Spring 3-19-2018

Microfinance Performance: The Dynamics Between Performance and Funding Sources Across Microfinance Institution Legal Charters and Age Groups

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Microfinance Performance: The Dynamics Between Performance and Funding Sources Across Microfinance Institution Legal Charters and Age Groups

by

Anthony Annan

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Executive Doctorate in Business

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY

ROBINSON COLLEGE OF BUSINESS

2018

ACCEPTANCE

This dissertation was prepared under the direction of the *Anthony Annan* Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

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ACKNOWLEDGEMENTS

I could never have been able to finish my research and the dissertation without the expertise contributed by my advisor, Dr. Conrad Ciccotello, who shared his brilliance in the area of finance, double bottom-line institutions and general research direction. I would like to thank Dr. Karen Loch for asking tough questions that led me to explore the international business aspect of my research. Also, I would say a big thank you to Dr. Felix Rioja for his expert guidance on the research scope, unbalanced panel data modeling, and presentation of my findings. My dissertation committee's top-notch guidance provided me with the confidence I needed to be productive and thorough as evidenced by the end product.

My profound appreciation goes to my wife, Gladys Annan, who encouraged me in many ways and, especially, ensuring I stayed in the doctorate program at a time of significant financial challenge. Also, I am so grateful to my beautiful daughters, Nhyira and Ayeyi for their understanding and insightful questions concerning the relevance of my research. Finally, I am very thankful for all the friends who proof-read and commented on my writing.

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ABSTRACT

Microfinance Performance: The Dynamics Between Performance and Funding Sources Across Microfinance Institution Legal Charters and Age Groups

by

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May 2018

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Because microfinance is an essential financial inclusion tool in helping to reduce poverty, it is vital that we understand the factors that help microfinance institutions (MFIs) achieve both their financial and social performance goals. Using an international sample of 2,955 MFIs across 123 countries from 1999 to 2016, my research contributes to this understanding by providing empirical insights into the dynamic relationship between these dual performance goals and the MFI funding source mix. It further offers an empirical test of the popular Microfinance Life Cycle Theory (MLCT) for explaining MFI development, growth, and performance.

My findings show that donation funding is negatively associated with MFI profitability across legal charters and age groups, but, for mature bank MFIs only, it has a positive impact on increasing the breadth and depth of client outreach. I also find that equity and deposits funding are positively related to financial improvement for all MFIs, but they have mixed impacts on the social goals of various MFI legal charters.

The insights from my research are an essential contribution to the conversation on MFI performance in the extant literature. My study also offers useful and detailed performance-funding

metrics based on MFI legal structure and age to inform and enhance decision-making among managers, funders, and policymakers.

INDEX WORDS: Age, Dual Performance, Funding Source, Life-cycle Theory, Legal Charter, Microfinance, Return on Assets, Unbalanced Panel Analysis.

I INTRODUCTION

I.1 The Problem

According to the World Bank, approximately four billion people on Earth live in poverty. In response to this level of poverty, developmental organizations and other concerned entities have established programs to help eradicate, or at least alleviate, this poverty. Microfinance has been adjudged an effective tool in this effort. Microfinance institutions (MFIs) offer essential financial services—including savings, credit, funds transfer, and insurance—to individuals and micro-businesses that would otherwise have no access to mainstream banking services. By providing small loans, MFIs help to ease the financial constraints the poor experience and support their consumption choices, increasing household welfare and providing avenues for future ongoing income (Yunus, 1999).

According to the 2015 Microcredit Summit report (Murdoch, 2016), MFIs have helped more than 211 million people access credit and savings. This finding is of particular importance because loans assist the poor in covering unexpected expenses and in cultivating a long-term adjustment in their consumption decisions (Karlan & Zinman, 2010). Studies have shown that MFIs also support the creation and growth of small businesses (Banerjee, Duflo, Glennerster, & Kinnan, 2015). Microfinance delivers further benefits by focusing on female borrowers (Cobb, Wry, & Zhao, 2016), who usually commit a considerable portion of their loan proceeds to health and education expenses—both of which contribute to an overall reduction in poverty (Angelucci, Karlan, & Zinman, 2015). By extending credit to the poorest communities, MFIs act as catalysts for the poor to create wealth and improve the economic well being of their local economies. MFIs also focus on the financial inclusion (Brown et al., 2016) of the most economically disadvantaged members of developing economies (e.g., women), with the belief that their financial services will

drive their clients' development and growth (Morduch, 1999; Imai et al., 2012; Donou-Adonsou and Sylwester 2016). Indeed, research has shown that the microfinance sector explains a significant portion of the growth in financial inclusion being observed in many parts of the world (Demirgüç-Kunt, Klapper, Singer, & Van Oudheusden, 2015). Finally, MFI loan and deposit volumes have gained significant market shares in some countries, making MFIs essential contributors to financial development in those economies (Di Bella, 2011).

At its most basic form, the microfinance industry has three principal actors: 1) borrowers, who apply for and receive loans from MFIs and benefit from the services they provide; 2) the MFIs, who provide the financial services; and 3) funders, who provide capital and act as funding sources for the MFIs.

Unfortunately, many MFIs fail due to capital (funding) constraints that negatively impact their operations (Wagner and Winkler 2013; Dominice, 2012; Aijazuddin and Iravantchi, 2015; Dorfleitner et al., 2014; Abrams and Trant, 2009; Schicks, 2014). Some research finds that MFIs fail in servicing their debt (Abrams and Trant, 2009), while other work finds outright default (Aijazuddin and Iravantchi 2015). Dwindling donations, grants, and subsidies for the developmental financing of projects have not helped the situation either (Johnson, 2015; Millson, 2013). MFIs are constrained by 1) inadequate capital, 2) unsuitable funding mixes, and 3) unsustainable funding flows. Access to funding is a deciding factor in determining the microfinance industry's overall health, as well as its effectiveness as a poverty-reduction tool (Cobb et al., 2016). Lafourcade et al. (2006) argue that the expansion of MFI activities in Africa is being hindered primarily by funding constraints. Further, Bogan (2012) concludes that over-dependence on donations funding is inhibiting the growth of MFIs into sustainable, competitive, and efficient institutions.

However, addressing the funding problem with the view that MFIs are homogeneous and identical financial services entities oversimplifies the issue. This research instead views MFIs as heterogeneous legal entities with charters that make them significantly different in terms of both the types of opportunities available to them and the risks they face. I therefore look at MFIs' performance at each life-cycle stage through two lenses—that of their legal structure or charter, and that of their capital structure, or *funding source mix*—as they strive to achieve their performance goals.

In this dissertation, my primary focus is on providing insights into how the relative performance of MFIs' social and financial metrics varies across legal charters and funding source mixes at each life-cycle stage. In grouping MFIs into legal charters to review their performance across the life cycle, I hope to contribute in-depth understanding of MFI development and thereby fill a gap in the microfinance academic literature; I also hope to extend the theoretical model to reflect better the processes that impact MFI performance. MFI managers, investors, policymakers, and other stakeholders should benefit from my findings as they put measures in place to help microfinance achieve its dual performance goals. The practical contribution will be in finding proven links between funding source mix strategies, relative performance, and the life cycle of various MFI legal charters.

Most of the extant microfinance literature has focused much attention on how MFIs affect the poor and very little on who funds them and how. While it is essential to understand how microfinance affects borrowers, it is also important to investigate how MFIs effectively fund their operations and capital needs, especially because that funding strongly impacts MFI profitability and outreach. Research indicates that the mix of an MFI's capital can adversely affect its performance—that is, its efficiency and its financial sustainability (Bogan, 2012). Access to and

the mix of funding are therefore crucial factors that should be taken seriously if the MFI's overall health and efficacy as a poverty-reduction tool is to be maintained.

Although some researchers have explored the link between MFI performance, funding, and relative profitability, there are very few systematic studies of how changes in the funding source mix impact MFIs' performance given their legal charters. Of the few studies that attempt to address the MFI performance and how it varies by funding mix, Bogan (2012) and Muriu (2011) are of particular importance to my research. Muriu (2011) analyzes about 210 MFIs across 31 countries in Africa, operating from 1997 to 2008, to determine the impact of financing choices on microfinance profitability in Africa. In addition to the fact that his research focuses on Africa, Muriu (2011) did not consider the gaping differences between the MFIs as legal entities that may further explain the variations between funding and performance. Bogan (2012) explores how changes in capital structure could improve MFI efficiency and financial sustainability. Her research also provides useful insights into the importance of donation funding and the link between donations and MFI sustainability. Here, I seek to extend Bogan's research in several ways. First, I will offer insights into how MFIs' financial and social performance varies at each developmental stage of the life cycle, as well as the role of the funding source mix in each stage. More importantly, MFI research should examine these institutions as heterogeneous entities with very different attributes and characteristics; I, therefore, analyze MFI performance by grouping firms into the five fundamental legal charters established in the microfinance literature. Second, Bogan's (2012) model for investigating the relationship between capital structure and MFI sustainability does not control for firm-level performance factors, which could moderate the impact of capital structure on sustainability factors. Firm-level factors that the extant literature documents as impacting MFI performance include: a) portfolio yield, b) the operating-expense-to-assets ratio, c) portfolio at risk

for more than 30 days, d) percentage of women borrowers, and e) the gross-loan-portfolio-to-assets ratio (Campbell and Rogers, 2012). I controlled for these factors in my research as I examined the impact of capital structure—which I refer to here are *funding source mix*—on profitability and outreach to the poor. Third, Bogan's (2012) model utilizes limited observations covering only the years 2003–2006. The microfinance industry has changed considerably since that time. My dataset has financial and social variables for 2,955 MFIs collected in 123 countries over an 18-year period (1999–2016), with 18,492 observations of unbalanced panel data. My data offers several advantages, including that it is both recent and quite large. The data's size and scope lets me categorize MFIs into legal charters and age groups, and do a truly systematic study; it also lets me examine the implications of performance and funding source mix variables over a much longer period. Finally, the data's breadth and depth let me effectively contribute insights on the impact of MFIs' funding choices on their financial and social performance.

Understanding the impact of funding source choices on MFIs' financial and social performance goals can offer valuable insights into financial intermediaries' performance as well. This is a key issue given that frictions restricting the supply and demand of financing for MFIs can prevent the flow of credit throughout the economies where these firms operate; events from the great recession attest to this connection.

I.2 Theoretical Framing

To gain insight into the role that funding source mix plays in the variability in MFIs' dual performance, we need a better theoretical approach to analyzing MFIs' performance and funding at each institutional development stage. Simply analyzing MFIs as if they are homogeneous legal entities limits the ability to show how these institutions are funded and perform from one development stage to another. A more rigorous approach would be to analyze these dual-

performance goal institutions in terms of how each legal charter survives the earlier life-cycle stages to succeed in the next stage, using different funding sources to achieve growth, profitability, and social impact. In the finance discipline, the impact of funding source mix on nonfinancial companies' valuation and profitability has been thoroughly researched and hotly debated for many years. Likewise, the economic performance of corporations is heavily reliant on the choice of financing and its link with optimal risk exposure (Leland, 1998).

In the microfinance literature, the most popular theory for explaining MFI development, growth, and performance is the LCT (Muriu, 2011; Bogan, 2012). The LCT seeks to explain how industries and businesses start, grow to maturity, and die (de Sousa-Shields & Frankiewicz, 2004); it has also been used to show how product development phases evolve (Porter, 1980). O'Rand & Krecker (1990) and Porter (1980) assert that the LCT provides fundamental insight into the growth, financing, marketing, pricing, survival, and production strategies of companies. A general version of the theory states that an organization's capacity to access and adapt to its funding sources may determine its development (Little, 1974; Channon, 2006).

Given their dual performance goals, we might conclude that MFIs evolve and develop differently than ordinary for-profit firms examined using the general LCT lens. Yet De Sousa-Shields (2004) argues that, at each stage of their evolution, MFIs and ordinary for-profit firms exhibit similar management capacity, market development, and financing structure standards, and that the LCT would point MFIs toward high financial and higher social performance as they grow. De Sousa-Shields and Frankiewicz (2004) therefore developed a version of the LCT for microfinance, the microfinance life-cylce theory (MLCT) that captures specific development factors related to the use of funding mix sources for MFI operations and capital requirements, the stability of their profitability, and their outreach to the poor. Additionally, because MFI legal

charters can vary significantly, it is reasonable to assume that MLCT will capture the development of an MFI's funding and performance differently depending on its specific legal charter. In this regard, Schneider and Greathouse (2004) note that, as MFIs evolve, their capital and funding structures change; further, the degree of leverage MFIs use increases at different life-cycle phases and their sources of funding become more diverse and sustainable (Hoque, Chishty, and Halloway (2011).

With the help of de Soussa and Frankiewicz's (2004) MLCT framework, I provide insights here to answer the research question:

How does the relationship between social/financial performance outcomes and funding source mix vary across MFI legal charters and age groups?

I.3 Methods

To attempt an answer to this research question requires a methodology. Below, I summarize my data sampling and collection method, define and analyze the major MFI groups, describe the dependent and independent variables, and specify models and approaches to the analysis.

A significant issue for this research is to test whether empirical evidence actually supports the MLCT, which seeks to explain how MFI performance and funding evolve through three developmental stages of MFI existence. To explore this, I combine microfinance industry and macroeconomic-level datasets comprising 2,955 MFIs from 123 countries. I then examine two important categories of MFI characteristics—legal charter and age—as reported in financial, social, and macroeconomic data for the most recent 18-year time period (1999–2016). This 18-year window provides adequate variation among legal charters and age group characteristics; it also offers a robust set of observations for the analytical inquiry. Conducting a global MFI study offers both benefits and challenges. The primary benefit is that the microfinance industry is

thriving across the world, and an in-depth, rigorous global study is long overdue. Such a study will help unify some industry concepts and observations. The primary challenge is that there are many regional, country, and firm-level specifics for which controls are needed. However, global factor variations can be effectively controlled for using statistical tools, such as the fixed-effect models.

Overall, I originally considered 18,492 observations for inclusion in the study. However, I dropped observations that either had missing values for legal charter or were declared as "Other." The research therefore contains a total of 18,024 observations. I reviewed a rather robust body of microfinance literature to determine the model's dependent and independent variables to ensure that their relationship is well established in the extant literature (Hartarska, 2005; Cull et al., 2007; Hartarska & Nadolnyak, 2007; Mersland and Strøm, 2009; Tchakoute-Tchuigoua, 2010).

The data collected is from two well-respected and trusted sources for microfinance research: 1) the Microfinance Information Exchange (MIX) market database, and 2) the World Bank's World Development Indicators (WDI) database. The significant advantages of using these two databases are that they are well known; compiled by third parties; cover a broad range of organizational and economic features, as well as social and financial indicators; and have been widely used in research published in leading and well-respected journals.

MIX asks MFIs to self-report; its in-house analysts then check the reported data and make adjustments. The MFIs that publish their information to the MIX database are typically sustainable institutions with the resources to report the requested information on a consistent basis.

The 18-year data window provides adequate variation among the target MFI characteristics and provides a robust set of observations for a rigorous global analysis. Dataset is entirely representative of the microfinance field. The MIX database contains a significant amount of data from mega-sized MFIs—creating a large-firm bias—but it also has substantial numbers of small

savings and credit cooperatives. As such, the MIX data provides a unique and comprehensive picture of the microfinance market.

The MFIs provide MIX with the data in local currency, after which MIX staff members convert the data into US dollars at contemporaneous exchange rates. The MIX market database is credited with being the best available representation of MFIs in the entire microfinance industry (Krauss/Walter, 2008; Di Bella, 2011; Hartarska and Nadolnyak, 2007) and has been used in many publications by leading microfinance researchers.[1]

WDI is the World Bank's premier annual compilation of data about development. The database contains more than 1,400 indicators for 217 economies dating back more than 50 years. WDI offers a current overview of the most recent data obtainable, as well as valuable regional data and income group analysis. As with MIX, the WDI database is used in key microfinance and economic research.

I.4 Proposed Analysis

I use standard analytical techniques to test for central tendencies, significant relationships, and differences among performance by legal charter and age, as well as to establish the expected impacts of funding mix sources on both performance categories in the context of the dataset's 2,955 MFIs.

To compute descriptive data analyzing means, medians, and standard deviations, I use univariate statistical techniques to determine central tendencies and evaluate data skewness and kurtosis. I use Stata software tools for modeling data with outliers to ensure data consistency, and T-testing to establish differences between means variables and identify significant differences

[1] Among these researchers are Bogan (2008, 2012), Morduch (1999,2000, 2005, 2010), Armendáriz and Morduch (2005), Tchakoute-Tchuigoua (2010, 2012), Hartarska (2005, 2007), Cull et al. (2007), and Nadolnyak (2007).

across the MFI dataset subsets. The data analyses compared relative performance variables and funding source metrics in aggregate across legal charters and age group levels. I used correlation analysis to describe the strength and direction of linear relationships between all variables. I calculated Pearson Moment Correlation Coefficients (r) for the model's continuous variables and calculated Spearman (rho) for the binary dummy variables. To determine the variation in the dependent variables that can be explained by the independent variables, I ran 80 models through linear-panel, fixed-effects multivariate regression models. Additionally, I evaluated regressors with statistically significant relationships and their marginal effects on the dependent variables.

I reviewed the results across MFI legal charter and age groups and identified important trends. To evaluate the models' overall adequacy, I used the F statistic and its associated p-factor. I reviewed the R^2, comprising overall, within, and between variation metrics, to determine how much of the variation in the dependent variable was explained by the independent variables. I evaluated each model for power and the implied factor effects of its results. I also conducted individual independent variable analysis to ensure significance and assess the impact on beta coefficients, t-scores, and p-values. Finally, I compared the results to determine common themes across the dataset and provide insight into the how the dual performance outcomes vary given variability in funding source metrics across MFI legal charters and age groups. The analysis provided the insights needed to answer the research question:

"***How do the relationships between social/financial performance outcomes and funding source mix vary across MFI legal charters and age groups?"***

I.5 Research Contribution

Regarding contribution to theory, I provided empirical evidence on the MLCT using data collected over an 18-year period from more than 2,955 MFIs covering 123 countries. To the best

of my knowledge, this analysis is the first time the MLCT has been tested on such broad scale in the microfinance literature. This research provides insights into the evolution of MFI development and offers theoretical insights into MFI processes that drive improvements in both profitability and social performance goal achievement. This research helps fill a gap in the microfinance literature on the relationship between funding and performance.

In terms of practical contribution, this work finds proven links between profitability, social performance outcomes, and funding source mix strategies. Understanding the funding source mix's role in the relative performance outcomes of the different MFI legal charters at various life-cycle stages is essential to MFI management, shareholders, and policymakers entrusted with making effective decisions to boost their institutions' profitability, growth, and social impact. My contributions may also provide valuable insights into other financial intermediaries' performance as, in many ways, these intermediaries' activities resemble those of MFIs. Further, this research provides tools that will help microfinance stakeholders keep MFIs in business by offering policy inputs to help MFIs identify optimal funding sources for various legal structures and age groups. The research will also benefit creditors by shedding light on funding structures, which can help improve their understanding of MFI risk management strategies.

Finally, my findings will be significant for a growing category of MFI *microfinance investment vehicles (MIV)* financiers. These MIVs tend to be commercially oriented in their funding decisions (Julie Abrams & Ivatury, 2005), i.e. they raise financing from investors who expect to be paid returns that are comparable to market rates. Understanding MFI funding needs and the impact of funding source mix on the performance objectives MIVs will assist them to make better investment decisions.

I.6 Outline of the Research

This dissertation is organized into six chapters. Chapter 1 is an introductory chapter that provides an overview and summary of the research. Chapter 2 offers a literature review and the theoretical framing and buildup of the applicable theory. Chapter 3 develops the argument for the using the MLCT to analyze performance across MFI legal charters and ages; it also offers hypotheses to help answer research questions. Chapter 4 describes the study's research methodology, analytical approach, and techniques. The study's results are then presented in Chapter 5, followed by a discussion and summary of contributions in Chapter 6.

II LITERATURE REVIEW

II.1 Microfinance Legal Forms

Although most research presents MFIs as if they are homogeneous entities, MFIs have diverse attributes that make them vary significantly in many respects. One major attribute is the legal form under which the MFI is registered. In the extant microfinance literature, this attribute is referred to as either a legal structure or, as I refer to it here, a *legal charter*. The literature identifies five primary legal charters: a formal commercial microfinance bank (referred to here as *bank*); a credit union or cooperative (here, *credit union*); a non-bank financial institution (*NBFI*); a non-governmental organization (*NGO*), and a rural or community bank (*rural bank*). These charters differ significantly regarding governance, ownership, organizational structure, products, services offered, and supervision by authorities or regulators. The type of legal charter or structure influences an MFI's financial products and services, regulation, mandate, and target market. Similarly, the legal charter determines the degree to which the state supervises the MFI and the categories of clients it serves; these factors, in turn, affect its product offerings, financial management, reporting needs, funding sources, and overall profitability and outreach. Thus, contrary to what most microfinance research seems to demonstrate, MFIs are not homogeneous financial services institutions. Table 1 summarizes the major MFIs legal charters and associated attributes.

Table 1: Major Attributes of MFI Legal Charters

	Main MFIs Legal Charters				
Attributes	**Banks**	**Credit Union**	**NBFI**	**NGO**	**Rural Bank**
Legal Status	Licensed as a bank or other form as per regulatory requirements	Registered with central authority	Licensed as a NBFI or modified financial institution (determined by country-specific legal charter	Registered as an NGO, not-for-profit institution, or company limited by guarantee	Licensed as a bank
Regulation and oversight	Regulated and supervised by central bank, ministry, or a specialized body	Credit unions may be regulated; oversight by specialized body	Regulated by central bank or specialized body or by one or more government units	Not regulated; may be subject to government oversight	Regulated by central bank or specialized body or by one or more government units
Ownership	Mostly private shareholders; some development banks as initial shareholders	Owned by members	Mix of public and private shareholders; sometimes other financial institutions or other companies	No private ownership, strong ownership characteristics among founders and board	Shareholders, government and private
Governance	Board of directors appointed by shareholders	Board of directors or management committee elected by members	Board of directors appointed by shareholders	Board of directors, appointed by founders and funders	Board of directors appointed by shareholders
Client type	Unserved or underserved individuals or micro or small businesses; In the urban areas they may serve commercial micro, small, and medium enterprise clients, fewer poor individual clients	A range of clients, depending on members	Clients vary depending on type of products (for example, credit or insurance)	Poor, "unbanked" clients; for multipurpose NGOs, various target clients, and beneficiaries	Broad target group: poor and nonpoor; rural
Products	Credit, savings, insurance, payment services; terms may be modified for client needs	Basic savings and credit, although inherently savings led	Range from credit only, leasing, insurance; normally not able to intermediate deposits	Traditionally credit led; multipurpose NGOs add financial services to other activities	Primarily savings; wide distribution network leveraged for payment services
Management and reporting	Professionally managed; report to central bank or supervisory authority	Professionally managed to varying degrees; report to supervisory authorities	Professionally managed; report to supervisory authority	Professionally managed to varying degrees; may need to report to registration body	Professionally managed to varying degrees; report to regulators

Source: Based on Ledgerwood (2013)

II.1.1 *MFI Banks*

In the broadest sense, banks are regulated financial institutions licensed to accept saving from depositors and make loans to borrowers. They are supervised by a central bank or other government agency or ministry, which ensures that banks are well capitalized to support economic activities and are not vulnerable to systemic economic risks. The term "banks" are therefore reserved for only certain types of financial institutions (Ledgerwood, 2013). Microfinance banks or *bank MFIs* share certain standard features with commercial or retail banks, but their lending and outreach are targeted to customers not usually reached by traditional banks. Several types of MFI bank provide financial services to the poor, including loan and savings banks, postal services, state banks, commercial banks, and rural banks.

II.1.1.1 *Loans and Savings Banks*

Loans and savings banks are regulated financial institutions that provide retail banking services such as accepting private depositors' savings, making payments, and extending credit and insurance to individuals and small- and medium-size enterprises. Loans and savings banks' service outreach extends across broad geographic areas; their objective is to reach clients not served by commercial banks. Ordinarily, their purpose is not to maximize profit but rather to be financially inclusive while sustaining their operations (Christen, Rosenberg, and Jayadeva 2004). Loans and savings banks are regulated by the banking authorities and could be either privately or publicly owned. Data from 2000 to 2003 showed that non-postal loans and savings bank assets made up approximately 20 percent of total banking assets (Christen, Rosenberg, and Jayadeva 2004). Also, according to the World Loans and Savings Banks Institute, these banks held 75% of the 1.5 billion accounts managed by financial institutions with dual performance goals, in 2006 (De Noose, 2007). Loans and savings banks have larger branch networks than other financially inclusive

service providers. As a result, they have greater access to the poor through geographic proximity to their communities. Additionally, some offer financial educational programs that contribute to developing the financial capabilities of poor communities and individuals (De Noose, 2007).

II.1.1.2 *Postal Savings Banks (PSBs)*

PSB financial services typically include small-amount money transfers, bill payment, and savings. That said, their services and products vary widely from country to country and may include some credit or insurance products, and even deposit intermediation. PSBs may also serve as commercial bank agents mobilizing deposits and extending credit to specific communities. In most countries, PSBs are entirely government owned, but in some countries that can be jointly owned with the private and public sectors. Central banks and their agencies provide direct supervision for PSBs (Christen, Rosenberg, and Jayadeva 2004). Many PSBs have point of sale locations in rural, peri-urban, or remote areas; they, therefore, have a substantial advantage in providing basic banking services to diverse communities (World Savings Banks Institute [WSBI], 2010).

II.1.1.3 *State Banks*

State banks comprise commercial state banks, agriculture development banks, and PSBs. Governments or state agencies own and control these banks, which are therefore considered semipublic or public entities. State banks are funded mostly by public capital and by deposits from clients (Yaron, Benjamin, and Piprek 1997). Because they have many savers and extensive branch networks, they are effective at reaching the poor with financial services.

State banks primarily serve the agriculture sector, extending credit and providing savings services to small-scale farming production, cottage and village industries, and other rural

livelihood activities in remote areas. Their target clients include farmers, merchants, cooperatives, and various associations (Robinson 1995).

Several risks can impact a state bank's ability to reach the poor with financial services. First, because state banks are primarily established to correct market failures and provide resources to underserved or high-priority economic sectors, they may be disposed to incumbent governments' political priorities and to political influences that may conflict with institutional objectives (Young and Vogel 2005). Second, state banks may not be accountable to regulators in the same way as private banks and financial services companies and might, therefore, become inefficient. Third, state bank board members might be appointed not due to professional competencies but rather to political considerations or other criteria or business rationales, limiting effective governance and perpetuating the challenges of fiduciary responsibility. Finally, governments have often been willing to subsidize continuing losses in state banks, weakening management discipline (Christen, Rosenberg, and Jayadeva 2004).

II.1.1.4 *Private Commercial Banks*

Commercial banks are regulated financial institutions that provide the most complete list of financial services to clients. Among their many services are extending credit, providing clients with the systems to make payments, and mobilizing savings for financial intermediation. They operate mostly in urban areas serving businesses and wealthier clientele, although some have begun reaching lower-income populations and markets with their services.

Commercial banks control many more resources than other financial providers. As a result, they attract different funding types, especially in relation to deposits and debt; they are also highly leveraged. They access debt from commercial sources, such as development finance institutions, other commercial banks, MIVs, and debt issuance through capital markets. Additionally,

commercial banks can raise equity from private placements or through the capital markets. Typically, commercial banks engage in microfinance in one of the following three ways. 1) *Downscaling*: creating an internal subsidiary or an affiliate that extends the bank's product offering to micro clients that otherwise cannot access financial services. 2) *Green-fielding*: creating an external institution to offer structured or regulated financial services to micro clients. 3) *Partnering*: entering into a partnership with an experienced microfinance organization or other providers on an agency relationship basis.

II.1.2 *Credit Unions and Financial Cooperatives (Credit Unions)*

Credit unions are not-for-profit organizations that provide financial services to their members; they are also known as *savings and credit cooperatives* (SACCOs), *building societies*, or *savings and loan associations*. Credit unions are member-owned and –controlled institutions with no external shareholders. Each member has the right to one vote. Credit unions are usually affiliated with geography, employment, or religion. Potential credit union members must purchase a specific number of shares to become members or clients (Johnson, Malkamaki, and Wanjau 2005). Each member purchases the same amount of shares by value, and the organization sets the share price for all members at specified times. Once a member, clients can deposit savings with and/or take out loans from the institution. Aside from offering plain-vanilla savings and credit products to members, many credit unions currently provide sophisticated financial products and services, such as contractual savings, housing loans, money transfer and payments, and insurance services (Branch 2005). Once they turn a profit, credit unions either reinvest the profit to expand their business or return the profit to members as dividends. These dividends sometimes act as subsidies to make loan costs more affordable, and savings returns more attractive to members (WOCCU, 2011). Christen and Mas (2009) found that, during the 2008 Great Recession, local

credit unions performed better than other financial services organizations that use external investments, primarily due to the stability and local nature of their deposits. Credit unions are customarily governed by volunteers, who are elected to the board of directors by other members.

As institutions that create loans from member savings, larger credit unions are typically supervised by regulators. Again, this supervision varies from one country to another. However, in most countries, the regulators who oversee agricultural, marketing, transport, and other cooperatives also supervise credit unions. The risk in using such regulators in developing countries is that these authorities may not have the necessary skills to properly supervise financial intermediaries. Thus, the general lack of financial oversight in such cases, coupled with weak governance, can compromise credit union safety and soundness, especially when poor people's savings are at risk (Ledgerwood, 2013). Although many still struggle with poor management, credit unions play a significant role as financial services providers to the poor in many developing countries.

II.1.3 *Non-banking Financial Institutions (NBFI)*

Here, I discuss two types of NBFIs: deposit-taking MFIs, and what I'll refer to here as "other NBFIs." *Deposit-taking MFIs* are NBFIs that are licensed to accept or mobilize savings from clients. These institutions, more than other NBFIs, can be easily transformed into fully licensed banks (Ledgerwood, 2013). As Ledgerwood and White (2006) note, deposit-taking MFIs can carry out financial intermediation, using deposits to fund their loans; this gives them access to commercial funds, which allows them to grow. Deposit-taking MFIs are shareholding institutions funded both by shareholder-contributed equity and by debt (that is, loans from lenders and capital markets). It is always tremendously challenging both structurally and culturally to turn a nonprofit organization into a for-profit company with shareholders. To achieve this transformation, the board

and top managers must commit fully to engaging with and managing the change, as well as to achieving equilibrium between their purpose—offering financial services to the poor—and shareholder desire for value and return.

Other NBFIs include insurance, leasing, consumer credit, and specialist credit companies seeking to provide more-inclusive financial services. Compared to deposit-taking NBFIs, these NBFIs offer fewer services and have fewer financing opportunities. For example, they typically cannot use deposits for loans or use payment/settlement systems. Because of these regulatory restrictions, these NBFIs have lower capital requirements and lower systemic risk, and thus obtaining a license to operate one is easy relative to obtaining one for a bank.

II.1.4 *Nongovernmental organization (NGO) MFIs*

NGO MFIs are a diverse group—ranging from large organizations with diverse services to small local firms—and differ from credit unions and community-based financial service providers primarily[2] because they are not managed or own by members. Instead, they are board-run. The board members, who are appointed by funders or founders, oversee and offer input on the MFI's activities and strategies. NGO MFIs are organized to suit their specific funding and mission. Typically, they must register in their host country, and that country outlines both what the MFI can do and how its incoming money from donors and operations is taxed. Because NGO MFI board members do not answer to investors and are rarely overseen by regulatory authorities, they are often not governed in a way that encourages fiscal responsibility.

[2]Mostly nonprofit organizations, which use their surplus revenues to achieve a social goal or mission. They do not distribute surplus income to their shareholders (or equivalents) as profit or dividends. NGOs provide public benefits by pursuing specific goals related to areas such as public safety, science, religion, education, literacy, and cruelty-prevention.

Typically funded by borrowings, donations,[3] accumulated equity, and debt, most NGO MFIs provide only credit-granting services, offering individuals or groups microenterprise loans—often using community-based guarantees such as group solidarity or village banking.[4] Some NGO MFIs also act as bank or insurance company agents, and most require compulsory savings. However, these MFIs cannot legally use their clients' savings as loan money. Operations revenue is expected to pay for the firm's daily operations and its growth (Pollinger, Outhwaite and Cordero-Guzman, 2007; Vanelli, 2002). Most firms spend their donations and grants on products, technical help, and channel development. As I discuss later, the NGO MFIs in my sample frequently use long-term debt rather than other funding sources to finance their operations; their next-largest funding comes from short-term borrowing and equity. This equity includes money donated to support capital and *retained earnings*—that is, a firm's revenue after expenses. NGO MFIs often have a weak ratio of debt-to-equity because their informality limits their ability to borrow. Increasingly, however, they are using debt (typically short-term loans). Funders previously require these MFIs to have collateral (that is, cash or their pledged loan portfolio), but today well-performing organizations can borrow with guarantees and little to no collateral requirements. Compared to regulated firms, NGO MFIs are informally structured and have fewer reporting requirements. They can thus more easily respond to client needs. Still, NGO firms often have weak management (particularly during expansion), making ongoing stability and growth a challenge. Although they were among the first microfinance providers in underserved areas, NGO MFIs' prominence has declined for two reasons: they often struggle to both cover costs and fund growth, and they are unable to offer savings services. So, while thousands of multipurpose NGOs offer

[3] Donations include grants and subsidized loans from donors and public developmental institutions
[4] Village banking usually comprises 5–30 neighbors who regularly meet with financial services providers to borrow and save money; the neighbors provide guarantees for each other's loans.

microcredit, the number of clients they actually serve is quite small. They might deal with this in various ways; some seek regulation, while bigger NGOs that offer many different services might make their financial offerings a completely separate and self-sustaining operation.

II.1.5 *Rural Banks*

As their names imply, rural banks and community banks (here, simply *rural banks*) provide agricultural loans and savings services in rural areas. Banking authorities license and oversee rural banks, which are typically owned by members, the government, or a private firm. Although often small, rural banks nonetheless support professional management and staff and restrict product offerings to a particular geographic area. These products include short- and long-term savings services, and investment/consumption loans for agriculture, petty trading, and so on. Some rural banks are licensed to let clients transfer money and make payments. Because they are small, these banks are often linked to larger institutions and thus benefit from technical support for mobilizing funds, building capacity, and managing their capital. In countries that support rural banks—including China, Ghana, India, and the Philippines—the banks are often established by the national government to encourage development in rural areas. In India, for example, rural banks offer basic banking services and actively support credit programs among community self-help groups (Linder 2010a, 2010b). Further, in the Philippines, some rural banks offer both banking and microinsurance services (BSP 2011).

II.2 MFI Performance Overview

MFIs are a unique set of financial institutions because they have a *double bottom line*—that is, they pursue a combination of financial and social-impact goals. MFIs thus follow good banking principles to sustain profitability, while also pursuing their social impact objective of alleviating poverty. The financial performance goal of profitability entails reducing dependence on subsidies

and reducing risk exposure. The social performance goals vary, and include achieving a stated social mission and commitments to corporate social responsibility. Examples include reducing financial exclusion and poverty, empowering women, and following ethical standards for consumer protection. Clear indicators and strategies to support such goals are often lacking, however. Some critics have cautioned that MFIs that become too focused on financial performance at the expense of outreach to poorer customers drift from their objectives of serving the poor (Murdoch, 2000; Cull, 2009). Other researchers (Rhyne, 1998; Christen and Drake (2002) have asserted that a more profitable microfinance industry can better meet its social goals of reaching the poorest members of their communities because being profitable makes MFIs more efficient and more willing to seek out new markets for their loan products. Focusing on profitable operations only, however, might require that MFIs charge high-interest rates and fees, which may discourage future customers who fear to get into excessive debt and not being able to pay off their loans (Roberts, 2013). On the other hand, an excessive focus on social orientation can make MFIs unsustainable. A careful tradeoff between financial and social performance can help MFIs avoid compromising microfinance's credibility and future as a poverty reduction tool (Servin, Lensink, & Van den Berg, 2012).

II.2.1 *Financial Performance*

The most prominent driver of an institution's financial performance is profitability; this profitability is determined by internal factors such as the institution's balance sheet and income statement, risk management, operations management, and technology, as well as external factors such as the economy, financial markets, regulations, and competition. *Profitability ratios* measure

an MFI's net income against the structure of its balance sheet[5] and help investors and managers determine whether the funds they invested in the MFI are earning an adequate return.

Profi[6]tability is also a sustainability measure for financial institutions, as the costs of capital, inflation, non-cash items, and operating expenses are paid out of operating revenues only. Commercial banks become profitable by competing to attract money through deposits and through lending money out as loans. A bank's profitability rests on its ability to attract deposits at a cost sustainably lower than the return on assets (mainly loans). MFIs are specialized financial institutions and exhibit most of these same characteristics. The MFI's balance sheet and income statement are similar to those of retail/commercial banks and are both asset and liability driven (see Tables A3 and A4 in the Appendix for examples). Low profitability weakens an MFI's capacity to absorb adverse shocks, which subsequently affects solvency (Muriu, 2011), while a profitable MFI's surpluses are used to expand its outreach (Rosenburg, 2009; Ayayi & Sene, 2010; Tehulu, 2013).

An MFI's financial performance is determined by examining its financial statements and ensuring that the items they include are consistent with generally accepted accounting principles. The Appendix includes tables that show example financial statements and definitions.

Determining profitability is quite straightforward: Does the MFI earn enough revenue, excluding grants and donations, to make a profit? Typically, three profitability ratios are used to assess a financial institution's financial performance: return on assets (ROA), return on business (ROB),[7] and return on equity (ROE). In the microfinance literature, however, the leading measure of profitability is ROA.

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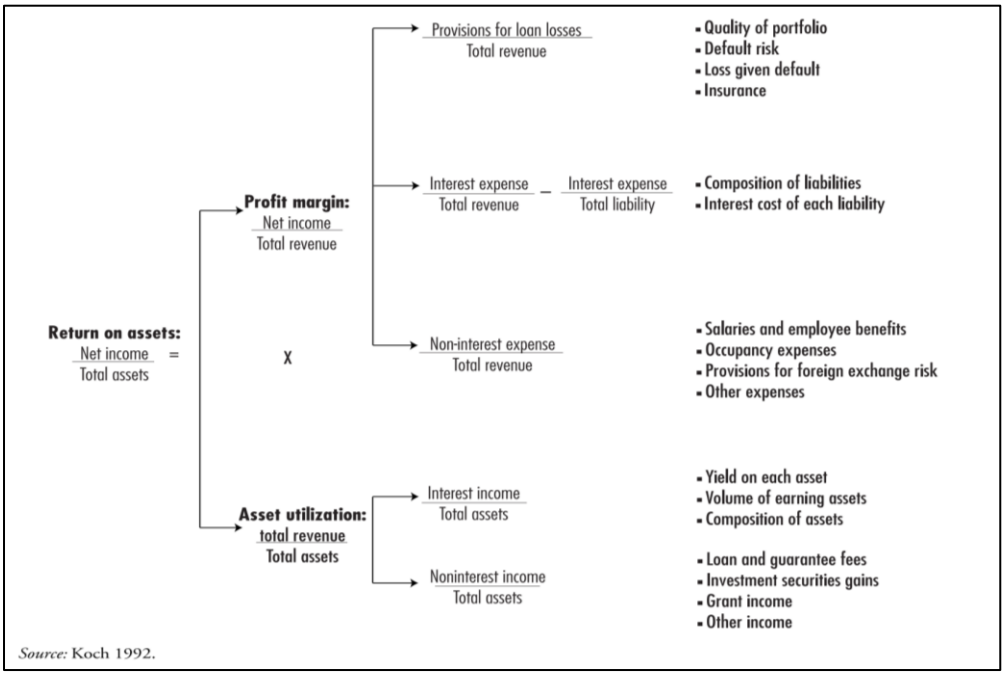
[5] Tables A2 and A3 in the Appendix show a sample of an MFI balance sheet and income statement, respectively.
[6] Cash flow matters a great deal too
[7] "Business" refers to the result of adding assets and liabilities together and dividing by two; this ratio is useful for MFIs that use mobilized savings to fund a majority of their assets.

