selection increase riskiness of MBs. Furthermore, conventional banks have more products and diversified groups of borrowers, more funding opportunities, better risk management incentives and systems. Therefore, we expect that the quality of their assets is better as to MBs. Based on above arguments, we formulate our fourth hypothesis as:

H4: Microfinance banks have poor asset quality compared to conventional banks.

4.3. Empirical framework

4.3.1. Econometric specification

Following Beck et al. (2013) and Bitar et al. (2017), we employ pooled ordinary least squares (OLS) regression model with country and year fixed effects to compare microfinance banks with conventional banks in terms of efficiency, business model, stability, and asset quality. As our main variable of interest microfinance dummy (M_i) is time-invariant and we are interested between variation of two groups (MBs vs CBs) rather than within variation, the fixed effect technique is not appropriate. To confirm our selection of econometric method, we first applied the Breusch-Pagan Lagrange multiplier (LM) test to choose between pooled OLS and random effect model. The insignificant p-value of LM test indicates that the pooled OLS model is more appropriate than the random effect model.

$$D_{i,j,t} = \alpha + \beta M_i + \gamma_k \sum X_{i,j,t} + \vartheta_j + \lambda_{\mathrm{t}} + \epsilon_{\mathrm{i,t}} \qquad (1)$$

In this model, the subscripts i, t, j denote individual banks, time dimension, and countries, respectively. D $_{is}$ our dependent variables (efficiency, business orientation, stability and asset quality) for bank i, in country j, and in year t. M is a dummy variable taking the value one for microfinance banks and 0 otherwise, X is a vector of time-varying bank characteristics including log of total assets as proxy for size, non-loan earning assets to total assets and fixed assets to total assets ratios. ϑ_j *and* λ_t are country and time fixed effects, and ε is an error term. By using this model, we compare the differences in the above dimensions between microfinance and conventional banks in a specific country and for a specific year. Following Bitar et al. (2017) and Beck et al. (2013), we allow the clustering of error term at bank level instead of country level, because some of the sample countries have a much larger number of observations than other countries that might create biased results. We expect that the estimated regression coefficients δ to be positive in case of hypotheses 1, 2(b), 3 and 4, and negative in case of hypothesis 2(a). The detail of all variables used in this chapter is given in Section 4.3.2.

We check our results by doing different robustness tests. First, we follow Saeed et al. (2020) and Altunbas et al. (2007) in specifying a system of four equations, one for each dimension of performance namely, efficiency, business models, stability, and asset quality. The system of equations is estimated using the Seemingly Unrelated Regression (SUR) approach of Zellner (1962). The main advantages of the SUR estimation technique are that it allows for simultaneity between the dependent variables, and it is an efficient estimation technique that uses contemporaneous correlation information among error terms of the equations.

Second, we use the propensity score matching (PSM) technique. We expect that banks' involvement in microfinancing leads to self-selection bias as this involvement is on a non-random basis. The propensity score matching procedure allows us to identify one matched non-microfinance bank (commercial bank-CB) for each microfinance bank in the sample based on observable bank characteristics. Our matched sample thus consists of banks that are similar except that the bank is of opposite type. One advantage of this methodology is that each commercial bank in a country is compared to the most similar microfinance bank in the same country. In this way, the differences in bank characteristics are closely controlled for. This matching approach minimizes any concern related to the relatively small sample of microfinance banks. We determine the matched CB sample by calculating the propensity of a bank operating as an MB, given bank characteristics using Gaussian Kernel and Caliper matching methods. The propensity score is the probability that bank i is involved in microfinancing and is calculated through probit regression, in which microfinance bank dummy (Mi) is the dependent variable.

PSM based on matched groups is considered to be more comparable and less diverse as non-matched groups. The differences in efficiency, business model, stability and asset quality may be higher (lower) than when a matched sample is used. Therefore, it is important to make banks as comparable as possible prior to uncovering the average estimates. For the validity of PSM, two conditions need to be fulfilled. First, the potential outcomes and treatment assignment are independent based on observed bank characteristics that are not influenced by the treatment. Second, the propensity score must be within the range of 0 and 1 so that there is sufficient area of common support or overlap between the treated and control observations.

After PSM, we performed different sub-sample analysis (across different sizes, regions, market share and during global financial crises period) to see the robustness of our main results. We also use a truncation of our sample at 1st and 99th percentiles instead of winsorizing at these thresholds. By doing truncation we tried to avoid the bias in the sample that occurred due to outliers in upper and lower end of the distribution. Finally, we took the reduced sample of countries where at least three MBs exist. Section 4.4 and 4.5 include the details of all the sub-sample analysis.

4.3.2. Variable Description

Dependent variables

Following Hermes & Lensink (2011), Beck et al. (2013), and Linares-Zegarra & Wilson (2018), we use two efficiency indicators: *Cost to assets ratio and Cost to income ratio*. The former indicates overhead costs such as rents, staff salaries and administrative cost as a percentage of total assets. The latter represents overhead costs as a percentage of total revenues generated by bank, the higher cost ratios reflect lower efficiency of the bank.

For business models, we use three indicators. The first indicator is *Loan deposit ratio*: it is calculated as loans divided by deposits and used as intermediation proxy in banking literature (Beck et al., 2013; Naqvi et al., 2018). A higher ratio indicates more intermediation as the bank is able to give more loans as it receives deposits. The second is the *Fee income ratio* that represents the share of non-interest income as a percentage of total operating income. Non-interest income can be generated through market-based activities (trading and underwriting) as well as traditional banking activities (commission, sale of insurance and other products, fund transfers, payment services, and investment income). This measure has been employed extensively in literature as a proxy for revenue diversification of banks and MFIs (Stiroh & Rumble, 2006; Zamore, 2018). The last indicator *Non-deposit funding* or Wholesale funding as a percentage of total funding, is an important source of market-based funding other than deposits. This allows institutions to quickly adjust their leverage, exploit investment opportunities, provide market discipline, and to refinance unexpected retail withdrawals. This variable is used by various prior studies as funding diversification such as (Stiroh & Rumble, 2006; Mercieca et al., 2007).

We use four indicators to measure stability. The first indicator is *Return on assets*: It represents after-tax profit as a percentage of total assets. Return on assets reflects the ability of bank management to generate profits from the bank's assets (Beck et al., 2013: Bitar et al., 2017). The second indicator is *Equity to assets ratio*: also known as the capital ratio, represents equity as a percentage of total assets (Meslier et al., 2014; Beck et al., 2013). Banks with higher capital are capable of absorbing any negative shocks and assumed to possess less insolvency risk. The third indicator is *Maturity match* and it represents the ratio of liquid assets to deposits and short-term funding. It shows the liquidity position of the bank whether the bank is capable of meeting sudden withdrawal of deposits and short-term funding. The higher ratio indicates more liquidity and fewer chances of bank run. Different prior studies widely used this measure for bank liquidity position (Beck et al., 2013; Han & Melecky, 2017). This ratio is also called deposit run off ratio or liquidity coverage ratio. The last indicator is *Z-score*: it is equal to the sum of return on average assets (ROAA) and equity to asset ratio divided by the standard deviation of ROAA (Laeven & Levine., 2009 and Beck et al., 2013). Z-score measures the distance of a bank from insolvency. A higher value of Z indicates more stability.

Finally, we used three indicators for assets quality. The first is *Portfolio at risk* (PAR > 90 days): also known as non-performing loans. It represents the value of all outstanding loans on which one or more instalments of the principal amount is overdue by more than 90 days. This measure is frequently used in microfinance and banking literature (Caudill et al., 2000; Kar, 2012; Zamore et al., 2019). A loan more than 90 days past due signals the associated credit risk for the institution. The second indicator is *Loan loss reserve* (LLR): it represents the amount that banks considered sufficient to cover the expected future losses (Berger et al., 2016; Beck et al., 2013). An increase in LLR indicates that there are more chances of future loan losses. The last indicator is *Loan loss provision,* which is the amount that banks set aside out of their revenues to cover loan losses. Loan loss provision also shows the adjustment of loan loss reserves and write-offs. Portfolio at risk > 90 days, Loan loss reserves and Loan loss provisions, all are scaled by gross loan portfolio.

Explanatory variables

We control for time-variant bank characteristics that might influence the relationship between the type of bank on one hand, and efficiency, business orientation, stability, and asset quality on the other hand. By using a log of total assets, we control for size, as larger institutes might be more efficient and availing economies of scale. They might have more non-lending income, funding, and other resources. According to Demirguc-Kunt & Huizinga (2010) there is an impact of non-lending activities on the stability and efficiency of the banks. Therefore, we use two measures to control for the impact of non-lending activities on various performance dimensions. The first measure is the non-loan earning assets (non-interest earning assets) and second is the fixed assets, both scaled by total assets. By capturing these two variables, we control for the associated opportunity cost foregone by the banks due to having non-lending assets and only capture the effect of lending activities of the banks in our analysis. Both these non-lending variables are used by Beck et al. (2013) and Naqvi et at. (2018). Table 4.1 reports the definition of all the variables used in this study.

Table 4.1. Variable Definitions

Variables	Description
Independent variable	
Microfinance bank	A dummy variable (M_i) equals to one for microfinance bank and zero otherwise.
Dependent variables	
Efficiency	
Cost to assets ratio	Overhead cost as a percentage of total assets.
Cost to income ratio	Overhead cost as a percentage of total revenues.
Business Model	
Loan deposit ratio	Total loans as a percentage of total deposits.
Fee income	Non-interest income as a percentage of total operating income.
Non-deposit funding	Funding other than deposits as a percentage of total funding of bank.
Stability	
Equity to asset ratio	Total equity as a percentage of total assets.
Return on assets	Net income as percentage of total assets.
Maturity match	Liquid assets as percentage of deposits and short-term funding
Z-score	It is a measure of bank insolvency calculated as (ROAA+ EAR)/SD (ROAA), where ROAA indicates return on average assets, EAR is the equity to assets ratio and SD(ROAA) is the standard deviations of the return on average assets.
Assets Quality	
Portfolio at risk	Value of all outstanding loans overdue or at risk greater than 90 days as a percentage of gross loan portfolio.
Loan loss reserves	Reserve created for future loan losses as a percentage of gross loan portfolio.
Loan loss provision	Loan loss provision expense as a percentage of gross loan portfolio.
Control variables	
Size	Natural log of total assets of bank.
Fixed assets	Fixed assets as a percentage of total assets.
Non-loan earning assets	Non-loan earning assets as a percentage of total assets.

4.3.3. Data

Our study includes microfinance and conventional banks. For MBs, the data is taken from microfinance information exchange (MIX Market), which is the largest source of publicly available data on microfinance institutions. We select Bankscope for data related to conventional banks[25] as it is the main source of data commonly used in academic work related to banking studies. Our sample consists of 60 countries, where both types of banks simultaneously exits. We exclude some countries in which MBs data is less than five years.

Our data contains annual observation of MBs and CBs in five regions of the world namely: Africa (AF), East Asia & Pacific (EAP), Eastern Europe and Central Asia (EECA), Latin America and Caribbean (LAC) and South Asia (SA). We exclude the Middle East and North American (MENA) region from our sample because of the non-availability of data for microfinance banks. In total, our sample consists of annual data of 392 MBs with 2244 observations and 1366 CBs with 10971 observations during 2001 to 2014. The time span allows us to control unobserved time-variant effect by introducing country and year dummies. The country-wise detail of all MBs and CBs is given in Appendix 4.1.

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[25] For comparison, we only used data for commercial banks and excluded other categories, such as Islamic banks, investment banks, savings banks, cooperative banks, mortgage banks, and real estate banks, which are given by Bankscope.

4.4. Results

4.4.1. Descriptive Statistics

Table 4.2 reports the descriptive statistics of all variables used in the study. In Panel A, we report the full sample statistics including the number of observations, mean, median, minimum, and maximum values of variables after winsorizing at 1st and 99th percentiles. To estimate the efficiency of MBs and CBs, we use two cost ratios: cost to assets ratio and cost to income ratio. The former has a mean value of 39.7% and ranges from 11.3% to 74.5%, and it is higher than 31.4% reported by Mersland et al. (2009). Whereas the latter has a mean value of 129.1% and ranges from less than zero to 700% respectively. This is higher than 75% reported by Abedifier et al. (2018) due to the higher cost structures prevailing in microfinance industry.

The second dimension of the business model includes three indicators: loan deposit ratio, with an average of 77.7% and ranges from 22% to 120%. This is higher than 62.5% reported by Beck et al. (2013) and lower than 89.4% reported by Naqvi et al. (2018). The second indicator is the fee income as a percentage of total operating income. It has an average value of 35.6% with a minimum value of 4 % and a maximum value of 86%. This is close to the 34.3% reported by Demirguc-Kunt & Huizinga (2010). The last indicator for the business model is non-deposit funding, it ranges between 10% to 98.6% with an average value of 36.6%. This ratio is higher than 29.67% reported by Kohler (2015).

The third dimension is stability and it includes four ratios. The first is maturity match that captures the short-term liquidity position of the bank, it has an average value of 48.8% with minimum value of 8% and a maximum value of 300%. It is similar to 48.8% reported by Beck et al. (2013). The second indicator is equity to asset ratio, it ranges from 7% to 99% with an average value of 40.4% in our sample. This is close to 36.9% reported by Zamore (2018).

Return on assets is our third indicator with an average value of 20.4% and ranges from -38.2% to 59%. This value is close to 22% reported by Hartarska at al. (2014). Finally, we calculate Z-score as a standard measure of bank stability and it ranges from 8 to 77 with an average value of 36, which is close to 34 reported by Kohler (2013).

The last dimension of comparison is asset quality. We use three indicators for asset quality: Portfolio at risk > 90 days has an average value of 39.5% and ranges from 10% to 90%. Then we use Loan loss reserves, they range from 11% to 84.6% with an average of 38.3%. Finally, we use Loan loss provision, it ranges from 7% to 31% with an average value of 23.8%. These values are close to the values reported by Balla & Rose (2015).

As to control variables, the first one is the fixed asset ratio, it ranges from 8% to 75% with an average of 42.1%. Then we use non-loan earning assets, having a range of 19% to 86% with an average value of 39.5%, which is similar to the value reported by Naqvi et al. (2018). Finally, we capture size based on the natural log of total assets. In our sample total assets range from \$0.12m to \$97700m with an average value of \$4010m. The mean comparison reveals that MBs have more fixed assets, whereas CBs have more non-loan earning assets.

Table 4.2 panel B displays the mean and median comparison of all variables for both groups of banks. MBs have substantially higher costs than commercial banks. On average MBs have higher loan deposit ratio, fee income and non-deposits funding as to CBs. This simple comparison shows that MBs intermediate more of their deposits and not only rely on their conventional business model to generate revenue from lending alone, but also diversify from interest income to fee income and increase their funding mix by relying more on market-based funding (wholesale funding). Additionally, we find that MBs have higher liquidity, non-performing loans, and fixed assets than commercial banks. On the other hand, we find commercial banks relative to microfinance banks are larger, well-capitalized, with more profitability, and non-loan-earning assets.

4.4.2. Correlation Matrix

Table 4.3 provides the correlation matrix to examine the presence of multicollinearity among the variables used in the study. We observe low correlation among most of the variables. The highest correlation value 0.415 is between log of total assets (size) and non-loan earning assets, which is much below the threshold of 0.8 as mentioned by Brooks (2008). This suggests that multicollinearity is not a problem in regression analysis.

Our univariate analysis reveals significant differences between MBs and CBs in terms of cost structures, intermediation, fee income, non-deposit funding, liquidity, and asset quality. In the following section, we proceed with multivariate analysis by including bank level controls.

Table 4.2. Descriptive statistics

This table shows the descriptive statistics of all the variables used in the study. Panel A presents the summary statistics of full sample and panel B presents t test of equality of mean and median comparison of variables between MBs and CBs. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

Panel A: Full sample

	N	St. Dev	Mean	Median	Min	Max
Efficiency						
Overhead cost ratio (%)	12595	.217	.397	.353	.113	.745
Cost to income ratio (%)	12413	3.42	1.291	.644	-0.425	7.67
Business model						
Loan deposit ratio (%)	10000	.286	.777	.75	.222	1.2
Fee income (%)	11546	.275	.356	.265	.042	.86
Non-deposit funding	10617	.236	.366	.282	.105	.986
Stability						
Maturity match (%)	12426	.477	.488	.356	.080	3.52
Equity to assets (%)	13109	.294	.404	.255	.072	.99
Return on assets (%)	13109	.262	.204	.233	-.382	.595
Z-score	13109	.241	.36	.253	.082	.776
Asset quality						
Portfolio at risk (%)	8936	.248	.395	.321	.102	.902
Loan loss reserves (%)	11011	.226	.383	.323	.112	.846
Loan loss provision (%)	11567	.081	.238	.275	.073	.313
Bank characteristics						
Fixed assets (%)	12600	.236	.421	.370	.085	.751
Non-loan earning assets (%)	12549	.168	.395	.331	.193	.867
Total assets ($m)	13161	12400	4010	346	0.12	97700

Panel B: Differences between two groups

	Observations		Mean differences			Median differences		
	MBs	CBs	MBs	CBs	Diff	MBs	CBs	Diff
Cost to asset ratio	2176	10419	0.40	0.376	-0.024***	0.360	0.259	-0.101***
Cost to income ratio	2175	10238	4.87	0.701	-4.169***	2.63	0.618	-2.012***
Loan deposit ratio	1984	8016	1.019	0.742	-0.277***	1.19	0.722	-0.468***
Fee income	2151	9395	0.533	0.329	-0.204***	0.450	0.253	-0.197***
Non-deposit funding	2064	8553	0.502	0.337	-0.165***	0.440	0.257	-0.183***
Maturity match	2165	10261	0.695	0.478	-0.217***	0.370	0.351	-0.019**
Equity to assets	2244	10865	0.341	0.416	0.075***	0.210	0.269	0.059***
Return on assets	2212	10897	0.241	0.282	0.041***	0.220	0.262	0.042***
Z-score	2119	10900	0.386	0.354	-0.032***	0.282	0.247	0.035***
Portfolio at risk	1924	7012	0.422	0.395	-0.027***	0.362	0.322	-0.040***
Loan loss reserves	1912	9099	0.384	0.371	-0.013	0.322	0.319	-0.003
Loan loss provision	1916	9651	0.240	0.237	-0.003	0.275	0.269	-0.006
Fixed assets	2175	10425	0.697	0.377	-0.320***	0.751	0.316	-0.435***
Non-loan earning assets	2127	10422	0.237	0.432	0.195***	0.263	0.492	-0.229***
Total assets ($m)	2244	10971	219	4790	4568.03***	21	517	496***

Table 4.3: Correlation Matrix

This table presents the correlation among the variables used in the analysis and ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Overhead cost ratio (1)	1														
Cost to income ratio (2)	0.030	1													
Loan deposit ratio (3)	-0.029^{*}	0.165^{***}	1												
Fee income ratio (4)	-0.019	0.366^{***}	0.087^{***}	1											
Non-deposit funding (5)	0.016	0.109^{***}	0.392^{***}	0.073^{***}	1										
Maturity match (6)	-0.063	0.078^{***}	0.025^{*}	0.055^{***}	0.312^{***}	1									
Equity to assets (7)	-0.052^{***}	-0.064^{***}	0.150^{***}	0.049^{***}	-0.062^{***}	0.021	1								
Return on assets (8)	-0.018	-0.031^{**}	0.012	0.099^{***}	0.010	0.030^{*}	0.013	1							
Z-score (9)	0.080^{***}	0.028^{*}	0.058^{***}	0.039^{**}	0.097^{***}	0.063^{***}	0.049^{***}	0.010	1						
Portfolio at risk (10)	0.028^{*}	0.015	-0.040^{**}	-0.008	0.010	-0.012	-0.026	-0.070	-0.015	1					
Loan loss reserves (11)	0.020	0.005	-0.006	-0.013	0.023	0.081	-0.048^{***}	-0.022	0.021	0.066^{**}	1				
Loan loss provision (12)	0.031^{*}	0.029^{*}	-0.001	-0.035	0.008	-0.016	-0.015	-0.054^{**}	0.023	0.023	0.050	1			
Size (13)	-0.073^{***}	-0.294^{***}	0.297^{***}	0.202^{***}	-0.220^{***}	-0.195^{***}	0.269^{***}	0.060^{**}	0.150^{**}	0.092	0.054^{**}	0.043^{**}	1		
Fixed asset ratio (14)	-0.033^{**}	0.226^{***}	0.236^{***}	0.178^{***}	0.145^{***}	0.033^{**}	0.079^{***}	0.049	0.073	0.026^{*}	0.015	0.027	0.298^{**}	1	
Non-loan earning assets (15)	-0.029^{*}	0.243^{***}	0.019	0.193^{***}	0.184^{***}	0.367^{***}	0.056^{***}	0.021	0.086^{**}	0.016	0.086	-0.021	0.415^{**}	0.194^{**}	1

The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

4.4.3. Regression results

We start the regression analysis by performing pooled OLS regressions. In all regressions, we adjust the standard errors at the bank level to correct possible heteroscedasticity problem. We first perform an analysis that only captures country and year fixed effects in order to see differences in both banks.

Panel A of Table 4.4 shows the result of pooled OLS regressions. We find that MBs have higher cost structures compared to commercial banks, as both measures of cost (cost to assets and cost to income ratios) are statistically significant. In terms of the business model, all three measures show clear differences between the two groups. MBs have 0.3 percentage point higher loan deposit ratio and 0.1 percentage point higher fee income than CBs. The third indicator of business model is non-deposit funding. We find that MBs have 0.2 percentage point higher non-deposit funding as compared to commercial banks.

The stability dimension results show that MBs have better equity resources, more liquid assets to meet short term requirements and higher Z-score compared to CBs. Finally, we analyze asset quality. The findings indicate both portfolio at risk over due by 90 days and loan loss reserves are increasing in MBs as compared to their counterparts.

The results of the system of equations estimated using Seemingly unrelated Regression (SUR) are presented in Panel B of Table 4.4. In the first equation of efficiency, we estimate two models simultaneously using cost to income ratio and cost to assets ratio as dependent variables. The insignificant p-value of Breusch-Pagan statistics presented at the bottom of the table suggests that both of these dependent variables are not related. We run the second equation for the business model by simultaneously running the loan-deposit ratio, fee-income ratio, and non-deposit funding. Again, the results are very much similar to OLS but the coefficients of fee-income ratio and non-deposit funding increase by 4 percentage points and 3 percentage points, respectively in SUR estimations. The insignificant p-value of Breusch-Pagan chi^2 statistic fails to establish any dependence among three variables of business models in the SUR estimations.

In the third simultaneous equation for stability, we run four models: return on assets, equity to assets ratio, maturity match, and Z-score. The results are somewhat similar to OLS regression. However, the Breusch-Pagan statistic shows strong significance, signifying that the four dependent variables are related. Finally, we run equation four for asset quality, using three models for portfolio at risk, loan loss reserves, and loan loss provision. The result of portfolio at risk becomes insignificant in SUR estimation, whereas loan loss reserves and loan loss provision are similar to OLS regressions. The significant value of the test of independence indicates the presence of correlation among the three variables of asset quality. Overall, in four simultaneous equations, we find that there is a slight increase in the value of R^2 for most of the models. Thus, we can conclude that SUR estimations have improved the estimations somewhat.

Table 4.4. Comparing Microfinance and commercial banks

Panel A: Ordinary least squares regressions

This table presents the results of differences between MBs and CB. The dependent variables are different indicators of efficiency, business model, stability and asset quality. The robust t-statistics, reported in parenthesis, are based on standard errors clustered at bank level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

	Efficiency		**Business model**			**Stability**				**Assets quality**		
	(1) Cost to assets ratio	(2) Cost to income ratio	(3) Loan deposit ratio	(4) Fee income ratio	(5) Non deposit funding	(6) Return on assets	(7) Equity to assets	(8) Maturity match	(9) Z-score	(10) Portfolio at risk	(11) Loan loss reserves	(12) Loan loss provision
Microfinance bank	0.023**	4.195***	0.321***	0.191***	0.210***	0.010	0.061***	0.242***	0.047***	0.003*	0.029**	0.006
dummy	(2.89)	(12.58)	(8.06)	(6.18)	(7.31)	(1.49)	(7.91)	(8.77)	(6.85)	(2.19)	(3.10)	(1.70)
Constant	0.491***	0.813***	0.358***	0.320***	0.201***	0.198**	0.241***	0.771***	0.417***	0.264***	0.415***	0.168***
	(6.33)	(9.57)	(3.74)	(3.39)	(3.57)	(2.76)	(4.10)	(7.35)	(3.61)	(30.18)	(7.04)	(4.06)
Observations	12595	12413	10000	11546	10617	12575	13109	12426	13019	8936	11011	11567
Adjusted R^2	0.160	0.266	0.393	0.175	0.310	0.148	0.165	0.152	0.119	0.120	0.129	0.085
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Seemingly unrelated regressions

This table presents the results of differences between MBs and CB. We used simultaneous equations modelling and estimate four models for efficiency, business model, stability and asset quality. The robust t-statistics, reported in parenthesis, are based on robust standard errors. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

	Efficiency		**Business model**			**Stability**				**Assets quality**		
Equations	**(1)**		**(2)**			**(3)**				**(4)**		
Model	(1)	(2)	(1)	(2)	(3)	(1)	(2)	(3)	(4)	(1)	(2)	(3)
	Cost to assets ratio	Cost to income ratio	Loan deposit ratio	Fee income ratio	Non deposit funding	Return on assets	Equity to assets	Maturity match	Z-score	Portfolio at risk	Loan loss reserves	Loan loss provision
Microfinance bank dummy	0.029*** (4.28)	4.171*** (13.14)	0.286*** (7.08)	0.232*** (7.71)	0.248*** (6.52)	0.01 (1.41)	0.077*** (8.62)	0.215*** (9.84)	0.026*** (4.42)	0.024 (1.49)	0.085* (2.12)	0.002 (1.05)
Constant	0.400*** (5.74)	0.702*** (9.33)	0.510*** (4.13)	0.327*** (4.10)	0.307*** (3.20)	0.237*** (3.55)	0.214*** (4.86)	0.475*** (8.87)	0.354*** (4.35)	0.294*** (19.65)	0.382*** (6.95)	0.201*** (2.40)
Observations	12413	12413	9920	9920	9920	12211	12211	12211	12211	8420	8420	8420
Adjusted R^2	0.174	0.272	0.362	0.183	0.294	0.157	0.173	0.148	0.125	0.119	0.135	0.090
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Breusch-Pagan test of independence chi² (p-value)	0.9743		0.2723			0.0432				0.0220		

As our basic analysis provides some important insights about the MBs and CBs. We further proceed with equation 1 and compare MBs and CBs by controlling for different bank characteristics: size as a log of total assets, fixed assets as a percentage of total assets, and non-loan earning assets as a percentage of total assets. Table 4.5 (Panel A) shows the result of pooled OLS regressions and confirm most of the findings of Table 4.4 (Panel A). In terms of the 1st dimension, MBs have lower efficiency as their cost ratio to income ratio is significantly higher than CBs. This leads to the acceptance of our 1st hypothesis. The result is in line with the findings of Gonzalez (2007), Hermes & Lensink (2011), and Yigma (2018).

