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Cost of Ownership in Microfinance Institutions

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Karl Fredrik Mersland

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Abstract

The purpose of this thesis is to identify the effect of ownership type on costs in microfinance institutions. The study utilize panel data containing information from 403 microfinance institutions in 74 countries. An ordinary least squares (OLS) regression analysis was applied to generate the results. This thesis focuses on how different ownership types, non-profit organizations, shareholder-firms and cooperatives affect operating costs, employee cost and personnel productivity. The main results of the analyses is that there are no significant differences in neither operating costs, employee costs nor personnel productivity between non-profit and shareholder owned microfinance institutions. These results contradict the suggestions from ownership and agency cost theory, which proposes that shareholder owned firms should display lower costs than non-profit firms.

Another result that contradicts the suggestions of ownership and agency theory relates to cooperative microfinance institutions. While theory propose that cooperatives should have lower costs than shareholder owned firms, cooperatives display lower operating costs, employee cost and personnel productivity, but the effect on the latter two fades with the inclusion of control variables. The effect on operating costs is consistent through the different model specifications.

A lack of exogeneity in the explanatory variables limits the confidence in the study's ability to determine causal effects. The results of the study are therefore of a suggestive rather than conclusive nature. Nevertheless, the study is a new contribution to the debate on ownership costs in microfinance institutions, and can serve as a starting point for further research on the topic. In addition to the academic relevance, the results of the study may have implications for several other stakeholders in the microfinance industry, such as managers, investors and policy makers.

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List of Abbreviations

MFI	Microfinance Institution
NPO	Non-profit Organization
SHF	Shareholder owned Firm
COOP	Cooperative Microfinance Institution
NGO	Non-governmental Organization
NBFI	Non-bank Financial Institution
CGAP	The Consultative Group to Assist the Poor. A global partnership of 34 organizations that seek to advance financial inclusion
MIX	The Microfinance Information Exchange
OLS	Ordinary Least Squares
POLS	Pooled Ordinary Least Squares
FD	First Differencing
FE	Fixed Effects
RE	Random Effects
VIF	Variance Inflation Factor
USD	US Dollars
IPO	Initial Public Offering

List of Variables

OEP	Ratio of Operational Expense to Average Outstanding Portfolio
CostEmployee	Personnel Cost per Employee
PersProd	Personnel Productivity. Measured as Credit clients per Employee
NPO	Non-profit Organization
SHF	Shareholder owned Firm
COOP	Cooperative Microfinance Institution
InternAudit	Internal Auditor reporting to the Board of Directors
PerformancePay	System for remunerating employees according to their performance
Competition	Measure of the level of competition in the area where the MFI operate
Regulation	Indicate whether the MFI is regulated by banking authorities
SA	Savings to Assets ratio. Measured as voluntary savings relative to total assets of the MFI
VB	Village Banking Lending Methodology
SG	Solidarity Groups Lending Methodology
Individual	Individual Loans
Asia	Regional dummy for Asia
AFR	Regional dummy for Africa
MENA	Regional dummy for Middle East and Northern Africa
LA	Regional dummy for Latin America
EECA	Regional dummy for Eastern Europe and Central Asia
LOA	Loan Outstanding Average
EF	Economic Freedom Index. Provided by The Heritage Foundation
HDI	Human Development Index. Provided by the United Nations Development Program

1. Introduction

The introduction chapter will start out with providing the motivation behind this thesis. Subsequently, the objective and scope of the study will be presented, before a presentation of the structure of the thesis concludes the chapter.

1.1 Motivation

1.1.1 Cost in Microfinance

Microfinance describes the provision of financial services to poor and low-income clients have little or no access to conventional banks (Rosenberg, Gonzalez, & Narain, 2009). From being a narrow, donor dependent activity, microfinance is today a global industry with an estimated \$73 billion in loans outstanding, serving about 200 million clients (Cull, Navajas, Nishida, & Zeiler, 2015). Microfinance has been considered a powerful tool for sustainable development (Lützenkirchen & Weistoffer, 2012). This view has however been challenged by academic researchers. Although Banerjee, Karlan and Zinman (2015) find some positive effects related to microfinance, they find no clear evidence that microfinance lead to improvements in social indicators, such as a reduction in poverty or increased living standards.

Historically, poverty alleviation were tied to productive loans issued to microenterprises only. However, there has been a recognition that access to capital is only one of the inputs required to stimulate economic development and poverty alleviation. Furthermore, there is an acknowledgement that the poor requires financial services for a variety of reasons, such as consumption and income smoothing (Ledgerwood, Earne, & Nelson, 2013).

Traditionally, donor backed organizations with idealistic motivation have dominated the industry, but there is a trend of *microfinance institutions (MFIs)* gradually becoming more self-financed. This trend is reinforced by the entrance of commercial banks, which has challenged the donor backed MFIs (Mersland & Strøm, 2010; Rhyne & Otero, 2006).

To meet the new challenges in the microfinance industry, policy makers¹ have advocated the transformation of non-profit MFIs to *shareholder owned firms (SHFs)*. Policy makers advocating transformation of non-profit MFIs highlight profitability and sustainability as factors that favors organizational change. They also claim that shareholders with incentives to improve governance will result in better performing MFIs (Christen, Lyman, & Rosenberg, 2003; Fernando, 2004; Jansson, Rosales, & Westley, 2004) Non-profit MFIs will henceforth be referred to by the abbreviation *NPO*² (*Non-Profit Organization*).

Measuring performance in MFIs is a challenge. The diversity of ownership types in the microfinance industry provides a sample of organizations that seek different objectives. A common measure of performance in other industries is profitability. Using this to measure performance in the microfinance industry is a problem, as a large fraction of the firms are non-profit organizations, who per definition do not maximize, or even generate profits. Obviously, these firms are driven by other objectives than profit maximization.

MFIs are often acquainted with a dual objective; the first one is financial sustainability, and the second is to improve their outreach (Armendariz & Morduch, 2010). *Outreach* is used to describe MFIs efforts to service an ever-wider audience and to reach the poorest of the poor (Conning, 1999). The objectives of outreach and financial sustainability are both affected by MFIs costs. While MFIs prioritize profit maximization differently, cost minimization is important for all types of MFIs, independent of objectives.

For profit minded MFIs, costs are directly linked to profit, as a reduction in costs would increase profits, if all other factors were held constant. Profits are essential for MFIs in order to attract investors. If the microfinance industry cannot attract investors, the sustainability of the industry may be threatened. To increase profit and improve financial sustainability, literature suggests that microfinance institutions should focus on cost efficiency (Hermes, Lensink, & Meesters, 2011; Mersland, 2009).

¹ Policymakers are development agencies and other institutions consulting MFIs to achieve financial inclusion. Examples of such policymakers are The World Bank, CGAP and The Inter-American Development Bank. Government and Parliament are also policymakers, but these are not recognized in this thesis.

² Non-profit organizations are not to be confused with Non-governmental Organizations, even though these terms are often used interchangeably. NPOs are defined by their ownership structure, while NGOs are defined by their legal organizational status. Nevertheless, NPOs are often NGOs, and NGOs are always NPOs.

The second objective, outreach, affects MFIs in the way that a high cost level will hamper the MFI's possibilities to expand their outreach and provide financial services to a larger share of the world's poor. In MFIs, costs are the largest contributor to interest rates (Rosenberg et al., 2009). Accordingly, having a high cost level will affect the MFIs outreach indirectly, as high interest rates could exclude the poorest from access to the microfinance services.

Costs implications on profitability and outreach emphasize costs relevance as a measure of performance in microfinance institutions. Following the arguments from the preceding paragraphs, MFIs should have incentives to control costs regardless of their focus on financial sustainability or outreach.

1.1.2 Ownership Costs

Along with the evolution of the microfinance industry, the scope of organizational forms in the industry has become broader. Today, the organizational forms that dominate the industry are non-profit organizations, shareholder-owned firms and cooperatives. These are organizational forms with different structures, and incentives (Hansmann, 1996). Agency theory suggests that different ownership structures could lead to differences in cost structures, as the incentives in an organization is highly affected by the organizational legal status (Mersland, 2011).

The focus on transforming MFIs from non-profit organizations to shareholder owned firms provides additional motivation for examining the ownership costs of MFIs. As policy papers argue for MFIs to transform from NPOs (Fernando, 2004; Rhyne, 2001; White & Campion, 2002), there seems to be a need for studies examining the effect of different ownership types. In particular, they emphasize that NPOs are less commercial and professional because they lack owners with pecuniary incentives to monitor the management. The policy documents also highlight SHFs' superior governance mechanisms, and the ability to be regulated by banking authorities, accept deposits and attract private equity (Mersland, 2009).

On the other hand, there is also literature suggesting that SHFs do not outperform NPOs (Crespi, Garcia-Cestona, & Salas, 2004; Mersland & Strøm, 2009). The divergence in these studies call for additional research.

1.1.3 Implications for Stakeholders, Policy Makers and Researchers

Several stakeholders have an interest in a deeper knowledge of the relationship between the ownership structure and costs of MFIs. The first group is the MFIs themselves. Why cost efficiency is of interest has already been discussed, and greater knowledge could help MFIs take actions to reduce their costs in order to fulfill their objectives.

The cost of ownership in MFIs is also relevant for policy makers. If SHFs display lower costs than other MFIs, then this would add substance to the argument favoring transformation of non-profit organizations into SHFs. On the other hand, if ownership types are not associated with cost differences, one of the arguments for advocating such a transformation disappear.

The added insight could also be useful for donors and investors in forming their MFIs into more profitable and effective organizations. Alternatively, the insight could result in a redistribution of funds from poorly performing MFIs toward MFIs that use their capital more efficiently.

Ultimately, academic researchers in the field of microfinance should also find this topic intriguing. We extend the work of Mersland (2009) on the ownership types and costs and provides new insight to this topic by examining the relation between ownership structures and employee costs. This study also responds to the need for more knowledge on corporate governance in MFIs (Hilton, 2008).

1.2 Objective

The main objective of this thesis is to examine ownership type effects on costs in microfinance organizations. The study is designed to provide comprehensive insight into the relation between ownership type and costs by including elements from principal-agent theory and governance mechanisms.

By applying general economic ownership theory on microfinance, this study aims to add new insight to the relation between ownership and cost. According to ownership theory, the intrinsic differences among non-profit organizations and shareholder firms should lead to differences in cost structures and governance.

Even though the aim of this study is to identify a causal relationship between ownership form and costs, the prerequisites for interpreting results causally is not satisfied. The problems of interpreting the results causally stems from endogeneity problems in the data. Firstly, a critical prerequisite for causal interpretation is that the explanatory variable affects the dependent variable. This is not satisfied, as the possibility of a reverse effect cannot be excluded. The causality may run from the dependent variable to the explanatory variable or both ways simultaneously. Secondly, relevant variables may be omitted from the models. This would lead estimates to be biased, and causal interpretation would be biased as well. Due to these weaknesses, the results of this study are of a suggestive rather than conclusive nature. Further research is needed to confirm the results.

In addition to suggesting possible causal relationships, descriptive findings are reported and commented. Descriptive research does not try to answer questions of causality, but is limited to describing characteristics of a population. The descriptive analysis has a value in itself, but can also motivate further research on the causal relations behind the observed characteristics.

1.3 Scope and limitations

According to Schreiner (2002), there is six aspects of social benefits for microfinance clients. All of which can be considered performance dimensions for the MFIs. The six aspects are cost, depth, breadth, length, scope and worth. In this thesis, we concentrate on the one dimension of cost, and rarely comment on other aspects of MFI performance.

In evaluating the effect of ownership types on MFI costs, we focus on operational costs, measured by operational expenses. Financial costs and loan losses contribute to the total costs of MFIs, but are not considered in this study.

The study examines the effect of ownership on operational expenses in general, and personnel costs specifically. In addition, personnel productivity is included to supplement the result from the study of personnel cost.

1.4 Structure of the thesis

The thesis consists of six chapters. Chapter 2 provides an overview of the microfinance industry, before the economic theory and our hypotheses are presented in chapter 3. Chapter 4 presents the research methodology, and chapter 5 provides the empirical analyses. Concluding remarks are made in chapter 6.

2. The Microfinance Industry

This chapter gives an overview of the microfinance industry, and includes the concept, history and definitions of microfinance. A more in-detail description of the industry's participants, products and services, trends and criticism is also provided in this chapter.

2.1 The concept of microfinance

Microfinance is based on the idea that low-income individuals, who lack access to financial services through the ordinary formal financial sector, will benefit from being offered financial services. In areas without ordinary financial services, informal moneylenders who provides access to money at high cost, is the main source of capital. The interest rates that these moneylenders charge are many times the monthly effective rates charged by sustainable financial institutions. Even after real, inflation adjusted, interest rates are used and transaction costs are included, it is normally far less expensive to borrow from a financial institution than from an informal moneylender³. The microfinance institutions also provide services that combine security, liquidity and returns (Robinson, 2001). These financial services may be savings and credit, and in some cases insurance and payment services. Microfinance distinguishes itself from ordinary banking by the intention of being a development tool as well as being a financial service (Ledgerwood, 1999).

A recognized definition of microfinance is the one of Robinson (2001): "Microfinance is defined as small-scale financial services -primarily credit and savings- provided to individuals and groups at the local levels of developing countries, both rural and urban" (p. 9).

The definition only covers the financial objective, and ignores the developing focus of microfinance. However, this definition corresponds well to this thesis as the focus is set on MFIs' financial sustainability, not outreach.

Microfinance usually involves small loans, which are typically intended to be working capital. The access to larger loans are generally based on the clients' repayment performance. Besides offering financial services, several MFIs also offer social intermediation such as group formation, development of self-confidence and training in financial literacy and management

³ Surprisingly, when microfinance institutions enter a new market and offer financial services at lower cost, informal moneylenders continue to service some fraction of the demand for credit. A possible explanation for this may be that informal moneylenders are more flexible than institutional credit providers (Pearlman, 2010).

capabilities among members of a group. This implies that microfinance serves both financial and social intermediation (Ledgerwood, 1999).

Microfinance got worldwide attention in the beginning of the 21st century. The UN designated 2005 as the International Year of Microcredit with the objectives “to unite Member States, UN Agencies and Microfinance partners in their shared interest to build sustainable and inclusive financial sectors and achieve the Millennium Development Goals” (UN, 2005). In 2006, the Nobel Peace Prize was awarded to Muhammad Yunus and Grameen Bank. This spurred great enthusiasm for the industry.

Today, the microfinance industry has moved toward providing low-income people with convenient and reasonably priced financial services. As microfinance has developed from microcredit into financial institutions who provides a broad range of financial products, some argue that microfinance is an outdated term. They point out that microfinance has evolved from being a small financial assistant into becoming a commercial industry (Armendariz & Morduch, 2010; Helms, 2006). The microfinance institutions’ ability to attract investments from the private sector is an example of how the industry are moving towards being more commercial (Cull, Demirg-Kunt, & Morduch, 2009).

As of 2011 only three IPOs had been carried out in the microfinance industry, but two of them were more than 13 times oversubscribed (Ledgerwood et al., 2013). This indicates a large interest for making equity investments in the microfinance industry.

2.2 Historical summary

Even though many consider Muhammad Yunus and his Grameen Bank as pioneers in the area of financial inclusion, the history of providing financial services to the poor stretches further back than the 1970s. Small, informal savings and credit group had been operating for several centuries all over the globe, and more formal institutions had also existed. The 18th century Irish Loan Fund system is often held forward as a precursor of modern microfinance. In Norway, parallels are drawn to the emergence of the local savings banks in the 1800s (Mersland, 2011).

Nevertheless, microfinance as we know it today emerged in the 1970s, when the term microcredit was coined. Pioneers like Grameen Bank and ACCION International started issuing small loans to women who in turn invested in their microenterprises. In the 1980s, Bank Rakyat Indonesia was among the first institutions to defy conventional wisdom

regarding financial services for the poor. They set interest rates that covered the bank's costs, and focused on a high level of repayment. This strategy enabled the microcredit institutions to expand their business and serve a vast number of clients. Microfinance was introduced as an integral part of the overall financial system, which led to a shift in the focus from providing the population with subsidized loans into building up local, sustainable institutions to serve the poor (CGAP, 2006).

As the organizations providing microcredit changed the array of services offered, microfinance replaced microcredit as the term used to describe serving financial services to the poor during the early 1990s. Savings, insurances and money transfers were more frequently offered by the MFIs. During this decade, one could also observe the first transformation from a non-profit to a for-profit commercial bank when Banco Sol was established based on the non-profit PRODEM in Bolivia. This exemplifies microfinance as a business of continuous development, which has emerged from being an industry of donor-driven organizations into consisting of both commercialized MFIs and commercial banks. These institutions have started to see the potential of combining profit with fighting poverty (CGAP, 2006). There is a realization towards that the large scale provision of microfinance to the poor, can be sustainable over time in financial self-sufficient commercial institutions in the regulated financial sector (Robinson, 2001).

There has been two paradigm shifts in the microfinance history. Until the 1980s microfinance concentrated on so-called agricultural-credit, or credit subsidized by government or donors to small-scale farmers. In the 1980s, the focus shifted to the poor, and there was a realization of the problem with asymmetric information and high transaction costs. Building cost-efficient MFIs became a focus. The second paradigm shift took place in the mid-2000, when the focus shifted from microfinance to inclusive finance. This was a shift from focusing on supporting discrete MFIs and initiatives into building financial sectors (CGAP, 2006).

Today the focus is on microfinance clients, and the recognition that access to capital is only one of the inputs required for economic development and poverty alleviation. The language of microfinance has changed according to the shifting focus in the industry. Initially *microcredit* became *microfinance* with the realization that microfinance clients needed savings services. Today, with the focus on outreach and providing a large scale of services, terms like *inclusive finance*, *access to finance*, *financial ecosystems* and *financial inclusion* is used (Ledgerwood et al., 2013).

2.3 Criticism

The microfinance industry's potential to alleviate poverty has been investigated by academics ever since the creation of the first MFIs. Karnani (2008) claims that initiatives to increase employment and productivity, through for example government initiatives are more effective than to push poor people into entrepreneurship. In his study on flagship programs in Bangladesh, Morduch (1998) finds that microfinance has a marginal positive impact on consumption and male schooling, but negative marginal impact on labor supply.

Both opponents and defenders of microfinance have relied heavily on correlations, and circumstantial evidence in their argumentation. As a response to this, the later years have seen an increase in studies with a higher focus on research designs that allow for causal interpretation. Banerjee, Karlan and Zinman (2015) presents the overall results of six studies that to a greater extent than earlier research contains an element of randomness. This randomness allow for a greater level of causal interpretation. The results of the six studies are consistent and state that there is little evidence to support transformative effects, such as reductions in poverty or improvements in living standards. However, the studies also coincide in refuting harmful effects of microfinance. Even though there is little support for the strongest claims of microfinance, the studies support some positive effects of microfinance, exemplified by occupational choice, business scale and female decision power.

As the microfinance industry has grown, the focus has shifted from a social movement to the integration of microfinance in the formal financial sector. This integration has led to conflict, as some argue that pursuing commercial objectives leads to a mission drift in microfinance (Ghosh & Van Tassel, 2011). The IPO listing of the Mexican bank Banco Compartamos, where shareholders sold 30 % of their existing stockholdings and realized large profits, is held forward as an example of mission drift. The critics of microfinance points at this example to demonstrate that MFIs generate profits on the back of poor people, in order to enrich their investors, and thus compromise the movement's idealistic principles (Ledgerwood, 2006).

The Microfinance industry is also criticized in the popular press. The Danish journalist Tom Heinemann drew attention to the possibility of debt-traps caused by microfinance, resulting from aggressive lending policies. His documentary "Fanget i Mikrogjeld" received great

attention (Sinclair, 2012). Milford Bateman⁴, who also warned about the negative outcomes of microfinance, supports this criticism. He pointed to the potential creation of poverty traps and inferior development effect of microfinance compared to other development tools (Bateman & Chang, 2012).

2.4 Microfinance characteristics

2.4.1 Clients

Microfinance institutions extends loans to more than 200 million clients (Cull, Navajas, Nishida, & Zeiler, 2015). As mentioned in the definition given by MIX, microfinance is provided to poor and low-income clients, however it is common to distinguish the poor and low-income people from the poorest of the poor. MFIs usually do not serve the latter group, and microfinance clients are typically self-employed, low-income entrepreneurs in both rural and urban areas. The clients are often traders, street vendors, small farmers, services providers, artisans and small producers. The activities that these clients are involved in usually provide a stable source of income, which enables them to down pay the loan and make a decent living (Ledgerwood, 1999). According to data from provided by MIX, Latin America and East Asia is the two biggest markets for microfinance when ranked by loan portfolio (Convergences, 2013).