The microfinance literature defines ROA as the MFI's net operating income after taxes divided by its assets. ROA is an important measure because it lets analysts compare the MFI's performance with that of other MFIs (Ledgerwood, 2013). It also tells investors the return they can expect from an investment in the MFI. A return should cover the risk-free rate and a markup to cover the MFI's systematic risk (Berk and DeMarzo, 2014). Such a risk-adjusted return is hard to calculate for MFIs because only a few of these institutions are listed as publicly traded firms. The following equation is adapted from the MIX market database's definition of ROA:

Equation 1. ROA Definition

$$\text{ROA} = \frac{(\text{Net operating income, less Taxes})}{\text{Average assets}}$$

Figure 1: Decomposition of Return on Assets (ROA)



Source: Adapted from Benjamin and Ledgerwood (1998)

ROA is a standard measure of an institution's long-term health (Koch, 1992; Ledgerwood, 1999). Many researchers use it to measure how well a firm is using its assets to generate profits (Bogan, 2012). Figure 1 shows a detailed breakdown of ROA into components to help further analyze an MFI's financial performance. This analysis reveals the sources of an MFI's profitability and may signal areas in which the institution could improve its operations and asset management from a profitability viewpoint. In particular, it can determine the portfolio yield and the performing assets and compare them with projected returns and between periods. At a top level, ROA can be decomposed into profit margin and asset utilization. When analyzing an MFI, it is useful to break down the profit margin and asset utilization into a series of ratios and relate each to the total income or total assets. This lets analysts examine the primary source of the MFI's revenue, along with other funding sources. The profit margin is the profits relative to total revenue earned. Further breaking down the profit margin ratio into the four costs an MFI incurs—showing each as a percentage of total revenue—provides insight into the MFI's risks and costs. *Asset utilization* is revenue as a ratio of total assets, which can be further broken down into interest and non-interest income to assets. These two components of asset utilization indicate the MFI's revenue source based on where the assets are invested (loan portfolio versus other investments). Breaking ROA into components shows just why this ratio is such a robust profitability measure.

Clearly, the objective of MFIs is not simply to maximize their value; they also aim to reduce poverty. However, in asserting that MFIs should rely less on donors and government funds and more on attracting commercial sources to fund their operations, many researchers have significantly boosted the idea of using ROAs as financial performance measures for MFIs (Benjamin and Ledgerwood, 1998). In the MIX market database, ROA is measured by net operating income (excluding taxes) compared to average total assets. This ratio, which is the net

of income taxes and excludes donations and non-operating items, shows how the MFI is managing its assets to optimize profitability.

II.2.2 *Social Performance*

Zeller, Lapenu, and Greeley (2003) define the social performance of an organization (whether a private-for-profit firm, cooperative, or NGO) as the organization's relations with its clients and other stakeholder groups. Obtaining a unique measure of an MFI's social performance is hard. However, two groups of metrics that have been used extensively in the microfinance literature are 1) outreach to the poor (Cull et al., 2007; De Bruyne, 2008; Mersland and Strøm, 2010; Lensink et al., 2011; van den Berg, Lensink and Servin, 2015), and 2) women's empowerment.

The MIX market database defines a measure for outreach breadth by the number of borrowers an MFI serves: a *large* outreach refers to an MFI that serves 30,000 borrowers or more, a *medium* one serves 10,000–30,000 borrowers, and *small* one serves less than 10,000 borrowers. Using the number of active borrowers as a measure of outreach breadth has weakness, however. For example, while big bank MFIs have many borrowers due to their size, it does not necessarily mean that they have a better social performance than, say, NGO MFIs. To ensure a reasonable basis for comparing outreach breadth across MFI legal charters, I scale the number of active borrower to the size of the MFI's assets. The MIX database also provides the depth of outreach definition as already described in this paper.

Outreach to the poor is usually measured by the breadth of outreach (i.e., the MFI's total number of clients) and depth of outreach (i.e., average outstanding balance as a percentage of gross national income, or GNI, per capita) (Cull et al., 2007; Hartarska, 2005; Hartarska & Nadolnyak, 2007; Tchuigoua, 2010). Schreiner (2002) contends that a lower loan amount could be interpreted

as a better outreach to poorer customers, so a lower average loan size could mean that the MFI is reaching poorer clients, which is a key microfinance goal. Also, D'Espallier, Hudon, and Szafarz (2017) argue that MFIs use average loan size to signal commitment to their social mission. To compare across countries, the average loan size can be taken as a percentage of per capita GNI (Bogan, 2012; De Bruyne, 2008; Mersland and Strøm, 2010; Armendariz and Morduch, 2010; Mersland and Strøm, 2010; D'Espallier et al., 2011).

Microfinance is essential not just as a tool for offering the poor social inclusion and financial access, but also as a significant vehicle for empowering women. Morduch (1999) argues that one reason microfinance has succeeded in reducing poverty is that it targets women. As is widely known, women are more likely than men to live in poverty, so increasing women's economic well-being can reduce poverty not just for the women themselves, but also for children, extended families, and thus the community as a whole. Some researchers have also explored the impact of women on microfinance sustainability and social performance. Ayayi and Sene (2010), for example, studied MFI sustainability as measured by financial sustainability by considering credit portfolio quality and, on several outreach ratios—including the percentage of women borrowers—concluded that women clients significantly and positively impact MFI profitability and the general well-being of poor communities. It is therefore not surprising that the number of women with access to credit has been steadily growing (Spina, 2013, Carney 1998; Scoones 1998; Ellis 2000, Hulme and Rutherford 2002). MFIs have expanded the boundaries of institutional finance and helped include the poor, especially poor women, in the formal financial system by giving them access to credit to fight poverty (Bogan, 2011). These factors drove my decision to include a women empowerment indicator as a social performance metric in my research. I measure

the women-empowerment construct by the MFI's percentage of female borrowers; a measure tracked in the MIX market database.

II.2.3 *Relative Social and Financial Performance and Funding Mix Sources*

Few studies have clearly established the dynamic relationship between an MFI's social impact and its financial return (Conning, 1999; Paxton, 2003; Cull et al., 2007; Quayes, 2011). Further, existing research often offers conflicting findings, thus creating confusion for policymakers in the financial industry. I discuss this conflicting research outcomes below:

Conning (1999) differentiates between three MFI categories: low-end, high-end, and broad-end.[8] Among his findings are that MFIs that are more socially oriented - as measured by average loan balances - show lower efficiency in relation to their staffing expenses; and that the interest rates charged by low- and broad-end MFIs are approximately twice as high on average as those of high-end MFIs. The latter is presumably because higher interest rates are needed to cover higher administrative costs. Conning also found that low- and broad-end MFIs' leverage level is lower than high-end MFIs. While extensive, Conning's research falls short of clearly delineating a relationship between financial and social returns.

Quayes (2011) adds to the body of research by clarifying financial and social performance, yet neglects to compare the dynamics between them. He analyzes 702 MFIs from the MIX database and offers empirical evidence emphasizing that an MFI's financial performance does not necessarily negatively impact outreach (Quayes, 2011). To measure social performance, Quayes divides that average loan balance by the per capita GNI (ALB_GNI). He uses a dummy variable

[8] Low-end MFIs serve clients with loans that are less than 20% of GNP per capita on average; high-end MFIs serve clients with loans greater than 85% of GNP per capita on average; and broad-end MFIs serve clients in between the high and low rates.

for financial self-sustainability (FSS) to represent a firm's financial performance and finds that FSS is positively related to outreach depth (using ALB_GNI) for high-disclosure MFIs. In one provocative result, Quayes finds that having lower average loan balances increases the probability that a high-disclosure MFI will achieve FSS; this comes close to providing evidence of a relationship between financial and social performance.

Paxton's (2003) poverty outreach measure includes outreach depth and scale; it shows, at best, a zero relationship between the reliance on subsidies and outreach. This suggests that MFIs that are financially self-sufficient tend to improve outreach to the largest number of poor people.

Cull et al. (2007) analyze trade-offs between outreach and MFI profitability, finding no significant connection between average loan size and profitability. They also use financial self-sufficiency as the primary way to asses profitability and operational self-sufficiency (OSS); for robustness checks, they use ROA. Among the authors findings are that lenders charge lower fees for bigger loans, regardless of whether the loans are for individuals or solidarity groups. Further, village banks showed the highest costs and subsidy levels, and lenders that focused on individual borrowers had the highest profits and the lowest outreach levels.

Hermes et al. (2011) analyze the interaction between MFI efficiency and social return. They investigated a possible trade-off between MFI efficiency and outreach and found that efficiency and the number of female borrowers and average loan balances are negatively related.

The literature shows inconsistent findings on the relationship between financial and social performance. In some research, deeper MFI outreach relates to lower efficiency (e.g., Conning, 1999; Cull et al., 2007; Hermes, 2011), while other research shows that financial self-sufficiency and outreach are positively related (e.g., Paxton, 2003; Quayes, 2011). Further, Cull et al. (2007) examined return measures and outreach, and they found no significant relationship. Additional

detailed analysis is clearly needed on these contradictory results. In addition to using traditional estimating factors to measure costs and return, I also analyze portfolio yield to identify how factors driving cost and yield—that is, the return measures—relate to outreach measures.

Existing research indicates that outreach to the poor can positively impact portfolio yield, but it also might increase MFI costs—resulting in little to no impact on return measures. Conning (1999) indicates that MFIs offering smaller loans charge higher interest rates. Because portfolio yield measures clients' gross interest payables by dividing interest and fee income by the average loan portfolio, researchers use it as a proxy for interest rate. Further, because smaller loans indicate higher outreach levels, researchers assume that higher financial return would link to greater outreach, if all else is constant. Until now, research has shown no significant relationship between financial return, measured as profitability, and social return, measured using various indicators (Cull et al., 2007; Quayes, 2011). With more secondary data and using different methods, I intend to add to the discussion of the dynamic relationship between financial and social performance; my goal is to help policymakers understand how to improve the odds of MFI success and solvency.

II.3 Funders of MFI Operations and Capital Requirements

Due to their social appeal, MFIs receive funding from governments, investors, and donors. In return, they are expected to provide financial services to their targeted market and ensure operational sustainability that benefits both the borrowers and the institution (Hermes & Lensink, 2011). MFIs use funding to fuel various ventures—including growth, product and channel development, and service to novel regions and market sectors—while their direct institutional funding targets loan portfolio expansion (El-Zoghbi et al., 2011). Microfinance funders can be classified as public or private, intermediary or direct, or local or cross-border. As microfinancing has progressed, so have the types of funders. The base has increased significantly from generous

(development-focused) donors to investors from private-sector firms, local and international banks, and private equity funds, and individual investors.

More recently, *impact investing* has emerged and brought funders into the fold who pursue investments that explicitly target social development goals. Furthermore, MFIs are looking to capital markets both for fundraising and to offer an exit mechanism for investors. By engaging with capital markets, MFIs are developing the capacity and sophisticated fundraising needed to showcase themselves to institutional investors as becoming "investment ready." Different funder types have different motives, ranging from straight profit-seeking to improving the public good.

Microfinancing is primarily funded publically, but private financing is rapidly increasing, driven by foundations and institutional investors and their often differing motivations. Foundations focus on development goals and usually fund through donation, while institutions and individuals want financial and social results. Regardless of type, funder motivations increasingly focus on commercialization, broad inclusion, and scale.

Debt financers rarely stipulate how their money can be used, but some other lenders require that MFIs use funds for particular products (such as agricultural loans) or markets (such as rural women), and donation funders specify how their funding can be used in explicit detail.

Typically funded by donations and equity, greenfield and early-stage institutions direct their resources mainly toward start-up, infrastructure, and capacity building. Because they generate enough income to cover costs, more mature institutions use debt and equity funding. Funders support different MFI types based on their mandate and their expectation of returns, both overall and in terms of social vs. financial. Young firms looking to grow toward profitability require patient capital, often from investors who want both financial and social returns and view

investments as a long-term engagement. Funders who want rapid returns and have constraints on liquidity and return typically fund only developed institutions.

Public funders—which include development finance institutions (DFIs) and government, local, bilateral, and multilateral agencies—aim to draw private investment to underfunded markets. Their funding targets development goals and their activities support defined social objectives. National budgets fund bilateral agencies; examples agencies include the US Agency for International Development (USAID) and the Swedish International Developmental Agency (SIDA). Countries also fund multilateral agencies, such as the United Nations and the World Bank, while DFIs are funded by in-country shareholder contributions at first, then by retained earnings. Examples of DFIs include Germany's KfW, the Netherlands' FMO, and the World Bank's private sector affiliate, the International Finance Corporation. DFIs also issue bonds on capital markets; they seek both social and financial returns and are accountable to the general public. Public funders use various tools—including donations, guarantees, debt, and equity—to provide resources in areas that private investors cannot or will not support. In so doing, public funders help create an environment that will encourage private-sector involvement.

- *Bilateral and multilateral agencies*. Bilateral agencies are country-specific and work directly with the host country's government, often in relation to its foreign policy initiatives. Bilateral agencies support specific MFIs and service market development; channeled through NGOs or the government, their funding is targeted at capacity expansion. Multilateral agencies have the same goals, but are supported by and work in multiple countries at the same time. Both bilateral and multilateral agencies have strong credit and thus can offer guarantees when providers issue debt for private sector participants to purchase.

- *Development finance institutions*. DFIs seek both social and financial returns, and can invest in MFIs in one of two ways: directly, or through holding companies, investment funds, or other intermediaries. DFIs often fund companies and projects that the private sector shows no interest in (at least initially).

Private funders include institutional investors, NGOs, banks, foundations, and individuals. Private funders are more diverse in their objectives and focus than public funders. For example, foundations focus more on market development, while other types of investors target dual performance goals that balance financial performance and social impact improvements.[9] The latter recognize that, on their own, charitable organizations and governments may not have adequate capital to address global problems. Many invest funds in this way out of a sense of corporate social responsibility (CSR), while others are interested in risk profiles that might offer increased financial and social rewards (Reille et al., 2011).

- *Foundations*. Endowments from multinational companies such as Microsoft (via the Bill & Melinda Gates Foundation) and other private enterprises and individuals are the primary source of foundation capital. Recognizing private money's crucial role in addressing poverty, foundations fund global philanthropic initiatives to support development. Foundations fund MFIs in various ways, but mainly either offer seed capital for start-up institutions or donate to existing MFIs to train staff members, build capacity, and develop products. Further, foundations motivate other investors by agreeing to absorb a portfolio's first loss. In this way, they cushion more risk-averse investors, who otherwise would not invest in the MFI portfolios. As I describe below, some foundations also invest in MIVs.

[9] Various investments in businesses or funds—including sustainable investment, double- and triple-bottom-line investment, and impact investment—are made purposefully to generate social or environmental good alongside financial returns.

- *Non-governmental organizations (NGOs)*. An NGO operates independently of any government and does not get directly involved in government-run programs. NGOs' primary purpose is to address a social or political issue. Many local and international NGOs fund microfinance using either multiple public and private sector funding sources or direct fundraising efforts that target individual donors. NGO donations typically fund product development or nonfinancial services, or provide seed capital for operations aimed at specific underserved groups within their general mission/target clientele. They can also help start or even be a direct shareholder[10] of a local MFI (Ledgerwood, 2013).
- *Institutional investors*. Institutional investors—including insurance companies and pension, hedge, and mutual funds—are increasingly investing in the microfinance sector both for social value and to diversify the returns they typically get with other investments; such investments are becoming well known as *impact investing*.[11] Institutional investors typically invest in microfinance through intermediaries. True to their dual goals, they seek financial benefit; thus, most of their funds are channeled into MFIs that are both established and profitable. Further, by influencing the way MFIs and intermediaries gather information for and meet their operational, financial, and social-impact reporting requirements, institutional investors have had a tremendous impact on MFI reporting standards.
- *Banks*. Commercial banks that invest equity and debt in MFIs initially did so in support of their CSR goals. Today, however, many use microfinance activities to meet financial goals as well. While local banks in some countries offer no MFI funding, in other countries, they

[10] NGOs with successful MFIs include Acción Comunitaria del Perú (MiBanco); Bolivia's FIE NGO (Banco FIE); Peru's Separ (Confianza); Rwanda's Urwego (UOB); and Cambodia's Acleda (Acleda).

[11] Socially responsible investing's "doing well by doing good" motto highlights its focus on making investments that have a positive social impact.

are the main providers of financial services for the poor. Further, some banks sell money management products to smaller MFIs and, once a connection is solidified, they offer other services, including credit or term loans. These banks typically have conservative lending conditions, such as requiring collateral from MFI borrowers or offering only shorter-term financing. In an effort to expand the local financing sector or reach new market segments, local banks might offer MFIs equity or create cobranded subsidiaries that focus on particular services.

- *Individual investors.* Individual investors may include ordinary community members—such as members of credit unions and rural banks—as well as high-net-worth individuals. These investors are often driven by trends. High-net-worth individuals typically use MIVs to directly invest equity in financial service providers, while retail investors donate funds through NGOs, foundations, MIVs, or, as I discuss later, peer-to-peer aggregators.

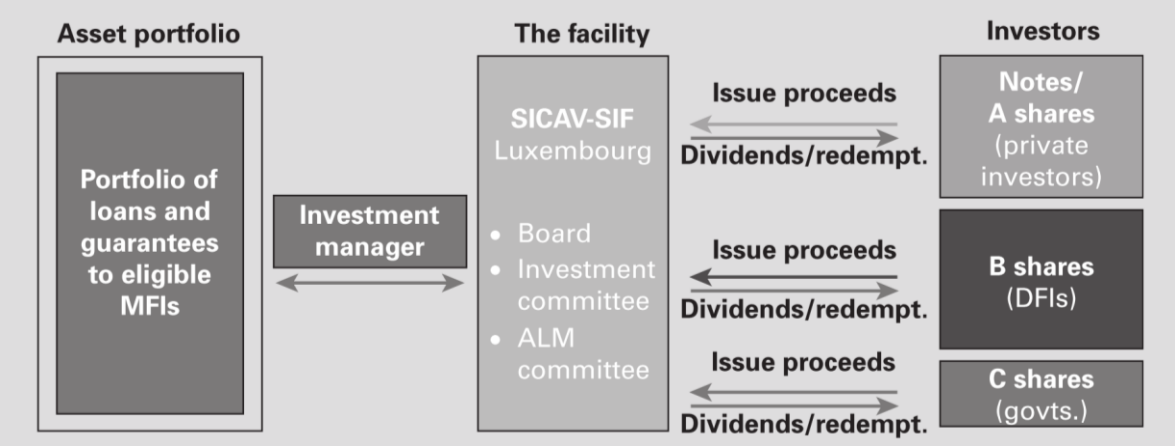
II.3.1 *Direct vs. Intermediary Funders.*

Direct funders provide their own funds directly to MFIs. For example, a banking institution is considered a direct funder because its board or management makes decisions on allocating funds to microfinance. In contrast, microfinance investment intermediaries (MIIs)—which include microfinance holding companies and MIVs—are funded from diverse public and private investors and in turn invest their funds into individual MFIs. Investors are attracted to MIIs because they offer industry and regional expertise, diverse portfolios, and economies of scale.

- *Microfinance investment vehicles (MIVs).* MIVs are private, managed investment funds that target underserved markets and rural areas and play a key mediating role between financial service providers and (usually foreign) investors. Approximately half of all development finance institutions investments in MFIs are channeled through MIVs (El-

Zoghbi et al., 2011). Although mainly funded by institutional investors, some MIVs allow retail investors. These debt and hybrid MIVs—which might, for example, be set up as mutual funds—provide short- to medium-term funding and let investors buy and sell their fund shares on a monthly or quarterly basis. Most MIVs target established, well-performing institutions and operate internationally to increase their geographical outreach and diversification. However, some MIVs—typically churches and support associations—are structured more like NGOs, are member-owned, focus on social performance, and target smaller institutions. Some MIVs set up debt funds as structured finance vehicles for a fixed time period. These products are often called *collateralized loan obligations* (CLOs) or *collateralized debt obligations* (CDOs). Finally, equity fund MIVs have a fixed duration and investors cannot sell their interest in them until the fund's term ends. Figure 1 shows the typical operations of an MIV fund.

Figure 2: How Microfinance Investment Vehicles (MIVs) Operate



Source: Adapted from International Finance Corporation (IFC)

- *Microfinance holding companies*. International microfinance networks channel donor and investor funding—in the form of equity, debt, donation, or guarantees—into global affiliate operations. These networks, which are established as holding companies or NGOs, include

ACCION International and Opportunity International. Some holding companies own 100 percent of the subsidiaries, with shareholders at the holding level, while others have investors at both holding and subsidiary levels to ease strategic investments (such as from local shareholders). As formal institutional models increasingly gain favor, interest in the microfinance holding companies model is declining.

- *Local apex organizations***.** An *apex* pools domestically created funds and lends those funds—typically as subsidized loans, but sometimes as donations—to MFIs. Apexes use public money and include government programs, NGOs, development banks, and commercial banks (Ledgerwood, 2013). In 2009, the 15 largest apexes lent funds to more than 1,500 NGOs, MFIs, and other finance companies providing microfinance services (Forster et al., 2012).
- *Peer-to-peer aggregators*. These intermediaries help individuals make direct, small-scale investments in MFIs through Internet-based platforms. At the local level, this approach has disadvantages, including that most aggregators have detailed and costly reporting requirements and do not provide funding in the local currency. Further, because aggregators have limited control over local providers, these providers might fund risky clients and products and thus create losses for investors.

II.4 MFI Funding Sources or Tools

MFIs fund their capital requirements and operations by accessing financial tools or sources such as debt, equity, client deposits and savings, short-term borrowings, donations, or hybrids of these basic sources. The institution's choice of funding depends on its mission and scope, as well as its performance and ability to gather deposits. It also depends on the environment the MFI operates in—specifically, the regulatory framework and the overall financial system's

sophistication level. As MFIs mature, various funding options become available for different financing needs. For instance, they typically use debt financing to refinance mature debt and fund portfolio growth, while equity supports regulatory goals, eases the process of obtaining other financing, and serves as a financial buffer for debt funders. Various structured finance innovations give both high- and lower-risk investors seeking diverse return conditions access to similar funding vehicles—for example, some investors might accept the first loss, while others take a more secure standing. Further, local currency debt lets MFIs borrow in the currency they use to serve their clients, while donations (grants and subsidies) can support frontier projects and organizations that private investors might find unattractive at the outset.

II.4.1 *Debt*

MFIs usually access debt funding to get the capital they need to make loans and grow operations (Morduch, 2000). *Debt* is funding that is lent to the MFI for a specified time period, during which the MFI must repay the debt and any added interest. Seniority in relation to debt defines which lender is paid first if the issuer has cannot repay all of its obligations. A *secured* debt means that the borrower has collateralized the debt by pledging an asset; the lender can then legally claim that asset if the borrower does not repay the debt. *Unsecured* debt requires no collateral and is backed only by the borrower's credit worthiness and willingness to pay.

Estimates suggest that debt financing outstrips both equity financing and donor funding by a ratio of 5:1. Debt financing includes debt issuance and loans from commercial lenders. MFIs annually receive approximately US$30 billion in funding, mostly in the form of interest-bearing loans (Lahaye et al., 2012), of which about 80% are extended as credit to MFI clients. As I now describe, MFIs typically use two types of debt: syndicated loans and bonds.

II.4.1.1 *Syndicated Loans*

MFIs enter into syndication with other services providers to issue debt when the amount they need is greater than the exposure they can manage. In this *syndicated loan*, the negotiations required to raise a large amount of debt are reduced as the investor group members agree to the same structure and terms, which the MFI negotiates with the lead syndication firm.

II.4.1.2 *Bonds*

Bonds are debts that lenders (or *bondholders*) can easily transfer among themselves. The bond issuer agrees to pay the bondholders the principle and interest due on designated dates, similar to a standard loan. Even if they are operating in a market that permits bond sales, few providers issue them because they have significant administrative, regulatory, and reporting requirements. They therefore make sense only if the amount borrowed is quite large or the MFI is trying to establish its name in the market to issue a later (and larger) bond.

II.4.1.3 *Borrowings*

Borrowings are the balance of funds received through a loan agreement. Borrowings might include loans from other financial institutions (payable within one year), commercial papers, repurchase agreements or similar debt securities, and credit lines. Borrowings are a reliable source of liquidity for MFI operations; the downside is that they are expensive. Many MFIs do not have the required collateral to secure borrowing; they are therefore risky for the lenders, who charge high interest rates commensurate with that risk. Borrowing significantly increases the cost of funding for MFIs, although it can give them much-needed liquidity to support their operations.

II.4.2 ***Equity***

Equity offers ownership interest in an MFI provider through shares. These shares act as a claim on the providers' assets in proportion to the percentage owned. Conning (1999) argued that

sustainable MFIs that serve the poor successfully should use equity to finance their operations. Tehulu (2013) asserts that equity financing's low costs can boost MFI profitability as they are not required to pay dividends. However, according to empirical evidence, MFI banks often hold extra equity to protect their franchises' value (Berger & di Patti, 2006). Also, it seems that MFIs with low liquidation options are likely to use more debt for funding, thus cutting back on equity levels.

Equity shareholders are owners and, as such, assume the greatest risk; if an MFI fails, these shareholders are the last to be paid (if they are paid at all). With added risk, however, comes the potential for greater reward. Unlike debt, which has fixed returns, dividends or gains from selling shares offer equity owners the potential for unlimited returns.

Unlike regular firms, MFIs also receive equity donated in the form of paid-in capital to support their loan portfolio growth. Also known as *loan capital*, donated equity consists of the funds donated to support microloan creation. MFIs often treat these donations as equity and record them on their balance sheets as an equity increase. Because loan fund capital donations are intended to fund assets rather than cover expenses incurred, they differ from donations for operations.

II.4.3 *Deposits*

Having cheaper sources of funds, such as short-term deposits, can make a difference in MFI profitability. Because deposits are inexpensive to mobilize and are used to generate loans, MFIs can achieve significant profit margins from the interest rate differential. Deposit-collecting MFIs can decrease the size of pricey borrowings they may require to fund operations (Kiiru, 2008; de Sousa-Shields & Frankiewicz, 2004). As Cull et al. (2008) discuss, many countries prohibit MFIs from collecting deposits unless they operate in an environment where regulators can license them. Such regulation can be expensive for MFIs, however, especially if they must meet capital

requirements, hire experts, and upgrade their information systems to comply (CGAP, 2005; Tehulu, 2013; Cull et al., 2009).

Deposits are important for MFIs. Not only do they provide a cheap source of funding for credit creation, but they are also liquid assets and thus ensure that clients can withdraw their funds when desired. However, to ensure institutional soundness and protect the funds of public depositors, deposits are strictly regulated. Although they vary depending on the country, these regulations typically include information system standards, reporting standards, and minimum capital ratios. Deposits mature quickly—depositors can withdraw demand deposits whenever they want, for example, while term deposits must mature, but typically do so in two to three months. Practically, deposits are usually a secure funding source, with long holding periods due to frequent depositor rollover. That said, if depositors feel unsure about the safety of their funds, they can make a sudden run on deposits and potentially jeopardize the institution's health. Finally, licensed MFIs that take deposits are more liquid, as they depend less on external—and more expensive—funding sources.

II.4.4 *Donations*

Donations include donated funds to finance operations and concessional loans (also known as *subsidies* or *donations*), but exclude donated equity for cushioning capital. Traditional intermediaries use debt, loans, and savings to fund their loan portfolios, but many MFIs rely primarily on concessional loans and donated equity.

Donations to cover operational costs directly subsidize MFIs. These funds are recorded on the MFI's income statement as revenue, but the funds are separated from revenue generated by lending and investment.

Donations are nonreimbursable and encourage MFIs to create new products, support microfinance market development, and expand their outreach. MFIs can use donations to cover their technical needs, or they can use them to attract investment to risky products and frontier markets. As frontier investments, donations serve as a cushion for providers, who can take greater risks up front and thus expand both outreach and innovation. Subsidized funding is primarily donation-based. For new or risk MFIs that lack commercial financing options, subsidized funding is a suitable alternative.

Donations give new microfinance programs breathing room to improve their operations and ensure adequate staffing. As MFIs continue their work in inclusive financing, donations remain an important and stable source of funds (Hudon & Traca, 2011).

II.5 MFI Performance[12] and Funding Sources

Total funding for MFIs broadly includes debt or borrowings (commercial and noncommercial), equity, donations, and deposits (both savings and time deposits) (Cull, Demirgu¨c-Kunt, and Morduch, 2009). Microfinance experts put the industry's total market funding needed at more than $300 billion[13]; only 10% of this need was met in 2008. Increasingly, short-term loans, mostly from commercial banks, are used to meet the funding shortfall (Tulchin, 2004; MacFarquhar, 2007). However, these commercial bank funds are expensive, with a global average effective interest rate of approximately 37%. The high interest rates paid on funding sourced from banks increases already high MFI operating costs and exacerbates the capital

[12] Throughout this paper, I define metrics for performance as follows. I define financial performance in terms of profitability, as measured by returns on assets. I define social performance in terms of the MFI's outreach, measured by the number of active borrowers (breadth) and the average loan per borrower per GNI/per capita. These are the most popular measures used in academic research.

[13] (Harald Hüttenrauch & Claudia, 2008; Ingrid Matthäus-Maier & J.D. von Pischke, 2008)

constraints in the MFI industry. This, in turn, prevents and limits MFIs from meeting the enormous demand for their resources (Bogan, 2012; Dehejia et al., 2005).

II.5.1 *Debt Funding and Microfinance Performance*

Most MFIs are non-deposits-taking (Galema, Lensink, & Spierdijk, 2011). Because deposits are a low-cost, short-term funding source for financial institutions, the lack of this funding resource and the mostly undeveloped domestic credit markets limit MFI financing opportunities and create financial constraints (Tchakoute Tchuigoua, 2014). Similarly, the inelastic demand for credit by the poor (Dehejia, Montgomery, & Morduch, 2012) collaborates with the high interest rates charged on funding to limit MFIs' ability to serve poorer potential clients.

Robinson (2001) claims that commercial funding has created accountability, transparency, efficiency, economic interest rate setting, capital mobilization, and appropriate management remuneration. However, to successfully mobilize commercial funds, MFIs should have the ability to accept savings or deposits, issue bonds in capital markets, attract funding from commercial investors and sources, and compete with other funds seekers to attract funding. But MFIs cannot successfully compete for commercial financing unless they are financially profitable. And, even if they are profitable, there is no guaranteed that MFIs could obtain commercial debt, as providers often see microfinance services and unsecured lending to the poor as too risky (UNCDF, 2002).

II.5.2 *Equity Capital and MFI Performance*

MFIs could arguably raise equity capital from capital markets. But, as previously mentioned, most MFIs are not profitable enough to attract profit-seeking equity investors. Without becoming profitable and developing the ability to offer competitive returns to investors, MFIs will fail to attract equity funding from commercial investors, who typically expect at least some sustainable returns on their investment. Research on profit-seeking firms' capital acquisition has

found that investors are attracted to organizations with low investment risk and the potential to generate substantial returns (e.g., Katila, Rosenberger, & Eisenhardt, 2008). As testimony to the power of profit, researchers point to some major MFIs that have aggressively expanded their operations, fueled by retained earnings. One such institution is Compartamos, whose 2007 public offering was heralded as the future of MFI funding strategy—that is, routinely attract investment from the private sector and thus liberate MFIs from high-minded, donor-supported initiatives (Cull, Demirgüç-Kunt, and Morduch (2009); Rosenberg (2007); Malkin (2008); Accion International, 2007).

II.5.3 *Donation and MFI Performance*

Many developments and donor organizations already believe that it is only by weaning-off donor dependency and adopting a commercial orientation that MFIs can truly attract the capital and savings base they need to scale up their microloan portfolios, increase sustainability and outreach, lower lending rates, and meet the demand for financial services for the poor. Most experts see donor funding as useful only in an MFI's start-up phase and thus unsustainable as an ongoing funding source(Armendáriz de Aghion & Morduch, 2005). Indeed, researchers argue that cost efficiency in microfinancing is now being driven by this shift from concessionary to commercial funding (Forkusam, 2014).

III THEORETICAL FRAMING AND HYPOTHESIS

Many metaphors have been adopted in the academic literature to explain an organization's development from its inception to termination. One of the prominent metaphors is the life cycle; usually used for ventures and organizations, products, and the developmental stages of an individual's career. The Life-cycle theory has been used to describe how an organization starts, develops to maturity and eventually ceases to exist (Kimberly & Miles, 1980). According to Van de Ven and Poole (1995), life-cycle is the most common explanation of development in the management literature, next to teleology.

The life-cycle theory (LCT) posits that "the developing entity has within it an underlying form, logic, program, or code that regulates the process of change and moves the entity from a given point of departure toward a subsequent end that is prefigured in the present state." In this inherent process of change, external environmental events and processes play a role in transforming the entity, but only through mediating the immanent logic, rules, or programs that govern the entity's development (Van de Ven & Poole, 1988).

The life-cycle model typically exhibits a single sequential progression of change events in stages or phases, where characteristics acquired by the entity in earlier stages are retained in later stages. Also, the stages are related to each other as they derive their sequence of events from a common underlying process. As such, each stage of development is seen as a necessary precursor of the succeeding stages.

Life-cycle theories of organizational entities often explain development regarding institutional rules or programs that require developmental activities to progress in a prescribed sequence.

Rogers (1983) building on the life-cycle theory proposed by Kimberly and Miles (1980), argued that not only do organizations' development follow its life-cycle but innovations in organizations may follow a logical or natural sequence developmental stages. He posited five stages of innovation: need recognition, research on problem, development of idea into useful form, commercialization, and diffusion and adoption. The order among these stages is necessitated both by logic and by the natural order of Western business practices.

Kapper (2007) outlines and describes four stages of the MFI life cycle: start-up, expansion, consolidation, and integration. In the *start-up phase*, MFIs are financed through donations and concessionary funds. At this point, Kapper says, MFI investment is too risky to attract commercial equity investors, so donors provide equity to control the lending in line with their goals. NGO MFIs are most successful in this phase because of the subsidies and donations they receive.

In the *expansion phase*, MFIs focus on extending their operations and expanding credit outreach to their clients. They also begin receiving equity capital from public investors to help stabilize their performance. International finance institutions provide seed capital, which offers excellent signals for commercial funding. However, subsidies, soft loans, and donations still flow in from donors (Brau & Woller, 2004).

The *consolidation stage* is characterized by the availability of commercial funding—including debt and short-term bank borrowings—for MFI operations. Some MFIs may acquire licenses to accept savings or deposits during this phase. Such deposits help expand loan creation at a low cost. Due to their low risk, only large MFIs can typically afford low-cost commercial funding, and private investors who expect good returns find them increasingly attractive. Also in this stage, local debt becomes a primary financing source for MFIs, because foreign debt—with its inherent exchange-rate risk and capital-flow regulations—can be quite expensive. Bank MFIs

may avoid this transition process, while others are most likely to progress in this way (Kapper, 2007).

In the final *integration stage*, subsidies and donations are no longer a significant part of the MFI funding structure. Most MFIs are financially sustainable and profitable during this stage, which is associated with high outreach. However, some researchers have warned that MFIs may begin to neglect the core responsibility to the poor and focus on profitability alone (Morduch & Haley, 2002; Morduch, 2000). This phenomenon, known as *mission drift*, is the theme of much research. Rhyne (1998), however, has argued that as MFIs develop, their clients thrive as well. As such, depth of outreach increases—that is, the average loans to clients get much bigger.

This approach to the MLCT is not the only framework in the microfinance literature. Helms (2006) and Hoque & Chishty (2011) identified three MFI growth stages: formative, maturing, and matured. Another schema organizes stages by time, with years 0–4 categorized as the start-up stage, years 5–8 as the growing stage, and 9 years and older as the mature stage (Robinson, 2001).

For this research, I adopt the MLCT framework proposed by Robinson (2001) and de Soussa & Frankiewicz (2004). In this framework, each of three stages is defined by an MFI's years of operation: 1) the new phase (0–4 years); 2) the young phase (4–8 years); and 3) the mature phase (8+ years). *New* MFIs are not financially viable and rarely show a profit, while *young* MFIs are profitable and *mature* MFIs are financially viable (de Soussa & Frankiewicz, 2004). Several other authors (Kooi, 2001; Van Maanen, 2005; Bogan, 2008) largely agree with this funding development framework and further argue that, in the new phase, MFIs need highly risk-tolerant subsidized capital in the form of donations and donated equity to support their early years of operation, as MFIs are not yet sustainable enough to attract commercial funding.

III.1 The MLCT and MFI Performance

The MLCT asserts that most MFIs start out as NGOs. They have a social vision and fund their operations with donations and concessional loans from donors and international financial institutions. I do not find such switching in my sample, as all MFIs maintain their legal status throughout their development.

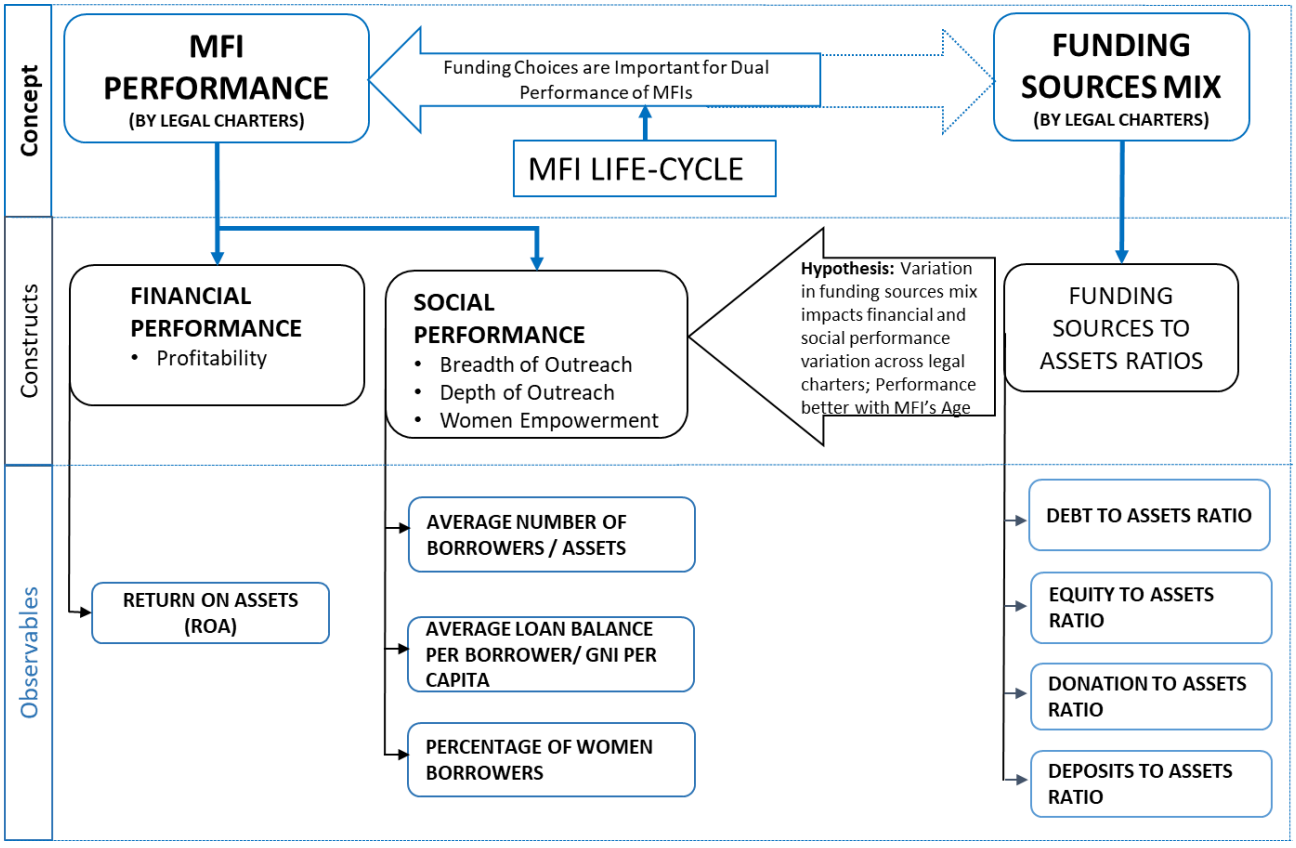
I did find, however, that MFIs wean off donations as they evolve through the development stages. The MLCT seems to explain this "weaning" phenomenon by suggesting that donor donations and soft loans typically constitute most of the funding in MFIs' formative stages. As MFIs mature, commercial debt funding becomes increasingly available to finance operations. The debt contracts, however, may have restrictive covenants or guarantees. In the maturity stage, traditional equity financing becomes available from NGOs and from public and private investors (Fehr & Hishigsuren, 2004; Bogan, 2012). This stage is characterized by the commercialization of funding and operations. By becoming regulated entities, MFIs invest in and achieve sustainability and formalize their activities. At this stage, MFIs also can be licensed to accept deposits (Bogan, 2012). An initial summary analysis of the MFIs in my sample shows, however, that they need not reach the maturity stage before obtaining a license to mobilize deposits. Deposit-taking can start at any stage, depending on the MFI's charter and factors such as institutional and regulatory environments (Ledgerwood, 1998, 2013). Although these factors are outside my research scope, my sample shows that MFIs reporting as banks, credit unions, and rural banks have a substantially high median-deposit-to-assets ratios, even in the life cycle's new and young phases.

