Governance and scope economies in Microfinance Institutions

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Abstract: This paper studies the relation between board size and composition and cost savings (scope economies) from combining savings mobilisation and lending by Microfinance Institutions (MFIs). The findings support the hypothesis that employee representation on the board is associated with positive scope economies, possibly due to internal knowledge. However, CEO-Chairman duality is associated with equal or larger probability of scope diseconomies, which is consistent with previous findings. Representation

of other stakeholders on the MFI board does not affect scope economies. The results seem to support the notion that, in highly uncertain environments, group cohesion may be an advantageous mechanism of control.

Keywords: MFIs; microfinance institutions; governance; board of directors; scope economies; intermediation.

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1 Introduction

The literature on the role of governance in microfinance is relatively recent and much remains to be learned about what constitutes good governance in MFIs. Research on the impact of internal and external governance mechanisms on MFIs' performance has identified mechanisms that could promote better performance (Labie, 2001; Hartarska, 2005; Mersland and Strøm, 2009). Recently, Hartarska and Mersland (2012) studied the impact of governance mechanisms on outreach efficiency, incorporating both cost minimisation and outreach goals of MFIs. This paper uses a related approach and follows up on the argument made by Berger and Humphrey (1997) that efficiency estimates in financial institutions are affected by the management which, in turn, is affected by governance mechanisms. Thus, we study the link between existing governance mechanisms and scope economies (managerial efficiency) in MFIs.

The existence of scope economies is well documented in the banking literature. Scope economies are efficiency gains that exist when it is cheaper to produce deposit mobilisation and lending by one firm (a bank) rather than by two separate banks each

producing only one output – only deposits or only loans. Recent microfinance studies develop new methods to estimate scope economies and show that, while most MFIs (would) have scope economies, some (could) experience significant scope diseconomies (Hartarska et al., 2011). Research also shows that geography, demography, economic conditions, and MFI-specific characteristics affect the magnitudes of the scope (dis)economies (Hartarska et al., 2010). Since scope economies result from managerial efficiency and thus governance structures and, since these links have not been studied so far, we set to determine how internal governance mechanisms and, in particular, board size and composition, are associated with (dis)economies of scope from jointly collecting savings and extending loans.

Following the literature on managerial efficiency, we first estimate scope economies from a cross-country sample by deploying a Semiparametric Smooth Coefficient (SPSC) model and then link these estimates to MFI governance structure. The SPSC model accommodates two important characteristics of the microfinance industry. First, we are able to address a major concern for similar cross-country microfinance studies – the need to control for direct and indirect impact of the external environment in which MFIs operate (Armendariz and Szafarz, 2011; Ahlin et al., 2011). This is important because previous papers have found that estimated scope economies with environmental variables are preferable to estimates without them (Hartarska et al., 2010, 2011). By controlling for environmental factors in the first stage (in the cost function directly, and by interacting environmental factors with input prices), we avoid misattributing (in)efficiency due to external factors to variations in the governance structure. Moreover, since it permits zero output values, our method allows using data from all institutions including lending-only institutions that represent the majority of MFIs.

Next, we look at differences in board size and composition between MFIs with scope economies and scope diseconomies to find out how they differ across various MFIs. In this second stage, we use simple mean differences comparison across groups with estimated scope economies and diseconomies and a panel probit model to study if there are differences in governance characteristics that affect the probability of an MFI having scope (dis)economies. We further estimate the impact of various governance mechanisms directly on the magnitudes of scope economies using random effects regressions to address possible differential effect of board composition identified in the literature (Konrad et al., 2008). Finally, we identify the differences in board size and composition between MFIs actually providing savings and deposits and lending-only MFIs using differences in means because, for some characteristics, the number of observations is not sufficient to estimate separate group regressions.

We find some support for the hypothesis that the use of internal information via employee representation on MFI boards may increase the scope economies. However, CEO-Chairperson duality is associated with a slightly larger probability of negative scope economies, consistent with previous work in microfinance (Hartarska and Mersland, 2012; Galema et al., 2012). The representation by other types of stakeholders such as clients, international directors and creditors, as well as gender and international diversity of board members, are not associated with higher scope economies. These results seem to support the notion that, in high uncertainty environments, group cohesion may be an advantageous mechanism of control, which is consistent with ideas proposed by Eisenhardt et al. (1997) and Kanter (1977).

The remainder of the paper is organised as follows. Section 2 reviews the related, mainly empirical, literature and lays out the hypotheses to be tested. Section 3 describes

the empirical methodology and Section 4 summarises the data. The results are discussed in Section 5, while the last section offers conclusions.