2.4.2 Providers

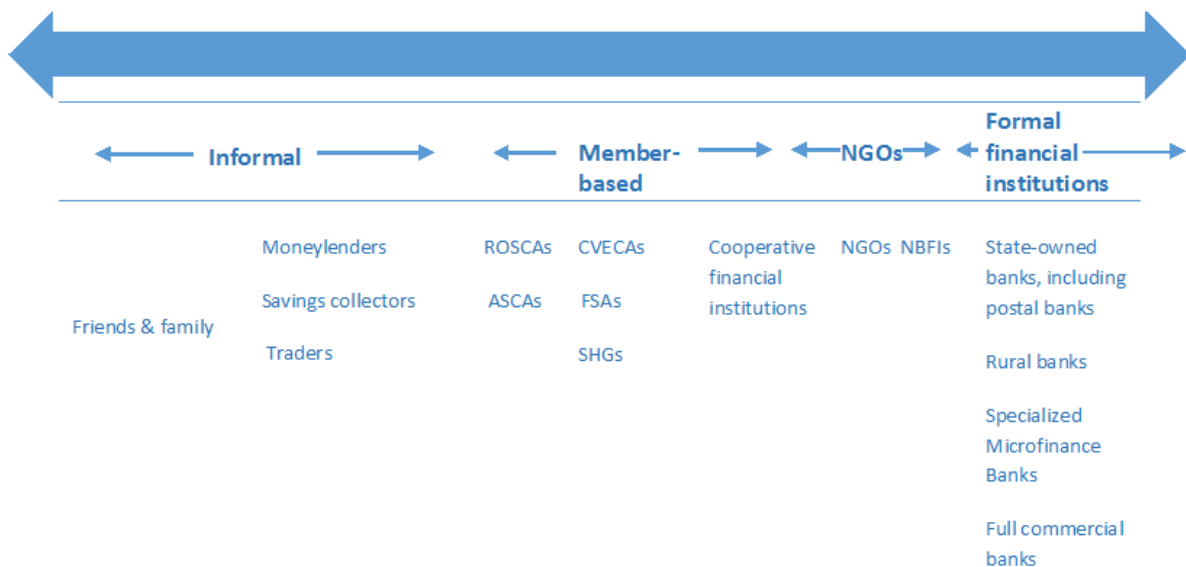
Microfinance organizations (MFIs) can take different organizational forms. The MFIs can be non-governmental organizations, credit unions, financial cooperatives, government banks, commercial banks, or nonbank financial institutions (Ledgerwood, 1999).

There is a broad scope of microfinance providers. Usually, the MFIS are presented along a continuum representing their level of formality. The MFIs level of formality is dependent on the sophistication of the organizational structure and governance, and the degree of oversight or supervision by governments (Helms, 2006). The informal sector consist of friends and family, moneylenders, pawnbrokers, community savings clubs, deposit collectors, traders and agricultural input providers. This sector represent the most common channel for poor people

⁴ Dr Milford Bateman is a freelance consultant and visiting professor at the University of Juraj Dobrila, Pula, Croatia. He is one of the most prominent criticizers of microfinance.

to raise capital. The informal providers stands out from the formal providers by having a simpler organizational structure and for being unsupervised (Helms, 2006).

Figure 1 - Microfinance Providers



Note: ROSCAs = rotating savings and credit associations, ASCAs = accumulating savings and credit associations; CVECAs = Caisses Villageoises d'Epargne et de Cr dit Autog r es; FSAs = financial service associations; SHG = self-help groups; NGOs = nongovernmental organizations; NBFIs = nonbank financial institution (Helms, 2006).

NGOs are organizations that are between the informal and the formal financial institutions. Historically, they have been central in the development of microfinance, as they often concentrate on serving a social mission. Donors finance most of the NGOs, which limits their ability to bring in capital. Given the social mission of reaching the poor clients, microfinance NGOs are often characterized by issuing small loans, and to have high operational costs (Helms, 2006).

The formal financial institutions are chartered by the government and are also subject to banking regulations and supervision (Ledgerwood, 1999). In the microfinance business, these providers consists of *non-bank financial institutions (NBFIs)*, state-owned banks, postal banks, rural banks, specialized MFI banks and full-service commercial banks. These institutions provide most financial services, and play an important role in making financial services inclusive in the poor areas of the world. However, these institutions have a history of being reluctant to serve the poorest of the poor (Helms, 2006).

Financial cooperatives are member-owned financial service providers, also called savings and credit cooperatives, savings and loan associations or credit unions. Financial cooperatives are organized and operated according to general cooperatives principals; no external shareholders, the members are the owners and each members has the right to one vote (Ledgerwood et al., 2013). When referring to cooperatives in this thesis, we are speaking of financial cooperatives with the characteristics presented above. A more in-depth presentation of cooperatives is provided in chapter 3.2.3.

2.5 Products and services

The MFIs mainly provide financial services to their customers. However, some MFIs also provide non-financial services. In the following, a short presentation of the most common services that MFIs offer is provided.

2.5.1 Credit Services

The MFIs provide credit to poor people that normally would not have access to the formal financial market. Loans are mainly intended for productive purposes which aim to stimulate entrepreneurship in poor regions. Nonetheless, microfinance loans are also issued for consumption, housing and other purposes. It is common to divide loans into two groups, individual loans and group-based loans. Individual loans are provided to individuals based on their ability to provide the MFI with assurances of repayment and some level of security.

Group loans are provided to clients that are difficult and expensive to reach. As group lending reduces the transaction costs and risk to providers, many group-lending programs target the very poor, as they do not have sufficient debt capacity, nor collateral or credit history. Group based loans are either given to one groups as a loan, to individuals that are part of a group, or to groups who then on-lend individually to the members. Group lending can be subcategorized as Solidarity Groups or Village Banking. The latter is characterized by larger groups and stricter focus on joint liability of the individuals in the group, than solidarity groups have. Solidarity groups normally consist of three to 10 people, each guaranteeing each other's individual loans, while a village bank consist of 15 to 50 people that makes individual loans to the members of the village bank (Ledgerwood et al., 2013).

2.5.2 Savings

The ability to place money and the possibility to earn returns on savings is a valued service for the world's poor. According to The World Bank's "Worldwide Inventory of Microfinance Institutions (2001), the largest and most sustainable banks rely heavily on savings mobilization. It is common to distinguish between compulsory and voluntary savings. Compulsory savings are not generally available for withdrawal while a loan is outstanding. In this way, compulsory savings act as a form of collateral, which implies that it should be considered as a part of the loan, rather than an actual savings product (Ledgerwood et al., 2013).

The voluntary savings provide people with the possibility to save money in the MFI. Although there obviously are positive effects of providing people with the possibility to save money, such as return on savings, smoothing of consumption and secure savings, there are some clear caveats related to this as well. The administrative complexity that comes with offering saving services, and the high risk exposed to clients, as MFIs uses savings to fund unsafe lending operations, are the most prevalent disadvantages (Ledgerwood et al., 2013).

2.5.3 Social and Nonfinancial Services

Some MFIs offer social services such as education, literacy, health and nutrition programs. The intent behind these services is to make it easier to establish sustainable financial intermediation with the poor in societies with high level of social capital. However, there are problems involved in providing both financial and social services, one being the conflicting interests that comes with providing two separate services. Another problem is the difficulty of identifying and controlling the costs per service, which makes it difficult to measure the self-sufficiency of the financial services (Ledgerwood, 1999).

2.5.4 Insurance, Payment Cards and Payment Services

As the market for financial services has emerged, insurance has evolved as a product offered more extensively by the MFIs. This springs from the growing demand among clients on life and health insurance, as well as insurance of property, livestock and agriculture (Ledgerwood et al., 2013).

Payment cards are to some extent offered by MFIs, but the lack of adequate infrastructure is an obvious constraint to the propagation. However, payment cards offer a great opportunity

for MFIs to minimize administration and operating costs and streamline operations. Payment services includes check cashing and check writing, and the transfer and remittance of funds from one area to another (Ledgerwood, 1999). Related to these services is mobile banking, which has spread rapidly in developing countries, since the challenges of providing reliable broadband access in these areas favor mobile technology (Ledgerwood et al., 2013). The SMS-based money transfer system, M-PESA has grown rapidly, reaching approximately 65 percent of Kenyan households only two years after being launched (Kumar, McKay, & Parker, 2010; Suri & Jack, 2011). Despite the fact that mobile banking is limited to money transfers and payments, it has a recognized potential to serve as a cheap and effective delivery channel for MFIs (Kumar, McKay, & Parker, 2010).

3. Theory and hypothesis formulation

In this chapter, we first present economic theory on ownership. Based on this we will assess general differences between investor-owned firms, non-profits and cooperatives. We will also present theory on agency costs and governance mechanisms, before we arrive at hypothesis formulations. All of the presented theories are general economic theories and not specific for the microfinance industry, but we will apply this to the microfinance industry when formulating hypotheses to test and analyse.

3.1 Ownership Theory

In the following, the term **firm** is used to describe companies and institutions, even though *organization* may be a more appropriate phrase in some situations. The term **patron** is utilized as a common term for all individuals and firms that are in a transactional relationship with the firm.

Ownership is often referred to as a bundle of property rights (Demsetz, 1988). The owners of a firm are those patrons who share two formal rights: the formal right to control the firm, and the right to appropriate residual earnings (Hansmann, 1988).

The firm in itself can be described as a nexus of contracts (Hendrikse, 2003; Jensen & Meckling, 1976). In other words, the firm is a common signatory of a group of contracts. The counterparties are all patrons to whom the firm relates; investors, employees, customers, bondholders or others. In his seminal paper “The Nature of the Firm” (Coase, 1937), Ronald Coase describes how the establishment of a firm is a superior arrangement compared to the construction of numerous individual contracts. The argument is that it is too costly to use the price mechanism of the market, when the number of relations is very high.

The contracts are restricting the firm’s actions. However, it would be extremely costly, and potentially impossible, to incorporate all possible eventualities of the future in contracts. Accordingly, the firm is left with some discretion within the boundaries of the contract. The right to exercise this discretion is the privilege of the firm’s owners. This right is an essential part of the control over the firm (Hansmann, 1996).

Generally, two different types of relationships can characterize all transactions of the firm. Hansmann (1996) denotes the first type as market contracting. In this transaction, contracts guide the relationship between the parties. No other mean of controlling the firm's behavior is available than enforcement of the contract, or in the final instance, abruption of the transactional relationship.

The second relationship, which is referred to simply as ownership (Hansmann, 1996), points to the situation where the party involved is also an owner of the firm. In this relationship, the patrons have the opportunity of controlling the firm's behavior directly. The election of board members and the general assembly are mechanisms that allow the owners to control the firm directly.

Both market contracting and ownership affect the costs of the firm. Assigning ownership to a class of patrons involves a trade-off between the costs and benefits for the patrons. In the following sections, we will present some of the costs associated with each relationship.

3.1.1 Cost of Contracting

The costs of contracting is essentially related to market power and asymmetric information. In a contractual relationship, one party may be in possession of substantial market power. The extreme case is when a monopoly exist. Microeconomic theory tells us that monopolies lead to deflated levels of production, which result in a deadweight loss (Pindyck & Rubinfeld, 2009). Market power can also lead to inefficiencies in less extreme cases. For example, a firm may have market power in transacting with their customers in the output market. This may result in the customers paying a high price, which could hamper their ability to compete in their own output market. In a situation like this, the customers would have an interest in ownership of the firm, to avoid paying an excessive price for the products (Hansmann, 1988). Providers of inputs, including capital providers, and employees may also be prone to exploitation from the firm.

Another variant of market power is denoted **lock-in**. When a patron enters into a contract with another, he constrains his own freedom. The arrangement leaves the firm with some degree of discretion, and the management can take actions that are less beneficial to the patron. The patron can seldom exit the relationship without incurring costs. The lock-in is particularly relevant when the patron has undertaken substantial specific investments in the firm. Training and education of employees may be examples of specific investments, which are hard to

retrieve when transferring ownership. Liquidity premiums in little traded stocks can also be an example of the cost of lock-in. If the patron owns the firm, the incentive for him to act opportunistically diminishes, because he is the residual claimant (Williamson, 1985).

Asymmetric information describes the situation where one party has substantially more information about a factor affecting the terms of the relationship than the other party. When there is a substantial asymmetry in information, the informed part has an incentive to utilize this advantage. If this informed patron is also an owner, the incentive to behave opportunistically diminishes, because as an owner he is entitled to the residual earnings of the firm. In other words, the right to residual claims disciplines the patrons by aligning their incentives (Hansmann, 1988).

3.1.2 Cost of Ownership

From the previous sections, it seems like we can overcome costs resulting of market contracting by assigning ownership to the right group of patrons. However, ownership also involves costs. We will later discuss agency costs in more detail, but for now, it is considered sufficient to state that when owners are unable to perfectly observe and control management, and the two groups have somehow conflicting interests, such costs does exist.

There are various types of ownership costs. Monitoring costs are the costs incurred by owners through getting informed about operations, communicating among themselves, and imposing their decisions on firm management.

A related cost is the cost of managerial opportunism by the managers. The owners can to some degree trade off the costs of monitoring and the cost of managerial opportunism. If the owners choose a high level of monitoring to reduce the managers' abilities to act opportunistically, the monitoring cost will be high. Conversely, reducing monitoring cost, and hence the effective control, permits the managers to pursue conflicting interests to a greater extent (Jensen & Meckling, 1976). Different groups of patrons may differ in their ability to control management efficiently. Even though a group of patrons are unable to control management efficiently, it is not trivial to say that they are not potential owners. Agents that serve poorly may be preferred to agents who actively promotes the interest of other stakeholders in the firm (Hansmann, 1996).

When ownership is assigned to a group of patrons, the owners will incur costs of collective decision-making. There are two reasons why collective decision-making is costly. First, designing and agreeing on voting schemes is both time-consuming and costly, and individuals have incentive to form coalitions in order to achieve disproportionate influence. Secondly, when the owners have conflicting interest voting schemes will most times result in sub-optimal decisions for some fraction of the owners (Hansmann, 1988).

The preceding sections relates to exercise of control, but there may also be costs related to the owner's role as residual beneficiary. The reason is the risk associated with residual claims. Only when all other obligations are met, will the owners be entitled to any claim. Different patrons may have different abilities to carry this risk. Ability to reduce the overall risk through diversification, and relative risk aversion, may distinguish possible owners. Owners who can diversify risk at a low cost, and owners with a relatively low level of risk aversion, have low costs of risk bearing.

3.2 Ownership structures

The following sections will present three different ownership forms based on the theory of ownership.

3.2.1 Shareholding Firms (Investor-Owned Firms)

In the following, we use the term **investor** to identify any patron supplying capital to the firm. The term includes outside providers of capital (lenders) and is therefore distinguished from the term owners. Ownership need not to be assigned to all investors. If it is, the firm will be fully equity financed.

Shareholder-owned firms are characterized by investors who receive ownership privileges in exchange for the provision of capital to the firm. By assigning ownership to the investors, a firm may reduce its contracting costs. The firm may improve their incentive structure, and thus reduce the agency costs. They will however incur ownership costs (Hansmann, 1996).

There are several benefits of assigning ownership to the investors of a firm. Investor ownership aligns incentives and protects investors from exploitation. Investors are prone to exploitation because owners will have incentives to act opportunistically. An example of such behavior is owners distributing excessive dividends or perquisites among themselves. This may reduce

the firm's ability to repay its debt. Owners may also undertake high-risk projects that generate disproportionate gains for owners in the event of success, but impose disproportionate losses on the investors in the event of a failure (Jensen & Meckling, 1976). The lock-in effect contributes to this negative effect on investors, because if owners could easily withdraw their investments, the possible capital efflux would discipline the owners (Hansmann, 1988).

Another benefit of investor ownership is the investors' ability to bear risk. Firstly, the investors often have access to diversification at a reasonable cost. This enables them to reduce the firm-specific risk, and therefore actually carry a lower total risk. Secondly, the investors are often wealthy, and thus less risk-averse on the margin (Hansmann, 1996).

Despite the obvious advantages of investor ownership, there are also some disadvantages. One problem is the owners lacking ability to carry out effective control. When ownership is dispersed within a large group of patrons, as investors often are, owners face difficulties in coordinating themselves. This results in an inefficient control function, which leaves managers with substantial leeway to act opportunistically (Hansmann, 1988).

A related challenge for shareholder owned firms is the collective decision making process. The large number of owners in investor-owned firms can increase the cost of organizing the decision-making process. However, if investors share similar interests, such as maximizing residual profits, the disadvantage of dispersed shareholding can be balanced. If this is the case, collective decision-making may not be more problematic to investor-owned firms than to others. Additionally, in shareholder owned MFIs ownership is often concentrated among few investors (Mersland, 2009). The concentration contributes to reduce the negative effect related to collective decision making and increase the investors' ability to carry out effective control.

3.2.2 Non-profit organizations

While owners play a vital role as principals of for-profit organizations, there are no obvious principals in the non-profit organizations at first glance. The non-profit organizations are characterized by non-ownership. Steinberg (2003), proposes to consider the non-profit as controlled by a board of directors that must obey the non-distribution constraint, but still have a lot of freedom. Nevertheless, he argues that this constraint determines neither how the board representatives are chosen, nor how the conflicting interests of stakeholders are dealt with.

Ben-Ner and Gui (2003) argue that the main weakness of non-profit organizations is the limited monetary incentives for founding and operating such an organization. If a non-profit status is chosen, they argue that it has to have certain strengths to overcome this weakness. One such strength relates to provision of quality output. Non-profit organizations are expected to be more trustworthy in supplying output of promised quality. For-profits would have incentives to provide cheaper, lower quality output in order to increase profits. If no owner can appropriate such profits, the incentive to reduce quality diminishes. The controlling function of the board in non-profit organizations is also argued to be lower, because patrons without pecuniary incentives elect the boards in non-profits. Some boards are even self-perpetuating (Hansmann, 1996).

Bacchiega and Borzega (2003) propose to focus on distribution of the control rights within organizations. They believe that distribution of control rights can explain both the existence of and difference between non-profit organizations. They point out that the control structures of non-profit organizations are often unclear, particularly since control rights are separated from the residual income claims. They propose that non-profit organizations are driven by redistributing concerns or demand activities, and that these driving forces are flexible.

By definition, non-profit organizations generally do not maximize profit. Instead, they promote the desire of their beneficiaries, driven by different degrees of altruistic and egoistic motives. Although some non-profit organizations are able to redistribute profits, e.g. cooperatives and mutuals, most non-profit organizations are restricted from doing so (Bacchiega & Borzega, 2003).

The conventional argument states that the non-distribution constraint undermines the manager's incentives for profit. Bielefeld and Galaskiewicz (2003) highlight both reduced incentives for customer exploitation and sub-optimization within the organization as possible challenges. They refer to social optimum maximization, to maximize a social objective, as an alternative to profit maximization for non-profit organizations. Nevertheless, empirical research points out the presence of some degree of profit maximization also in non-profit organizations (Bielefeld & Galaskiewicz, 2003).

Financial rigidity is a challenge for non-profit organizations evolution. Brody (1996) pins out that non-profits must either reinvest or spend, due to their distribution constraint. As non-profit organizations are unable to distribute dividends, and thus cannot sell meaningful shares of

stock to secure financial capital, Steinberg (2003) argues that non-profit organizations in general are unable to choose the combination of debt and equity that minimizes the cost of capital. The inefficient debt ratio will in turn impede the growth rate of the non-profit sector. Although the problem of financial rigidity is an important characteristic of non-profit organizations, it is beyond the scope of this thesis.

3.2.3 Cooperatives

A cooperative is a legal entity owned and controlled by its members or customers. A true cooperative describes businesses where the owners are one of the groups of individuals who transact with the company. Employees, customers and producers are potential owners of cooperatives (Hansmann, 1996). This implies that cooperative members could have strong incentives to monitor the performance of the firm (Gorton & Schmid, 1999).

Since they enable people to pool assets and resources, cooperatives can under the right circumstances, play an important role in poverty reduction. In communities that government agencies and non-governmental organizations have little contact with, cooperatives are formed in order to enable production of resources or land. This idea of self-help is especially prevalent in rural farming and agriculture (Birchall, 2004).

Institutional restrictions imply that cooperative shares can only be traded within the cooperative itself and at face value. This means that cooperatives are protected against hostile takeovers, and hence the ownership structure cannot easily be changed. Another important restriction is that votes cannot be accumulated into blocks, since regardless of the amount of stock owned, each person only have one vote. This implies that monitoring by stock shareholders gets more difficult, since block shareholders cannot fully exert their voting power (Gorton & Schmid, 1999). In fact, Rasmusen (1988) argues that cooperatives have no stockholders because the managers are isolated from monitoring.

3.3 Theory of the Principal and Agent (Agency costs)

The existence of agency costs was established in the introduction to ownership theory. However, since agency costs is an important prerequisite for the ownership theory, the following sections are designated at providing a more thorough presentation of the theory of agency costs.

The principal-agent model represents a situation of both conflicting interests and asymmetric information. In line with the literature, we will refer to the owner as the **principal**, and the manager as the **agent** (Hansmann, 1996; Hendrikse, 2003; Jensen & Meckling, 1976). According to Hansmann (1996), ownership is defined as a patron who has the formal right to control, as well as the right to residual income. The principal-agent problem arises when the owner deliberately gives up some of his control rights to an agent.

The standard representation of the agency theory is a situation where a principal instructs an agent to perform some sort of action on his behalf. The principal designs a contract, which governs the relationship. The agent decides whether to accept the contract, and the level of effort committed to honor the contract. The level of effort applies to several aspects, and can be number of hours worked, the dedication of managers and the use of non-pecuniary benefits (Hendrikse, 2003). The principal-agent problem exist in various relationships and an individual or group can act simultaneously as both principal and agent in different relations. As an example, the executive board acts as an agent in relation to the owners of the firm, and at the same time as a principal in the relationship with the management (Aghion & Tirole, 1997).

The principal-agent model is characterized by a situation of available surplus, conflicts of interests and asymmetric information. When the principal's willingness to pay exceed the agent's cost of executing a task, there is an available surplus. This surplus can be distributed among the parties. The delegation of tasks and responsibilities between the principal and the agent is generally not without problems. The principal can observe the result, but not the actual effort provided by the agent and the circumstances that influence the agent. This implies that the principal faces a loss of control over the agent (Hendrikse, 2003).