Deposits expand loan creation at a low funding cost. Commercial debts also become very important in the MFI funding structure. By obtaining stability, MFIs can acquire funding from domestic banks. Further, foreign funds are used as guarantees for debt obtained by MFIs in the

local market, and MFIs can mobilize increasing commercial capital. However, as I noted early, because only large mature MFIs can afford such funding (due to their low risk), they can attract private investors who are keen on receiving high returns.

As described below in detail, I test the central hypothesis that variations in an MFI's capital structure can explain the changes in its performance across its developmental stages, and that its performance gets increasingly better with age. Figure 3 shows the various relationships, constructs, and observable metrics typically used in the microfinance literature to quantify MFI's financial and social performance and funding source mix; I define the measurements later.

Figure 3. MFI Performance and Funding Source Mix and MLCT



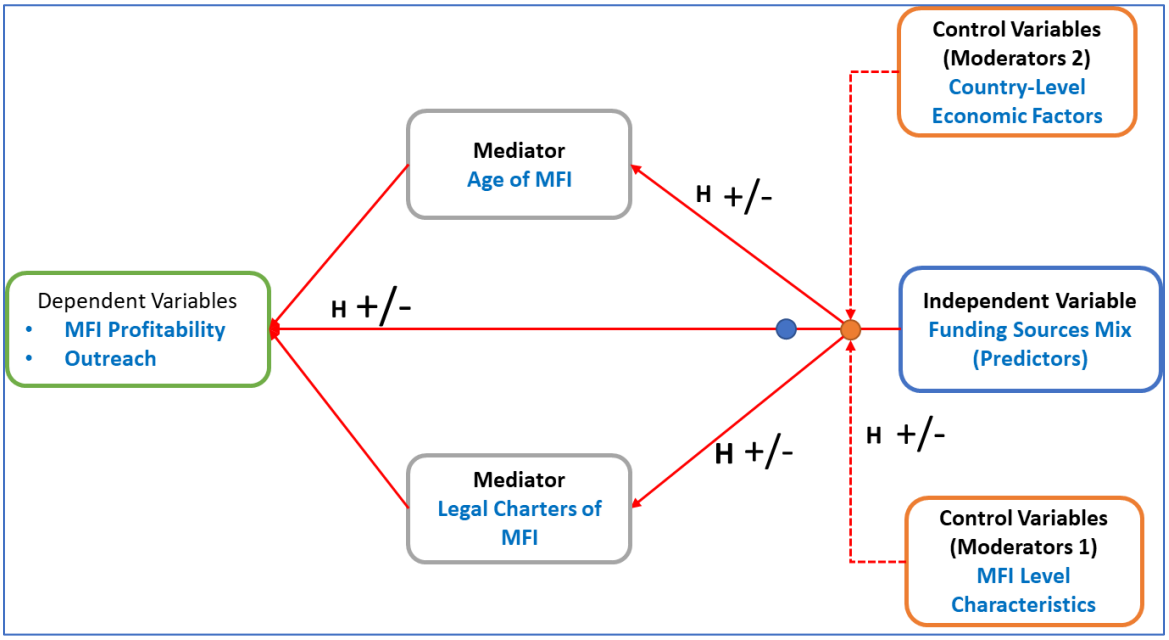
Source: Own analysis

For corporate business, capital structure can be defined as the mix of debt, equity, and other financing types that firms employ to finance their operations. Although optimal capital

structure for nonfinancial firms has been thoroughly studied since Modigliani and Miller published their famous "Irrelevance Theory" in 1958 and 1963 (e.g., Faulkender and Petersen, 2006; Harris & Raviv, 1991; Titman & Wessels, 1988), Modigliani-Miller (MM) and other corporate finance theorems do not adequately apply to lending institutions (Cohen, 2004). While MM capital structure theory is popular in corporate finance, it is irrelevant to MFIs, which, as lending institutions, are licensed to attract deposits, and which depend heavily on donations and subsidies to fund their operations. MM theory posits that, depending on relevant considerations (tax advantages, bankruptcy costs, agency costs, transaction costs, asymmetric information, or corporate control), firms can choose an optimal capital structure to produce desired profitability. To suit lending institutions, MM theory requires adjustments[14] (Cohen, 2003; Rosenzweig, 2004). Unlike traditional financial institutions, MFIs pursue dual performance objectives reflecting their social and financial obligations (Murdoch, 1999; Mersland & Strom, 2010; Kumar, 2012). Thus, the issue of donation money, soft loans, and donations complicate capital structure question for MFIs. Also, MFIs operate in markets with less well-established institutions and weaker regulations. In such markets, adverse selection considerations make it expensive for MFIs to raise funds. These constraints, among others, make an MFI's optimal funding source mix entirely different from that of corporations.

[14]objective of social performance goal in addition to fiscal performance like profits

Figure 4. High-level model of MFI performance



Source: Own Analysis

Figure 4 shows a high-level model of the relationship between an MFI's funding mix and its dual performance. As the figure shows, the MFI's funding mix or capital structure may directly impact variations in the institution's performance, but that impact can be mediated by the MFI's age (which is used as a proxy for the different MFI development stages). Additionally, micro-economic characteristics of the MFI's country of operations, as well as the MFI's internal performance factors, can moderate the relationship between funding mix and performance.

III.1.1 *The MLCT and MFI Financial Performance*

As discussed earlier, MFI financial performance is measured by profitability and sustainability. Here, I focus on profitability. The observable for profitability is ROA. The evolution of MFI development and growth suggested by the MLCT implies that mature MFIs, having made it through earlier stages of transformation, are financially profitable. In these earlier stages, MFIs may focus on acquiring customers, developing products, investing in staff and other assets that

sharpen the business model, and developing information systems to improve service delivery at acceptable cost. As MFIs mature, their access to various financing sources increases, which in turn lowers their cost of capital, improves their risk management, and increases their profitability (Maisch, 2011). Schneider & Greathouse (2004) also argue that regulatory provisions, profitability, regulation status, accessibility of donations, and country-specific factors contribute to MFI development and growth.[15]

III.1.2 *The MLCT and MFI Social Performance*

Social performance is measured by MFI client outreach. I measure the breadth and depth of outreach by their proxies: the number of active borrowers per assets and the average loan per borrower over GNI per capita, respectively. Although useful measures, these indicators can be misleading; loans vary in their terms and in what they are used for, and they may not be linked to client income level. Further, outreach depth can have many different meanings. If it is viewed as *providing financial services to those excluded from formal financial services*, then it is important to define which sectors of society have little or no access to formal financing (adapted from Paxton and Fruman 1998).

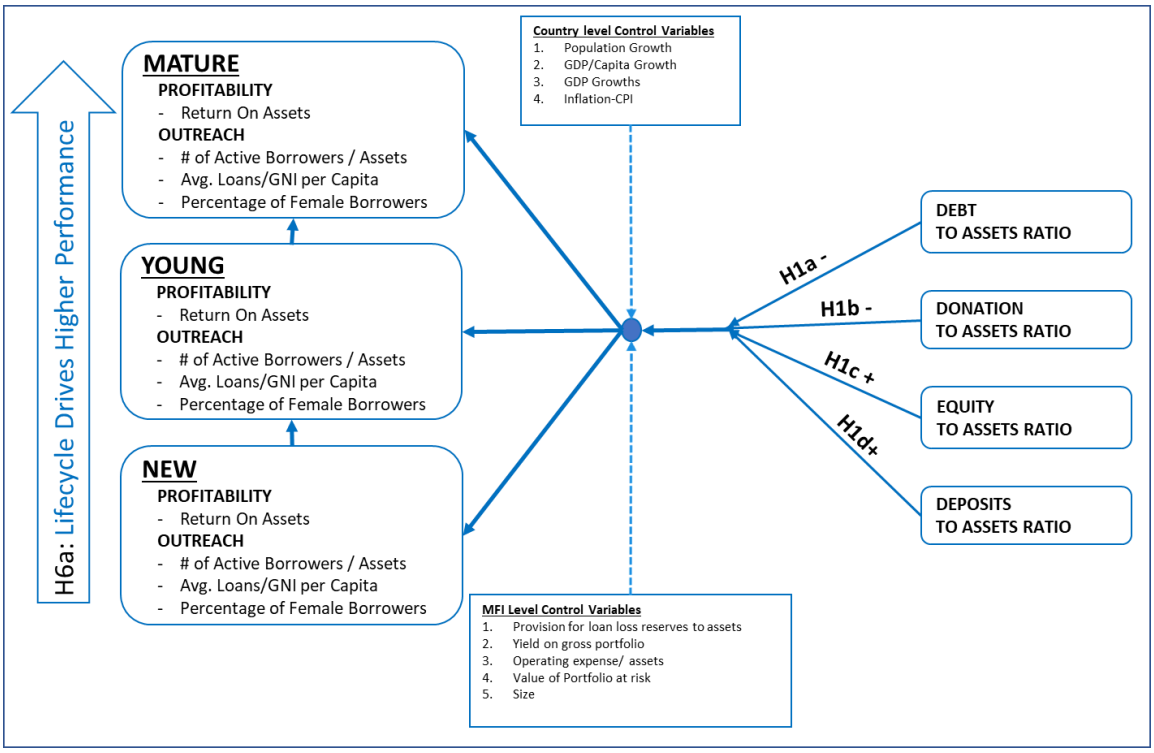
Below, I examine the five MFIs legal charter models. I use the MLCT to formulate a hypothesis to explore whether social and financial performance metrics vary across MFI legal charters, given the variations in their funding source mix, and whether these performances get better with age. This approach is significant given how different MFIs are depending on their legal charters, which include being registered as banks, credit unions, NBFIs, NGOs, or rural banks.

[15] Farrington and Abrams (2002) discuss trends that will prevail as MFIs develop across the various life-cycle stages, including a) the tendency toward increased leveraging of capital, b) increase in public deposits mobilization, and (c) a shift away from subsidized donor money toward commercial funding.

III.2 The MLCT and Bank MFI Performance and Funding Source Mix

In line with the MLCT (Schneider and Greathouse, 2004), I expect that, as Bank MFIs evolve, their capital and funding structures also change. Specifically, the degree of debt they utilize should increase at different life-cycle phases and their funding sources should become more diverse and sustainable. As funding sources diversify, bank MFIs should be able to choose less expensive funding sources for capital and operational needs and thereby become more profitable as they age. I also expect that, the more expensive a bank MFI's funding sources, the more negative the link between funding source mix and social and financial performance. Given this, I posit the following set of hypotheses:

Figure 5: Bank MFI Performance Model



Hypothesis 1a: The debt-to-assets ratio will be negatively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for bank MFIs.

Hypothesis 1b: The donations-to-assets ratio will also be negatively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for bank MFIs.

Hypothesis 1c: The equity-to-assets ratio will be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for bank MFIs.

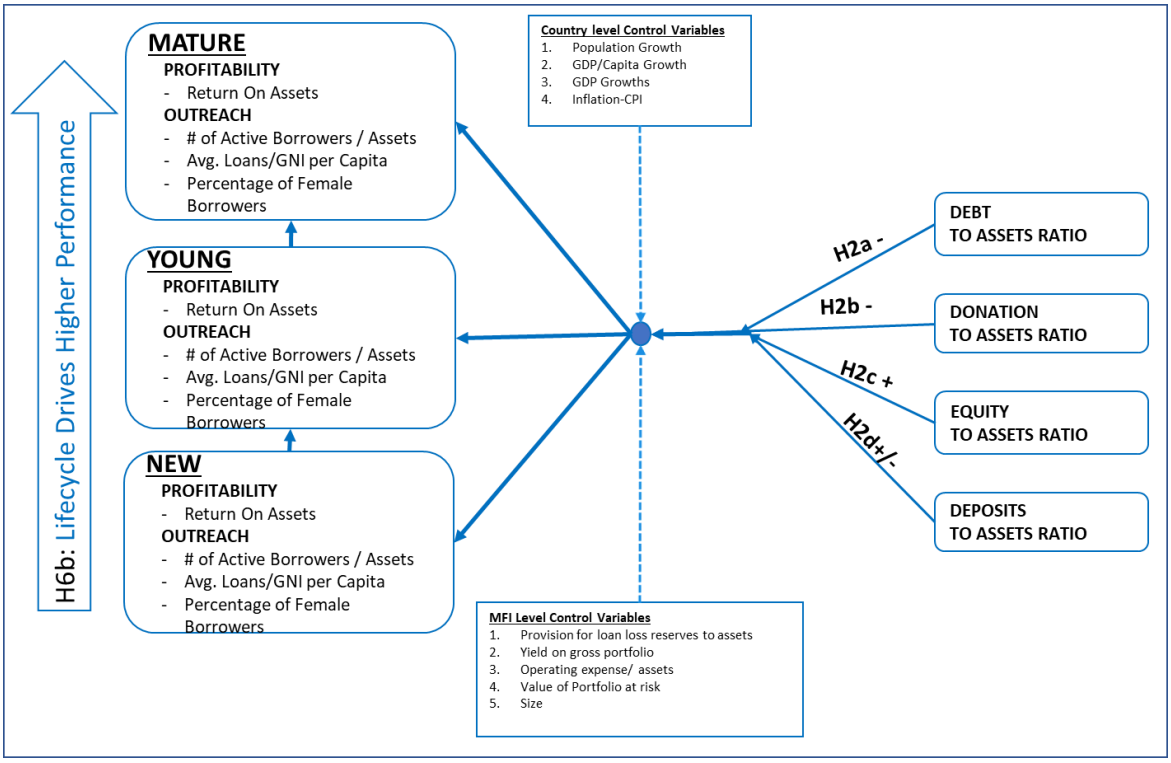
Hypothesis 1d: The deposits-to-assets ratio will also be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for bank MFIs.

Hypothesis 6a: As the bank MFIs age, the funding source mix will positively impact their ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita.

III.3 The MLCT and Credit Union MFI Performance and Funding Source Mix

A major difference between credit union MFIs and bank MFIs is the ownership form and profits distribution. Credit unions are owned by their members/clients and are nonprofit, while banks are owned by shareholders and are for-profit. However, beyond a lower variation between funding and performance, I do not expect the funding source mix/performance relationship to be any different for credit union MFIs than for bank MFIs.

Figure 6: Credit Union MFI Performance Model



In line with the discussions on MLCT and bank MFIs, I posit the following hypotheses:

Hypothesis 2a: The debt-to-assets ratio will be negatively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for credit union MFIs.

Hypothesis 2b: The donations-to-assets ratio will also be negatively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for credit union MFIs.

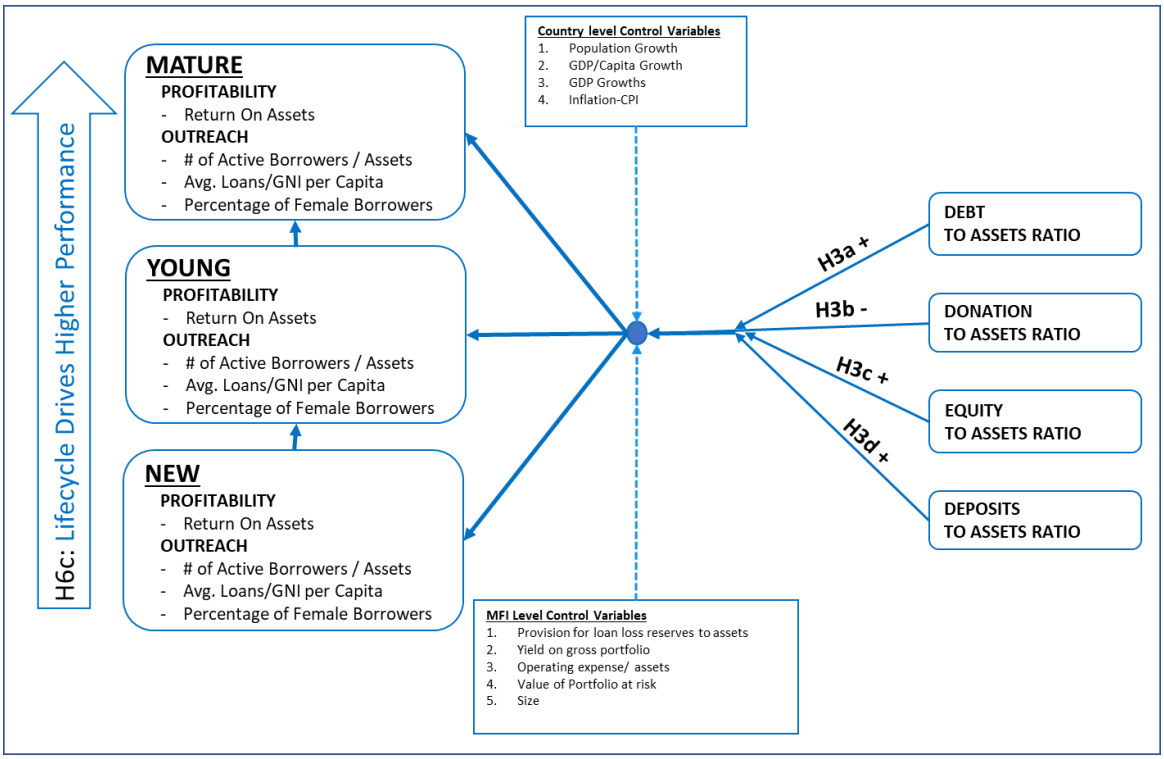
Hypothesis 2c: The equity-to-assets ratio will be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for credit union MFIs.

Hypothesis 2d: The deposits-to-assets ratio will also be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for credit union MFIs.

Hypothesis 6b: As credit union MFIs age, the funding source mix will positively impact their ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita.

III.4 The MLCT and NBFI MFI Performance and Funding Source Mix

Figure 7: Non-Bank Financial Institution (NBFI) MFI Performance Model



In line with earlier discussions on MLCT, I posit the following hypotheses:

Hypothesis 3a: The debt-to-assets ratio will be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for NBFI MFIs.

Hypothesis 3b: The donations-to-assets ratio will be negatively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for NBFI MFIs.

Hypothesis 3c: The equity-to-assets ratio will be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for NBFI MFIs.

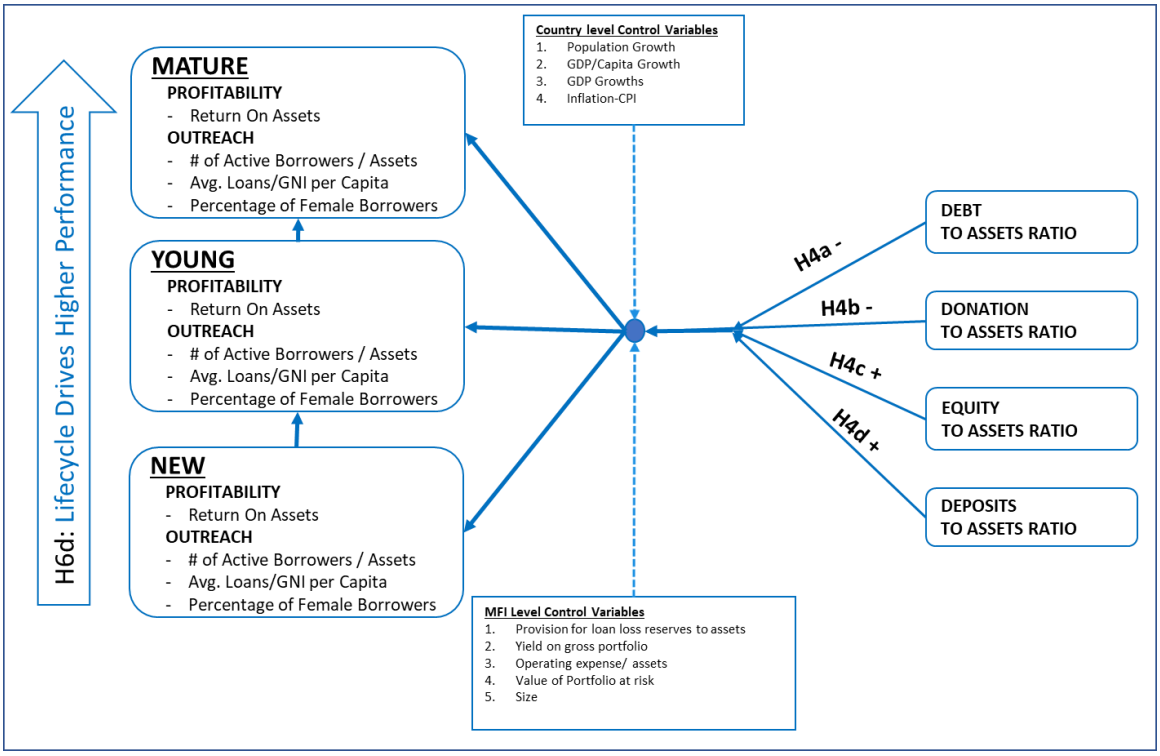
Hypothesis 3d: The deposits-to-assets ratio will also be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for NBFI MFIs.

Hypothesis 6c: As NBFI MFIs age, the funding source mix will positively impact their ROA, the number of active borrowers per assets, and the average loans, per borrower, over GNI per capita.

III.5 The MLCT and NGO MFI Performance and Funding Source Mix

In line with the MLCT, NGO MFIs use high levels of donations in the new stage, but gradually wean off them as they transition into the mature stage. NGO MFIs use minimum deposits, because most of them are not licensed to intermediate deposit. They also seem to increasingly use debt as they transition to the mature stage.

Figure 8: Non-Governmental Organization (NGO) MFI Performance Model



In line with the MLCT discussions, I posit the following hypotheses:

Hypothesis 4a: The debt-to-assets ratio will be negatively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for NGO MFIs.

Hypothesis 4b: The donations-to-assets ratio will also be negatively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for NGO MFIs.

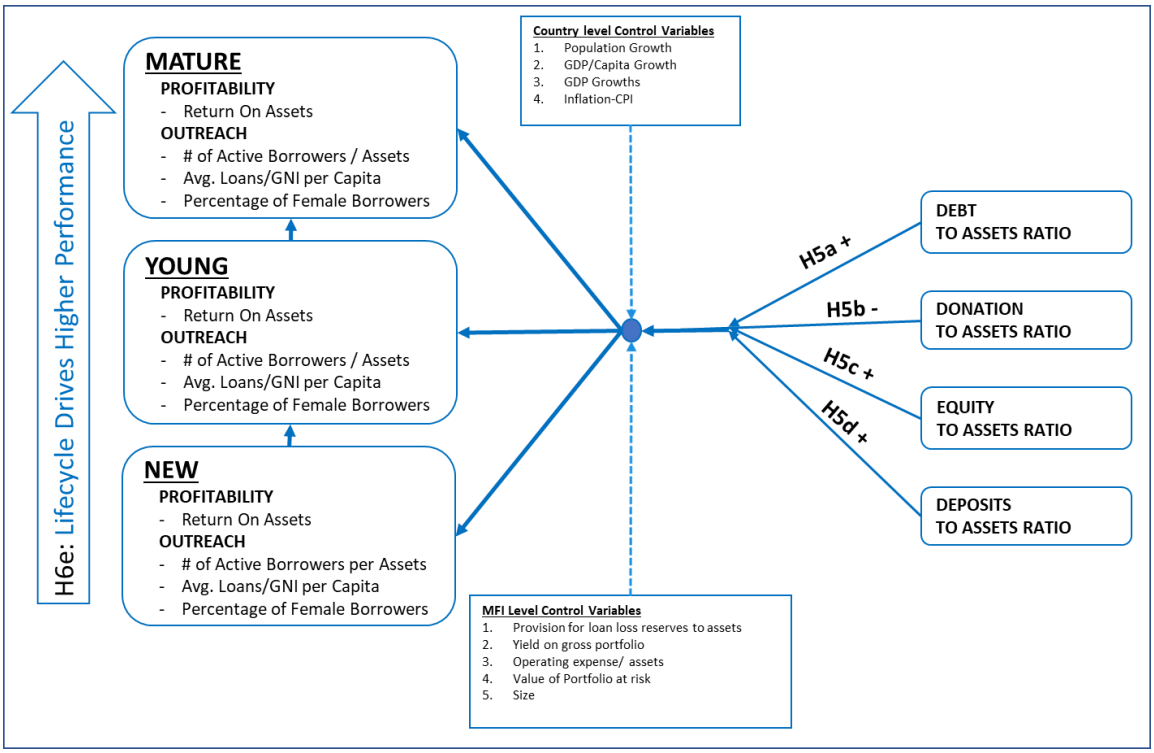
Hypothesis 4c: The equity-to-assets ratio will be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for NGO MFIs.

Hypothesis 4d: The deposits-to-assets ratio will also be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for NGO MFIs.

Hypothesis 6d: As NGO MFIs age, the funding source mix will positively impact their ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita.

III.6 The MLCT and Rural Bank MFI Performance and Funding Source Mix

Figure 9: Rural Bank MFI Performance Model



In line with the MLCT discussions, I posit the following hypotheses:

Hypothesis 5a: The debt-to-assets ratio will be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for rural bank MFIs.

Hypothesis 5b: The donations-to-assets ratio will be negatively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for rural bank MFIs.

Hypothesis 5c: The equity-to-assets ratio will be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for rural bank MFIs.

Hypothesis 5d: The deposits-to-assets ratio will also be positively related to ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita for rural bank MFIs.

Hypothesis 6e: As rural bank MFIs age, their funding source mix will positively impact their ROA, the number of active borrowers per assets, and the average loans per borrower over GNI per capita.

III.7 Possible limitations of the MLCT

Despite the MLCT's popularity, evidence on it remains scanty as few researchers have studied it. To answer the question: *Do MFIs develop towards financial sustainability?* Bogan (2012) used cross-sectional data on the top 300 MFIs. Results did not support the MLCT. However, they did underscore the importance of capital in determining financial sustainability, as capital constraints and costs limit microfinance expansion. De Sousa-Shields and Frankiewicz (2004) noted that the shift to private capital has already begun, and some MFIs are now being fully funded by private capital. The authors emphasized that an MFI's ability to survive any MLCT stage depends on its ability to attract the ideal financing resources. However, Fehr and Hishigsuren (2006) note that, while market-oriented MFI financing is noticeable, evidence of noncommercial funding remains and opposes the MLCT evolution style. Financing programs (such as ACCION)

linking MFIs with investors and commercial banks through credit enhancement lower the MFI financing costs as they turn into commercially viable entities, thus defying the MLCT.

Evidence shows, however, that opposing factors shape how MFIs are funded and which funding instruments may be available for financing their operations. Some researchers have argued that such factors may underline the regional variations in MFI funding patterns—variations that may have been shaped by historical factors, including traditional savings and lending patterns (Jansson, 2003; Conger, 2003; Bogan, 2012). Variations in regulatory environments and capital market maturity in the MFI's country also impact allocation of funding and other resources (Banerjee, Duflo, & Munshi, 2003).

IV METHODS

Two key questions here are: *How do the relative performances of social versus financial metrics vary across the MFI legal charters given variations in funding source mix? Do these performances improve as MFIs age?"* In an attempt to quantify these questions, I developed an empirical methodology. Here, I further clarify the data sampling and the collection method, and also define and describe dependent and independent variables and specified models.

Prior research from the microfinance performance literature informed my choice of the appropriate variables for financial and social performance, as well as my expectations about the impact of firm-level and macroeconomic country-level factors that impact MFI performance. Among the previous work that fueled these insights were Muriu (2011), Tchakoute-Tchuigoua (2010), Hartarska (2005), Cull et al. (2007), Hartarska & Nadolnyak (2007), R Mersland and RØ Strøm (2009), and Campbell and Rogers (2012).

IV.1 Data Collection

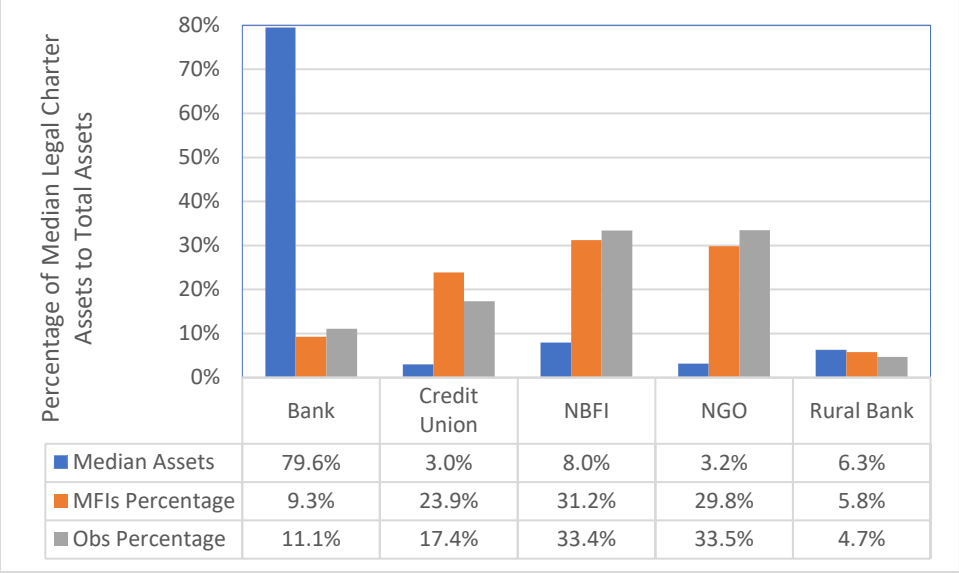
My research is empirical and quantitative and uses model specification similar to that in Bogan (2012). I collected data for the study from two sources: 1) the MIX market database, and 2) the WDI. The significant advantages of choosing these two databases are that they are widely known, compiled by third parties, and cover a broad range of organizational and economic features, as well as social and financial indicators; they have also been used widely in research published in leading, well-respected journals. To provide a robust dataset, the study uses MFI data from more than 18 years (1999–2016) on 2,955 MFIs from 123 countries. I thus have a global sample of unbalanced panel data, most of which belongs to the 2003–2015 time period. Because MFIs neither enter nor drop out of the sample in a systematic way, I can perform panel data analyses in a regular manner (Greene, 2010). Using unbalanced panel data offers a truly effective

representation of the market: it includes all MFIs, and prevents survivorship bias (Baum, 2006). The 18-year data window offers adequate variation among the MFI characteristics I am analyzing, and it may provide a robust set of observations for a rigorous and truly global analysis. Although an enhanced dataset with additional observation is always preferable, the benefit of going further back in time than the prescribed 18 years may be outweighed by constraints on data availability and accuracy. No dataset is entirely representative of the microfinance field. In particular, the MIX database contains a significant amount of data from mega-sized MFIs, creating a large firm bias, but it also includes many small savings and credit cooperatives. Data on the MFIs used are included in a special data package that provides a unique, comprehensive picture of the microfinance market. Data are converted into US dollars at contemporaneous exchange rates and closely monitored by MIX. Participating MFIs must disclose detailed information on their performance, including their financial statements and annual reports. However, because MFIs report their data themselves on a voluntary basis, it is always possible that data retrieved from MIX are biased. MFIs participating in the MIX presumably receive some potential benefit from their data disclosure, such as attracting investor interest and being included in research analyses. It is therefore likely that some of the more commercially orientated banks are under-represented in the database. MIX does not check the reliability of each participating MFI, although it does adjust data to make comparison easier, such as correcting for inflation, loan loss provisioning/write-offs, and subsidies (MIX [ed.], 2007). MIX's data on MFIs is credited with being the best available representation of MFIs in the entire microfinance industry (Krauss and Walter, 2008; Di Bella, 2011; Hartarska and Nadolnyak, 2007). However, because its data quality has often been criticized, MIX began using a "diamonds" rating system, with a 1–5 scale to indicate MFI reporting quality

and completeness. For example, an MFI receiving five diamonds publishes audited financial statements on a yearly basis, accompanied by a rating or due diligence report.

IV.2 Statistical Models of Performance and Funding Source Mix

My analytical framework uses an unbalanced panel dataset comprising 2,955 MFIs[16] from 123 countries observed over an 18-year period (1999–2016) to explore how funding mix impacts MFI profitability and outreach. Also, given my much larger sample size, I compare my results with those of Bogan (2012), analyzing how MFI capital structure (funding source mix) behaves in relation to MFI age and legal status. These categories may be significant in establishing the link between funding source mix and the key MFI success metrics of sustainability, profitability, and outreach.



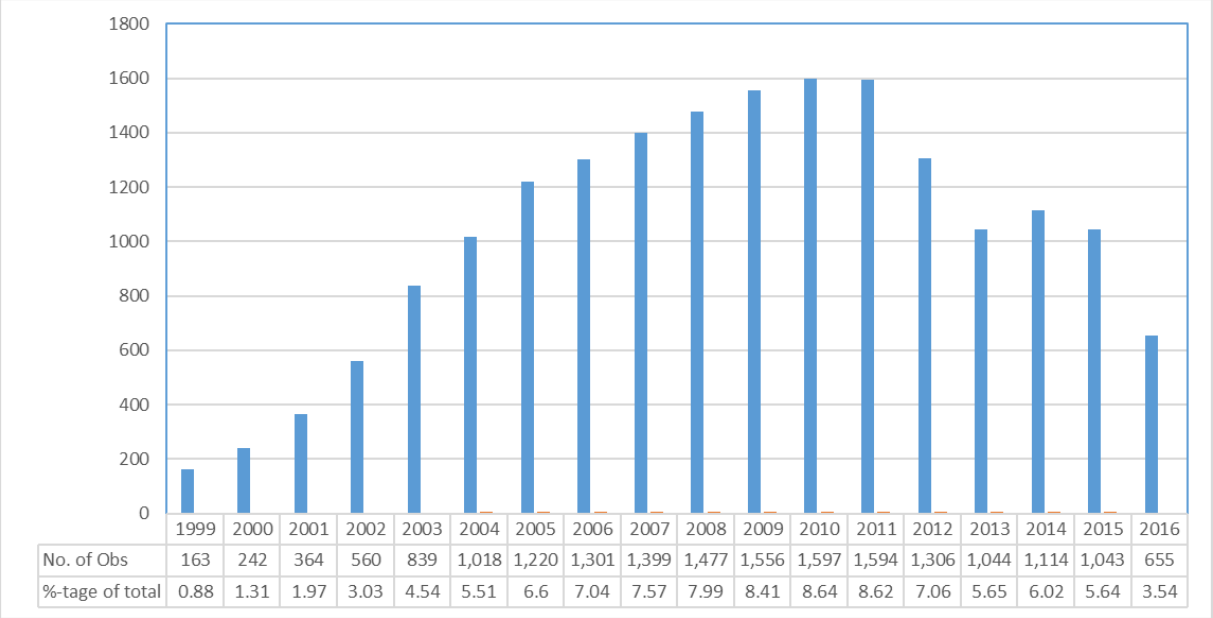
	Bank	Credit Union	NBFI	NGO	Rural Bank
Median Assets	79.6%	3.0%	8.0%	3.2%	6.3%
MFIs Percentage	9.3%	23.9%	31.2%	29.8%	5.8%
Obs Percentage	11.1%	17.4%	33.4%	33.5%	4.7%

In the dataset, NBFIs make up the largest number of legal charters, followed by NGO MFIs. However, NGO MFIs constitute the highest percent (33.5%) of the MFIs/Years observation,

[16] These institutions are united in their strong commitments to achieving financial self-sufficiency and a willingness to open their accounts to careful scrutiny. Thus, these MFIs represent some of the best hopes for achieving poverty reduction while concurrently earning a profit (or at least operating without ongoing subsidies).

followed by NBFIs. Rural banks make up the lowest percentage of observations and number of MFIs in the dataset. Banks make up 9.3% of the dataset, yet their median asset value is 80% of the dataset's value. By comparison, with 31.2% frequency, NBFIs' median assets make up only 8% of the total dataset value.

Figure 10: Frequency of MFIs in Observation



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
No. of Obs	163	242	364	560	839	1,018	1,220	1,301	1,399	1,477	1,556	1,597	1,594	1,306	1,044	1,114	1,043	655
%-tage of total	0.88	1.31	1.97	3.03	4.54	5.51	6.6	7.04	7.57	7.99	8.41	8.64	8.62	7.06	5.65	6.02	5.64	3.54

Most of the observations are from 2004 to 2015, with the highest number occurring in 2010 and 2011.

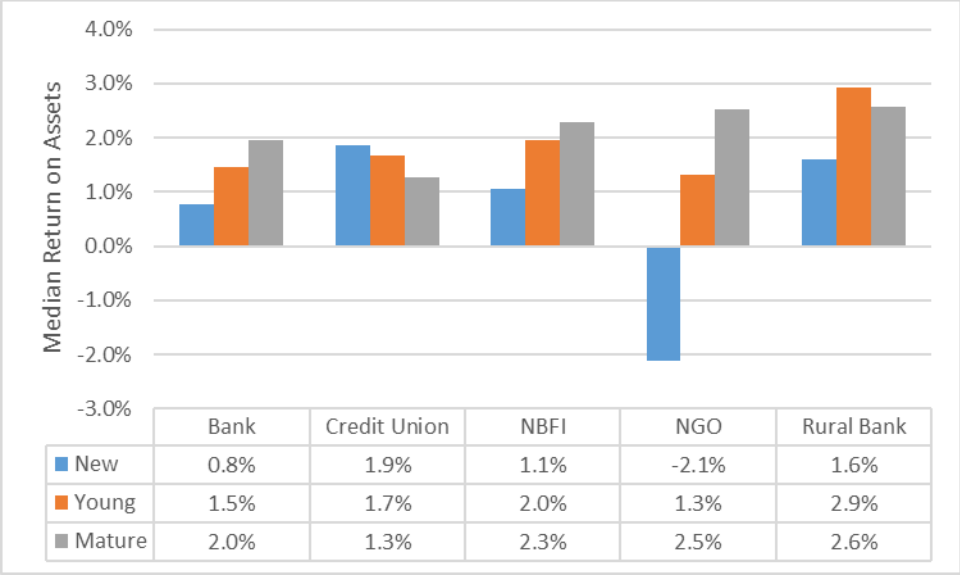
IV.2.1 *Dependent Variables*

The dependent variables for modeling MFI's financial performance are ROA, while the average loan per borrower per GNI/per Capita (the *ALB*), the number of active borrowers (the *NAB*), and the percentage of female borrowers (the *PFB*) model social performance. I chose these variables to help quantify variations in MFI financial and social performance with variations in funding source mix. I also group these selected variables by legal charter and MFI age to help determine whether performance gets better with age. I offered detailed definitions and rational for

choosing these variables earlier (Chapter 2, section 2.2). Figures 13-15 show the median values of each dependent variables by legal charter and age. Due to extreme values or outliers in the data it is proposed that the median is used as the measure of central tendency instead of the mean.

IV.2.1.1 *Return on Assets (ROA)*

Figure 11: Median ROAs by MFI Legal Charter and Age

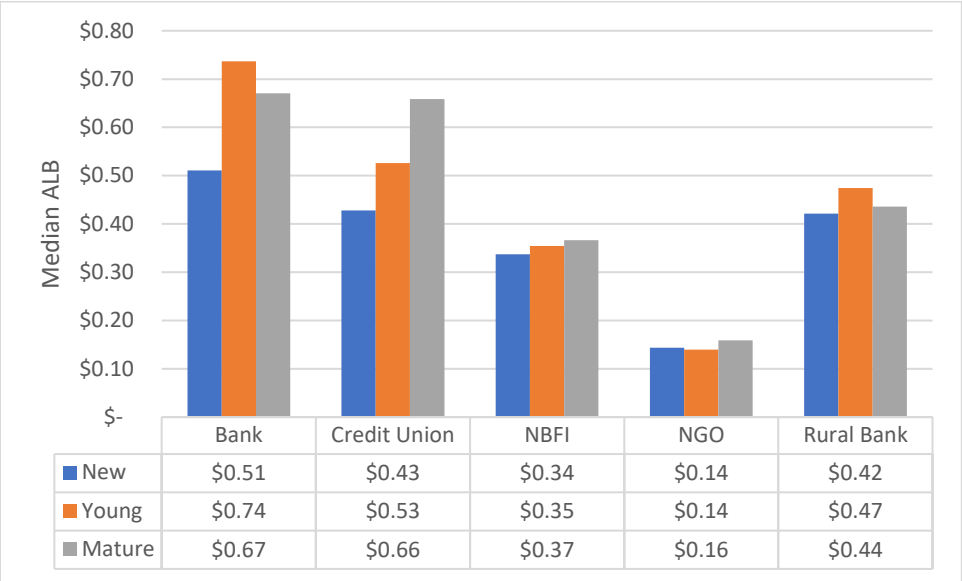


	Bank	Credit Union	NBFI	NGO	Rural Bank
New	0.8%	1.9%	1.1%	-2.1%	1.6%
Young	1.5%	1.7%	2.0%	1.3%	2.9%
Mature	2.0%	1.3%	2.3%	2.5%	2.6%

As I described earlier, the ROA is the net operating income (less taxes) compared to average assets. ROA measures how the MFI is managing its assets to optimize its profitability. This ratio is the net of income taxes and excludes donations and non-operating items. Young rural bank MFIs record the highest median ROA (2.9%), while new NGO MFIs record the lowest. For bank, NBFI, and NGO MFIs, median ROA increases with age, while the medians for credit union MFIs decrease with age. Young rural bank MFIs seem to be more profitable than new and mature ones. The median bank ROA is highest at the mature stage.