The second dimension of comparison is the business model. Our results show that MBs have 0.3 percentage point higher intermediation and 0.1 percentage point higher fee income as compared to CBs. This leads to the rejection of our hypothesis 2a. The high intermediation of MBs indicates that deposits provide a stable source of funding for these institutions. The finding is similar to those reported by Delgado et al. (2014) and Abakaeva & Glisovi-Mezieres (2009). The generation of income other than lending is a sign that MBs expand their revenue base through diversifying into non-lending activities. It is in line with the study of Zamore (2018). The last indicator of business model is non-deposit funding. Our results show that MBs rely more on wholesale funding as non-deposit funding ratio is 0.1 percentage point higher than that of CBs. Thus, we accept hypothesis 2(b). It is in line with the study of Reille et al. (2009).

On average, MBs earn 0.08 percentage point higher return on their assets as compared to CBs. In addition, MBs have 0.11 percentage point higher liquidity at their disposal and are more stable (higher Z score) than to commercial banks. These results are in line with the studies of Wagner & Winkler (2013) and Cornett et al. (2011), who state that small loan sizes, shorter repayment periods, and availability of market funds provide a continuous source of liquidity injection to microfinance banks and therefore provide them a buffer against contingencies. This leads to the acceptance of our 3rd hypothesis.

As to asset quality, all three indicators show the poor performance of MBs as compared to CBs. Microfinance banks have 0.04 percentage point higher loans overdue by 90 days. Similarly, MBs have 0.04 percentage point higher loan loss reserves and 0.01 percentage point higher loan loss provisions as compared to CBs and this leads to the acceptance of our 4th hypothesis. This poor asset quality of microfinance banks can be attributed to many reasons: adverse selection, moral hazard, ineffective risk management, and less diversified loan portfolio. The higher amount of overdue loans, loan loss reserves and loan loss provisions of MBs are in line with the study of Christen et al. (2012) and Tchuigoua (2015).

The other bank characteristics show expected signs in Table 4.5. The size of the bank matters, as larger banks reduce the cost by gaining economies of scale. There is a significant negative relationship between cost to assets ratio and size in column 2. Larger banks also report higher loan deposit ratio, return on assets, loan loss provisions, are better capitalized and have less reliance on non-deposits funding (wholesale funding). We also find that larger banks are less liquid and less stable than small size banks. The result is in agreement with the study of Beck et al. (2013). Furthermore, we find that banks with more percentage of fixed assets are not better capitalized as they invest more of the capital in fixed assets. This result is in accordance with the findings of Bitar et al. (2017) and Wijesiria et al. (2017). Finally, banks with a high share of non-loan earning assets have lower loan deposit ratios, returns on assets, and loan loss provisioning but these banks are better capitalized, liquid and have more availability of wholesale funding.

In Panel B of Table 4.5, the results of the system of equations using Seemingly Unrelated Regression (SUR) are shown. In the first equation of efficiency, we run two models for the cost to income ratio and cost to asset ratio as dependent variables. The coefficient for the microfinance bank dummy is significant for both the dependant variables in comparison to OLS regressions. The negligible p-value of the Breusch-Pagan statistic at the bottom of the table indicates that both dependent variables are unrelated. By simultaneously running the loan-deposit ratio, fee-income ratio, and non-deposit funding, we can solve the second equation for the business model. The results are quite similar to OLS. However, the coefficients of microfinance bank variable for fee-income ratio and non-deposit ratio are increased by 3 and 11 percentage points, respectively in SUR estimations. The insignificant p-value of the Breusch-Pagan chi^2 statistic rejects any dependence among the three dependent variables in SUR estimation.

We run four models: return on assets, equity to asset ratio, maturity match, and Z-score in the third simultaneous equation for stability dimension. Both the return on assets and equity to assets ratio are insignificant in SUR estimation compared to OLS regressions. Whereas the coefficients of microfinance bank dummy are increased by 1 and 5 percentage points for maturity match and Z-score in SUR estimation. The significant p-value of the Breusch-Pagan statistic indicates that four dependent variables of stability dimension are correlated.

Finally, we run equation four for asset quality dimension, using three models for portfolio at risk, loan loss reserves, and loan loss provision. In the SUR estimation, the coefficient of the microfinance bank dummy is significant and modestly increases for all three dependent variables. There is also evidence of correlation among three dependent variables of asset quality as can be seen by the significant value of the test of independence. Overall, in four simultaneous equations, we observe that the value of R^2 increases slightly for the majority of the models as well as the sign and significance of most of the control variables are improved in SUR estimation. As a result, we can conclude that SUR estimations outperform OLS regressions by a small margin.

Table 4.5. Comparing microfinance and commercial banks after controlling for bank characteristics

Panel A: Ordinary least squares regressions

This table presents the results of differences between MBs and CBs along with bank level controls. The dependent variables are different indicators of efficiency, business model, stability and asset quality. The robust t-statistics, reported in parenthesis, are based on standard errors clustered at bank level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

	Efficiency		**Business model**			**Stability**				**Assets quality**		
	(1) Cost to assets ratio	(2) Cost to income ratio	(3) Loan deposit ratio	(4) Fee income ratio	(5) Non deposit funding	(6) Return on assets	(7) Equity to assets	(8) Maturity match	(9) Z-score	(10) Portfolio at risk	(11) Loan loss reserves	(12) Loan loss provision
Microfinance bank dummy	0.089	4.010***	0.351***	0.181***	0.129***	0.081***	0.012	0.110***	0.017*	0.045***	0.041***	0.010**
	(0.91)	(10.27)	(12.72)	(9.08)	(7.10)	(8.01)	(0.29)	(3.23)	(2.81)	(3.54)	(4.27)	(2.78)
Size	-0.029	-0.019*	0.009***	0.007	-0.006***	0.005***	0.008***	-0.017***	-0.004***	0.004	-0.045	0.005*
	(-0.61)	(-2.55)	(13.81)	(0.19)	(-12.56)	(9.07)	(12.48)	(-10.69)	(-8.71)	(0.63)	(-0.72)	(2.27)
Fixed assets ratio	0.063	0.031	-0.026	0.019	0.077	-0.016	-0.039**	-0.076	-0.017	0.023	-0.030	0.019
	(0.09)	(0.44)	(-0.21)	(1.63)	(0.76)	(-0.93)	(-3.11)	(-0.27)	(-1.03)	(1.68)	(-0.29)	(0.51)
Non-loan earning assets	-0.029	0.016	-0.504***	0.077	0.112***	-0.146***	0.041*	1.160***	-0.018	0.169***	0.083***	-0.026***
	(-1.34)	(0.04)	(-21.40)	(0.32)	(6.02)	(-7.36)	(2.26)	(13.39)	(-1.04)	(7.61)	(4.70)	(-4.34)
Constant	0.470***	1.156***	0.930***	0.246**	0.263**	0.231***	0.110	0.492***	0.556***	0.146***	0.414***	0.186***
	(7.63)	(4.36)	(9.97)	(2.97)	(3.18)	(3.61)	(1.55)	(4.28)	(4.63)	(5.70)	(6.50)	(4.55)
Observations	12187	12044	9943	11415	10425	12168	12460	12323	12423	8838	10949	11292
Adjusted R^2	0.170	0.267	0.448	0.178	0.328	0.166	0.185	0.237	0.133	0.127	0.132	0.090
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Seemingly unrelated regressions

This table presents the results of differences between MBs and CB. We used simultaneous equations modelling and estimate four models for efficiency, business model, stability and asset quality. The robust t-statistics, reported in parenthesis, are based on robust standard errors. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

Equation	Efficiency (1)		Business model (2)			Stability (3)				Assets quality (4)		
Model	(1)	(2)	(1)	(2)	(3)	(1)	(2)	(3)	(4)	(1)	(2)	(3)
	Cost to assets ratio	Cost to income ratio	Loan deposit ratio	Fee income ratio	Non deposit funding	Return on assets	Equity to assets	Maturity match	Z-score	Portfolio at risk	Loan loss reserves	Loan loss provision
Microfinance bank dummy	0.051*** (5.45)	4.224*** (13.82)	0.315*** (5.76)	0.215*** (7.88)	0.235*** (9.40)	0.014 (1.74)	0.092 (0.96)	0.120*** (6.00)	0.06*** (7.36)	0.047* (2.17)	0.060*** (5.34)	0.014** (2.23)
Size	-0.009*** (-10.19)	-0.049*** (-3.87)	-0.015*** (-7.10)	0.016 (1.23)	-0.027*** (-7.48)	0.010*** (8.91)	0.029*** (3.71)	-0.035*** (-3.02)	-0.056*** (-4.61)	-0.032 (-0.54)	-0.082 (-3.20)	0.024** (2.76)
Fixed assets ratio	0.011 (1.01)	0.029 (1.23)	0.003 (0.24)	0.034** (2.94)	0.023 (0.67)	-0.054 (-0.78)	-0.032** (-2.96)	0.039 (1.35)	-0.0901 (-0.86)	0.036** (2.77)	0.036 (0.31)	-0.028 (-0.07)
Non-loan earning asset	-0.012 (-0.80)	-0.024 (-0.13)	-0.180*** (-2.41)	0.050* (2.44)	0.164*** (9.46)	-0.137*** (-8.14)	0.041* (2.18)	1.243*** (4.04)	0.0172 (1.10)	0.166*** (8.00)	0.116*** (6.19)	-0.023*** (-3.74)
Constant	0.030*** (6.26)	1.701*** (6.15)	0.198*** (2.39)	0.269*** (4.45)	0.268*** (3.49)	0.060** (2.61)	0.185** (2.69)	0.040*** (5.71)	0.570*** (3.29)	0.360*** (5.14)	0.538*** (6.03)	0.192*** (5.84)
Observations	12042	12042	9,998	9,998	9,998	12,514	12,514	12,514	12,514	8798	8798	8798
Adjusted R^2	0.183	0.273	0.390	0.156	0.330	0.158	0.189	0.229	0.135	0.132	0.132	0.099
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Breusch-Pagan test of independence chi² (p-value)	0.0928		0.1083			0.0021				0.0001		

4.4.4. Propensity score matching

Table 4.6 presents the PSM analysis. We use two matching methods for comparison between MBs and Non-MBs (CBs) group: Gaussian Kernel and Caliper matching with a radius of (0.001). Panel A shows the summary of bank characteristics including size, fixed assets, and non-loan earning assets between MBs and CBs. Panel B shows the significant differences in means of MBs and CBs before matching. Nevertheless, after matching, we get balancing scores between MBs and CBs in all bank characteristics: size, fixed assets ratio and non-loan earning assets. The insignificant differences in mean values of MBs and CBs indicate the good quality of matching.

In Panel B of Table 4.6, the differences between MBs and CBs group in terms of efficiency, business model, stability and asset quality are presented. We find support for most of our previous results that MBs are significantly different from the CBs as they have higher cost structures, higher loans as to deposits, higher fee income and non-deposits funding and poor asset quality under both matching methods. These differences between MBs and CBs in various performance dimensions are mostly significant at the 1% level except cost to assets ratio which is significant at 10%. We find insignificant result only for equity to assets ratio.

Table 4.6. Comparing Microfinance and commercial banks-Propensity score matching

This table presents results of propensity score matching where microfinance banks are matched with non-microfinance banks. The matching starts with a probit regression where dependent variable is microfinance bank dummy along with bank characteristics that can potentially affect involvement of banks in microfinance. We use Gaussian Kernel and Caliper matching with a radius of (0.001). All variables are defined in Table 4.1. *t* statistics in parentheses $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Panel A: Summary of bank characteristics for matching of MBs and CBs

	Kernel			Caliper		
Bank Characteristics	MBs	CBs	Test of diff (t-stat)	MBs	CBs	Test of diff (t-stat)
Size (log total assets)	10.97	12.68	-1.76	10.88	12.22	-1.69
Fixed assets ratio	.704	.698	0.48	.699	.687	0.73
Non-loan earning assets	.433	.475	-0.71	.429	.469	-0.91

Panel B: Propensity Score Matching

Differences in efficiency, business orientation, stability and asset quality indicators between matched (MBs) and control (CBs)

	Kernel	Caliper
Efficiency		
Cost to assets ratio	0.017*	0.015*
	(1.95)	(1.90)
Cost to income ratio	2.245***	2.363***
	(8.10)	(9.30)
Business Model		
Loan deposit ratio	0.591***	0.583***
	(7.99)	(8.50)
Fee income ratio	0.176***	0.180***
	(5.99)	(5.28)
Non-deposit funding	0.096***	0.069**
	(4.92)	(2.06)
Stability		
Return on assets	0.095***	0.083**
	(3.20)	(2.44)
Equity to assets ratio	-0.051	-0.073
	(-1.55)	(-1.33)
Maturity match	0.325***	0.372***
	(2.90)	(3.30)
Z-score	0.044***	0.048*
	(2.83)	(1.93)
Asset quality		
Portfolio at risk	0.142***	0.012***
	(4.40)	(3.37)
Loan loss reserves	0.132***	0.102***
	(4.76)	(3.67)
Loan loss provisions	0.023***	0.060*
	(3.81)	(1.92)

4.4.5. Sub-sample analysis

We further analyze our findings by doing different sub-sample analysis including microfinance banking across different sizes, regions, market share and during the global financial crisis. In the following pages we discuss each analysis separately.

Microfinance and commercial banking across different sizes

We take different sizes of banks for the first sub-sample analysis, as we expect different sizes of banks have different implication on their performance. Large banks enjoy more economies of scale, are better able to diversify, involved in more risky activities, and use more short-term debt to finance their activities that lead to liquidity shortages. Larger banks rely less on relationship lending, face more pressure from their borrowers who have many other alternative options at their disposal. These banks are able to use the latest technologies for their operations (Shleifer & Vishny, 2010). On the other hand, Wheelock, (2012) argues that the level of moral hazard, risk-taking, operational inefficiencies are higher for large banks and thus financial markets with smaller and more competitive banks are more stable.

$$D_{i,j,t} = \alpha + \sum_{i} \delta_i M_i * S_i + \gamma_k \sum X_{i,j,t} + \vartheta_j + \lambda_t + \epsilon_{i,t} \qquad (2)$$

We use equation (2) to gauge the performance of MBs across different sizes. The coefficient δ_i represent the differential behaviour of microfinance banks in terms of two sizes: large and small on the basis of median value of their asset size, the value below the median represents small size and above represents large size microfinance banks. We then interact microfinance bank dummy (M_i) with small and large size dummy (S_i). We also control for bank characteristics, country and year fixed effects.

Table 4.7 reports the results of analysis between microfinance and commercial banks of different sizes. We observe that many of the differences between MBs and CBs are driven by small size microfinance banks as most of the differences between small size MBs and CBs are significant at 1% level. As for efficiency indicators, smaller microfinance banks have a higher cost than small conventional banks as both the coefficients of cost to assets and cost to income ratios are positive and significant in column (1) and (2). In terms of business model, there is not much difference in terms of small and large size MBs in comparison of small and large CBs as all three indicators: loan deposit ratio, fee income, and non-deposit funding are positive and significant for both groups in columns (3) to (5).

In terms of stability, column (6) shows no difference between small and large MBs as both have significant return on their assets as compared to their counterparts. The significant positive coefficient (small size * microfinance bank dummy) shows better capitalization of small MBs as compared to small CBs in column (7). Whereas the significant positive coefficients (large size * microfinance bank dummy) show more liquidity and stability of large MBs as to large CBs in columns (8) and (9). Finally, we see the effect of different sizes of microfinance banks on asset quality. Both large and small size MBs have significant non-performing loans (portfolio at risk > 90 days) than conventional banks but the magnitude is higher for smaller banks as shown in column (10). We also find that large MBs have greater loan loss reserves (column 11), whereas small size MBs have better provisioning for loan losses than CBs (column 12). Finally, we test the coefficients of large and small MBs and find out that there are significant differences between both categories as 7 out of 12 dimensions (cost to assets ratio, fee income ratio, return on assets, equity to assets, portfolio at risk, loan loss reserves and loan loss provision) are significant (see test p-value). In short, there are major variations between different sizes of microfinance and conventional banks, and the magnitude of differences between MBs and CBs are higher for smaller microfinance banks.

Table 4.7. Comparing Microfinance and commercial banks across different sizes

This table presents the results of differences between MBs and CBs across different sizes using pooled OLS regressions. Size is a dummy variable indicating large and small size MBs on the basis of median value of their total assets. The dependent variables are different indicators of efficiency, business model, stability and asset quality. The median value of size is 10.9523, below this value MBs are classified as small size and vice versa. The robust t-statistics, reported in parenthesis, are based on standard errors clustered at bank level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

	Efficiency		Business model			Stability				Assets quality		
	(1) Cost to assets ratio	(2) Cost to income ratio	(3) Loan deposit ratio	(4) Fee income ratio	(5) Non deposit funding	(6) Return on assets	(7) Equity to assets	(8) Maturity match	(9) Z-score	(10) Portfolio at risk	(11) Loan loss reserves	(12) Loan loss provision
Large size * Microfinance bank dummy	0.001	4.177*	0.350*	0.219***	0.122***	0.073***	-0.033**	0.131***	0.022*	0.026*	0.051***	0.007
	(0.09)	(4.13)	(3.73)	(13.56)	(11.77)	(6.17)	(-2.89)	(3.64)	(2.06)	(2.06)	(4.73)	(1.89)
Small size * Microfinance bank dummy	0.034*	3.583***	0.378***	0.091***	0.115***	0.129***	0.089***	-0.084	0.007	0.083***	0.021	0.017***
	(2.40)	(9.57)	(12.25)	(4.16)	(7.30)	(7.68)	(5.42)	(-1.41)	(0.53)	(4.62)	(1.42)	(3.43)
Size	-0.007	-0.028***	0.008***	-0.019**	-0.071***	0.006***	0.010***	-0.016***	-0.052***	-0.048	-0.003	0.006**
	(-1.46)	(-4.34)	(12.08)	(-2.79)	(-11.82)	(9.62)	(14.07)	(-9.33)	(-8.60)	(-0.60)	(-0.05)	(2.82)
Fixed assets ratio	0.009	0.022*	-0.022	0.017	0.077	-0.097	-0.037**	-0.006	-0.010	0.0217	-0.022	0.021
	(0.01)	(2.32)	(-0.19)	(1.49)	(0.75)	(-0.86)	(-2.94)	(-0.25)	(-1.05)	(1.59)	(-0.21)	(0.56)
Non-loan earning assets	-0.028	0.027	-0.525***	0.009	0.112***	-0.146***	0.039*	1.159***	-0.016	0.172***	0.082***	-0.026***
	(-1.32)	(0.06)	(-21.45)	(0.37)	(6.02)	(-7.37)	(2.16)	(14.33)	(-1.02)	(7.68)	(4.66)	(-4.38)
Constant	0.479***	1.263***	0.928***	0.270***	0.264**	0.221***	0.086	0.483***	0.559***	0.144***	0.413***	0.184***
	(7.92)	(5.11)	(9.64)	(3.50)	(3.22)	(3.51)	(1.23)	(4.14)	(4.64)	(5.62)	(6.87)	(4.53)
Test (p value) Large = Small	0.024*	0.205	0.085	0.000*	0.665	0.001*	0.000*	0.447	0.319	0.001*	0.049*	0.038*
Observations	12187	12044	9943	11415	10425	12168	12460	12323	12423	8838	10949	11292
Adjusted R^2	0.170	0.267	0.448	0.182	0.328	0.167	0.189	0.237	0.133	0.128	0.132	0.090
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Microfinance and commercial banking across different regions

Our second sub-sample analysis is based on the regional comparison. Countries with physical endurance and proximity together are classified into a single region. Due to this proximity, the countries within the same region carry a sense of unity. Since regions are geographically remote, distinguished by unique cultural and social characteristics, they are economically different. They also have an effect on the cost, profitability, and stability of the companies operating in specific regions (Qian et al., 2013). As our sample of MBs covers various regions of the world, where microfinancing takes place, it is better to capture the cross-regional variations.

$$D_{i,j,t} = \alpha + \sum_{j} \delta_j M_i * R_J + \gamma_k \Sigma X_{i,j,t} + \vartheta_j + \lambda_t + \epsilon_{i,t} \qquad (3)$$

Equation 3 captures the cross regional differences between MBs and CBs. In this equation, R_J represents regional dummies and the coefficients δ_j indicate the differential behaviour of MBs in a particular region (j). We interact microfinance bank dummy with all 5 regional dummies: Africa, East Asia and Pacific, Eastern Europe and Central Asia, Latin America and Caribbean and South Asia. We also include control variables along with country and year fixed effects. In Equations (2) and (3), we drop the standalone microfinance bank dummy $\mathrm{M_i}$ and focuses only on the interaction terms to explore the behaviour of MBs either in terms of their size or in a particular region.

Table 4.8 presents the results of cross-regional differences between MBs and CBs. As to efficiency, we find that the coefficient δ_j (Microfinance bank dummy * AF) shows that MBs in Africa have higher cost ratios than CBs (column 1) in comparison with MBs and CBs in other regions. Our results suggest that African MBs have better intermediation ability than CBs as these banks possess higher loan deposit ratios as to other regions (column 3). The coefficients δ_j (Microfinance bank dummy * AF) and (Microfinance bank dummy * SA) show higher revenue diversification of African and South Asian MBs, as can be seen from higher fee income ratios in column (4) as compared to CBs in these regions The positive and significant coefficient for MB dummy in non-depositing funding regression in Tables 4.4 and 4.5 is mainly driven by African and Latin American microfinance banks as can be seen in column (5).

The stability indicators show that African MBs earn a higher return on their assets than their counterparts (column 6). Microfinance banks in Eastern Europe, Latin America, and South Asia are better capitalized than CBs in these regions (column 7). Our results in column (8) indicates that MBs located in Africa, East Asia, and Latin America have more liquidity than CBs in these regions. Finally, African and East Asian MBs have higher non-performing loans, loan loss reserves, and loan loss provisions in comparison to CBs in these regions as shown in columns (10) to (12). Overall, we find that the performance of MBs and CBs vary significantly across regions. The higher cost ratios, higher fee income, higher liquidity, and higher overdue loans are mainly due to the regional differences and are not consistent across the whole sample.