2 Literature review

2.1 The role of the board in the literature on MFI performance and governance

Few empirical studies evaluate the impact of governance mechanisms and board size and composition in particular on MFIs' performance. The first empirical study on microfinance by Hartarska (2005) uses survey data from MFIs in Eastern Europe and Central Asia (ECA) to study how managerial compensation, board size and composition (stakeholder representation, gender, and skills), as well as external factors such as prudential regulations, external rating, and auditing affect financial performance and outreach. She finds that some traditional control mechanisms, such as performance-based compensation, are ineffective, while others, such as board independence, improve performance. This work highlights the importance of performance measures which may capture different dimension of MFIs' objectives. For example, boards with a higher proportion of donors were found to have lower sustainability but reach poorer borrowers, while MFIs with client representation have better sustainability but serve fewer poor clients. This paper does not find consistent evidence that board size (as well as regulation, audits, or ratings) affects MFI outreach or sustainability.

Mersland and Strøm (2009) use a larger sample of rated MFIs and study whether the CEO-Chairperson duality, female CEOs, international directors, board size, and external factors affect financial performance and outreach. These authors find no evidence that typical governance mechanisms work, but their results may also be affected by using measures of different aspects of performance. For example, this work finds that MFIs with female CEOs have better ROA, that MFIs with dual CEO-Chairperson positions have a higher portfolio yield and serve more clients but show no other measurable performance difference, that MFIs with larger boards distribute smaller loans, and that external factors play a limited role at best.

Closest to the present work is the study of Hartarska and Mersland (2012) who investigate the impact of governance on technical efficiency. They find that MFIs in which the positions of the CEO and board chair are merged are less efficient and, similarly, that MFIs with a larger proportion of insiders on the board are less efficient. They also find that managerial efficiency increases with board size up to nine members and decreases after that, and that donors' representation on the board is not beneficial, while that of creditors may improve efficiency, although very few MFIs in the sample had creditors as directors. These findings are interpreted to mean that most MFIs have already organised their internal governance structures to be relatively successful.

2.2 Board size and composition as an internal governance mechanism

The microfinance board is a major internal governance mechanism. In a typical MFI, board members are not paid, but their incentives are aligned with those of stakeholders, because members are legally responsible for effective monitoring. Such board members offer their reputation as collateral and will try to minimise the risk of damage to it (Handy, 1995). Board members do not collude with managers and are effective

supervisors due to reputational concerns and peer pressure (Fama and Jensen, 1983a, 1983b).[1] In practice, MFIs want to identify board members who are able and willing to dedicate the time needed to effectively monitor management (Labie, 2001). Since MFI managers strive to achieve outreach and sustainability, they reveal more information to their boards than what would have been revealed under a single profit maximisation objective (Hartarska, 2002). Thus, the board plays an important role in an MFI, and it is important to study how scope economies achievable by the MFI are associated with variations in board size and composition.

A significant part of the empirical literature has focused on the impact of *board size* on firm performance. Since free-riding is more likely in larger boards, there is evidence that larger boards are less effective in corporations as well as in small firms (Yermack, 1996; Eisenberg et al., 1998). Financial intermediaries usually have larger boards than do non-financial firms, but the empirical evidence shows both a positive and negative relation between board size and performance (Adams and Mehran, 2003; Pathan et al., 2008). Studies on non-profits boards have suggested that larger boards may be more successful because of the additional duties that board members take on in supervising fundraising, but there is no empirical support for this claim (Oster and O'Reagan, 2004).

Cheng (2008) finds evidence that larger corporate boards are associated with less variability in firm performance, because larger boards take longer to reach consensus and their decisions are less extreme. The importance of communicating stability to customers in an MFI would suggest that there may be benefits to a larger size. Yet, thus far, the empirical evidence is mixed. Hartarska (2005) did not find consistent evidence of a positive impact of larger boards on ROA, or on the number of actual borrowers, while Mersland and Strøm (2009) found weak evidence that MFIs with larger boards offer smaller-sized loans, suggesting targeting of poorer clients. Hartarska and Mersland (2012) found a non-linear relationship with an optimal size of about nine members. Since the association between board size and scope economies of the MFIs has not been explored, we propose

> *Hypothesis 1: Board size has a non-linear impact on the probability of an MFI possessing positive scope economies.*

Board *composition* reflects a board's quality and its ability to monitor and advise the manager (Boone et al., 2007). Several aspects of board composition are usually considered in the literature, and the impacts of *independent directors* (those without stakes in the firm) as well as *separate CEO and Board Chair roles* are the most studied (Bhagat and Jefferie, 2002).[2] Empirical evidence supports both a positive and a negative relation between the proportion of outside directors and firm performance (Mayers et al., 1997; Rosenstein and Wyatt, 1997). The explanation in the literature is that when a firm operates in a noisy environment, board monitoring costs are higher and there will be less monitoring. Allen and Gale (2000) also show that the board's monitoring is often ineffective in environments of high uncertainty with less divergence between the CEO and owners objectives, when the firm's financing is out of retained earnings and owners may find it advantageous to yield control to the CEO.