IV.2.1.2 *Median Loan per Borrower/GNI per Capita[17](ALB)*

Figure 12: Median Loan per Borrower/GNI per Capita by MFI Legal Charter and Age



	Bank	Credit Union	NBFI	NGO	Rural Bank
New	$0.51	$0.43	$0.34	$0.14	$0.42
Young	$0.74	$0.53	$0.35	$0.14	$0.47
Mature	$0.67	$0.66	$0.37	$0.16	$0.44

The median loan per borrower per GNI/per capita is computed from the average outstanding loan balance compared to local GNI per capita to estimate loan outreach relative to the country's low-income population. The GNI per capita is calculated in the national currency converted to US dollars at official exchange rates for comparisons across economies, but an alternative rate is used when the official exchange rate is judged to diverge considerably from the rate applied to international transactions. To smooth fluctuations in prices and exchange rates, the World Bank uses a special Atlas conversion method.

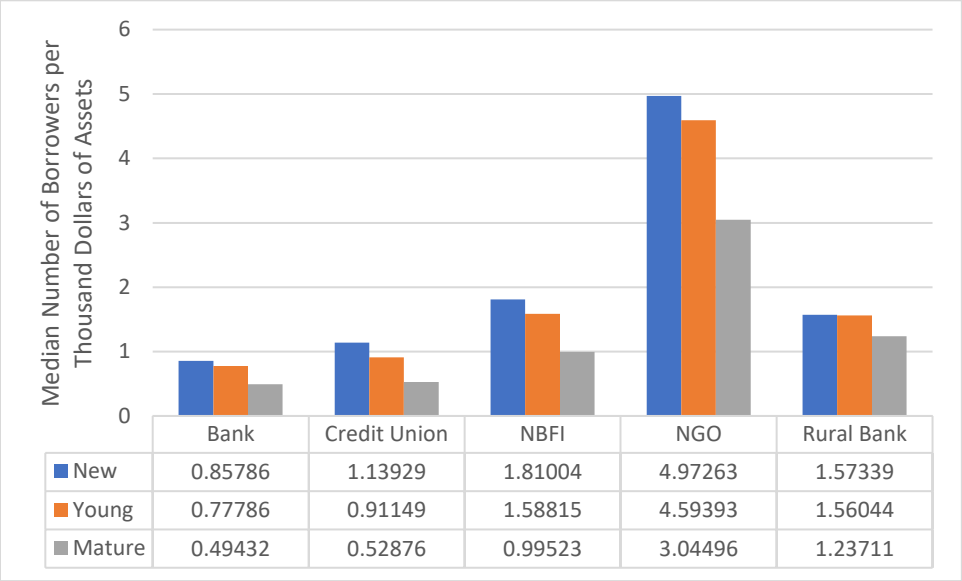
As Figure 11 shows, bank MFIs have the highest median outreach depth, while NGO MFIs have the lowest. Also, the median loan per borrower per GNI/per capita (the measure for outreach depth) does not increase with age for all legal charters. Young bank MFIs have the highest outreach depth,

[17] The variable is equivalent to the target market (depth = avg. loan balance per borrower/GNI per capita) categorized into 1) Low end: depth < 20% OR average loan size < USD 150; 2) Broad: depth between 20% and 149%; 3) High end: depth between 150% and 250%, and 4) Small business: depth greater than 250%.

followed by mature bank MFIs. Median outreach depth increases with age for credit union and NBFI MFIs, but not for the other legal charters.

IV.2.1.3 *Number of Active Borrowers per Assets*

Figure 13: Median Number of Active Borrowers per Assets by MFI Legal Charter and Age



	Bank	Credit Union	NBFI	NGO	Rural Bank
New	0.85786	1.13929	1.81004	4.97263	1.57339
Young	0.77786	0.91149	1.58815	4.59393	1.56044
Mature	0.49432	0.52876	0.99523	3.04496	1.23711

The median number of active borrowers per assets is computed from the number of individuals or entities that currently have an outstanding loan balance with the MFI or are primarily responsible for repaying any portion of the gross loan portfolio. This number is divided by total assets to scale it for comparison across legal entities. Individuals with multiple loans with MFIs are counted as a single borrower.

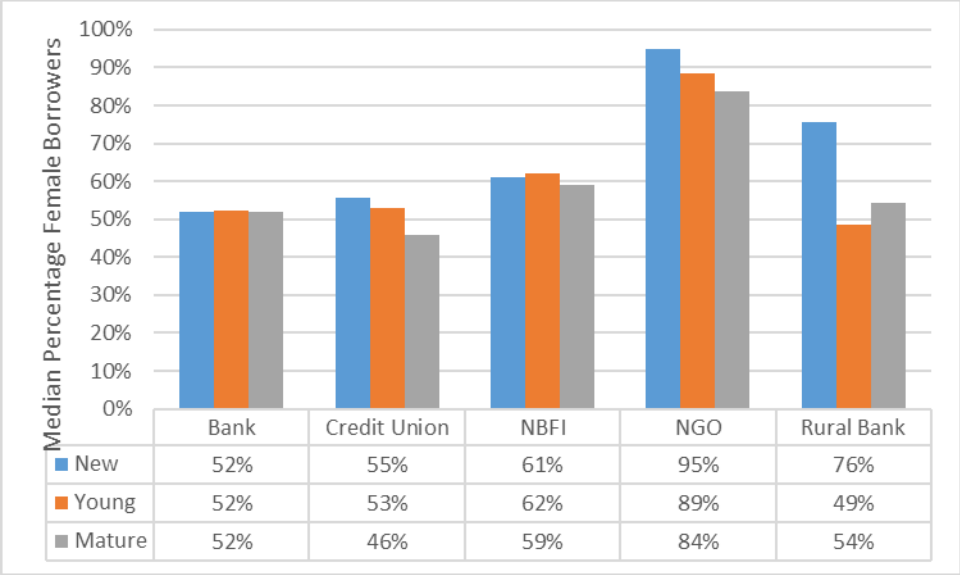
NGO MFIs lead the median breadth of outreach, measured by the number of active borrowers per assets. It is interesting to note that the median outreach breadth decreases with MFI age across all legal charters. As expected, bank MFI's have the lowest outreach breadth, followed by credit union, NBFI, and rural bank MFIs. Again, the median outreach breadth is consistent with

insights from the microfinance literature, which shows that NGO MFIs demonstrate a greater capacity for reaching the poor.

IV.2.1.4 *Number of Active Borrowers per Assets*

Microfinance benefits include a focus on female borrowers (Zhao &Wry, 2016). On average, women dedicate a larger portion of loan proceeds to health and education expenses, both of which contribute to poverty reduction (Angelucci, Karlan, & Zinman, 2012). For unmarried women, loans also provide an avenue for economic participation beyond the informal or illegal economy (Mair, Marti, & Ventresca, 2012). Outreach to women is therefore an important outcome for achieving social performance.

Figure 14: Median Percentage of Female Borrowers by MFI Legal Charter and Age



	Bank	Credit Union	NBFI	NGO	Rural Bank
New	52%	55%	61%	95%	76%
Young	52%	53%	62%	89%	49%
Mature	52%	46%	59%	84%	54%

The median percentage of female borrowers is computed from the number of active women borrowers as a percentage of total borrowers at the period's end. As Figure 13 shows, NGO MFIs have the highest median percentage of female borrowers and thus seem to empower more women than the other legal entities. Additionally, for NGO and credit union MFIs, the median reduces

with institution age; for bank and NBFI MFIs, the median percentage of female borrowers is flat across time.

IV.2.2 *Independent Variables.*

Independent variables include MFI capital structure variables—that is, debt to assets ratio, donations[18] to assets ratio, equity to assets ratio, and deposit to assets ratio. "Donations" here are synonymous with donations and subsidies. MFIs firm-level characteristic variables include percentage of female borrowers, personnel, portfolio at risk > 30 days, provision for loan impairment/assets, yield on gross portfolio (real), operating expense/assets, and the natural log of assets. The microfinance literature agrees on these variables as being determinants of MFIs performance (Muriu, 2011; Tchakoute-Tchuigoua, 2010; Hartarska, 2005; Cull et al., 2007; Hartarska & Nadolnyak, 2007; R Mersland and RØ Strøm, 2009; Campbell and Rogers, 2012). Further, studies testing bank-risk developments across countries also include country control variables that cover macroeconomic and structural characteristics—that is, GDP growth, inflation, GDP per capita, and bank concentration. I include these macroeconomic variables as moderators because preliminary evidence (Ahlin & Lin, 2006) suggests that macroeconomic factors could affect MFI performance. Major independent variables in the model include the following:

IV.2.2.1 *Model Predictor Variables (Independent Variables)*

- Debt-to-assets ratio: The amount of interest-bearing liabilities or debts as a percentage of total assets. Interest-bearing debts include borrowings, subordinated debt, and other short-term financial liabilities. They do not include deposits, which

[18] as a percent of assets, deposits relative

I examine separately below. Borrowings are all the funds received through loan agreements, and they may include bonds or similar debt securities issued and credit lines. They could be short-term, in which the principal balance is due within or at 12 months from the statement date, or long-term, in which the principal balance is due in more than 12 months for all funds received through a loan or other contractual agreement.[19] Other short-term financial liabilities include debts with an initial term of less than one year such as overdrafts or other short-term financing arrangements.

- Equity-to-assets ratio: The total equity compared to assets. This is a measure of a financial institution's solvency, and it helps to assess its ability to meet its obligations and absorb unexpected losses. It is the reciprocal of the debt-to-equity ratio. Equity includes paid-in capital, share premium, donated equity, retained earnings, reserves, treasury shares, and other equity interest. (For definitions of these accounts, see the Appendix).

- Donation-to-assets ratio: The amount of donations received as a percent of total assets. This includes the value of all donations recognized as revenue during the period, whether they were restricted or not. It includes 1) donations for loan capital, which are used for funding the loan portfolio; and 2) donations for operating

[19] Examples of short term include money market loans, inter-bank borrowings, repos, commercial papers; long term borrowings include debentures.

expenses, including paying personnel and administrative expenses, and purchasing fixed assets.

- Deposit-to-assets ratio: The total deposits compared to assets. Deposits are funds placed in an MFI account that are payable to a depositor. They include accounts such as current/transactional accounts, term accounts, interest-bearing accounts, and e-money accounts. Deposits could be categorized as 1) demand deposits by the general public and MFI members, which the MFI is liable to repay on demand; 2) short-term time deposits by the general public and MFI members, which the MFI is liable to repay on a fixed date within 12 months of the statement date; or 3) long-term time deposits by the general public and MFI members, which the MFI is liable to repay with a fixed maturity date greater than 12 months from the statement date.

IV.2.2.2 *MFIs Firm-level Performance Control Variables*

- Personnel: The number of individuals actively employed by an MFI, including contract employees or advisors who dedicate a substantial portion of their time to the institution, even if they are not on the employee roster.

- Loans per staff member: Total number of loans divided by total personnel. This helps assess the overall productivity of the financial institution's employees regarding outstanding loan management.

- Portfolio at risk > 30 days (PAR30): This represents the portion of loans more than 30 days past due, including the value of all renegotiated loans (restructured,

rescheduled, refinanced, or otherwise revised) compared to the gross loan portfolio. PAR30 is the most accepted measure of the portfolio quality of financial institutions (including MFIs), and therefore of their risk and profitability. I use this variable to control for different risk structures by measuring the portion of the portfolio with payments more than 30 days overdue.

- Provision for loan impairment/assets: This includes impairment losses on loans—that is, the net of written-off loan recoveries—compared to average assets. This variable represents the actual expense incurred due to credit losses or write-offs in the portfolio.

- The yield on gross portfolio (real): Financial revenue from loans compared to the average gross loan portfolio. This helps estimate the financial institution's ability to generate revenues from interest, fees, and commissions on its gross loan portfolio. It also includes income from late fees and penalties. The results are the nominal yield on the gross portfolio, which is then adjusted for inflation.

- Operating expense/assets: The total operating expense compared to the average assets. This variable helps determine the proportion of total operating expenses incurred to support the MFI's core microfinance activities. As I noted earlier, operating expenses to assets is included because ROA could be affected by the type of borrower an MFI attracts; it could be argued that servicing lower-income clients

is costlier and hence may lead to lower ROA. This variable controls for such a possibility.

- Natural log of assets: The asset balance is the total value of all resources that the MFI controls as a result of past events and from which future economic benefits are expected to flow to the institution. For calculation purposes, assets are the sum of each asset account listed. I use assets balance as a proxy for MFI size. Size, as measured by assets, has been found to significantly relate to MFI performance metrics (Cull et al., 2007; Barnett and Salomon, 2006; Zacharias, 2008; Bogan, 2012). The larger the MFI (as measured by assets), the higher the expected self-sufficiency in terms of delivering service to a group of clients or even of extending larger loan amounts to clients. I introduce the natural log of assets to control for size, ensuring that any relationship between social and financial performance is unaffected by differences in MFI size. I use the natural logarithm of total MFI assets to control for the impact of size (Kyereboah-Coleman, 2007).

IV.2.2.3 *Country-level Macroeconomic Performance Control Variables*

- GDP per capita growth (%): The World Bank defines GDP per capita growth as the annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 US dollars. GDP per capita is the GDP divided by the midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy, plus any product taxes and minus any subsidies not included in the products' value. It is calculated without

deducting for the depreciation of fabricated assets or the depletion and degradation of natural resources.

- Rural population growth (%): Rural population refers to people living in rural areas as defined by national statistical offices. It is calculated as the difference between total population and urban population.

- Population growth (%): This is the annual population growth rate for the target year. It is the exponential rate of growth of midyear population from the previous year to the year in question, expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of their legal status or citizenship.

- Inflation (%): Inflation, as measured by the consumer price index, reflects the annual percentage change in what it costs the average consumer to acquire a basket of goods and services; that change may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is used.

IV.2.2.4 *Fixed-Effects Dummy Variables*

In addition to the variables listed above, I add to the model multiple dummy variables that result in different intercepts for each observation. These dummy variables control for various fixed effects of particular variables such as year, age, profit status, target market, scale of outreach, region and country of operations, and extent of financial intermediation (Wooldridge, 2003).

- Year fixed-effects dummies: These variables take on value of 1 for the year they represent and 0 for all other years. The year fixed-effect dummies control for variations in social and financial performance not adequately captured by the model's explanatory variables. They capture the influence of aggregate (time series) trends. Not including a year fixed-effect dummy can lead to omitted variable bias.
- Age fixed-effects dummies: The age dummy variables control for the impact of the MFI's business experience on financial and social performance. *Age* indicates the number of years an MFI has been in operation. It takes on three values: *new*, for MFIs operating for 1–4 years; *young*, for those operating 4–8 years; and *mature*, for those operating more than 8 years. Research has found that age may positively impact MFI efficiency (Caudill et al., 2009).
- Other MFI-characteristic dummies: These dummy variables are peer-group-specific categories that the literature indicates may help differentiate MFI financial performance. The variables include financial intermediation and scale (gross loan portfolio); see the Appendix for detailed definitions.

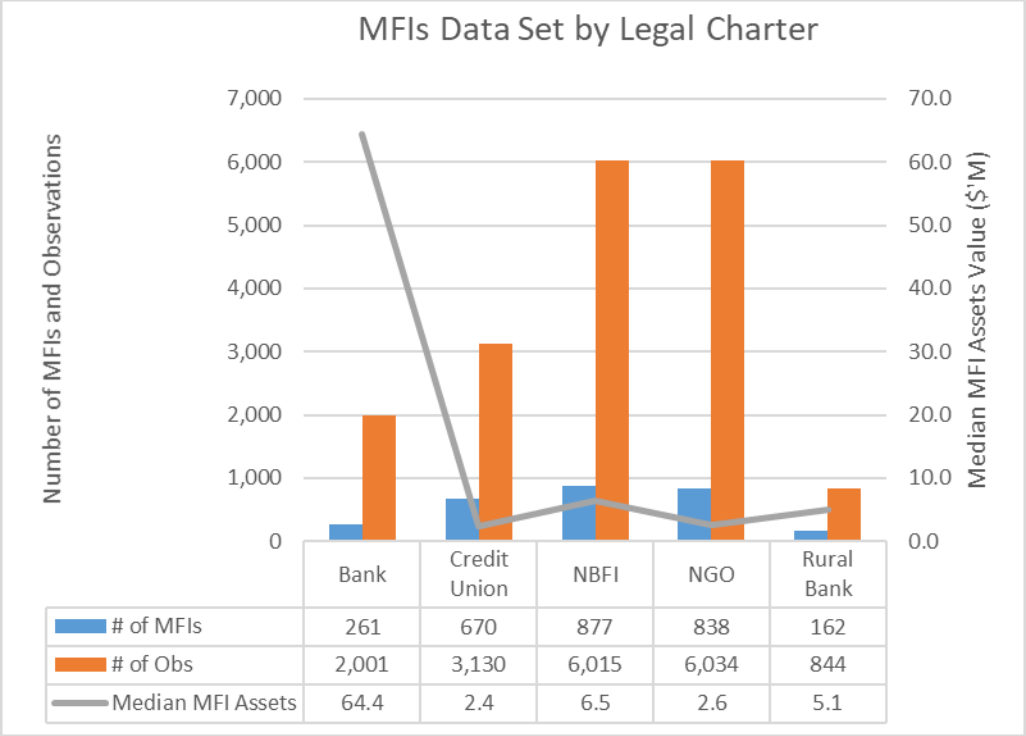
IV.3 Dataset Descriptive Statistics and Analysis

Of the total MFIs observed in the dataset, 50% were observed for five years or less, while only 5% were observed for 15 years or more. The largest group of MFIs observed over time was from 2009 to 2011. Still, this group comprised only 3.23% (95 MFIs) of the sample. The second largest group, 2.28% (67 MFIs), was observed from 2014 to 2015. MFIs reported data or were observed in each of the 18 total years of data collection.

IV.3.1 *MFI Dataset Description by Legal Charters*

To effectively evaluate the variations in the relative MFI performance as funding mix varies, I classified the institutions into the five different legal charters noted earlier in this paper.

Figure 15: Total Number and Size of Assets by MFI Legal Charter



Source: Own analysis

Figure 14 shows the number, observations, and asset values of the dataset MFIs according to legal charter. The dataset's 260 bank MFIs comprise $64.4 million, or 79.4%, of the median total asset value in the entire sample. Although NGO MFIs are the second highest legal charter reporting in the sample, they comprise only 3.2% of the total assets by value, indicating that they are small institutions.

Table 2: MFI Descriptive Statistics by Legal Charter

	Bank MFIs n=260 N=1,983				Credit Union MFIs n=671 N=3,124				NBFI MFIs n=873 N=5,965				NGO MFIs n=839 N=6,018				Rural Bank MFIs n=162 N=844			
	Min	Max	Median	STD	Min	Max	Median	STD	Min	Max	Median	STD	Min	Max	Median	STD	Min	Max	Median	STD
Return on Assets	-1.95	0.53	0.02	0.087	-0.93	0.97	0.01	0.082	-2.14	0.84	0.02	0.126	-7.46	2.09	0.02	0.240	-0.33	0.16	0.03	0.046
Average Loan per Borrower per GNI per Capita	0	145.91	0.65	6.573	0	557.73	0.62	11.167	0	3,827.53	0.36	52.121	0	22.36	0.15	0.811	0.00	40.25	0.44	1.581
Number of Active Borrowers over Assets	0	2,492	0	61	0	4	0	0	0	10	0	0	0	12,734	0	173	0	5	0	0
Percentage of female borrowers	0	100	52	25.0	0	100	48	23.1	0	100	60	26.6	0	100	85	26.4	0	100	55	31.8
Debt to Assets Ratio	0	4.98	0.15	0.284	-0.05	18.81	0.04	0.502	0	3.21	0.37	0.322	-0.09	11.53	0.32	0.397	0	72.18	0.06	2.541
Equity to Asset Ratio	-0.62	1.70	0.17	0.214	-14.82	17.75	0.20	0.585	-2.78	3.83	0.31	0.304	-18.35	156.07	0.34	2.122	-0.64	1.98	0.14	0.133
Donations to Assets Ratio	0	1.30	0.00	0.054	0	1.62	0.00	0.070	0	686.77	0.00	9.094	0	7.36	0.00	0.278	0	0.37	0.00	0.020
Deposits to Assets Ratio	0.00	4.87	0.55	0.317	0.00	14.62	0.63	0.458	0.00	2.05	0.28	0.278	0.00	0.99	0.24	0.178	0.00	8.96	0.66	0.385
Natural Log of Personnel	0.69	10.65	5.95	1.543	0.00	8.44	3.30	1.512	0.00	12.48	4.50	1.618	0.00	10.46	4.04	1.628	1.39	8.16	4.30	1.208
Portfolio at risk > 30 days	0	7.11	0.03	0.260	0	6.84	0.05	0.203	0	3.73	0.03	0.120	0	1.00	0.03	0.112	0	1.00	0.07	0.130
Provision for loan impairment/ assets	-0.05	0.36	0.01	0.023	-0.34	0.47	0.01	0.032	-0.18	1.26	0.01	0.046	-0.30	1.08	0.01	0.039	-0.06	0.26	0.01	0.017
Yield on gross portfolio (real)	-0.17	1.79	0.16	0.164	-0.22	2.02	0.15	0.129	-0.25	2.86	0.24	0.220	-1.31	10.62	0.21	0.240	-0.06	0.81	0.20	0.114
Operating expense/ assets	0	2.21	0.11	0.115	0	1.19	0.10	0.096	0	2.22	0.16	0.163	-1.08	12.75	0.17	0.324	0.00	0.44	0.11	0.067
Natural Log of Assets	1.93	24.47	17.98	2.404	3.01	21.41	14.71	2.211	3.29	21.82	15.68	2.075	-0.69	21.53	14.75	1.934	6.11	21.94	15.44	1.650
GDP per capita growth (%)	-47.92	33.03	3.47	4.141	-17.87	33.03	2.70	3.745	-47.92	33.03	4.03	4.384	-47.92	50.12	3.40	3.232	-1.53	11.28	3.56	1.761
Rural population growth (%)	-3.58	5.54	1.60	1.007	-2.85	3.97	1.67	1.204	-10.96	7.06	1.42	1.079	-10.96	7.06	1.49	0.832	0.48	4.52	1.62	0.501
Populaton growth (%)	-3.34	4.53	0.87	1.241	-3.61	3.79	1.13	1.334	-3.34	6.09	0.74	1.226	-4.04	6.09	0.77	1.317	-2.21	4.13	1.33	1.048
Inflation (%)	-35.84	109.68	6.58	7.767	-8.97	431.70	4.23	15.146	-35.84	1,096.68	5.30	18.627	-35.84	431.70	5.79	10.970	-0.70	26.67	6.41	4.288

Table 2 shows descriptive statistics of the major variables in the study. The next step of the initial statistical analysis is to group legal charter data by age (new, young, and mature) to analyze how the dual performance varies across the MFI life cycle. Admittedly, some power is lost if the dataset of 2,955 transactions is reduced to define 15 subsets of MFI legal charters by age groupings; however, the probative value of splitting the dataset this way is a worthwhile tradeoff. I also group the dataset by legal charter and age to summarize the funding source mix. Statistically significant relationships are identified at the 0.1, 0.05, and 0.01 levels. Figure 15 shows the funding source mix measured by the median of each funding type over the assets of bank MFIs by age.

Table 3: MFI Descriptive Statistics by Age Groups

	New MFIs n=1,152 N=3,602				Young MFIs n=1,334 N=3,042				Mature MFIs n=1,827 N=11,265			
	Min	Max	Median	STD	Min	Max	Median	STD	Min	Max	Median	STD
Return on Assets	-4.48	0.67	0.01	0.263	-5.32	0.80	0.02	0.169	-3.45	1.01	0.02	0.112
Average Loan per Borrower per GNI per	0	3,827.53	0.31	75.902	0	557.73	0.31	10.010	0	242.71	0.29	4.122
Number of Active Borrowers over Assets	0	12,734	0	261	0	7	0	0	0	10	0	0
Percentage of female borrowers	0	4	64%	0.3	0	6.6891	65%	0.3	0	1.2719	65%	0.3
Debt to Assets Ratio	0	11.53	0.00	0.410	0.00	2.38	0.19	0.321	-0.0943	72.18	0.27	0.784
Equity to Asset Ratio	-2.13	156.07	0.36	3.021	-18.35	5.92	0.29	0.507	-5.36	17.75	0.23	0.347
Donations to Assets Ratio	0	6.91	0.00	0.306	0	686.77	0.00	11.806	0	5.83	0.00	0.110
Deposits to Assets Ratio	0.00	8.96	0.35	0.474	0.00	5.70	0.33	0.375	0.00	14.62	0.46	0.339
Natural Log of Personnel	0.00	10.65	3.22	1.439	0.00	12.48	3.91	1.530	0.00	11.68	4.73	1.676
Portfolio at risk > 30 days	0	6.84	0.02	0.195	0	5.48	0.03	0.162	0	7.11	0.04	0.138
Provision for loan impairment/ assets	-0.18	1.26	0.01	0.048	-0.32	0.65	0.01	0.035	-0.61	1.08	0.01	0.039
Yield on gross portfolio (real)	-0.22	10.62	0.23	0.408	-0.25	2.22	0.23	0.221	-1.31	1.49	0.20	0.161
Operating expense/ assets	0	4.76	0.20	0.273	0	12.75	0.16	0.334	-1.0825	3.09	0.13	0.141
Natural Log of Assets	-0.69	21.03	13.81	2.151	4.06	20.82	14.83	1.937	1.93	24.47	15.90	2.100
GDP per capita growth (%)	-47.92	50.12	4.13	4.459	-47.92	33.03	3.89	4.546	-29.89	33.03	3.27	3.311
Rural population growth (%)	-10.96	7.06	1.62	1.198	-2.85	7.06	1.56	1.076	-3.11	7.06	1.50	0.927
Populaton growth (%)	-3.34	6.09	1.10	1.253	-3.29	6.09	0.96	1.217	-4.04	6.09	0.76	1.265
Inflation (%)	-35.84	431.70	6.87	16.452	-8.28	1,096.68	5.83	19.915	-35.84	431.70	5.21	11.146

Where n is number of MFIs and N is MFI-Fiscal Year observations

Figure 16: Bank MFIs: Funding Source Mix by Age

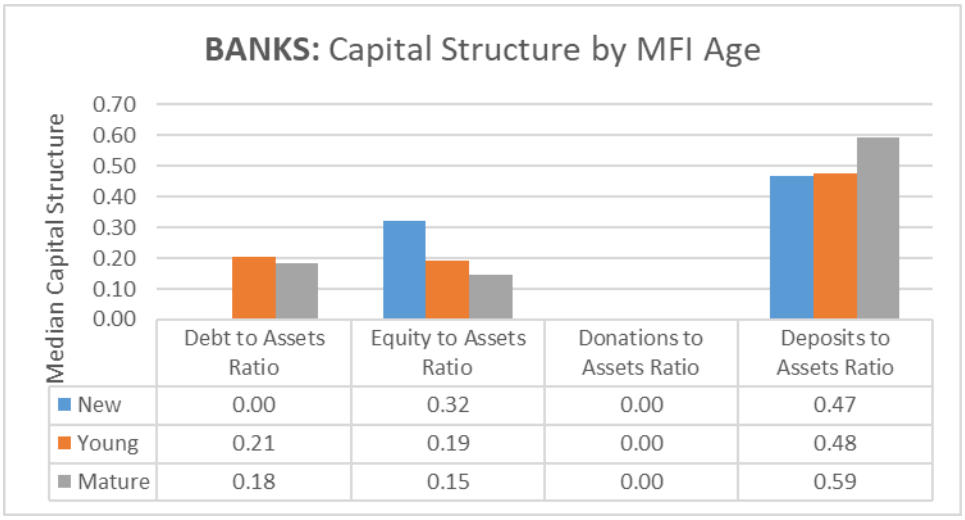


Figure 15 shows the funding source mix by life cycle proxied by bank MFI age. Not surprisingly, bank MFIs receive little or no donations, or subsidies. Debt use by bank MFIs in my dataset is quite low across all ages. It appears that the preferred source of funding for Bank MFIs is deposit; which is in line with my insights from the industry.

The graph also shows that bank MFIs use a higher share of equity capital in the new phase. The equity share seems to decline as they transition through to the mature phase. Bank MFIs also make significant use of deposits as they reach the mature stage. Also, mature bank MFIs show liquidity from internal sources, including retained earnings; they may also raise equity from investors, who do not require dividend payments and are therefore cheaper funding sources.

Figure 16 shows credit union MFI funding sources by age, including a high use of both debt and deposits.

Table 4: Bank MFIs: Correlation Between Predictor Variables

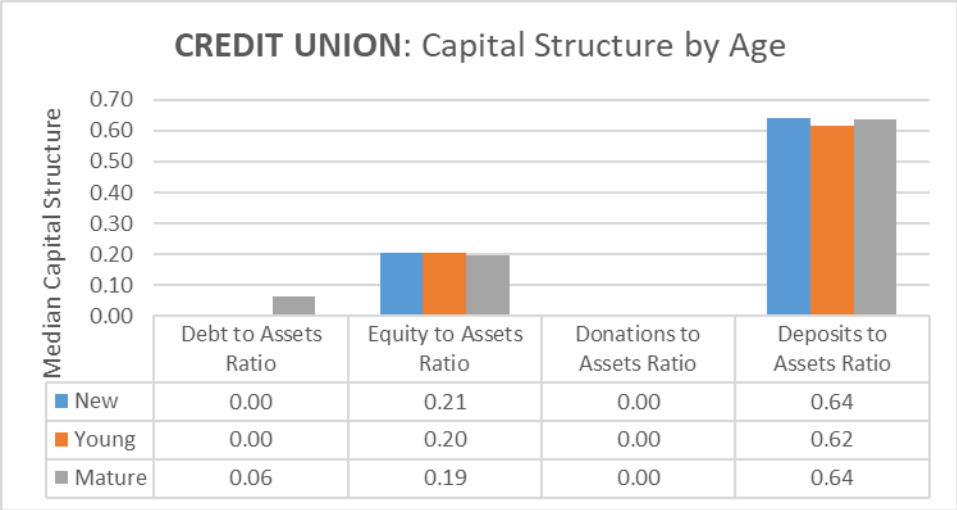
		1	2	3	4	5	6	7	8	9	10	11	12	13
1	**Debt Relative to Assets Ratio**	**1**												
	P-values	-												
	N	1,880												
2	**Equity to Asset Ratio**	**-0.180*** **	**1**											
	P-values	0.000	-											
	N	1,862	1,862											
3	**Donations to Assets Ratio**	**-0.075*** **	**0.264*** **	**1**										
	P-values	0.001	0.000	-										
	N	1,880	1,862	1,880										
4	**Deposits to Assets Ratio**	**-0.542*** **	**-0.150*** **	**-0.113*** **	**1**									
	P-values	0.000	0.000	0.000	-									
	N	1,392	1,381	1,392	1,392									
5	**Natural Log of Personnel**	**0.183*** **	**-0.377*** **	**-0.155*** **	**0.0154**	**1**								
	P-values	0.000	0.000	0.000	0.585	-								
	N	1,686	1,673	1,686	1,257	1,769								
6	**Portfolio at risk > 30 days**	**-0.027**	**-0.007**	**-0.024**	**0.0379**	**-0.124*** **	**1**							
	P-values	0.310	0.794	0.369	0.223	0.000	-							
	N	1,395	1,393	1,395	1,033	1,395	1,437							
7	**Provision for loan impairment/ assets**	**0.076*** **	**0.019**	**0.033**	**-0.116*** **	**-0.0129**	**0.115*** **	**1**						
	P-values	0.003	0.465	0.192	0.000	0.626	0.000	-						
	N	1,555	1,551	1,555	1,178	1,434	1,290	1,557						
8	**Yield on gross portfolio (real)**	**-0.026**	**0.332*** **	**0.114*** **	**-0.178*** **	**-0.071***	**0.0233**	**0.302*** **	**1**					
	P-values	0.347	0.000	0.000	0.000	0.012	0.433	0.000	-					
	N	1,339	1,336	1,339	1,167	1,245	1,139	1,326	1,345					
9	**Operating expense/ assets**	**-0.046***	**0.384*** **	**0.395*** **	**-0.238*** **	**-0.246*** **	**0.0105**	**0.280*** **	**0.684*** **	**1**				
	P-values	0.068	0.000	0.000	0.000	0.000	0.706	0.000	0.000	-				
	N	1,563	1,559	1,563	1,187	1,440	1,294	1,555	1,333	1,565				
10	**Natural log of Assets**	**0.143*** **	**-0.462*** **	**-0.194*** **	**0.0478**	**0.786*** **	**-0.091*** **	**-0.058***	**-0.261*** **	**-0.433*** **	**1**			
	P-values	0.000	0.000	0.000	0.075	0.000	0.001	0.023	0.000	0.000	-			
	N	1,880	1,862	1,880	1,392	1,686	1,395	1,555	1,339	1,563	1,880			
11	**GDP per capita growth (%)**	**0.060*** **	**-0.025**	**-0.002**	**-0.0108**	**0.0257**	**-0.063***	**-0.162*** **	**-0.0283**	**-0.0443**	**0.0152**	**1**		
	P-values	0.009	0.277	0.920	0.689	0.280	0.017	0.000	0.301	0.081	0.510	-		
	N	1,871	1,853	1,871	1,384	1,767	1,435	1,549	1,337	1,556	1,871	1,976		
12	**Population growth (%)**	**-0.244*** **	**0.144*** **	**0.008**	**0.089*** **	**-0.258*** **	**0.061***	**0.0386**	**0.229*** **	**0.252*** **	**-0.336*** **	**-0.155*** **	**1**	
	P-values	0.000	0.000	0.726	0.001	0.000	0.020	0.129	0.000	0.000	0.000	0.000	-	
	N	1,871	1,853	1,871	1,384	1,767	1,435	1,549	1,337	1,556	1,871	1,976	1,976	
13	**Inflation (%)**	**-0.070*** **	**0.144*** **	**0.037**	**-0.0044**	**-0.197*** **	**0.0073**	**-0.0427**	**-0.179*** **	**0.070** **	**-0.214*** **	**-0.058***	**0.159*** **	**1**
	P-values	0.002	0.000	0.110	0.871	0.000	0.781	0.093	0.000	0.006	0.000	0.010	0.000	-
	N	1,871	1,853	1,871	1,384	1,767	1,435	1,549	1,337	1,556	1,871	1,976	1,976	1,976

Pearson's correlation coefficients: *** p<=0.01, ** p<=0.05, * p<=0.1 significant levels

Correlation between the covariates is generally low, except for a couple of instances where the covariates have coefficient of correlation (CoC) above 0.5 absolute value. For instance, the negative and moderately high CoC between Deposit and Debt is very much expected. For the rest of this section, I present correlation tables for the funding mix regressors by legal charters and

highlight CoCs above 0.5 absolute value. It is clear from the tables that autocorrelation is not an issue for the regressors and the other covariates.

Figure 17: Credit Union MFIs: Funding Source Mix by Age



	Debt to Assets Ratio	Equity to Assets Ratio	Donations to Assets Ratio	Deposits to Assets Ratio
New	0.00	0.21	0.00	0.64
Young	0.00	0.20	0.00	0.62
Mature	0.06	0.19	0.00	0.64

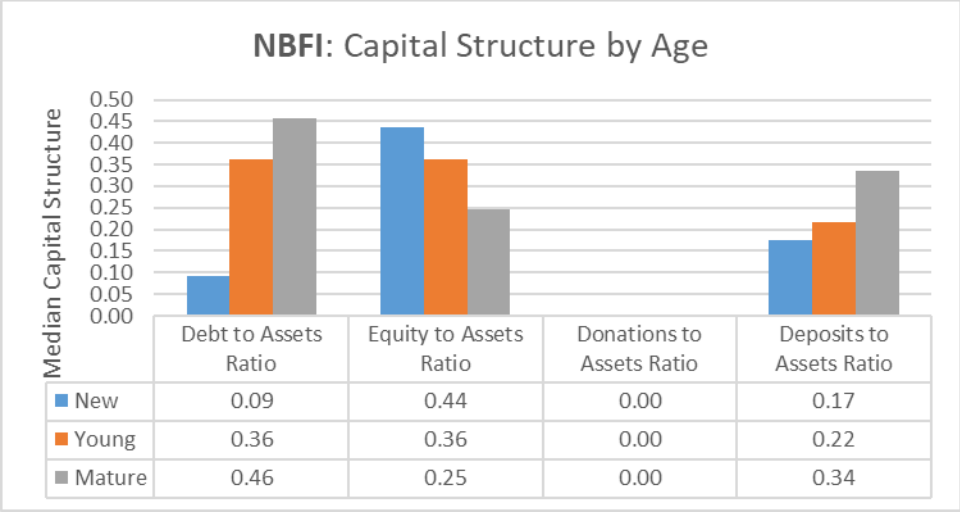
As Figure 17 shows, the various funds used by credit union MFIs in the dataset do not vary much with age: deposits are the dominant source of funding, followed by debt. As credit union MFIs age, debt assumes a smaller role in their funding.

Table 5: Credit Union MFIs: Correlation Between the Funding Source Mix Metrics

	1	2	3	4
Debt Relative to Assets Ratio	**1**			
P-values	-			
N	2,782			
Equity to Asset Ratio	**0.539*** **	**1**		
P-values	0.000	-		
N	2,769	2,769		
Donations to Assets Ratio	**-0.032***	**0.030**	**1**	
P-values	0.096	0.112	-	
N	2,782	2,769	2,782	
Deposits to Assets Ratio	**0.492*** **	**0.186*** **	**-0.034**	**1**
P-values	0.000	0.000	0.144	-
N	1,874	1,866	1,874	1,874

Pearson's correlation coefficients: *** p<=0.01, ** p<=0.05, * p<=0.1 significant levels

Figure 18: Non-Bank Financial Institution (NBFI) MFIs: Funding Source Mix by Age



As with the previously discussed institutions, NBFI MFIs use a high level of debt across all ages (see Figure 18). Like their bank counterparts, NBFI MFIs in the sample use increasing

amounts of debt as they age. The opposite is true of their equity capital use: median deposits and donations for NBFIs appear to be zero.

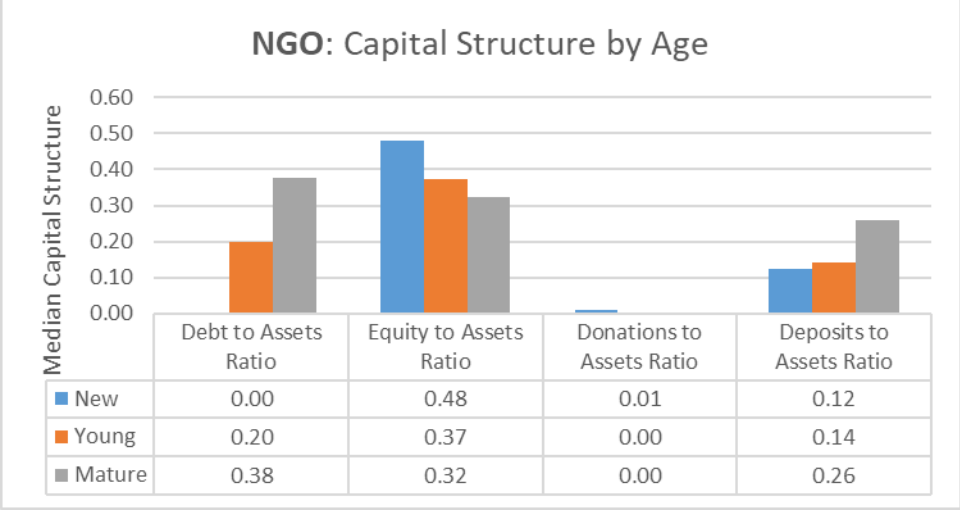
As Figure 19 shows, NGO MFIs also show funding mix trends that are similar to the other institutions—that is, higher debt and decreasing or negligible levels of donations as they age.