Table 4.8. Comparing Microfinance and commercial banks across different regions

This table presents the results of differences between MBs and CBs across different regions using pooled OLS regressions. We have five regional dummies representing AF, EAP, EECA, LAC and SA. The dependent variables are different indicators of efficiency, business model, stability and asset quality. The robust t-statistics, reported in parenthesis, are based on standard errors clustered at bank level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

	Efficiency		Business model			Stability				Assets quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Cost to assets ratio	Cost to income ratio	Loan deposit ratio	Fee income ratio	Non deposit funding	Return on assets	Equity to assets	Maturity match	Z-score	Portfolio at risk	Loan loss reserves	Loan loss provision
Microfinance bank dummy * AF	0.19***	3.49***	0.35***	0.18***	0.03*	0.10***	0.02	0.431***	0.02	0.06**	0.06**	0.01*
	(11.32)	(6.23)	(16.17)	(6.11)	(2.13)	(4.90)	(1.07)	(10.01)	(1.01)	(2.66)	(3.13)	(2.32)
Microfinance bank dummy * EAP	0.30	-3.59	-0.34	-0.87	-0.51	-1.46	3.56***	2.13*	-0.35	2.31*	2.32**	0.39
	(0.33)	(-1.32)	(-0.41)	(-0.94)	(-0.62)	(-1.33)	(4.30)	(2.14)	(-0.41)	(2.36)	(3.12)	(1.17)
Microfinance bank dummy * EECA	1.47	12.77	-1.78	-0.40	-0.76	-0.33	-0.41	-1.06	-1.49	0.63	1.51	-0.51
	(1.30)	(1.94)	(-1.76)	(-0.63)	(-0.81)	(-0.28)	(-0.42)	(-1.05)	(-1.39)	(0.58)	(1.75)	(-1.48)
Microfinance bank dummy * LAC	1.15	3.59	-0.52	0.08	2.80*	-0.86	4.23***	3.25***	-0.49	-0.82	0.13	-0.25
	(1.30)	(1.23)	(-0.60)	(0.06)	(2.43)	(-0.88)	(6.56)	(4.05)	(-0.53)	(-0.72)	(0.16)	(-0.80)
Microfinance bank dummy * SA	1.19	4.19	-0.16	1.12*	-0.50	-0.70	1.81***	-1.87**	-0.26	0.17	-0.00	0.60*
	(1.66)	(1.84)	(-0.24)	(2.41)	(-0.95)	(-0.79)	(5.70)	(-2.68)	(-0.42)	(0.20)	(-0.01)	(2.53)
Size	-0.00	-0.03***	-0.01***	-0.00	-0.01***	0.01***	0.01***	-0.02***	-0.00***	0.00	0.00	0.00**
	(-0.40)	(-3.90)	(-12.84)	(-1.04)	(-15.85)	(9.78)	(11.37)	(-13.17)	(-8.49)	(0.08)	(0.06)	(2.66)
Fixed assets ratio	0.00	0.03	-0.00	0.02	0.01	-0.01	-0.04**	-0.00	-0.01	0.02	-0.00	0.00
	(0.40)	(0.46)	(-0.23)	(1.78)	(0.73)	(-0.84)	(-2.89)	(-0.06)	(-0.79)	(1.71)	(-0.17)	(0.50)
Non-loan earning assets	-0.04*	-0.01	-0.52***	0.00	0.11***	-0.15***	0.03	1.13***	-0.03	0.17***	0.08***	-0.03***
	(-2.53)	(-0.04)	(-21.11)	(0.07)	(5.89)	(-7.43)	(1.81)	(14.19)	(-1.58)	(7.37)	(4.35)	(-4.27)
Constant	-0.50	1.55	1.45*	1.59***	0.93	1.01	1.94***	2.68***	0.89	-0.06	0.42	0.79***
	(-0.70)	(0.71)	(2.13)	(3.49)	(1.80)	(1.14)	(6.30)	(3.91)	(1.47)	(-0.07)	(0.64)	(3.41)
Observations	12187	12044	9943	11415	10425	12168	12460	12323	12423	8838	10949	11292
Adjusted R^2	0.143	0.215	0.401	0.117	0.286	0.109	0.131	0.207	0.074	0.047	0.067	0.020

Microfinance and commercial banking across different market shares

After analyzing cross-regional differences, we further explore whether some of these regional differences are driven by different market shares of microfinance banks. Some prior studies also show that different market shares have different impacts on the intermediation, cost, income, and stability of banks. Beck et al. (2006) state that countries in which large banks hold a significant share of market are more stable. Furthermore, Berger & Hannan (1998) support the positive relationship between larger market share and profitability of banks. They explain that due to larger share banks gain more market power and are able to charge higher prices for their services and thus increase their profitability. Although these authors state that due to less competitive pressure these banks are motivated to cut their costs. Therefore, it is important to see the implication of different market shares on various performance dimensions of MBs and CBs.

$$D_{i,j,t} = \alpha + \sum_{j} \delta_j \, M_i * MS_j + \gamma_k \Sigma X_{i,j,t} + \vartheta_j + \lambda_t + \epsilon_{i,t} \qquad (4)$$

To see how differently MBs behave from CBs if they hold different market shares. The coefficients δ_j in Eq (4) gauge the relative market share[26] of microfinance banks in a specific country as we interact microfinance bank dummy (M_i) with market share variable (MS_j). The different relative market shares of MBs and CBs in these countries may be one of the reasons why we find significant cross-regional differences between MBs and CBs in Table 4.8. Higher market share of microfinance in a particular country also displays the dominance of microfinance practices over conventional banking. Table 4.9 (Panel A) reports the interaction term of relative market share of microfinance banks and microfinance bank dummy. To gauge the continuous variation of differences between MBs and CBs with different shares of microfinance banks, we only focus on the coefficient of the interaction term between microfinance share and microfinance bank dummy with country and year fixed effects and leave out the control variables in panel A. The results of Panel A confirm some of our previous findings. The significant coefficient δ_j (Microfinance share * Microfinance bank dummy) shows that MBs have higher fee income, non-deposit funding, liquidity, and stability in countries and years having higher market share of MBs than CBs in columns (4), (5), (8) and (9) respectively. Although other dimensions of performance do not vary significantly with the market share of MBs in comparison to CBs.

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[26] The relative share of microfinance banks is calculated by taking the sum of total microfinance banks 'assets in a specific country as a percentage of total assets of MBs and CBs in that country.

In Panel B of Table 4.9, we further divide relative market share of microfinance banks in two categories: high share and low share based on above and below the median value of the relative market share of microfinance banks. The Panel enables us to see a clear contrast between MBs and CBs in countries and years with high and low market shares of MBs.

The results of Panel B suggest that the high overhead cost of MBs than that of CBs is associated with markets having lower share of MBs, as the microfinance bank dummy enters significantly at 1% for both the cost ratios (columns 1 & 2). We also observe that MBs are better capitalized and stable than CBs in markets with lower share of microfinance banks (the t-statistics are significant at 1% for markets having lower share of MBs in columns 7 and 9). Additionally, we observe higher liquidity of MBs is driven by markets with large share of microfinance banks as shown in column (8). Finally, our results suggest poor asset quality of MBs is found in markets with a high market share of microfinance banks as all three indicators: portfolio at risk, loan loss reserves, and loan loss provision are positive and significant in columns (10) to (12). The difference in coefficients test reveals significant differences in high and low market shares of microfinance banks (the test p-values are significant for 7 out of 12 dimensions). In short, our previous results are supported, although it is clear that some of the cross-regional variations between MBs and CBs in Table 4.8 are motivated by differences in MBs' market share.

Table 4.9. Comparing Microfinance banks and commercial banks –Controlling for market shares

This table presents the results of differences between MBs and CBs across different markets using pooled OLS regressions. Microfinance share is a dummy variable indicating percentage of microfinance assets as total baking assets. In panel B, High and low share is based on the median value (0.253) of microfinance share. The dependent variables are different indicators of efficiency, business model, stability and asset quality. The robust t-statistics, reported in parenthesis, are based on standard errors clustered at bank level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

	Efficiency		Business model			Stability				Asset quality		
	(1) Cost to assets ratio	(2) Cost to income ratio	(3) Loan deposit ratio	(4) Fee income ratio	(5) Non deposit funding	(6) Return on assets	(7) Equity to assets	(8) Maturity match	(9) Z-score	(10) Portfolio at risk	(11) Loan loss reserves	(12) Loan loss provision
Panel A												
Microfinance bank dummy	0.062	3.967***	0.307***	0.145***	0.226***	0.019	0.062***	0.312***	0.082***	0.012	0.003	0.007*
	(0.58)	(7.15)	(13.99)	(7.61)	(12.51)	(1.59)	(5.51)	(7.43)	(7.95)	(0.95)	(0.33)	(2.01)
Microfinance share *Microfinance bank dummy	0.049	1.684	0.077	0.504***	0.260***	0.025	0.016	0.567**	0.230**	0.055	0.049	0.069
	(0.83)	(1.09)	(1.17)	(4.18)	(3.91)	(0.39)	(0.21)	(2.89)	(3.25)	(0.66)	(0.77)	(0.03)
Constant	0.498***	0.899***	0.371***	0.323***	0.204***	0.194**	0.245***	0.768***	0.404***	0.261***	0.447***	0.177***
	(7.74)	(9.66)	(3.39)	(3.43)	(3.64)	(2.59)	(4.14)	(8.25)	(3.44)	(25.34)	(6.95)	(4.33)
Bank level controls	No	No	No	No	No	No	No	No	No	No	No	No
Observations	9518	9358	7591	8971	8012	9502	9870	9396	9806	6836	8359	8672
R-squared	0.173	0.250	0.341	0.170	0.341	0.145	0.133	0.131	0.118	0.118	0.119	0.077
Panel B												
High share * Microfinance bank dummy	0.045	4.404**	0.368***	0.234*	0.115*	0.072***	0.022	0.130***	0.015	0.050***	0.065***	0.008*
	(3.96)	(5.32)	(13.80)	(4.16)	(3.38)	(5.92)	(1.76)	(3.39)	(1.39)	(3.73)	(5.78)	(2.19)
Low share * Microfinance bank dummy	0.049***	3.376***	0.337***	0.105***	0.129***	0.116***	0.041**	0.098	0.072***	0.027	0.004	0.012*
	(3.50)	(8.63)	(2.31)	(4.81)	(8.86)	(7.05)	(2.76)	(1.95)	(5.18)	(1.61)	(0.31)	(2.51)
Test (p-value) High share= Low share	0.000***	0.027*	0.063	0.000***	0.366	0.014***	0.000***	0.563	0.000***	0.217	0.000***	0.526
Bank level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9230	9123	7320	8860	7995	9324	9530	9120	9642	6750	8210	8530
Adjusted R^2	0.173	0.268	0.448	0.182	0.328	0.166	0.186	0.237	0.135	0.127	0.133	0.090

Microfinance and commercial banking during the financial crisis

Finally, we try to gauge the impact of the global financial crisis on the performance of MBs and CBs, as prior studies provide evidence that financial crises negatively hit their performance. As a result, there is a decline in productivity, funding and deposits base of these institutions. Kollmann et al. (2013) state that the global financial crisis severely hit the conventional banks, whereas Wagner & Winkle (2013) and Wanger (2012) provide the same crisis effect for microfinance institutions.

According to Wijesiri (2016), microfinance banks and NBFI are more vulnerable during the financial crises period because these institutions are more exposed to commercial funding sources that severely damage these institutes. In addition, there is a huge withdrawal of deposits during the crisis period. Therefore, it is important to analyze whether MBs are better capable of bearing the exogenous financial shocks as compared to CBs. We interact microfinance bank dummy with crises dummy[27].

$$D_{i,j,t} = \alpha + \delta_1 M_i + \delta_2 M_i * GFC_t + \delta_3 M_i * T_t + \gamma_k \sum X_{i,j,t} + \vartheta_j + \lambda_t + \epsilon_{i,t} \qquad (5)$$

The coefficients δ_2 enable us to analyze the differential performance of MBs during the global financial crisis (*GFC).* We also introduce a time trend (T) and interact it with microfinance bank dummy, the coefficients δ_3 capture trend-driven divergence between both groups of banks. By controlling for a time trend (T), we try to segregate between the effect of financial crisis and any trend-driven deviation between both groups of banks.

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[27] Following Beck et al. (2013) and Bitar et al. (2017), we include Global financial crisis (GFC) dummy in our analysis, it takes the value of 1 for crisis period 2007-2009 and 0 otherwise.

The results of regression equation 5 are presented in Table 4.10. The results provide supports for our previous results when we use microfinance bank dummy only. The coefficient δ_2 shows the results of interaction between microfinance bank dummy and crisis dummy and reveals two notable differences between MBs and CBs during crisis period. The first is the higher costs of MBs than CBs even during the crisis period (column 2) and second is that MBs are less liquid than CBs during the crisis period (column 8). However, we do not find significant differences between MBs and CBs in terms of loan deposit ratio, fee income, non-deposit funding, return on assets, capitalization, stability (Z-scores), and loan portfolio quality during the crises period. This result is in line with the findings of Wagner (2012) who state that there are structural differences between microfinance and conventional banks. However, both types of banks exhibit similarities during crises.

Table 4.10. Comparing microfinance and commercial banks during crisis period

This table presents the results of differences between MBs and CBs along with bank level controls using pooled OLS regressions. GFC is a dummy variable indicating global financial crisis and interacted with MBs dummy to capture the crisis effect. The dependent variables are different indicators of efficiency, business model, stability and asset quality. The robust t-statistics, reported in parenthesis, are based on standard errors clustered at bank level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

	Efficiency		**Business model**			**Stability**				**Asset quality**		
	(1) Cost to assets ratio	(2) Cost to income ratio	(3) Loan deposit ratio	(4) Fee income ratio	(5) Non deposit funding	(6) Return on assets	(7) Equity to assets	(8) Maturity match	(9) Z-score	(10) Portfolio at risk	(11) Loan loss reserves	(12) Loan loss provision
Microfinance bank dummy	0.14***	4.02***	0.33***	0.23***	0.13***	0.17***	0.11**	0.14	-0.06*	0.09**	0.08**	0.02*
	(4.18)	(4.79)	(10.12)	(4.66)	(3.55)	(5.65)	(3.18)	(0.83)	(-2.14)	(3.06)	(3.04)	(2.06)
Microfinance bank dummy * GFC	0.02	0.87*	-0.01	0.04	-0.00	0.01	0.01	-0.11*	0.01	0.01	0.01	-0.00
	(1.69)	(1.98)	(-0.53)	(1.60)	(-0.05)	(0.55)	(0.41)	(-2.38)	(0.74)	(0.61)	(0.38)	(-0.36)
Microfinance bank dummy * trend	0.01**	0.02	0.00	-0.00	-0.00	0.01**	0.01**	-0.03*	0.01	0.00	0.00	-0.00
	(2.82)	(0.20)	(0.43)	(-0.96)	(-1.08)	(3.41)	(2.86)	(-2.11)	(1.95)	(1.24)	(0.77)	(-0.83)
Size	-0.00***	-0.02***	0.01***	0.00	-0.00**	0.01***	0.01***	-0.01***	0.01***	-0.00	0.00***	0.00***
	(-5.47)	(-4.05)	(5.43)	(0.41)	(-3.26)	(6.38)	(12.05)	(-6.23)	(7.12)	(-0.58)	(3.97)	(4.27)
Fixed assets ratio	-0.00	0.02	0.00	0.03	0.02	-0.01	-0.04*	0.02	0.03**	0.03*	0.00	0.00
	(-0.02)	(0.27)	(0.20)	(1.92)	(1.09)	(-0.55)	(-2.03)	(0.47)	(2.65)	(2.25)	(0.11)	(0.54)
Non-loan earning assets	-0.02	-0.04	-0.60***	0.01	0.13***	-0.17***	0.06*	1.19***	-0.00	0.19***	0.12***	-0.02**
	(-0.89)	(-0.13)	(-18.70)	(0.32)	(3.76)	(-5.98)	(2.49)	(8.61)	(-0.19)	(5.82)	(3.84)	(-2.89)
Constant	0.49***	1.18***	1.00***	0.31***	0.37***	0.18***	0.17***	0.47***	0.48***	0.35***	0.41***	0.22***
	(25.79)	(7.84)	(35.20)	(13.72)	(14.86)	(9.33)	(7.83)	(8.10)	(24.42)	(19.89)	(24.91)	(47.05)
Observations	12187	12044	9943	11415	10425	12168	12460	12323	12423	8838	10949	11292
Adjusted R^2	0.116	0.187	0.188	0.105	0.121	0.121	0.148	0.120	0.171	0.123	0.101	0.140
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4.5. Alternative estimation techniques

To examine the robustness of our main findings, we further perform two alternative estimations: first on the truncated sample (we truncate our sample at the 1st and 99th percentiles rather than winsorizing at these thresholds) and second on a reduced sample of countries with at least three microfinance banks. Table 4.11 presents our analysis of the truncated sample with fewer observations. Most of our previous results are reconfirmed that MBs are less efficient as they have higher costs than CBs. Similarly, MBs have higher loan deposits, fee income, and non-deposit funding than CBs. Finally, we find evidence that MBs are more profitable and liquid and have a poor asset quality as compared to CBs.

Table 4.12 presents robustness analysis based on the sample of countries in which at least three MBs exist. This reduces the number of countries from 60 to 29 with a total of 347 MBs along with 1968 observations, and 719 CBs along with 5727 observations. Most of our results remain similar to that we report in Table 4.5. As expected, MBs have higher cost structures, fee income, intermediation ability and non-deposits funding in comparison to CBs. However, MBs possess poor asset quality as shown by overdue portfolios, higher loan loss reserves, and provisions. We find two notable differences in the reduced sample of 29 countries. First, we observe a significant equity to assets ratio for MBs. Secondly, we find an insignificant liquidity ratio (maturity match) of MBs. Both of these results are different from our full sample analysis. Overall, with a reduced sample of countries with a minimum three micro banks, most of our results on differences between MBs and CBs are broadly confirmed. Most of our results are reconfirmed in various sub-sample analysis. In general, our results are fairly vigorous across various robustness checks.

Table 4.11. Comparing microfinance and commercial banks- truncated sample

This table presents the results of differences between MBs and CBs along with bank level controls using pooled OLS regressions. The sample is truncated at 1st and 99th percentiles to see the robustness of results. The dependent variables are different indicators of efficiency, business model, stability and asset quality. The robust t-statistics, reported in parenthesis, are based on standard errors clustered at bank level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

	Efficiency		Business model			Stability				Asset quality		
	(1) Cost to assets Ratio	(2) Cost to income ratio	(3) Loan deposit ratio	(4) Fee income ratio	(5) Non deposit funding	(6) Return on assets	(7) Equity to asset	(8) Maturity match	(9) Z-score	(10) Portfolio at risk	(11) Loan loss reserves	(12) Loan loss provision
Microfinance bank dummy	0.071	6.058**	4.596*	3.652**	0.164***	0.078***	0.019	0.211**	0.035	0.015	0.043**	0.016
	(0.41)	(3.10)	(2.04)	(2.77)	(6.97)	(3.56)	(1.17)	(2.67)	(1.86)	(0.08)	(2.97)	(1.85)
Size	-0.046	0.070	0.079	0.059	-0.042***	0.073***	0.011***	-0.011***	-0.005***	0.001	-0.001	-0.007
	(-0.49)	(1.46)	(1.47)	(1.89)	(-5.59)	(5.15)	(10.45)	(-3.78)	(-4.44)	(1.08)	(-1.85)	(-0.69)
Fixed asset ratio	-0.014	0.755	3.126	0.559	0.018	0.012	-0.030	-0.142***	-0.029	0.020	-0.017	-0.022
	(-1.07)	(1.17)	(1.81)	(1.15)	(1.56)	(0.06)	(-1.84)	(-3.45)	(-1.86)	(1.39)	(-1.24)	(-1.45)
Non-loan earnings assets	0.026	-0.044	-0.027	-0.004	-0.004*	-0.004	0.003	0.008	0.003*	-0.018	0.055*	-0.013
	(1.47)	(-0.15)	(-1.11)	(-0.19)	(-2.36)	(-1.30)	(1.52)	(0.96)	(2.07)	(-0.15)	(2.50)	(-0.95)
Constant	0.883***	-2.190	-6.343*	-1.800	0.381***	-0.056	-0.052	1.511***	0.181***	0.246***	0.431***	0.183***
	(33.06)	(-0.83)	(-1.99)	(-1.01)	(18.65)	(-1.54)	(-0.19)	(14.34)	(5.76)	(9.81)	(17.42)	(7.04)
Observations	11980	11845	9793	11240	10270	12000	12285	12158	12238	8680	10799	11137
Adjusted R^2	0.227	0.148	0.082	0.117	0.354	0.186	0.256	0.234	0.166	0.157	0.169	0.126
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4.12. Comparing Microfinance and commercial banks in countries with at least three MBs

This table presents the results of differences between MBs and CBs along with bank level controls in 29 countries in which at least 3 MBs exist using pooled OLS regressions. The dependent variables are different indicators of efficiency, business model, stability and asset quality. The robust t-statistics, reported in parenthesis, are based on standard errors clustered at bank level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 4.1 for variable definitions.

	Efficiency		**Business Model**			**Stability**				**Asset Quality**		
	(1) Cost to assets ratio	(2) Cost to income ratio	(3) Loan deposit ratio	(4) Fee income ratio	(5) Non deposit funding	(6) Return on assets	(7) Equity to asset	(8) Maturity match	(9) Z-score	(10) Portfolio at risk	(11) Loan loss reserves	(12) Loan loss provision
Microfinance bank dummy	0.011	3.682***	0.374***	0.189***	0.162***	0.096***	0.012*	0.059	0.044*	0.045*	0.058***	0.012*
	(0.46)	(8.36)	(6.56)	(5.83)	(6.37)	(5.14)	(1.98)	(1.84)	(2.19)	(2.54)	(3.54)	(2.44)
Size	-0.004	-0.061	0.025***	0.004	0.082*	0.012***	0.019***	-0.019**	-0.071*	0.029	-0.024	0.017*
	(-1.34)	(-1.70)	(5.79)	(1.16)	(2.33)	(4.24)	(4.59)	(-2.62)	(-2.23)	(1.07)	(-0.90)	(2.16)
Fixed asset ratio	0.004**	0.164*	0.017	0.019	0.024	-0.019	-0.047	-0.074	-0.056	0.035	0.024	-0.041
	(2.21)	(1.97)	(0.67)	(0.81)	(1.11)	(-1.04)	(-1.90)	(-1.51)	(-0.03)	(1.83)	(1.49)	(-0.69)
Non-loan earnings assets	-0.031	-0.261	-0.564***	-0.034	0.138***	-0.174***	0.031	0.023***	-0.041	0.182***	0.119***	-0.038***
	(-1.00)	(-0.49)	(-11.23)	(-0.69)	(3.67)	(-5.28)	(0.88)	(7.44)	(-1.36)	(4.87)	(3.63)	(-4.02)
Constant	0.244***	1.647*	1.530***	0.231*	0.405***	-0.035	-0.202*	0.383*	0.495***	0.087	0.348***	0.235***
	(3.35)	(2.10)	(14.05)	(1.98)	(4.95)	(-0.38)	(-2.29)	(2.32)	(4.83)	(1.46)	(3.96)	(8.72)
Observations	6784	6695	5374	6442	5764	6769	7017	6906	6978	5421	6403	6427
Adjusted R^2	0.134	0.226	0.475	0.159	0.332	0.135	0.177	0.253	0.101	0.110	0.136	0.0840
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4.6. Conclusion

This study empirically analyzes the differences in microfinance and commercial banks in terms of four performance dimensions: efficiency, business model, stability and asset quality. The sample consists of 60 countries where both types of banks co-exist from 2001 to 2014.

We find significant differences between MBs and CBs. Overall, we find MBs are inefficient as compared to CBs supporting the prior work of Lascelles & Mendelson (2011), Hermes & Lensink (2011) and Yigma (2018). We also find evidence of high-cost structures of MBs not only in our full sample but also in all sub-samples' analysis. We also find significant differences in the business orientation of two groups. Our results suggest that MBs have higher intermediation (loan to deposit ratios) and wholesale funding (non-deposit funding) compared to their counterparts. These findings are in line with Delgado et al. (2014) and Reille et al. (2009). Contrary to our expectation, we find MBs have higher fee-income ratios. The finding is in line with that of Zamore (2018) who states that microfinance banks started diversifying by generating more income from non-lending activities.

In terms of stability, our results suggest that MBs are more liquid and better able to meet their short-term obligations than CBs. We do find that MBs are more stable than CBs in the long-term as their Z-scores are higher than CBs, but this result is not consistent in our subsample analysis. Moreover, we find that MBs have poor asset quality as compared to CBs. They have more risky loans (non-performing loans), higher loan loss reserves and loan loss provisions at their disposal as to CBs. These results are consistent across different sizes, different regions and in line with prior studies of Christen et al. (2012) and Tchuigoua, (2015). We find full support for our 1st, 2(b), 3rd and 4th hypotheses, whereas we reject hypothesis 2(a) as MBs display higher intermediation and fee income as compared to CBs.

Our results suggest that microfinance banks prove themselves on a standalone basis that they are better than commercial banks in terms of higher intermediation, non-interest income (fee income), wholesale funding and liquidity. Still, they need to cut down their cost structures (administrative and operating cost) and improve their asset quality that may be due to adverse selection, moral hazard or less diversified loan portfolio.

We notice substantial differences in both types of banks by comparing MBs and CBs on the basis of the different balance sheet and income statement measures. However, a deeper understanding of the governance structures, consumer characteristics, products, and services provided by both types of banks is needed. In a few countries, by opening a microfinance window, some traditional banks have already begun microfinance operations. Future research may also cater to the performance of these banks alongside their product and service data in order to better understand the differences in the financial service capacity of both banks.

Our study has important implications for policymakers and regulators. Microfinance banks are proving to be more involved in the dual banking climate, with greater intermediation, liquidity, stronger wholesale financing and more diversified revenue choices as compared to commercial banks. We propose that policymakers and regulators need to explore new technical ways of reducing MB’s costs, such as mobile banking, virtual branch networks, in remote areas. This will not only reduce the costs but also increase the penetration of MBs in remote areas. Finally, in order to enhance their asset quality, policymakers and regulators must consider introducing systemic risk management techniques such as credit scoring, computerized databases of borrowers' credit histories and loan delinquency rates for these organizations.

Appendix 4.1.

This table presents country-wise distribution of microfinance and commercial banks.

No	Country	MBs	CBs	No	Country	MBs	CBs
1	Afghanistan	1	9	31	Malawi	2	5
2	Albania	2	9	32	Mexico	3	44
3	Angola	1	13	33	Moldova	1	16
4	Argentina	1	47	34	Mongolia	3	8
5	Armenia	3	12	35	Montenegro	1	9
6	Azerbaijan	7	19	36	Mozambique	3	9
7	Bangladesh	1	36	37	Namibia	1	4
8	Bhutan	1	3	38	Nepal	13	28
9	Bolivia	8	11	39	Nicaragua	2	7
10	Bosnia and Herzegovina	2	23	40	Nigeria	65	39
11	Brazil	3	86	41	Pakistan	9	23
12	Bulgaria	4	17	42	Papua New Guinea	4	3
13	Cambodia	1	21	43	Paraguay	2	16
14	Chile	2	19	44	Peru	1	18
15	China	8	102	45	Philippines	58	23
16	Colombia	7	9	46	Poland	1	50
17	Congo, Democratic Republic	2	12	47	Romania	1	24
18	Dominican Republic	4	23	48	Rwanda	6	7
19	Ecuador	6	32	49	Serbia	2	27
20	El Salvador	2	14	50	Sierra Leone	4	8
21	Georgia	2	15	51	South Africa	3	16
22	Ghana	37	21	52	Sri Lanka	1	24
23	Guinea	1	7	53	Suriname	2	4
24	Honduras	3	20	54	Tajikistan	5	2
25	India	2	53	55	Tanzania	9	22
26	Indonesia	56	65	56	Uganda	3	16
27	Kenya	4	21	57	Ukraine	1	71
28	Kyrgyzstan	6	9	58	Uzbekistan	3	24
29	Macedonia	1	16	59	Venezuela	2	36
30	Madagascar	1	6	60	Vietnam	2	33
	Total banks	179	750		Total banks	213	616

CHAPTER 5
CEO ATTRIBUTES AND FINANCIAL PERFORMANCE OF MICROFINANCE INSTITUTIONS

5.1. Introduction

Chief executive officers (CEOs) are the most visible and influential individuals in organizations[28]. They play an important role in the success and survival of companies. A large and growing literature has investigated individual-level, firm-level, and cross-country differences between female and male CEOs' careers. Thompson (1967) points out that a CEO is the driving force who perceives, creates, and pursues organizational opportunities, leading to performance differences. A leader is a person who binds the members of the organization by formulating a collective purpose. Moreover, a good leader is a "change agent" who brings vision, develops strategies, builds momentum, and institutionalizes new approaches (Kotter, 1998).