A typical situation in which the principal and the agent do not have aligned objectives, is when the manager pursues a bonus triggering goal, rather than pursuing the best interests of the firm and its stakeholders, such as maximizing profit (Hendrikse, 2003). Such behavior triggers agency costs. The agency costs occur since the managers do not have the possibility to observe the agent's effort, or do not choose to do so since the cost of observing the agent is greater than the benefit of knowing the exact effort level. Accordingly, the agent has superior information regarding the provision of effort (Hendrikse, 2003; Jensen & Meckling, 1976).

Jensen and Meckling (1976) describes three sources of agency costs. Firstly, the principal will incur monitoring costs in his attempt to get information about how the agent performs the task given by the principal, and limit his ability for actions. The cost of having a board of directors controlling the management, or internal audits are examples of monitoring costs. Secondly, the agent may incur bonding costs. Bonding cost is cost incurred by the agent in limiting his own opportunities, and hence reducing the chance of opportunistic behavior. The ultimate source for agency costs is the residual loss. This stems from the fact that it is prohibitively costly to instruct the agent perfectly of how to take actions that is in line with the interests of the principal. Accordingly, suboptimal decisions will be made. These decisions result in a residual loss.

3.4 Governance Mechanisms

Corporate governance mechanisms are tools for reducing agency costs, stemming from the division between ownership and control (OECD, 2004). These are rules, practices, and processes by which the firm is directed and controlled. Governance mechanisms also includes outside factors that contribute to control the management, such as competition. These mechanisms can be classified as ownership structures, board composition, financial policy and corporate environment (Berzins, Bøhren, & Rydland, 2008).

Further, corporate governance involves the interaction and relationship between the owners, the board, company management and the other stakeholders of the firm. The stakeholders are groupings of people who have interest in the company's welfare, including its employees, its customers, its suppliers and creditors, governments and society (OECD, 2004).

Balancing the interests of the partners, while ensuring that the firm has the necessary control mechanisms that enables it to develop, is an important aspect of corporate governance (Lapie, 2001). A firm's governance system is particularly important when control rights are distributed to the management (Bøhren & Josefsen, 2007). The principal-agent problems argues that firms in competitive markets will underperform and disappear in the long run unless they have monitors who actively discipline managers in order to ensure economic performance (Bøhren & Josefsen, 2007). According to this logic, stockholders have an important role in monitoring management and ensuring that decision-making favors optimal utilization of the capital supplied.

3.5 Hypotheses

The economic theories presented in the previous sections is quite general. The following section will draw on these theories, as well as the characteristics of the microfinance industry, when formulating the hypotheses that we test later in this thesis.

3.5.1 Hypothesis number 1

The theory of ownership and agency costs suggest that the shareholders' right to residual claims gives them incentives to monitor the management, while in cooperatives such incentives are weak. NPOs are per definition ownerless due to the non-distribution constraint, and accordingly have no owners with pecuniary incentives to monitor management. This argumentation is related to the principal-agent relation between owners and management and do not exclude the possibility of NPOs implementing a performance pay system that equip managers with pecuniary incentives to monitor their subordinates. Since the shareholders in SHFs carry the cost of the management's decisions through reduced residual payments, they will ensure minimization of unnecessary spending. In COOPs, the members carry this cost implicitly through higher prices, but the relation is less obvious, and the cost of collective decision-making is often high because the members have conflicting interests (Cuevas & Fischer, 2006). For NPOs, a board is executing the control function, but board members do not experience any monetary effect of slack control, and their incentive to control management is therefore limited. Based on this we suggest that operating cost levels are higher in NPOs and COOPs than in SHFs.

Formally, we propose the following:

H_0 : NPOs and COOPs do not have any effect on operating costs in MFIs

H_A : NPOs and COOPs have a positive⁵ effect on operating costs in MFIs

⁵ A **positive effect** is here associated with **higher level of operating costs**. NPOs and COOPs are associated with higher levels of operating cost. This is of course *negative* for the MFI. This should not be confused with a deflated cost level, which would be *positive* for the MFI.

3.5.2 Hypothesis number 2

According to Gonzalez (2007) and Hug (2014) personnel costs contribute the larger part of operating expenses. In order to delve deeper into the possible relation between ownership operating costs, we examine the cost of employees.

When considering the ownership theory, the incentive structure provided by the residual claims once again stand out as an important feature of SHFs. Owners of SHFs have a pecuniary incentive to monitor the compensation scheme in an MFI because they are the residual claimants. Such incentives are weak and non-existent in COOPs and NPOs. Our proposition is that since shareholders have pecuniary incentives in avoiding over-compensation of employees, they will monitor their agents to prevent splurging on excessive wages. In other words, we expect NPOs and COOPs to display higher wage levels than SHFs.

We provide the formal presentation of the hypothesis below:

H₀: NPOs and COOPs does not have an effect on personnel costs in MFIs

H_A: NPOs and COOPs have a positive⁶ effect on personnel costs in MFIs

3.5.3 Hypothesis number 3

When considering personnel costs, one should also keep personnel productivity in mind. The last hypothesis therefore relates to personnel productivity. High personnel costs need not be negative in itself. If high personnel cost enable MFIs to attract employees that contribute a correspondingly high productivity or even superior productivity, the high cost approach may be justified, from an efficiency perspective. How to measure productivity is however far from trivial. We will return to this discussion in the section were we present our chosen variables.

In formulating the hypothesis related to productivity, we rely on a relationship proposed by Adam Smith. He wrote, “Where wages are high, accordingly, we shall always find the workmen more active, diligent and expeditious, than where they are low” (Smith, 1993, p. 86). The theory of efficiency wages (Yellen, 1984) corresponds with Smith’s assertion of a positive correlation between wage level and workforce productivity. The relationship advocate a higher

⁶ A **positive effect** is here associated with **higher level of personnel costs**. NPOs and COOPs are associated with higher levels of personnel cost. This is of course *negative* for the MFI. This should not be confused with a deflated cost level, which would be *positive* for the MFI.

personnel productivity in NPOs and COOPs than in SHFs, because SHFs are expected to display lower personnel costs.

On the other hand, one could argue that since SHFs have a greater incentive to monitor their employees, they are likely to be better at detecting shirking and thus should be associated with a higher productivity level. This positive effect for SHFs is expected to be dominated by the previously described effect of wage level.

In accordance with the previously proposed positive effect of NPOs and COOPs on personnel cost, and the expected productivity gains from higher wage levels, we suggest that NPOs and COOPs are associated with higher productivity. Due to the conflicting arguments stemming from the incentives to monitor, our prior on this question is less strong than what is the case for the previous hypotheses.

We represent the hypothesis formally:

H_0 : NPOs and COOPs do not have any effect on personnel productivity in MFIs

H_A : NPOs and COOPs have a positive effect on personnel productivity in MFIs

4. Research methodology

In the following sections, we will describe our research methods and the data sample. We later describe the variables and econometric models applied to conduct the empirical analyses.

4.1 Research method

Research methods in social science are often divided in two main categories, quantitative and qualitative methods. In accordance with the name, quantitative research relates to collection and analysis of numerical data (Blaxter, Hughes & Tight, 1996). Quantitative methods emphasize large-scale and representative data, and seek to reach a generalized conclusion on the subject or relationship in question. Results of quantitative research have a high degree of external validity due to the large sample sizes (Jacobsen, 2005). The basis for conducting quantitative analyses is a good basic understanding of the investigated subject, while the objective is to clarify the frequency or the extent of the effect.

Qualitative research is a more explorative process. The researcher is more open and responsive to his subject. In this method, the researcher investigates all kinds of data, also non-numeric (Blaxter et al., 1996). Frankfort-Nachmias and Nachmias (2000) describe qualitative research as:

“An attempt to understand behavior and institutions by getting to know the persons involved and their values, rituals, beliefs, and emotions. Applying such a perspective, researchers would, for example, study poverty by immersing themselves in the life of the poor rather than collecting data with a structured interview schedule.”(p. 257)

Our review of ownership and agency theory provides a theoretical basis for suggesting that ownership type affects different cost aspects in MFIs. We will use a quantitative approach in order to investigate this relation further.

Little research has been conducted using large international datasets on the relation between ownership structure and costs. A quantitative study could give an overview of the typical relationship.

A drawback of a quantitative study is that there is no information on contextual factors to help interpret the results or to explain variations in behaviour. More specifically for our study, the

quantitative approach does not allow us to capture the MFIs' motivation for choosing one legal organization form over another. The study therefore needs both more quantitative studies as well as qualitative studies to scrutinize its findings.

Nevertheless, we believe that the existence of applicable theory and our access to relevant data makes a quantitative analysis a good starting point for examining the relationship between ownership and costs in microfinance institutions.

4.2 Data collection & sample

For our study, we use secondary data from a dataset compiled by a team led by Professor Roy Mersland at the University of Agder. The dataset contains information on 403 MFIs from 74 countries. The dataset is compiled from individual rating reports for each MFI. These rating reports are publicly available, but the full dataset is not. The dataset has been the basis for several academic research articles as well as other graduate theses (D'Espallier, Guérin, & Mersland, 2011; Lislevand, 2012; Meberg & Krpo, 2009; Mersland & Strøm, 2008). The extensive use of the dataset support its credibility.

Data validity is further enhanced by the fact that the source is five different third-party rating agencies. MicroRate, Microfinanza, Planet Rating, Crisil and M-Cril are all approved by CGAP⁷. Trained and experienced personnel conducted the transformation from individual rating reports to a cohesive dataset. To safeguard the reliability the data entry was controlled by at least two individuals.

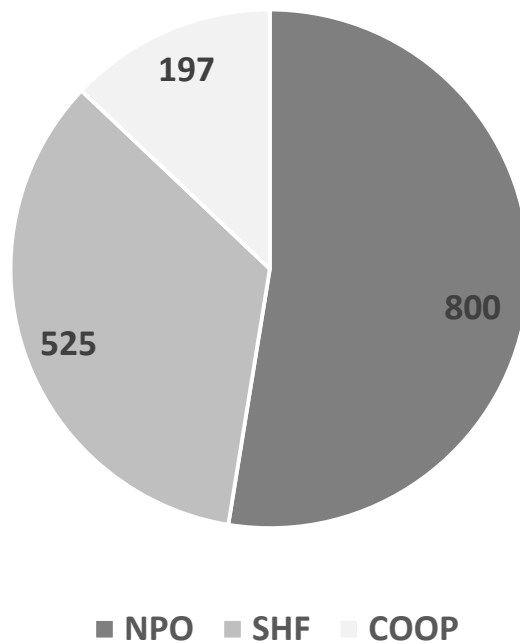
The data has a certain selection bias. Since the dataset is compiled from rating reports, only MFIs that are willing to expose their accounts for scrutiny and rating are represented. Hence, the selection is skewed towards the larger and better performing MFIs. The selection hinders us from examining differences between rated and unrated MFIs, and from interpreting the effect of ownership types on costs for unrated MFIs. The selection bias may also have some positive consequences by filtering out noise, such as very small MFIs and development programs that do not intend to operate in a business-like manner.

⁷The Consultative Group to Assist the Poor is a global partnership of 34 leading organizations that seek to advance financial inclusion. The World Bank and UNDP are among the members. See www.cgap.org

A rating report contains information on several years for each MFI. Some variables are however only quoted for the year of the report. This hampers the ability to use panel data methods, because many MFIs are left with a single observation of the variable in question. Such variables, which are included in the model, are held constant over the period of the other observations, because they are assumed to not change often. This is in line with practice in several research papers (D'Espallier, Guérin, & Mersland, 2011; Mersland & Strøm, 2009). The variables that are held constant are control variables related to governance mechanisms.

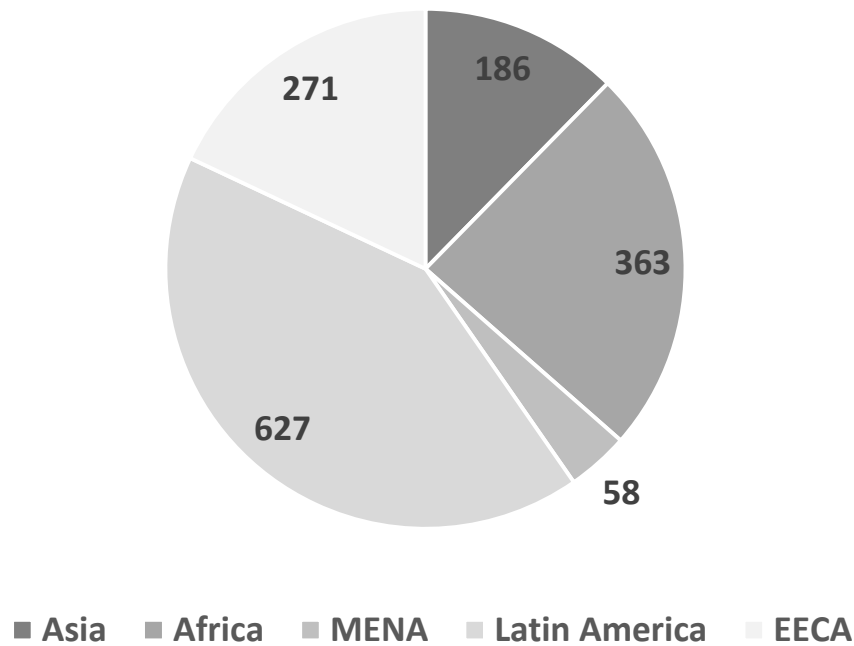
The following figures illustrate the distribution of observations over ownership types and geographical regions.

Figure 2 - Observations per Ownership Type



Note: NPO refer to non-profit organizations, SHF denote shareholder-owned firms and COOP represent cooperatives.

Figure 3 - Observations per Geographical Region



Note: MENA refers to the Middle East and Northern Africa region, while EECA represents the Eastern Europe and Central Asia category.

4.3 Econometric Models

We use multiple regression analyses to identify the effect of ownership structures on MFI costs. Even if the causal effect of ownership type on costs is what we really want to study, we must be aware that causality can also run in the opposite direction, or the apparent relation may be completely spurious. We will return to criticism of our methods later.

Studenmund (2006) provides a description of the regression analysis:

“Econometricians use regression analysis to make quantitative estimates of economic relationships that previously have been completely theoretical in nature. Regression is a statistical technique that attempts to “explain” movements in one variable, the dependent variable, as a function of movements in a set of other variables, called the independent (or explanatory) variables, through the quantification of a single equation.” (p. 6)

The dataset is on panel-form. Panel data contains multiple observations of each cross-sectional unit (MFI), from different points in time (Baltagi, 2013). The panel is unbalanced, which implies that we do not have observations of all MFIs at each point in time (year).

Consider a true panel data model that is given by:

$$(I) \quad y_{it} = \alpha + \beta x_{it} + \gamma z_i + u_{it}$$

y denotes the dependent variable of the model. α is a constant term, often referred to as the intercept, and u_{it} is an idiosyncratic error term. x_{it} is variables that vary between cross-sectional units and over time. z_i represents characteristics that varies between MFIs but are constant over time. These are often hard to observe and correspondingly often referred to as unobserved effects. These unobserved effects could stem for instance from abilities or culture, and can exist if the cross-sectional unit is persons, firm, countries or some other unit. We neglect unobserved time effects, since we circumvent these by including T-1 dummy variables for years. These dummies are not reported in the regression results. Since the z -values does not have a time aspect, we interpret the model as having individual intercepts for each MFI. The model can be written as:

$$(II) \quad y_{it} = \alpha_i + \beta x_{it} + u_{it}$$

α_i now represents all time invariant heterogeneity (Wooldridge, 2014).

4.3.1 Pooled OLS

Ordinary Least Squares (OLS) regress the data to identify the equation that minimize the squared residuals (Wooldridge, 2014).

Pooled OLS simply means that we use the OLS technique on a pool of cross-sections. By using this technique, we disregard the fact that we have observations on the same cross-sectional unit over time. We estimate (II) directly, and hence take advantage of all the variation in our samples, both between and within.

The models need to satisfy a number of assumptions for pooled OLS to produce consistent estimators. Wooldridge (2014) presents the assumptions:

POLS1: x_t is contemporaneously exogenous. It means that for a given year explanatory variables are uncorrelated with the error term. (As opposed to strict exogeneity, which implies that the error term is uncorrelated with the explanatory variables for all periods.)

POLS2: Absence of multicollinearity. No perfect linear relationship exists among the explanatory variables.

POLS3a: Homoscedasticity. Conditional variance does not depend on explanatory variables. Unconditional variance is the same in all periods.

POLS3b: No autocorrelation. This prohibits a unit specific error component.

The first two assumptions are sufficient to assure consistent estimates. POLS3 must also be satisfied for usual test statistics to be valid.

4.3.2 Panel Data Models

When examining panel data, there are several other techniques available. *First Differencing (FD)*, *Fixed Effects (FE)*, and *Random Effects (RE)* are all methods that use transformations to overcome the problems of unobserved individual specific effects (Wooldridge, 2014). However, our data set rules out the use of the two first mentioned. As we have already mentioned, some of our control variables are assumed constant, and additionally the explanatory variables related to ownership are almost perfectly time-invariant. The transformations used in the FE and FD models wipe out all time-invariant effects, and prohibits us from using these to analyse the data (Strøm, D'Espallier, Mersland, 2014).

4.3.2.1 Random Effects

The random effects model lean on a transformation that does not eliminate the unobserved effects, α_i , from the model, but treat the unobserved effects as random effects. This interpretation makes the requirements for producing consistent estimates even stricter than the requirements of the pooled OLS model. The complicated transformation method involves subtracting a fraction of the time average for all variables in order to obtain the GLS estimator. Through this transformation, we arrive at a model that allow explanatory variables to be

constant over time. This is the main advantage of the RE model compared to the FE and FD model (Wooldridge, 2014).

However, the RE model also have some requirements that have to be satisfied for the estimates to be consistent. The list of assumptions is quite comprehensive (Wooldridge, 2014).

1. We have a linear model.
2. We have a random sample of cross-sections.
3. There is no multicollinearity.
4. Both alphas and error terms are uncorrelated with the explanatory variables, and mutually uncorrelated.
5. Alphas and error terms have constant variances. Homoscedasticity.
6. There is no serial correlation in the idiosyncratic error terms.

The assumption that distinguishes the RE model from other linear panel data models is number 4. The RE model requires the unobserved effect to be uncorrelated with all explanatory variables. Like the FD and FE models, the RE model also requires strict exogeneity, compared to the contemporaneous exogeneity requirement of the pooled OLS model.

Hausman (1978), developed a test to identify whether the conditions for using the RE model were satisfied. The null hypothesis states that there is no misspecification, in other words, the results of estimating the RE model are not significantly different from those of the FE model. When the null hypothesis is rejected, the RE model is rejected because it produces inconsistent estimates.

We will later return to the assumptions for both the pooled OLS and random effects model, and evaluate whether the assumptions are satisfied in our analysis.

4.4 Variables presentation

In this section, we present the variables that are being used to identify and measure differences in cost structures in MFIs.

4.4.1 Dependent Variables

4.4.1.1 *Operating Expenditures to Portfolio*

This variable states the ratio of the operating expenses to the annual average loan portfolio. Both CGAP (2003) and MIX (2015) use the ratio. The OEP ranges between 0 and 1. Annualized figures are used if the report gives figures from within a year.

The following formula is used:

$$OEP\ Ratio = \frac{Operating\ expense}{Annual\ average\ total\ loan\ portfolio}$$

The OEP ratio can have several interesting implications, one being the strong relationship between cost reduction and gross loan to portfolio discovered by Gonzales (2007). His findings suggest that a 10 percent increase in gross loan portfolio to assets yields a 7 percent decrease in costs. Gonzalez (2007) also state that operational expenses constitute about 62 per cent of the rates MFIs charge their clients.

The ratio is suitable for our analysis primarily because it includes operating expense, which is a good proxy for operating costs. Using a ratio instead of the dollar figure on operating expenses helps us relate the cost to some output measure. This allow us to study cost-efficiency rather than pure money expenses. The ratio also wipes out differences between MFIs that result from currency effects.

Alternatively, one could use the ratio of operating expense to total assets. This is a better measure when other assets than the loan portfolio constitutes a large fraction of an MFIs total assets. Nevertheless, our sample displays adequately high and consistent portfolio-to-assets ratios to defend the applicability of the OEP ratio as dependent variable.

4.4.1.2 *Personnel Cost per Employee*

The cost per employee ratio states the personnel costs to the total number of employees. This ratio is used to calculate the MFIs average cost per employee. The variable is measured in US

dollars. This ratio helps us find a meaningful measure for the MFIs personnel unit cost. The following formula is used:

$$\textit{Personnel Cost per Employee} = \frac{\textit{Personnel Cost}}{\textit{Total number of Employees}}$$

The cost per employee is not previously used in academic research and represents a new contribution to the discussion of the relation between ownership forms and costs in MFIs.

The variable captures the compensation level in MFIs and is hence suitable for the analysis of our second hypothesis.