Table 6: NBFI MFIs: Correlation Between the Funding Source Mix Metrics

		1	2	3	4
1	**Debt Relative to Assets Ratio**	**1**			
	P-values	-			
	N	5,612			
2	**Equity to Asset Ratio**	**-0.541*** **	**1**		
	P-values	0.000	-		
	N	5,578	5,578		
3	**Donations to Assets Ratio**	**-0.017**	**-0.015**	**1**	
	P-values	0.196	0.269	-	
	N	5,612	5,578	5,612	
4	**Deposits to Assets Ratio**	**-0.517*** **	**-0.335*** **	**-0.168*** **	**1**
	P-values	0.000	0.000	0.000	-
	N	1,811	1,807	1,811	1,811

Pearson's correlation coefficients: *** p<=0.01, ** p<=0.05, * p<=0.1 significant levels

Figure 19: Non-Governmental Organization (NGO) MFIs: Funding Source Mix by Age



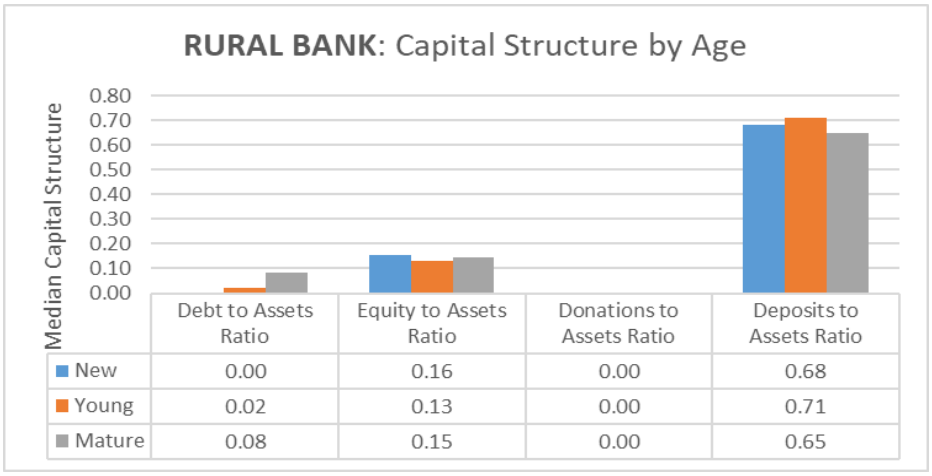
NGO MFIs use significant levels of debt to fund their operations, and the median of that debt usage increases with age. Equity usage appears flat across all life cycle stages, while median donations reduce as NGO MFIs age.

Table 7: NGO MFIs: Correlation Between the Funding Source Mix Metrics

		1	2	3	4
1	**Debt Relative to Assets Ratio**	**1**			
	P-values	-			
	N	5,509			
2	**Equity to Asset Ratio**	**0.304*** **	**1**		
	P-values	0.000	-		
	N	5,479	5,490		
3	**Donations to Assets Ratio**	**-0.108*** **	**0.022**	**1**	
	P-values	0.000	0.110	-	
	N	5,509	5,479	5,509	
4	**Deposits to Assets Ratio**	**-0.270*** **	**-0.011**	**-0.060** **	**1**
	P-values	0.000	0.639	0.013	-
	N	1,742	1,742	1,742	1,748

Pearson's correlation coefficients: *** p<=0.01, ** p<=0.05, * p<=0.1 significant levels

Figure 20: Rural Bank MFIs: Funding Source Mix by Age



Finally, although rural bank MFIs show high usage of debt, the young institutions use the highest level of debt for this group. As Figure 20 shows, however, their primary funding source appears to be Deposits. Interestingly, the median deposit utilization does not appear to change significantly across the three age bands. Median equity usage is also relatively flat across age groups, while median donations once again appear to be zero.

Table 8: Rural Bank MFIs: Correlation Between the Funding Source Mix Metrics

		1	2	3	4
1	**Debt Relative to Assets Ratio**	**1**			
	P-values	-			
	N	790			
2	**Equity to Asset Ratio**	**-0.016**	**1**		
	P-values	0.664	-		
	N	789	789		
3	**Donations to Assets Ratio**	**-0.006**	**0.169*** **	**1**	
	P-values	0.862	0.000	-	
	N	790	789	790	
4	**Deposits to Assets Ratio**	**-0.483*** **	**0.518*** **	**-0.040**	**1**
	P-values	0.000	0.000	0.311	-
	N	633	632	633	633

Pearson's correlation coefficients: *** p<=0.01, ** p<=0.05, * p<=0.1 significant levels

IV.3.2 *Operating Models*

My core analysis centers around linear relationships between performance and funding source mix captured by the regression models. The base models consist of the performance-measuring variables as the left-hand-side, or *dependent*, variables, and 15 right-hand-side, or *independent*, variables.

Equation 2: ROA as the Dependent Variable

$$\textbf{Return On Assets}_{\textbf{Li}} = \beta_0 + \sum_{j=1}^{4} \beta_j X + \sum_{j=5}^{10} \beta_j Y + \sum_{j=11}^{15} \beta_j Z + \epsilon_i$$

Where ROA measures profitability or financial performance, L represents the five MFI legal charters, X represents the four MFI funding source mix variables, Y represents MFI firm-level performance variables, Z represents country-level macroeconomic indicators, and ϵ_i is the usual regression error term of unobserved components. Additionally, I introduce dummy variables into the equation to control for other factors that my explain performance, other than funding source mix. The maximum number of explanatory variables may reach as high as 32 depending on the model type.

Equation 3: Average Loan per Borrower/ GNI per Capita as the Dependent Variable

$$\textbf{Average Loan per Borrower/ GNI per Capita}_{\textbf{Li}} = \beta_0 + \sum_{j=1}^{4} \beta_j X + \sum_{j=5}^{10} \beta_j Y + \sum_{j=11}^{15} \beta_j Z + \epsilon_i$$

In Equation 3, the average loan balance per borrower compared to the local GNI per capita (here, the *ALB*) is a social measure. I use it to measure the depth of outreach to the poor, as I discussed earlier. The independent variables are the same as those defined in Equation 2.

Equation 4: Number of Active Borrowers per Assets as the Dependent Variable

$$\textbf{Number of Active Borrowers/Assets}_{\textbf{Li}} = \beta_0 + \sum_{j=1}^{4} \beta_j X + \sum_{j=5}^{10} \beta_j Y + \sum_{j=11}^{15} \beta_j Z + \epsilon_i$$

In Equation 4, the number of active borrowers per assets (or *NAB*) is a social performance measure that compares the efficiency of an MFI's outreach breadth to the poor to that of other MFIs. The independent variables are again the same as defined in Equation 2.

Equation 5: Percentage of Female Borrowers as the Dependent Variable

$$\textbf{Percentage of Female Borrowers}_{Li} = \beta_0 + \sum_{j=1}^{4} \beta_j X + \sum_{j=5}^{10} \beta_j Y + \sum_{j=11}^{15} \beta_j Z + \epsilon_i$$

In Equation 5, the percentage of female borrowers (or *PFB*) is used as a measure of social performance. As I discussed earlier, MFIs explicitly target women because more women than men are poor, especially in rural areas; and they also spend a higher percentage of money on education and healthcare (Hartarska, Mersland, and Nadolnyak, 2014).

Equation 6: The MLCT – Funding Source Mix and Dual Performance Outcomes Linkage to Age

Equation 6: The MLCT

$$\textbf{Age}_{i} = \beta_0 + \sum_{j=1}^{4} \beta_j X + \sum_{j=5}^{8} \beta_j Y + \sum_{j=9}^{9} \beta_j Z + \epsilon_i$$

Where **i** represents the three developmental stages of the MFI life-cycle namely, New, Young, and Mature; **X** is the four funding source mix variables, Y represents the performance outcome variables, and Z represents the control variable Size (i.e. natural log of Assets).

In Equation 6, I use MFI age as measure for the MCLT dependent variable and funding source mix, performance outcomes as well as the Size of the MFI (i.e. measured by logarithm of Assets) as independent variables to assess the relationship between the ages of MFIs and their performance and funding sources. Again, this approach to empirically testing the MCLT has precedence in the literature (Bogan, 2012).

IV.3.3 *Empirical Method*

In the empirical analysis that follows, I used fixed-effects (within) regression designed for panel data analysis to estimate the linear models. These estimators control for individual firm-level effects. In statistical modeling, two estimator properties are most desirable: consistency and efficiency. If an unobserved component in the error term is related to the regressors, our estimators lack consistency. Two popular estimators that overcome this problem are the fixed-effects and random-effects estimators. I performed a Hausman test on both estimators, and the fixed-effects proved to be a more appropriate estimator for my model (Greene, 2012). This makes sense as my models include variables with effects that vary over time and therefore need to be estimated using dummy variables (Green, 2012; Wooldridge, 2003). Having already defined the relevant variables, I grouped the data by legal charter and age groups and estimated the regression by identifying the coefficients parameters of the regressions described earlier. I tested the estimated coefficients' values, sign, and significance to help me answer the research question. I also applied statistical tests to validate the model. Because my dataset is panel data—that is, it includes many observations for each MFI over several years—the standard errors may be correlated. I therefore utilized heteroskedasticity-robust standard errors to ensure that ordinary least-square (OLS) standard errors are corrected if they are correlated (Petersen, 2009). It is safe to use the robust standard errors, especially since I have a large sample size. Further, even if no heteroskedasticity exists, the robust standard errors are still appropriate to use even under homoscedastic conditions—that is, even when the regression errors have the same finite variance. Also, I used some dummy variables to control for MFI attribute-specific effects such as the influence on social and financial performance, financial intermediation level, target market, scale of operations, geographical region of operation, profit orientation, regulation, and age since starting its operations. Additionally, because an

unobservable incident in a specific year could influence the observations, I control for time effects by including dummy variables for each year from 1999 to 2016.

The model's firm-level control variables include personnel, portfolio at risk > 30 days, provision for loan impairment/assets, yield on gross portfolio (real), operating expense over assets, and the natural log of assets as a measure of firm size (Kyereboah-Coleman, 2007). I control for these variables because they have been found to correlate with MFI performance measures (Cull et al., 2007; Barnett and Salomon, 2006; Zacharias, 2008, Campbell and Rogers, 2012; Bogan, 2012). Controlling for these variables ensures that their differences do not contribute to the performance–regressors relationship. Also, research has found that an MFI's age can positively impact its efficiency (Caudill et al., 2009). Moreover, larger MFIs often have lower costs per borrower and lower costs per dollar lent; because larger MFIs are likely to be older, we can explain this relationship by either scale or a learning-curve effect (González, 2011). I therefore control for MFI scale.

Also, two of the social measures—PFB and ALB—effect each other in ways that are opposite of what is expected. The reason for this is that the female variable is positively related to outreach (that is, it increases outreach), while ALB is negatively related to outreach.

For size, I use the natural logarithm of total MFI assets. Finally, as I defined it earlier, *age* refers to the number of years an institution has been active, using the year of inception as the starting point.

I fitted the model using the fixed-effects (within) estimator to estimate the relationship between performance and the independent variables described in the previous chapter. The estimation already accounts for individual firm heterogeneity and time-invariant characteristic effects such as country and geographical region.

I also tested for omitted variables. As I described earlier, I included several control variables in the model. However, despite this effort to account for everything, it is still possible that I omitted some relevant covariates. To test for this, I introduced a dummy variable for each MFI in the fixed-effects model. Each institution's dummy variable allows for a different intercept in the model (Wooldridge, 2003). The institutional dummy will, therefore, control for specific MFI characteristics that could influence both financial and social performance and erase the relationship between the measures that produce biased test results. For example, management quality or human resources quality might influence both the dependent and independent variables; to control for this endogeneity, I included 2,955 dummy variables in the fixed-effects regression to account for all MFIs while using one MFI as a reference group. The dummy variables control for all the MFIs' time-invariant, unobservable characteristics that could affect the dependent variable by monitoring the unobserved heterogeneity between MFIs (Wooldridge, 2003). This is a very strong test, which controls for all the individual MFI characteristics that could influence the relationship between the independent and dependent variables. An initial run of the model revealed that there was almost no variation in the MFIs individual dummy variables. I therefore eliminated them from the model.

Having described the models, I now share their results.

V RESULTS

I now present my results from the econometric models I used to understand how funding mix sources impact MFIs' financial and social performance. I also present evidence on how the social–financial performance relationship varies across MFI legal charters and age, and summarize my results and findings on the MLCT for each legal charter.

Past research has produced mixed results regarding the MFI funding source mix's impact on financial and social performance goals. Many of these differences in research outcomes can be traced to differences in measurement approach, in how MFIs are defined, and in the granularity of the data analyzed. However, a significant cause of the varying conclusions might also emanate from the fact that MFIs are bulked together into a single homogeneous group. In truth, the various legal charters of these institutions create very real and specific distinctions among them. They should thus be analyzed accordingly. The results below are consistent with most leading MFI analyses, but they offer deeper insights into how and where funding source mix varies with social and financial performance. I also provide results of social and financial performance outcomes by MFI age to ascertain if funding and performance vary over time.

I divide the dataset into five groups corresponding to the five legal charters discussed in Chapter 2—that is, bank, credit union, NBFI, NGO, and rural bank MFIs. I then run the model for each of these datasets to analyze the relationship between the financial and social performance measures and the funding source mix variables for each legal charter.

In subsequent tables, I present results from the model's linear regressions that estimate the relationship between these dual performance [20] outcomes and funding source mix. Each

[20] Again, there are four performance outcomes comprising ROA as a financial performance outcome—average loan per borrower per GNI per capita (ALB), number of active borrowers per assets (NAB), and percentage of female borrowers (PFB)—all of which are social performance outcomes.

relationship is first captured under five different models: A, B, C, D, and E. *Model A* captures results from the base regression equation using the performance outcomes as dependent variables (DVs), and the four funding source mix regressors[21] as independent variables (IVs). *Model B* includes all IVs in model A, along with an age dummy variable. *Model C* comprises all IVs in model B, along with six MFI firm-level performance control variables and three macroeconomic indicator control variables. *Model D* consists of all IVs introduced in model C, along with year dummy variables to control for year-specific effects that may impact performance outcomes. *Model E* includes all the variables in model D, along with dummy variables to control for performance variations that may be attributed to different levels of MFI financial intermediation. Finally, I focus on model E alone, breaking it into three age groups to further analyze the relationships between MFIs' dual performance goals and the funding source mix metrics.

For the rest of this chapter, I adopt a consistent pattern to present the estimation results from the regressions. First, I present the summary of important findings. Second, I present results for all MFIs, regardless of legal charter. Finally, I present the result by legal charters. For each of the last two categories (sections 5.2 and 5.3), I further divide the results into three subcategories: 1) financial performance, 2) social performance, and 3) evidence from MLCT. I analyze these three subcategories overall, then by MFI age groups.

V.1 Summarized Results

V.1.1 *Dual Performance Outcomes and Funding Source Mix*

[21] The regressors of interest (funding source mix) are debt-to-assets, equity-to-assets, donation-to-assets, and deposit-to-assets ratios.

The results indicate that, generally, both social and financial performance outcomes vary with funding sources. Of particular interest is the negative association between the financial performance outcome, ROA, and donation. Higher donations are associated with a lower ROA for all MFIs. This relationship is confirmed by regressions across MFI ages and legal charters. A unit increase in the donation-to-asset ratio is associated with a 22.7% reduction in ROA, at a 1% significance level for all five models. Thus, rather than positively associating financial performance, donation funding associates negatively.

MFI cumulative-level regression estimates show that the debt-to-assets ratio is positively associated with at least one social performance outcome (ALB and NAB), and the financial performance outcome, ROA. A unit increase in debt-to-assets ratio is associated with 1.5% increase in NAB and 2.3% in ROA. The relationships described here vary with MFI age. More debt funding positively impacts new MFIs' ALB, NAB, and ROA at 5%, 1%, and 5% levels, respectively. As MFIs transition from the new to young stages, debt funding associates positively only with ROA (5% significance level). At the mature stage, debt has a positive association only with NAB (1% significance level). Thus, debt takes on different age-dependent roles in its relationship with the dual performance outcomes.

The equity-to-assets ratio is positively associated with financial objectives (ROA); as far as social performance, it is positively associated with two outcomes for mature forms and one for young MFIs. For new MFIs, funding seems to be non-significant.

Deposits related positively to NAB across all ages. Increased deposits seem to associate with higher ALB and NAB for mature MFIs; on aggregate, increased deposits are associated with both social and financial performance for all MFIs. However, deposits to assets have an unexpectedly negative association with PFB for young MFIs, at a 10% significance level.

Also, it appears that, overall, funding source mix is not associated with dual performance for bank MFIs. That said, there are significant associations as we look at bank MFIs by age. For example, the donation-to-assets ratio is positively and significantly associated with both ALB and NAB for mature banks. Thus, all things being equal, providing more donations to mature bank MFIs can lead to increases in depth and breadth of outreach to the poor.

The relationship between dual performance outcomes and funding source mix metrics also varies across legal charters. The strongest significant association between ROA and debt- and equity-to-assets ratios is observed in NBFI MFIs. However, young credit union MFIs show the highest association, with 16.3% between ROA and equity.

V.1.2 *Performance, Funding Source Mix, and the MLCT*

As I have just shown, funding source mix generally varies with both social and financial performance outcomes across age groups and legal charters; funding sources are also significantly associated with different stages of MFIs development, as measured in the age dummy regressions. While these associations are interesting, I wanted to quantify their impact on performance outcomes at both aggregate MFI and legal charter levels. To do this, I included three dummy variables—one each for each MFI developmental stage (age). I did this to further test the MLCT, which links funding sources and MFI performance to different MFI developmental stages.

At the aggregate level, MFI social performance outcomes (NAB and PFB) show significant variations by age. The coefficient of the new and young MFIs' dummy variables are significant at a 1% level for PFB, indicating that new and young MFIs attain, on average, 3.1% and 1.7% lower PFBs, respectively, than mature MFIs. Again, new and young MFIs attain 0.1% and 0.06% lower NAB per assets, respectively, compared to mature MFIs, although these estimates are significant at 10% levels. Also, new MFIs' ROA is an average of 3% higher than mature MFIs' ROA, at a

1% significance level. However, young and mature MFI ROAs show no significant differences. I offer details by legal charter in section 5.3.

V.2 MFI Performance and Funding Source Mix—Aggregate MFI Level Results

Table 8 shows the results of estimated coefficients, their robust standard errors (S.E.), significance levels (indicated by stars), and p-values. The table, like the many that follow it, presents the overall, within, and between variabilities of the DVs explained by the models' IVs (R^2). Because I fitted the model with within or fixed-effects estimator regressions, I am particularly interested in the variation among individual MFIs over time—that is, the within R^2. At the regression levels, all of the models are very significant at less than 1%. The regression coefficient estimates retain their signs across models A–E. The scenarios show how the regression statistics, estimated coefficients, standard errors, and significance evolve as more covariates enter the models as control variables.

Table 9: MFI Performance and Funding Source Mix—Aggregate Level

Dependent variables:	DV: ROA					DV: ALB					DV: NAB					DV: PFB				
Models:	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
Independent Variables																				
Debt Relative to Assets Ratio	**0.048****	**0.039***	**0.022***	**0.023***	**0.023***	**-0.037**	**-0.032**	**-0.047**	**0.019**	**0.021**	**-0.124**	**-0.126**	**0.015*****	**0.015*****	**0.015*****	**-0.020**	**-0.018**	**-0.018**	**-0.009**	**-0.009**
S.E.	*(0.021)*	*(0.020)*	*(0.012)*	*(0.012)*	*(0.012)*	*(0.115)*	*(0.116)*	*(0.093)*	*(0.089)*	*(0.089)*	*(0.130)*	*(0.133)*	*(0.003)*	*(0.003)*	*(0.003)*	*(0.017)*	*(0.017)*	*(0.020)*	*(0.021)*	*(0.021)*
P-values	0.018	0.054	0.071	0.056	0.059	0.746	0.781	0.609	0.835	0.810	0.342	0.342	0.000	0.000	0.000	0.245	0.283	0.371	0.678	0.670
Equity to Asset Ratio	**0.157*****	**0.154*****	**0.083*****	**0.086*****	**0.086*****	**0.001**	**0.001**	**0.126**	**0.211****	**0.209****	**0.012***	**0.012***	**0.019*****	**0.019*****	**0.019*****	**-0.017**	**-0.017**	**-0.029****	**-0.020**	**-0.019**
S.E.	*(0.019)*	*(0.020)*	*(0.013)*	*(0.013)*	*(0.013)*	*(0.008)*	*(0.008)*	*(0.081)*	*(0.093)*	*(0.091)*	*(0.007)*	*(0.007)*	*(0.004)*	*(0.004)*	*(0.004)*	*(0.013)*	*(0.013)*	*(0.014)*	*(0.014)*	*(0.014)*
P-values	0.000	0.000	0.000	0.000	0.000	0.860	0.868	0.118	0.023	0.023	0.064	0.066	0.000	0.000	0.000	0.185	0.187	0.039	0.159	0.167
Donations to Assets Ratio	**-0.548*****	**-0.522*****	**-0.225*****	**-0.227*****	**-0.227*****	**-0.003**	**0.030**	**0.269****	**0.096**	**0.097**	**-0.002**	**-0.017**	**0.006*****	**0.006*****	**0.006*****	**0.061****	**0.058****	**0.041**	**0.017**	**0.017**
S.E.	*(0.096)*	*(0.097)*	*(0.064)*	*(0.064)*	*(0.064)*	*(0.076)*	*(0.080)*	*(0.137)*	*(0.127)*	*(0.126)*	*(0.023)*	*(0.036)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.027)*	*(0.027)*	*(0.028)*	*(0.027)*	*(0.026)*
P-values	0.000	0.000	0.000	0.000	0.000	0.964	0.710	0.049	0.450	0.440	0.919	0.637	0.001	0.002	0.002	0.024	0.032	0.143	0.526	0.527
Deposits to Assets Ratio	**0.095*****	**0.071*****	**0.046*****	**0.050*****	**0.043*****	**0.084**	**0.073**	**0.346**	**0.513****	**0.574****	**0.252**	**0.257**	**0.016*****	**0.016*****	**0.015*****	**-0.024**	**-0.019**	**-0.003**	**0.016**	**0.000**
S.E.	*(0.021)*	*(0.021)*	*(0.015)*	*(0.015)*	*(0.014)*	*(0.139)*	*(0.139)*	*(0.228)*	*(0.216)*	*(0.250)*	*(0.260)*	*(0.265)*	*(0.003)*	*(0.003)*	*(0.003)*	*(0.025)*	*(0.026)*	*(0.028)*	*(0.030)*	*(0.030)*
P-values	0.000	0.001	0.002	0.001	0.002	0.544	0.599	0.130	0.018	0.022	0.331	0.332	0.000	0.000	0.000	0.334	0.459	0.925	0.585	0.987
Age: New	-	**-0.053*****	**-0.026*****	**-0.028*****	**-0.028*****	-	**-0.067**	**0.231**	**0.190**	**0.190**	-	**0.029**	**-0.001***	**-0.001***	**-0.001***	-	**0.008**	**-0.025***	**-0.031****	**-0.031****
S.E.		*(0.010)*	*(0.007)*	*(0.007)*	*(0.007)*		*(0.108)*	*(0.142)*	*(0.138)*	*(0.138)*		*(0.031)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.012)*	*(0.015)*	*(0.014)*	*(0.014)*
P-values		0.000	0.000	0.000	0.000		0.533	0.103	0.168	0.168		0.350	0.096	0.060	0.060		0.512	0.094	0.031	0.032
Age: Young	-	**0.000**	**0.004**	**0.003**	**0.002**	-	**-0.046**	**0.091**	**0.046**	**0.047**	-	**0.015**	**0.000**	**-0.001***	**-0.001***	-	**0.014****	**-0.011**	**-0.016****	**-0.017****
S.E.		*(0.004)*	*(0.003)*	*(0.003)*	*(0.003)*		*(0.041)*	*(0.068)*	*(0.060)*	*(0.060)*		*(0.016)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.007)*	*(0.008)*	*(0.008)*	*(0.008)*
P-values		0.888	0.258	0.462	0.478		0.261	0.180	0.442	0.434		0.348	0.132	0.063	0.060		0.048	0.208	0.047	0.043
MFI & Macro Level Controls Included	-	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**
Time Dummies Included	-	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**
Financial Intermediation Dummies Included		**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**
Constants	**-0.077*****	**-0.058*****	**0.105****	**0.036**	**0.039**	**0.861*****	**0.880*****	**-3.681*****	**-6.163*****	**-6.188*****	**0.300*****	**0.293*****	**0.014*****	**0.011*****	**0.011*****	**0.667*****	**0.662*****	**0.929*****	**0.660*****	**0.663*****
S.E.	*(0.016)*	*(0.016)*	*(0.041)*	*(0.063)*	*(0.063)*	*(0.033)*	*(0.037)*	*(1.368)*	*(2.122)*	*(2.127)*	*(0.083)*	*(0.091)*	*(0.004)*	*(0.004)*	*(0.004)*	*(0.012)*	*(0.013)*	*(0.104)*	*(0.151)*	*(0.151)*
P-values	0.000	0.000	0.011	0.564	0.536	0.000	0.000	0.007	0.004	0.004	0.000	0.001	0.000	0.003	0.003	0.000	0.000	0.000	0.000	0.000
***Overall* R^2**	***0.43***	***0.44***	***0.71***	***0.70***	***0.71***	***0.01***	***0.00***	***0.09***	***0.09***	***0.09***	***0.00***	***0.00***	***0.41***	***0.42***	***0.42***	***0.04***	***0.02***	***0.03***	***0.00***	***0.00***
***Between* R^2**	***0.56***	***0.55***	***0.72***	***0.71***	***0.71***	***0.01***	***0.00***	***0.11***	***0.09***	***0.09***	***0.00***	***0.00***	***0.15***	***0.15***	***0.15***	***0.05***	***0.03***	***0.01***	***0.00***	***0.00***
***Within* R^2**	***0.21***	***0.24***	***0.66***	***0.66***	***0.66***	***0.00***	***0.00***	***0.05***	***0.06***	***0.06***	***0.00***	***0.00***	***0.69***	***0.69***	***0.69***	***0.00***	***0.00***	***0.02***	***0.04***	***0.04***
F	***20.00***	**19.80**	**36.80**	**22.30**	**21.70**	***0.40***	**0.40**	**4.60**	**3.70**	**3.60**	***1.80***	**1.10**	**15.70**	**13.00**	**12.60**	***1.60***	**1.60**	**2.20**	**2.70**	**2.70**
No. Obs	***6,245***	***6,245***	***5,126***	***5,126***	***5,126***	***6,629***	***6,629***	***5,077***	***5,077***	***5,077***	***6,664***	***6,664***	***5,083***	***5,083***	***5,083***	***5,249***	***5,249***	***4,382***	***4,382***	***4,382***

Significance at 1% level (***), 5% level (**) and, 10% level (*) ; Robust standard errors (S.E.) are reported in parentheses; P-values below S.E.s calculated based on robust standard errors

Other Microfinance characteristics include MFIs' Financial Intermediation, Target Market, Scale of operations, Region, Profit orientation and whether the institution is Regulated

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is Percentage of Female Borrowers

The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

- *Aggregate Level MFI Financial Performance and Funding Source Mix.*

In Table 8, the link between ROA and the funding source mix metrics is captured in the first column. The models' F-test results indicate high significance at regressions levels, and the within R^2 ranges are from 0.21 to .66 for models A–E, respectively. The IVs explain almost two-thirds of Model E's ROA variability.

Overall, the financial performance outcome, ROA, is positively associated with the funding source mix metrics except for in the donation-to-assets ratio, which shows a very significant but negative ROA association. A unit increase each in debt-to-assets, equity-to-assets, and deposit-to-assets is, on average, associated with an ROA increase of 2.3%, 8.6%, and 4.6%, respectively.

Equity, therefore, seems to give MFIs a faster way to improve financial performance as measured by ROA. Further, each unit of donation-to-assets is associated with an average ROA decrease of 22.7%.

Breaking aggregate MFI results by age groups, we see that higher debt-to-assets ratio levels are positively associated with a much higher ROA for new MFIs (9.3%) than for young MFIs (4.3%).

As already established, the equity-to-assets ratio is positively associated with ROA. However, viewed by age groups, young MFIs are likely to produce higher ROA per unit of equity increase (12.3%) than mature MFIs (9.0%). New MFIs show no significant association between their ROA and equity-to-assets.

Donation is negatively associated with ROA for all age groups. A unit increase in donation-to-assets ratio is related to ROA decreases of 13.7% and 26.4% for young and mature MFIs, respectively.

Although a unit increase in deposit-to-assets ratio is associated with an average ROA increase of 4.3%, no significant associations were observed when I group MFIs by ages.

- *Aggregate Level MFI Social Performance and Funding Source Mix.*

Noteworthy associations between MFI social performance metrics ALB, NAB, and PFB and funding source mix metrics are as follows.

On the average, a unit increase in deposit-to-assets ratio is associated with the highest increase in ALB ($0.57), while a similar increase in equity-to-assets ratio leads to $.21 more ALB. Thus, to effectively increase the size of average loans per borrower, the MFI's deposits mobilization capacity is key. That said, a look at MFIs by age group shows that debt is a close runner-up to deposits for increasing ALB. A unit increase in debt-to-assets ratio associates with an increase of $0.67 for new MFIs' ALB, while the same increase in deposit-to-assets ratio for mature MFIs associates with an ALB increase of $0.68. Thus, on aggregate, stakeholders looking to increase ALB might explore the option of issuing debt in new MFIs or increasing deposit mobilization efforts for mature MFIs.

As noted earlier, NAB is the number of clients divided by the MFI's total assets. On average, all funding sources significantly and positively associate with NAB. The highest increase in NAB is associated with a unit increase of equity-to-assets ratio. The smallest NAB increase is related to an increase in the donation-to-assets ratio. Thus, even when donations have a positive association, they may still be a least-effective funding source for achieving performance. By age group, mature MFIs show the greatest increase in NAB per unit of increase in any of the funding source metrics. For these mature institutions, the most effective funding source is equity (0.02), followed by a tie between debt and deposits, and then donations.

Generally, funding source mix is not actively associated with PFB, except for a weakly significant and negative association with the deposit-to-assets ratio.

- *Aggregate Level MFI Performance, Funding Source Mix, and the MLCT.*

At the aggregate MFI level, the MLCT seems confirmed for PFB and NAB. On average, new and young MFIs achieve lower PFBs of 3.1% and 1.7%, respectively, compared to mature MFIs. These results are significant at the 5% level. A similar result is observed for NAB, where new and young MFIs achieve 0.001 fewer clients in relation to assets compared to mature MFIs.

Table 10: Aggregate MFIs: Performance and Funding Source Mix by Age

	DV: ROA				DV: ALB				DV: NAB				DV: PFB			
	Aggregate	New	Young	Mature	Aggregate	New	Young	Mature	Aggregate	New	Young	Mature	Aggregate	New	Young	Mature
Debt Relative to Assets Ratio	**0.023***	**0.093****	**0.043****	**0.001**	**0.021**	**0.668****	**0.776**	**-0.143**	**0.015*****	**0.003*****	**0.000**	**0.016*****	**-0.009**	**-0.024**	**-0.028**	**0.020**
S.E.	*(0.012)*	*(0.037)*	*(0.018)*	*(0.025)*	*(0.089)*	*(0.325)*	*(0.774)*	*(0.109)*	*(0.003)*	*(0.001)*	*(0.001)*	*(0.002)*	*(0.021)*	*(0.035)*	*(0.053)*	*(0.029)*
P-values	0.059	0.013	0.018	0.963	0.810	0.041	0.316	0.191	0.000	0.001	0.963	0.000	0.670	0.497	0.595	0.497
Equity to Asset Ratio	**0.086*****	**0.013**	**0.123*****	**0.090*****	**0.209****	**0.165**	**0.697**	**0.174***	**0.019*****	**0.001**	**0.000**	**0.020*****	**-0.019**	**-0.005**	**-0.064**	**-0.027**
S.E.	*(0.013)*	*(0.052)*	*(0.027)*	*(0.025)*	*(0.091)*	*(0.377)*	*(0.985)*	*(0.104)*	*(0.004)*	*(0.001)*	*(0.001)*	*(0.003)*	*(0.014)*	*(0.037)*	*(0.079)*	*(0.017)*
P-values	0.000	0.803	0.000	0.000	0.023	0.661	0.480	0.094	0.000	0.209	0.817	0.000	0.167	0.896	0.422	0.123
Donations to Assets Ratio	**-0.227*****	**-0.102**	**-0.137****	**-0.264****	**0.097**	**0.348**	**-0.083**	**0.205**	**0.006*****	**-0.002***	**-0.001**	**0.008****	**0.017**	**-0.055**	**0.074**	**0.030**
S.E.	*(0.064)*	*(0.073)*	*(0.057)*	*(0.114)*	*(0.126)*	*(0.369)*	*(0.210)*	*(0.128)*	*(0.002)*	*(0.001)*	*(0.002)*	*(0.003)*	*(0.026)*	*(0.060)*	*(0.075)*	*(0.042)*
P-values	0.000	0.160	0.017	0.021	0.440	0.346	0.693	0.110	0.002	0.087	0.686	0.023	0.527	0.361	0.324	0.472
Deposits to Assets Ratio	**0.043*****	**0.072**	**0.047**	**0.025**	**0.574****	**-1.349**	**1.773**	**0.682****	**0.015*****	**0.002****	**0.002****	**0.016*****	**0.000**	**-0.044**	**-0.152***	**0.000**
S.E.	*(0.014)*	*(0.045)*	*(0.033)*	*(0.022)*	*(0.250)*	*(1.563)*	*(2.270)*	*(0.274)*	*(0.003)*	*(0.001)*	*(0.001)*	*(0.002)*	*(0.030)*	*(0.045)*	*(0.083)*	*(0.041)*
P-values	0.002	0.108	0.149	0.259	0.022	0.389	0.435	0.013	0.000	0.020	0.040	0.000	0.987	0.320	0.069	0.999
Age: New	**-0.028*****	-	-	-	**0.190**	-	-	-	**-0.001***	-	-	-	**-0.031****	-	-	-
S.E.	*(0.007)*				*(0.138)*				*(0.000)*				*(0.014)*			
P-values	0.000				0.168				0.060				0.032			
Age: Young	**0.002**	-	-	-	**0.047**	-	-	-	**-0.001***	-	-	-	**-0.017****	-	-	-
S.E.	*(0.003)*				*(0.060)*				*(0.000)*				*(0.008)*			
P-values	0.478				0.434				0.060				0.043			
Constants	**0.039**	**0.029**	**-0.332****	**-0.001**	**-6.188*****	**-3.695**	**-1.967**	**-8.485*****	**0.011*****	**0.032*****	**0.022*****	**0.007**	**0.663*****	**0.819*****	**0.952****	**0.498****
S.E.	*(0.063)*	*(0.325)*	*(0.162)*	*(0.078)*	*(2.127)*	*(2.310)*	*(2.544)*	*(3.209)*	*(0.004)*	*(0.008)*	*(0.005)*	*(0.004)*	*(0.151)*	*(0.253)*	*(0.402)*	*(0.208)*
P-values	0.536	0.928	0.041	0.987	0.004	0.111	0.440	0.008	0.003	0.000	0.000	0.112	0.000	0.001	0.018	0.017
Overall R^2	***0.71***	***0.69***	***0.42***	***0.76***	***0.09***	***0.01***	***0.04***	***0.11***	***0.42***	***0.14***	***0.22***	***0.54***	***0.00***	***0.03***	***0.04***	***0.00***
Between R^2	***0.71***	***0.68***	***0.46***	***0.78***	***0.09***	***0.01***	***0.04***	***0.10***	***0.15***	***0.16***	***0.18***	***0.21***	***0.00***	***0.04***	***0.02***	***0.00***
Within R^2	***0.66***	***0.73***	***0.57***	***0.64***	***0.06***	***0.18***	***0.07***	***0.10***	***0.69***	***0.38***	***0.30***	***0.77***	***0.04***	***0.12***	***0.09***	***0.05***
F	**21.68**	**21.15**	**18.42**	**12.62**	**3.58**	**1.55**	**1.45**	**3.35**	**12.64**	**4.43**	**4.63**	**10.37**	**2.65**	**1.38**	**1.92**	**3.16**
No. Obs	***5,126***	***448***	***889***	***3,789***	***5,077***	***444***	***883***	***3,750***	***5,083***	***447***	***883***	***3,753***	***4,382***	***399***	***764***	***3,219***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is Percentage of Female Borrowers

Models incldue macroeconomic indicator control variables and MFI firm levels control variables

V.3 MFI Performance and Funding Source Mix—MFI Legal Charter Level Results

V.3.1 *Bank MFI Performance and Funding Source Mix*

Table 10 shows results on the relationship between bank MFIs' dual performance outcomes for ROA, ALB, NAB, and PFB and the funding source mix metrics (debt-to-assets ratio, equity-to-assets ratio, donation-to-assets ratio, and deposit-to-assets ratio). Again, I describe the models at regression level, and then analyze the coefficient estimation results.

Of the five model scenarios, A and B do not seem significant at the regression level for all the performance outcomes, except for ROA for model B. The rest of the models show high significance. Focusing on model E, the regression level F-statistics are highly significant at $F(29,159) = 12.1$, $p < 0.001$ for ROA. The within R^2 at the aggregate legal charter level is .52.

Table 11: Bank MFIs: Performance and Funding Source Mix

Dependent variables:	DV: ROA					DV: ALB					DV: NAB					DV: PFB				
Models: / Independent Variables	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
Debt Relative to Assets Ratio	**-0.026**	**-0.039**	**0.003**	**0.003**	**0.003**	**0.345**	**0.386**	**0.320**	**0.433**	**0.452**	**-3.824**	**-3.754**	**0.000**	**0.000**	**0.000**	**-0.046**	**-0.066**	**-0.054**	**-0.051**	**-0.051**
s.e.	*(0.043)*	*(0.043)*	*(0.022)*	*(0.022)*	*(0.022)*	*(0.933)*	*(0.914)*	*(1.124)*	*(1.123)*	*(1.118)*	*(4.051)*	*(3.991)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.061)*	*(0.055)*	*(0.069)*	*(0.067)*	*(0.067)*
p-values	0.547	0.370	0.899	0.896	0.895	0.712	0.673	0.776	0.700	0.687	0.346	0.348	0.629	0.758	0.744	0.449	0.228	0.432	0.448	0.445
Equity to Asset Ratio	**-0.007**	**0.004**	**0.019**	**0.024**	**0.024**	**-0.506**	**-0.711**	**1.118**	**1.421**	**1.371**	**-9.045**	**-9.844**	**0.001**	**0.001**	**0.001**	**0.049**	**0.056**	**0.040**	**0.054**	**0.052**
s.e.	*(0.050)*	*(0.051)*	*(0.029)*	*(0.029)*	*(0.029)*	*(0.737)*	*(0.825)*	*(1.417)*	*(1.584)*	*(1.564)*	*(9.261)*	*(10.066)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.073)*	*(0.070)*	*(0.086)*	*(0.077)*	*(0.076)*
p-values	0.881	0.932	0.509	0.423	0.422	0.493	0.390	0.431	0.371	0.382	0.330	0.329	0.367	0.260	0.241	0.505	0.425	0.646	0.486	0.498
Donations to Assets Ratio	**-1.344***	**-1.371***	**-0.257**	**-0.259**	**-0.260**	**2.525**	**2.667**	**3.438****	**2.171***	**2.030**	**8.207**	**8.490**	**0.024*****	**0.023*****	**0.023*****	**-0.111**	**-0.145**	**-0.147**	**-0.192****	**-0.199****
s.e.	*(0.729)*	*(0.725)*	*(0.226)*	*(0.226)*	*(0.226)*	*(2.352)*	*(2.194)*	*(1.535)*	*(1.280)*	*(1.250)*	*(8.660)*	*(8.829)*	*(0.004)*	*(0.004)*	*(0.004)*	*(0.099)*	*(0.092)*	*(0.090)*	*(0.078)*	*(0.082)*
p-values	0.067	0.060	0.256	0.253	0.252	0.284	0.226	0.027	0.092	0.106	0.344	0.337	0.000	0.000	0.000	0.263	0.116	0.105	0.016	0.016
Deposits to Assets Ratio	**-0.014**	**-0.036**	**-0.005**	**0.003**	**0.004**	**0.479**	**0.675**	**1.068**	**1.512**	**1.655**	**-2.759**	**-1.949**	**-0.001**	**0.000**	**0.000**	**-0.030**	**-0.071**	**-0.054**	**-0.041**	**-0.031**
s.e.	*(0.036)*	*(0.036)*	*(0.022)*	*(0.022)*	*(0.025)*	*(0.608)*	*(0.526)*	*(1.375)*	*(1.344)*	*(1.387)*	*(3.093)*	*(2.389)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.063)*	*(0.055)*	*(0.067)*	*(0.066)*	*(0.067)*
p-values	0.702	0.326	0.804	0.879	0.882	0.432	0.200	0.438	0.262	0.235	0.373	0.416	0.587	0.948	0.869	0.634	0.204	0.426	0.540	0.640
Age: New	-	**-0.033*****	**-0.026****	**-0.028****	**-0.028****	-	**0.378**	**0.505**	**0.493**	**0.477**	-	**1.551**	**0.000**	**0.000**	**0.000**	-	**-0.045***	**-0.074*****	**-0.082*****	**-0.083*****
S.E.		*(0.012)*	*(0.012)*	*(0.012)*	*(0.012)*		*(0.425)*	*(0.462)*	*(0.459)*	*(0.462)*		*(1.587)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.025)*	*(0.025)*	*(0.024)*	*(0.024)*
P-values		0.009	0.033	0.017	0.017		0.376	0.276	0.285	0.303		0.329	0.397	0.278	0.297		0.079	0.004	0.001	0.001
Age: Young	-	**0.010****	**0.005**	**0.001**	**0.001**	-	**0.041**	**-0.003**	**-0.013**	**-0.011**	-	**0.587**	**0.000**	**0.000***	**0.000***	-	**0.019**	**-0.005**	**-0.013**	**-0.013**
S.E.		*(0.005)*	*(0.005)*	*(0.004)*	*(0.004)*		*(0.121)*	*(0.183)*	*(0.168)*	*(0.168)*		*(0.603)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.014)*	*(0.014)*	*(0.014)*	*(0.014)*
P-values		0.032	0.280	0.769	0.768		0.736	0.986	0.938	0.948		0.331	0.318	0.098	0.097		0.174	0.696	0.384	0.383
MFI & Macro Level Controls Included	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Time Dummies Included	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**
Financial Intermediation Dummies Included	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**
Constants	**0.027**	**0.041**	**0.105***	**-0.036**	**-0.036**	**1.781*****	**1.640*****	**-7.466**	**-12.177**	**-12.175**	**6.336**	**5.694**	**0.012*****	**0.007****	**0.007****	**0.522*****	**0.548*****	**0.871*****	**0.739****	**0.741****
s.e.	*(0.035)*	*(0.035)*	*(0.062)*	*(0.089)*	*(0.090)*	*(0.496)*	*(0.420)*	*(5.639)*	*(10.507)*	*(10.514)*	*(4.482)*	*(3.871)*	*(0.003)*	*(0.003)*	*(0.003)*	*(0.057)*	*(0.050)*	*(0.208)*	*(0.308)*	*(0.307)*
p-values	0.433	0.236	0.094	0.685	0.685	0.000	0.000	0.187	0.248	0.249	0.159	0.143	0.000	0.047	0.045	0.000	0.000	0.000	0.018	0.017
***Overall* R^2**	***0.38***	***0.43***	***0.44***	***0.45***	***0.45***	***0.01***	***0.01***	***0.03***	***0.03***	***0.03***	***0.00***	***0.00***	***0.15***	***0.07***	***0.07***	***0.00***	***0.01***	***0.03***	***0.04***	***0.04***
***Between* R^2**	***0.57***	***0.60***	***0.59***	***0.56***	***0.56***	***0.01***	***0.00***	***0.05***	***0.04***	***0.04***	***0.00***	***0.01***	***0.27***	***0.10***	***0.09***	***0.00***	***0.01***	***0.01***	***0.02***	***0.02***
***Within* R^2**	***0.25***	***0.28***	***0.49***	***0.52***	***0.52***	***0.00***	***0.01***	***0.09***	***0.11***	***0.11***	***0.00***	***0.00***	***0.42***	***0.45***	***0.45***	***0.01***	***0.05***	***0.12***	***0.16***	***0.16***
F	***1.50***	**4.20**	**11.50**	**11.90**	**12.10**	***0.80***	**0.80**	**2.30**	**2.50**	**2.40**	***0.20***	**0.20**	**11.00**	**6.30**	**6.00**	***1.20***	**2.00**	**2.50**	**3.80**	**3.70**
Number of Observations	***1,192***	***1,192***	***947***	***947***	***947***	***1,200***	***1,200***	***930***	***930***	***930***	***1,209***	***1,209***	***931***	***931***	***931***	***867***	***867***	***750***	***750***	***75***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (s.e.) in parentheses, and p-values below s.e. calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is the Percentage of Female Borrowers

- *Bank MFI Financial Performance and Funding Source Mix.*

  At the aggregate bank MFI level, none of the funding source mix metrics significantly relate to ROA. Thus, on average, funding seems to be unimportant for bank MFIs' financial performance.