Prior studies mainly focus on the role of top leadership in organizational performance. Lieberson & O'Connor (1972) were the first to analyze the effect of CEOs on the performance of major public companies in the US during 1946-1965. Other researchers including Weiner & Mahoney (1981), Thomas (1988), Finkelstein & Hambrick (1997) and Mackey (2008) also examine the impact of top leadership on organizational performance in various industries and countries. All these studies conclude that the leadership effect on an organization's performance does matter.

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[28] The words firms, companies, and organizations are used interchangeably in this chapter; likewise, attributes, characteristics, and features are interchangeable terms without any specific connotation.

According to the upper echelons theory (UET), CEOs differ distinctly in beliefs, perceptions, capabilities, skills, and actions. Therefore, the resulting performance of their organizations varies considerably (Hambrick & Mason, 1984). This theory is based on the premise that the more complex a decision, the more important are the personal attributes possessed by the decision makers. Additionally, the UET states that leaders have bounded rationality, their decisions are based on cognitive, social, and physiological orientation, which are reflected in their strategic choices and organizational outcomes. On the other hand, the resource-based theory (RBT) states that firms are a combination of various tangible and intangible resources which affect the performance and strategies of the firms (Barney, 1991; Wernerfelt, 1984). The resource-based theory explains the relationships between top executive attributes and organizational performance and suggests that the top executives who become the most valuable resources for their firms are associated with higher organizational outcomes and returns.

Research on CEO attributes is scant in the microfinance industry. Prior studies mainly focus on corporate governance issues in microfinance institutions (MFIs). Among available studies, Hartarska (2005) analyzes different board characteristics and their effects on financial and social performance of Eastern European MFIs from 1998 to 2002. She finds that financial performance is associated with more independent board, whereas having an employee member as a board director reduces both financial performance and outreach of MFIs. Mersland & Strom (2009) study the governance and performance of MFIs and find that financial performance of MFIs increases when these institutions employ local directors and internal board auditor. Additionally, they find that the outreach of MFIs increases when the board chairman also acts as CEO of these institutions. Chakrabarty & Bass (2014) state that MFIs with boards that are more connected to social and economic intentions have reduced operating costs and are better able to cater to underprivileged borrowers. Another study by Iqbal et al.

(2019) show that microfinance institutions with good governance systems are more profitable than their counterparts.

Some other studies specifically focus on the role of top management in MFIs. Galema et al. (2012) analyze how the decision-making capacity of CEOs affects the performance of MFIs. The authors particularly focus on how the structural power of CEOs affects their decisions regarding risk-taking and financial performance of NGOs in comparison to other types of MFIs. On the other hand, Randoy et al. (2015) state that MFIs managed by entrepreneur-CEOs outperform other MFIs in terms of achieving better social objectives (outreach to a greater number of credit clients and faster portfolio growth), resulting higher financial sustainability, lower operating expenses, and fewer losses. Mersland et al. (2019) analyze that MFIs in which CEOs are internally hired perform financially better and have lower variability of returns in comparison to externally recruited CEOs. All of these studies focus on a specific CEO attribute and examine how that attribute affects MFI performance. We go a step further and analyze why and how multiple traits of CEOs matter.

Different attributes of CEOs like gender, education, experience, and founder status are important for the success of any organization and also for the financial performance of MFIs. Prior studies did not primarily focus on the gender of CEOs. Aduesi & Obeng (2019) study the effect of board gender diversity and find that MFIs with more female board members have lower debt levels. Gyapong & Afrifa (2019) examine a global sample of MFIs and find that in communities where individuality and uncertainty avoidance are prioritized, fewer women managers are appointed. High power distance societies, on the other hand, are connected with the appointment of women managers. In this study, we specifically focus on the gender of CEOs, as it is considered that microfinance is not only a business for women but also to a large extent a business by women. Existing literature indicates a “female bias” in microfinance industry in terms of both clientele and top executives. The reasons for this are manifold. Amongst poorest families, there is at least one-woman borrower who takes a loan from MFI for household and self-employment purposes (Gonzalez, 2011). Another reason is higher repayment rates by female borrowers that also make them eligible for future loans (D’Espallier et al., 2011). Other than female clientele, the ratio of females in top management positions is higher in MFIs than in traditional firms.[29] Strom et al. (2014) report a higher percentage of female representatives in MFIs. Their sample shows that the proportion of female board members is 29%, female CEOs is 27%, and female chairs is 23% in comparison to only 8.8% female directors in traditional US-based firms (Adams & Ferreira, 2009).

A CEO's business education represents a human capital resource endowment, that can differentiate the success of the institution on the basis of the skill, abilities, and knowledge possessed by its employees (Cull et al., 2014; Graham et al., 2013). MFIs are hybrid organizations, competing on both ends: financial sustainability and social welfare. Therefore, it is important that the CEOs of these institutions possess related business knowledge and skills to meet both ends simultaneously. Likewise, domain-specific experience shows entrenchment of the CEO with the structure, resources, and environment of the organization (Li & Patel, 2019). The psychological affiliation is embedded in the MFI if the CEO is also the founder of the institution (Adams et al., 2009). All these CEO attributes are important drivers of the performance of MFIs.

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[29] According to the equal opportunity for women in the workplace agency (EOWA, 2006) and European professional women’s network (EPWN, 2004) reports the percentage of female directors in various firms of Japan, Europe, Australia, and Canada is 0.4%, 8.0%, 8.7%, and 10.6%, respectively.

Our study contributes to the extant literature of microfinance and leadership in two ways. First, this study focuses on microfinance institutions as these institutions have commonly been overlooked by past research on leadership attributes. Available studies of MFIs mostly discuss corporate governance aspects (e.g. number of board members, board duality, board power, ownership structure, etc.). We try to add new evidence to this debate by focusing on top executives. Second, available studies on MFIs primarily focus on a single CEO attribute. As to the best of our knowledge, this is the first study that uses empirically analyzes multiple CEO attributes and their impact on financial performance of MFIs.

The remainder of the chapter is organized as follows. Section 5.2 provides theoretical background and hypotheses. Section 5.3 presents the empirical framework. Section 5.4 presents results and Section 5.5 concludes the paper.

5.2. Theoretical background and Hypothesis development

Prior literature has shown that CEOs' attributes can explain the performance differentials of companies (Hambrick & Mason, 1984). A recent shift from governance to management literature indicates that an organization's performance is significantly influenced by the profile, knowledge, and background of CEOs (Graham et al., 2013). Since each of the CEO attributes has its unique effect, we discuss each attribute separately and formulate hypotheses accordingly.

5.2.1. CEO gender

The presence of females in upper echelons not only increases a firm's diversity in terms of both human capital and social structure but also advocates that the involvement of qualified women at top levels increases the board's cognitive variety and value-creating potentials (Adams & Ferreira, 2009). Francoeur et al. (2008) state that the quality of decision-making is largely affected by creativity, knowledge, perspective, and judgment of the CEO, and the decision-making quality is superior in more diverse boards. Carter et al. (2003) analyze management diversity of large US-based firms and find that the higher percentage of women and minorities at top management positions is associated with increased firm performance. Similarly, Smith et al. (2006) study management diversity of Danish firms and find that the presence of women in top management positions has positive effect on firm performance.

MFIs are mission-driven enterprises that primarily serve low-income households, particularly women. The targeting of women, according to Morduch (2000) and others, is one of the key reasons for microfinance's success. The client base of MFIs has changed dramatically over the last three decades. For example, the proportion of women at the Grameen Bank increased from 44% in 1983 to 98% in 2005 (Armendariz & Morduch, 2010). The authors attributed this to better repayment rates and the contribution of women's economic activity to economic growth. Female targeting and financial sustainability of MFIs are perfectly matched, according to other authors such as Mayoux (2011) and Fernando (2006). The reasons are, on the one hand, women's discipline and docility are the main reasons for high repayment rates, and on the other hand, serving women improves the efficiency and profitability of MFIs. D'Espallier et al. (2011) and Shahriar et al. (2020) further add that women are better borrowers for MFIs since the enhanced repayment effect appears to be driven by women's inherent risk aversion, trustworthiness, and cooperative behaviour.

Microfinance, according to Strom et al. (2014), is mostly a women's business. MFIs' largest market is female borrowers, and lending to women is one of the key reasons of microfinance's growing popularity in developing countries. The authors further state that microfinance is not only a business for women, but it is also a business run by women to a great extent, as the proportion of women in senior executive positions in MFIs is higher (29%) in comparison of other financial and non-financial enterprises (around 8%) in the Western world. A growing body of research in microfinance discusses gender-related disparities. Among them, a few studies analyze the participation of women on the board of directors and find a link between board gender diversity and performance of MFIs (Hartarska 2005; Hartarska et al., 2014). Female loan officers also have a better ability to create trusting connections with borrowers. The loans they provide have a reduced chance of defaulting, that enhances the efficiency of MFIs (Bibi et al., 2018; Beck et al., 2013).

Strom et al. (2014) believe that female directors have a better understanding of the MFI's client base than their male counterparts because the customers of MFIs are mostly women. Along the same line, we argue that female CEOs may have an advantage in knowing their clients better. In addition, anticipating and addressing clients' requirements may be critical in MFIs, as evidence suggests that women clients are better at managing their money (Beck et al., 2013). Furthermore, we expect that the close relationship between female CEOs and female customers allows female executives to gain soft information about clients and their needs, expand their female network, and better understand local market conditions, all of which improve the quality and creativity of their decision-making process, resulting in performance differences (Smith et al., 2006). As a result, a female leader is better able to recognize the needs of clients, particularly when the majority of them are women, and to build goods and programs that are adapted to their needs.

Because many MFIs cater to female clientele, the presence of female CEOs in MFIs is seen as a better match for the difficulties and opportunities faced by female clients. This is a matching argument, which states that an MFI will perform better if it is paired with a leader who has similar traits. The term "similar traits" in this instance refers to gender. Therefore, an MFI that caters to female clients would be coupled with female leadership. The matching argument is based on the “marriage market model” of Becker[30] (1973). Thus, the premise is that the female CEO will improve the MFI's financial performance as a result of the better match between the MFI's leadership and female clientele. This technique was also used by Ghatak (2000) to match good borrowers in a microfinance group lending program. According to Thomas & Ramaswamy (1996), matching specific leadership attributes to the organization's strategy improves corporate success. This also suggests that female CEOs are endogenous, in the sense that they are more likely to be found in MFIs with more female clients, and that the financial performance of MFIs improves with female CEOs. We will address both of these endogeneity problems in the methodology section. Thus, based on the matching argument, we formulate our first hypothesis as

H1: The presence of female CEOs is associated with higher financial performance of MFIs.

5.2.2. CEO business education

According to the upper echelons theory, educational accomplishment affects career outcomes in terms of career trajectory and pay. Educational accomplishment comprises prospects on the latent ability of CEOs and affects decision-making and firm investments (Donkers et al., 2001). Prior studies show the rising trend of business education in recent years because of the increasing demand for managerial skills as to technical skills (Frydman, 2019). This demand results from the fact that now the firms become more complex and larger due to innovations in business practices and technological advances. Chevalier & Ellison (1999) report that managers who possess MBA or BBA degrees and are graduated from universities having tougher entry requirements implement better management practices, take aggressive strategies that generate higher corporate returns. Bertrand & Schoar (2003) and King et al. (2016) report that organizations led by CEOs with business degrees perform better than their peers.

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[30] Becker (1973) provides various examples of matching in his study. For example, ‘‘the ideal sorting of more capable people and more capable enterprises, more ‘‘modern" farms and more capable farmers, or more educated customers and more honest shopkeepers".

According to Finkelstein (1992) and Neubaum et al. (2009), CEOs of MFIs with business knowledge are better able to instil altruistic behaviour that necessitates an awareness of the complexities of stakeholder transactions and the environment in which the organization operates. Furthermore, it has an impact on the CEO's strategic decisions by influencing his or her capacity to use talents that result not only in financial gains for the MFI but also in social development.

The same logic applies in the case of MFIs, as Cull et al. (2014) state that the productivity and performance of MFIs can be affected by different resources. One of these is the relevant education of CEOs. The business knowledge enables a CEO to efficiently use organizational resources, effectively implement processes and enhance overall performance of the organization (Murphy & Zabojnik, 2007). Battilana & Dorado (2010) undertake two case studies and claim that the profile of top managers to a large extent decides whether an MFI manages to balance the two institutional logics (financial & social) or not. Pascal et al. (2017) state that in microfinance industry, CEOs with business education background outperform CEOs with different degrees/education.

Business education enables CEOs to understand the organizational settings and operational capacity better. It also equips the CEO the knowledge necessary to ensure the sustainability of the organization. We expect that in MFIs, a CEO's business education enables him/her to manage the organizational resources well and achieve higher financial performance. Thus, our second hypothesis is:

H2: The CEO with business education is associated with higher financial performance of MFIs.

5.2.3. CEO domain-specific experience

Human capital represents skills, knowledge, and experience possessed by CEOs. It can be of two types: general and company-specific, where the earlier one is based on skills transferable through different businesses and industries and the later includes skills that are more relevant to the current firm (Becker, 1962). Based on Becker's framework, prior studies mention two categories of CEO experience: generalist and domain-specific. CEOs with generalist experience work in different industries and firms. These CEOs have lower levels of firm related expertise, face various challenges in pairing their previous skills and experience with current firms, have shallow knowledge of the current organizational environment and resources, resulting in lower firm performance (Wang & Murnighan, 2013). Kang & Snell (2009) further explain that the general experience of CEOs enables them to learn at a slower rate, have a greater reliance on past cognitive maps and their skills are less transferable because of their relevance with current environment.

On the contrary, CEOs with domain-specific expertise and experience have a better understanding of the inter-relationships between internal competencies and external factors and are more able to obtain, assimilate and incorporate diverse information in order to formulate successful strategic actions (Brown & Duguid, 1991). Domain-specific experience positively impacts the problem-solving abilities of the CEOs based on their past cognitive linkages and alignment with the current organization. It also enables the CEOs to take prompt decisions, effectively implement strategies, and efficiently use resources to improve organizational performance.

Based on the domain expertise lens, Armendariz de Aghion & Morduch (2010) state that MFI's business model is complicated for a newly hired CEO if he/she does not possess any prior microfinance experience. Mersland et al. (2019) state that in MFIs, domain-specific experience matters a lot as the internally hired CEO spends more years in the same organization, he/she becomes much more aligned towards the mission of the MFI. We expect that whether the CEO is internally hired or has prior experience of working in the microfinance industry can take better and quick decisions, explores more opportunities, expand current services and products that lead to an increase in the financial performance of MFI. Based on the above argument, our third hypothesis is:

H3: The CEO with domain-specific experience is associated with higher financial performance of MFIs.

5.2.4. CEO founder status

Research on founder CEOs suggests that these managers have a different way of running businesses than hired CEOs, confirming a positive impact on firm's valuation and performance (Fahlenbrach, 2009; Adams et al., 2009). According to the upper echelons theory, a founder CEO is involved in designing the mission and strategy of the firm and has the functional expertise of the firm. This strong motivation and involvement of founder CEO are associated with the growth and success of the firm (Fischer & Pollock, 2004).

The founder CEO has a different intrinsic motivation to run the firm than a non-founder or hired CEO that removes costly monitoring mechanisms and high incentives. Moreover, the CEO is involved with the firm since its inception, he/she has more organizational skills, a better relationship with employees and customers, improved decision-making ability that leads to performance enhancement (Randøy et al., 2015). Battilana & Dorado (2010) analyze the role of founder CEO in two microfinance institutions and find that founder CEOs are persuasive in implementing mission-supporting hiring practices and socialization of staff. The authors further show that to create a "sustainable hybrid organization," MFIs run by founding CEOs effectively apply two distinct institutional logics: banking and development, the former reflects MFI's sustainability efforts and the latter reflects its poverty reduction and outreach efforts.

Demirguc-Kunt & Klapper (2013) state that a high number of MFIs is still handled by founders' CEOs. Since formation, these founder-CEOs have been part of the MFIs and are well aware of the dual objectives of the MFIs. The authors further add that a founder CEO has a strong motivation greater than that of a hired CEO to start and run MFI in its first foundational years. This association with the organization and its mission contributes to promote CEO conduct that enhances results. Randøy et al. (2015) report that reduced costs, increased outreach, and sustainability are common practices in MFIs led by founding CEOs. Some examples of well-known founders of successful MFIs include Muhammad Yunus of Bangladesh (Grameen Bank), Pilar Ramirez of Bolivia (Banco FIE), and Ingrid Monroe of Kenya (Jami Bora Trust). Based on these examples and earlier arguments, we formulate the following hypothesis:

H4: The founder CEO is associated with higher financial performance of MFIs.

5.2.5. The moderating effect of tenure on CEO attributes and financial performance of MFIs

The organizational tenure of team members may qualify as having the most significant theoretical footing of all demographic variables (Pfeffer. 1983).

CEO tenure reflects the life cycles in which executives learn and understand the company while holding the position. Prior studies indicate that the "best characteristic" for identifying executives is organizational tenure, as specific organizational skills, experience, perspective, and insights are embedded in it (Wernerfelt, 1984). The tenure shapes the behaviour of top executives in terms of designing and implementing strategies, taking decisions, motivating, evaluating, and rewarding the employees (Bergh, 2001).

According to the UET, successful organizational outcomes are associated with short tenure executives as they are more flexible, quickly adapt to changes and take actions during uncertainties (Finkelstein & Hambrick, 1990). However, the RBT states that longer tenure of top executives enables them to possess non-transferable and idiosyncratic knowledge about the history, culture, structure, market potential, and relationship network of the company that would lead to more successful organizational performance (Bergh, 2001).

MFIs are hybrid institutions pursuing goals of sustainability as well as development. The tenure of top managers is a very critical and deciding factor in the performance of these organizations as a whole. Wisdom learned from years of tenure helps top executives to thoroughly understand the particular business model, structure, culture and long-term relationships of these institutions along with the know-how of practices that previously succeeded and failed in MFIs (Battilana & Dorado, 2010). The longer tenure also increases the discretional power of CEOs that encourages productive initiatives for MFIs expansion (Randoy et al., 2015).

Based on these arguments, we expect that a long-tenured CEO in MFI positively moderates the relationships between various CEO attributes and financial performance of these institutions. Therefore, we separately state moderating effect of CEO tenure on each of the CEO attributes and financial performance dimension below as formal hypotheses:

H5: CEO tenure positively moderates the relationship between CEO gender and financial performance of MFIs.

H6: CEO tenure positively moderates the relationship between CEO business education and financial performance of MFIs.

H7: CEO tenure positively moderates the relationship between CEO domain-specific experience and financial performance of MFIs.

H8: CEO tenure positively moderates the relationship between CEO founder status and financial performance of MFIs.

5.3. Empirical framework

5.3.1. Econometric specification

A main methodological challenge in studies analyzing the relationship between CEO attributes and firm performance is endogeneity (Li & Patel, 2019; Antonakis et al., 2010). On one hand, firms may choose CEOs based on specific attributes such as gender, skills, experience, and background, whereas CEOs may choose firms based on their human resources or specific attributes, causing endogeneity concerns. For example, our hypothesis regarding the female CEOs and financial performance of MFIs entails that female leadership is more likely to be found in MFIs with a bias towards female clientele and that an MFI's financial performance improves with female CEOs are endogenous. We encounter two potential endogeneity problems here. The first is the reverse causality case (Hermalin & Weisbach, 1998), when the

MFI performing financially well attracts a female CEO. We control for reverse causation of female leadership in financial performance regressions by the Heckman (1979) model for an endogenous dummy variable. The second endogeneity problem is sample selectivity, that is, the selection of a female CEO might be related to the emphasized focus on female clientele, for example, MFIs hire a female CEO because most clients are women, not because of their qualifications. We handle this second endogeneity concern by the inverse Mill's ratio (IMR) test.

We employ the Heckman (1979) dummy endogenous variable model to account for endogeneity associated with different CEO attributes and self-selection bias. In which as a first stage, we set up a selection model by using a probit regression to predict various CEO attributes on relevant instruments using the following equation:

$$P(CEO\_Attributie)_{it} = \gamma\ Instrument_{it} + \delta\ Controls_{it} + \mu_{it} \qquad (1)$$

We follow the same procedure for each of the CEO attributes separately. The various CEO attributes: gender, business education, domain-specific experience, and founder status are dependent variables in the first stage and regress against relevant instruments and MFIs and country-level control variables along with regional and year dummies. We use *gender bias*[31] as an instrument for female CEO and *MFI age*[32] as an instrument for CEO business education, CEO domains-specific experience, and CEO founder following the studies of, Strom et al.

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[31] Gender bias indicates that MFI focuses more on female clientele.

[32] We also take average loan size, female clients, NGOs, and Cooperatives instead of gender bias for analyzing the likelihood of female CEO and for CEO business education, experience, and founder status, we take two other time-related variables: MFIs year of incorporation and the difference between the date of establishment of the firm and its incorporation as MFI. We find similar results in case of other alternative instruments. Therefore, for brevity, we do not report these results.

(2014), Randoy et al. (2015), and Pascal et al. (2017), Adams et al. (2009), and Fahlenbrach (2009). These instruments have a high correlation with different CEO attributes but not with any financial performance variable. We calculate the Inverse mills ratio (IMR) from first stage and include it as an additional regressor in the second stage regression.

$$Financial\_Performance_{it} = \alpha_0 + \beta\ CEO\_Attribute_{it} + \varphi\ Controls_{it} + \mu_{\ it} \qquad (2)$$

The financial performance is captured by return on assets (ROA) and portfolio yield (PTY). The various CEO attributes include gender, business education, domain-specific experience, and founder status. We try to capture MFI and country-level heterogeneity through various control variables: MFI size[33], ownership type, regulations, internationally initiation, competition, human development index (HDI), regional and year dummies. The definition of all variables is given in Table 5.1.

Additionally, we apply the Wald test to see the validity of the procedure. A non-correlation with the random error term μ is needed for the validity of the instrumental variable procedures, and the instrumental variables should also have a non-zero coefficient, that is, it must be partially correlated with instrumented endogenous explanatory variable, once other explanatory variables are netted out (Wooldridge, 2010).

We also conduct two-stage least square (2SLS) regressions as a robustness check. As our main variables of interest are CEO attribute(s) is dichotomous and endogenous, 2SLS is considered an appropriate technique to deal with endogeneity arising due to omitted variable bias and reverse causality. We also apply Seemingly unrelated regression (SUR) to see correlation among the errors of different models. We expect that different estimating procedures may increase the confidence in the robustness of results, but none of our identification strategies can fully eliminate endogeneity concerns, therefore our findings should be viewed with caution.

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[33] The first stage includes all exogenous control variables except size as it is considered endogenous.

5.3.2. Variable description

We use three groups of variables for the current study. The first group is based on different proxies of dependent variable: financial performance, the second group consists of our main explanatory variables: CEO attributes and the third is the control group based on different MFI and country level-characteristics. In the following sections, we explain each group of variables in detail:

Financial performance

We use two different proxies[34] for measuring financial performance of MFIs. Return on assets (*ROA)* represents an MFI's bottom-line performance and is calculated by total operating income divided by average total assets of MFI. This indicator is commonly used in literature to gauge the financial performance of MFIs. Portfolio yield (*PTY)* represents the total interest received by MFI through its lending operations. These two indicators are widely used in prior studies (Adusei, 2021; Beisland et al., 2021; Strom et al., 2014).

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[34] We also use two other financial performance variables: operational self-sustainability (OSS) is defined as revenues and expenses out of MFIs core operations while excluding non-operating revenues and donations. Financial self-sustainability (FSS) is defined as when an MFI can cover all types of expenses: operational, loan losses, and financial expenses after adjusted for inflation. This indicator shows that MFI can sustain its operation without the injection of subsidies. We find similar results with these two additional variables for brevity, we do not report these results.

CEO attributes

We include different CEO attributes in our analysis. The first one is the *CEO gender*, it is a binary variable representing 1 if the CEO is a female and 0 otherwise. Next, we use *CEO business education*, it is a binary variable, indicating 1, if the CEO has a degree in business education and 0 otherwise. *CEO domain-specific experience* indicates that the experience of CEO through his/her affiliation with MFI, if the CEO has domain-specific experience then 1 and otherwise 0. *CEO founder* is a binary variable, representing 1 if the CEO holds his/her position in MFI when it was established and 0 otherwise. We measure *CEO tenure*, as the length of time a CEO spends in MFI.

Control variables

As microfinance institutions vary in size, time of establishment, organizational form, countries of origin, and regulated status, it is important to incorporate firm and country-specific variables. In our analysis, we include *Size* based on the natural logarithm of the total assets possessed by the MFIs. *Age* shows the number of years of operations starting from the time of the establishment of MFI. *Shareholder firms* represent the ownership types of MFIs: banks and non-banking financial institutions (NBFI) represent shareholders firms, whereas non-governmental organizations (NGOs) and cooperatives are non-shareholders firms. It is a binary variable coded 1 for shareholder firms and 0 otherwise. *Internationally initiated* is a binary variable having the value of 1 if MFIs are initiated by an international organization and 0 otherwise. *Regulated* is a binary variable and treated as 1 if the MFI is regulated by the law of the country where it operates and 0 otherwise. Following Hossain et al. (2020), we also cater to *competition* among MFIs based on the rater's assessment. The competition index is based on a Likert scale of 1 to 7, where a higher value indicates more competition among MFIs.

As our dataset covers MFIs belonging to different regions of the world, we try to control for country specific differences in education, health, and income GNI per capita through the human development index (*HDI*). This index is developed by the United Nations to compare differences among countries in terms of literacy, life expectancy, and standard of living. Finally, we use regional and year dummies in our analysis. Table 1 presents the details of all the variables used in the study.