4.4.1.3 Personnel Productivity

Personnel productivity is a measure of the productivity of the human resources in the MFIs. The variable we use measures number of credit clients per employee. Formally, the variable is defined as:

$$\textit{Personnel Productivity} = \frac{\textit{Total number of credit clients}}{\textit{Total number of employees in the MFI}}$$

By measuring personnel productivity with regards to the total number of employees, we focus on overall personnel output. One could use a ratio of credit clients to credit officers. This would disregard inefficiencies of a large fraction of administrative personnel, and therefore we use total number of employees as the denominator in the ratio. The measure of credit clients to credit officers would also favour MFIs who report a small number of credit officers, without taking into account the number of administrative staff. Some MFIs may have highly specialized and productive credit officers, but to realize this high level of credit officer productivity, they may have to employ more administrative personnel. By focusing on overall personnel productivity, we do not have to worry about the distribution of employees.

Another way to measure productivity could be to measure output per dollar spent on employees. One would require more output from a high-paid worker than a low-paid, arguing that this is the reason why the worker justifies a higher wage. A drawback with this measure is the fact that we have data for very different countries where purchasing power and hence perceived value of a given salary varies.

One could also imagine a different measure of output, in a productivity variable. An example could be gross portfolio per employee. This measure has the same problems with variety between countries as the previous, and additionally omits information on number of clients.

Even though there are many possible productivity measures, they all seem to have challenges. Therefore we keep the personnel productivity ratio as our measure of employee productivity. Both CGAP (2003) and MIX (Miller, 2003) use the measure and hence confirm its relevance.

4.4.2 Ownership Variables

The explanatory variables we use to test our hypotheses are dummy variables on ownership forms. Our dataset consist of MFIs registered as five different types of legal organizations. We remove the category “Others” and the dataset then contain banks, non-bank financial institutions, NPOs, and cooperatives/ credit unions. In our regressions, we merge banks and non-bank financial institutions and denote them SHFs. This is consistent with previous research (Mersland & Strøm, 2008). The NPO variable is a dummy variable, which indicates if the MFI is a non-profit organization, or not. The COOP variable is a dummy variable, indicating whether the MFI is a cooperative. With SHFs serving as a reference category, we eliminate the risk of multicollinearity.

4.4.3 Control Variables

The following variables are background variables, which we include in our analyses to control for differences among MFIs that are results of other dissimilarities than ownership form. The first five variables share in common that they are all governance mechanisms.

4.4.3.1 Internal Audit

Internal audits disciplines the organization and limits the opportunity for managerial opportunism. However, the cost of auditing will only benefit the organization if the audit cost does not surpass the gains. The variable is computed as a dummy, which is denoted 1 if the MFI has an internal auditor reporting directly to the board, and 0 otherwise. An internal board auditor that reports directly to the board, is expected to be value enhancing (Mersland & Strøm, 2009). The relevance of having an internal auditor in MFIs is stressed in policy papers, and it is recommended that the internal auditor reports directly to the board (Steinwand, 2000). Having an internal auditor reporting to the board is a way of connecting the board governance with internal firm governance. Previous work shows no significant influence on MFI

performance, which is somewhat surprising given the importance given to this measurement in microfinance policy (Mersland & Strøm, 2009). Nevertheless, as earlier research focused on MFI performance, there is a call to investigate if having an internal board auditor effects the cost in the MFIs.

4.4.3.2 Performance Pay

Paying the employees based on their financial performance is a common way of compensating employees in firms (Lazear, 2000). The basic premise for performance pay systems is that once the employee's incentives are aligned to those of the owners through a well-designed payment system, it will lead to a significant contribution to an organization's effectiveness (Lawler, 1990). Although the efficiency gains of introducing a performance pay scheme is well documented (Lazear, 2000), the costs of implementing, monitoring and quality decline are costs that will hamper the effectiveness gain from a well-designed performance pay scheme.

Overall, we expect MFIs with performance pay systems to have lower costs than MFIs without such systems. When it comes to cost per employee, we expect an ambiguous effect, as introducing a performance pay system normally will imply reducing the fixed salary. The effect of the bonus system is expected to be positive, but whether or not it will fully compensate the reduction in fixed salary is unknown. We expect a positive effect on personnel productivity.

The variable for performance pay is a dummy variable that takes the value 1 if any performance pay system is implemented, and 0 otherwise. Accordingly, we are not able comment on details of the systems. For example, whether different strength of incentives affect costs differently we therefore have to leave to future research to investigate.

4.4.3.3 Competition

Competition is a central aspect in disciplining the organizations. For example, new entrants in a market are expected to drive down cost and increase efficiency in order to survive in the market and stay competitive (Pindyck & Rubinfeld, 2009). Market competition is also a substitute for other governance mechanisms, and can thus be an effective tool to discipline the management and the organization as a whole. Bøhren & Josefsen (2007), find that market competition is an important governance mechanism for Norwegian saving banks. Further, Mersland & Strøm (2009), find a significant increase in performance with an increase in

competition, since new entrants force MFIs to drive down cost and increase efficiency. Performance is in their study defined as the portfolio yield. However, some research suggest the opposite, that increased competition leads to higher costs and lower efficiency. Gorton and Winton (2003) argues that increased competition undermines the long-term customer relationship, and forces firms to engage in costly non-profitable activities in order to keep the customers. Ferro-Luzzi and Weber (2008), who show that the number of competitors has a strong negative influence on financial performance support this.

Based on the preceding discussion we expect the market competition to have an effect on the MFIs costs. Although we are uncertain about the magnitude, we expect increased competition to result in a reduction in cost, since the incentives to lower cost, in order to stay competitive, is considered to dominate the contrasting effects.

The variable used to measure market competition is constructed by experienced microfinance professional's subjective assessment of all information provided in the rating reports. The raters have multi-country experience and have rated numerous MFIs, and should thus be able to provide judged information. Nevertheless, this variable should be interpreted with caution. The market competition variable is discrete, and has a seven-point scale ranging from 1 to 7, with 1 indication low or no competition, and 7 indicating high competition.

4.4.3.4 Regulation

Regulation will discipline the organization and limit the opportunity for managerial opportunism; however, there might be substantial costs involved in complying with the regulations. Furthermore, regulation can be a substitute for ownership (Bøhren & Josefsen, 2007). Regulation may differ according to country specific differences. This is particularly important for our data, as the MFIs are located in regions of the world with poor regulation and governmental institutions. Therefore, there might be large discrepancies in how the MFIs are regulated. Accordingly, the findings in our study should be interpreted with caution. Nonetheless, we believe that the disciplining effect will dominate the added compliance costs, and hence suggest that regulated MFIs have lower costs.

Regulation is also measured by a dummy variable. The variable takes the value 1 if the MFI is regulated by banking authorities, and 0 if the MFI is unregulated. In interpreting the results, we have to keep in mind that even though it is simple to determine whether an MFI is regulated, regulation practices may differ significantly between countries.

4.4.3.5 Savings to Assets Ratio

The *savings-to-assets ratio (SA)* is computed as follows:

$$\text{Savings to assets} = \frac{\text{Total voluntary savings}}{\text{Total assets}}$$

Savings to assets is a measure of how large proportion of the assets that are financed by voluntary savings from the clients. Since deposits can be withdrawn at short notice, a large savings to assets ratio is expected to discipline management (Mersland, 2009). Based on this, we believe that MFIs with a high savings to assets ratio have lower operating expenditure ratio.

4.4.3.6 Main Loan Methodologies

We include two dummy variables for main loan methodology that both indicate whether or not the MFIs primarily offer group loans. Group lending is divided into *Solidarity Groups (SG)* and *Village Banking (VB)*. In village banking the groups are quite large, typically 15-50 members. The solidarity groups are smaller, and often count around five members. The joint liability of members is becoming less common in the solidarity group method (Ledgerwood et al., 2013). The village bank dummy variable indicates whether the MFI primarily utilize a village banking methodology. The solidarity group dummy variable indicates whether the MFI primarily offers solidarity group loans. Individual loans are the most widespread methodology and serves as a reference category. Both dummy variables are expected to have a positive effect on both operating expenses, and personnel productivity.

4.4.3.7 Size

Total assets can be a measure of MFI size. The average cost of operations changes as the size of a financial institution changes, implying that efficiency increases due to economies of scales (Humphrey, 1987). We expect that size has a negative effect on the operating expense ratio.

The size variable is compiled as the natural logarithm of total assets. We do this transformation to avoid extreme impacts related to the great inequality in size among MFIs in our dataset.

4.4.3.8 Age

Kneiding and Mas (2009) suggest three reasons why older MFIs are more efficient than younger MFIs; higher numbers of loans may drive scale economies, higher average loan sizes may improve the cost structure, and more knowledge about customers may streamline

processes. Gonzalez (2007) shows that MFI efficiency is strongly related to age and that efficiency increases substantially over the years. Still, he finds that growing beyond 2000 customers has no significant efficiency gain that can point in the direction of scale economies. This can be explained by the learning curve. When the customer base is build up, and most internal processes have been tested and improved the trend begins to level off. The positive effect of age may also be partly attributable to the survival bias (Brown, Goetzmann, & Ross, 1995). This bias comprehends that poor performing MFIs are likely to go bankrupt before they reach a high age. This implies a reverse causal relationship, stating that high performance explains high age. Contradicting the expected positive effect of age on MFI cost, Kyereboah-Coleman (2007) finds that ageing MFIs increase default rates. Meberg and Krpo (2009) suggest that this may be attributed to the fact that they grant credit to new customers who may not be as creditworthy as the present customer-base. Despite the question of causal direction and the contradicting partial effect, we expect the overall effect of age on both operating expenses and personnel productivity to be positive.

4.4.3.9 Regional Variables

Indicator variables for geographical regions are included to control for regional differences. The regions are Asia, *Africa (AFR)*, *Latin America (LA)*, *Middle East and Northern Africa (MENA)* and *Eastern Europe and Central Asia (EECA)*. The EECA variable is omitted from regressions to avoid issues of multicollinearity.

4.4.3.10 Loan Outstanding Average

Loan outstanding average is measured in the following way:

$$\text{Loan outstanding average} = \frac{\text{Gross ousstanding portfolio}}{\text{Number of active credit clients}}$$

We expect larger average loans to be associated with lower personnel productivity, because a large loan require more managing capacity than a small one. Still, larger loans are expected to have negative effects on operating expense ratio, as larger loans are not expected to demand proportionately more work compared to a smaller loan.

4.4.3.11 Economic Freedom & Human Development Indices

Ideally, we would use wage statistics for each country to control for differences between countries. This is especially relevant in the personnel cost model were we operate with dollar figures. In the absence of wage statistics for all countries, The Heritage Foundation's

Economic Freedom Index and the Human Development Index developed by the United Nations Development Program serves as proxies, and helps us adjust for country specific differences because they are expected to be correlated with the wage level.

4.5 Model presentation

We will estimate three models for three different dependent variables. First, we examine the relation between ownership and cost by choosing an operating expense ratio as our dependent variable. The ratio records operating expenses relative to total loan portfolio. Secondly, we will delve deeper into the relationship between employee cost and ownership, as we use cost per employee as our explained variable. The third dependent variable is personnel productivity measured as number of credit clients per employee. This last model reflects productivity differences, which are not part of the second model. For each dependent variable, we first estimate a simple model using only dummy variables related to ownership type. The second step is to control for various governance mechanisms, and ultimately we control for a number of other factors, such as loan outstanding average, size and geographical location.

$$(1) OEP_{it} = \beta_1 NPO_{it} + \beta_2 COOP_{it} + \alpha_i + u_{it}$$

$$(2) OEP_{it} = \beta_1 NPO_{it} + \beta_2 COOP_{it} + \beta_3 Competition_{it} + \beta_4 InternAudit_{it} + \beta_5 PerformancePay_{it} + \beta_6 Regulated_{it} + \beta_7 SA_{it} + \alpha_i + u_{it}$$

$$(3) OEP_{it} = \beta_1 NPO_{it} + \beta_2 COOP_{it} + \beta_3 Competition_{it} + \beta_4 InternAudit_{it} + \beta_5 PerformancePay_{it} + \beta_6 Regulated_{it} + \beta_7 SA_{it} + \beta_8 VB_{it} + \beta_9 SG_{it} + \beta_{10} SIZE_{it} + \beta_{11} AGE_{it} + \beta_{12} ASIA_{it} + \beta_{13} AFR_{it} + \beta_{14} MENA_{it} + \beta_{15} LA_{it} + \beta_{16} LOA_{it} + \beta_{17} EF_{it} + \beta_{18} HDI_{it} + \alpha_i + u_{it}$$

$$(4) CostEmployee_{it} = \beta_1 NPO_{it} + \beta_2 COOP_{it} + \alpha_i + u_{it}$$

$$(5) CostEmployee_{it} = \beta_1 NPO_{it} + \beta_2 COOP_{it} + \beta_3 Competition_{it} + \beta_4 InternAudit_{it} + \beta_5 PerformancePay_{it} + \beta_6 Regulated_{it} + \beta_7 SA_{it} + \alpha_i + u_{it}$$

$$(6) CostEmployee_{it} = \beta_1 NPO_{it} + \beta_2 COOP_{it} + \beta_3 Competition_{it} + \beta_4 InternAudit_{it} + \beta_5 PerformancePay_{it} + \beta_6 Regulated_{it} + \beta_7 SA_{it} + \beta_8 VB_{it} + \beta_9 SG_{it} + \beta_{10} SIZE_{it} + \beta_{11} AGE_{it} + \beta_{12} ASIA_{it} + \beta_{13} AFR_{it} + \beta_{14} MENA_{it} + \beta_{15} LA_{it} + \beta_{16} LOA_{it} + \beta_{17} EF_{it} + \beta_{18} HDI_{it} + \alpha_i + u_{it}$$

$$(7) \text{PersonnelProductivity}_{it} = \beta_1 \text{NPO}_{it} + \beta_2 \text{COOP}_{it} + \alpha_i + u_{it}$$

$$(8) \text{PersonnelProductivity}_{it} = \beta_1 \text{NPO}_{it} + \beta_2 \text{COOP}_{it} + \beta_3 \text{Competition}_{it} + \beta_4 \text{InternAudit}_{it} + \beta_5 \text{PerformancePay}_{it} + \beta_6 \text{Regulated}_{it} + \beta_7 \text{SA}_{it} + \alpha_i + u_{it}$$

$$(9) \text{PersonnelProductivity}_{it} = \beta_1 \text{NPO}_{it} + \beta_2 \text{COOP}_{it} + \beta_3 \text{Competition}_{it} + \beta_4 \text{InternAudit}_{it} + \beta_5 \text{PerformancePay}_{it} + \beta_6 \text{Regulated}_{it} + \beta_7 \text{SA}_{it} + \beta_8 \text{VB}_{it} + \beta_9 \text{SG}_{it} + \beta_{10} \text{SIZE}_{it} + \beta_{11} \text{AGE}_{it} + \beta_{12} \text{ASIA}_{it} + \beta_{13} \text{AFR}_{it} + \beta_{14} \text{MENA}_{it} + \beta_{15} \text{LA}_{it} + \beta_{16} \text{LOA}_{it} + \beta_{17} \text{EF}_{it} + \beta_{18} \text{HDI}_{it} + \alpha_i + u_{it}$$

Note: OEP is the operating expense to portfolio ratio. CostEmpl is the personnel cost per employee. PersProd is personnel productivity defined as number of credit clients per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. AFR=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

4.6 Data analysing tools

The statistical software STATA, version 13, was our tool for analysing data. STATA is a well-known and reliable statistical program for quantitative analyses.

5. Data analysis and findings

In this chapter, we start out by evaluating whether the underlying assumptions of our models are satisfied, and move on to present descriptive characteristics of our variables. We present the results of the pooled OLS regressions and comment on these. At the end of the chapter, we present the results of the RE models and cross-sectional analysis as robustness checks for our pooled OLS results.

5.1 Evaluation of pooled OLS assumptions

An important part of conducting regression analyses is to evaluate whether the assumptions the models rely on are satisfied (Studenmund, 2006).

5.1.1 Contemporaneous Exogeneity (POLS1)

We have not identified methods to test formally whether this assumption is satisfied or not. The following is therefore a discussion of the matter.

Problems of endogeneity stems from three possible sources (Wooldridge, 2010). The sources are omission of relevant variables, measurement errors and simultaneity. We first turn to the problem with omitted relevant variables. The variation caused by the omitted variable would be accounted for partly by the included variable(s) and partly by the error term. These would then of course be correlated, breaking the assumption. The key concern when conducting quantitative analyses is the risk of omitting relevant variables. We have a quite comprehensive data set, but still it would be naïve to claim that all possible effects on an MFIs costs is represented by the included variables. By excluding some MFIs that contain obvious measurement errors, we have reduced the endogeneity problems related to measurement errors. Still, we cannot exclude the possibility of some degree of measurement error in the retained observations. We have a problem of simultaneity if the dependent variable of our analysis influence the explanatory variables. Between ownership forms and, for instance, operational costs, such relationships may exist. As we have previously stated, we try to examine the effect of ownership form on cost, but we cannot rule out the possibility that costs may influence choice of ownership form. Even though the ownership form is seldom changed, it does happen from time to time. Overall, the lack of exogeneity is a clear weakness of conducting a pooled OLS analysis on our data.

5.1.2 Multicollinearity (POLS2)

Multicollinearity is a problem that occurs when an explanatory variable may be written as a perfect linear combination of other explanatory variables. For the ownership types, lending methodologies and the regional dummy variables we exclude one category from the models to prevent multicollinearity. After this precaution was taken, tests for multicollinearity did not detect high levels in the models, and the requirement of absence of multicollinearity is therefore considered as satisfied. The test results are reported in Appendix 1.

5.1.3 Homoscedasticity (POLS3a) and Serial Correlation (POLS3b)

We both ensure homoscedasticity and avoid serial correlation by clustering the error terms at MFI level. This means that we allow for correlation between observations of the same MFI, in some unknown way. By clustering error terms, we obtain larger residual, and thus tighten the requirements for the null hypotheses of our analyses to be rejected.

5.2 Additions for Random Effects

We have already discussed why the fixed effects or the first differentiated model is not suitable for our analysis. The options are therefore to use pooled OLS or the random effects model. If the models have a unit specific error component, OLS estimation will produce biased estimators, due to omitted relevant variables.

5.2.1 Testing for Random Effects versus OLS

The Breusch-Pagan test allows testing of whether or not we have a unit specific error component (Breusch & Pagan, 1980). Since we are operating with an unbalanced panel we use Baltagi and Li's extension of the test (Baltagi & Li, 1990). The null hypothesis for the test is that there is no unit specific error component. However, the null is resoundingly rejected for all models, implying that a unit specific differences that is not accounted for in the models exist.

The Breusch-Pagan test suggests that we discard the pooled OLS model, and opt for a random effects analysis because there is an unobserved unit specific effect. The results of the Breusch-Pagan tests are reported in Appendix 2.

The advantage of the random effects model is that it allow for time-invariant unit specific differences. However, there are disadvantages related to the random effects model to. No explanatory variables may be correlated with the unit specific error component. Additionally, where contemporaneous exogeneity was a necessity for pooled OLS to produce consistent estimates, the random effects model require strict exogeneity.

5.2.2 Strict Exogeneity

According to Bond (2002), strict exogeneity rules out any feedback from current or past shocks to current values of the variable. This is often not a natural restriction when models include several jointly determined variables The arguments against contemporaneously exogeneity of course also apply to strict exogeneity, and we conclude that the RE model also suffer from a lack of exogeneity among explanatory variables.

5.2.3 Correlation between Explanatory Variables and the Unobserved Effect

The Hausman test for misspecification is not satisfied for the models that include all control variables, with the exception of the CostEmployee model. Accordingly, for some of our specifications we discard all our possible tools for evaluating the models. In the models with less control variables, the Hausman test affirms our model specifications. The results of the Hausman test is reported in Appendix 3.

The conclusion is that neither of the models are flawless. Endogeneity is a serious problem in both models. Despite the discouraging results of this chapter, the stronger requirement of exogeneity in the RE model convince us to elect the pooled OLS model for our analysis. We will not completely abandon the RE model, but will return to this as a robustness check on our results.

5.3 Descriptive Statistics

Before we move on to the results of our empirical analyses, we will present some descriptive characteristics of our variables. Descriptive statistics helps to familiarize oneself with the data, and provides a starting point for examining differences between MFIs with different ownership type.

Examination of the data set reveals some unusual observations. This leads us to exclude seven MFIs from the analysis. The eliminated case numbers are 72, 75, 121, 276, 316, 318 and 362. One must show great care in excluding variables, as the regression should explain all data in the sample not just the well-behaved ones (Studenmund, 2006). However, when examining the MFIs in question, it seems obvious that some kinds of measurement errors exist. Previously we have also excluded MFIs characterized by the ownership type “Other”, and those MFIs with missing values on ownership type. The exclusion leaves us with 1522 observations distributed over 381 MFIs.

Table 1 presents descriptive characteristics of our variables after the exclusion of the unwanted observations, and measures taken to keep one-time governance variables constant.