  Grouped by age, important associations become noticeable. The donation-to-assets ratio is negatively associated with ROA for young and mature bank MFIs. A unit increase in the donation-to-assets ratio relates to a 125.4% and 24.7% ROA reduction for young and mature bank MFIs, respectively. Also, a unit increase in debt- and deposit-to-assets ratios are associated with a 5.3% and 3% ROA, respectively, for mature bank MFIs. All other relationships between ROA and funding metrics are not significant.

- *Bank MFI Social Performance and Funding Source Mix.*

  The regressions for Bank MFIs' social performance outcomes are all very significant at $F(29,156) = 2.35$, $p < 0.001$; $F(29,156) = 6.03$, $p < 0.001$; and $F(29,138) = 3.67 < 0.001$ for ALB, NAB, and PFB, respectively. The within R^2 are .11, .45, and .16 for ALB, NAB, and PFB, respectively.

  At the aggregate bank MFIs level, there seem to be no significant relationships between ALB and the funding source mix metrics. However, when grouped by ages, important associations arise that are worth analyzing. For young bank MFIs, ALB is positively associated with all funding source mix metrics except the donation-to-assets ratio, with a unit increase in debt-, equity-, and deposit-to-assets ratios associated with an ALB of \$18.9, \$18.6, and \$17.9, respectively. So, as long as the funding source is not donations, an

increase in funding may increase ALB size by a similar amount. For mature bank MFIs, however, the donation-to-assets ratio positively associates with ALB.

Regarding NAB, on average, a unit increase in the donation-to-assets ratio associates with only a 0.023 increase. Further analysis of bank MFIs by age group shows that donation impacts NAB positively only for mature bank MFIs. Although debt- and deposit-to-assets ratios also have significant associations with NAB for mature bank MFIs, these relationships are negative.

All associations between PFB and funding source mix metrics are not significant on the average, except for the negative relationship with the donation-to-assets ratio. An increase of one unit in donation is associated with an average decrease of 20% in PFB overall, and a 101.6% decrease for young bank MFIs.

Table 11 provides further details on the variability between performance and funding source mix metrics for bank MFIs.

- *Bank MFI Performance, Funding Source Mix, and the MLCT.*

I did not find evidence of the MLCT at work in bank MFIs. Although a strong significant difference exists between financial performance of new bank MFIs compared to mature ones, I did not find a significant difference between young and mature MFIs' ROAs. On average, new MFIs attain 2.8% lower ROA compared to mature MFIs. Young bank MFIs' ROA does not significantly differ on average from that of mature bank MFIs.

Also, while new bank MFIs have, on average, an 8.3% lower PFB than mature bank MFIs, there appears to be no significant difference in PFB for young and mature bank MFIs. So, instead of three-stage performance outcomes, I can identify only two: from new to mature.

Table 12: Bank MFIs: Performance and Funding Source Mix by Age

	DV: ROA				DV: ALB				DV: NAB				DV: PFB			
	Aggregate	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**
Debt Relative to Assets Ratio	**0.003**	**0.105**	**0.006**	**-0.053****	**0.452**	**1.178**	**18.918****	**-0.610**	**0.000**	**0.000**	**0.001**	**-0.003****	**-0.051**	**0.051**	**0.027**	**-0.185***
S.E.	*(0.022)*	*(0.113)*	*(0.057)*	*(0.021)*	*(1.118)*	*(0.856)*	*(8.202)*	*(0.862)*	*(0.001)*	*(0.003)*	*(0.001)*	*(0.001)*	*(0.067)*	*(0.121)*	*(0.186)*	*(0.095)*
P-values	0.895	0.357	0.924	0.015	0.687	0.174	0.024	0.481	0.744	0.903	0.449	0.022	0.445	0.675	0.884	0.054
Equity to Asset Ratio	**0.024**	**0.033**	**0.025**	**0.051**	**1.371**	**1.306**	**18.577****	**2.097**	**0.001**	**0.004**	**0.002**	**0.001**	**0.052**	**0.092**	**0.391***	**-0.056**
S.E.	*(0.029)*	*(0.106)*	*(0.060)*	*(0.045)*	*(1.564)*	*(0.798)*	*(9.114)*	*(1.777)*	*(0.001)*	*(0.004)*	*(0.001)*	*(0.002)*	*(0.076)*	*(0.115)*	*(0.212)*	*(0.076)*
P-values	0.422	0.758	0.681	0.260	0.382	0.107	0.046	0.240	0.241	0.296	0.148	0.576	0.498	0.426	0.070	0.461
Donations to Assets Ratio	**-0.260**	**-0.824**	**-1.254*****	**-0.247****	**2.030**	**2.272**	**12.926**	**3.766***	**0.023*****	**-0.006**	**-0.005**	**0.026*****	**-0.199****	**0.794**	**-1.016*****	**-0.126**
S.E.	*(0.226)*	*(0.499)*	*(0.262)*	*(0.106)*	*(1.250)*	*(3.334)*	*(8.398)*	*(1.928)*	*(0.004)*	*(0.007)*	*(0.004)*	*(0.005)*	*(0.082)*	*(0.686)*	*(0.331)*	*(0.096)*
P-values	0.252	0.104	0.000	0.021	0.106	0.499	0.129	0.053	0.000	0.358	0.186	0.000	0.016	0.253	0.004	0.193
Deposits to Assets Ratio	**0.004**	**-0.021**	**-0.018**	**-0.030***	**1.655**	**0.503**	**17.914****	**0.282**	**0.000**	**0.005**	**0.001**	**-0.003****	**-0.031**	**0.341**	**-0.197**	**-0.168**
S.E.	*(0.025)*	*(0.100)*	*(0.050)*	*(0.018)*	*(1.387)*	*(1.062)*	*(8.070)*	*(0.984)*	*(0.001)*	*(0.004)*	*(0.001)*	*(0.001)*	*(0.067)*	*(0.203)*	*(0.169)*	*(0.103)*
P-values	0.882	0.833	0.723	0.091	0.235	0.638	0.030	0.775	0.869	0.182	0.285	0.033	0.640	0.100	0.249	0.107
Age: New	**-0.028****	-	-	-	**0.477**	-	-	-	**0.000**	-	-	-	**-0.083*****	-	-	-
S.E.	*(0.012)*				*(0.462)*				*(0.000)*				*(0.024)*			
P-values	0.017				0.303				0.297				0.001			
Age: Young	**0.001**	-	-	-	**-0.011**	-	-	-	**0.000***	-	-	-	**-0.013**	-	-	-
S.E.	*(0.004)*				*(0.168)*				*(0.000)*				*(0.014)*			
P-values	0.768				0.948				0.097				0.383			
Constants	**-0.036**	**0.711****	**-0.112**	**-0.142***	**-12.175**	**-2.037**	**-14.070**	**-20.799**	**0.007****	**0.012**	**-0.006**	**0.007****	**0.741****	**-0.015**	**-0.779**	**0.812****
S.E.	*(0.090)*	*(0.342)*	*(0.241)*	*(0.075)*	*(10.514)*	*(5.432)*	*(19.784)*	*(15.626)*	*(0.003)*	*(0.015)*	*(0.007)*	*(0.003)*	*(0.307)*	*(0.729)*	*(0.673)*	*(0.360)*
P-values	0.685	0.042	0.642	0.060	0.249	0.709	0.480	0.186	0.045	0.433	0.357	0.014	0.017	0.984	0.253	0.026
***Overall* R^2**	***0.45***	***0.19***	***0.32***	***0.36***	***0.03***	***0.00***	***0.00***	***0.04***	***0.07***	***0.30***	***0.00***	***0.40***	***0.04***	***0.01***	***0.00***	***0.13***
***Between* R^2**	***0.56***	***0.16***	***0.20***	***0.51***	***0.04***	***0.00***	***0.02***	***0.03***	***0.09***	***0.39***	***0.00***	***0.27***	***0.02***	***0.00***	***0.00***	***0.06***
***Within* R^2**	***0.52***	***0.88***	***0.67***	***0.52***	***0.11***	***0.70***	***0.44***	***0.19***	***0.45***	***0.60***	***0.40***	***0.60***	***0.16***	***0.65***	***0.58***	***0.23***
F	**12.11**	**.**	**16.48**	**52.12**	**2.35**	**.**	**2.21**	**2.27**	**6.03**	**.**	**3.01**	**157.83**	**3.67**	**.**	**44.94**	**3.75**
No. Obs	***947***	***106***	***172***	***669***	***930***	***106***	***170***	***654***	***931***	***106***	***170***	***655***	***750***	***86***	***124***	***540***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is Percentage of Female Borrowers

Models incldue macroeconomic indicator control variables and MFI firm levels control variables

V.3.2 *Credit Union MFIs: Performance and Funding Source Mix*

Table 12 shows the model results from fixed-effects panel models that estimate the relationship between credit union MFIs' social and financial performance and funding source mix metrics.

- *Credit Union MFI Financial Performance and Funding Source Mix.*

  At the regression level, the models for estimating the results are all very significant. The covariates explain 57% of the overall variation in credit union MFIs' ROA at $F(29,1135) = 9.15$, $p < 0.001$.

  At the aggregate credit union MFI level, two important associations exist between ROA and equity- or donation-to-assets ratios. A unit increase in equity-to-assets ratio associates with a 7.7% increase in ROA, while the same increase in donation-to-assets associates with a 20% decrease in ROA. Grouped by ages, donation-to-assets relates negatively to ROA across all age groups. A unit increase in donation funding is associated with ROA decreases of 84.3%, 48.7%, and 28.9% for new, young, and mature MFIs, respectively. All funding source metrics other than donation have positive and very significant associations with ROA for young credit union MFIs. A unit increase in equity-to-assets ratio relates to the ROA highest increase (16.3%) for this age group, followed by deposit-to-assets ratio (12.9%) and debt-to-assets ratio (6.3%).

- *Credit Union MFI Social Performance and Funding Source Mix*.

  No significant relationship exists between ALB and the funding source mix measures at the aggregate credit union MFI level. As expected, however, the deposit-to-assets ratio associates positively with ALB for mature credit union MFIs. A unit increase in deposits is associated with $0.73 increase in ALB.

In terms of outreach breadth (NAB), I found no significant association, except for a negative relationship with donation-to-assets ratio.

PFB relates significantly and negatively with debt-, equity-, and deposit-to-assets ratios at the aggregate credit union MFI level, decreasing PFB by 17.9%, 19.7%, and 19.2%, respectively. Mature credit union MFIs reflect this pattern of association, with 19.9%, 22.2%, and 24.7% decreases in PFB given a unit increase in the three funding metrics, respectively. For further details, see Tables 12 and 13.

Table 13: Credit Union MFIs: Performance and Funding Source Mix

Dependent variables:	DV: ROA					DV: ALB					DV: NAB					DV: PFB				
Models:	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
Independent Variables																				
Debt Relative to Assets Ratio	**-0.020**	**-0.020**	**0.027**	**0.026**	**0.028**	**0.212**	**0.225**	**0.085**	**0.175**	**0.157**	**0.002*** **	**0.002*** **	**0.002*** **	**-0.001**	**-0.001**	**-0.179*** **	**-0.180*** **	**-0.203*** **	**-0.187*** **	**-0.179*** **
S.E.	*(0.053)*	*(0.053)*	*(0.033)*	*(0.030)*	*(0.030)*	*(0.164)*	*(0.160)*	*(0.256)*	*(0.278)*	*(0.269)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.001)*	*(0.001)*	*(0.058)*	*(0.059)*	*(0.066)*	*(0.067)*	*(0.064)*
P-values	0.705	0.705	0.400	0.387	0.366	0.198	0.159	0.741	0.531	0.560	0.000	0.000	0.000	0.301	0.299	0.002	0.003	0.002	0.006	0.006
Equity to Asset Ratio	**0.076**	**0.076**	**0.066***	**0.075***	**0.077***	**-0.102**	**-0.123**	**0.449**	**0.835**	**0.814**	**0.003*** **	**0.003*** **	**0.003*** **	**-0.001**	**-0.001**	**-0.172** **	**-0.177** **	**-0.234** **	**-0.209** **	**-0.197** **
S.E.	*(0.046)*	*(0.047)*	*(0.039)*	*(0.041)*	*(0.041)*	*(0.180)*	*(0.168)*	*(0.516)*	*(0.530)*	*(0.512)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.001)*	*(0.001)*	*(0.078)*	*(0.079)*	*(0.092)*	*(0.092)*	*(0.086)*
P-values	0.102	0.102	0.094	0.065	0.060	0.572	0.464	0.384	0.116	0.112	0.000	0.000	0.000	0.567	0.556	0.029	0.025	0.012	0.024	0.022
Donations to Assets Ratio	**-0.432** **	**-0.427** **	**-0.201***	**-0.193***	**-0.197***	**-0.209**	**-0.428***	**0.034**	**0.045**	**0.091**	**-0.004**	**-0.004***	**-0.004***	**-0.003**	**-0.003**	**0.020**	**0.005**	**0.036**	**0.018**	**0.004**
S.E.	*(0.183)*	*(0.184)*	*(0.114)*	*(0.114)*	*(0.114)*	*(0.224)*	*(0.258)*	*(0.375)*	*(0.352)*	*(0.350)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.091)*	*(0.095)*	*(0.085)*	*(0.092)*	*(0.093)*
P-values	0.019	0.021	0.079	0.090	0.084	0.352	0.098	0.927	0.898	0.796	0.104	0.066	0.066	0.124	0.138	0.829	0.959	0.672	0.843	0.966
Deposits to Assets Ratio	**-0.037**	**-0.037**	**0.015**	**0.027**	**0.014**	**-0.144**	**-0.135**	**-0.116**	**0.247**	**0.385**	**0.002*** **	**0.002*** **	**0.002*** **	**0.000**	**0.000**	**-0.095**	**-0.095**	**-0.145***	**-0.136***	**-0.192** **
S.E.	*(0.057)*	*(0.057)*	*(0.034)*	*(0.033)*	*(0.034)*	*(0.161)*	*(0.156)*	*(0.311)*	*(0.335)*	*(0.299)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.001)*	*(0.001)*	*(0.067)*	*(0.068)*	*(0.081)*	*(0.080)*	*(0.084)*
P-values	0.522	0.515	0.653	0.419	0.679	0.373	0.389	0.708	0.461	0.199	0.000	0.000	0.000	0.811	0.955	0.156	0.162	0.073	0.090	0.023
Age: New	-	**-0.006**	**-0.013**	**-0.015**	**-0.014**	-	**0.193**	**0.398**	**0.339**	**0.326**	-	**0.000*** **	**0.000*** **	**0.000**	**0.000**	-	**0.015**	**-0.026**	**-0.030**	**-0.025**
S.E.		*(0.016)*	*(0.009)*	*(0.009)*	*(0.009)*		*(0.155)*	*(0.252)*	*(0.243)*	*(0.241)*		*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.037)*	*(0.050)*	*(0.049)*	*(0.049)*
P-values		0.698	0.164	0.111	0.136		0.216	0.115	0.164	0.178		0.003	0.003	0.351	0.312		0.678	0.609	0.537	0.608
Age: Young	-	**-0.003**	**0.003**	**0.002**	**0.003**	-	**0.047**	**0.171**	**0.125**	**0.121**	-	**0.000*** **	**0.000*** **	**0.000**	**0.000**	-	**0.010**	**-0.007**	**-0.007**	**-0.006**
S.E.		*(0.006)*	*(0.005)*	*(0.005)*	*(0.005)*		*(0.068)*	*(0.114)*	*(0.111)*	*(0.108)*		*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.014)*	*(0.019)*	*(0.019)*	*(0.018)*
P-values		0.635	0.468	0.614	0.563		0.492	0.137	0.260	0.262		0.002	0.002	0.123	0.122		0.495	0.713	0.689	0.744
MFI & Macro Level Controls Included	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**
Time Dummies Included	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**
Financial Intermediation Dummies Included	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**
Constants	**0.022**	**0.023**	**0.025**	**-0.088**	**-0.086**	**1.002*** **	**0.976*** **	**-1.643**	**-4.958** **	**-4.970** **	**-0.001*** **	**-0.001*** **	**-0.001*** **	**0.016** **	**0.016** **	**0.637*** **	**0.635*** **	**0.962*** **	**0.914*** **	**0.901*** **
S.E.	*(0.049)*	*(0.049)*	*(0.081)*	*(0.119)*	*(0.117)*	*(0.073)*	*(0.066)*	*(1.225)*	*(2.048)*	*(2.027)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.007)*	*(0.007)*	*(0.055)*	*(0.056)*	*(0.233)*	*(0.303)*	*(0.301)*
P-values	0.650	0.633	0.760	0.461	0.462	0.000	0.000	0.181	0.016	0.015	0.000	0.000	0.000	0.027	0.027	0.000	0.000	0.000	0.003	0.003
***Overall* R^2**	***0.14***	***0.14***	***0.41***	***0.42***	***0.42***	***0.01***	***0.02***	***0.00***	***0.00***	***0.00***	***0.49***	***0.49***	***0.49***	***0.14***	***0.14***	***0.00***	***0.00***	***0.02***	***0.02***	***0.02***
***Between* R^2**	***0.16***	***0.16***	***0.43***	***0.43***	***0.44***	***0.01***	***0.02***	***0.01***	***0.00***	***0.00***	***0.08***	***0.09***	***0.09***	***0.15***	***0.15***	***0.01***	***0.01***	***0.00***	***0.00***	***0.00***
***Within* R^2**	***0.17***	***0.17***	***0.55***	***0.56***	***0.57***	***0.00***	***0.01***	***0.05***	***0.12***	***0.12***	***0.79***	***0.79***	***0.79***	***0.10***	***0.11***	***0.01***	***0.02***	***0.03***	***0.06***	***0.07***
F	***4.20***	**3.20**	**11.90**	**9.00**	**9.20**	***0.60***	**1.20**	**1.30**	**2.20**	**2.20**	***9,352.40***	**6,326.20**	**6,326.20**	**2.50**	**2.50**	***2.70***	**1.80**	**1.40**	**1.80**	**1.90**
No. Obs	***1,458***	***1,458***	***1,135***	***1,135***	***1,135***	***1,533***	***1,533***	***1,118***	***1,118***	***1,118***	***1,542***	***1,542***	***1,542***	***1,119***	***1,119***	***1,244***	***1,244***	***1,017***	***1,017***	***1,017***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is the Percentage of Female Borrowers

- *Credit Union MFI Performance, Funding Source Mix, and the MLCT.*

  On average, I found no significant estimates for the age group dummies. However, the relationship between financial performance (ROA) and donation-to-assets seems to follow the MLCT for credit union MFIs.

Table 14: Credit Union MFIs: Performance and Funding Source Mix by Age

	DV: ROA				DV: ALB				DV: NAB				DV: PFB			
	Aggregate	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**
Debt Relative to Assets Ratio	**0.028**	**-0.082**	**0.063*** **	**0.029**	**0.157**	**-1.823***	**-0.147**	**0.340**	**-0.001**	**0.004**	**0.000**	**0.000**	**-0.179*** **	**-0.875**	**0.026**	**-0.199***
S.E.	*(0.030)*	*(0.249)*	*(0.016)*	*(0.027)*	*(0.269)*	*(0.996)*	*(0.091)*	*(0.506)*	*(0.001)*	*(0.003)*	*(0.000)*	*(0.002)*	*(0.064)*	*(0.711)*	*(0.134)*	*(0.107)*
P-values	0.366	0.745	0.000	0.289	0.560	0.073	0.108	0.502	0.299	0.184	0.127	0.823	0.006	0.224	0.847	0.064
Equity to Asset Ratio	**0.077***	**0.119**	**0.163*** **	**0.037**	**0.814**	**-3.663*** **	**-0.055**	**0.565**	**-0.001**	**0.008***	**0.000**	**0.000**	**-0.197*** **	**-1.006**	**0.181**	**-0.222***
S.E.	*(0.041)*	*(0.217)*	*(0.061)*	*(0.033)*	*(0.512)*	*(1.380)*	*(0.295)*	*(0.546)*	*(0.001)*	*(0.005)*	*(0.001)*	*(0.001)*	*(0.086)*	*(0.985)*	*(0.185)*	*(0.124)*
P-values	0.060	0.585	0.009	0.269	0.112	0.010	0.853	0.301	0.556	0.087	0.942	0.788	0.022	0.312	0.329	0.076
Donations to Assets Ratio	**-0.197***	**-0.843*** **	**-0.487*** **	**-0.289***	**0.091**	**-0.140**	**0.241**	**-0.159**	**-0.003**	**-0.012*** **	**-0.002***	**0.002**	**0.004**	**-1.901*** **	**0.155**	**-0.001**
S.E.	*(0.114)*	*(0.322)*	*(0.223)*	*(0.149)*	*(0.350)*	*(1.357)*	*(0.881)*	*(1.572)*	*(0.002)*	*(0.004)*	*(0.001)*	*(0.003)*	*(0.093)*	*(0.918)*	*(0.343)*	*(0.264)*
P-values	0.084	0.011	0.031	0.053	0.796	0.918	0.785	0.919	0.138	0.010	0.055	0.544	0.966	0.043	0.654	0.996
Deposits to Assets Ratio	**0.014**	**-0.038**	**0.129*** **	**0.008**	**0.385**	**-1.596***	**-0.456***	**0.753***	**0.000**	**0.004**	**0.000**	**0.001**	**-0.192*** **	**-0.982**	**0.015**	**-0.247*** **
S.E.	*(0.034)*	*(0.259)*	*(0.053)*	*(0.028)*	*(0.299)*	*(0.919)*	*(0.267)*	*(0.453)*	*(0.001)*	*(0.004)*	*(0.001)*	*(0.001)*	*(0.084)*	*(0.858)*	*(0.180)*	*(0.125)*
P-values	0.679	0.885	0.017	0.772	0.199	0.088	0.091	0.098	0.955	0.354	0.569	0.417	0.023	0.258	0.933	0.050
Age: New	**-0.014**	-	-	-	**0.326**	-	-	-	**0.000**	-	-	-	**-0.025**	-	-	-
S.E.	*(0.009)*				*(0.241)*				*(0.000)*				*(0.049)*			
P-values	0.136				0.178				0.312				0.608			
Age: Young	**0.003**	-	-	-	**0.121**	-	-	-	**0.000**	-	-	-	**-0.006**	-	-	-
S.E.	*(0.005)*				*(0.108)*				*(0.000)*				*(0.018)*			
P-values	0.563				0.262				0.122				0.745			
Constants	**-0.086**	**-2.020*** **	**0.002**	**-0.100**	**-4.970*** **	**-6.054*** **	**0.847**	**-4.804*** **	**0.016*** **	**0.031*** **	**0.007*** **	**0.017*** **	**0.901*** **	**-2.423**	**-0.977**	**1.235*** **
S.E.	*(0.117)*	*(0.733)*	*(0.335)*	*(0.086)*	*(2.027)*	*(2.460)*	*(1.321)*	*(1.748)*	*(0.007)*	*(0.009)*	*(0.002)*	*(0.008)*	*(0.301)*	*(1.932)*	*(1.050)*	*(0.323)*
P-values	0.462	0.008	0.995	0.248	0.015	0.017	0.523	0.007	0.027	0.001	0.005	0.031	0.003	0.215	0.354	0.000
Overall R^2	***0.42***	***0.07***	***0.25***	***0.29***	***0.00***	***0.00***	***0.08***	***0.01***	***0.14***	***0.04***	***0.29***	***0.10***	***0.02***	***0.04***	***0.01***	***0.02***
Between R^2	***0.43***	***0.06***	***0.27***	***0.32***	***0.00***	***0.00***	***0.13***	***0.00***	***0.15***	***0.01***	***0.25***	***0.13***	***0.00***	***0.06***	***0.02***	***0.00***
Within R^2	***0.57***	***0.86***	***0.74***	***0.57***	***0.12***	***0.69***	***0.29***	***0.11***	***0.10***	***0.91***	***0.38***	***0.13***	***0.07***	***0.66***	***0.43***	***0.10***
F	**9.15**	**.**	**.**	**12.40**	**2.16**	**.**	**.**	**2.09**	**2.50**	**.**	**.**	**2.40**	**1.87**	**.**	**.**	**2.04**
No. Obs	***1,135***	***87***	***201***	***847***	***1,118***	***87***	***200***	***831***	***1,119***	***87***	***200***	***832***	***1,017***	***82***	***179***	***756***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is Percentage of Female Borrowers

Models incldue macroeconomic indicator control variables and MFI firm levels control variables

V.3.3 *NBFI MFIs: Performance and Funding Source Mix*

Table 14 shows results from the regression model fitted with fixed-effects or within estimators for NBFI MFIs. The overall regressions are very significant, with $F(29, 1{,}345) = 17.55$, $p < 0.001$ for ROA; $F(29, 1{,}336) = 3.0$, $p < 0.001$ for ALB; $F(29, 1{,}337) = 5.67$, $p < 0.001$ for NAB; and $F(29, 1{,}330) = 2.38$, $p < 0.001$ for PFB. R^2 of the regressions have high explanatory powers of .66, .17, .52, and .08, respectively.

- *NBFI MFI Financial Performance and Funding Source Mix.* The results show a positive association between ROA and all funding sources metrics except for the donation-to-assets ratio, which has a negative association with ROA at aggregate NBFI MFI levels. This highly significant negative relationship between ROA and donation-to-assets ratio is expected. The highest ROA increase per unit increase of funding comes from equity (16.8%), followed by debt (9.0%) and deposits (8.9%). Observing the relationship by age group, equity maintains its positive association with ROA for mature NBFI MFIs, as does deposit for new NBFI MFIs. However, all other associations between ROA and funding sources are not significant.
- *NBFI MFI Social Performance and Funding Source Mix.*

  On aggregate NBFI MFIs level, I found a positive association between donation-to-assets ratio and ALB. All other relationships at this level are not significant. By age group, negative associations exist between ALB and the debt- and equity-to-assets ratios for mature NBFI MFIs. All other relationships are not significant.

  On the average, NAB is positively associated with all funding sources except the donation-to-assets ratio. By age group, only the equity- and deposit-to-assets ratios are associated with NAB. Increased equity and deposits relate to increases in NAB only for mature NBFI

MFIs. PFB is not significantly associated with any of the funding source mix metrics. However, as with NAB, PFB is positively associated with the debt- and equity-to-assets ratios for mature NBFI MFIs.

Table 15: NBFI MFIs: Performance and Funding Source Mix

Dependent variables:	DV: ROA					DV: ALB					DV: NAB					DV: PFB				
Models:	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
Independent Variables																				
Debt Relative to Assets Ratio	**0.238*** **	**0.217*** **	**0.092** **	**0.088** **	**0.090** **	**0.068**	**0.059**	**-0.062**	**-0.036**	**-0.011**	**0.001**	**0.001**	**0.002** **	**0.002** *	**0.002** **	**0.044**	**0.050**	**0.006**	**0.012**	**0.014**
S.E.	*(0.091)*	*(0.080)*	*(0.041)*	*(0.040)*	*(0.040)*	*(0.184)*	*(0.185)*	*(0.196)*	*(0.203)*	*(0.201)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.041)*	*(0.040)*	*(0.050)*	*(0.054)*	*(0.054)*
P-values	0.010	0.007	0.024	0.029	0.024	0.712	0.751	0.753	0.861	0.956	0.185	0.170	0.027	0.052	0.049	0.292	0.213	0.911	0.830	0.792
Equity to Asset Ratio	**0.314*** **	**0.298*** **	**0.166*** **	**0.163*** **	**0.168*** **	**-0.100**	**-0.087**	**0.047**	**0.064**	**0.111**	**0.004*** **	**0.004*** **	**0.003*** **	**0.003*** **	**0.003*** **	**0.051**	**0.051**	**0.011**	**0.020**	**0.025**
S.E.	*(0.096)*	*(0.088)*	*(0.048)*	*(0.048)*	*(0.048)*	*(0.139)*	*(0.143)*	*(0.194)*	*(0.197)*	*(0.200)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.045)*	*(0.045)*	*(0.051)*	*(0.054)*	*(0.054)*
P-values	0.001	0.001	0.001	0.001	0.001	0.473	0.546	0.807	0.746	0.582	0.000	0.000	0.001	0.002	0.001	0.263	0.254	0.834	0.714	0.648
Donations to Assets Ratio	**-0.449*** **	**-0.367*** **	**-0.118** **	**-0.121*** **	**-0.121*** **	**0.453**	**0.579** **	**0.703** **	**0.559** *	**0.564** *	**0.002**	**0.000**	**0.000**	**0.000**	**0.000**	**0.099**	**0.076**	**-0.039**	**-0.047**	**-0.047**
S.E.	*(0.145)*	*(0.131)*	*(0.046)*	*(0.047)*	*(0.046)*	*(0.287)*	*(0.255)*	*(0.346)*	*(0.297)*	*(0.303)*	*(0.002)*	*(0.002)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.075)*	*(0.075)*	*(0.079)*	*(0.075)*	*(0.075)*
P-values	0.002	0.006	0.011	0.010	0.009	0.116	0.024	0.043	0.061	0.063	0.403	0.810	0.902	0.743	0.746	0.185	0.314	0.621	0.529	0.531
Deposits to Assets Ratio	**0.271*** **	**0.234*** **	**0.109** **	**0.106** **	**0.089** **	**0.298**	**0.269**	**0.346**	**0.371**	**0.207**	**0.001**	**0.001**	**0.003*** **	**0.003*** **	**0.002*** **	**-0.045**	**-0.035**	**-0.036**	**0.003**	**-0.015**
S.E.	*(0.090)*	*(0.077)*	*(0.043)*	*(0.042)*	*(0.042)*	*(0.326)*	*(0.332)*	*(0.296)*	*(0.327)*	*(0.396)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.053)*	*(0.053)*	*(0.050)*	*(0.055)*	*(0.052)*
P-values	0.003	0.003	0.011	0.013	0.036	0.361	0.419	0.243	0.257	0.601	0.515	0.325	0.000	0.002	0.002	0.397	0.507	0.470	0.960	0.768
Age: New	-	**-0.092*** **	**-0.019**	**-0.020** *	**-0.021** *	-	**-0.165**	**0.054**	**0.034**	**0.023**	-	**0.002*** **	**0.000**	**0.000**	**0.000**	-	**0.035** *	**0.025**	**0.018**	**0.017**
S.E.		*(0.020)*	*(0.012)*	*(0.012)*	*(0.011)*		*(0.135)*	*(0.163)*	*(0.155)*	*(0.157)*		*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.019)*	*(0.027)*	*(0.025)*	*(0.025)*
P-values		0.000	0.112	0.086	0.066		0.221	0.740	0.824	0.884		0.000	0.710	0.741	0.717		0.059	0.353	0.475	0.502
Age: Young	-	**-0.008**	**0.012** *	**0.011** *	**0.010**	-	**-0.033**	**0.107** **	**0.078** *	**0.071**	-	**0.001*** **	**0.000**	**0.000**	**0.000**	-	**0.008**	**-0.003**	**-0.012**	**-0.013**
S.E.		*(0.007)*	*(0.007)*	*(0.007)*	*(0.006)*		*(0.047)*	*(0.049)*	*(0.045)*	*(0.045)*		*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.013)*	*(0.017)*	*(0.016)*	*(0.016)*
P-values		0.285	0.083	0.095	0.110		0.477	0.029	0.082	0.117		0.000	0.598	0.608	0.618		0.559	0.833	0.443	0.410
MFI & Macro Level Controls Included	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**
Time Dummies Included	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**
Financial Intermediation Dummies Included	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**
Constants	**-0.246*** **	**-0.209*** **	**0.112**	**0.088**	**0.092**	**0.646*** **	**0.685*** **	**-5.347*** **	**-6.465*** **	**-6.420*** **	**0.001*** **	**0.001***	**0.021*** **	**0.021*** **	**0.021*** **	**0.641*** **	**0.629*** **	**0.707*** **	**0.454***	**0.451***
S.E.	*(0.084)*	*(0.072)*	*(0.122)*	*(0.142)*	*(0.141)*	*(0.097)*	*(0.108)*	*(1.601)*	*(1.768)*	*(1.738)*	*(0.000)*	*(0.000)*	*(0.004)*	*(0.005)*	*(0.005)*	*(0.033)*	*(0.032)*	*(0.240)*	*(0.272)*	*(0.273)*
P-values	0.004	0.004	0.358	0.537	0.512	0.000	0.000	0.001	0.000	0.000	0.001	0.082	0.000	0.000	0.000	0.000	0.000	0.004	0.097	0.099
***Overall* R^2**	***0.20***	***0.27***	***0.69***	***0.69***	***0.69***	***0.01***	***0.00***	***0.10***	***0.06***	***0.07***	***0.04***	***0.05***	***0.25***	***0.27***	***0.26***	***0.13***	***0.13***	***0.03***	***0.02***	***0.02***
***Between* R^2**	***0.19***	***0.23***	***0.66***	***0.66***	***0.66***	***0.02***	***0.00***	***0.12***	***0.07***	***0.08***	***0.00***	***0.01***	***0.14***	***0.15***	***0.15***	***0.13***	***0.14***	***0.02***	***0.03***	***0.03***
***Within* R^2**	***0.13***	***0.20***	***0.65***	***0.66***	***0.66***	***0.00***	***0.01***	***0.15***	***0.17***	***0.17***	***0.14***	***0.19***	***0.51***	***0.53***	***0.53***	***0.02***	***0.02***	***0.06***	***0.08***	***0.08***
F	***5.10***	**6.10**	**31.10**	**17.90**	**17.50**	***0.80***	**1.60**	**3.40**	**2.90**	**3.00**	***19.20***	**17.30**	**7.50**	**5.80**	**5.70**	***1.00***	**1.50**	**1.80**	**2.40**	**2.40**
No. Obs	***1,564***	***1,564***	***1,345***	***1,345***	***1,345***	***1,676***	***1,676***	***1,336***	***1,336***	***1,336***	***1,685***	***1,685***	***1,337***	***1,337***	***1,337***	***1,345***	***1,345***	***1,130***	***1,130***	***1,130***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is the Percentage of Female Borrowers

- *NBFI MFI Performance, Funding Source Mix, and the MLCT.*

  The MLCT was not observed for NBFI MFIs performance, given the non-significant coefficients for the age dummy variables across all performance outcomes.