Table 5.1. Variable Description

Variables	Description
Independent Variables	
CEO female	A binary variable coded 1 if CEO is a female and 0 otherwise.
CEO business education	A binary variable coded 1 if CEO holds a degree in business education and 0 otherwise.
CEO domain-specific experience	A binary variable coded 1 if CEO has prior experience in microfinance industry and 0 otherwise.
CEO founder status	A binary variable coded 1 if current CEO is also the founder of MFI and 0 otherwise.
CEO tenure	The maximum number of years spent as a CEO in same MFI.
Dependent variables	
Return on assets (ROA)	Net operating income divided by average total assets.
Portfolio yield (PTY)	Total interest received on loans divided by average gross loan portfolio.
MFI and country level controls	
Gender bias	A binary variable coded 1 if MFI focuses more on female clients and 0 otherwise.
MFI age	Difference of observation year and the year MFI commenced its operations
MFI size	Natural logarithm of total assets of MFI.
Shareholders firm	A binary variable coded 1 if MFI is a shareholder's firm and 0 otherwise.
Internationally initiated	A binary variable coded 1 if MFI is initiated by an international organization and 0 otherwise.
Regulated	A binary variable coded 1if MFI is registered by banking authority in the country of origin and 0 otherwise.
Competition	A 7-point scale in which 1 represents low level and 7 represents high level of competition in markets where MFI operates.
Human development index (HDI)	An index representing each country in terms of income per capita, health, education and standard of living on yearly basis.
Regions	Location of MFI in any of the following regions: Latin America & Caribbean, South Asia, Eastern Europe & Central Asia, South Africa, Middle East & North Africa, and East Asia & Pacific.

5.3.3. Data

We use MFIs data rated by top-five MFI rating agencies namely: *Planet Rating, Microfinanza, MicroRate, M-Cril, and Crisil*. This data[35] is the latest version of the data set compiled by Mersland & Strom (2009) from annual reports of MFIs and is accessible through websites of rating agencies. These five rating agencies compile the most comprehensive data on MFIs and are also approved by Consultative Group to Assist the Poor *(CGAP)*, which is the microfinance branch of the World Bank. The information provided by these rating agencies is independent, authentic, and transparent and is based on standard indicators that are similarly calculated by all rating agencies (Beisland & Mersland, 2012).[36]

Our sample consists of unbalanced data of 375 MFIs from 1999 to 2012 with 1263 firm-year observations. The sample is based on the availability of data for the majority of the variables used in the study during the sample period. The data set reveals a wide variation among different CEO attributes, ranging from the highest number of observations (1263) for the CEO tenure variable to the lowest number of observations (456) for the CEO-business education variables during the sample period. Our sample consists of all organizational forms of MFIs (NGO, NBFI, bank, Cooperatives) covering 78 countries[37] in six different regions (Latin

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[35] We used data from rating agencies as the data related to CEO attributes is not provided by Microfinance information exchange (Mix Market).

[36] The rating agencies take into consideration various factors including asset quality, costs, rate of return, efficiency, risk, capital adequacy, management, and organizational style, and social performance for doing performance assessment of these institutions. The reports of these rating agencies are publicly available at www.ratingfund2.org and also on their websites.

[37] The detailed list of the countries with a total number of MFIs is given in appendix 5.1.

America, South Asia, East Asia & Pacific, South Africa, Eastern Europe, and the Middle East) of the world.

The MFIs in our dataset represent those unique institutions which decided to allow themselves to be rated by independent agencies to improve their transparency. This may lead to selection bias which is hard to overcome in microfinance research (D'Espallier et al., 2012). According to Strom et al. (2014), no perfect data set exists that accurately represents the microfinance industry. The data set used in this study does not cover all the small savings and credit cooperatives worldwide. The majority of our MFIs are small and medium in size. The rating reports provided by the five agencies are much wider in the scope of information compared to traditional credit ratings (Beisland & Mersland, 2012). They cover a wide range of information including outreach, financial sustainability, governance, clients, ownership, regulation, products, among others. Although the data of rating agencies suffer from certain selection bias, nonetheless it makes our data of CEO attributes more authentic and reliable than if collected from self-reported sources like annual reports and websites (Mersland & Strøm, 2009). As a result, our dataset includes a greater number of commercial and professional MFIs that have decided to be rated by third-party agencies.

5.4. Results

5.4.1. Descriptive statistics

Table 5.2 presents the descriptive statistics of all variables used in the analysis. To remove outliers, we winsorize all the variables at 1% from both ends. As to different CEO attributes, our sample indicates that 25% of the CEOs are female, 80% of the CEOs have business-related degrees and 93% of the CEOs have domain-specific experience. We find that almost 36% of

CEOs in our sample are founders of MFIs in which currently they are holding positions. On average the tenure of a CEO in MFIs is 6 years and ranges from 1 year to 34 years.

The two dependent variables ROA and PTY have a mean of 2.9% and 37.5%, respectively. The result of ROA is close to the values reported by Strom et al. (2014) and D'Espallier et al. (2013). The average return on assets is generally low in MFIs as the main motive of these institutions is welfare, not profit-making. The PTY represents the main source of revenues collected by MFIs on their lending operations and it is close to the values reported by D'Espallier et al. (2011) and Mersland et al. (2009).

The MFIs level control variables reveal that almost 46% of sample MFIs are gender bias-having inclination towards female clients. This value is close to 44% reported by Strom et al. (2014). The average age of MFI is 12 years and the average total assets of MFIs are $20.3 million in our sample. Whereas 40% of the sample MFIs are owned by shareholders. This percentage is higher than reported by Pascal et al. (2017). In our sample, 39% of the MFIs are initiated by Western organizations. This is close to the 36% reported by Storm et al. (2014). Our sample indicates that 38% of the MFIs are regulated by the banking authorities. The average competition score is 4.8 points, suggesting that MFIs are progressively competing against each other. Finally, the human development index has an average value of 0.620 and ranges between 0 to 1. The value of HDI is close to the value of 0.63 and 0.61 reported by Randoy et al. (2015) and Pascal et al. (2017).

5.4.2. Correlation Matrix

Table 5.3 presents the correlation matrix of the main variables used in the study. The significant high correlations among CEO attributes are between CEO-business education and CEO domain-specific experience (0.440), as well as between CEO-founder and CEO-tenure (0.442), while the rest have low correlations. Among control variables size and human development index (HDI) have a significant positive correlation with ROA and PTY, whereas MFI age and regulation are negatively correlated with ROA and PTY. The highest correlation value 0.481 is between CEO-female and gender bias, that is much below the threshold of 0.8 as mentioned by Brooks (2008). We also check the multicollinearity by calculating the variance inflation factor (VIF) and find that the value of VIF is around 2.5 which is much below the threshold of 10 as mentioned by Verbeek (2012). So, multicollinearity is not a problem in our analysis.

Table 5.2. Descriptive Statistics

This table shows the descriptive statistics of all variables used in the study.

Variables	**N**	**Mean**	**S.D**	**Min**	**p25**	**p50**	**p75**	**Max**
Independent variables								
CEO characteristics								
CEO female	848	0.258	0.437	0	0	0	1	1
CEO business education	456	0.807	0.395	0	1	1	1	1
CEO domain-specific experience	740	0.933	0.248	0	1	1	1	1
CEO founder	752	0.357	0.479	0	0	0	1	1
CEO tenure	1263	6.463	5.388	1	3	5	9	34
Dependent variables								
Return on assets	1224	0.029	0.079	-0.90	0.011	0.039	0.073	0.80
Portfolio yield	1245	0.375	0.172	0.029	0.254	0.343	0.452	1.132
MFI and country level controls								
Gender bias	1065	0.464	0.497	0	0	0	1	1
MFI age	1236	12.57	8.310	0	5	10	15	50
Total assets (1000 USD)	1237	20300	64800	21	1932	4825	17400	350800
Shareholder firm	1242	0.399	0.491	0	0	0	1	1
International initiated	1239	0.395	0.489	0	0	0	1	1
Regulated	1227	0.381	0.459	0	0	0	1	1
Competition	1211	4.831	1.56	1	3	5	6	7
HDI	1240	0.620	0.138	0.071	0.381	0.581	0.724	0.807

Table 5.3. Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) CEO female	1														
(2) CEO bus-edu	0.264**	1													
(3) CEO domain-exp	0.279**	0.440***	1												
(4) CEO founder	0.192*	0.199*	0.083	1											
(5) CEO tenure	0.061	0.066	0.015	0.442***	1										
(6) ROA	0.016	0.215*	0.109	0.129	0.134	1									
(7) PTY	0.034	0.098	0.126	0.167	0.034	0.198	1								
(8) Gender bias	0.481	-0.069	0.065	-0.055	-0.033	0.053	0.096	1							
(9) MFI age	-0.110	0.186*	0.195*	0.177*	0.205*	-0.126	-0.372***	0.042	1						
(10) Size	-0.072	0.171*	0.095	-0.127	0.021	0.225*	0.354**	-0.145	0.180*	1					
(11) Shareholder firm	-0.216*	0.049	-0.014	-0.099	-0.221**	0.036	0.041	-0.223**	0.084	0.071	1				
(12) Int. initiated	-0.125	0.062	0.018	-0.335***	-0.152	-0.027	-0.037	0.147	0.090	0.042	0.032	1			
(13) Regulated	-0.201*	0.180*	0.067	0.021	-0.080	-0.261**	-0.218	-0.197*	0.129	0.323***	0.022	-0.056	1		
(14) Competition	0.091	-0.032	0.024	0.019	0.123	-0.069	-0.207*	-0.032	0.208*	-0.231**	-0.140	0.177*	-0.128	1	
(15) HDI	0.139	-0.115	-0.027	0.098	0.111	0.237**	0.210*	-0.061	-0.205*	-0.238**	-0.093	-0.161*	-0.303***	0.064	1

The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

5.4.3. Regression results

Table 5.4 presents the results of probit model. We regress CEO female, CEO business education, CEO domain-specific experience, and CEO founder on relevant instruments and various MFI and country-level control variables. In column (1), we use gender bias as an instrument for female CEO. The significant coefficient of gender bias indicates that female leadership appears to be more likely in MFIs that concentrate on female clients. As a result, the argument that female CEOs are better positioned to reach into the female networks and address the expectations and demands of female clients is supported (Strom et al., 2014).

As can be seen from Table 5.4, MFI age as a time variable provides good instrumentation for CEO business education, CEO domain-specific experience, and CEO founder status. The coefficient of MFI age is positive and statistically significant at 10% and 5% levels in columns (2), (3), and (4) respectively, suggesting that in more mature MFIs, there is a higher likelihood of a CEO having business education, domain-specific experience, and founder status.

The control variables also yield some interesting results. In column (1), HDI is significant at a 10% level suggesting that the MFIs operating in countries, which are more developed in terms of GDP, health, and education show a higher probability of hiring female CEOs. The MFIs other than NGOs and cooperatives are more likely to have experienced CEOs, whereas if MFIs are initiated by international organizations, they have less probability of having a founder CEO as can be seen from columns (3) and (4), respectively.

Table 5.4. Probit Regression based on CEO attributes and MFI level controls

This table presents the results of probit regression. The binary dependent variables include CEO female, CEO business education, CEO domain-specific experience and CEO founder. The robust t-statistics, reported in parenthesis, are based on clustered standard errors at MFI level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 5.1. for variable definitions.

	(1) CEO female	(2) CEO business education	(3) CEO business experience	(4) CEO founder
Gender bias	0.478** (3.04)			
MFI age		0.047* (2.24)	0.076* (2.46)	0.037** (2.78)
Shareholder firm	-0.281 (-1.55)	0.129 (0.44)	0.800* (2.29)	-0.046 (-0.25)
Int. initiated	-0.255 (-1.65)	0.123 (0.53)	0.0662 (0.25)	-0.702*** (-4.57)
Regulated	0.014 (0.07)	0.032* (2.42)	-0.343 (-0.96)	0.008 (0.04)
Competition	-0.039 (-0.82)	-0.012 (-0.16)	0.053 (0.63)	0.000 (0.01)
HDI	1.638* (2.54)	-0.312 (-0.32)	-0.699 (-0.60)	0.764 (1.23)
Constant	-1.195 (-1.91)	-0.147 (-0.16)	0.027 (0.02)	0.369 (0.61)
No of MFIs	355	333	318	309
No of Observations	1083	1030	1098	1146
Pseudo R^2	0.077	0.094	0.136	0.085
P- value (chi square)	0.002	0.001	0.000	0.000
Year dummies	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes

5.4.4. Impact of CEO attributes on the financial performance of MFIs

After conducting the first stage of probit regression, Table 5.5 (Panel A) reports our results of second stage regression, in which we use financial performance as dependent variable and CEO attribute(s) as independent variable along with IMR estimated from first stage regression. We use separate regressions for each of the CEO attributes: gender, business education, domain-specific experience, and founding status in Table 5.5 (Panel A).

We use two variables to measure the financial performance of MFIs: ROA is the average return on assets and PTY is the portfolio yield that MFIs generate by giving loans to clients. In Panel A of Table 5.5, columns (1) and (2) present the female CEO's impact on the financial performance of MFIs. The coefficient of CEO-female variable is positive and statistically significant at 5% and 1% level in both columns, suggesting that MFIs having a female CEO performed financially well. The findings reveal that MFIs led by female CEOs can achieve a 15% higher return on investment than MFIs led by male CEOs. At the 5% and 1% levels in both columns, the coefficient of the CEO-female variable is positive and statistically significant, indicating that MFIs with a female CEO performed well financially. The findings reveal that MFIs led by female CEOs can achieve a 15% higher return on assets than MFIs led by male CEOs. MFIs managed by female CEOs, on the other hand, are far superior in collecting interest on loans, with an estimated magnitude of 65% in terms of PTY, reinforcing the fact that female CEOs' better connections with clients not only enable MFIs to receive interest on loans, but also increase timely repayments on loans, as found by D' Espallier et al (2012).

The positive effect of having a female CEO suggests the importance of better monitoring of MFI-customer relationship as well as the high ability of female CEO due to a superior match of leadership and tasks. This leads to the acceptance of our hypothesis 1. This result is in line with the studies of Francoeur et al. (2008), Smith et al. (2006), and Strom et al. (2014), supporting the better understanding of organizational tasks and superior decision-making ability of female executives that resulted in a higher financial performance of MFIs.

The coefficient of CEO business education is positive and significant at 10% level in columns (3) and (4) of Panel A and support our 2nd hypothesis that CEOs with business education are associated with better financial performance of MFIs than those led by CEOs with non-business education. The estimated magnitude is smaller: around 3% for ROA and 1% for PTY in columns (3) and (4), respectively. This result is in line with prior studies upholding the importance of business education for managerial positions (Bertrand & Schoar, 2003; Pascal et al. 2017). Next, we analyze the impact of CEO with domain specific-experience on the financial performance of MFIs. The results indicate a positive and significant relationship between CEO domain-specific experience with both performance variables: ROA and PTY and favour the acceptance of our 3rd hypothesis. According to the findings of columns (5) and (6) of Panel A, MFIs led by CEOs with microfinance experience outperform MFIs led by CEOs who lack prior microfinance experience or come from other backgrounds by about 8% to 11% on both financial performance indicators. This is in line with the studies of Mersland et al. (2019) and Brown & Duguid (1991). Both of the above results highlight the importance of human capital in organizational performance.

Finally, in columns (7) and (8) of Table 5.5 (Panel A), we analyze the impact of the founder CEO on the financial performance of MFIs. The CEO founder coefficient is significant and positive, although the magnitude is relatively minor for both financial performance indicators. These findings corroborate our fourth hypothesis, which states that if the CEO is also the founder of MFI, he or she has a deep connection to the institute, which is evidenced by increased financial performance. This result is in line with prior studies of Randoy et al. (2015) and Battilana & Dorado (2010), who suggest that founder CEO has intrinsic motivation towards the organization over the hired CEO resulting in higher financial gains.

In terms of control variables, the coefficient of size has a significant positive effect on financial performance variables at 1% in most of the models, suggesting that bigger MFIs have economies of scale advantage that can enhance their performance. This is in line with the study of Hartarska et al. (2013) and Wijesiria et al. (2017). MFIs' status as shareholder firms also enhance their financial performance, this can be seen from columns (1), (2), and (3) of Table 5.5 (Panel A). Being internationally initiated and regulated have a mixed impact on the financial performance of MFIs. On the other hand, competition and HDI have a significant positive impact on the financial performance of MFIs in most of the columns and inconsistent with the findings of Hossain et al. (2020). Both of these results are according to expectation as more competition enables MFIs to operate more efficiently and cost-cutting gains lead to the enhanced financial performance of MFI. The positive impact of HDI on financial performance of MFIs is in line with the study of Ahlin et al. (2011), who state MFIs show better performance in countries with better financial development and living standards.

In Panel B of Table 5.5, the results of the system of equations using Seemingly Unrelated Regression (SUR) are shown. We apply the SUR method to analyze the correlation of error terms between the dependent variables. In the first equation, we regress two models: ROA and PTY against the female CEO variable. The coefficient for the female CEO is significant for both ROA and PTY variables in models (1) and (2). The significant p-value of the Breusch-Pagan statistic indicates that error terms across both dependent variables are correlated. Next, in Equation 2, we simultaneously regress ROA and PTY against the CEO business education dummy. The coefficient of CEO business education is statistically significant. The result indicates that an educated CEO increases the ROA and PTY of MFIs by 7 and 5 percentage points respectively in comparison to non-business educated CEO. The significant p-value of the chi^2 statistic indicates the dependence between ROA and PTY in SUR estimation.

The significant coefficient of CEO-domain experience in Equation 3 suggests that a CEO with microfinance expertise increases the ROA and PTY of MFIs by 17 and 24 percentage points respectively in SUR estimation in comparison of a CEO without domain expertise. The significant p-value of the Breusch-Pagan statistic indicates both the dependent variables are correlated.

Finally, in Equation 4, the coefficient of CEO founder is significant in both models and indicates that a CEO who is also the founder of MFI increases the ROA and PTY of MFIs by 10 and 18 percentage points respectively in comparison to non-founder CEO. There is also evidence of correlation among the two dependent variables: ROA and PTY as can be seen by the significant value of the test of independence. Overall, in four simultaneous equations, we observe that the value of R^2 increases in the case of all the estimated models. The sign and significance of most of the control variables are improved in SUR estimation. As a result, we can conclude that SUR estimations have fairly improved the estimations somewhat.

Table 5.5. CEO attributes and financial performance of MFIs

Panel A: Heckman endogenous regression model.

This table presents results from the second-stage of the Heckman two-step dummy endogenous regression model. The instruments are the fitted probabilities from probit regression explaining the dummy CEO female, dummy CEO business education, dummy CEO domain-specific experience and dummy CEO founder. The robust t-statistics, reported in parenthesis, are based on clustered standard errors at MFI level. ***, **, and * indicate at 1%, 5%, and 10% respectively. See Table 5.1. for variable definitions.

Variables	(1) ROA	(2) PTY	(3) ROA	(4) PTY	(5) ROA	(6) PTY	(7) ROA	(8) PTY
CEO female	0.151*	0.656***						
	(2.25)	(4.28)						
CEO business education			0.031*	0.019*				
			(1.98)	(2.03)				
CEO domain-specific exp					0.079*	0.106*		
					(2.05)	(2.42)		
CEO founder							0.002*	0.008*
							(2.17)	(2.00)
Size	0.019***	0.008	0.012*	-0.020	0.074***	-0.029**	0.017***	0.054**
	(3.79)	(0.70)	(2.19)	(-1.59)	(4.14)	(-3.00)	(3.66)	(3.24)
Shareholder firm	0.121**	0.486***	0.042*	0.038	-0.002	0.048	0.023	-0.020
	(2.88)	(5.05)	(2.41)	(0.94)	(-0.00)	(1.54)	(1.72)	(-0.41)
Int. initiated	0.115**	0.465***	0.015	0.041	0.037	0.022	-0.018	0.003
	(2.65)	(4.68)	(1.07)	(1.31)	(0.89)	(1.02)	(-1.04)	(0.01)
Regulated	0.029*	-0.049	0.004	-0.057	-0.055	0.063*	0.032*	0.030
	(2.56)	(-1.91)	(0.17)	(-0.99)	(-1.00)	(2.02)	(2.28)	(0.59)
Competition	0.012*	0.049***	0.008	-0.010	0.012	-0.006	-0.002	0.017
	(2.16)	(3.73)	(0.18)	(-1.05)	(0.93)	(-0.95)	(-0.66)	(1.34)
HDI	0.430*	2.00***	-0.183*	0.342	-0.001	0.093	0.159***	0.072
	(1.98)	(4.05)	(-2.03)	(1.66)	(-0.01)	(0.98)	(3.62)	(0.44)
IMR	-0.461*	-1.93***	0.346**	-0.072	0.522*	0.146	0.047	0.016
	(-2.46)	(-4.52)	(2.63)	(-0.24)	(2.17)	(1.06)	(1.56)	(0.15)
Constant	0.434	3.506***	-0.306*	0.702*	-0.276	0.737***	-0.332***	0.149
	(1.57)	(5.56)	(-2.51)	(2.53)	(-0.89)	(4.31)	(-4.54)	(0.56)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of MFIs	327	327	228	228	301	301	304	304
No of Observations	813	813	456	456	705	705	730	730
P-value chi square	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adjusted R^2	0.138	0.203	0.239	0.269	0.147	0.110	0.116	0.084
Wald test of exogeneity	0.000	0.000	0.003	0.002	0.001	0.001	0.000	0.001

Panel B: Seemingly unrelated regressions

This table presents the results of simultaneous equations modelling using seemingly unrelated regressions. We estimate four equations each uses two models to analyze the impact of different CEO attributes: gender, education, domain experience, and founding status on the financial performance variables. The first model in each equation uses ROA, whereas second model uses PTY as dependent variables respectively. The robust t-statistics, reported in parenthesis and ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 5.1 for variable definitions.

Equations	(1)		(2)		(3)		(4)	
Models	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Variables	ROA	PTY	ROA	PTY	ROA	PTY	ROA	PTY
CEO female	0.108**	0.132*						
	(2.80)	(2.04)						
CEO business education			0.079*	0.056*				
			(2.36)	(2.02)				
CEO domain-specific exp					0.175**	0.245*		
					(2.60)	(2.41)		
CEO founder							0.108*	0.180*
							(2.28)	(2.01)
Size	0.015***	-0.017**	0.017***	-0.033*	0.012***	-0.023	0.043*	0.0202
	(4.29)	(-2.82)	(5.02)	(-1.96)	(3.31)	(-1.25)	(2.35)	(1.78)
Shareholder firm	0.017	0.040*	-0.0271*	-0.15***	0.023**	0.023*	-0.038**	-0.0934
	(1.14)	(2.57)	(-2.53)	(-9.81)	(3.03)	(2.01)	(-2.76)	(-0.61)
Int. initiated	-0.027**	-0.036	-0.0243**	-0.023	-0.021**	-0.038**	-0.024**	-0.184
	(-2.65)	(-1.87)	(-3.04)	(-1.85)	(-2.77)	(-3.00)	(-3.00)	(-1.53)
Regulated	-0.030**	0.013	-0.039***	-0.038	-0.032**	0.021	-0.048***	-0.233
	(-2.83)	(0.77)	(-3.89)	(-0.29)	(-3.20)	(0.15)	(-4.87)	(-1.83)
Competition	0.077**	0.095*	0.026***	0.01***	0.026***	0.016***	0.025***	0.0868*
	(2.80)	(2.06)	(9.88)	(3.97)	(10.18)	(4.17)	(9.60)	(2.41)
HDI	0.075	-0.105***	0.059*	0.041	0.061**	-0.087*	0.019***	0.105
	(1.56)	(-4.09)	(2.41)	(1.79)	(2.67)	(-2.54)	(5.34)	(0.66)
Constant	0.249***	-1.244***	-0.537***	0.648***	0.298**	-0.417*	-0.462**	-0.179
	(4.15)	(-5.64)	(-7.24)	(4.74)	(3.69)	(-2.22)	(-6.91)	(-0.57)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of MFIs	327	327	228	228	301	301	304	304
No of Observations	813	813	456	456	705	705	730	730
Adjusted R^2	0.158	0.219	0.243	0.282	0.171	0.131	0.135	0.102
Breusch-Pagan test of independence chi^2 (p-value)	0.007		0.004		0.001		0.009	

5.4.5. The moderating effect of tenure on CEO attributes and financial performance of MFIs

Table 5.6 shed light on the possible effects of CEO tenure on different CEO attributes and financial performance of MFIs. The results in columns (1) and (2) show that female CEO with longer tenure has a significant positive impact on both financial performance variables: ROA and PTY, although the estimated magnitude is very small around 1% in terms of both variables. It suggests that as the female CEO spell in MFI increases, she is more aligned with the culture, market, people and processes that help her in understanding the organization better, thus increasing organizational performance. This leads to the acceptance of hypothesis 5. The finding is in line with the resource-based perspective and the studies of Gupta & Govindarajan (1986), Michel & Hambrick (1992), and Bergh (2001).

We further analyze the impact of tenure on CEO business education (CEO domain-specific experience) and financial performance of MFIs in columns (3) to (6). Contrary to our results of the female CEO, we do not find any moderating effect of tenure on both of the above CEO attributes and financial performance of MFIs. Thus hypotheses 6 and 7 are rejected. These two results are quite surprising. A potential explanation of these outcomes could be the lack of motivation and monotony in a workplace, through which work dissatisfaction and less stimulating behaviours could outweigh the benefits of human capital. This phenomenon is known in the literature as a movement from “transition phase” to “maintenance phase” where earlier is associated with the initial learning stage of the job and the latter involves routine tasks that are already established (Murphy, 1989).