Table 1 – Overall Descriptive Statistics

Variable	Observations	Mean Value	Std. Dev.	Min Value	Max Value
OEP	1419	0.323	0.304	0.015	4.255
CostEmployee	1250	6 374.814	4 185.253	4.194	26 363.950
PersProd	1403	126.793	84.977	2.000	720.000
SHF	1522	0.345	0.476	0	1
NPO	1522	0.526	0.500	0	1
COOP	1522	0.129	0.336	0	1
Competition	1461	4.366	1.519	1	7
InternAudit	1352	0.431	0.495	0	1
PerformancePay	1489	0.583	0.493	0	1
Regulated	1483	0.282	0.450	0	1
SA	1458	0.114	0.237	0	1.142
VB	1522	0.185	0.388	0	1
SG	1522	0.244	0.430	0	1
Individual	1522	0.511	0.500	0	1

Size	1494	14.797	1.361	9.867	19.329
Age (Years)	1515	9.342	6.793	0	79
Asia	1522	0.122	0.328	0	1
Afr	1522	0.239	0.426	0	1
MENA	1522	0.038	0.192	0	1
LA	1522	0.412	0.492	0	1
EECA	1522	0.178	0.383	0	1
LOA	1410	743.380	1 233.852	0	24 589.000
EF	1478	56.389	6.039	29.400	78.000
HDI	1483	0.565	0.133	0.239	0.764

Note: OEP is the operating expense to portfolio ratio. CostEmployee is the variable measuring personnel cost per employee. The values of this variable is measured in USD. PersProd is personnel productivity measured by credit clients per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SHF refer to shareholder-owned MFIs. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Individual=Lending to individuals. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. EECA=Eastern Europe and Central Asia. LOA=Loan Outstanding Average measured in USD. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

We observe that the sample size is good for all variables. CostEmployee display the largest share of missing data, with approximately 18 % missing values. Before we comment the figures of Table 1, we will also present Table 2. After this, we comment the two tables jointly.

Table 2 represents the mean values when we sort observations into groups based on the three different ownership types. We run tests to check whether differences in means between groups are statistically significant. The null hypothesis of the t-tests is that the means are not different from each other. Formally, we test whether the mean of one group subtracted from the mean of the comparing group is significantly different from zero.

$$H_0 : \mu_1 - \mu_2 = 0$$

We use 5 % significance level to evaluate the hypotheses. The p-values of the test for equal means are also included in the table.

Table 2 - Descriptive Statistics per Ownership Type

Variable	Mean Values			P-Values		
	SHF	NPO	COOP	SHF	SHF	NPO
				versus NPO	versus COOP	versus COOP
OEP	0.358	0.335	0.181	0.2556	0.0000	0.0000
CostEmployee	6181.244	6868.346	4723.475	0.0056	0.0000	0.0000
PersProd	128.150	133.960	90.959	0.2855	0.0000	0.0000
SHF	1	0	0			
NPO	0	1	0			
COOP	0	0	1			
InternAudit	0.574	0.406	0.314	0.0023	0.0014	0.2283
Performance						
Pay	0.638	0.652	0.288	0.7699	0.0000	0.0000
Competition	4.361	4.676	3.600	0.0437	0.0012	0.0000
Regulated	0.591	0.039	0.471	0.0000	0.0044	0.0000
SA	0.140	0.016	0.436	0.0000	0.0000	0.0000
VB	0.124	0.250	0.081	0.0000	0.0797	0.0000
SG	0.284	0.270	0.036	0.5824	0.0000	0.0000
Individual	0.571	0.433	0.670	0.0000	0.0160	0.0000
Size	15.085	14.653	14.607	0.0000	0.0001	0.7000
Age (Years)	8.207	9.212	12.868	0.0035	0.0000	0.0000
Asia	0.124	0.134	0.071	0.5963	0.0242	0.0045

Afr	0.354	0.133	0.360	0.0000	0.8786	0.0000
MENA	0.023	0.058	0.000	0.0010	No COOP	No COOP
LA	0.290	0.509	0.345	0.0000	0.1483	0.0000
EECA	0.196	0.155	0.223	0.0564	0.4202	0.0357
LOA	825.975	576.581	1253.976	0.0023	0.0000	0.0000
EF	56.800	55.952	57.092	0.0134	0.5471	0.0134
HDI	0.529	0.591	0.552	0.0000	0.0716	0.0009

Note: OEP is the operating expense to portfolio ratio. CostEmployee is the variable measuring personnel cost per employee. The values of this variable is measured in USD. PersProd is personnel productivity measured by credit clients per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SHF refer to shareholder-owned MFIs. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Individual=Lending to individuals. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. EECA=Eastern Europe and Central Asia. LOA=Loan Outstanding Average measured in USD. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

A p-value lower than 0.05 indicate that we can reject the null hypothesis that states that there is no difference between the means of the two compared groups.

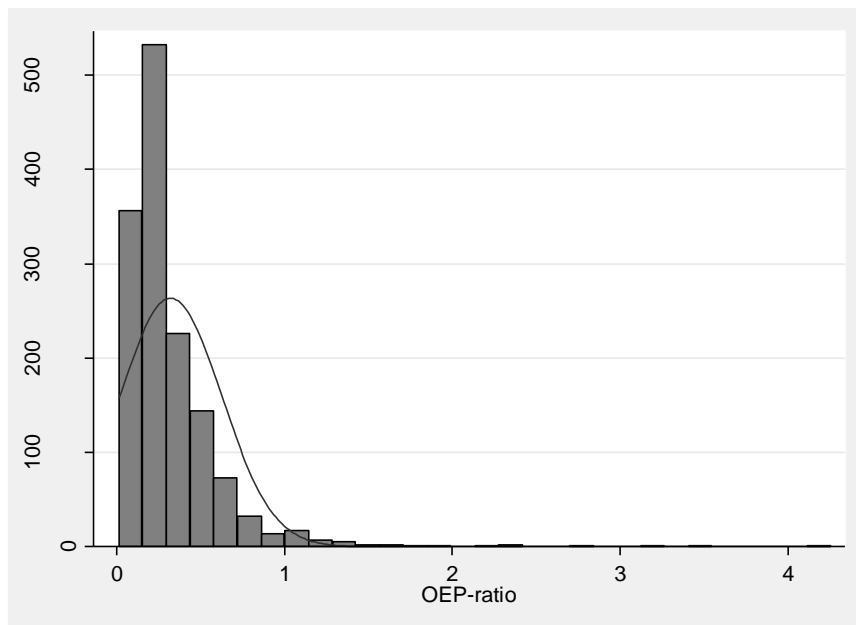
The results of the tests give us a starting point for evaluating differences among the different ownership groups.

5.3.1 Dependent Variables

Operating Expense to Total Loan Portfolio (OEP)

The mean value of OEP is 0.323. It means that on average the MFIs use approximately one third of their outstanding portfolio on yearly operating expenses. Values ranging from 0.015 to above 4, and a standard deviation of 0.3 indicates a large variation among the MFIs. Values above 1, which imply that operating expenses are larger than the overall portfolio, indicate highly inefficient MFIs. An explanation for such values may be that some MFIs are in their infancy and incur costs that are disproportionate to their outstanding loan portfolios. Most observations fall in the second lowest bin of the histogram.

Figure 4 - Distribution of the OEP Ratio

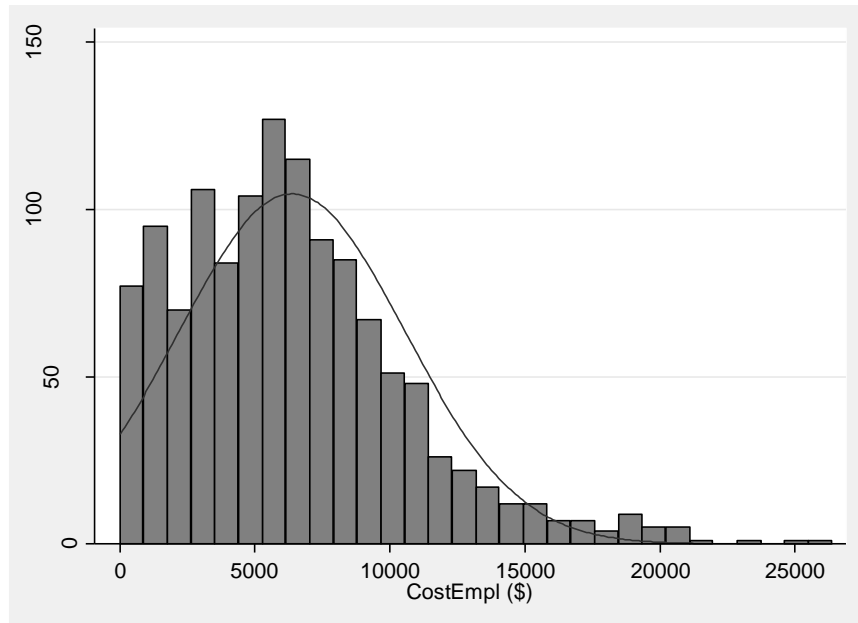


The difference among groups shows us that the mean value of COOPs are significantly lower than that of the other groups. Actually the average cost ratio of COOPs is barely exceeding half that of the other groups. The difference between NPOs and SHFs is not significant according to the t-test for difference in means.

Personnel Cost per Employee (CostEmployee)

The mean value of 6374.81 suggests that, on average, one employee cost the MFIs slightly above 6,000 USD. Again, we observe large variation, with values ranging from 4 USD to 26,364 USD. Some observations display large values, which result in a right-tailed distribution.

Figure 5 - Distribution of Personnel Cost

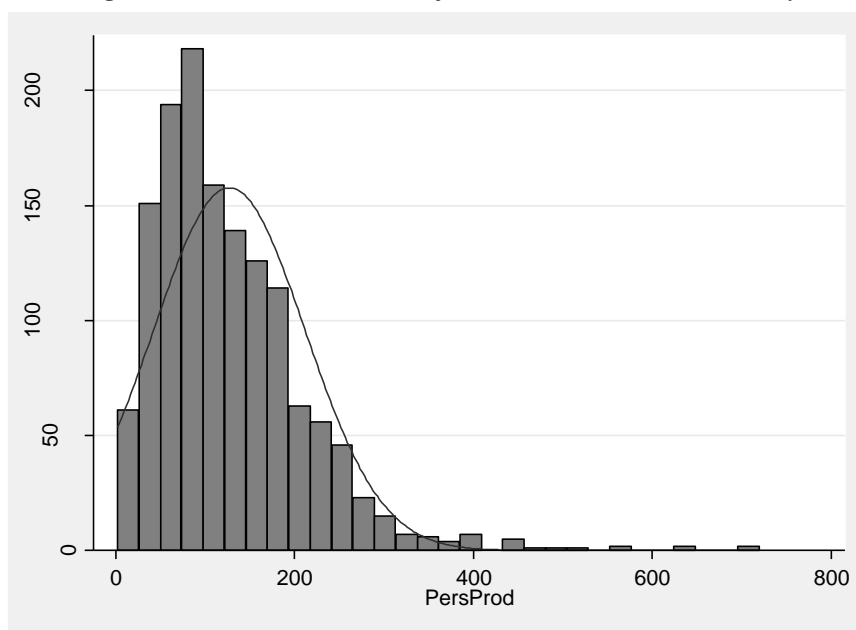


COOPs have the lowest average costs related to employees, and also SHFs have significantly lower costs than NPOs. One could argue that paying more for your employees makes economic sense if you receive greater productivity.

Personnel Productivity (PersProd)

The mean value of personnel productivity is approximately 127. The interpretation of this number is that, on average over all MFIs, there is 127 credit clients per employee. This variable show significant variation with values ranging from 720 clients per employee to two clients per employee. The lowest values may be artificially low due to the effect of start-up years, when MFIs typically have few clients. Measurement error may be an alternative explanation for the low values. The highest concentration seem to be just around 100, but the right-hand tail pushes the mean higher.

Figure 6 - Distribution of Personnel Productivity

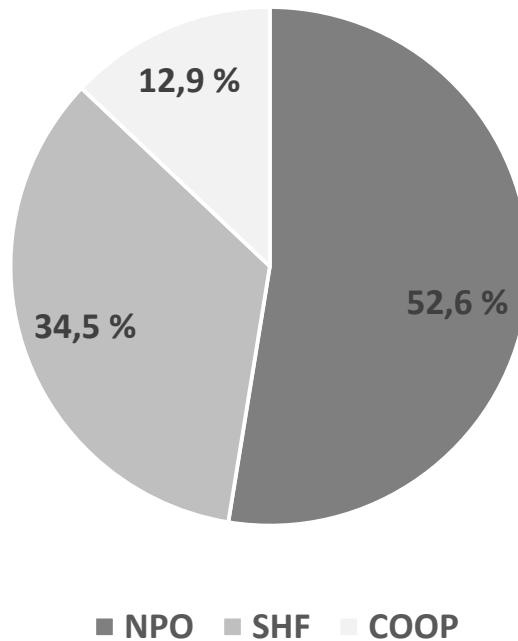


The variable is a productivity measure and closely related to the cost of employees. As mentioned previously in the section regarding personnel cost per employee, a firm can justify paying more for workers who deliver higher productivity. COOPs had the lowest costs related to employees, and also stand out here, this time in a negative fashion by displaying the lowest personnel productivity. NPOs displayed higher employee costs than SHFs, but cannot boast of a significantly higher productivity.

5.3.2 Ownership Variables

Slightly above half the observations are of non-profit MFIs. The SHFs constitute about one third, while COOPs account for 13 % of the observations.

Figure 7 - Distribution of Ownership Types



Note: NPO refer to non-profit organizations, SHF denote shareholder-owned firms and COOP represent cooperatives.

5.3.3 Control Variables

Internal Audits

The mean value of the internal audit variable is 0.431, which signify that 43 % of all MFIs in the study have internal auditors reporting to the board of directors. The SHFs stand out as the group with the highest level of internal audits, while NPOs apparent superiority over COOPs is not confirmed by the statistical test. The t-test referred in Table 2 indicate that there is no significant difference between NPOs and COOPs propensity to carry out internal audits.

Performance Pay

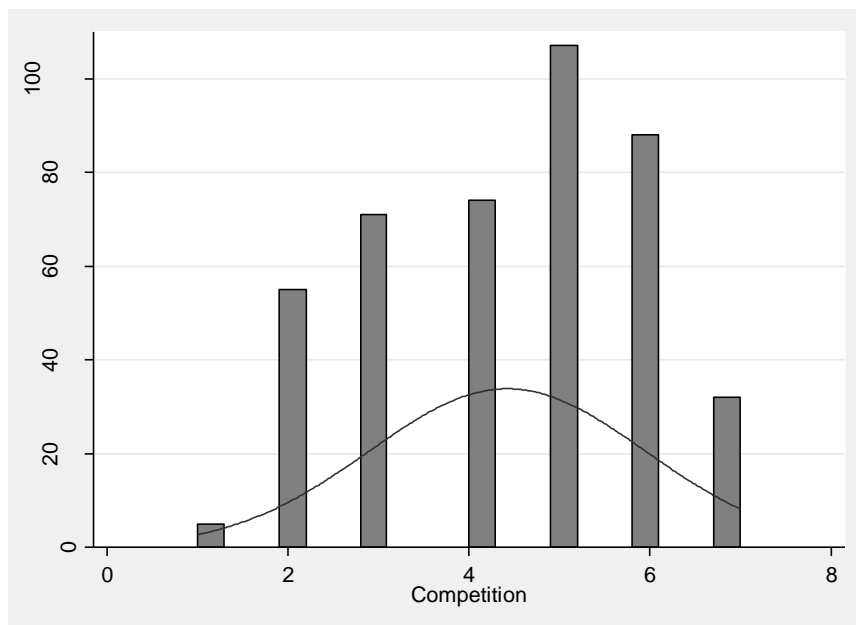
58.3 % of all MFIs implement a performance pay system. In the COOP category, the level is considerably lower than both the others. Less than one third of COOPs implement a

performance pay system, while the number is roughly two out of three for both NPOs and SHFs. There is no significant difference between the two latter categories.

Market Competition

The market competition variable is discrete and ranges from 1 to 7, where 7 is the most competitive environment. The average level of competition is 4.366, and there are a number of observations on all levels, except from the lowest level, which display only five observations.

Figure 8 - Distribution of Competition



Yet again, COOPs distinguish themselves from rest, and seem to be operating in markets that are less competitive than those of NPOs and SHFs are on average.

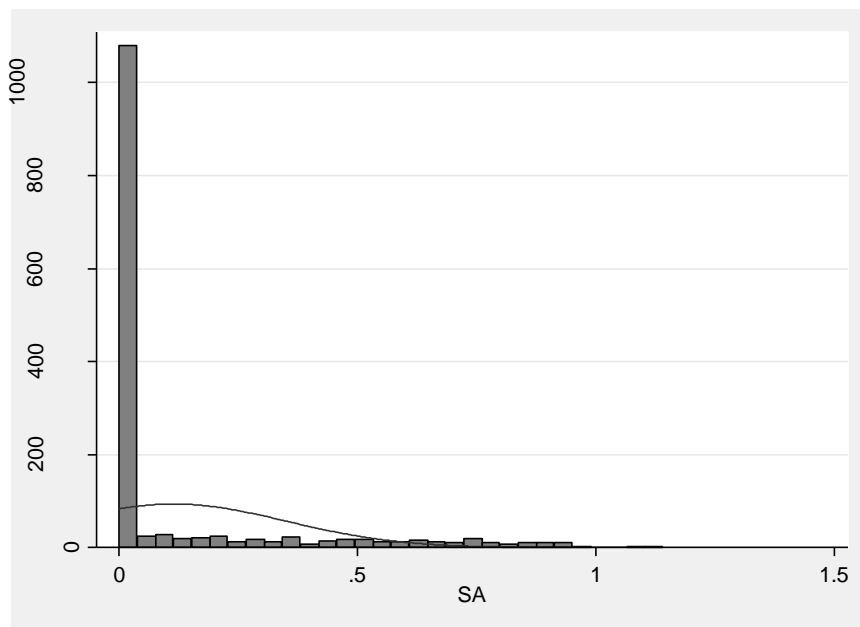
Bank Regulation

When we consider all MFIs jointly, 28.6 % are regulated. The variation between groups is conspicuous. Less than 5 % of NPOs are regulated, while almost 60 % of SHFs are. Among the COOPs, 47 % are regulated.

Savings-to-Assets Ratio

The overall mean savings-to-assets ratio is 0.114. We observe that a vast majority of our observations display zero values.

Figure 9 - Distribution of Savings-to-Asset Ratio



When looking behind the graph, we find that the number of zero values is especially high for NPOs. We also note that the average savings-to-asset ratio of NPOs is 0.016. Savings constitute less than 2 % of total assets. This should not be surprising, keeping in mind the insight from the previous section. The fact that most NPOs are unregulated effectively prohibits them from mobilizing savings, which in turn result in deflated savings-to-asset ratios. Mean savings ratio for SHFs is 0.140. COOPs display mean ratio of 0.436. This number may be driven partly by a relative small fraction of zero observations among COOPs (7 % as compared to 92 % and 59 % of NPOs and SHFs respectively).

We also note that adjusting for zero values produce consistent ranking of the groups mean ratios. This may imply that COOPs have a business model which is more reliant on mobilizing savings among clients in order to supply loans, compared to the other groups.

Main Loan Methodologies (VB, SG & Individual)

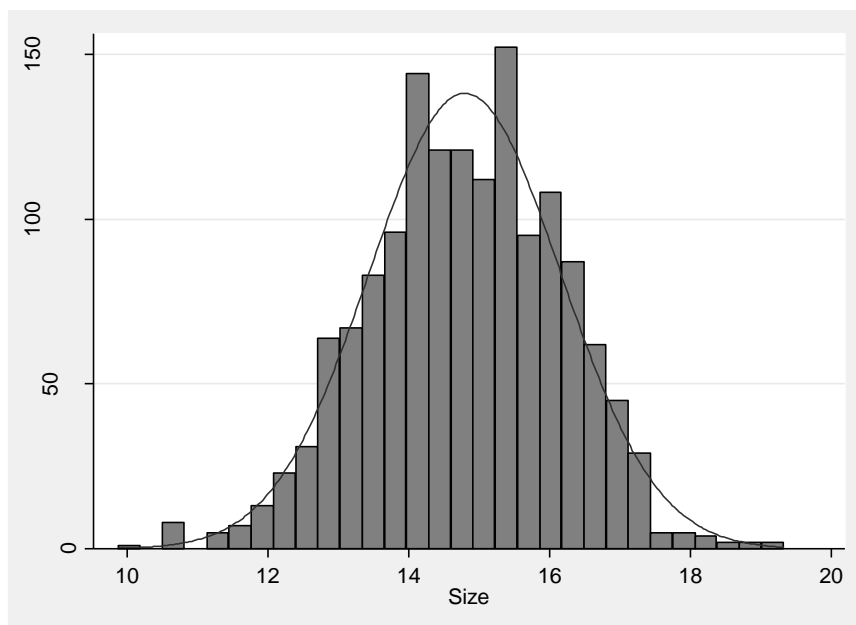
In all groups, individual lending account for the greatest share of observations, ranging from 43 % to 67 %. Village Banking is the main methodology for one of four NPOs, while for SHFs and COOPs the number is about one out of ten. The difference between them is not significant.

Lending through solidarity groups is the main methodology for slightly above 28 % of SHFs. The number is similar for NPOs, while COOPs to a lesser extent use this methodology.

Size

The mean value of the size variable is 14.797. This is however difficult to interpret, because the size variable is the logarithmic transformation of total assets. We perform this transformation due to the immense variety of size. To illustrate this the minimum value of assets is 19 288 USD, while the maximum value is 248 115 376 USD. For single observations, we can reverse the transformation and arrive at the asset value, but we cannot do the same for the mean value. This is because the mean of the logarithms is not equal to the logarithm of the mean of total assets.