Table 16: NBFI MFIs: Performance and Funding Source Mix by Age

	DV: ROA				DV: ALB				DV: NAB				DV: PFB			
	Aggregate	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**
Debt Relative to Assets Ratio	**0.090****	**0.067**	**0.094**	**0.008**	**-0.011**	**0.701**	**0.077**	**-0.489***	**0.002****	**0.001**	**0.001**	**0.001**	**0.014**	**-0.065**	**-0.004**	**0.198****
S.E.	*(0.040)*	*(0.078)*	*(0.059)*	*(0.034)*	*(0.201)*	*(1.098)*	*(0.196)*	*(0.275)*	*(0.001)*	*(0.002)*	*(0.001)*	*(0.001)*	*(0.054)*	*(0.069)*	*(0.090)*	*(0.083)*
P-values	0.024	0.399	0.113	0.804	0.956	0.525	0.696	0.077	0.049	0.728	0.139	0.254	0.792	0.352	0.969	0.018
Equity to Asset Ratio	**0.168*****	**0.006**	**0.111**	**0.135****	**0.111**	**-0.083**	**-0.362**	**-0.564****	**0.003*****	**-0.001**	**0.001**	**0.003*****	**0.025**	**-0.125***	**-0.026**	**0.137***
S.E.	*(0.048)*	*(0.084)*	*(0.075)*	*(0.057)*	*(0.200)*	*(1.635)*	*(0.235)*	*(0.264)*	*(0.001)*	*(0.002)*	*(0.001)*	*(0.001)*	*(0.054)*	*(0.069)*	*(0.117)*	*(0.070)*
P-values	0.001	0.943	0.145	0.018	0.582	0.960	0.125	0.034	0.001	0.710	0.344	0.005	0.648	0.074	0.822	0.053
Donations to Assets Ratio	**-0.121*****	**-0.145**	**-0.113****	**-0.219***	**0.564***	**0.231**	**0.116**	**-0.209**	**0.000**	**-0.002**	**-0.002**	**0.002**	**-0.047**	**-0.012**	**0.136**	**-0.159**
S.E.	*(0.046)*	*(0.107)*	*(0.055)*	*(0.122)*	*(0.303)*	*(1.727)*	*(0.288)*	*(0.505)*	*(0.001)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.075)*	*(0.092)*	*(0.157)*	*(0.098)*
P-values	0.009	0.177	0.042	0.074	0.063	0.894	0.687	0.680	0.746	0.422	0.307	0.310	0.531	0.898	0.390	0.109
Deposits to Assets Ratio	**0.089****	**0.116***	**0.025**	**0.008**	**0.207**	**-5.817**	**0.334**	**0.281**	**0.002*****	**0.000**	**0.002**	**0.002***	**-0.015**	**-0.055**	**0.040**	**0.024**
S.E.	*(0.042)*	*(0.065)*	*(0.093)*	*(0.046)*	*(0.396)*	*(4.194)*	*(0.501)*	*(0.300)*	*(0.001)*	*(0.002)*	*(0.002)*	*(0.001)*	*(0.052)*	*(0.070)*	*(0.167)*	*(0.085)*
P-values	0.036	0.080	0.793	0.869	0.601	0.169	0.506	0.350	0.002	0.949	0.210	0.060	0.768	0.432	0.814	0.773
Age: New	**-0.021***	-	-	-	**0.023**	-	-	-	**0.000**	-	-	-	**0.017**	-	-	-
S.E.	*(0.011)*				*(0.157)*				*(0.000)*				*(0.025)*			
P-values	0.066				0.884				0.717				0.502			
Age: Young	**0.010**	-	-	-	**0.071**	-	-	-	**0.000**	-	-	-	**-0.013**	-	-	-
S.E.	*(0.006)*				*(0.045)*				*(0.000)*				*(0.016)*			
P-values	0.110				0.117				0.618				0.410			
Constants	**0.092**	**0.088**	**-0.253**	**0.054**	**-6.420*****	**-22.291**	**-1.895**	**-8.171*****	**0.021*****	**0.032*****	**0.024****	**0.009***	**0.451***	**0.547**	**0.705**	**-0.192**
S.E.	*(0.141)*	*(0.487)*	*(0.219)*	*(0.133)*	*(1.738)*	*(15.392)*	*(1.234)*	*(1.794)*	*(0.005)*	*(0.009)*	*(0.010)*	*(0.005)*	*(0.273)*	*(0.352)*	*(0.544)*	*(0.513)*
P-values	0.512	0.857	0.250	0.685	0.000	0.151	0.127	0.000	0.000	0.001	0.020	0.063	0.099	0.124	0.197	0.709
Overall R^2	***0.69***	***0.57***	***0.67***	***0.38***	***0.07***	***0.00***	***0.02***	***0.03***	***0.26***	***0.18***	***0.10***	***0.21***	***0.02***	***0.01***	***0.04***	***0.02***
Between R^2	***0.66***	***0.50***	***0.63***	***0.35***	***0.08***	***0.00***	***0.02***	***0.02***	***0.15***	***0.13***	***0.07***	***0.08***	***0.03***	***0.03***	***0.06***	***0.01***
Within R^2	***0.66***	***0.86***	***0.68***	***0.54***	***0.17***	***0.43***	***0.28***	***0.49***	***0.52***	***0.49***	***0.54***	***0.50***	***0.08***	***0.55***	***0.21***	***0.14***
F	**17.55**	**.**	**30.51**	**8.81**	**3.00**	**.**	**1.75**	**3.75**	**5.67**	**.**	**10.80**	**3.82**	**2.38**	**.**	**4.37**	**4.48**
No. Obs	***1,345***	***165***	***272***	***908***	***1,336***	***164***	***269***	***903***	***1,337***	***165***	***269***	***903***	***1,130***	***150***	***240***	***740***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is Percentage of Female Borrowers

Models incldue macroeconomic indicator control variables and MFI firm levels control variables

V.3.4 *NGO MFIs: Performance and Funding Source Mix*

Table 16 shows results from the regression model fitted with fixed-effects or within estimators for NGO MFIs. The overall regressions are very significant, with $F(29, 1{,}275) = 24.54$, $p < 0.001$ for ROA; $F(29, 1{,}272) = 3.95$, $p < 0.001$ for ALB; $F(29, 1{,}275) = 41.67$, $p < 0.001$ for NAB; and $F(29, 1{,}189) = 1.89$, $p < 0.005$ for PFB. R^2 of the regressions have high explanatory powers of .76, .13, .84, and .08, respectively.

- *NGO MFIs: Financial Performance and Funding Source Mix.*

  At the aggregate NGO MFIs level, ROA relates positively to the equity and deposit-to-assets ratios, but negatively to donation-to-assets ratio, as expected. A unit increase in deposit-to-assets is associated with 13.1% in ROA compared to 7.9% for the equity-to-assets ratio. What makes this result interesting is that, normally, NGO MFIs do not accept saving and deposits. But, all things being equal, deposits for these institutions seem to be key for financial performance. The relationship between ROA and debt-to-assets ratio is not significant.

  At the age group level, ROA again relates positively to equity and deposit-to-assets ratios for young and mature NGO MFIs, but not for new MFIs. Mature NGO MFIs, however, exhibit a significantly negative relationship between ROA and donation-to-assets ratio. A unit increase in donations associates with a 22.4% decrease in ROA. All other relationships are not significant.

- *NGO MFI Social Performance and Funding Source Mix.*

  On the NGO MFI aggregate level, ALB is positively related only to the equity-to-assets ratio. This performance outcome's relationship with other funding sources is not significant. A review by MFI age groups shows two additional associations: ALB relates

positively to the equity-to-assets ratio for mature and new NGO MFIs, but negatively to the donation-to-assets ratio for new NGO MFIs.

Further, NAB is positively associated with all funding source mix metrics except for the donation-to-assets ratio. This pattern of association is also observed for mature NGO MFIs. Increased deposits associate with higher NAB only for new NGO MFIs. PFB relates negatively to the equity-to-assets ratio, but positively to the deposit-to-assets ratio.

Table 17: NGO MFIs: Performance and Funding Source Mix

Dependent variables:	DV: ROA					DV: ALB					DV: NAB					DV: PFB				
Models:	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
Independent Variables																				
Debt Relative to Assets Ratio	**0.011**	**0.002**	**0.013**	**0.016**	**0.016**	**-0.087**	**-0.095**	**-0.053**	**0.001**	**0.001**	**0.007*** **	**0.007*** **	**0.017*** **	**0.017*** **	**0.017*** **	**-0.003**	**-0.003**	**-0.004**	**0.014**	**0.014**
S.E.	*(0.026)*	*(0.027)*	*(0.020)*	*(0.020)*	*(0.020)*	*(0.080)*	*(0.079)*	*(0.064)*	*(0.053)*	*(0.053)*	*(0.002)*	*(0.002)*	*(0.003)*	*(0.003)*	*(0.003)*	*(0.024)*	*(0.024)*	*(0.028)*	*(0.031)*	*(0.031)*
P-values	0.669	0.936	0.512	0.406	0.407	0.281	0.231	0.413	0.985	0.983	0.000	0.000	0.000	0.000	0.000	0.913	0.908	0.888	0.659	0.659
Equity to Assets Ratio	**0.168*** **	**0.166*** **	**0.078*** **	**0.080*** **	**0.079*** **	**0.006**	**0.007**	**0.073**	**0.106** **	**0.107** **	**0.008*** **	**0.007*** **	**0.021*** **	**0.021*** **	**0.021*** **	**-0.024***	**-0.024**	**-0.046*** **	**-0.036** **	**-0.036** **
S.E.	*(0.027)*	*(0.028)*	*(0.021)*	*(0.021)*	*(0.021)*	*(0.006)*	*(0.006)*	*(0.045)*	*(0.053)*	*(0.052)*	*(0.000)*	*(0.000)*	*(0.003)*	*(0.003)*	*(0.003)*	*(0.014)*	*(0.014)*	*(0.017)*	*(0.016)*	*(0.016)*
P-values	0.000	0.000	0.000	0.000	0.000	0.286	0.213	0.106	0.047	0.041	0.000	0.000	0.000	0.000	0.000	0.089	0.101	0.006	0.031	0.030
Donations to Assets Ratio	**-0.555*** **	**-0.534*** **	**-0.242*** **	**-0.244*** **	**-0.244*** **	**-0.060**	**-0.032**	**0.004**	**-0.049**	**-0.048**	**0.021**	**0.020**	**0.003**	**0.002**	**0.002**	**0.048***	**0.049***	**0.075***	**0.053**	**0.053**
S.E.	*(0.127)*	*(0.131)*	*(0.089)*	*(0.088)*	*(0.088)*	*(0.055)*	*(0.044)*	*(0.064)*	*(0.072)*	*(0.072)*	*(0.013)*	*(0.013)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.026)*	*(0.028)*	*(0.040)*	*(0.039)*	*(0.040)*
P-values	0.000	0.000	0.007	0.006	0.006	0.276	0.457	0.948	0.496	0.502	0.102	0.121	0.200	0.283	0.282	0.070	0.083	0.058	0.183	0.186
Deposits to Assets Ratio	**0.088** **	**0.071***	**0.115*** **	**0.124*** **	**0.131*** **	**-0.209***	**-0.245***	**-0.111**	**0.009**	**-0.031**	**0.009**	**0.009**	**0.021*** **	**0.020*** **	**0.020*** **	**0.088**	**0.088**	**0.126**	**0.161***	**0.160***
S.E.	*(0.037)*	*(0.040)*	*(0.041)*	*(0.040)*	*(0.037)*	*(0.118)*	*(0.126)*	*(0.111)*	*(0.100)*	*(0.089)*	*(0.012)*	*(0.012)*	*(0.003)*	*(0.002)*	*(0.003)*	*(0.064)*	*(0.066)*	*(0.084)*	*(0.085)*	*(0.085)*
P-values	0.017	0.078	0.005	0.002	0.001	0.078	0.053	0.317	0.925	0.729	0.446	0.430	0.000	0.000	0.000	0.172	0.181	0.135	0.059	0.061
Age: New	-	**-0.051** **	**-0.028***	**-0.026**	**-0.026**	-	**-0.095**	**0.007**	**-0.024**	**-0.024**	-	**0.000**	**-0.002**	**-0.002**	**-0.002**	-	**0.000**	**-0.021**	**-0.031**	**-0.031**
S.E.		*(0.023)*	*(0.016)*	*(0.016)*	*(0.016)*		*(0.097)*	*(0.029)*	*(0.037)*	*(0.037)*		*(0.002)*	*(0.001)*	*(0.001)*	*(0.001)*		*(0.025)*	*(0.019)*	*(0.019)*	*(0.019)*
P-values		0.029	0.077	0.113	0.112		0.329	0.819	0.507	0.513		0.873	0.227	0.162	0.162		1.000	0.272	0.118	0.118
Age: Young	-	**0.002**	**0.001**	**0.001**	**0.001**	-	**-0.043**	**0.051** **	**0.008**	**0.008**	-	**0.000**	**-0.001**	**-0.001**	**-0.001**	-	**0.019**	**-0.011**	**-0.023**	**-0.023**
S.E.		*(0.009)*	*(0.009)*	*(0.009)*	*(0.009)*		*(0.069)*	*(0.023)*	*(0.031)*	*(0.031)*		*(0.002)*	*(0.001)*	*(0.001)*	*(0.001)*		*(0.018)*	*(0.020)*	*(0.019)*	*(0.019)*
P-values		0.794	0.871	0.886	0.879		0.529	0.031	0.795	0.803		0.921	0.273	0.162	0.161		0.299	0.597	0.241	0.239
MFI & Macro Level Controls Included	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**
Time Dummies Included	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**
Financial Intermediation Dummies Included	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**
Constants	**-0.054*** **	**-0.043** **	**0.109**	**0.059**	**0.057**	**0.366*** **	**0.391*** **	**-0.478*** **	**-2.310** **	**-2.297** **	**0.002**	**0.002**	**0.037*** **	**0.038*** **	**0.038*** **	**0.853*** **	**0.849*** **	**1.109*** **	**0.635** **	**0.636** **
S.E.	*(0.016)*	*(0.019)*	*(0.077)*	*(0.133)*	*(0.134)*	*(0.053)*	*(0.059)*	*(0.171)*	*(1.069)*	*(1.077)*	*(0.004)*	*(0.004)*	*(0.006)*	*(0.012)*	*(0.012)*	*(0.016)*	*(0.017)*	*(0.164)*	*(0.279)*	*(0.276)*
P-values	0.001	0.028	0.156	0.659	0.674	0.000	0.000	0.006	0.032	0.034	0.673	0.657	0.000	0.002	0.002	0.000	0.000	0.000	0.023	0.022
Overall R^2	***0.66***	***0.64***	***0.84***	***0.84***	***0.84***	***0.00***	***0.00***	***0.13***	***0.12***	***0.12***	***0.04***	***0.04***	***0.58***	***0.59***	***0.59***	***0.01***	***0.01***	***0.00***	***0.00***	***0.00***
Between R^2	***0.82***	***0.80***	***0.85***	***0.85***	***0.85***	***0.00***	***0.00***	***0.12***	***0.11***	***0.11***	***0.00***	***0.00***	***0.18***	***0.19***	***0.19***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***
Within R^2	***0.36***	***0.37***	***0.75***	***0.76***	***0.76***	***0.01***	***0.01***	***0.06***	***0.13***	***0.13***	***0.06***	***0.06***	***0.84***	***0.84***	***0.84***	***0.01***	***0.01***	***0.06***	***0.08***	***0.08***
F	***20.00***	**16.10**	**33.70**	**22.20**	**24.50**	***1.30***	**1.30**	**4.00**	**3.80**	**3.90**	***21,587.60***	**15,593.00**	**35.20**	**43.00**	**41.70**	***1.10***	**0.80**	**1.60**	**1.90**	**1.90**
No. Obs	***1,517***	***1,517***	***1,275***	***1,275***	***1,275***	***1,650***	***1,650***	***1,272***	***1,272***	***1,272***	***1,658***	***1,658***	***1,275***	***1,275***	***1,275***	***1,414***	***1,414***	***1,189***	***1,189***	***1,189***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is the Percentage of Female Borrowers

- *NGO MFI Performance, Funding Source Mix, and the MLCT.*

  Given the non-significant coefficients for the age dummy variables across all performance outcomes, I did not observe an MLCT linkage to NBFI MFI performance.

Table 18: NGO MFIs: Performance and Funding Source Mix by Age

	DV: ROA				DV: ALB				DV: NAB				DV: PFB			
	Aggregate	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**	**Aggregate**	**New**	**Young**	**Mature**
Debt Relative to Assets Ratio	**0.016**	**-0.012**	**0.006**	**0.010**	**0.001**	**-0.034**	**-0.021**	**-0.091**	**0.017*** **	**-0.001**	**0.000**	**0.018*** **	**0.014**	**0.053**	**0.053**	**0.033**
S.E.	*(0.020)*	*(0.089)*	*(0.017)*	*(0.032)*	*(0.053)*	*(0.082)*	*(0.026)*	*(0.090)*	*(0.003)*	*(0.002)*	*(0.001)*	*(0.002)*	*(0.031)*	*(0.182)*	*(0.068)*	*(0.046)*
P-values	0.407	0.892	0.733	0.750	0.984	0.678	0.423	0.316	0.000	0.630	0.734	0.000	0.659	0.774	0.437	0.469
Equity to Asset Ratio	**0.079*** **	**-0.117**	**0.151*** **	**0.069*** **	**0.107** **	**0.169***	**-0.063**	**0.133** **	**0.021*** **	**-0.004**	**0.002**	**0.021*** **	**-0.036** **	**0.174**	**-0.101**	**-0.045** **
S.E.	*(0.021)*	*(0.172)*	*(0.032)*	*(0.025)*	*(0.052)*	*(0.086)*	*(0.040)*	*(0.066)*	*(0.003)*	*(0.003)*	*(0.002)*	*(0.002)*	*(0.016)*	*(0.244)*	*(0.081)*	*(0.021)*
P-values	0.000	0.499	0.000	0.005	0.041	0.057	0.117	0.044	0.000	0.207	0.350	0.000	0.030	0.480	0.212	0.034
Donations to Assets Ratio	**-0.244*** **	**0.135**	**-0.067**	**-0.224** **	**-0.048**	**-0.336*** **	**-0.049**	**-0.016**	**0.002**	**0.002**	**-0.003**	**0.004**	**0.053**	**-0.132**	**-0.116**	**0.057**
S.E.	*(0.088)*	*(0.212)*	*(0.065)*	*(0.109)*	*(0.072)*	*(0.041)*	*(0.058)*	*(0.084)*	*(0.002)*	*(0.005)*	*(0.003)*	*(0.003)*	*(0.040)*	*(0.113)*	*(0.144)*	*(0.054)*
P-values	0.006	0.527	0.311	0.040	0.502	0.000	0.402	0.847	0.282	0.737	0.415	0.134	0.186	0.251	0.423	0.290
Deposits to Assets Ratio	**0.131*** **	**0.497**	**0.204** **	**0.114** **	**-0.031**	**-0.220**	**-0.254**	**-0.085**	**0.020*** **	**0.023*** **	**0.004**	**0.020*** **	**0.160***	**-0.149**	**0.049**	**0.205** **
S.E.	*(0.037)*	*(0.410)*	*(0.081)*	*(0.048)*	*(0.089)*	*(0.292)*	*(0.169)*	*(0.124)*	*(0.003)*	*(0.008)*	*(0.003)*	*(0.002)*	*(0.085)*	*(0.809)*	*(0.338)*	*(0.104)*
P-values	0.001	0.232	0.014	0.018	0.729	0.456	0.136	0.494	0.000	0.005	0.275	0.000	0.061	0.855	0.884	0.050
Age: New	**-0.026**	-	-	-	**-0.024**	-	-	-	**-0.002**	-	-	-	**-0.031**	-	-	-
S.E.	*(0.016)*				*(0.037)*				*(0.001)*				*(0.019)*			
P-values	0.112				0.513				0.162				0.118			
Age: Young	**0.001**	-	-	-	**0.008**	-	-	-	**-0.001**	-	-	-	**-0.023**	-	-	-
S.E.	*(0.009)*				*(0.031)*				*(0.001)*				*(0.019)*			
P-values	0.879				0.803				0.161				0.239			
Constants	**0.057**	**-2.132**	**-1.054*** **	**-0.027**	**-2.297** **	**-0.948**	**-0.144**	**-3.135** **	**0.038*** **	**0.056***	**0.053*** **	**0.021***	**0.636** **	**3.268** **	**1.786*** **	**0.478**
S.E.	*(0.134)*	*(1.348)*	*(0.229)*	*(0.126)*	*(1.077)*	*(0.858)*	*(0.381)*	*(1.590)*	*(0.012)*	*(0.029)*	*(0.016)*	*(0.011)*	*(0.276)*	*(1.362)*	*(0.676)*	*(0.342)*
P-values	0.674	0.121	0.000	0.831	0.034	0.276	0.707	0.050	0.002	0.061	0.001	0.066	0.022	0.021	0.010	0.164
Overall R^2	***0.84***	***0.00***	***0.25***	***0.87***	***0.12***	***0.47***	***0.19***	***0.05***	***0.59***	***0.06***	***0.36***	***0.61***	***0.00***	***0.01***	***0.02***	***0.00***
Between R^2	***0.85***	***0.01***	***0.22***	***0.88***	***0.11***	***0.48***	***0.15***	***0.05***	***0.19***	***0.08***	***0.30***	***0.20***	***0.00***	***0.01***	***0.00***	***0.00***
Within R^2	***0.76***	***0.92***	***0.75***	***0.75***	***0.13***	***0.86***	***0.21***	***0.16***	***0.84***	***0.82***	***0.44***	***0.89***	***0.08***	***0.79***	***0.30***	***0.10***
F	**24.54**	**.**	**75.39**	**17.66**	**3.95**	**.**	**10.69**	**5.60**	**41.67**	**.**	**6.75**	**34.10**	**1.89**	**.**	**270.25**	**1.32**
No. Obs	***1,275***	***76***	***211***	***988***	***1,272***	***74***	***211***	***987***	***1,275***	***76***	***211***	***988***	***1,189***	***73***	***193***	***923***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is Percentage of Female Borrowers

Models incldue macroeconomic indicator control variables and MFI firm levels control variables

V.3.5 *Rural Bank MFI Performance and Funding Source Mix*

Table 19 shows results from the regression model fitted with fixed-effects or within estimators for rural bank MFIs. At the aggregate rural bank level, the fitted regressions are very significant, with $F(29, 424) = 271.38$, $p < 0.001$ for ROA; $F(29, 421) = 1{,}224.36$, $p < 0.001$ for ALB; $F(29, 421) = 35.04$, $p < 0.001$ for NAB; and $F(29, 296) = 2.68$, $p < 0.005$ for PFB. R^2 of the regressions have high explanatory powers of .68, 0.37, 0.55, and 0.20, respectively.

- *Rural Bank MFI Financial Performance and Funding Source Mix.*

  The results show a significant negative relationship between ROA and donations-to-assets as expected, but no other significant relationship with funding source mix metrics. On average, a $1 increase in donations associates with a 145.3% ROA reduction. At age group levels, the results for new and young rural bank MFIs' cannot be interpreted due to insufficient data. However, mature rural bank MFIs exhibit a positive relationship between ROA and equity-to-assets ratio, where a $1 increase in equity relates to a 6.5% increase in ROA.

- *Rural Bank MFI Social Performance and Funding Source Mix.*

  At the aggregate level, no significant relationship exists between social performance as measured by ALB and the funding source mix measures for rural bank MFIs. Likewise, relationships between NAB and PFB and the funding source mix measures are not significant.

- *Rural Bank MFI Performance, Funding Source Mix, and the MLCT.*

  The MLCT seems to hold for rural bank MFI social performance outcomes (that is, ALB). Estimation coefficients for the age dummy variables indicate that, on average, new and young rural banks provide $0.65 and $0.47 lower ALB to their clients, respectively,

compared to mature rural bank MFIs. These average loan size decreases are significant at the 5% level.

Table 19: Rural Bank MFIs: Performance and Funding Source Mix

Dependent variables:	DV: ROA					DV: ALB					DV: NAB					DV: PFB				
Models:	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
Independent Variables																				
Debt Relative to Assets Ratio	**0.007**	**0.003**	**-0.024**	**-0.022**	**-0.022**	**0.327**	**0.380**	**0.316**	**0.358**	**0.367**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**-0.109**	**-0.134**	**-0.122**	**-0.102**	**-0.086**
S.E.	*(0.033)*	*(0.032)*	*(0.019)*	*(0.017)*	*(0.017)*	*(0.282)*	*(0.314)*	*(0.245)*	*(0.299)*	*(0.297)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.143)*	*(0.142)*	*(0.146)*	*(0.197)*	*(0.203)*
P-values	0.834	0.916	0.200	0.200	0.184	0.248	0.229	0.200	0.233	0.220	0.179	0.205	0.173	0.160	0.149	0.445	0.347	0.403	0.606	0.674
Equity to Asset Ratio	**0.243*** **	**0.249*** **	**0.058***	**0.046**	**0.047**	**-1.137**	**-0.926**	**-0.298**	**-0.079**	**-0.058**	**-0.001**	**-0.002**	**-0.001**	**-0.001**	**-0.001**	**-0.084**	**-0.078**	**-0.043**	**-0.032**	**-0.010**
S.E.	*(0.088)*	*(0.076)*	*(0.030)*	*(0.034)*	*(0.032)*	*(1.045)*	*(0.770)*	*(0.641)*	*(0.424)*	*(0.436)*	*(0.002)*	*(0.001)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.122)*	*(0.120)*	*(0.259)*	*(0.233)*	*(0.242)*
P-values	0.007	0.001	0.058	0.172	0.149	0.279	0.231	0.643	0.853	0.894	0.396	0.263	0.554	0.412	0.442	0.489	0.518	0.869	0.890	0.967
Donations to Assets Ratio	**-0.159**	**-0.111**	**-1.474*** **	**-1.452*** **	**-1.453*** **	**-1.760**	**-0.673**	**-6.719*** **	**-4.908***	**-4.916***	**0.003**	**0.002**	**0.002**	**0.002**	**0.002**	**0.184**	**0.153**	**0.974**	**0.897**	**0.976**
S.E.	*(0.403)*	*(0.324)*	*(0.127)*	*(0.136)*	*(0.136)*	*(2.112)*	*(0.869)*	*(2.305)*	*(2.884)*	*(2.892)*	*(0.003)*	*(0.003)*	*(0.009)*	*(0.009)*	*(0.009)*	*(0.163)*	*(0.119)*	*(0.632)*	*(0.826)*	*(0.847)*
P-values	0.693	0.732	0.000	0.000	0.000	0.406	0.440	0.004	0.091	0.092	0.295	0.517	0.799	0.824	0.826	0.261	0.202	0.126	0.280	0.252
Deposits to Assets Ratio	**0.048**	**0.005**	**-0.020**	**-0.016**	**-0.016**	**1.002***	**0.364**	**0.321**	**0.508**	**0.498**	**0.000**	**0.001**	**0.001**	**0.002**	**0.001**	**0.053**	**0.051**	**-0.190**	**-0.200**	**-0.229**
S.E.	*(0.059)*	*(0.045)*	*(0.023)*	*(0.022)*	*(0.022)*	*(0.523)*	*(0.386)*	*(0.273)*	*(0.347)*	*(0.358)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.175)*	*(0.174)*	*(0.235)*	*(0.244)*	*(0.255)*
P-values	0.411	0.911	0.392	0.468	0.471	0.057	0.346	0.241	0.145	0.167	0.760	0.324	0.326	0.291	0.309	0.764	0.769	0.420	0.416	0.373
Age: New	-	**-0.054**	**-0.030**	**-0.028**	**-0.028**	-	**-1.006*** **	**-0.696*** **	**-0.653*** **	**-0.651*** **	-	**0.001*** **	**0.000**	**0.000**	**0.000**	-	**0.013**	**-0.086*** **	**-0.011**	**-0.004**
S.E.		*(0.036)*	*(0.024)*	*(0.023)*	*(0.023)*		*(0.398)*	*(0.339)*	*(0.295)*	*(0.297)*		*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.049)*	*(0.042)*	*(0.054)*	*(0.057)*
P-values		0.137	0.211	0.231	0.232		0.013	0.042	0.029	0.030		0.001	0.709	0.993	0.976		0.784	0.041	0.837	0.946
Age: Young	-	**-0.024**	**-0.007**	**-0.008**	**-0.008**	-	**-0.647*** **	**-0.484**	**-0.468*** **	**-0.468*** **	-	**0.001*** **	**0.001**	**0.000**	**0.000**	-	**0.032**	**-0.046***	**-0.014**	**-0.018**
S.E.		*(0.017)*	*(0.008)*	*(0.007)*	*(0.007)*		*(0.277)*	*(0.295)*	*(0.228)*	*(0.228)*		*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*		*(0.020)*	*(0.023)*	*(0.023)*	*(0.025)*
P-values		0.160	0.332	0.246	0.246		0.021	0.104	0.042	0.042		0.022	0.102	0.192	0.185		0.124	0.052	0.543	0.468
MFI & Macro Level Controls Included	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**
Time Dummies Included	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**
Financial Intermediation Dummies Included	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**No**	**Yes**
Constants	**-0.043**	**-0.013**	**-0.081**	**-0.067**	**-0.067**	**0.119**	**0.579***	**1.367**	**0.555**	**0.576**	**0.001**	**0.001**	**0.018*** **	**0.016*** **	**0.016*** **	**0.555*** **	**0.556*** **	**0.745***	**0.470**	**0.522**
S.E.	*(0.051)*	*(0.039)*	*(0.070)*	*(0.068)*	*(0.067)*	*(0.394)*	*(0.335)*	*(1.483)*	*(1.376)*	*(1.362)*	*(0.001)*	*(0.001)*	*(0.003)*	*(0.004)*	*(0.004)*	*(0.130)*	*(0.127)*	*(0.442)*	*(0.616)*	*(0.605)*
P-values	0.398	0.733	0.249	0.328	0.324	0.764	0.086	0.359	0.687	0.673	0.132	0.304	0.000	0.000	0.000	0.000	0.000	0.094	0.447	0.390
Overall R^2	***0.07***	***0.15***	***0.41***	***0.50***	***0.50***	***0.01***	***0.00***	***0.00***	***0.00***	***0.00***	***0.08***	***0.00***	***0.19***	***0.19***	***0.19***	***0.21***	***0.20***	***0.01***	***0.05***	***0.11***
Between R^2	***0.02***	***0.07***	***0.27***	***0.41***	***0.41***	***0.00***	***0.00***	***0.01***	***0.01***	***0.01***	***0.06***	***0.00***	***0.10***	***0.09***	***0.08***	***0.09***	***0.08***	***0.00***	***0.05***	***0.06***
Within R^2	***0.13***	***0.19***	***0.66***	***0.68***	***0.68***	***0.10***	***0.27***	***0.28***	***0.37***	***0.37***	***0.03***	***0.11***	***0.52***	***0.55***	***0.55***	***0.01***	***0.01***	***0.13***	***0.20***	***0.20***
F	***3.80***	**3.30**	**135.30**	**280.40**	**271.40**	***1.40***	**3.80**	**50.80**	**1,222.60**	**1,224.40**	***1.10***	**5.00**	**11.60**	**33.80**	**35.00**	***0.80***	**0.80**	**7.10**	**5.00**	**2.70**
No. Obs	***514***	***514***	***424***	***424***	***424***	***570***	***570***	***421***	***421***	***421***	***570***	***570***	***421***	***421***	***421***	***379***	***379***	***296***	***296***	***296***

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is the Percentage of Female Borrowers

Table 20: Rural Bank MFIs: Performance and Funding Source Mix by Age

	DV: ROA				DV: ALB				DV: NAB				DV: PFB			
	Aggregate	New	Young	Mature	Aggregate	New	Young	Mature	Aggregate	New	Young	Mature	Aggregate	New	Young	Mature
Debt Relative to Assets Ratio	**-0.022**	**2.717**	**0.193*** **	**-0.024**	**0.367**	**-26.549*** **	**14.821*** **	**0.370**	**0.001**	**-0.002*** **	**-0.007**	**0.001**	**-0.086**	**-**	**5.920**	**-0.082**
S.E.	*(0.017)*	.	*(0.000)*	*(0.015)*	*(0.297)*	*(0.002)*	*(0.002)*	*(0.345)*	*(0.001)*	*(0.000)*	.	*(0.001)*	*(0.203)*		.	*(0.199)*
P-values	0.184	.	0.000	0.116	0.220	0.000	0.000	0.285	0.149	0.000	.	0.317	0.675		.	0.681
Equity to Asset Ratio	**0.047**	**2.395**	**-0.246*** **	**0.065** **	**-0.058**	**-6.028*** **	**114.089*** **	**0.379**	**-0.001**	**-0.011*** **	**0.032**	**-0.002**	**-0.010**	**-0.149*** **	**13.513**	**0.011**
S.E.	*(0.032)*	.	*(0.004)*	*(0.032)*	*(0.436)*	*(0.001)*	*(0.012)*	*(0.410)*	*(0.002)*	*(0.000)*	.	*(0.002)*	*(0.242)*	*(0.000)*	.	*(0.233)*
P-values	0.149	.	0.000	0.047	0.894	0.000	0.000	0.357	0.442	0.000	.	0.194	0.967	0.000	.	0.964
Donations to Assets Ratio	**-1.453*** **	**29.991**	**1.974*** **	**-1.141*** **	**-4.916***	**-340.628*** **	**-57.019*** **	**1.050**	**0.002**	**0.000**	**0.023**	**0.033*** **	**0.976**	**-150.317*** **	**-29.100**	**-0.068**
S.E.	*(0.136)*	.	*(0.002)*	*(0.108)*	*(2.892)*	*(0.017)*	*(0.007)*	*(1.385)*	*(0.009)*	*(0.000)*	.	*(0.004)*	*(0.847)*	*(0.000)*	.	*(1.683)*
P-values	0.000	.	0.000	0.000	0.092	0.000	0.000	0.450	0.826	0.753	.	0.000	0.252	0.000	.	0.968
Deposits to Assets Ratio	**-0.016**	**3.109**	**-0.676*** **	**-0.010**	**0.498**	**-31.173*** **	**53.425*** **	**0.810**	**0.001**	**-0.004*** **	**0.021**	**0.001**	**-0.229**	**-**	**6.724**	**-0.346**
S.E.	*(0.022)*	.	*(0.002)*	*(0.023)*	*(0.358)*	*(0.002)*	*(0.007)*	*(0.509)*	*(0.001)*	*(0.000)*	.	*(0.002)*	*(0.255)*		.	*(0.296)*
P-values	0.471	.	0.000	0.658	0.167	0.000	0.000	0.115	0.309	0.000	.	0.453	0.373		.	0.246
Age: New	**-0.028**	-	-	-	**-0.651** **	-	-	-	**0.000**	-	-	-	**-0.004**	-	-	-
S.E.	*(0.023)*				*(0.297)*				*(0.000)*				*(0.057)*			
P-values	0.233				0.030				0.976				0.946			
Age: Young	**-0.008**	-	-	-	**-0.468** **	-	-	-	**0.000**	-	-	-	**-0.018**	-	-	-
S.E.	*(0.007)*				*(0.228)*				*(0.000)*				*(0.025)*			
P-values	0.246				0.042				0.185				0.468			
Constants	**-0.067**	**-3.983**	**-1.648*** **	**-0.274*** **	**0.576**	**35.571*** **	**-53.638*** **	**-3.833*** **	**0.016*** **	**0.002*** **	**-0.009**	**0.012*** **	**0.522**	**0.711*** **	**-10.001**	**0.868**
S.E.	*(0.067)*	.	*(0.001)*	*(0.080)*	*(1.362)*	*(0.002)*	*(0.004)*	*(1.062)*	*(0.004)*	*(0.000)*	.	*(0.004)*	*(0.605)*	*(0.000)*	.	*(0.724)*
P-values	0.324	.	0.000	0.001	0.673	0.000	0.000	0.001	0.000	0.000	.	0.001	0.390	0.000	.	0.234
***Overall* R^2**	***0.50***	***0.26***	***0.01***	***0.13***	***0.00***	***0.00***	***0.14***	***0.09***	***0.19***	***0.18***	***0.66***	***0.24***	***0.11***	***0.01***	***0.32***	***0.24***
***Between* R^2**	***0.41***	***0.12***	***0.01***	***0.10***	***0.01***	***0.02***	***0.07***	***0.11***	***0.08***	***0.23***	***0.55***	***0.15***	***0.06***	***0.08***	***0.23***	***0.11***
***Within* R^2**	***0.68***	***1.00***	***1.00***	***0.61***	***0.37***	***1.00***	***1.00***	***0.18***	***0.55***	***1.00***	***1.00***	***0.55***	***0.20***	***1.00***	***1.00***	***0.22***
F	**271.38**	**.**	**.**	**1,119.06**	**1,224.36**	**.**	**.**	**6.14**	**35.04**	**.**	**.**	**1,511.41**	**2.68**	**.**	**.**	**3.30**
No. Obs	***424***	***14***	***33***	***377***	***421***	***13***	***33***	***375***	***421***	***13***	***33***	***375***	***296***	***8***	***28***	***260***

Significance at 1% level (***), 5% level (**) and, 10% level (*)
Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors
Where :
ROA is Return on Assets,
ALB is Average Loan per Borrower per GNI per Capita
NAB is Number of Active Borrowers per Assets
PFB is Percentage of Female Borrowers
Models incldue macroeconomic indicator control variables and MFI firm levels control variables

I also use ordered Logit and Probit models to estimate the link between age of MFIs on one side and performance and financing on the other. The results confirm what I have described in the results so far, namely, financing and performance outcomes are linked to the different stages of the MLCT when MFIs are grouped by legal charters.

VI DISCUSSION

The results from extant research reveal, to some extent, the source of the seemingly conflicting outcomes related to MFIs' social and financial performance and their funding source mix. These results suggest that the divergent research conclusions can be traced to the varied approaches, varied estimation models and analysis scope specifications, and, more importantly, the varied definitions of what MFIs really are. Often, these conflicting outcomes arise simply from viewing all MFIs as homogeneous financial institutions with homogeneous legal charters. Other times, microfinance researchers focus on specific geographical locations or a single aspect of microfinance data, and then attempt to generalize for the entire universe of institutions, which vary widely in legal structure, size, and age.

Generally speaking, the results of my research show that, when grouped by legal charter, MFIs exhibit surprising, significant relationships between funding source mix (capital structure) and social and financial performance. Some of these relationships are revealed upon categorizing the MFIs into legal charters and age groups—an approach left largely unexplored by the extant literature.

VI.1 Key Findings—Microfinance Dual Performance and Funding Source Mix

That debt and equity are positively associated with both social and financial performance outcomes aligns with my hypotheses 1a and 1b across all legal charters. The positive association between ROA and debt-to-assets ratio is consistent with other research findings. Focusing on small and medium enterprises (SMEs), capital structure, and profitability, Abor (2005) shows that short-term debt ratio is positively correlated with return on equity. This confirms Michaelas et al. (1999), who found a positive impact on performance of interest-bearing debt since providers have return expectations. These investors provide more commercial funding in the form of debt or equity to

profitable MFIs. Commercially funded MFIs are more incentivized to operate efficiently, increasing outreach by serving poorer or rural clients who have higher delivery costs (Armendáriz de Aghion & Morduch, 2005). Further, MFIs that use debt are more likely to achieve high social performance (Battilana & Lee, 2014; Von Stauffenberg and Rosas 2011; Cobb, Wry, and Zhao, 2016).

That said, it could also be that shareholders opt for interest-bearing debt as a way of managing agency costs, disciplining management to be more efficient by reducing managerial cash-flow waste (Grossman and Hart, 1982; Williams 1987; Kar, 2012), or pressuring managers to generate cash flow to pay interest expenses (Jensen, 1986; Abor, 2005).

Also, while equity providers have incentives for higher profitability, they may not be averse to social performance. Most equity holders who are not also borrowers have significant control rights and strong profit motives. This became obvious in 2007, for example, when Compartamos, a bank MFI in Mexico that served low-income women with non-collateralized micro loans to support small businesses (e.g., neighborhood shops or tortilla-making businesses), had its public issuance of equity oversubscribed by 13 times (Rosenberg, 2007; Malkin, 2008; Accion International, 2007). This initial public offering (IPO) was heralded as "a future in which microfinance routinely attracts investment from the private sector, freeing it from the ghetto of high-minded, donor-supported initiatives." (Cull, Demirgu¨c-Kunt, and Morduch, 2009). Compartamos, previously a small, unknown bank MFI, became one of the largest MFIs in Latin America with its net worth skyrocketing to $1.6 billion. The institution's growth and expansion between 2000 and 2007 had been aggressive, driven primarily by its retained earnings. Within this short period, it grew its borrower base from 60,000 to more than 800,000. The Compartamos experience shows the power of profit in boosting equity to finance both social and financial goals.

As already discussed, I found that the equity-to-assets ratio positively associates with profitability (ROA). This finding contradicts that of Bogan (2012), who found a negative relationship between share capital as a percentage of assets and sustainability. She argues that her finding is consistent with those of Osterloh and Barrett (2007), who show that financial service association microfinance models, which harness local equity capital by selling shares, do not demonstrate sound screening and lending practices. Thus, share capital that includes local equity capital would not generate the profit incentive efficiencies of the typical lending institution. These findings are problematic, however, for several reasons.

First, Bogan's (2012) focus was on share capital, which excludes other aspects of equity that impact financing decisions—aspects such as share premium, donated equity, retained earnings, reserves, and treasury shares. The difference between my equity definition and Bogan's (2012) may be crucial in deciding the direction of the relationship between performance outcome and funding. Second, the findings from Osterloh and Barrett's (2007) research on particular MFI factors and their impact on the institution share value focused on a very small geographical location in Kenya; they should not be generalized for global MFI outcomes unless conditions in Kenya are representative of the global environment. Third, both Osterloh and Barrett (2007) and Bogan (2012) focus on large MFIs as representative of all MFIs.

Given these three factors, a reasonable explanation for the positive association between equity funding and profitability could be that regulators may set minimums requirements for equity capital as a way of deterring excessive risk-taking, which in turn may affect MFI financing choices, with positive implications on profitability. Alternatively, profitable MFIs—and especially those legal charters that are not obliged to distribute profits—may generate additional equity by accumulating retained earnings. These equity forms are a cheap source of funding for the

institutions and could be used to fund operational and developmental growth, and therefore the institutions' profitability. My research strongly supports this explanation. Young and mature MFIs across all legal charters are more profitable than new MFIs. Apart from bank MFIs, all other legal charters are not obliged to distribute their retained earnings. Interestingly, the equity-to-assets ratio is very significantly and positively associated with ROA only for this group of MFIs—that is, for young and mature MFIs with credit union, NBFI, NGO, and rural bank legal structures.

Similarly, socially oriented investors who do not demand profit or dividends may direct them toward social outreach, thereby positively impacting social performance outcomes, as in the case of mature NBFIs and NGOs. Cases such as the Compartamos IPO make it possible to assert that investors can provide $30 billion annually to fund microfinance globally (Funk, 2007) against the $4 billion a year projected by the Consultative Group to Assist the Poorest in 2008. Indeed, the power of profit makes it possible to imagine serving more than one billion low-income customers—rather than the approximately 175 million families projected for 2015 (Daley-Harris, 2007).