Finally, in columns (7) and (8) we analyze the moderating effect of tenure on CEO founding status and both financial performance variables. Column (7) demonstrates that the CEO founder's coefficient has a substantial positive impact on ROA and that the moderating effect of tenure is significantly positive on the relationship between the CEO founder and financial results. In column (8), we regress CEO founder, CEO tenure, and moderating effect of tenure on the founding CEO status and financial performance using PTY as a dependent variable. We find that not only the individual coefficients of CEO founder and CEO tenure are significant but also the coefficient of CEO founder * CEO tenure is significant at 10% level. The results of interactions in columns (7) and (8) show that founder CEO with longer tenure enhance the financial performance of MFIs around 1% to 4% in terms of both performance indicators. The finding indicates that a founding CEO with longer tenure increases the financial performance of MFIs. This result supports our last hypothesis. It is in line with the resource-based perspective, suggesting that the longer tenure strengthens the keen affiliation of the founder CEO with MFI and leads to improved financial performance (Bergh, 2001).

In terms of control variables, size has a significant positive impact on financial performance variables in most columns. Being regulated has a significant negative, whereas HDI has a significant positive impact on the financial performance of MFIs in most regressions. We find mixed results in the case of shareholder firms, internationally initiated, and competition on financial performance variables. Overall, we find support for hypotheses 5 and 8 indicating that female CEOs and founder CEOs with longer tenure enhance the financial performance of MFIs.

Table 5.6. Moderating effect of tenure on CEO attributes and financial performance of MFIs

This table presents results from the second-stage of the Heckman two step dummy endogenous regression model. The instruments are the fitted probabilities from probit regression explaining the dummy CEO female, dummy CEO business education, dummy CEO domain-specific experience and dummy CEO founder. CEO tenure is used as moderator. The t-statistics, reported in parenthesis, are based on clustered standard errors at MFI level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively. See Table 5.1. for variable definitions.

Variables	(1) ROA	(2) PTY	(3) ROA	(4) PTY	(5) ROA	(6) PTY	(7) ROA	(8) PTY
CEO female	0.018	0.237***						
	(0.27)	(4.72)						
CEO tenure	0.010	0.060**						
	(1.88)	(2.64)						
CEO female*Tenure	0.014*	0.012*						
	(1.97)	(2.40)						
CEO business education			0.009	0.012*				
			(1.00)	(2.17)				
CEO tenure			0.118*	0.039				
			(2.31)	(1.18)				
CEO business education * tenure			0.004	0.001				
			(1.36)	(0.78)				
CEO domain-specific experience					0.009	0.014***		
					(0.65)	(4.74)		
CEO tenure					0.021	0.097		
					(0.76)	(1.68)		
CEO domain experience * tenure					0.020	0.044		
					(0.13)	(1.31)		
CEO founder							0.049*	0.016***
							(2.29)	(4.60)
CEO tenure							0.033	0.090*
							(1.32)	(1.99)
CEO founder * tenure							0.003*	0.049*
							(2.25)	(1.97)
Size	0.009*	0.022**	0.045*	-0.007	0.011*	-0.021	0.014**	-0.026**
	(2.16)	(2.61)	(2.05)	(-0.51)	(2.18)	(-1.90)	(2.66)	(-2.69)

Continued on next page

Shareholder firm	0.027*	0.002	0.074	0.029	0.037	-0.104*	0.037*	0.036
	(2.19)	(0.09)	(1.02)	(0.63)	(1.74)	(-2.30)	(2.43)	(1.32)
Int. initiated	0.005	0.014	0.097	0.026	0.057	-0.0162	-0.032	-0.170**
	(0.54)	(0.68)	(1.83)	(0.76)	(0.05)	(-0.63)	(-1.11)	(-3.24)
Regulated	-0.044***	-0.043	0.076	-0.051	-0.051**	-0.030	-0.046**	-0.063*
	(-3.50)	(-1.54)	(0.78)	(-0.81)	(-3.01)	(-0.85)	(-2.89)	(-2.20)
Competition	-0.006	-0.017*	-0.003	-0.014	-0.026	-0.015*	-0.022	-0.007
	(-0.23)	(-2.52)	(-0.18)	(-1.34)	(-0.69)	(-1.97)	(-0.57)	(-1.10)
HDI	0.151***	0.219**	-0.523	0.333	0.075	0.129	0.143*	0.453***
	(3.53)	(2.66)	(-1.55)	(1.52)	(1.58)	(1.30)	(2.47)	(4.44)
IMR	0.021	-0.035	0.971	-0.093	0.038	-0.645***	0.082	0.343***
	(1.13)	(-0.89)	(1.91)	(-0.28)	(0.49)	(-3.97)	(1.51)	(3.58)
Constant	-0.232**	0.774***	0.086	0.609*	-0.145	1.086***	-0.317**	0.584***
	(-3.31)	(5.64)	(0.19)	(2.04)	(-1.67)	(6.03)	(-3.28)	(3.41)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of MFIs	327	327	228	228	301	301	304	304
No of Observations	804	804	448	448	693	693	722	722
P-value chi square	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adjusted R^2	0.126	0.195	0.247	0.296	0.175	0.213	0.162	0.207
Wald test of exogeneity	0.000	0.001	0.001	0.002	0.000	0.002	0.000	0.000

5.5. Robustness Analysis

To further strengthen the confidence in our findings, we conduct two-stage least square (2SLS) regressions. As our main variables of interest are CEO attribute(s) is dichotomous and endogenous, 2SLS is considered an appropriate technique to deal with endogeneity arising due to omitted variable bias and reverse causality. We take the same instruments from the matching regressions of Table 5.4.

Table 5.7 reports our analysis of the 2SLS technique. Most of our results remain the same, as reported in Table 5.5. Female CEO and CEO domain-specific experience show a positive effect on both financial performance variables in columns (1), (2), (5), and (6), respectively. The results suggest that MFIs led by female CEOs have a 6% higher return on their assets and generate 46% higher interest on loans than MFIs led by male CEOs. In the same manner, MFIs in which CEOs have prior microfinance experience outperform 28% to 55% in terms of ROA and PTY than CEOs with non-microfinance backgrounds.

In terms of CEO business education and founder CEO, the only impact on PTY turned out positive and significant. The estimated magnitude shows that CEOs with business education generate around 25 percentage higher interest on loans than CEOs with non-business education. On the other hand, founder CEOs generate 31 percentage higher interest on loans than non-founder CEOs. In terms of size, 5 out of 8 columns show a significant positive impact on the financial performance of MFIs. Among other variables, regulation has a significant negative impact on performance variables in columns (1) and (7). On the other hand, competition and being internationally initiated have an insignificant impact on performance variables. Finally, HDI shows a significant positive impact on both financial performance variables in columns (7) and (8) only.

The reported first stage F-statistic in Table 5.7 indicates the strength (weakness) of instruments. The statistics are above the threshold value of 10 in all columns, suggesting that our instruments for endogenous variables are not weak. Durbin Wu-Hausman's test of exogeneity shows a chi-square p-value < 0.05 in all specifications indicating the presence of endogeneity in our model and appropriateness of using the 2SLS technique over OLS. Overall, we find support for our hypotheses regarding MFIs with female CEO, CEO with business education, CEO with domain-specific experience, and founder CEO performed financially well and these are in line with the results of Table 5.5.

Table 5.7. Robustness analysis: CEO attributes and financial performance of MFIs

This table presents results of the instrumental variable regression (2SLS) to determine the impact of different CEO attributes on financial performance of MFIs. The instruments for first stage are gender bias for CEO female regression and MFI age for CEO business education, CEO domain-specific experience and CEO founder. The robust t-statistics, reported in parenthesis, are based on clustered standard errors at MFI level. ***, **, and * indicate significance at 1%, 5% & 10%.

Variables	(1) ROA	(2) PTY	(3) ROA	(4) PTY	(5) ROA	(6) PTY	(7) ROA	(8) PTY
CEO female	0.069*	0.461*						
	(1.98)	(2.49)						
CEO business education			1.126	0.248*				
			(1.25)	(1.96)				
CEO domain-specific exp					0.279*	0.542*		
					(2.01)	(1.98)		
CEO founder							0.092	0.307*
							(1.71)	(2.01)
Size	0.010**	-0.028	0.111*	0.016*	0.080***	-0.004	0.015**	-0.029**
	(2.66)	(-1.49)	(1.98)	(2.36)	(3.35)	(-0.18)	(3.18)	(-2.66)
Shareholder firm	0.028*	0.150*	-0.019	0.032	0.035	0.177*	0.028*	0.0433
	(2.40)	(2.35)	(-0.19)	(0.41)	(0.48)	(2.05)	(2.05)	(1.35)
Int. initiated	0.016	0.093	0.107	0.029	0.020	0.104	0.025	0.0866*
	(1.52)	(1.86)	(1.33)	(0.51)	(0.38)	(1.67)	(1.41)	(2.10)
Regulated	-0.027*	-0.047	0.049	0.011	-0.044	-0.108	-0.030*	-0.0522
	(-2.37)	(-0.79)	(0.37)	(0.12)	(-0.62)	(-1.49)	(-2.01)	(-1.50)
Competition	0.005	-0.001	0.0062	-0.0165	0.014	-0.004	-0.020	-0.063
	(0.19)	(-0.11)	(0.23)	(-0.83)	(0.81)	(-0.26)	(-0.01)	(-0.74)
HDI	-0.122	-0.138	0.018	0.140	0.081	0.232	0.140**	0.243*
	(-1.81)	(-0.48)	(0.050)	(0.530)	(0.350)	(1.67)	(3.05)	(2.35)
Constant	-0.239*	0.787*	0.001	0.723	0.559	1.908**	-0.335***	0.577***
	(-2.28)	(1.99)	(0.120)	(1.74)	(1.22)	(2.60)	(-4.28)	(3.30)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of MFIs	327	327	228	228	301	301	304	304
No of Observations	813	813	456	456	705	705	730	730
Adjusted R^2	0.071	0.101	0.103	0.110	0.072	0.134	0.091	0.081
P-value chi^2	0.000	0.000	0.000	0.000	0.001	0.031	0.000	0.000
First stage F-stat	12	16	12	13	10	14	10.89	11
Durbin Wu-Hausman test of exogeneity	0.041	0.000	0.003	0.005	0.003	0.000	0.001	0.001

5.6. Conclusion

We empirically examine the impact of different CEO attributes: CEO gender, CEO business education, CEO domain-specific experience, and founder CEO on the financial performance of MFIs using hand-collected data of 375 MFIs from 1999 to 2012 in 78 countries of the world. Based on upper echelon and resource-based theories, our results suggest that MFIs headed by female CEO, CEO with business education, domain-specific experience, and as a founder member show an increase in financial performance. These results are robust to different alternative methods (Heckman and 2SLS), and different proxies of financial performance variables.

Our findings clearly support our hypotheses. MFIs are operating in an industry where the majority of clients are female, thus having female CEOs not only confirm the gender bias but also have the better business acumen that results in enhanced financial performance of these institutions and in line with the findings of Strom et al. (2014) and Francoeur (2008). The favourable impact of having a female CEO points to the need for better monitoring of the MFI-customer connection, as well as the female CEO's high ability due to a better fit of leadership and tasks. CEOs with business education are more dynamic, take riskier incentives, and have more innovative business models, thus exhibit higher profitability (King et al., 2016; Pascal et al., 2017).

On the other hand, MFIs having CEOs with domain-specific experience show significant financial performance as relevant domain expertise allows these CEOs to spend a significant time of their career in one functional area that enables them to relate and visualize the business problems and offer relevant solutions. Therefore, improve the overall efficiency and performance of the organizations (Mersland et al. 2019; Brown & Duguid, 1991).

We also find support for the impact of founder CEO on the financial performance of MFIs. Because founder-CEOs are more internally motivated in making decisions and putting them into action than hired CEOs, MFIs led by founder CEOs have fewer agency conflicts than other MFIs (i.e., lower agency costs related to employee contracts, funding relationships, and other stakeholder relations). As a result, there is less of a need for costly managerial incentives. As a result of the special link that exists between the founder CEO and MFI, he(she) can play a pivotal role in defining the MFI's objective and pursuing its operations, which leads to performance differences (Adams et al, 2009; Randoy et al., 2015).

We also find support that female CEO and founder CEO with longer tenure have a significant effect on the financial performance of MFIs. Over the time female CEO and founder CEO are better able to understand the organizational complexities on one hand, and on another hand, these CEOs can fully utilize their potential. These results are in line with Gupta & Govindarajan (1986) and Michel & Hambrick (1992).

Our results have important implications for practitioners, policymakers, and MFIs. The board must evaluate a candidate's demographic qualities while selecting and developing qualified persons for the role of MFI’s CEO because it is the most important position in the company. Recruiting female CEOs, according to the findings of our study, not only encourages more female clients of MFIs but also enables MFIs to better address their concerns and design tailor-made products. It also indicates the high ability of female CEOs due to a superior match of leadership and tasks, which leads to the improved financial performance of MFIs. We believe as the majority of microfinance clients are women, and the percentage of female CEOs in MFIs is over 30% (our sample shows 25%), which is three times higher than the percentage of female CEOs in other financial and non-financial enterprises around the world (Strom et al., 2014). As a result, increasing this percentage is not only possible, but also attainable, because the majority of MFI clients are female, and MFIs that recruit female CEOs are better equipped to deal with their clients' demands and make better decisions, resulting in improved financial performance.

In the same way, recruiting people with more business knowledge and domain experience enhances the financial returns of these institutes. MFIs in which CEOs possess business degrees and prior microfinance experience are better able to instil altruistic behaviour, which needs an insight into the challenges of borrowers and the environment in which the MFIs operate. It also has an impact on the CEO's strategic decisions by impacting his or her ability to deploy talents that result in both financial and social development for the MFI.

The founder CEO's role and relevance show that maintaining the same person in the crucial position of CEO allows MFI to make more financial development because the founder CEO has an emotional tie to the company. This unique relationship allows the CEO to play a pivotal role in defining the firm's objective and pursuing the activities that lead to differences. Additionally, our findings imply that the size and type of ownership of MFIs have a significant impact on their financial performance.

Although our results provide important insights on the relationship between different CEO attributes and financial performance of MFIs, few limitations could affect the results. Data availability confines us not to focus on many other CEO attributes (age, ethnicity, inner circle, narcissism, humility, confidence, etc.) that might have a significant effect on performance. The analysis of current research is only limited to the financial performance of MFIs. It could be useful to incorporate the social and operational performance of these institutions to see a holistic picture. Another limitation of our study is that, while we try to capture the moderating effect of CEO tenure on CEO attributes and financial performance of MFIs, it could be interesting to analyze this effect in case of CEO replacement from female to male (female to female) and founder to non-founder CEO.

The use of different estimation techniques may enhance confidence in the robustness of the results, though none of our identification strategies can fully resolve endogeneity issues; reverse causality, sample selection bias, and omitted variable bias. Therefore, our results should be interpreted with caution, as these can be idiosyncratic to the sample MFIs and the period. Future studies can use a broader number of MFIs by combining data of rating agencies and the Mix Market with a larger set of control variables to strengthen the current findings. We hope that these results spur additional research encompassing the limitations identified here, that can extend our understanding of the antecedents of various CEO attributes as well as of the mechanisms underlying the relationship between CEO-specific differences and organizational performance.

Appendix 5.1.

This table shows the sample countries along with number of MFIs in each country.

No	Country	MFIs	No	Country	MFIs
1	Albania	2	41	Lebanon	1
2	Argentina	2	42	Madagascar	2
3	Armenia	4	43	Malawi	2
4	Azerbaijan	3	44	Mali	3
5	Bangladesh	2	45	Mexico	23
6	Benin	6	46	Moldova	2
7	Bolivia	12	47	Mongolia	2
8	Bosnia Herzegovina	10	48	Montenegro	2
9	Brazil	18	49	Morocco	5
10	Bulgaria	2	50	Mozambique	1
11	Burkina Faso	3	51	Nepal	5
12	Burundi	1	52	Nicaragua	12
13	Cambodia	14	53	Niger	3
14	Cameroon	3	54	Nigeria	3
15	Chad	2	55	Pakistan	1
16	Chile	2	56	Palestine	2
17	China	4	57	Paraguay	2
18	Colombia	7	58	Peru	27
19	Congo Democratic RP	1	59	Philippines	11
20	Costa Rica	2	60	Romania	3
21	Croatia	1	61	Russia	9
22	Dominican RP	4	62	Rwanda	4
23	Ecuador	18	63	Samoa	1
24	Egypt	4	64	Senegal	7
25	El Salvador	5	65	Serbia	1
26	Ethiopia	5	66	Sierra Leone	1
27	Gambia	1	67	South Africa	3
28	Georgia	5	68	Sri Lanka	1
29	Ghana	3	69	Sudan	1
30	Guatemala	6	70	Tajikistan	2
31	Guinea	2	71	Tanzania	2
32	Haiti	2	72	Togo	2
33	Honduras	9	73	Tunisia	1
34	India	25	74	Turkey	1
35	Indonesia	2	75	Uganda	9
36	Jordan	3	76	Vietnam	3
37	Kazakhstan	3	77	Yemen	1
38	Kenya	6	78	Zambia	2
39	Kosovo	3			
40	Kyrgyzstan	5		Total MFIs	375

CHAPTER 6
CONCLUSIONS

6.1. Conclusions and policy implications

Microfinance institutions' continued existence and growth provide evidence that if poor people cater to mainstream banks and financial institutions, there would be no vocabulary and campaign of microfinance institutions. The emergence of microfinance institutions promises to provide financial services to the poor and deprived class of society. For more than four decades, microfinance institutions have been seen as the only option in many developing countries to provide credit for consumption and investment purposes to poor households, so that they can generate revenue, build savings, handle emergencies, manage risks, become micro-entrepreneurs and eventually come out of poverty. This thesis empirically evaluates the performance of global microfinance institutions (MFIs). It focuses on three research projects, in which the first two analyze the relative performance of these institutions in a dual financial system where microfinance institutions co-exist with commercial banks. The third project analyzes the impact of different CEO attributes on the financial performance of microfinance institutions.

The first research project investigates the impact of microfinance institutions on financial development, economic welfare, and banking efficiency. Primarily, I explore whether and how MFIs can accelerate financial development, economic growth, reduce income inequality and poverty at the country level in an environment where they co-exist with commercial banks. Furthermore, I investigate whether the existence of microfinance institutions alongside commercial banks could increase the efficiency of the whole banking system by putting banks into more competition. I observe that microfinance institutions increase financial development, whether it is in terms of financial intermediation as measured by bank deposits or the allocation of credit as measured by private credit. I also find support for reducing income inequality and poverty, but not for an increase in economic growth.

Analyzing further the link between microfinance institutions' presence and commercial banks' efficiency, I observe that microfinance institutions negatively impact the commercial banks' cost structures. It implies that when conventional banks operate alongside microfinance institutions, they are more cost-effective. MFIs increase the efficiency of commercial banks and discipline them by subjecting them to more competition. My results are robust to different estimation techniques (OLS & FE), sub-sample analysis, and different proxies of independent and dependent variables.

The second research project compares microfinance banks (MBs) and commercial banks (CBs) in a sample of countries, where both types of banks co-exist by analyzing the differences in four performance dimensions: efficiency, business model, stability, and asset quality. I find MBs are inefficient, indicating that their cost structures are higher as to CBs. I also find significant differences in the business orientation of the two groups. I find MBs have higher intermediation, wholesale funding, and non-interest income: implying that microfinance banks are diversifying towards commercial funding and non-lending activities. In terms of stability, I find that MBs are more liquid and better able to meet their short-term obligations and are more stable than CBs in the long-term.

Moreover, I find that MBs have poor asset quality as compared to CBs. They have more risky loans (non-performing loans), higher loan loss reserves, and loan loss provisions at their disposal. Overall, the second project's finding infers that microfinance banks prove themselves on a standalone basis that they are better than commercial banks in higher intermediation, non-interest income, wholesale funding, and liquidity. Still, they need to cut down their cost structures (administrative and operating costs) and improve their asset quality due to adverse selection, moral hazard, or less diversified loan portfolio. I obtain consistent results in sub-sample analysis and different estimation techniques (Pooled OLS, SUR, and PSM).

The third research project examines the impact of different CEO attributes: gender, business education, domain-specific experience, and founder status on the financial performance of MFIs. The results suggest that MFIs headed by a female CEO, a CEO with business education, domain-specific experience, and a CEO founder increase the financial performance of MFIs. These results are robust to different estimation methods (Heckman, SUR, and 2SLS), and different proxies of financial performance variables. My findings provide implications for MFIs, academicians, and policymakers that specific CEO attributes are vital for the increased financial performance of MFIs. As MFIs are operating in an industry where most clients are female, having a female CEO is associated with an increased focus on women clientele and better business acumen, resulting in enhanced financial performance. My findings also suggest that CEOs with business education (degrees in any of the disciplines: accounting, economics, business, commerce, or finance) are more dynamic, take riskier incentives, prompt decisions, and have more innovative business models thus exhibiting higher financial performance.

Similarly, CEOs with domain expertise show significant financial performance as relevant experience allows them to spend a significant time of their career in one functional area that enables them to relate and visualize the business problems and relevant solutions. I also find support for the impact of founder CEO on the financial performance of MFIs, as the founder

CEO has an emotional attachment with the firm, this special bond enables the CEO to play an extraordinary role in defining the mission and pursuing the activities of the firm that leads to performance differentials. I also analyze the moderating effect of tenure on the CEO attributes and financial performance of MFIs. My findings suggest that female CEO and founder CEO with longer tenure have a significant positive effect on the financial performance of MFIs. These findings infer that longer tenure enables the female CEO and founder CEO to understand the organizational complexities better and fully utilize the potential that aligns them towards achieving enhanced financial performance.

The three empirical projects of this thesis offer important implications to MFIs, policymakers, and regulators. Since MFIs increase financial development, credit allocation, and reduce poverty, inequality, and operational cost of commercial banks, policymakers must begin to take steps to incorporate microfinancing into a country's mainstream financial system. MFIs’ operations and branches must be opened in places where they have a market niche or where commercial banks cannot support low-income borrowers. Additionally, MFIs could become more active with start-ups and small-scale enterprises, an operation that has the potential to boost economic growth. Furthermore, policymakers and regulators must introduce new technical ways: mobile banking and virtual branch networks to minimize the operational cost of microfinance banks and enhance their penetration in remote areas. Likewise, policymakers and regulators should consider adopting systematic risk management techniques such as credit scoring, computerized databases of borrowers' credit histories, loan delinquency rates, and default records to increase the asset quality of these institutions. Finally, MFIs must consider the demographic characteristics when identifying and selecting suitable candidates for the position of CEO. The research findings indicate that MFIs that hire female CEOs, CEOs with business degrees, CEOs with microfinance experience, and CEOs who are also the founders of MFIs are more likely to increase the financial performance of these institutions.

6.2. Limitations and direction for future research

The three research projects in this thesis investigate the performance of MFIs in a global setting. However, these projects' findings are subject to various limitations, therefore providing direction for future research.

First, the current research focuses on MFIs' contributions to financial development and economic welfare. Future research can extend this line of inquiry by examining the magnitude of this impact and answer new questions, such as: What is the change in the deposits base and credit allocation of the economy after the presence of MFIs in a dual financial system? What is the change in a country's poverty and inequality indexes after the presence of MFIs in the dual financial system? How many people are financially inclusive as a result of the presence of MFIs in financial system? What is the difference in poor people's living conditions after they are supported by MFIs? How many new business ventures are launched, and how many new women join the workforce as a result of the presence of MFIs in financial system? In addition, based on data availability future studies can make a regional comparison of MFIs in order to see where these institutions are more active in increasing financial development, economic welfare, and efficiency of commercial banks.

Second, I combine two data sets of MFIs and commercial banks, the country coverage of these two data sets does not perfectly match, resulting in the absence of certain countries. Due to the combination of different data sources, the number of observations of variables under consideration varies from each other. Regression analysis further encounters the variation in the number of usable observations of variables across different models. Moreover, different variables (MFI-Share variable) and methodologies (lag transformation) are constructed to address various research questions, minimizing the number of observations of variables. Conditional on data availability, future research can extend the MFIs performance in a macroeconomic context with a larger number of countries and a broader set of variables to further validate the findings of this research.

Third, the research conducted in the second project is the very first step to explore the differences between microfinance and commercial banks. To better understand the differences between the two bank groups, more information and the disaggregated data regarding their products, financial service provision, and clientele are needed. A good avenue for future research is the incorporation of those commercial banks having microfinance windows or some specific products targeted specifically to poor or low-income clientele. Additionally, it is very interesting to analyze how the growth of microfinance banks affects the outreach, access, and usage of products and services of commercial banks.

Fourth, the current research caters to both for-profit (banks and NBFIs) and non-profit MFIs (NGOs and COOP) in projects 1 & 3. I am more interested in the aggregate effects of MFIs; therefore, I include all MFIs regardless of their sub-types in my research. Generally, financial motives are a priority for for-profits MFIs whereas non-profits focus more on social issues like poverty, inequalities, and welfare. Future research can study the behaviour of a particular type of MFIs and also compare different types of MFIs based on their financial and social orientation and come up with new insights.

Fifth, the third research project explores the influence of CEO attributes on the financial performance of MFIs. Data availability restricts me to focus on some other attributes of the CEO (e.g. age, nationality, inner circle, narcissism, humility, confidence). These attributes other than those used in this analysis may significantly impact performance of these institutes. Further, the analysis of current research is only limited to the financial performance of MFIs. It could be useful to incorporate social and operational performance of these institutes to see a holistic picture. Another limitation of this research is that while I try to capture the moderating effect of CEO tenure on CEO attributes and financial performance of MFIs, it could be interesting if I can analyze this effect in case of CEO replacement from female to male (female to female) and founder to non-founder CEO. I hope that these results inspire more research into the constraints found here in order to gain a better understanding of different CEO attributes and the processes that underpin the relationship between individual differences in CEOs and company performance.

Sixth, due to the unavailability of data, current research is unable to include more MFI level control variables that are particularly important in a cross-country context such as borrowers' socio-economic characteristics: gender, age, education, or income, as well as some other control variables focusing on contact and frequency of visits, geographical distance, and relationship quality (old or new) among MFIs and their stakeholders that may validate or strengthen the current findings.