Figure 10 - Distribution of Size

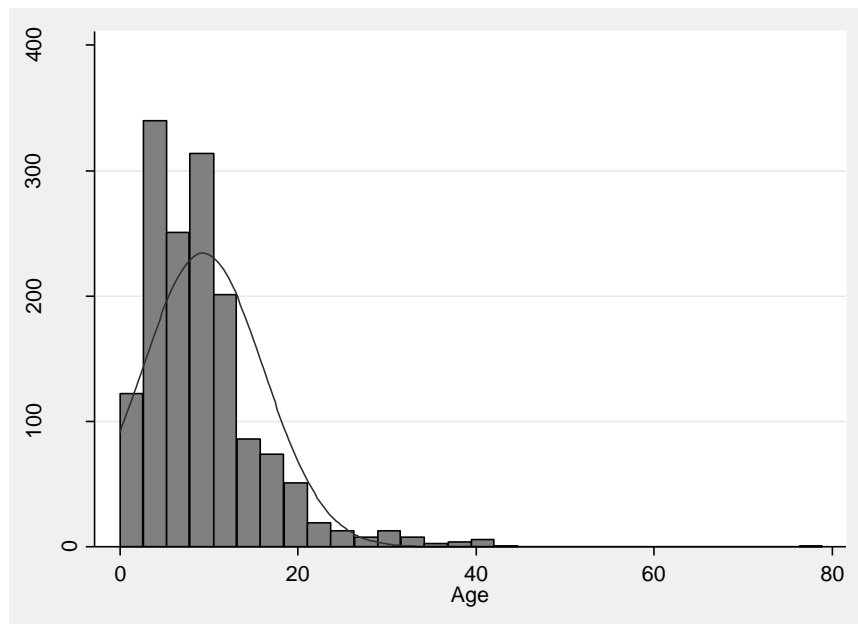


Let us turn to the descriptive properties of the total assets. The mean value of total MFI assets is 6 433 831 USD. When comparing mean total assets we observe that SHFs are typically larger than NPOs and COOPs displaying mean assets of 9 033 188 USD. COOPs are also significantly larger than NPOs.

Age

The average age of MFIs is slightly above 9 years. The oldest is however 79 years old at the last observation. Combined with the fact that no MFI can display negative age, a few old MFIs makes the distribution slightly right-tailed.

Figure 11 - Distribution of Age



On average, the COOPs are older than the NPOs, who in turn are older than the SHFs. This concurs with the evolution of microfinance described in section 2.2, as shareholder owned firms are the latest ownership form adapted in the microfinance industry.

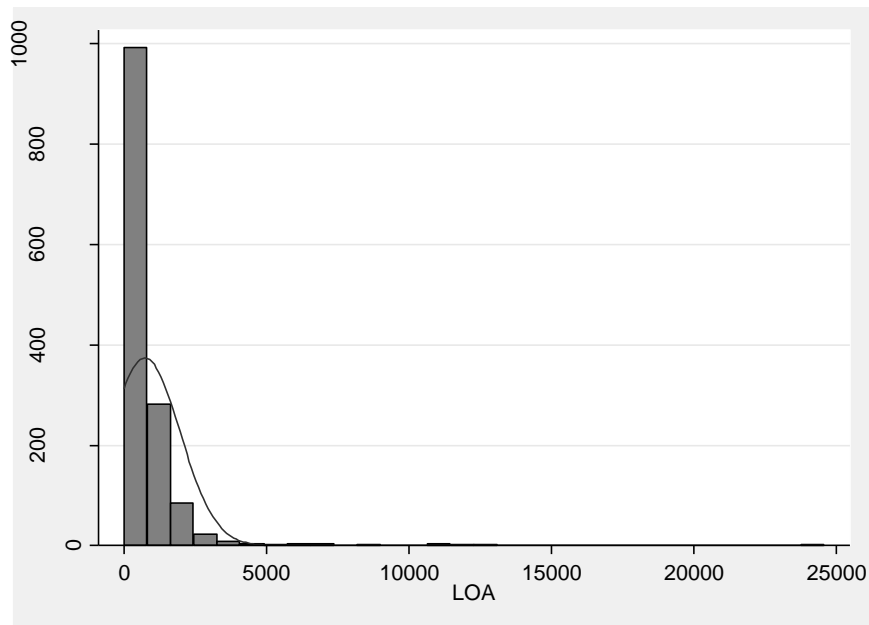
Geographical Regions

The distribution over geographical regions are not of great interest, but we notice that there are no observations of COOPs in the Middle East and Northern Africa region (MENA). We also observe that the NPOs display significantly lower share of African MFIs, but a larger share of the Latin-American MFIs.

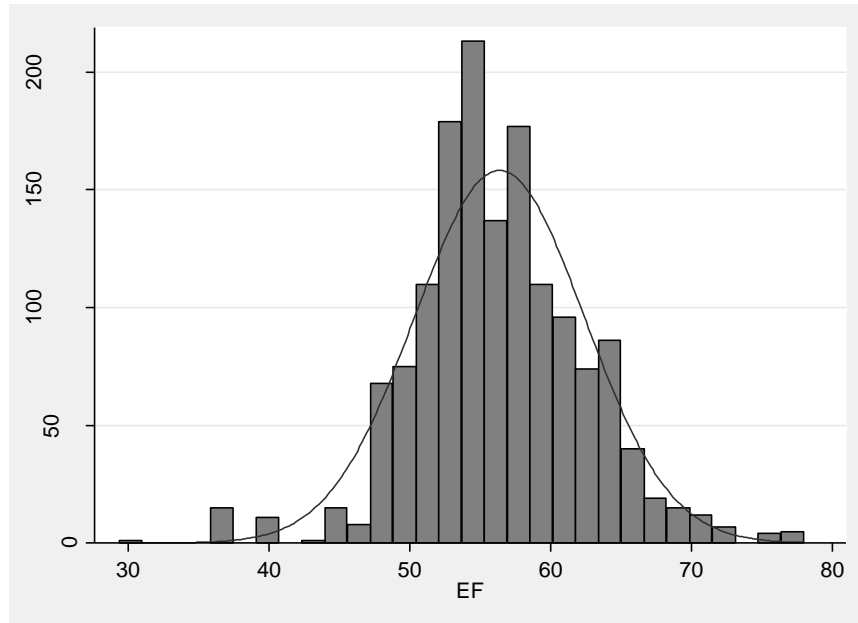
Loan Outstanding Average (LOA)

The average loan size, considering all MFIs, is approximately 750 USD. The variation among individual MFIs are tremendous, illustrated by the histogram below.

Figure 12 - Distribution of Loan Outstanding Average

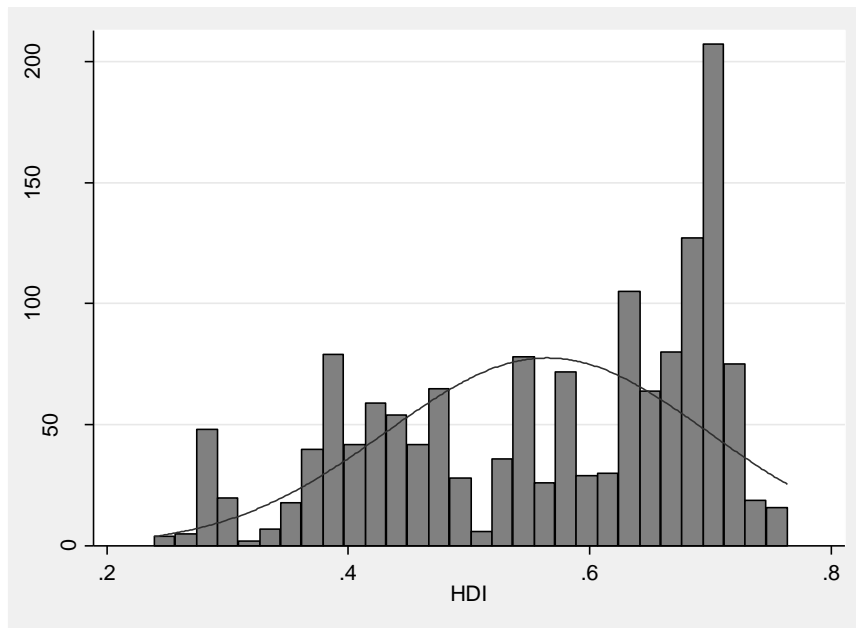


The average loan size ranges from almost zero to nearly 25,000 USD. When splitting into groups it seems apparent that COOPs typically provide the largest loans. Their mean loan size is 1,254 USD. This is peculiar given the fact that COOPs are also the group with the largest share of MFIs focusing on individual loans. The average loan size of SHFs is 826 USD, while that of NPOs is 577 USD. In studies focusing on outreach, a smaller loan size is typically associated with an objective of reaching a poorer clientele.

*Economic Freedom and Human Development Index**Figure 13 - Distribution of the Economic Freedom Index*

The Heritage Foundation computes the Economic Freedom Index, based on a thorough assessment of factors that demonstrate the rule of law, government involvement, regulatory efficiency and openness of markets. All countries receive an overall score ranging from 0 to 100. The mean score of the sample is 56.4, while an average of all rated countries is 60.4. On average, the MFIs operate in countries with less than average economic freedom, but we also observe that there is a number of observations of MFIs operating in countries with a rather high level of economic freedom. NPOs have a slightly lower average level of the economic freedom index.

Figure 14 - Distribution of the Human Development Index



The United Nations Development Programme computes the Human Development Index. The index range is 0 to 1. The mean of the sample is 0.565, compared to the 2015 world average of 0.702. This indicates that the MFIs operate in countries that are less developed than the average country. This graph also demonstrates a large variation among our observations. The average levels of the different ownership types are all in the range between 0.5 and 0.6, with NPOs displaying the highest mean level at 0.590. The interpretation is that NPOs on average operate in more developed countries, than other MFIs. This contradicts the traditional notion that NPOs target the poorest clients and therefore operate in the least developed countries.

5.4 Regression Results and Discussion

The models are evaluated using the pooled OLS technique and the results of the models that utilize the operating expense to portfolio ratio as dependent variable is presented first. The result for the personnel cost and personnel productivity models follow subsequently.

Table 3 - OEP Models Estimated with Pooled OLS

VARIABLES	(1) OEP	(2) OEP	(3) OEP
NPO	-0.0228 (0.0346)	0.00172 (0.0445)	-0.0198 (0.0393)
COOP	-0.177*** (0.0338)	-0.179*** (0.0312)	-0.112*** (0.0393)
Competition		-0.0133 (0.00915)	-0.00738 (0.00797)
InternalAudit		-0.0113 (0.0289)	0.0570* (0.0340)
PerformancePay		0.0330 (0.0269)	0.0679** (0.0275)
Regulation		-0.0207 (0.0423)	0.00591 (0.0459)
SA		0.0210 (0.0677)	0.00538 (0.0679)
VB			0.173*** (0.0424)
SG			0.0773 (0.0486)
Size			-0.0559*** (0.0108)
Age			-0.00517** (0.00221)
Asia			0.0385 (0.0469)
Afr			0.283*** (0.0676)
MENA			0.0616* (0.0358)
LA			0.0973** (0.0381)
LOA			-1.98e-05** (8.14e-06)
EF			0.00386** (0.00150)
HDI			0.575*** (0.207)

Constant	0.358*** (0.0302)	0.384*** (0.0465)	0.494** (0.214)
Observations	1,419	1,168	1,087
R-squared	0.034	0.055	0.269

Note: OEP is the operating expense to portfolio ratio. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

*Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Which means that the null hypothesis, stating no effect of the explanatory variable on the target variable, is rejected at respectively 1 %, 5 % and 10 % significance levels. See Appendix 4 for a general discussion of significance levels.*

NPOs appear to have an OEP ratio similar to the SHFs. This result is also consistent when we include control variables. The lack of significance may be discouraging at first, but the insight of the interpretation is interesting. The model suggests that there is no difference between NPOs and SHFs when considering their operating expenses relative to their portfolio. The insignificant coefficient is changing its sign back and forth between positive and negative, further highlighting the obscurity of the effect. This result challenges the established view among policy makers, that SHFs are more cost efficient than NPOs.

The OEP ratio is significantly lower for COOPs. The COOPs maintain this characteristic even after we control for governance mechanisms and other factors like size and geography. The coefficient indicates that, when we do not control for any other factors than ownership type, the COOPs have an OEP that is 0.18 lower than SHFs. This corresponds with the descriptive analysis. Controlling for governance mechanisms does not change the coefficient, but in the full model, the coefficient is reduced to 0.11. This indicate that the two first models may suffer from omitted variable bias, while this bias is reduced when introducing more control variables.

The result contradicts the hypothesis proposed by the agency theory, which suggested that COOPs should display higher OEP ratios than SHFs. Mersland (2009) provides a possible explanation for this result. In cooperatives, there is a diverging interest between net-borrowers and net-depositors. Initially, one would think that balancing the conflicting interest could be costly. Still, Falkenberg (1996) suggested that the conflict of interest actually serves as a governance mechanism that reduces the costs in the cooperatives. The net-borrowers put pressure on the organization to lower interest rates while net-depositors encourage the

management to increase the rates. This can result in a slim and effective organization, which is a necessity for thriving with a small net interest margin.

Furthermore, it is worth noticing that the inclusion of governance variables (model 2) adds virtually nothing to our analysis. No governance mechanisms appear to have a significant effect on the OEP ratio, coefficients of the ownership variables are unchanged, and the explanatory power of the model is still low. There may be two different explanations for why we observe this. First, there may be some sort of heterogeneity leading the coefficients to be biased. Specifically we call this a type 2 error. The model does not detect an effect that actually exists (Løvås, 1999). A second explanation may be that the positive effect of a certain governance mechanism, such as aligned incentives or increased control, does not surpass the added costs of implementing the system. The overall effect is therefore neutral.

When we include additional control variables, we observe that many of them have a significant effect on the OEP ratio. Among the variables that display a positive relation with the ratio are the dummies for village banking method, African MFI, and the HDI. We interpret that an MFI deploying the village banking method, or operating in Africa, will incur higher operating expenses relative to their portfolio size than otherwise identical MFIs. MFIs operating in a more developed country will also be associated with a higher OEP ratio.

Other variables have a significant negative relation to the OEP ratio. For example, the data supports a statement claiming that larger MFIs are associated with lower OEP ratios. The coefficient related to age and average loan size have a similar sign. Learning curve effects and economies of scale may explain the two first. For a given portfolio size, it also seems quite intuitive that the cost of servicing a few large clients must be lower than the cost of serving many small clients.

We also notice that, when we introduce more control variables, some of the previously insignificant governance variables become significant. At respectively 5 % and 10 % significance level, performance pay systems and internal audits display a positive relation with the OEP ratio. This means that, all else equal, MFIs with some sort of performance pay system will have a ratio between operating expenses and portfolio that is 0.0679 higher. For internal audits, the effect is slightly lower at 0.057.

It is easy to point to the fact that both systems involve costs for the organization. For example, implementation of a performance pay system would require management, which is not cost-

free. On the other hand, the agency theory teaches us that agency costs should be reduced through the alignment of incentives. Our analysis indicates that the added costs of implementing a system for performance payment in MFIs exceeds the benefits of reduced agency costs.

With this insight in mind, it also makes sense to look at the other governance mechanisms that display insignificant effects on the OEP ratio. The variable for the savings-to-asset ratio and the dummy for bank regulation both display coefficients that are not significantly different from zero. This may indicate that the costs related to mobilizing savings outweigh the reduction in agency costs stemming from the governance effect of savings. Similarly, the cost of complying with bank regulation may even out the positive governance effect of regulation.

Table 4 - Personnel Cost Models Estimated with Pooled OLS

VARIABLES	(1) CostEmpl	(2) CostEmpl	(3) CostEmpl
NPO	687.1 (466.4)	538.6 (578.8)	89.81 (580.7)
COOP	-1,458** (579.0)	-221.9 (752.3)	-899.1 (673.2)
Competition		411.5*** (148.7)	171.3 (139.4)
InternalAudit		860.9* (444.0)	-303.3 (404.9)
PerformancePay		1,500*** (465.5)	400.4 (384.5)
Regulation		-633.0 (618.1)	-160.7 (596.7)
SA		307.5 (1,033)	-902.7 (906.0)
VB			-402.6 (528.5)
SG			-114.3 (532.3)
Size			1,177*** (155.4)
Age			-5.763 (21.18)
Asia			-3,897*** (997.4)
Afr			-452.7 (1,325)
MENA			-3,532*** (1,063)

LA			-122.4 (691.7)
LOA			0.173 (0.231)
EF			-29.90 (27.63)
HDI			8,181** (3,552)
Constant	6,181*** (323.2)	3,359*** (876.5)	-14,187*** (3,528)
Observations	1,250	1,048	977
R-squared	0.028	0.103	0.380

Note: CostEmpl is the personnel cost per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

*Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Which means that the null hypothesis, stating no effect of the explanatory variable on the target variable, is rejected at respectively 1 %, 5 % and 10 % significance levels. See Appendix 4 for a general discussion of significance levels.*

Table 4 presents the results of the models that estimate the effect of ownership type on personnel cost, measured by the overall personnel cost divided by total number of employees. The variable is a proxy for average wage level.

NPOs display consistently positive coefficients, suggesting that there may be a positive relation between non-profit MFIs and a higher average compensation of employees. The coefficients are however also consistently insignificant, meaning that we cannot, with a reasonable certainty, conclude that a positive effect exists.

The lack of significance suggest that there is no proven relation between the ownership type and cost per employee. This contradicts our hypothesis of a positive relationship between ownership type and employee costs. Other theories may contribute to shedding light over the lack of conformity between our hypothesis and the regression results.

Besley and Ghatak's (2004) theory of motivated agents highlights that agents may experience a motivational effect when they work in an organization whose goals are coinciding with their own. For example, one could argue that employees may identify themselves with the noble intentions of a non-profit and hence be more motivated, than their colleagues in the SHFs are.

This motivational effect may reduce the need for pecuniary incentives, which would imply a negative effect of non-profit MFIs on cost per employee. As we can see, the traditional agency theory and the theory on motivated agents propose different effects of non-profit ownership on employee cost. A possible interpretation may be that these effects level each other out, and thus result in insignificant coefficients of NPOs.

COOPs stand out when it comes to personnel costs per employee as well. In the simplest model, we see that, on a 5 % significance level, the COOPs have a lower personnel cost per employee. The coefficient shows that the average cost per employee is actually 1 458 USD lower in COOPs than in SHFs. Once again, the effect of COOPs contradicts our hypothesis. The hypothesis proposed a positive correlation between cooperative MFIs and the cost of employees. As opposed to the OEP models, we observe that the inclusion of governance mechanism wipes out the effect of COOPs. This indicates that the negative effect in model 1 may be a result of omitted variable bias. The effect first assigned to cooperatives may better be explained by differences in governance structures.

Competition level and performance pay systems have effects on 1 % significance level, while internal audits also has an effect on 10 % level. All significant governance effects are positive, meaning that for example introducing a performance pay system is associated with higher overall personnel cost per employee. We explain this by referring to the internal audit variable. An MFI that implements such a system must employ employee auditors. Such personnel are often highly skilled and require a compensation above the average of the organization. Based on this logic, it does not seem surprising that MFIs with internal audit systems display higher costs per employee. The reason behind this could also be that high-cost MFIs hire more auditors because they need to improve. These arguments supports the observed effect, but reverse the causality of the argument.

The positive coefficients for these governance mechanisms give important implications for practitioners. If governance mechanisms are implemented to improve the overall performance of the MFI, they must result in cost reductions in other areas, or increased income that exceeds the implementation costs, to be justifiable.

When introducing even more control variables (model 3) the explanatory power of the model is significantly increased. The governance mechanism coefficients are no longer statistically significant, but some of the new control variables are. The ownership variables are still

insignificant. Size and HDI display positive coefficients, implying that respectively larger MFIs, and MFIs operating in more developed countries have higher personnel costs per employee. Originally, we included the HDI as a proxy for the dollarized wage level of different countries, stating that the unobserved wage level will likely have a positive correlation with the development level. The observed positive effect of HDI on employee corresponds well to this idea. The dummy variables for Asia and MENA regions show negative coefficients, suggesting that MFIs operating in these regions have significantly lower costs per employee than MFIs operating in Eastern Europe and Central Asia, which serves as the reference category.

Table 5 - Personnel Productivity Models Estimated with Pooled OLS

VARIABLES	(1) PersProd	(2) PersProd	(3) PersProd
NPO	5.810 (10.02)	-3.749 (12.14)	-6.829 (10.56)
COOP	-37.19*** (11.42)	-26.76* (14.85)	1.280 (14.33)
Competition		-0.621 (3.149)	0.768 (2.693)
InternalAudit		2.383 (8.452)	-11.41 (7.686)
PerformancePay		-9.745 (9.665)	-7.972 (7.877)
Regulation		-8.719 (13.19)	-22.36** (9.938)
SA		-42.78* (22.50)	-51.13*** (18.67)
VB			67.08*** (11.18)
SG			50.88*** (11.78)
Size			19.75*** (2.929)
Age			1.509* (0.791)
Asia			39.50 (24.98)
Afr			28.86 (20.22)
MENA			-3.946 (16.81)
LA			-3.919 (9.997)

LOA			-0.0155*** (0.00321)
EF			0.326 (0.487)
HDI			5.798 (52.18)
Constant	128.1*** (8.582)	143.4*** (20.81)	-202.3*** (60.28)
Observations	1,403	1,154	1,084
R-squared	0.025	0.038	0.375

Note: PersProd is personnel productivity defined as number of credit clients per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

*Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Which means that the null hypothesis, stating no effect of the explanatory variable on the target variable, is rejected at respectively 1 %, 5 % and 10 % significance levels. See Appendix 4 for a general discussion of significance levels.*

The models presented in Table 5 is complementary to the previous in taking productivity of the employees into account, by estimating the effect of ownership type on the number of clients per employee.