MFIs that receive relatively higher donations show lower ROA. This finding generally holds for all MFIs, regardless of age group or legal charter. The negative association between ROA and donations is an important insight especially because it supports the profit-incentive theory. It also helps the microfinance industry, which supports the notion that MFIs should decrease their reliance on donations, soft loans, and other types of donor funding (Bogan, 2012). Donation funding can create moral hazard, high agency costs, and inefficiencies in MFI operations, with adverse consequences for profitability. Additionally, donations may increase incentives for risk shifting or lax risk-management styles that can also negatively affect profitability. Tchakoute

Tchuigoua (2013) finds that donations are significantly correlated with past-due loans and tangible assets, indicating that donors or their mandates care about risk when they decide to give.

Scholars and practitioners alike have advanced the idea that donations are most beneficial when used to fund start-up costs for younger MFIs (Morduch, 2005). However, I did not find empirical evidence to support this assertion; the association between financial performance and the donation-to-assets ratio is not significant for new MFIs, regardless of legal charter and age grouping. Further, even the social performance outcomes do not seem to support the assertion that donations are beneficial for new MFIs. Indeed, the only significant relationship between donation funding and social performance outcomes was negative. Higher donations are associated with decreased ALB for new NGO MFIs and decreased NAB and PFB for new and young credit union MFIs, respectively.

Deposits are positively related mainly to social outcomes across age, but also to ROA on average. Deposits are low-cost, longer-term funds, and they are a far more stable source of funds than debts, which are usually short-term for most MFIs (Christen and Mas, 2009); they are therefore preferred to debt (Muriu, 2011). Deposits are a cheap source of funding for banks and other financial services institutions. They have a relatively low cost of capital and make the most sense for institutions with the option of raising capital by collecting savings deposits (Cull, Demirgu¨c-Kunt, and Morduch, 2009). Usually, the deposit-taking institution pays very low or no interest on the funds—thus the low cost. As long as there is no run on the institution, and the cost of mobilizing deposits is reasonably low, a significant portion of the deposits (the core) can become a long-term funding source for funding short- to long-term loans, guaranteeing the institution high-interest margins. Given all this, it is not surprising that higher rates of deposit significantly associate with higher MFI profitability.

Also, in MFIs, deposits are viewed as financial products consisting of short-term demand deposits (savings accounts) or time deposits (remunerated savings accounts). From a financial intermediation viewpoint, deposits can be seen as a resource that MFIs use to fund their operations and make loans (Consultative Group to Assist the Poor [CGAP], 2011; Cull et al., 2009). Moreover, some deposit-taking MFIs use deposits as a tool to reinforce contracts. In this sense, deposits could be viewed as financial collateral required from borrowers to secure a loan (Armendáriz de Aghion & Morduch, 2004, 2010). In countries with better creditor protections and better law enforcement, deposits are likely less important as a tool for risk management. However, MFIs operate mostly in countries with weaker institutions for credit protection; in such countries, deposits would be more significant and could positively impact loan provision—or even bad debt—and therefore profitability.

VI.2 Research Contribution and Limitations

VI.2.1 *Contribution to Theory*

My research addresses conflicting research outcomes on how funding source mix relates to MFIs' social and financial performance. I dealt with the issue of why some researchers find that debt and equity have a negative relationship with profitability (Bogan, 2012), while others find a positive relationship (Muriu, 2011). Further, using legal charters to analyze the relationship direction between funding sources and MFIs' dual performance provides deeper insights into the important associations between key variables that could be lost at the aggregated analysis level. My findings can offer researchers a new perspective on how performance and funding vehicle dynamics evolve as MFIs mature. To the best of my knowledge, rigorous empirical evidence based on credible control-treatment evaluations is scanty regarding MFI dual performance and funding source mix on this point. Also, because many microfinance researchers view MFIs as

homogeneous institutions, they analyze them at the aggregate level. Although such analysis provides insights into these institutions, it also overlooks details lurking beneath the aggregation. Having analyzed MFIs by legal charter and age groups, I address some of the gaps in the discussion on how funding impacts dual microfinance performance. Finally, I provide rigorous empirical evidence for the MLCT and for which legal charters' funding and performance types conform to it.

VI.2.2 *Contribution to Practice*

VI.2.2.1 *MFI managers, insights on funding choices for optimal performance*

The findings in this research will offer managers a detailed resource on the links between funding and the dual MFI performance outcomes. Such information will be a useful input to managerial capital structure decisions targeted at optimizing profitability, ALB, the number of clients, and outreach to women. Additionally, as managers formulate corporate strategies to grow their institutions, this research offers a clear perspective on which financing strategies will work for them given their legal structures. My research will also inform MFI managers when they face choices about alternative funding instruments. Managers who can identify the optimal capital structure will be rewarded for minimizing their institutions' cost of finance and maximizing their firm's income.

VI.2.2.2 *Marginal effects input for the sector's policymakers*

Because they specify quantified relationships and even causalities between MFIs' dual performance and funding sources, my findings would be useful for informing government and private policymakers in setting specific policy targets. Littlefield and Kneiding (2009) and some microfinance researchers argue that increasing funding for MFIs during financial crisis effectively supports these institutions in weathering the storm only for the short term. My findings could help

policymakers craft laser-focused funding decisions that optimize outcomes during times of crises. They can achieve this optimized policy outcome by using my research to determine which type of funding will be effective for different types of MFIs.

Policymakers and social investors also must grapple with the question of whether the costs of subsidizing microfinance activities actually generate large, important social benefits and/or benefits the poor in large numbers when compared to alternative interventions (Cull, Demirgu¨c-Kunt, and Morduch, 2009). Findings in this research provide inputs to help answer these policy questions. For example, having read my research, a policymaker interested in policies to spur MFI profitability growth would avoid encouraging donations as that funding type is associated with decreasing, rather than increasing, MFI profitability.

VI.2.2.3 *Guidance for optimizing investor and philanthropist investment decisions*

Both public and private funders, as well as hybrid investors, require good screening systems for choosing potential MFIs investment targets that meet their social and profitability goals. The findings in this research could be a great resource to help investors make informed decisions about MFI investment targets. The research will help investors and financiers understand MFI risk-management strategies, as well as focus on financing structures that improve MFI performance toward both social and financial goals.

VI.2.3 *Limitations of the Research*

This research has several limitations that future researchers could pursue to further contribute to the conversation on MFI performance and funding.

First, I measure MFIs' financial performance using their ROA. The ROA indicates how well the MFI can generate profit from its assets; it is calculated as after-tax net operating income over average annual assets. While I provide evidence for how specific funding sources impact

ROA in relation to various MFI charters and age groups, I do not consider the impact of funding strategies on risk-adjusted financial performance outcomes. Profit-oriented microfinance investors who are interested in the risk and return dynamics of their investment decisions would benefit from a study that quantifies the association between the various funding sources and risk-adjusted ROA or other financial return metrics.

In this research, I also consider the impact of funding source mix on three important social performance outcomes: ALB, NAB, and PFB. I chose these variables because they are often used for measuring social performance in the microfinance literature. Some researchers argue that social performance measures have failed to achieve the same clarity, consistency, and acceptance level as financial performance measures such as ROA (Copestake, 2007). However, it is an arduous task to find a generally accepted social performance measure that reflects all the relevant aspects of MFIs' social goals, which include mission, ownership, management principles, relation to and care for their staff, outreach, services, products, market behavior, and relationships with clients and other stakeholders, such as community, social, and political organizations. Future research might involve finding an index that better reflects these aspects of social performance.

Finally, although I have controlled for endogeneity in my model, I am still not confident that even the highly significant associations between performance outcomes and the funding source mix metrics have causal interpretations, which I wanted to achieve. An alternative approach might be to use dynamic panel models that include instrumental variables to separate the impact of regressors that correlate with the latent variables in the errors term (individual effects). This approach might help establish causal effects for the performance outcomes, and at least for the equity-, donation-, and deposit-to-assets ratios across legal charters and age groups. Achieving such causal results would be most useful for policymakers.

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APPENDIX

Table A1: MFI Region Details

No.	Region	No. of MFIs	Obs
1	Africa	856	4,140
2	Latin America	611	5,037
3	Eastern Europe	516	3,197
4	South Asia	470	3,110
5	East Asia	420	2,307
6	Middle East	80	699
7	North America	1	2
	Total	**2,954**	**18,492**

Table A2: Country Details

No.	Country	MFIs No.	Obs
1	India	237	1,419
2	Russia	128	548
3	Philippines	120	787
4	Mexico	115	683
5	Nigeria	87	317
6	Bangladesh	85	631
7	Ghana	85	336
8	Senegal	84	282
9	China	81	303
10	Indonesia	78	361
11	Peru	75	778
12	Ecuador	71	680
13	Pakistan	54	385
14	Brazil	53	300
15	Rwanda	52	195
16	Vietnam	51	281
17	Tajikistan	49	312
18	Kazakhstan	48	249
19	Nepal	47	357
20	Kenya	47	278
21	Kyrgyzstan	47	262
22	Colombia	46	350
23	Azerbaijan	43	303
24	Uganda	39	211
25	Nicaragua	37	357
26	Benin	37	234
27	Togo	36	162
28	Laos	36	145
29	Uzbekistan	36	145
30	Cameroon	33	181
31	Cote d'Iviore	33	132
32	Burkina	32	142
33	Congo, Democrat	31	127
34	Bolivia	28	341
35	Honduras	28	271
36	Sri Lank	28	177
37	Guatemala	27	235
38	Ethiopia	27	195
39	Bulgaria	26	188
40	Tanzania	24	162
41	Mali	23	153
42	Cambodia	22	253
43	Burundi	22	121
44	Niger	22	105
45	Georgia	21	152
46	El Salvadore	20	183
47	Argentina	19	156
48	Dominican Repul	19	138
49	Costa Rica	18	166
50	Afghanistan	18	134
51	South Africa	18	77
52	Bosnia	17	199
53	Armenia	17	148
54	Madagasca	17	148
55	Egypt	16	152
56	Mongolia	16	99
57	Sierra Leone	13	55
58	Kosovo	12	122
59	Mozambique	12	99
60	Iraq	12	62
61	Moldova	12	56
62	Morocco	11	132
63	Palestinia	11	95
64	Malawi	10	73
65	Papua New Guinea	10	62
66	Yemen	10	62
67	Zambia	10	62
68	Myanmar	10	27
69	Jordan	9	97
70	Zimbabwe	9	32
71	Haiti	8	92
72	Albania	8	82
73	Romania	8	79
74	Panama	8	62
75	Guinea	8	44
76	Paraguay	7	84
77	Chile	7	56
78	Jamaica	7	31
79	South Sudan	7	26
80	Lebanon	6	49
81	Congo, Republic	6	42
82	Liberia	5	18
83	Serbia	4	57
84	Macedonia	4	56
85	Montenegro	4	30
86	Poland	4	29
87	Chad	4	24
88	Trinidad	4	15
89	Guinea-Bissau	4	12
90	Comoros	4	7
91	Ukraine	3	31
92	East Timol	3	29
93	Syria	3	27
94	Gambia	3	17
95	Thailand	3	16
96	Suriname	3	11
97	Belarus	3	8
98	Angola	2	18
99	Turkey	2	18
100	Venezuel	2	18
101	Croatia	2	16
102	Swaziland	2	15
103	Sudan	2	14
104	Namibia	2	12
105	Uruguay	2	9
106	Central African Republic	2	8
107	Guyana	2	7
108	Grenada	2	5
109	Gabon	2	4
110	Saint Luis	2	4
111	Tunisia	1	18
112	Samoa	1	17
113	Tonga	1	8
114	Bhutan	1	7
115	Fiji	1	7
116	Belize	1	5
117	Hungary	1	5
118	Israel	1	5
119	Malaysia	1	5
120	Solomon Islands	1	4
121	Slovakia	1	3
122	United States	1	2
123	Vanuatu	1	2
	Total	**2,954**	**18,492**

Table A3: Sample MFI Balance Sheet

SAMPLE BALANCE SHEET (adjusted for subsidies)

as at December 31, 1994

		1994	*Adjust*	*1994A*
ASSETS				
Cash and bank current accounts		2,500		2,500
Interest-bearing deposits		7,000		7,000
Loans outstanding				
Current		50,000		50,000
Past due		29,500		29,500
Restructured		500		500
Loans outstanding (gross)		70,000		70,000
(Loan loss reserve)		(5,000)		(5,000)
Net loans outstanding		65,000		65,000
Other current assets		1,000		1,000
TOTAL CURRENT ASSETS		75,500		75,500
Long-term investments		11,000		11,000
Property and equipment				
Cost		4,000		4,000
(Accumulated depreciation)		(300)		(300)
Net property and equipment		3,700		3,700
TOTAL LONG-TERM ASSETS		14,700		14,700
TOTAL ASSETS		90,200		90,200
LIABILITIES				
Short-term borrowings (commercial rate)		12,000		12,000
Client savings		0		0
TOTAL CURRENT LIABILITIES		12,000		12,000
Long-term debt (commercial rate)		15,000		15,000
Long-term debt (concessional rate)		30,000		30,000
Restricted or deferred revenue		0		0
TOTAL LIABILITIES		57,000		57,000
EQUITY				
Loan fund capital		33,000		33,000
Accumulated capital—financial costs	0	2,100	2,100	
Accumulated capital—donation	0	950	950	
Retained net surplus (deficit) prior years	0		0	
Current-year net surplus (deficit)		200	(2,850)	(2,850)
TOTAL EQUITY		33,200		33,200
TOTAL LIABILITIES AND EQUITY		90,200		90,200

Source for unadjusted statements: SEEP Network and Calmeadow 1995.

Source: SEEP Network and Calmeadow (1995) and Ledgerwood (1999)

Table A4: Sample MFI Income Statement

SAMPLE INCOME STATEMENT (adjusted for subsidies)

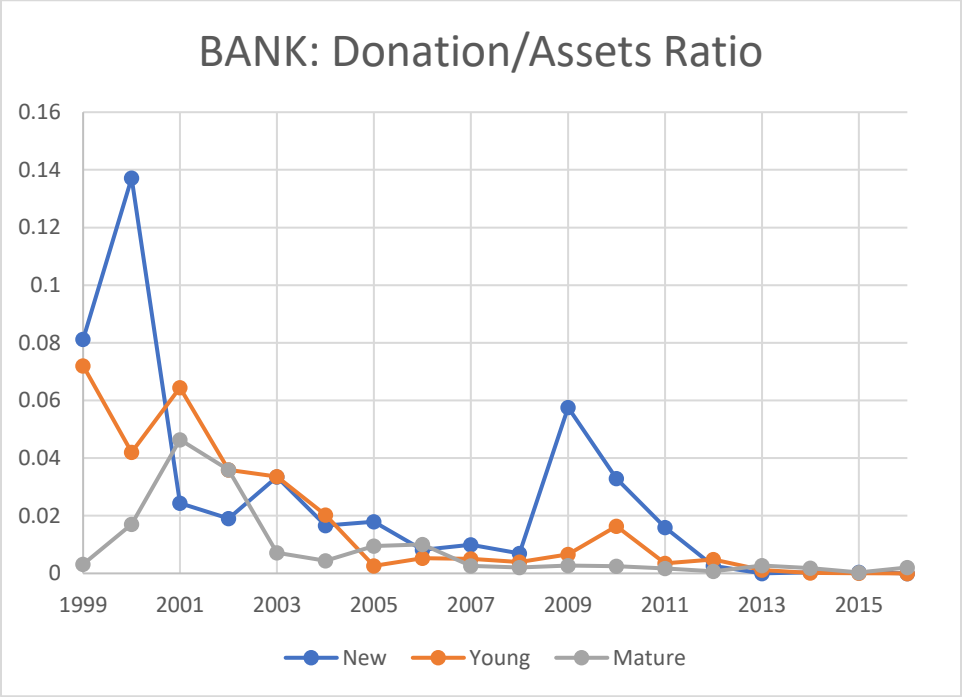
for the period ended December 31, 1994

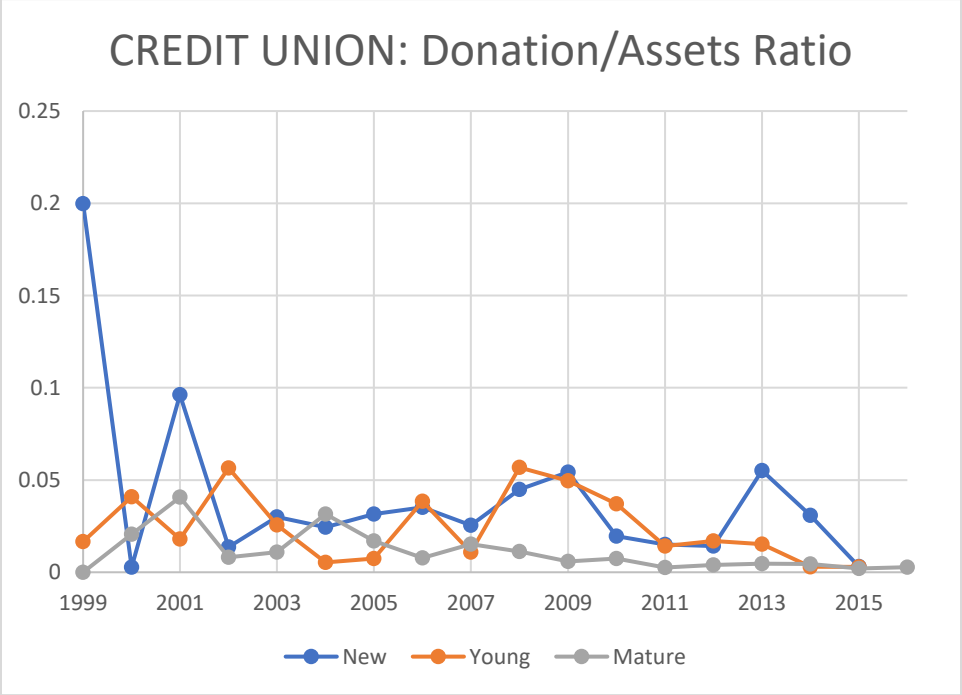
	1994	*Adjustment*	*1994A*
FINANCIAL INCOME			
Interest on current and past due loans	12,000		12,000
Interest on restructured loans	50		50
Interest on investments	1,500		1,500
Loan fees and service charges	5,000		5,000
Late fees on loans	300		300
TOTAL FINANCIAL INCOME	18,850		18,850
FINANCIAL COSTS			
Interest on debt	3,500		3,500
Adjusted concessional debt	0	2,100	2,100
Interest paid on deposits	0		0
TOTAL FINANCIAL COSTS	3,500		5,600
GROSS FINANCIAL MARGIN	15,350		13,250
Provision for loan losses	3,000		3,000
NET FINANCIAL MARGIN	12,350		10,250
OPERATING EXPENSES			
Salaries and benefits	5,000		5,000
Administrative expenses	2,500		2,500
Occupancy expense	2,500		2,500
Travel	2,500		2,500
Depreciation	300		300
Other	300		300
TOTAL OPERATING EXPENSES	13,100		13,100
NET INCOME FROM OPERATIONS	(750)		(2,850)
Grant revenue for operations	950	(950)	0
EXCESS OF INCOME OVER EXPENSES	200		(2,850)

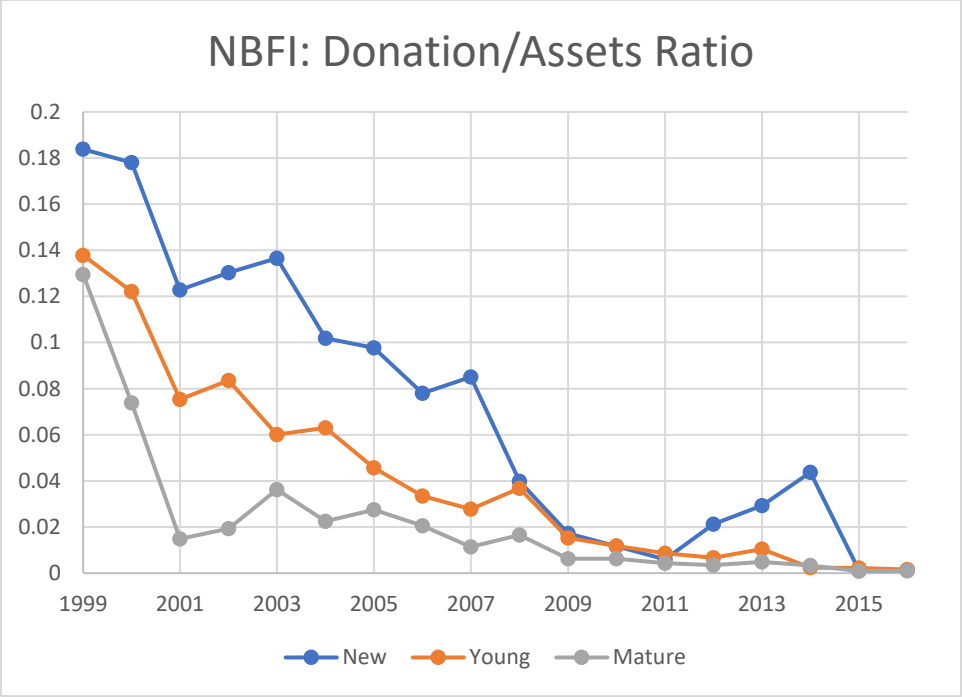
Source for unadjusted statements: SEEP Network and Calmeadow 1995.

Source: SEEP Network and Calmeadow (1995) and Ledgerwood (1999)

Table A5: Donation Usage Trends by Legal Charters






NBFI: Donation/Assets Ratio
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1999
2001
2003
2005
2007
2009
2011
2013
2015
New
Young
Mature

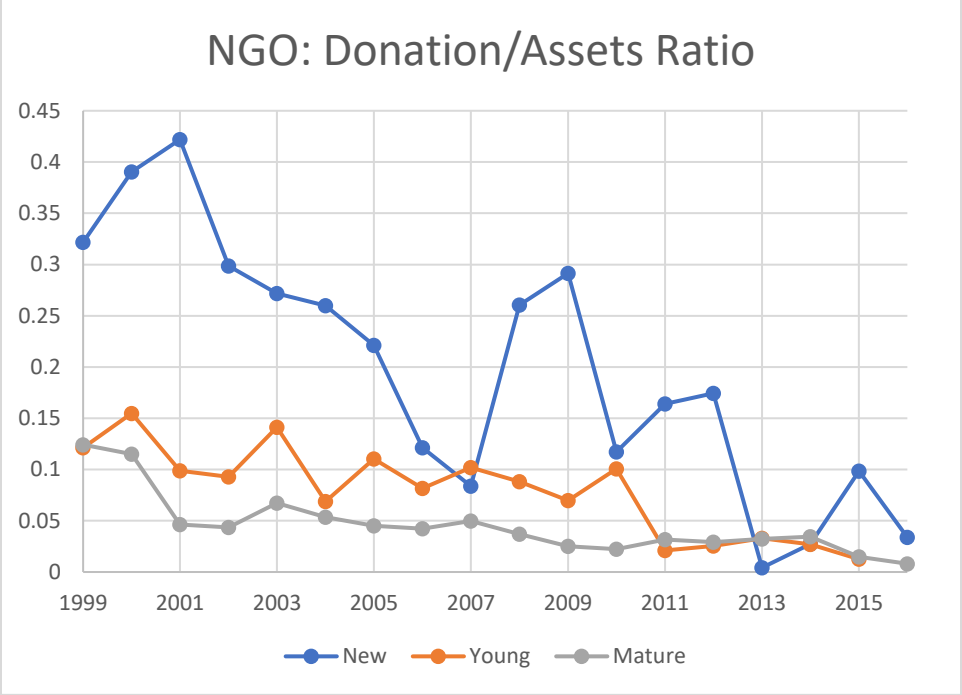

NGO: Donation/Assets Ratio
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1999
2001
2003
2005
2007
2009
2011
2013
2015
New
Young
Mature

Table A6: Ordered Logit Model Result on MLCT – ROA and ALB

	Performance Outcome: ROA						Performance Outcome: ALB					
Independent Variables	**Aggregate**	**Bank**	**Credit Union**	**NBFI**	**NGO**	**Rural Bank**	**Aggregate**	**Bank**	**Credit Union**	**NBFI**	**NGO**	**Rural Bank**
Performance Outcome	**2.592*** **	**3.679** **	**1.324**	**2.763*** **	**4.155*** **	**-**	**0.048** **	**0.012**	**-0.070**	**0.138** **	**-0.017**	**-**
S.E.	*(0.615)*	*(1.607)*	*(2.051)*	*(0.822)*	*(1.159)*		*(0.023)*	*(0.016)*	*(0.193)*	*(0.060)*	*(0.342)*	
P-values	0.000	0.022	0.518	0.001	0.000		0.038	0.451	0.717	0.021	0.961	
Debt Relative to Assets Ratio	**0.261**	**1.972***	**0.153**	**2.141** **	**0.524**	**-**	**0.386***	**1.368**	**-0.961**	**2.510*** **	**0.276**	**-**
S.E.	*(0.385)*	*(1.162)*	*(1.506)*	*(0.938)*	*(0.560)*		*(0.204)*	*(0.848)*	*(1.588)*	*(0.874)*	*(0.595)*	
P-values	0.498	0.090	0.919	0.023	0.349		0.058	0.107	0.545	0.004	0.642	
Equity to Asset Ratio	**-0.545**	**1.122**	**-0.893**	**1.727**	**-0.670**	**-**	**-0.066*** **	**0.710**	**-2.228**	**2.066** **	**-0.057**	**-**
S.E.	*(0.338)*	*(1.008)*	*(1.636)*	*(1.086)*	*(0.425)*		*(0.015)*	*(0.550)*	*(1.614)*	*(0.926)*	*(0.045)*	
P-values	0.106	0.266	0.585	0.112	0.115		0.000	0.197	0.168	0.026	0.203	
Donations to Assets Ratio	**0.998**	**7.887***	**1.547**	**1.291**	**0.937**	**-**	**-0.188**	**1.394**	**0.249**	**0.274**	**-0.658**	**-**
S.E.	*(0.730)*	*(4.605)*	*(3.205)*	*(1.372)*	*(1.156)*		*(0.592)*	*(3.337)*	*(2.616)*	*(1.193)*	*(0.611)*	
P-values	0.172	0.087	0.629	0.347	0.418		0.751	0.676	0.924	0.818	0.281	
Deposits to Assets Ratio	**-1.084*** **	**-0.605**	**-0.363**	**1.305**	**-3.398*** **	**-**	**-0.622*** **	**-0.523** **	**-1.906**	**1.161**	**-2.531** **	**-**
S.E.	*(0.420)*	*(1.022)*	*(1.678)*	*(0.961)*	*(1.247)*		*(0.196)*	*(0.231)*	*(1.614)*	*(0.973)*	*(1.259)*	
P-values	0.010	0.554	0.829	0.174	0.006		0.002	0.024	0.238	0.233	0.045	
Log of Assets	**-0.845*** **	**-0.619*** **	**-1.152*** **	**-1.058*** **	**-1.014*** **	**-**	**-0.722*** **	**-0.542*** **	**-1.089*** **	**-0.802*** **	**-0.754*** **	**-**
S.E.	*(0.061)*	*(0.100)*	*(0.140)*	*(0.115)*	*(0.175)*		*(0.049)*	*(0.083)*	*(0.124)*	*(0.088)*	*(0.144)*	
P-values	*0.000*	*0.000*	0.000	0.000	0.000		*0.000*	*0.000*	0.000	0.000	0.000	

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is Percentage of Female Borrowers

Table A7: Ordered Logit Model Result on MLCT – NAB and PFB

	Performance Outcome: NAB						Performance Outcome: PFB					
Independent Variables	**Aggregate**	**Bank**	**Credit Union**	**NBFI**	**NGO**	**Rural Bank**	**Aggregate**	**Bank**	**Credit Union**	**NBFI**	**NGO**	**Rural Bank**
Performance Outcome	**0.000*** **	**0.000*** **	**-57.356**	**-10.132**	**0.021**	**-**	**0.114**	**0.626**	**-0.294**	**0.161**	**1.387**	**-**
S.E.	*(0.000)*	*(0.000)*	*(48.341)*	*(19.953)*	*(0.400)*		*(0.355)*	*(0.888)*	*(0.884)*	*(0.621)*	*(0.923)*	
P-values	0.000	0.000	0.235	0.612	0.958		0.749	0.481	0.740	0.795	0.133	
Debt Relative to Assets Ratio	**0.408** **	**1.406***	**-0.747**	**2.611*** **	**0.272**	**-**	**0.059**	**0.699**	**-0.519**	**2.197*** **	**0.079**	**-**
S.E.	*(0.197)*	*(0.855)*	*(1.460)*	*(0.850)*	*(0.591)*		*(0.402)*	*(1.487)*	*(1.897)*	*(0.813)*	*(0.577)*	
P-values	0.039	0.100	0.609	0.002	0.646		0.883	0.638	0.784	0.007	0.891	
Equity to Asset Ratio	**-0.068*** **	**0.693**	**-2.043**	**2.083** **	**-0.057**	**-**	**-0.112**	**1.609**	**-1.217**	**1.923** **	**-0.105**	**-**
S.E.	*(0.015)*	*(0.527)*	*(1.492)*	*(0.907)*	*(0.045)*		*(0.347)*	*(1.445)*	*(1.991)*	*(0.858)*	*(0.367)*	
P-values	0.000	0.189	0.171	0.022	0.201		0.747	0.265	0.541	0.025	0.774	
Donations to Assets Ratio	**-0.176**	**1.520**	**0.088**	**0.351**	**-0.677**	**-**	**-0.418**	**0.274**	**0.533**	**0.289**	**-0.979**	**-**
S.E.	*(0.597)*	*(3.338)*	*(2.805)*	*(1.216)*	*(0.615)*		*(0.660)*	*(3.657)*	*(2.817)*	*(1.436)*	*(0.793)*	
P-values	0.768	0.649	0.975	0.773	0.271		0.527	0.940	0.850	0.840	0.217	
Deposits to Assets Ratio	**-0.607*** **	**-0.515** **	**-1.792**	**1.351**	**-2.540** **	**-**	**-0.823***	**-0.139**	**-0.781**	**1.542***	**-2.638***	**-**
S.E.	*(0.193)*	*(0.234)*	*(1.485)*	*(0.963)*	*(1.253)*		*(0.452)*	*(1.395)*	*(2.063)*	*(0.897)*	*(1.360)*	
P-values	0.002	0.028	0.227	0.160	0.043		0.069	0.920	0.705	0.086	0.052	
Log of Assets	**-0.717*** **	**-0.545*** **	**-1.118*** **	**-0.817*** **	**-0.754*** **	**-**	**-0.741*** **	**-0.581*** **	**-1.055*** **	**-0.794*** **	**-0.880*** **	**-**
S.E.	*(0.049)*	*(0.083)*	*(0.127)*	*(0.094)*	*(0.141)*		*(0.055)*	*(0.102)*	*(0.126)*	*(0.093)*	*(0.153)*	
P-values	*0.000*	*0.000*	0.000	0.000	0.000		*0.000*	*0.000*	0.000	0.000	0.000	

Significance at 1% level (***), 5% level (**) and, 10% level (*)

Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors

Where :

ROA is Return on Assets,

ALB is Average Loan per Borrower per GNI per Capita

NAB is Number of Active Borrowers per Assets

PFB is Percentage of Female Borrowers

Table A8: Ordered Probit Model Result on MLCT – NAB and PFB

	Performance Outcome: ROA						Performance Outcome: ALB					
Independent Variables	**Aggregate**	**Bank**	**Credit Union**	**NBFI**	**NGO**	**Rural Bank**	**Aggregate**	**Bank**	**Credit Union**	**NBFI**	**NGO**	**Rural Bank**
Performance Outcome	**1.450*** **	**2.115** **	**0.733**	**1.528*** **	**2.233*** **	-	**0.029** **	**0.007**	**-0.026**	**0.078** **	**-0.013**	-
S.E.	*(0.344)*	*(0.850)*	*(1.078)*	*(0.478)*	*(0.661)*		*(0.014)*	*(0.010)*	*(0.104)*	*(0.032)*	*(0.190)*	
P-values	0.000	0.013	0.496	0.001	0.001		0.033	0.439	0.803	0.016	0.946	
Debt Relative to Assets Ratio	**0.129**	**1.192***	**-0.012**	**1.168** **	**0.255**	-	**0.214***	**0.838***	**-0.574**	**1.400*** **	**0.121**	-
S.E.	*(0.220)*	*(0.690)*	*(0.830)*	*(0.536)*	*(0.327)*		*(0.121)*	*(0.477)*	*(0.805)*	*(0.495)*	*(0.336)*	
P-values	0.559	0.084	0.989	0.029	0.435		0.076	0.079	0.476	0.005	0.719	
Equity to Asset Ratio	**-0.316***	**0.701**	**-0.626**	**0.927**	**-0.363**	-	**-0.038*** **	**0.434**	**-1.314**	**1.151** **	**-0.031**	-
S.E.	*(0.190)*	*(0.625)*	*(0.894)*	*(0.610)*	*(0.245)*		*(0.009)*	*(0.327)*	*(0.841)*	*(0.522)*	*(0.025)*	
P-values	0.096	0.262	0.484	0.128	0.139		0.000	0.185	0.118	0.027	0.221	
Donations to Assets Ratio	**0.582**	**4.449***	**0.848**	**0.782**	**0.478**	-	**-0.092**	**1.062**	**0.238**	**0.140**	**-0.360**	-
S.E.	*(0.414)*	*(2.416)*	*(1.492)*	*(0.778)*	*(0.643)*		*(0.332)*	*(1.883)*	*(1.347)*	*(0.655)*	*(0.377)*	
P-values	0.160	0.066	0.570	0.315	0.457		0.782	0.573	0.860	0.830	0.340	
Deposits to Assets Ratio	**-0.648*** **	**-0.337**	**-0.343**	**0.708**	**-1.977*** **	-	**-0.368*** **	**-0.308** **	**-1.145**	**0.645**	**-1.446** **	-
S.E.	*(0.241)*	*(0.627)*	*(0.918)*	*(0.542)*	*(0.735)*		*(0.114)*	*(0.136)*	*(0.839)*	*(0.546)*	*(0.731)*	
P-values	0.007	0.590	0.708	0.192	0.007		0.001	0.024	0.172	0.237	0.048	
Log of Assets	**-0.501*** **	**-0.371*** **	**-0.670*** **	**-0.614*** **	**-0.601*** **	-	**-0.431*** **	**-0.325*** **	**-0.640*** **	**-0.474*** **	**-0.453*** **	-
S.E.	*(0.034)*	*(0.058)*	*(0.077)*	*(0.062)*	*(0.095)*		*(0.028)*	*(0.048)*	*(0.069)*	*(0.049)*	*(0.077)*	
P-values	*0.000*	*0.000*	0.000	0.000	0.000		*0.000*	*0.000*	0.000	0.000	0.000	

Significance at 1% level (***), 5% level (**) and, 10% level (*)
Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors
Where :
ROA is Return on Assets,
ALB is Average Loan per Borrower per GNI per Capita
NAB is Number of Active Borrowers per Assets
PFB is Percentage of Female Borrowers

Table A9: Ordered Probit Model Result on MLCT – NAB and PFB

	Performance Outcome: NAB						Performance Outcome: PFB					
Independent Variables	**Aggregate**	**Bank**	**Credit Union**	**NBFI**	**NGO**	**Rural Bank**	**Aggregate**	**Bank**	**Credit Union**	**NBFI**	**NGO**	**Rural Bank**
Performance Outcome	**0.000*** **	**0.000*** **	**-30.923**	**-5.901**	**-0.026**	**-**	**0.074**	**0.322**	**-0.156**	**0.094**	**0.818**	**-**
S.E.	*(0.000)*	*(0.000)*	*(28.359)*	*(11.677)*	*(0.200)*		*(0.204)*	*(0.509)*	*(0.492)*	*(0.356)*	*(0.531)*	
P-values	0.000	0.000	0.276	0.613	0.896		0.718	0.527	0.751	0.792	0.123	
Debt Relative to Assets Ratio	**0.226***	**0.858***	**-0.469**	**1.464*** **	**0.119**	**-**	**0.022**	**0.530**	**-0.340**	**1.256*** **	**0.000**	**-**
S.E.	*(0.116)*	*(0.480)*	*(0.755)*	*(0.483)*	*(0.335)*		*(0.229)*	*(0.875)*	*(0.956)*	*(0.474)*	*(0.325)*	
P-values	0.052	0.074	0.534	0.002	0.721		0.925	0.544	0.722	0.008	0.999	
Equity to Asset Ratio	**-0.039*** **	**0.424**	**-1.222**	**1.175** **	**-0.031**	**-**	**-0.065**	**1.032**	**-0.782**	**1.097** **	**-0.083**	**-**
S.E.	*(0.009)*	*(0.315)*	*(0.790)*	*(0.513)*	*(0.025)*		*(0.198)*	*(0.867)*	*(1.030)*	*(0.494)*	*(0.215)*	
P-values	0.000	0.178	0.122	0.022	0.223		0.743	0.234	0.448	0.026	0.700	
Donations to Assets Ratio	**-0.083**	**1.135**	**0.135**	**0.193**	**-0.369**	**-**	**-0.216**	**0.400**	**0.354**	**0.160**	**-0.518**	**-**
S.E.	*(0.334)*	*(1.880)*	*(1.419)*	*(0.666)*	*(0.379)*		*(0.377)*	*(2.048)*	*(1.478)*	*(0.781)*	*(0.463)*	
P-values	0.804	0.546	0.924	0.772	0.330		0.567	0.845	0.811	0.838	0.263	
Deposits to Assets Ratio	**-0.358*** **	**-0.302** **	**-1.087**	**0.751**	**-1.452** **	**-**	**-0.485***	**-0.003**	**-0.541**	**0.884***	**-1.481***	**-**
S.E.	*(0.112)*	*(0.138)*	*(0.786)*	*(0.540)*	*(0.729)*		*(0.258)*	*(0.833)*	*(1.058)*	*(0.518)*	*(0.793)*	
P-values	0.001	0.028	0.167	0.164	0.046		0.060	0.998	0.609	0.088	0.062	
Log of Assets	**-0.429*** **	**-0.327*** **	**-0.653*** **	**-0.482*** **	**-0.453*** **	**-**	**-0.440*** **	**-0.347*** **	**-0.614*** **	**-0.471*** **	**-0.514*** **	**-**
S.E.	*(0.028)*	*(0.048)*	*(0.070)*	*(0.053)*	*(0.076)*		*(0.031)*	*(0.059)*	*(0.070)*	*(0.053)*	*(0.084)*	
P-values	*0.000*	*0.000*	0.000	0.000	0.000		*0.000*	*0.000*	0.000	0.000	0.000	

Significance at 1% level (***), 5% level (**) and, 10% level (*)
Standard errors (S.E.) in parentheses, and P-values below S.E.s calculated based on robust standard errors
Where :
ROA is Return on Assets,
ALB is Average Loan per Borrower per GNI per Capita
NAB is Number of Active Borrowers per Assets
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VITA

Anthony Annan is President of Gladston Group LLC, a Washington D.C.-based consultancy and advisory services firm specializing in the sectors: financial services, agriculture, oil and gas, real estate, and retail. As President, Annan manages the firm's projects and oversees and coordinates its growth, investments, and business-building programs.

Prior to founding Gladston Group, Annan was Senior Advisor for the Whitaker Group Inc., a premier consultancy, transaction advisory, and project-development firm specializing in Africa. At Whitaker Group, Annan advised on strategic partnerships, corporate finance, financial administration, strategic planning, and project implementation. He also counseled both the CEO and the firm's clients on long-term strategic direction, economic/political environments, transaction structure, risk mitigation, and key investment opportunities.

Annan previously served as a senior executive at top international firms, including Ecobank Transnational Inc., the International Monetary Fund (IMF), Citigroup Inc., and the Standard Bank Group.

As Ecobank's Group CFO, Annan provided leadership in business transformation and re-engineering, M&A due diligence and advisory, strategic cost management, organizational optimization, investor relations, and overall financial management. He also oversaw operational and financial risk management, global treasury, and the bank's capital and liquidity in 36 African countries, where he led discussions with regulators and auditors.

At IMF, Annan served as Deputy Division Chief, managing a $250M+ annual budget to provide the technology backbone for IMF's entire worldwide organization. At Citigroup, Annan was a Vice President of finance, strategy, accounting, and operations for an $800M business, focusing primarily on administering stock plans for large corporate clients.

Annan has also held key public- and private-sector positions in Africa, including Finance Manager at the Volta River Authority and Electricity Company of Ghana, and Treasurer for Ghana's Standard Bank Group and First Atlantic Merchant Bank.

Annan has a doctorate in Business Administration from Georgia State University, an MBA from The Wharton Business School at the University of Pennsylvania, and an MSc in Applied Mathematics and Informatics from the Warsaw School of Economics.

He is a certified analyst and member of the National Association of Certified Valuators and Analysts (NACVA), is on the board of several not-for-profit organizations, and was a Professor of Finance and Strategy in the School of Business at Virginia International University (VIU).

Annan resides in Ashburn, Virginia, with his wife Gladys and their teenaged daughters Nhyira and Ayeyi.