Seventh, all projects of this thesis use unbalanced panel data, as it is a common practise in most of the studies related to MFIs. The reason is that most studies use data from the Microfinance Information Exchange (Mix Market), which was established in 2002. Mix Market follows the International Financial Reporting Standards (IFRS), and its analysts scrutinize the data for outliers, extremes, or discrepancies, standardize the data according to globally agreed accounting standards, and finally converts data in to a single currency (US dollars) for better comparison (Maksoduva, 2010). Still, there is a lack of continuity in the Mix dataset, especially prior to 2000. This may be due to two reasons: first, not all MFIs disclose and share their data with Mix Market that leads to country-wise data variation and second, since Mix's arrival, some new MFIs have arisen and others have stopped operations, resulting in a huge difference in Mix's data. It will be very useful, if future studies can combine Mix Market data with data from MFI rating agencies that not only increase the data availability but also enable researchers to explore new avenues that are not possible either with Mix data or rating agencies data.

Finally, we use the data from a global platform: Microfinance Information Exchange (MIX Market) that aggregates data on MFIs. These data are considered to be of high quality because they are examined by in-house analysts after submission. Furthermore, all the data submitted to MIX Market are standardized to facilitate comparability (Ledgerwood, 2013). Although the Mix Market is open to all institutions and aims to increase the number of reporting institutions, it is up to each microfinance institution to decide whether to participate and report data to the Mix market or not. Thus, despite the high quality and usability of these data, it may suffer from a self-selection bias due to an over-representation of financially sustainable MFIs, who are willing to comply with the MIX market's extensive reporting standards. Therefore, there is a high possibility that the MFIs reporting to the MIX Market are the best-performers in the microfinance industry (Armendáriz & Labie, 2011).

Fortunately, the self-selection bias is partly mitigated by the fact that the MIX database contains data on more than 2500 MFIs across 116 countries of the world, thus, covering 85% of microfinance clients in six regions of the world namely: Latin America & the Caribbean, South

Asia, Eastern Europe & Central Asia, South Africa, Middle East & North Africa, and East Asia & Pacific (Sun & Liang, 2021; Ahmad et al., 2020; Chakrabarty & Bass, 2014; Ledgerwood, 2013). MIX Market data are therefore not a random sample of all MFIs, but it is the most representative sample of MFIs across the globe. Nevertheless, the statistical inferences drawn from the MIX dataset cannot be valid for the entire microfinance universe. As we use Mix Market data in this thesis, therefore, the results of these studies need to be interpreted with caution, as these can be idiosyncratic to the sample countries and period and may not be generalized to the whole universe of microfinance institutions.

REFERENCES

Abakaeva, J. & Glisovic-Mezieres, J. (2009). Are deposits a stable source of funding for microfinance institutions? CGAP Brief, 1-31.

Abedifar, P., Hasan, I., & Tarazi, A. (2016). Finance-growth nexus and dual-banking systems: Relative importance of Islamic banks. *Journal of Economic Behavior & Organization*, *54,* 30-48.

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics, 94*(2), 291–309.

Adams, R., Almeida, H., & Ferreira, D. (2009). Understanding the relationship between founder-CEOs and firm performance. *Journal of Empirical Finance, 16*(1), 136–150.

Adusei, M. (2021). Interest rate and the social performance of microfinance institutions. *Quarterly Review of Economics and Finance*, *80*, 21–30.

Adusei, M., & Obeng, E. Y. T. (2019). Board gender diversity and the capital structure of microfinance institutions: A global analysis. *Quarterly Review of Economics and Finance*, *71*, 258–269.

Aghion, P., Caroli, E., & Garccia-Peñalosa, C. (1999). Inequality and economic growth: The perspective of the new growth theories. *Journal of Economic Literature*, *37*(4), 1615–1660.

Ahlin, C., & Jiang, N. (2008). Can micro-credit bring development? *Journal of Development Economics, 86*(1), 1–21.

Ahlin, C., Lin, J., & Maio, M. (2011). Where does microfinance flourish? Microfinance institution performance in macroeconomic context. *Journal of Development Economics, 95*(2), 105–120.

Akerlof, G. A. (1970). The markets for lemons: Quality uncertainity and market mechanism. *The Quarterly Journal of Economics*, *84*(3), 488–500.

Albanesi, S. (2007). Inflation and inequality. *Journal of Monetary Economics, 54*(4), 1088–1114.

Alldén, S. (2009). Microfinance and post-conflict development in Cambodia and Timor-Leste. *Sojourn: Journal of Social Issues in Southeast Asia*, *24*(2), 269–284.

Altunbas, Y., Carbo, S., Gardener, E. P. M., & Molyneux, P. (2007). Examining the relationships between capital, risk and efficiency in European banking. *European Financial Management*, *13*(1), 49–70.

Armendáriz, B., & Morduch, J. (2010). *The economics of microfinance.* (2nd Ed). Cambridge, MA: MIT Press.

Armendáriz, B, & Labie, M. (2011). The Handbook of Microfinance: World Scientific Singapore.

Ashraf, B. N. (2018). Do trade and financial openness matter for financial development? Bank-level evidence from emerging market economies. *Research in International Business and Finance, 44,* 434–458.

Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *Leadership Quarterly*, *21*(6), 1086–1120.

Arrow., K. J. (1984). *The economics of information*. Belknap Press of Harvard University Press, Cambridge, MA.

Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, M. (2008). How important are financing constraints? The role of finance in the business environment. *World Bank Economic Review. 22,* 483–516.

Baier, S. L., Clance, M., & Dwyer, G. P. (2012). Banking crises and economic freedom. Economic freedom of the world, Annual Report, 201–218.

Balla, E., & Rose, M. (2011). Loan loss reserves, accounting constraints, and bank ownership structure. *Journal of Economics and Business, 78,* 92–117.

Banerjee, A. V., & Duflo, E. (2007). The economic lives of the poor. *Journal of Economic Perspectives*, *21*(1), 141–167.

Banto, J. M., & Monsia, A. F. (2021). Microfinance institutions, banking, growth and transmission channel: A GMM panel data analysis from developing countries. *Quarterly Review of Economics and Finance*, *79*, 126–150.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120.

Barnett, W. P., Greve, H. R., & Park, D. Y. (1994). An Evolutionary model of organizational performance. *Strategic Management Journal*, *15*, 11–28.

Barr, M. S. (2005). Microfinance and financial development. *Michigan Journal of International Law, 26*(1), 271–296.

Barr, R, S., Seiford, L, M., and Siems, T, F., (1994). Forecasting bank failure: A non-parametric frontier estimation approach. *Recherchés Economiques de Louvain, 60*(4), 417-429

Battilana, J., & Dorado, S. (2010). Building sustainable hybrid organizations: The case of commercial microfinance organization. *The Academy of Management Journal, 53*(6), 1419–1440.

Beck, T., Levine, R., & Loayza, N. (2000.) Finance and the source of growth. *Journal of Financial Economics, 58*(1), 261–300.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank concentration, competition, and crises: First results. *Journal of Banking and Finance, 30*(5), 1581–1603.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth, 12*(1), 27–49.

Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. *Journal of Banking & Finance. 37,* 433–447.

Beck, T., Behr, P., & Guettler, A. (2013). Gender and banking: Are women better loan officers? *Review of Finance*, *17*(4), 1279–1321.

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy, 70,* 9–49.

Becker, G. S. (1973). A theory of marriage. *Journal of Political Economy*, *81*(4), 813–846.

Beisland, L. A., & Mersland, R. (2012). An analysis of the drivers of microfinance rating assessments. *Nonprofit and Voluntary Sector Quarterly, 41*(2), 213–231.

Beisland, L. A., Djan, K. O., Mersland, R., & Randøy, T. (2021). Measuring social performance in social enterprises: A global study of microfinance institutions. *Journal of Business Ethics*, *171*(1), 51–71.

Bergh, D. D. (2001). Executive retention and acquisition outcomes: A test of opposing views on the influence of organizational tenure. *Journal of Management*, *27*(5), 603–622.

Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banking. *Journal of Banking and Finance, 21,* 849–870.

Berger, A. N., & Udell, G. F. (2006). A more complete conceptual framework for SME finance. *Journal of Banking and Finance, 30*(11), 2945–2966.

Berger, A. N., Frame, W. S., & Ioannidou, V. (2016). Reexamining the empirical relation between loan risk and collateral: The roles of collateral liquidity and types. *Journal of Financial Intermediation*, *26*, 28–46.

Berger, A. N., & Hannan, T. H. (1998). The Efficiency cost of market power in the banking industry: A test of the "Quiet Life" and related hypotheses. *The Review of Economics and Statistics*, *80*(3), 454–465.

Berger, A. N., Herring, R. J., & Szego, G. P. (1995). The role of capital in financial institutions. *Journal of Banking and Finance, 19,* 393–430.

Berger, A. N., Hunter, W. C., & Timme, S. G. (1993). The efficiency of financial institutions: A review and preview of research past, present and future. *Journal of Banking and Finance, 17*(2–3), 221–249.

Bergh, D. D. (2001). Executive retention and acquisition outcomes: A test of opposing views on the influence of organizational tenure. *Journal of Management, 27*(5), 603–622.

Bertrand, M., & Schoar, A. (2003). Managing with Style: The Effect of managers on firm policies. *The Quarterly Journal of Economics, 118*(4), 1169–1208.

Besley, T. (1994). How do market failures justify interventions in rural credit markets? *The World Bank Research Observer*, *9*(1), 27–47.

Besley, T., & Coate, S. (1995). Group lending, repayment incentives and social collateral. *Journal of Development Economics*, *46*(1), 1–18.

Bardhan, P., & Udry, C. (1999). *Development microeconomics.* Oxford University Press, 1-242.

Bibi, U., Balli, H. O., Matthews, C. D., & Tripe, D. W. L. (2018). Impact of gender and governance on microfinance efficiency. *Journal of International Financial Markets, Institutions and Money*, *53*, 307–319.

Bikbaeva, G., & Gaibnazarova, M. (2009). Impact of microfinance on alleviating rural poverty in Uzbekistan. *Problems of Economic Transition, 52*(2), 67–85.

Bitar, M., Madiès, P., & Taramasco, O. (2017). What makes Islamic banks different? A multivariate approach. *Economic Systems, 41*(2), 215–235.

Blume, L. E., & Sargent, T. J. (2015). Harrod 1939. *The Economic Journal*, *125*, 350–377.

Bos, J. W. B., & Millone, M. (2015). Practice what you preach: Microfinance business models and operational efficiency. *World Development, 70*, 28–42.

Bouman, F. J. A. (1995). Rotating and accumulating savings and credit associations: A development perspective. *World Development*, *23*(3), 371–384.

Breuer, J. B. (2006). Problem bank loans, conflicts of interest, and institutions. *Journal of Financial Stability, 2*(3), 266–285.

Brown, J. S., & Duguid, P. (1991). Organizational learning and communities of practice: Toward a unified view of working, learning, and innovation. *Organizational Science, 2*(1), 40–57.

Brooks, C. (2008). *Introductory Econometrics for Finance.* Cambridge University Press, Cambridge.

Boyd, J. H., & Prescott, E. C. (1986). Financial intermediary-coalitions. *Journal of Economic Theory*, *38*(2), 211–232.

Buckle, M., & Thompson, J. (2005). *The UK financial system: Theory and practice.* Manchester University Press.

Buera, F. J., & Kaboski, J. P. (2012). Scale and the origins of structural change. *Journal of Economic Theory, 147*(2), 684–712.

Buera, F. J., Kaboski, J. P., & Shin, Y. (2012). The macroeconomics of microfinance. NBER Working Paper.

Burgess, R., & Pande, R. (2005). Can rural banks reduce poverty? Evidence from the Indian social banking experiment. *American Economic Review, 95,* 780-795.

Brei, M., Ferri, G., & Leonardo, G. (2018). Financial structure and income inequality. *BIS Working Papers No 756*, (Vol. 54).

Carter, D. A., Simkins, B. J., & Simpson, W. G. (2003). Corporate governance, board diversity, and firm value. *The Financial Review, 38,* 33–53.

Caudill, S. B., Gropper, D. M., & Hartarska, V. (2009). Which microfinance institutions are becoming more cost effective with time? Evidence from a mixture model. *Journal of Money, Credit and Banking, 41*(4), 651–672.

CGAP (2014). Advancing financial inclusion to improve the lives of the poor. Washington, DC: Consultative Group to Assist the Poor, *CGAP Annual Report.*

CGAP (2010). Access to finance for the poor. Washington, DC: Consultative Group to Assist the Poor, *CGAP Annual Report.*

CGAP (2009). The impact of the financial crisis on microfinance institutions and their clients. Consultative Group to Assist the Poor, *CGAP Annual Report.*

CGAP (2005). Mapping of funding flows. Washington, DC: Consultative Group to Assist the Poor, *CGAP Annual Report.*

CGAP (2002). Financial services for the poor: The basics. Washington, DC: Consultative Group to Assist the Poor, *CGAP Annual Report.*

Chakrabarty, S., & Bass, A. E. (2014). Corporate governance in microfinance institutions: Board composition and the ability to face institutional voids. *Corporate Governance: An International Review, 22*(5), 367–386.

Chen, G., Rasmussen, S., & Reille, X. (2010). Growth and vulnerabilities in microfinance. Focus Note 61. Washington, D.C.: CGAP.

Chevalier, J., & Ellison, G. (1999). Are some mutual fund managers better than others? The *Journal of Finance, 4*(3), 875–899.

Christen, R, P., Lauer, K., Lyman, T, R., & Rosenberg, R. (2012). A guide to regulation and supervision of microfinance. Washington, D.C.: CGAP.

Collins, D., Morduch, J., Rutherford, S., & Ruthven, O. (2009). *Portfolios of the poor: how the world's poor live on $2 a day*. Princeton University Press.

Conning, J. (1999). Outreach, sustainability and leverage in monitored and peer-monitored lending. *Journal of Development Economics, 60*(1), 51–77.

Cornett, M. M., McNutt, J. J., Strahan, P. E., & Tehranian, H. (2011). Liquidity risk management and credit supply in the financial crisis. *Journal of Financial Economics, 101*(2), 297–312.

Crossland, C., Zyung, J., Hiller, N. J., & Hambrick, D. C. (2014). CEO career variety: Effects on firm-level strategic and social novelty. *Academy of Management Journal*, *57*(3), 652–674.

Cull, R., Demirgüç-kunt, A. & Morduch, J. (2007). Financial performance and outreach: A global analysis of leading micro banks, *The Economic Journal, 117,* 107-133.

Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2009). Microfinance meets the market. *Journal of Economic Perspectives, 23*(1), 167–192.

Cull, R., Demirgüç-kunt, A., & Morduch, J. (2014). Banks and microbanks. *Journal of Financial Services Research, 46,* 1–53.

D'Espallier, B., Guerin, I., & Mersland, R. (2011). Women and repayment in microfinance: A global analysis. *World Development, 39*(5), 758–772.

De Koker, L., & Jentzsch, N. (2013). Financial Inclusion and financial Integrity: Aligned Incentives? *World Development, 44*, 267–280.

De la Torre, A., Peria, M. S. M., & Schmukler, S. L. (2010). Bank involvement with SMEs: Beyond relationship lending. *Journal of Banking and Finance, 34*(9), 2280–2293.

Delgado, M. S., Parmeter, C. F., Hartarska, V., & Mersland, R. (2014). Should all microfinance institutions mobilize microsavings? Evidence from economies of scope. *Empirical Economics, 48*(1), 193–225.

Delis, M. D., & Kouretas, G. P. (2011). Interest rates and bank risk-taking. *Journal of Banking and Finance, 35*(4), 840–855.

Demirguc-Kunt, A., & Klapper, L. (2013). Measuring financial inclusion: Explaining variation in use of financial services across and within countries. Brookings Papers on Economic Activity.

Demirgüç-Kunt, A., & Huizinga, H. (2010). Bank activity and funding strategies: The impact on risk and returns. *Journal of Financial Economics, 98*(3), 626–650.

Demsetz, H. (1973). Industry structure, market rivalry, and public policy. *The Journal of Law & Economics, 16*(1), 1–9.

Dewatripont, M., Rochet, J. C., & Tirole, J. (2010). *Balancing the banks: Global lessons from the financial crisis.* Princeton University Press. 1–138.

Devos, J., Landeghem, V. H., & Deschoolmeester, D. (2010). The theory of the lemon markets in IS Research. Ghent University working paper, Belgium.

Di Bella, G. (2011). The impact of the global financial crisis on microfinance and policy implications. IMF Staff Papers.

Diamond, D. W. (1984). Financial intermediation and delegated monitoring. *Review of Economic Studies*, *51*(3), 393–414.

Dixit, A. (1987). Trade and insurance with moral hazard. *Journal of International Economics*, *23*(3–4), 201–220.

Domar, E. D. (1947). Expansion and employment. *The American Economic Review*, *37*(1), 34–55.

Donkers, B., Bertrand, M., & Arthur, V, S. (2001). Estimating risk attitudes using lotteries: A large sample approach. *Journal of Risk and Uncertainty, 22*(2), 165-195.

Donou-Adonsou, F., & Sylwester, K. (2016). Financial development and poverty reduction in developing countries: New evidence from banks and microfinance institutions. *Review of Development Finance, 6*(1), 82–90.

Donou-Adonsou, F., & Sylwester, K. (2017). Growth effect of banks and microfinance: Evidence from developing countries. *Quarterly Review of Economics and Finance, 64*, 44–56.

Draca, M., Machin, S., & Reenen, J. Van. (2011). Minimum wages and firm value. *American Economic Journal: Applied Economics*, *36*(1), 129–151.

Drucker, P. F. (1992). *Managing the non-profit organization: Principles and practices*. New York: Collins.

Elahi, Q. K., & Rahman, M. L. (2006). Micro-credit and micro-finance: Functional and conceptual differences. *Development in Practice*, *16*(5), 476–483.

European Microfinance Platform (2016). http://www.e-mfp.eu/Autumn 2016 Newsletter.

Ernst, E. (2019). Finance and jobs: How financial markets and prudential regulation shape unemployment dynamics. *Journal of Risk and Financial Management*, *12*, 1–30.

Fahlenbrach, R. (2009). Founder-CEOs investment decisions and stock market performance. *Journal of Financial and Quantitative Analysis, 44*(2), 439–466.

Fernando, J. L. (2006). Microfinance: Perils and prospects. London: Routledge.

Finkelstein, S. (1992). Power in top management teams dimensions, measurement, and validation. *The Academy of Management Journal*, *35*(3), 505–538.

Finkelstein, S., & Hambrick, D, C. (1997). Strategic leadership: Top executives and their efforts on organizations. *The Academy of Management Review, 22*(3), 802–805.

Finkelstein, S., & Hambrick, D. C. (1990). Top management team tenure and organizational outcomes: The moderating role of managerial discretion. *Administrative Science Quarterly, 35*(3), 484–503.

Fischer, H. M., & Pollock, T. G. (2004). Effects of social capital and power on surviving transformational change: The case of initial public offerings. *Academy of Management Journal, 47*(4), 463–481.

Francoeur, C., Labelle, R., & Sinclair-Desgagné, B. (2008). Gender diversity in corporate governance and top management. *Journal of Business Ethics, 81*(1), 83–95.

Frank, C., Lynch, E., & Schneider-Moretto, L. (2008). Stemming the tide of mission drift: Microfinance transformations and the double bottom Line. WWB Focus Note.

Frydman, C. (2019). Rising through the ranks: The evolution of the market for corporate executives, 1936–2003. *Management Science*, *65*(11), 4951–4979.

Galema, R., Lensink, R., & Mersland, R. (2012). Do powerful CEOs determine microfinance performance? *Journal of Management Studies, 49*(4), 718–742.

Ganle, J. K., Afriyie, K., & Segbefia, A. Y. (2015). Microcredit: Empowerment and disempowerment of rural women in Ghana. *World Development, 66,* 335–345.

Ghatak, M. (2000). Screening by the company you keep: Joint liability lending and the peer selection effect. *The Economic Journal*, *110*, 601–631.

Ghatak, M., & Guinnane, T. W. (1999). The economics of lending with joint liability: Theory and practice. *Journal of Development Economics*, *60*(1), 195–228.

Godfrey, P. C., & Hill, C. W. L. (1995). The problem of unobservables in strategic management research. *Strategic Management Journal*, *16*(7), 519–533.

Goldsmith, R. W. (1969). *Financial structure and development.* New Haven, Yale University Press.

Gonzalez, A. (2007). Efficiency drivers of microfinance Institutions (MFIs): The case of operating costs. Micro Banking Bulletin.

Gonzalez, A. (2010). Is microfinance growing too fast? *MIX Data Brief (5).*

Gonzalez, A. (2011). Lessons for strengthening microfinance institutions through financial crises, fluctuation in food and fuel prices, and other major risks. Microcredit Summit Campign.1-14.

Gonzalez, L., Diniz, E. H., & Pozzebon, M. (2015). The value of proximity finance: How the traditional banking system can contribute to microfinance. *Innovations 10(1-2)*, 125-137.

Graham, J. R., Harvey, C. R., & Puri, M. (2013). Managerial attitudes and corporate actions. *Journal of Financial Economics, 109*(1), 103–121.

Guiyazuddin, M. A., & Gupta, S. (2012). Andhra Pradesh MFI crisis and its impact on clients. MicroSave Consulting (MSC), IFMR - Centre for microfinance.

Gull, A. A., Nekhili, M., Nagati, H., & Chtioui, T. (2018). Beyond gender diversity: How specific attributes of female directors affect earnings management. *British Accounting Review, 50*(3), 255–274.

Gupta, A. K., & Govindarajan, V. (1986). Resource sharing among SBUs: Strategic antecedents and administrative implications. *The Academy of Management Journal, 29*(4), 695–714.

Gupta, N., & Shaw, J. D. (2014). Employee compensation: The neglected area of HRM research. *Human Resource Management Review*, *24*(1), 1–4.

Gurley, J. G., & Shaw, E. S. (1960). *Money in a theory of finance.* Washington, D.C.: The Brookings Institution.

Gyapong, E., & Afrifa, G. A. (2021). National culture and women managers: Evidence from microfinance institutions around the world. *Business and Society*, *60*(6), 1387–1430.

Hafer, R. W. (2013). Economic freedom and financial development: International Evidence. *Cato Journal*, *33*(1), 111–126.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review, 9*(2), 193–206.

Han, R., & Melecky, M. (2017). Broader use of saving products among people can make deposit funding of the banking system more resilient. *Journal of International Financial Markets, Institutions and Money, 47,* 89–102.

Hartarska, V., Nadolnyak, D., & Mersland, R. (2014). Are women better bankers to the poor? Evidence from rural microfinance institutions. *American Journal of Agricultural Economics*, *96*(5), 1291–1306.

Hartarska, V., Shen, X., & Mersland, R. (2013). Scale economies and elasticities of substitution in microfinance institutions. *Journal of Banking &Finance, 37*(1), 118-131.

Hartarska, V., Parmeter, C. F., Nadolnyak, D., & Zhu, B. (2010). Economies of scope for microfinance: Differences across output measures. *Pacific Economic Review, 15*(4), 464–481.

Hartarska, V. (2005). Governance and performance of microfinance institutions in Central and Eastern Europe and the newly independent states. *World Development*, *33*(10), 1627–1643.

Heckman, J, J. (1979). Sample selection bias as a specification error. *The Econometrica*, *47*(1), 153–161.

Hermalin, B., & Weisbach, M. (1998). Endogenously chosen boards of sirectors and their monitoring of the CEO. *The American Economic Review, 88*(1), 96-118.

Herrmann, P., & Datta, D, K. (2005). Relationships between top management team characteristics and international diversification: An Empirical Investigation, *16*, 69–78.

Hermes, N., Lensink, R., & Meesters, A. (2018). *Financial development and the efficiency of microfinance institutions.* In: Research Handbook on Small Business Social Responsibility. Edward Elgar Publishing Ltd.

Hermes, N. (2014). Does microfinance affect income inequality? *Journal of Applied Economics, 46*(9), 1021-1034.

Hermes, N., & Lensink, R. (2011). Microfinance: Its impact, outreach, and sustainability. *World Development*, *39*(6), 875–881.

Hermes, N., Lensink, R., & Meesters, A. (2009). Outreach and Efficiency of Microfinance Institutions. *World Development*, *39*(6), 938–948.

Hicks, J. (1935). Annual survey of economic theory: The theory of monopoly. *Econometrica, 3*, 1–20.

Honohan, P. (2008). Cross-country variation in household access to financial services. *Journal of Banking & Finance, 32,* 2493–2500.

Hossain, S., Galbreath, J., Hasan, M. M., & Randøy, T. (2020). Does competition enhance the double-bottom-line performance of microfinance institutions? *Journal of Banking and Finance*, *113*, 1–17.

Hughes, J.P., Mester, L., & Moon, C. (2001). Are scale economies in banking elusive or illusive: Evidence obtained by incorporating capital structure and risk-taking into models of bank production. *Journal of Banking &. Finance, 25,* 2169–2208.

Huybens, E., & Smith, B. D. (1998). Financial market frictions, monetary policy, and capital accumulation in a small open economy. *Journal of Economic Theory, 81*(2), 353–400.

Iqbal, S., Nawaz, A., & Ehsan, S. (2019). Financial performance and corporate governance in microfinance: Evidence from Asia. *Journal of Asian Economics, 60,* 1-13.

Imai, K. S., Gaiha, R., Thapa, G., & Annim, S. K. (2012). Microfinance and poverty: A macro perspective. *World Development*, *40*(8), 1675–1689.

Isern, J., & Porteous, D. (2005). Commercial banks and microfinance: Evolving model of success. *CGAP Brief No*: *28*, 1–8.

Islam, A., Nguyen, C., & Smyth, R. (2015). Does microfinance change informal lending in village economies? Evidence from Bangladesh. *Journal of Banking and Finance, 50*, 141–156.

Jaffee, D. M., & Russell, T. (1976). Imperfect information, uncertainty, and credit rationing. *The Quarterly Journal of Economics*, *90*(4), 651–666.

Jalilian, H., & Kirkpatrick, C. (2002). Financial development and poverty reduction in developing countries. *International Journal of Finance & Economics, 7*(2), 97-108.