In model (1) there is no significant difference between NPOs and SHFs. While this contradicts our original hypothesis, the hypothesis was largely founded on the proposed effect in the employee cost model. When NPOs are not associated with higher levels of employee cost, there is little reason to believe that they should be more effective. On the contrary, one could even imagine that the SHFs' proposed advantage in carrying out control functions would make them better able to prevent shirking, and thus promote a higher level of productivity. The insignificant coefficients do however not support a proposition like this. After including different amounts of control variables, the sign of the coefficient changes. This indicates that when we control for other factors, NPOs are generally less efficient than SHFs, not more, as the first model suggests. However, none of the coefficients is significantly different from zero, so we cannot conclude that a relationship exists.

The COOPs stand out also in this last group of models. The COOPs appear to be less efficient than their peers are. In model (1) the coefficient tells us that on average an employee in a COOP serve 37 clients less than an employee in a SHF. The significance level is 1 %.

Including governance mechanisms as control variables changes the coefficient to roughly minus 27, but it is still significant on a 10 %-level. When we include additional control variables, the COOPs are no longer significantly different from the SHFs. A decreasing degree of omitted variable bias in models 1 and 2 may explain the diminishing significance of the COOP coefficient we observe when more control variables are included.

When turning to the control variables we observe that the savings-to-assets ratio display a significantly negative effect in both models. The interpretation is that, if everything else is kept equal, a higher level of the savings-to-asset ratio will be associated with a lower number of credit clients per employee. An explanation for why we observe this relation may be that when an MFI start to collect savings, they will have to use employees to manage this part of their business. If they appoint extra personnel to perform these tasks, they increase the denominator of the ratio. If they, on the other hand relocate existing credit officers, they are likely to reduce the number of credit clients, hence reducing the numerator of the ratio. Either way, the ratio of credit clients to employees seems to diminish, when introducing a savings program.

Furthermore, we observe that in the last model, regulation is also associated with a reduction in the personnel productivity ratio. The explanation is somehow coinciding with that of mobilizing savings. If an MFI is regulated by banking authorities, some personnel must be assigned to make sure the MFI complies with the regulating standards. This can again be done through outside or inside recruitment, which both result in a diminishing personnel productivity ratio.

We can also observe that the group lending methods are associated with higher employee efficiency, as is also elder and larger MFIs. To the contrary, MFIs with a high average loan size tend to display a lower ratio of credit clients to employees. When we control for size, the latter may be seen as trivial. If an MFI choose to increase the average loan size, they have to reduce the number of credit clients served, if the funds available is limited.

5.5 Robustness checks

In this chapter, we are running alternative regressions in order to test the robustness of the results from the pooled OLS analysis.

5.5.1 Random Effects Analysis

We return to the discussion from the research methodology chapter. We have analysed our data using the pooled OLS method, and now we re-introduce the random effects model.

We perform a random effects analysis to verify the robustness of our results. As the three-by-three structure of the models are identical to the pooled OLS, we only alter our analytical method.

Table 6 - OEP Models Estimated with Random Effects

VARIABLES	(1) OEP	(2) OEP	(3) OEP
NPO	-0.0132 (0.0310)	0.0196 (0.0372)	-0.0151 (0.0351)
COOP	-0.160*** (0.0317)	-0.168*** (0.0287)	-0.134*** (0.0345)
Competition		-0.0159* (0.00812)	-0.00575 (0.00733)
InternAudit		-0.0155 (0.0255)	0.0663** (0.0325)
PerformancePay		0.00871 (0.0231)	0.0561** (0.0246)
Regulation		-0.00607 (0.0333)	0.0236 (0.0414)
SA		-0.00638 (0.0536)	0.0187 (0.0434)
VB			0.144*** (0.0357)
SG			0.0641 (0.0420)
Size			-0.0833*** (0.0143)
Age			-0.00402** (0.00189)
Asia			0.0146 (0.0443)
Afr			0.252*** (0.0640)
MENA			0.0726** (0.0329)

LA			0.102*** (0.0366)
LOA			-1.37e-05 (8.98e-06)
EF			0.00288** (0.00128)
HDI			0.497** (0.202)
Constant	0.346*** (0.0280)	0.395*** (0.0406)	0.986*** (0.207)
Observations	1,419	1,168	1,087
Number of case	378	298	286

Note: OEP is the operating expense to portfolio ratio. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

*Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Which means that the null hypothesis stating no effect of the explanatory variable on the target variable is rejected at respectively 1 %, 5 % and 10 % significance levels. See Appendix 4 for a general discussion of significance levels.*

For the models which make use of the OEP ratio as dependent variable we observe more or less identical results as we did in the pooled OLS analysis. The main differences are that the coefficient for competition is significant on a 10 % level in the RE model (2), and insignificant in the OLS analysis. In model 3 the average loan size is not significant in the RE model. Apart from this, the same variables have significant coefficients, the signs of the coefficients are consistent, and the size of the coefficients are also fairly consistent with OLS.

Table 7 - Personnel Cost Models Estimated with Random Effects

VARIABLES	(1) CostEmpl	(2) CostEmpl	(3) CostEmpl
NPO	353.9 (416.1)	767.9 (514.2)	346.5 (504.1)
COOP	-1,759*** (560.4)	-376.6 (622.1)	-1,074* (581.8)
Competition		405.7*** (124.5)	150.2 (119.2)
InternAudit		848.7** (363.9)	-258.0 (368.7)

PerformancePay		1,228*** (373.7)	83.43 (310.7)
Regulation		150.9 (508.1)	81.06 (513.0)
SA		340.0 (655.9)	-732.8 (668.5)
VB			-133.4 (411.9)
SG			-110.8 (450.6)
Size			1,235*** (142.9)
Age			23.72 (20.93)
Asia			-4,149*** (872.5)
Afr			-831.6 (1,165)
MENA			-3,843*** (1,116)
LA			-406.5 (565.5)
LOA			0.0876 (0.101)
EF			17.81 (21.88)
HDI			7,795** (3,209)
Constant	6,079*** (310.6)	3,007*** (708.1)	-17,483*** (3,102)
Observations	1,250	1,048	977
Number of case	332	269	258

Note: CostEmpl is the personnel cost per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

*Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Which means that the null hypothesis, stating no effect of the explanatory variable on the target variable, is rejected at respectively 1 %, 5 % and 10 % significance levels. See Appendix 4 for a general discussion of significance levels.*

The RE analysis using personnel cost per employee as dependent variable also generates similar results as the pooled OLS model. The coefficient of the COOPs is now significant at a 10 % level in model 3, but apart from that, all the same variables display significant

coefficients. We observe some variation in the size of the coefficients, but the sign of significant coefficients are consistent.

Table 8 - Personnel Productivity Models Estimated with Random Effects

VARIABLES	(1) PersProd	(2) PersProd	(3) PersProd
NPO	-4.782 (10.35)	-10.12 (14.74)	-3.961 (14.06)
COOP	-42.22*** (11.46)	-37.06*** (14.02)	-23.38 (15.06)
Competition		3.051 (2.714)	0.629 (2.425)
InternAudit		8.254 (6.452)	-3.372 (7.584)
PerformancePay		-1.142 (8.145)	-6.097 (7.059)
Regulation		-3.881 (12.24)	-22.80** (10.91)
SA		-14.60 (13.70)	-17.11 (13.96)
VB			51.41*** (17.69)
SG			42.05*** (13.13)
Size			13.79*** (3.849)
Age			2.114* (1.199)
Asia			39.60 (28.44)
Afr			30.84 (24.41)
MENA			-13.67 (21.49)
LA			-18.92 (21.90)
LOA			-0.00858** (0.00436)
EF			0.694* (0.415)
HDI			3.948 (60.76)
Constant	135.7*** (9.223)	121.9*** (18.52)	-139.5** (66.02)
Observations	1,403	1,154	1,084
Number of case	371	293	283

Note: PersProd is personnel productivity defined as number of credit clients per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

*Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Which means that the null hypothesis, stating no effect of the explanatory variable on the target variable, is rejected at respectively 1 %, 5 % and 10 % significance levels. See Appendix 4 for a general discussion of significance levels.*

When we examine the personnel productivity models using RE, we find two differences in model 3. The coefficient for savings-to-assets ratio was significant at 1 % level when we used pooled OLS, but when we turn to RE the coefficient is no longer significantly different from zero. For the economic freedom variable, the effect is contrasting. An insignificant effect in the pooled OLS model is turned to a significantly positive relation when we use the RE method. The coefficient is significant at a 10 % level.

The values of other coefficients differ between the two methods, but all significant coefficient have consistent signs. In general, the random effect models confirm the results obtained from the pooled OLS analyses.

5.5.2 Cross-Sectional Analysis (OLS)

In order to challenge the results from the pooled OLS analysis further, we also conduct an OLS analysis on a cross section of the MFIs. In a cross-sectional analysis we neglect the inner variation in the MFIs, in other words, the time variation in an individual MFI.

Because the cross-section is compiled of observations of MFIs from different points in time, we must include a variable stating which year the observation is from. When we estimated our models, the year variable was consistently insignificant for all regressions. Based on the consistent insignificance we refrain from reporting the year variable in our tables.

Table 9 - OEP Models - Cross-Sectional Analysis

VARIABLES	(1) OEP	(2) OEP	(3) OEP
NPO	0.0129 (0.0236)	0.0362 (0.0259)	0.00184 (0.0203)
COOP	-0.103*** (0.0219)	-0.117*** (0.0252)	-0.0726*** (0.0232)
Competition		-0.0249 (0.0197)	0.0196 (0.0201)
InternAudit		0.0132 (0.0199)	0.0267 (0.0180)
PerformancePay		-0.00592 (0.00593)	-0.00105 (0.00547)
Regulation		-0.0174 (0.0227)	-0.0135 (0.0207)
SA		0.0688 (0.0528)	0.0544 (0.0422)
VB			0.110*** (0.0274)
SG			0.0587** (0.0237)
Size			-0.0286*** (0.00799)
Age			-0.00266*** (0.000956)
Asia			0.000202 (0.0345)
Afr			0.160*** (0.0426)
MENA			0.0133 (0.0296)
LA			0.0752*** (0.0208)
LOA			-3.95e-05*** (9.87e-06)
EF			0.00356*** (0.00130)
HDI			0.412*** (0.133)
Constant	0.279*** (0.0335)	0.286*** (0.0398)	0.218 (0.164)
Observations	375	289	275
R-squared	0.042	0.093	0.413

Note: OEP is the operating expense to portfolio ratio. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa.

MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

*Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Which means that the null hypothesis stating no effect of the explanatory variable on the target variable is rejected at respectively 1 %, 5 % and 10 % significance levels. See Appendix 4 for a general discussion of significance levels.*

We notice that COOPs are still associated with significantly lower OEP ratios than SHFs in all models. The sizes of the coefficients are also somehow consistent. NPOs are also displaying consistent coefficient throughout the models, but the positive relation to OEP ratio is never significant.

We observe some differences when we compare the results of the pooled OLS with OLS analysis of a cross-section of observations. Performance pay and internal audit, which both had a positive relation to the OEP ratio in the pooled OLS model do not have any significance in the cross-sectional analysis. Other dissimilarities between the pooled OLS analysis and the cross-sectional OLS analysis are a significant positive effect of solidarity group lending, and a lack of significant effect of the Middle East and Northern Africa dummy when the cross section is examined. The MENA had a positive effect in the pooled OLS model. The differences are all in model 3. Unmentioned significant coefficients display consistent signs.

Table 10 - Personnel Cost Models - Cross-Sectional Analysis

VARIABLES	(1) CostEmpl	(2) CostEmpl	(3) CostEmpl
NPO	663.3 (519.3)	960.3 (718.2)	701.4 (709.4)
COOP	-1,121 (686.4)	565.4 (830.0)	87.96 (898.1)
Competition		1,059** (537.3)	-481.5 (502.9)
InternAudit		1,854*** (615.1)	386.8 (529.5)
PerformancePay		437.0** (180.1)	183.6 (169.4)
Regulation		-249.7 (731.8)	302.7 (721.2)
SA		319.6 (1,123)	-925.7 (1,209)
VB			-93.22 (577.9)

SG			-166.4 (677.3)
Size			1,382*** (199.8)
Age			-46.14 (29.38)
Asia			-3,589*** (1,157)
Afr			842.4 (1,533)
MENA			-3,723*** (1,433)
LA			188.9 (818.4)
LOA			0.308 (0.363)
EF			4.741 (35.95)
HDI			11,873*** (4,074)
Constant	6,373*** (718.6)	3,122** (1,259)	-22,171*** (4,595)
Observations	322	256	243
R-squared	0.020	0.114	0.427

Note: CostEmpl is the personnel cost per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

*Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Which means that the null hypothesis, stating no effect of the explanatory variable on the target variable, is rejected at respectively 1 %, 5 % and 10 % significance levels. See Appendix 4 for a general discussion of significance levels.*

The cross-sectional analysis of costs per employee shows no significant effects of any ownership forms. The pooled OLS analyses were also weak on significant effects, but displayed a negative effect of COOPs in model 1. The effect of COOPs switches from negative to positive when control variables are introduced, but the coefficient remains insignificant. The NPOs display consistently positive, but also insignificant effects throughout the models. In model 2 and 3, the same variables have significant coefficients as in the corresponding models analysed with pooled OLS. The variables also display consistent signs and sizes.

Table 11 - Personnel Productivity Models - Cross-Sectional Analysis

VARIABLES	(1) PersProd	(2) PersProd	(3) PersProd
NPO	-2.012 (12.31)	-17.71 (15.90)	-23.32 (15.67)
COOP	-46.91*** (13.79)	-40.32** (17.53)	-2.750 (18.71)
Competition		0.691 (11.16)	-20.84* (10.69)
InternAudit		-14.34 (13.29)	-14.31 (10.70)
PerformancePay		-0.0423 (4.075)	0.375 (3.427)
Regulation		-4.009 (15.92)	-24.16* (13.52)
SA		-55.74** (27.57)	-70.12*** (24.66)
VB			73.45*** (15.63)
SG			48.61*** (12.52)
Size			24.24*** (3.969)
Age			2.647** (1.286)
Asia			10.00 (29.97)
Afr			15.45 (25.43)
MENA			-37.38 (24.27)
LA			-18.49 (13.74)
LOA			-0.0266*** (0.00472)
EF			-0.363 (0.733)
HDI			-19.56 (67.18)
Constant	145.5*** (18.39)	182.4*** (34.28)	-172.8* (98.79)
Observations	368	284	272
R-squared	0.028	0.052	0.426

Note: PersProd is personnel productivity defined as number of credit clients per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity

Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

*Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$,*

** $p < 0.1$ Which means that the null hypothesis, stating no effect of the explanatory variable on the target variable, is rejected at respectively 1 %, 5 % and 10 % significance levels. See Appendix 1 for a general discussion of significance levels.*

At last, we turn to the personnel productivity model. When analysing the cross section using model 3, we find that internal audit has a negative effect on productivity. The effect is significant on 10 % level, and is distinguished from the results of the pooled OLS analysis. This is the only case where a variable display a significant effect in the cross-sectional analysis and not in the pooled OLS analysis. For all other significant coefficients from the pooled OLS, the signs are consistent, while the size of the effects vary.

Overall, the results of the robustness checks are in line with the result of our pooled OLS analysis. The consistency of the results strengthens our confidence in the analyses. Nevertheless, all methods have their weaknesses. Endogeneity problems are prevalent and some of the RE models are also incorrectly specified according to the Hausman-test. These problems persuade us to use caution in reading causality into the results, in spite of the affirming results of the robustness checks.

5.6 Summary of the models

Table 12 - Summary of the Results

Dependent variable	Method	Model	NPO	COOP	
Operating Expense to Portfolio (OEP)	Hypothesis		+	+	
	Pooled OLS	1	0	-	
		2	0	-	
		3	0	-	
	Random Effects	1	0	-	
		2	0	-	
		3	0	-	
	Cross-section OLS	1	0	-	
		2	0	-	
		3	0	-	
	Personnel Cost per Employee (CostEmpl)	Hypothesis		+	+
		Pooled OLS	1	0	-
2			0	0	
3			0	0	
Random Effects		1	0	-	
		2	0	0	
		3	0	-	
Cross-section OLS		1	0	0	
		2	0	0	
		3	0	0	
Personnel Productivity (PersProd)		Hypothesis		+	+
		Pooled OLS	1	0	-
	2		0	-	
	3		0	0	
	Random Effects	1	0	-	
		2	0	-	
		3	0	0	
	Cross-section OLS	1	0	-	
		2	0	-	
		3	0	0	

Note: + signify a positive effect, meaning that the coefficient of the display, or is expected to display a positive sign. - signify a negative effect, meaning that the coefficient of the display, or is expected to display a negative sign. 0 indicate that the variable display an insignificant effect, the coefficient is not significantly different from zero, when evaluated at 1 %, 5 % and 10 % significance level. See Appendix 1 for a general discussion of significance levels.

6. Conclusion

Motivated by an increased consciousness of costs in the microfinance industry, and a call from policy makers for transformation of nonprofit MFIs, this study has investigated the relation between ownership types and costs in microfinance institutions.

Economic theory propose that shareholder owned firms should be more cost-effective than nonprofits and cooperatives, mainly due to their advantageous incentive structure. However, our empirical analysis do not concur with the theoretical propositions. Regardless of model specification and method of analysis, the nonprofit variable displays insignificant effects on MFI costs. One plausible interpretation is that operating structures of nonprofits and SHFs are fairly similar. This suggestion does however not correspond well with the descriptive evidence provided in Table 2. For example, NPOs display a larger propensity for group lending, while SHFs generally provide larger loans. These two characteristics may even each other out, when it comes to total effect on MFI costs. Group lending is considered to be cost effective because some of the monitoring control function is outsourced to the inner justice of the groups. Larger loan size is also associated with lower costs, since fixed costs contribute a considerable fraction of the overall costs related to a loan. These effects are confirmed by our results from regression 3, displayed in Table 3, regression 3.

An alternative explanation is that NPOs possess some undisclosed cost benefits that balance the drawbacks of their incentive structure. For example, the environment the MFI operates in may favor NPOs through beneficial tax treatment. This example illustrates the issue of endogeneity, as the advantageous tax system may have affected the organizations original choice of nonprofit status. In other words, the nonprofit organization form may affect the cost structure; but the cost structures may also affect the choice of organizational form. The possible two-way causality limits our ability to interpret our results as causal effects of ownership type on MFI costs. A favorable environment may be one potential source of cost benefits, NPOs may also have other cost advantages compared to SHFs. We encourage further research on the cost advantages of the nonprofit organization form.

Our analysis also show that cooperatives display significantly lower operating expenses than shareholder owned firms do. This contradicts our hypothesis, but Falkenberg (1996) provides a plausible explanation, based on the conflict of interest between net-borrowers and net-depositors in cooperatives. Net-borrowers have a desire for low interest rates, while the net-

depositors would argue for higher interest rates because it benefits them. This cross pressure advocates slim margins between borrowing and deposit rates. Operating with a slim interest margin can only be sustainable if operational costs are low, and the conflict of interests can therefore serve as a governance mechanism in cooperatives.

Different econometric models were utilized to evaluate the theoretical hypotheses. The random effects model and an OLS analysis of a cross section of MFIs confirmed the results of the pooled OLS model. However, results must be interpreted carefully as the assumptions for consistent estimates were violated for all of the models. Specifically, the lack of exogeneity is a recurring issue in all models. The Hausman test for misspecification also uncovers that some of the RE models were misspecified.

To control for other factors than ownership type that is expected to affect costs in the MFIs, a number of control variables are included in our analyses. Overall, the models generate consistent results after the inclusion of control variables, but the negative effect of COOPs on personnel cost and personnel productivity is wiped away. This may indicate that the lower personnel cost and higher personnel productivity displayed by COOPs in the simplest models are better explained by the differences in the control variables.

Despite problems of endogeneity, this study should encourage further research on the subject of ownership costs in microfinance. Specifically, we recommend other researchers to investigate the relation of ownership type and employee cost, for example through a more detailed assessment of the effect of incentive wages and performance pay in MFIs.

7. References

- Aghion, P., & Tirole, J. (1997). Formal and Real Authority in Organizations. *Journal of Political Economy*, 105(1), 1-29. doi: 10.1086/262063
- Armendariz, B., & Morduch, J. (2010). *The Economics of Microfinance* (2nd ed.). Cambridge, MA: MIT Press.
- Bacchiega, A., & Borzega, A. (2003). The Economics of the Third Sector: Toward a More Comprehensive Approach. In H. Anheier and A. Ben Ner (Eds.) *The Study of the Nonprofit Enterprise: Theories and Approaches* (pp. 27-48). New York: Kluwer Academic / Plenum Publishers.
- Baltagi, B. H. (2013). *Econometric Analysis of Panel Data* (5th ed.). Chichester: Wiley.
- Baltagi, B. H., & Li, Q. (1990). A Comparison of Variance Components Estimators Using Balanced Versus Unbalanced Data. *Econ Theory*, 6(2) 283-285. doi: 10.1017/S026646660000517X
- Banerjee, A., Karlan, D., & Zinman, J. (2015). Six Randomized Evaluations of Microcredit: Introduction and Further Steps. *American Economic Journal. Applied Economics*, 7(1), 1-21. doi: 10.1257/app.20140287
- Bateman, M., & Chang, H.-J. (2012). The Microfinance Illusion. *World Economic Review*, 1, 13-36.
- Ben-Ner, A., & Gui, B. (2003). The Theory of Nonprofit Organizations Revisited. In H. Anheier and A. Ben Ner (Eds.) *The Study of the Nonprofit Enterprise: Theories and Approaches* (pp. 3-26). New York: Kluwer Academic / Plenum Publishers.
- Berzins, J., Bøhren, Ø., & Rydland, P. (2008). *Corporate Finance and Governance in Firms with Limited Liability: Basic characteristics* (CCGR Research Report 01/2008). Handelshøyskolen BI, Oslo.
- Besley, T., & Ghatak, M. (2004). Competition and Incentives with Motivated Agents. *American Economic Review*. 95(3), 616-636. doi: 10.1257/0002828054201413
- Bielefeld, W., & Galaskiewicz, J. (2003). The Behavior of Organizations. In H. Anheier and A. Ben Ner (Eds.) *The Study of the Nonprofit Enterprise: Theories and Approaches* (pp. 205-238). New York: Kluwer Academic / Plenum Publishers.
- Birchall, J. (2004). *Cooperatives and the Millenium Development Goals*. Geneva: International Labour Organization.
- Blaxter, L., Hughes, C. & Tight, M. (1996). *How to Research*. Buckingham: Open University Press.
- Bond, S. (2002). Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice. *Portuguese Economic Journal*, 1(2), 141-162. doi: 10.1007/s10258-002-0009-9
- Breusch, T. S., & Pagan, A. R. (1980). The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics. *The Review of Economic Studies*, 47(1), 239-253.

-
- Brody, E. (1996). Agents without Principals: The Economic Convergence of the Nonprofit and For-Profit Organizational Forms. *New York Law School Law Review*, 40(3), 457-536.
- Brown, S. J., Goetzmann, W. N., & Ross, S. A. (1995). Survival. *Journal of Finance*, 50(3), 853-873. doi: 10.1111/j.1540-6261.1995.tb04039.x
- Bøhren, Ø., & Josefsen, M. F. (2007). *Do Stakeholders Matter for Corporate Governance? Behavior and Performance of Norwegian banks 1985-2002* (CCGR Research Report 01/2008). Handelshøyskolen BI, Oslo.
- CGAP. (2003). *Microfinance Consensus Guidelines*. Washington DC: CGAP/The World Bank Group.
- CGAP. (2006). The History of Microfinance. Retrieved 12.05, 2015, from <http://www.globalenvision.org/library/4/1051>
- Christen, R. P., Lyman, T. R., & Rosenberg, R. (2003). Guiding Principles on Regulation and Supervision of Microfinance. *Microfinance Consensus Guidelines*. Washington: CGAP.
- Coase, R. H. (1937). The Nature of the Firm. *Economica*, 4(16), 386-405. doi: 10.1111/j.1468-0335.1937.tb00002.x
- Conning, J. (1999). Outreach, Sustainability and Leverage in Monitored and Peer-monitored Lending. *Journal of Development Economics*, 60(1), 51-77. doi: 10.1016/S0304-3878(99)00036-X
- Convergences. (2013). *Microfinance Barometer 2013*. Retrieved from: http://www.citi.com/citi/microfinance/data/2013a_barometer.pdf
- Crespi, R., Garcia-Cestona, M. A., & Salas, V. (2004). Governance Mechanisms in Spanish Banks. Does Ownership Matter? *Journal of Banking and Finance*, 28(10), 2311-2330. doi: 10.1016/j.jbankfin.2003.09.005
- Cull, R., Demirg-Kunt, A., & Morduch, J. (2009). Microfinance Meets the Market. *Journal of Economic Perspectives*, 23(1), 167-192. doi: 10.1257/jep.23.1.167
- Cull, R., Navajas, S., Nishida, I., & Zeiler, R. (2015). A New Index of the Business Environment for Microfinance. *World Development*, 70, 357. doi: 10.1016/j.worlddev.2014.11.023
- Daley-Harris, S. (2006). *State of the Microcredit Summit Campaign* (Report 2006). Washington: The Microcredit Summit Campaign.
- Demsetz, H. (1988). *The Organization of Economic Activity : 1 : Ownership, Control and the Firm*. Oxford: Basil Blackwell.
- D'Espallier, B., Guérin, I., & Mersland, R. (2011). Women and Repayment in Microfinance: A Global Analysis. *World Development*, 39(5), 758-772. doi: 10.1016/j.worlddev.2010.10.008
- Falkenberg, A. W. (1996). A Yardstick for Justice and Ethical Evaluation of Economic Organizations. *The Journal of Socio-Economics*, 25(2), 157-187.

-
- Fernando, N. A. (2004). *Micro Success Story? Transformation of Nongovernmental Organizations into Regulated Financial Institutions*. Manila: Asian Development Bank.
- Ferro-Luzzi, G., & Weber, S. (2008). Measuring the Performance of Microfinance Institutions. *SSRN Working Paper Series*. doi: 10.2139/ssrn.918750
- Frankfort-Nachmias, C. & Nachmias, D. (2000). *Research Methods in the Social Sciences* (6th ed.). New York: Worth Publishers.
- Ghosh, S., & Van Tassel, E. (2011). Microfinance and Competition for External Funding. *Economics Letters*, 112(2), 168-170. doi: 10.1016/j.econlet.2011.03.037
- Gonzalez, A. (2007). Efficiency Drivers of Microfinance Institutions: The Case of Operating Costs. Washington DC: MicroBanking Bulletin.
- Gorton, G., & Schmid, F. (1999). Corporate Governance, Ownership Dispersion and Efficiency: Empirical Evidence from Austrian Cooperative Banking. *Journal of Corporate Finance*, 5(2), 119-140. doi: 10.1016/S0929-1199(98)00019-4
- Gorton, G., & Winton, A. (2003). Financial Intermediation. *Handbook of the Economics of Finance*, 1(A), 431-552. doi:10.1016/S1574-0102(03)01012-4
- Hansmann, H. (1988). Ownership of the Firm. *Journal of Law, Economics, & Organization*, 4(2), 267-304.
- Hansmann, H. (1996). *The Ownership of Enterprise*. Cambridge, Mass: Harvard University Press.
- Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica*, 46(6), 1251-1271.
- Helms, B. (2006). *Access for All : Building Inclusive Financial Systems*. Washington, D.C: World Bank.
- Hendrikse, G. (2003). *Economics and Management of Organizations : Co-ordination, Motivation and Strategy*. London: McGraw-Hill.
- Hermes, N., Lensink, R., & Meesters, A. (2011). Outreach and Efficiency of Microfinance Institutions. *World Development*, 39(6), 938-948. doi: 10.1016/j.worlddev.2009.10.018
- Hilton, A. (2008). *Microfinance Banana Skins – Risk in a Booming Industry*. New York: Centre for the Study of Financial Innovation.
- Hug, C. (2014). Efficiency is the Key to Lower Interest Rates in Microfinance *Research Insight*. Zurich: ResponsAbility Investments AG.
- Humphrey, D. B. (1987). Cost Dispersion and the Measurement of Economies in Banking. *FRB Richmond Economic Review*, 73(3), 24-38.
- Jacobsen, D. I. (2005). *Hvordan gjennomføre undersøkelser? : innføring i samfunnsvitenskapelig metode* (2nd ed.). Kristiansand: Høyskoleforl.
- Jansson, T., Rosales, R., & Westley, G. D. (2004). *Principles and Practices for Regulating and Supervising Microfinance*. Washington: IADB.

-
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3(4), 305-360. doi: 10.1016/0304-405X(76)90026-X
- Karnani, A. (2008, December). Employment, not Microcredit, is the Solution. *The Journal of Corporate Citizenship*, 32, 23-28.
- Kneiding, C., & Mas, I. (2009). Efficiency Drivers of MFIs: The Role of Age. Washington DC: CGAP.
- Kumar, K., McKay, C., & Parker, S. R. (2010). *Microfinance and Mobile Banking: The Story So Far* (Focus Note No. 62). Washington: CGAP.
- Kyereboah-Coleman, A. (2007). The Impact of Capital Structure on the Performance of Microfinance Institutions. *The Journal of Risk Finance*, 8(1), 56-71. doi: 10.1108/15265940710721082
- Labie, M. (2001). Corporate Governance in Microfinance Organizations: A long and Winding Road. *Management Decision*, 39(4), 296-302. doi: 10.1108/00251740110391466
- Lawler, E. E. (1990). *Strategic Pay: Aligning Organizational Strategies and Pay Systems*. San Francisco, CA: Jossey-Bass.
- Lazear, E. P. (2000). Performance Pay and Productivity. *American Economic Review*, 90(5), 1346-1361. doi: 10.1257/aer.90.5.1346
- Ledgerwood, J. (1999). *Microfinance Handbook: An Institutional and Financial Perspective*. Washington, D.C: World Bank.
- Ledgerwood, J. & White V. (2006). Transforming Microfinance Institutions: Providing Full Financial Services to the Poor. Washington, DC: World Bank
- Ledgerwood, J., Earne, J., & Nelson, C. J. (2013). *The New Microfinance Handbook: A Financial Market System Perspective*. Washington, DC: World Bank. doi: 10.1596/978-0-8213-8927-0.
- Lislevand, C. J. (2012). *The Effect of Capital Structure on Microfinance Institutions Performance* (Master's Thesis). Universitetet i Agder, Kristiansand.
- Løvås, G. G. (1999). *Statistikk - for universiteter og høyskoler*. Oslo: Universitetsforlaget.
- Lützenkirchen, C., & Weistoffer, C. (2012). *Microfinance in Evolution: An Industry Between Crisis and Advancement*. (DB Research, Current Issues). Frankfurt Am Main: Deutsche Bank AG.
- Meberg, E., & Krpo, M. (2009). *Efficiency Drivers in Microfinance Institutions* (Master's Thesis): Universitetet i Agder, Kristiansand.
- Mersland, R. (2009). The Cost of Ownership in Microfinance Organizations. *World Development*, 37(2), 469-478. doi: 10.1016/j.worlddev.2008.03.006
- Mersland, R. (2011). The Governance of Non-profit Microfinance Institutions: Lessons from History. *Journal of Management & Governance*, 15(3), 3327-348. doi: 10.1007/s10997-009-9116-7

-
- Mersland, R., & Strøm, R. Ø. (2009). Performance and Governance in Microfinance Institutions. *Journal of Banking and Finance*, 33(4), 662-669. doi: 10.1016/j.jbankfin.2008.11.009
- Mersland, R., & Strøm, R. Ø. (2010). Microfinance Mission Drift? *World Development*, 38, 28-36. doi: 10.1016/j.worlddev.2009.05.006
- Miller, J. (2003). *Benchmarking Latin American Microfinance*. Washington DC: The Microfinance Information Exchange.
- Morduch, J. (1998). *Does Microfinance Really Help the Poor? New Evidence from Flagship Programs in Bangladesh*. Stanford: Stanford University.
- O'Brien, R. M. (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity*, 41(5), 673-690.
- OECD. (2004). *OECD Principles of Corporate Governance*. Paris: OECD.
- Pearlman, S. (2010). *Flexibility Matters: Do More Rigid Loan Contracts Reduce Demand for Microfinance?* Unpublished Background Paper for CAFs Reporte de Economía y Desarrollo. Vassar College: Poughkeepsie, NY.
- Pindyck, R. S., & Rubinfeld, D. L. (2009). *Microeconomics* (7th ed.). Upper Saddle River, N.J: Pearson Prentice Hall.
- Rasmusen, E. (1988). Mutual Banks and Stock Banks. *The Journal of Law and Economics*, 31(2), 395-421. doi: 10.1086/467162
- Rhyne, E. (2001). *Mainstreaming Microfinance: How Lending to the Poor Began, Grew and Came of Age in Bolivia*. West Hartford: Kumarian Press.
- Rhyne, E., & Otero, M. (2006, November). *Microfinance through the Next Decade: Visioning the Who, What, Where, When and How*. Paper presented at the Global Microcredit Summit, Halifax, Canada.
- Robinson, M. S. (2001). *The Microfinance Revolution*. Washington: World Bank.
- Rosenberg, R., Gonzalez, A., & Narain, S. (2009). *The New Moneylenders: Are the Poor Being Exploited by High Microcredit Interest Rates?* (Occasional Paper No.15). Washington, DC: CGAP.
- Schreiner, M. (2002). Aspects of Outreach: A Framework for Discussion of the Social Benefits of Microfinance. *Journal of International Development*, 14(5), 591-603. doi: 10.1002/jid.908
- Sinclair, H. (2012). *Confessions of a Microfinance Heretic: How Microlending Lost Its Way and Betrayed the Poor*. San Francisco: Berrett-Koehler.
- Smith, A. (1993). *An Inquiry into the Nature and Causes of the Wealth of Nations*. Edited and commented by K. Sutherland. Oxford: Oxford University Press.
- Steinberg, R. (2003). Economic Theories of Nonprofit Organization: An Evaluation. In H. Anheier and A. Ben Nér (Eds.) *The Study of the Nonprofit Enterprise: Theories and Approaches* (pp. 277-310). New York: Kluwer Academic / Plenum Publishers.
- Steinwand, D. (2000). *A Risk Management Framework for Microfinance Institutions*. Eschborn, Germany: GTZ.

- Strøm, R. Ø., D'Espallier, B., & Mersland, R. (2014). Female Leadership, Performance, and Governance in Microfinance Institutions. *Journal of Banking and Finance*, 42, 60-75. doi: 10.1016/j.jbankfin.2014.01.014
- Studenmund, A. H. (2006). *Using Econometrics: A Practical Guide* (5th ed.). Boston, Mass: Pearson Education.
- Suri, T. & Jack, W. (2011). *Mobile Money: The Economics of M-PESA* (NBER Working Paper No.16721). National Bureau of Economic Research, Cambridge, MA.
- TheMIX. (2015). Glossary. Retrieved 21.05, 2015, from <http://www.mixmarket.org/about/faqs/glossary>
- UN. (2005). International Year of Microcredit 2005. Retrieved from <http://www.yearofmicrocredit.org/>
- White, V., & Campion, A. (2002). Transformation - Journey from NGO to Regulated MFI. In D. Drake & E. Rhyne (Eds.), *The Commercialization of Microfinance*. Bloomfield: Kumarian Press.
- Williamson, O. E. (1985). Employee Ownership and Internal Governance: A Perspective. *Journal of Economic Behavior & Organization*, 6(3), 243-245.
- Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data*. Cambridge: MIT Press.
- Wooldridge, J. M. (2014). *Introduction to Econometrics*. Andover: Cengage Learning.
- WorldBank. (2001). *Sustainable Banking with the Poor: A Worldwide Inventory of Microfinance Institutions*. Washington: World Bank.
- Yellen, J. L. (1984). Efficiency Wage Models of Unemployment. *The American Economic Review*, 74(2), 200-205.

8. Appendices

8.1 Appendix 1. Results from Test for Multicollinearity

We use the *variance inflation factor (VIF)* to examine whether we have issues of multicollinearity in our models. According O'Brien (2007) a VIF of 10 is commonly used as a threshold for a problematic level of multicollinearity. The following tables present no VIFs exceeding this threshold.

Table A-1 - Multicollinearity Test in OEP Models

Model	Variable	VIF
(1)	OEP	1.03
	NPO	1.20
	COOP	1.24
(2)	OEP	1.06
	NPO	1.84
	COOP	1.64
	InternalAudit	1.10
	PerformancePay	1.15
	Competition	1.12
(3)	Regulated	1.63
	SA	1.63
	OEP	1.37
	NPO	2.03
	COOP	1.99
	InternalAudit	1.28
	PerformancePay	1.26
	Competition	1.18
	Regulated	1.76
	SA	1.91
VB	1.37	
SG	1.31	
Size	1.54	

Age	1.36
Asia	1.86
Afr	5.04
MENA	1.35
LA	2.49
LOA	1.29
EF	1.12
HDI	3.75

Note: OEP is the operating expense to portfolio ratio. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

Table A-2 - Multicollinearity in Personnel Cost Models

Model	Variable	VIF
(1)	CostEmployee	1.03
	NPO	1.21
	COOP	1.22
(2)	CostEmployee	1.11
	NPO	1.86
	COOP	1.64
	InternalAudit	1.09
	PerformancePay	1.18
	Competition	1.13
	Regulated	1.63
SA	1.67	
(3)	CostEmployee	1.61
	NPO	2.09
	COOP	2.06
	InternalAudit	1.25
	PerformancePay	1.30
	Competition	1.22
Regulated	1.77	

SA	1.96
VB	1.29
SG	1.23
Size	1.58
Age	1.36
Asia	1.81
Afr	3.93
MENA	1.36
LA	2.31
LOA	1.26
EF	1.13
HDI	3.27

Note: CostEmpl is the personnel cost per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation

Table A-3 - Multicollinearity in Personnel Productivity Models

Model	Variable	VIF
(1)	PersProd	1.03
	NPO	1.19
	COOP	1.21
(2)	PersProd	1.04
	NPO	1.82
	COOP	1.61
	InternalAudit	1.09
	PerformancePay	1.14
	Competition	1.11
	Regulated	1.65
SA	1.64	
(3)	PersProd	1.60

NPO	2.02
COOP	1.99
InternalAudit	1.26
PerformancePay	1.25
Competition	1.18
Regulated	1.80
SA	1.96
VB	1.47
SG	1.39
Size	1.53
Age	1.37
Asia	1.84
Afr	4.76
MENA	1.34
LA	2.37
LOA	1.37
EF	1.10
HDI	3.63

Note: PersProd is personnel productivity defined as number of credit clients per employee. NPO is an indicator variable for a non-profit organization, while COOP indicate whether an MFI is a cooperative. SA=Savings-to-assets ratio. VB=Village Banking. SG=Solidarity Groups. Afr=Africa. MENA=Middle East and Northern Africa. LA=Latin America. LOA=Loan Outstanding Average. EF=Economic Freedom Index. HDI=Human Development Index. For further information about the construction of the variables, we refer to chapter 4.4 Variables Presentation.

8.2 Appendix 2. Results from Breusch-Pagan Test

The Breusch-Pagan test indicates whether a unit specific error component exist in the model, and thus whether pooled OLS is valid. If not we should opt for a random effects model (Breusch & Pagan, 1980). The null hypothesis stating that OLS is valid is rejected for all models.

Table A-4 - Results from Breusch-Pagan Test

	Chi²	P-value
OEP(1)	900.10	0.0000
OEP(2)	788.38	0.0000
OEP(3)	560.02	0.0000
CostEmployee(1)	1269.22	0.0000
CostEmployee(2)	995.70	0.0000
CostEmployee(3)	814.81	0.0000
PersProd(1)	1267.60	0.0000
PersProd(2)	989.87	0.0000
PersProd(3)	758.04	0.0000

Note: OEP refers to the Operating Expense to Portfolio Ratio. CostEmployee is defined as personnel cost per employee. PersProd is Personnel Productivity and refers to the ratio of credit clients over total employees.

8.3 Appendix 3. Results of the Random Effects Analyses

This appendix presents the chi-squared values and p-values from the Hausman-test for all RE-models. The null hypothesis states that the RE model is correctly specified and hence producing consistent estimates. The alternative hypothesis states that the RE model is producing inconsistent estimates because it is misspecified. A 5 % significance level is used in evaluation of the hypotheses. Models where the null hypothesis is rejected are marked in **bold**. The appendix also include a table displaying the explanatory power (R^2) of the random effects models.

Table A-5 - Results of the Hausman Test

	Chi²	P-value
OEP(1)	1.73	0.4201
OEP(2)	4.63	0.5918
OEP(3)	41.72	0.0001
CostEmployee(1)	0.41	0.5241
CostEmployee(2)	6.74	0.3459
CostEmployee(3)	21.11	0.0707
PersProd(1)	1.45	0.4842
PersProd(2)	9.07	0.1698
PersProd(3)	48.84	0.0000

Note: OEP refers to the Operating Expense to Portfolio Ratio. CostEmployee is defined as personnel cost per employee. PersProd is Personnel Productivity and refers to the ratio of credit clients over total employees.

Table A-6 - Explanatory Power of the Random Effect Models

	R²
OEP(1)	0.0335
OEP(2)	0.0519
OEP(3)	0.2562
CostEmployee(1)	0.0263
CostEmployee(2)	0.0957
CostEmployee(3)	0.3705
PersProd(1)	0.0221
PersProd(2)	0.0209
PersProd(3)	0.3431

Note: OEP refers to the Operating Expense to Portfolio Ratio. CostEmployee is defined as personnel cost per employee. PersProd is Personnel Productivity and refers to the ratio of credit clients over total employees.

8.4 Appendix 4. Significance Levels & P-values

Significance levels explain what margin of error we accept in committing type 1 errors. Type 1 errors are incurred when we reject a null hypothesis that is actually correct. A 5 % significance level signify that we accept that there is a 5 % probability of committing a type 1 error. When we reduce the probability of committing a type 1 error, we need to accept a greater probability of conducting a type 2 error. A type 2 error occurs when we do not reject the null hypothesis, even though the hypothesis is wrong. A type 1 error is more severe than a type 2 error as we run the risk of claiming an effect that does not exist, as opposed to failing to detect an actual effect. P-values relate to significance levels in the following way: If the p-value is lower than the chosen significance level, we reject the null hypothesis (Løvås, 1999). In this thesis, we operate with three different significance levels, 1 %, 5 %, and 10 %-level.