Jarrow, R. A., & Turnbull, S. M. (2000). The intersection of market and credit risk. *Journal of Banking & Finance, 24*(2), 271–299.

Jurevicius, O. (2013). Resource based view. https://strategicmanagementinsight.com/topics/resource-based-view.html

Kai, H., & Hamori, S. (2009). Globalization, financial depth, and inequality in Sub-Saharan Africa. *Economics Bulletin, 29*(3), 2025–2037.

Kang, J. S., Chung, Y. W., & Sohn, H. S. (2013). The Effects of monetary policy on individual welfares. *Korea and the World Economy*, *14*(1), 1–29.

Kang, S., & Snell, S. A. (2009). Intellectual capital architectures and ambidextrous learning: A framework for human resource management. *Journal of Management Studies, 46*(1), 65-92.

Kar, K, A., (2012) Microfinance institutions: A cross-country empirical investigation of outreach and sustainability, *Journal of Small Business & Entrepreneurship, 24*(3), 427-446.

Kempson, E., Atkinson, A., & Pilley, O. (2004). Policy level response to financial exclusion in developed economies: Lessons for developing countries. University of Bristol Personal Finance Research Centre.

King, R, G. & Levine, R. (1993). Finance and growth: Schumpeter might be right. Quarterly *Journal of Economics, 108*(3), 717-737.

King, T., Srivastav, A., & Williams, J. (2016). What's in an education? Implications of CEO education for bank performance. *Journal of Corporate Finance, 37*, 287–308.

Köhler, M. (2015). Which banks are more risky? The impact of business models on bank stability. *Journal of Financial Stability, 16*, 195–212.

Kollmann, R., Ratto, M., Roeger, W., & Veld, J. in't. (2013). Fiscal policy, banks and the financial crisis. *Journal of Economic Dynamics and Control*, *37*(2), 387–403.

Kotter, J, P. (1998). *Leading Change: Why transformation efforts fail.* Harvard Business Review, Harvard Business School Boston.

Krauss, N., & Walter, I. (2009). Can microfinance reduce portfolio volatility? *Economic Development and Cultural Change, 58*(1), 85–110.

Krishnan, H. A., & Park, D. (2005). A few good women-on top management teams. *Journal of Business Research, 58*(12), 1712–1720.

Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics, 93*(2), 259–275.

Lascelles, D. & Mendelson, S. (2011). Microfinance banana skin: The CSFI survey of microfinance risk. Centre for the study of financial innovation, London, UK.

Ledgerwood, J. (1999). *Sustainable banking with the poor: Microfinance handbook: An institutional and financial presentative*. The World Bank Washington, D. C.

Ledgerwood, J. (2013). *The new microfinance handbook: A financial market system perspective.* The World Bank Washington, D. C.

Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature, 35*(2), 688–726.

Levine, R. (2005*). Finance and growth: Theory and evidence.* In *Handbook of Economic Growth*, Eds. P. Aghion and S. N. Durlauf, Vol. 1, Part A, Elsevier, 865–934.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: causality and causes. *Journal of Monetary Economics, 46,* 31–77.

Li, M., & Patel, P. C. (2019). Jack of all, master of all? CEO generalist experience and firm performance. *The Leadership Quarterly, 30*(3), 320–334.

Lieberson, S., & Connor, J, F. (1972). Leadership and organizational performance: A study of large corporations. *American Sociological Review, 37*(2), 117–130.

Liñares-Zegarra, J., & Wilson, J. O. S. (2018). The size and growth of microfinance institutions. *British Accounting Review*, *50*(2), 199–213.

Lopatta, K., & Tchikov, M. (2016). Do microfinance institutions fulfil their promise? Evidence from cross-country data. *Applied Economics, 48*(18), 1655–1677.

Lutzenkirchen, C., & Weistroffer, C. (2012). Microfinance in evolution: An industry between crisis and advancement. Deutsche Bank AG, DB Research, 60262 Frankfurt am Main, Germany.

Ly, P., & Mason, G. (2012). Competition between microfinance NGOs: Evidence from Kiva. *World Development, 40*(3), 643-655.

Mackey, A. (2008). The effect of CEOs on firm performance. *Strategic Management Journal, 29,* 1357–1367.

Maksudova, N. (2010). Macroeconomics of microfinance: How do the channels work? CERGE-EI working paper.

McKinnon, R. I. (1973). *Money and capital in economic development*. The Brookings Institution, Washington DC.

Mayoux, L. (2010). *Taking gender seriously: Toward a gender justice protocol for financial services.* In Armendariz, & Labie (Eds.), Handbook of microfinance. Washington: World Scientific Publishing.

Mercieca, S., Schaeck, K., & Wolfe, S. (2007). Small European banks: Benefits from diversification? *Journal of Banking and Finance, 31*(7), 1975–1998.

Mergaerts, F., & Vennet, V. R. (2016). Business models and bank performance: A long-term perspective. *Journal of Financial Stability, 22*, 57–75.

Mersland, R., & Strom, R. O. (2009). Performance and governance in microfinance institutions. *Journal of Banking and Finance, 33*(4), 662–669.

Mersland, R., & Strøm, R. O. (2012). *The past and future of innovations in microfinance.* In D. Cumming (Ed.), The Oxford handbook of entrepreneurial finance. New York, Oxford University Press, Inc. 859-891.

Mersland, R., & Strøm, R. Ø. (2014) *Microfinance financial and social Performance: An Introduction*. In: Mersland R., Strøm R.Ø. (Eds) Microfinance Institutions. Palgrave studies in impact finance. Palgrave Macmillan, London.

Mersland, R., Beisland, L. A., & Pascal, D. (2019). The origin of chief executive officers and performance in hybrid businesses: The case of microfinance. *Journal of Small Business Management, 57*(4), 1578–1594.

Merton, R. C., & Bodie, Z. (2005). Design of financial systems: Towards a synthesis of function and structure. *Journal of Investment Management*, *3*(1), 1–23.

Meslier, C, Tacneng, R & Tarazi, A. (2014). Is bank income diversification beneficial? Evidence from an emerging economy, *Journal of International Financial Markets, Institutions and Money, 31*, 97-126.

Michel, J. G., & Hambrick, D. C. (1992). Diversification posture and top management team characteristics. *Academy of Management Journal, 35*(1), 9–37.

Microfinance Barometer (2013). Convergences towards a fair and sustainable world. Convergences: Paris, France.

Microfinance Barometer (2019). 10 year already: A look back at the trends in microfinance Convergences: Paris, France.

Microfinance Market Outlook (2017). Micro and SME Finance: A survey. responsAbility investments AG.

Microcredit Summit Campaign Report (2015). Mapping Pathways out of Poverty. Microcredit Summit Campaign (MCS). Washington, D. C.

Mishkin, F. S. (2007). Inflation dynamics. *International Finance*, *10*(3), 317–334.

Morduch, J. (2000). The microfinance schism. *World Development, 28*(4), 617-629.

Murphy, K. J., & Zabojnik, J. (2007). Managerial capital and the market for CEOs. Working Paper 1110, Economics Department, Queen's University.

Murphy, K. R. (1989). Is the relationship between cognitive ability and job performance stable over time? *Human Performance, 2*(3), 183–200.

Naqvi, B., Rizvi, S. K. A., Uqaili, H. A., & Chaudhry, S. M. (2018). What enables Islamic banks to contribute in global financial reintermediation? *Pacific Basin Finance Journal, 52*, 5–25.

Navajas, S., Schreiner, M., Meyer, R. L., Gonzalez-Vega, C., & Rodriguez-Meza, J. (2000). Microcredit and the poorest of the poor: Theory and evidence from Bolivia. *World Development, 28*(2), 333–346.

Neubaum, D. O., Pagell, M., Drexler J. J. A., McKee-Ryan, F. M., & Larson, E. (2009). Business education and its relationship to student personal moral philosophies and attitudes toward profits: An empirical response to critics. *Academy of Management Learning & Education*, *8*(1), 9–24.

Nielsen, B, B., & Nielsen, S. (2011). The role of top management team international orientation in international strategic decision-making: The choice of foreign entry mode. *Journal of World Business*, *46*(2), 185–193.

Pascal, D., Mersland, R., & Mori, N. (2017). The influence of the CEO's business education on the performance of hybrid organizations: The case of the global microfinance industry. *Small Business Economics, 49,* 339–354.

Pellegrina, L. D. (2011). Microfinance and investment: A comparison with bank and informal Lending. *World Development, 39*(6), 882–897.

Pfeffer, J. (1983). *Organizational Demography. Research in organizational behaviour*. Greenwich, CT: JAI Press.

Qian, G., Li, L., & Rugman, A. M. (2013). Liability of country foreignness and liability of regional foreignness: Their effects on geographic diversification and firm performance. *Journal of International Business Studies*, *44*(6), 635–647.

Rajan, R. G. (2006). Has finance made the world riskier? *European Financial Management, 12*(4), 499–533.

Randøy, T., Strom, R, O., & Mersland, R. (2015). The impact of Entrepreneur-CEOs in microfinance institutions: A global survey. *Entrepreneurship Theory and Practice, 39*(4), 927–953.

Ramakrishnan, R. T. S., & Thakor, A. V. (1984). Information reliability and a theory of financial intermediation. *The Review of Economic Studies*, *51*(3), 415–432.

Ray, D. (1998). *Development Economics*. Princeton, NJ: Princeton University Press.

Reed, L. R. (2011). State of the Microcredit Summit Campaign Report 2011. Washington, DC: Microcredit Summit Campaign (MCS).

Reille, X. (2009). The rise, fall, and recovery of the microfinance sector in Morocco. CGAP Brief, 1-4.

Reille, X., Glisovic-Mezieres, J., Berthouzoz, Y., & Milverton, D. (2009). MIV performance and prospects: Highlights from the CGAP 2009 MIV benchmark survey. CGAP Brief. Washington, D. C.

Reille, X., Kneiding, C., Rozas, D., O'Donohoe, N., & Rozeira de Mariz, F., (2010). All eyes on microfinance asset quality: Microfinance global valuation survey. CGAP Brief. Washington, D. C.

Reille, X., Forster, S., & Rozas, D. (2011). Foreign capital investment in microfinance: Reassessing financial and social returns. CGAP Focus Note (71). Washington, D. C.

Riley, R., & Bondibene, C. R. (2016). Raising the standard: Minimum wages and firm productivity. *Labour Economics*, *44*, 27–50.

Robinson, M. S. (2001). *The microfinance revolution: Sustainable finance for the poor.* Washington, D.C.: World Bank.

Roengpitya, R., Tarashev, N., & Tsatsaronis, K. (2014). Bank business models. *BIS Quarterly Review,* 55–65.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41–55.

Rousseau, P. L., & Wachtel, P. (2002). Inflation thresholds and the finance–growth nexus. *Journal of International Money and Finance, 21,* 777–793.

Salas, V., & Saurina, J. (2002). Credit risk in two institutional regimes: Spanish commercial and savings banks. *Journal of Financial Services Research, 22*(3), 203–224.

Saeed, M., Izzeldin, Marwan., Hassan, M. K., & Pappas, V. (2020). The inter-temporal relationship between risk, capital and efficiency: The case of Islamic and conventional banks. *Pacific Basin Finance Journal*, *62*, 1–22.

Sealey, C. W., & Lindley, J. T. (1977). Inputs, outputs, and a theory of production and cost at depository financial institutions. *The Journal of Finance*, *32*(4), 1251–1266.

Servin, R., Lensink, R., & Berg, M. (2012). Ownership and technical efficiency of microfinance institutions: Empirical evidence from Latin America. *Journal of Banking and Finance, 36*(7), 2136-2144.

Shaw, E. S. (1973*). Financial deepening in economic development.* Oxford University Press, New York.

Shahriar, A. Z. M., Unda, L. A., & Alam, Q. (2020). Gender differences in the repayment of microcredit: The mediating role of trustworthiness. *Journal of Banking and Finance*, *110,* 1–16.

Shleifer, A., & Vishny, R. W. (2010). Unstable banking. *Journal of Financial Economics*, *97*(3), 306–318.

Sinha, S. (2013). Microfinance in Cambodia: Investors' playground or force for financial inclusion? M-CRIL, European Microfinance Platform.

Slyke, D. M. Van. (2007). Agents or stewards: Using theory to understand the government-nonprofit social service contracting relationship. *Journal of Public Administration Research and Theory*, *17*(2), 157–187.

Smith, N., Smith, V., & Verner, M. (2006). Do women in top management affect firm performance? A panel study of 2,500 Danish firms. *International Journal of Productivity and Performance Management, 55*(7), 569–593.

Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, *87*(3), 355–374.

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*, *71*(3), 393–410.

Stigler, G. J. (1961). The economics of information. *The Journal of Political Economy*, *69*(3), 213–225.

Stiroh, K. J., & Rumble, A. (2006). The dark side of diversification: The case of US financial holding companies. *Journal of Banking and Finance, 30*(8), 2131–2161.

Strom, R, Ø., D'Espallier, B., & Mersland, R. (2014). Female leadership, performance, and governance in microfinance institutions. *Journal of Banking & Finance, 42,* 60–75.

Sun, S. L., & Liang, H. (2021). Globalization and affordability of microfinance. *Journal of Business Venturing*, *36*(1), 106065.

Tabak, B. M., Fazio, D. M., & Cajueiro, D. O. (2012). The relationship between banking market competition and risk-taking: Do size and capitalization matter? Journal *of Banking and Finance, 36*(12), 3366–3381.

Tang, J. J., Quayes, S., & Joseph, G. (2019). Microfinance institutions, financial intermediation and the role of deposits. *Accounting and Finance*, *60*(2), 1–38.

Tchuigoua, T. H. (2015). Capital structure of microfinance institutions. *Journal of Financial Services Research, 47*(3), 313–340.

Tchuigoua, T. H. (2016). Buffer capital in microfinance institutions. *Journal of Business Research*, *69*(9), 3523–3537.

The Economist (2010). Microfinance in India: Discredited, https://www.economist.com/finance- and-economics/2010/11/04/discredited

The Banker (2005). Microfinance joins the mainstream. https://www.yearofmicrocredit.org/pages/reslib/reslib_inthenews_feb05.asp#020205

Thomas, A. B. (1988). Does leadership make a difference to organizational performance? *Administrative Science Quarterly, 33*(3), 388–400.

Thompson, J. D. (1967). *Organizations in action: Social science bases of administrative theory.* New York, US, McGraw-Hill.

Thomas, A. S., & Ramaswamy, K. (1996). Matching managers to strategy: Further tests of the miles and snow typology. *British Journal of Management*, *7*(3), 247–261.

Vanroose, A., & D'Espallier, B. (2013). Do microfinance institutions accomplish their mission? Evidence from the relationship between traditional financial sector development and microfinance institutions' outreach and performance. *Applied Economics*, *45*(15), 1965-1982.

Verbeek, M. (2012). A guide to modern econometrics. 4th ed. Chichester: Wiley

Wagner, C. (2012). From boom to bust: How different has microfinance been from traditional banking? *Development Policy Review, 30*(2), 187–210.

Wagner, C., & Winkler, A. (2013). The vulnerability of microfinance to financial turmoil: Evidence from the global financial crisis. *World Development, 51,* 71–90.

Wang, L., & Murnighan, J. K. (2013). The generalist bias. *Organizational behavior and human decision processes, 120*(1), 47–61.

Wasmer, E., & Weil, P. (2004). The macroeconomics of labor and credit market imperfections. *American Economic Review*, *94*(4), 944–963.

Wheelock, D. C. (2012). Too big to fail: The pros and cons of breaking up big banks. *The Regional Economist*, *20*(4), 1–25.

Wijesiri, M. (2016). Weathering the storm: Ownership structure and performance of microfinance institutions in the wake of the global financial crisis. *Economic Modelling*, *57*, 238–247.

Wijesiri, M., Yaron, J., & Meoli, M. (2017). Assessing the financial and outreach efficiency of microfinance institutions: Do age and size matter? *Journal of Multinational Financial Management*, *40*, 63–76.

Weiner, N., & Mahoney, T. A. (1981). A model of corporate performance as a function of environmental, organizational, and leadership influences. *The Academy of Management Journal, 24*(3), 453–470.

Werner, R. A. (2016). A lost century in economics: Three theories of banking and the conclusive evidence. *International Review of Financial Analysis*, *46*, 361–379.

Wernerfelt, B. (1984). A resource-based view of the firm. Strategic *Management Journal, 5*(2), 171–180.

Wooldridge, J. (2010). *Econometric analysis of cross section and panel data.* The MIT Press, Cambridge, Mass.

World Bank (2017). World Bank Annual Report. Washington, D. C.

Yimga, J. (2018). Microfinance expansion and its effects on cost efficiency. *Quarterly Review of Economics and Finance. 69,* 205-216.

Zamore, S. (2018). Should microfinance institutions diversify or focus? A global analysis. *Research in International Business and Finance, 46,* 105–119.

Zamore, S., Beisland, L. A., & Mersland, R. (2019). Geographic diversification and credit risk in microfinance. *Journal of Banking and Finance*, *109*, 1–13.

Zeller, M. (2000). *On the safety net role of microfinance for income and consumption smoothing*. In shielding the poor: Social protection in developing countries, Ed. N. Lustig. Washington, DC: Brookings Institution and Interamerican Development Bank.

Zellner, A. (1962). An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. *Journal of the American Statistical Association*, *57*(298), 348–368.

SAMENVATTING (Summary in Dutch)

Sinds meerdere jaren floreren microfinancieringsinstellingen in veel ontwikkelingslanden. Door de opkomst van microfinancieringsinstellingen (MFI's) worden financiële diensten verleend aan de arme en achtergestelde klasse van de samenleving. Al meer dan vier decennia worden microfinancieringsinstellingen in veel ontwikkelingslanden gezien als de enige optie om krediet voor consumptie- en investeringsdoeleinden te verstrekken aan arme huishoudens, zodat deze inkomsten kunnen genereren, kunnen sparen, op noodsituaties kunnen anticiperen, risico's kunnen beheersen, micro-ondernemers kunnen worden, en uiteindelijk aan armoede kunnen ontkomen. Dit proefschrift focust op drie onderzoeksprojecten waarbij de prestaties van microfinancieringsinstellingen in een mondiale omgeving bestudeerd worden. In de eerste twee studies worden de relatieve prestaties van deze instellingen geanalyseerd in een duaal financieel systeem waarin microfinancieringsinstellingen naast commerciële banken bestaan. De derde studie analyseert de impact van verschillende attributen van *Chief Executive Officers* (CEO's).

In het eerste onderzoeksproject bestuderen wij hoe microfinancieringsinstellingen financiële ontwikkeling en economische groei kunnen versnellen, inkomensongelijkheid en armoede kunnen verminderen. Verder onderzoeken we of het bestaan van MFI's, naast commerciële banken, de efficiëntie van het gehele banksysteem zou kunnen vergroten door banken meer te laten concurreren. We zien dat microfinancieringsinstellingen de financiële ontwikkeling vergroten, of het nu gaat om financiële bemiddeling gemeten aan de hand van de bewaring van banktegoeden of de toewijzing van krediet gemeten in de vorm van privékredieten. We vinden ook bewijzen voor een vermindering van inkomensongelijkheid en armoede, maar geen toename van de economische groei. Als het verband tussen de aanwezigheid van microfinancieringsinstellingen en de efficiëntie van commerciële banken verder wordt geanalyseerd, wordt duidelijk dat MFI’s een sterke impact hebben op de kostenstructuren van commerciële banken: ze verhogen de efficiëntie van commerciële banken door ze aan meer concurrentie te onderwerpen.

In het tweede onderzoeksproject worden microfinancieringsbanken (MB’s) en commerciële banken (CB’s) vergeleken door de verschillen in vier prestatiedimensies te analyseren: efficiëntie, bedrijfsmodel, stabiliteit en activa-kwaliteit. We constateren dat MB’s inefficiënt zijn, hetgeen betekent dat hun kostenstructuren hoger zijn dan voor CB’s. We vinden ook significante verschillen in de zakelijke oriëntatie van de twee groepen. We zien dat MB’s een hogere bemiddeling, meer *wholesale*-financiering verstrekken en niet-rente-inkomsten genereren. Dit impliceert dat MB’s zich diversifiëren middels commerciële financieringen en niet-kredietactiviteiten. In termen van stabiliteit stellen we vast dat MB’s meer liquide zijn en beter in staat zijn om aan hun korte-termijn-verplichtingen te voldoen, en op de lange termijn stabieler zijn dan CB’s.

Bovendien wordt duidelijk dat microfinancieringsbanken een slechtere activakwaliteit hebben dan commerciële banken. Ze hebben meer risicovolle leningen (niet-renderende leningen), hogere reserves voor kredietverliezen en voorzieningen voor verliezen op leningen tot hun beschikking. Al met al leidt de bevinding van het tweede project tot de conclusie dat microfinancieringsbanken beter zijn dan commerciële banken wat betreft bemiddeling, niet-rentebaten, *wholesale*-financiering en liquiditeit. Toch moeten ze hun kostenstructuren verlagen (administratieve en operationele kosten) en hun activa-kwaliteit verbeteren, mogelijk als gevolg van een ongunstige selectie, moreel risico of een minder gediversifieerde kredietportefeuille.

Het derde project onderzoekt de impact van verschillende *CEO*-attributen: geslacht, bedrijfsopleiding, domein specifieke ervaring en oprichtersstatus op de financiële prestaties van MFI's. De resultaten tonen aan dat de financiële prestaties van MFI's verhoogd worden door: een vrouwelijke *CEO*, een *CEO* met bedrijfsopleiding, domein-specifieke ervaring en een *CEO*-oprichter. Onze bevindingen impliceren dat bepaalde *CEO*-attributen van vitaal belang zijn voor de betere financiële prestaties van microfinancieringsinstellingen. Aangezien MFI's actief zijn in een branche waar de meerderheid van de klanten vrouw is, wordt het hebben van een vrouw als CEO niet alleen geassocieerd met een grotere focus op vrouwelijke klanten, maar ze hebben ook een beter zakelijk inzicht, wat resulteert in verbeterde financiële prestaties van deze instellingen. Onze bevindingen suggereren ook dat CEO's met een bedrijfskundeopleiding dynamischer zijn, risicovollere projecten selecteren, sneller beslissingen nemen en meer innovatieve bedrijfsmodellen omarmen, en daarmee hogere financiële prestaties leveren. Ten slotte concluderen wij dat een langere ambtsperiode de vrouwelijke CEO en de oprichtende CEO in staat stelt om niet alleen de complexiteit van de organisatie beter te begrijpen, maar ook om het potentieel dat hen op één lijn brengt om betere financiële prestaties te bereiken, volledig te benutten.

De drie empirische projecten van dit proefschrift bieden belangrijke implicaties voor MFI's, beleidsmakers en toezichthouders. Aangezien MFI's de financiële ontwikkeling en de toewijzing van kredieten vergroten en armoede, ongelijkheid en operationele kosten van commerciële banken verminderen, moeten beleidsmakers maatregelen nemen om microfinanciering op te nemen in het reguliere financiële systeem van een land. De activiteiten en bijkantoren van MFI's moeten worden geopend op plaatsen waar ze een marktniche hebben of waar commerciële banken kredietnemers met een laag inkomen niet kunnen ondersteunen. Bovendien zouden MFI's actiever kunnen worden met start-ups en kleinschalige ondernemingen, een operatie die de potentie heeft om de economische groei te stimuleren. Daarenboven moeten beleidsmakers en regelgevers nieuwe technische manieren introduceren: mobiel bankieren en virtuele filiaalnetwerken om de operationele kosten van microfinancieringsbanken te minimaliseren en hun penetratie in afgelegen gebieden te vergroten. Ten slotte moeten MFI's rekening houden met de demografische kenmerken bij het identificeren en selecteren van geschikte kandidaten voor de functie van CEO.

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Afsheen Abrar
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Afsheen Abrar was born in Rawalpindi, Pakistan. She completed her Bachelor of Commerce from University of the Punjab, Lahore. She secured a scholarship and a certificate of merit for her excellent academic performance. She did Master of Business Administration (MBA) from Quaid-e-Azam University, Islamabad. After completing her MBA, she joined the National University of Modern Languages (NUML), Islamabad as a Lecturer. In 2012, she completed Master of Science (MS) in Finance from Shaheed Zulfikar Ali Bhutto Institute of Science and Technology, Islamabad, Pakistan. In 2015, she was promoted to the position of Assistant Professor. In the same year, she was awarded a fully-funded scholarship under Faculty Development Program by NUML, Islamabad to pursue her Doctorate at the Department of Finance and Accounting at the University of Twente, Netherlands. Afsheen has various publications in national and international journals. She has presented her research at several departmental seminars and conferences. She has also attended various professional and research training sessions and workshops, both domestic and international.

MFI
MICROFINANCE

This thesis aims to enhance the understanding of microfinance institutions (MFIs) by empirically analyzing their performance in a cross-country setting. It focuses on three research projects, in which the first two analyze the relative performance of these institutions in a dual financial system where microfinance institutions co-exist with commercial banks. The third project analyzes the impact of different CEO attributes on the financial performance of MFIs. The findings of the thesis provide important insights and offer various implications to policymakers, regulators, and MFIs. Policymakers must begin to take steps to incorporate microfinancing into a country's mainstream financial system. The operations and branches of MFIs must be opened in places where they have a market niche or where commercial banks cannot support low-income borrowers. Additionally, MFIs could become more active with start-ups and small-scale enterprises, an operation that has the potential to boost economic growth. Furthermore, policymakers and regulators must introduce new technical ways such as mobile banking and virtual branch networks to minimize the operational cost of microfinance banks and enhance their penetration in remote areas. Likewise, policymakers and regulators should consider adopting systematic risk management techniques such as credit scoring, computerized databases of borrowers' credit histories, loan delinquency rates, and default records to increase the asset quality of these institutions. Finally, MFIs must consider the demographic characteristics when identifying and selecting suitable candidates for the position of CEO. Research findings indicate that MFIs that hire female CEOs, CEOs with business degrees, CEOs with domain-specific experience, and CEOs who are also the founders of MFIs are more likely to increase the financial performance of these institutions.