The empirical findings from high-growth firms show that they have smaller boards with a high proportion of insiders, since outside directors are less effective (Coles et al., 2008). Firms facing greater information asymmetry will have less independent boards because of the higher cost of monitoring (Linck et al., 2008). However, the expected benefits of an inside director's expert knowledge outweigh the

expected costs of managerial entrenchment when managerial and outside shareholder interests are closely aligned (Rosenstein and Wyatt, 1997). Banks typically have a larger proportion of outside directors, and empirical work finds that the proportion of independent directors has a positive impact on performance in some banks (Adams and Mehran, 2003; Pathan et al., 2008).

For a sample of MFIs in the ECA region, Hartarska (2005) finds that MFIs with a larger proportion of independent directors achieve better outreach, but board size had no effect on financial results. Hartarska and Mersland (2012) find that outreach efficiency is inversely related to the proportion of insiders measured by proportion of employees. Since scope economies are likely to be affected by insiders' knowledge, namely the ability to understand both savers' and borrowers' incentives and preferences, it is important to study whether the presence of insiders on the board will affect scope economies. Therefore, we form

Hypothesis 2: The proportion of insiders on the board, measured as the proportion of employees on the board, affects scope economies.

In some MFIs, the CEO is also the chairman of the board, in spite of previous calls to split the role. For example, Otero and Chu (2002) attribute the collapse of Corposol/ Finansol in Colombia to a lack of proper board independence and to poor oversight, both of which allowed too much power to be concentrated in the hands of one executive. Duality of CEO and board Chairperson may be a sign of CEO entrenchment, since the CEO may pursue policies that allow him private benefits (Hermalin and Weisbach, 1998). Mersland and Strøm (2009) found that in MFIs, the CEO-Chairperson duality had a positive impact on portfolio yields and on the number of clients served. It did not, however, influence overall financial performance measures. Hartarska and Mershland (2012), however, found that duality is associated with less efficient outreach, while Galema et al. (2012) report that duality in not for profit MFIs leads to weaker and more variable financial results.

Hypothesis 3: MFIs in which the positions of CEO and board Chairperson are split perform better than those in which the position is not split.

Other stakeholders also matter. For example, the presence of creditors on the board improves the value and performance of German firms, perhaps by reducing agency costs (Gorton and Schmidt, 2000). Unlike most other boards, the MFI board may also include representatives of social investors (when the organisation has raised funds in the external markets) such as donors as well as clients. These groups of stakeholders may play a role similar to that of large blocks of stakeholders and may improve efficiency. The interests of each group may not coincide with the interest of the other two groups. For example, investors may prefer better returns, while donors and clients may prefer outreach, as suggested in Hartarska (2005). However, Mersland and Strøm (2009) do not find that these stakeholder groups influence performance, while Hartarska and Mersland (2012) find that creditors may improve outreach efficiency. Therefore, we hypothesise that

Hypotheses 4–6: The proportions of each group of creditors, clients, and donors on the board affect scope economies.

Board diversity is another aspect of governance that has attracted attention. MFIs often target female customers (Armendariz and Morduch, 2010). A female CEO may be better at obtaining information from predominantly female customers compared

to a male CEO, and this could affect scope economies.[3] Representation by international directors is also of interest because it is common (in about fifth of the MFIs) and because some evidence suggests that corporate performance may improve with the presence of international directors (e.g., Oxelheim and Randøy, 2003). Moreover, Hartarska (2005) finds positive association between women on the board and performance for MFIs in ECA, and Mersland and Strom (2009) find that MFI financial performance is positively associated with female CEOs.

Some empirical evidence from corporate boards suggests that board diversity may improve shareholder wealth maximisation (Brancato and Patterson, 1999; Westphal and Milton, 2000; Carter et al., 2003). For non-profits, evidence shows that women directors spend more time on monitoring activities but better performing organisations do not have proportionally more women and minorities on the boards (Oster and O'Reagan, 2004).

Organisational scholars have pointed out, however, that diverse teams may disagree more, and the same may be true for MFI boards. Thus, to improve board effectiveness, it may not be enough to simply increase the number of female directors but it may also require additional mechanisms to ensure cooperation between directors (Eisenhardt et al., 1997). Kanter (1977) suggests that when uncertainty regarding the outcome of managerial effort is high, explicit pay-performance contracts are too costly and group homogeneity is more valuable. There is some empirical evidence that firms facing more variability in their stock returns have fewer women on their boards of directors (Adams and Ferreira, 2009). Dutta and Bose (2006) also find inconsistent results regarding the relation between women representation on the board and banks' performance in Bangladesh.

MFIs serve high-risk clients and face high uncertainty. Moreover, their managers usually do not receive performance-based compensation. It is unknown, however, if board homogeneity may lead to better governance through better cooperation between similar board members. Thus, while board diversity may be desirable from the equity point of view, it is still unknown if in MFIs it is effective given the high level of uncertainty that exists in organisations with multiple objectives. In microfinance, we are interested in two aspects of diversity – representation of women and of international directors. Thus we test

Hypothesis 7: Scope economies are affected by the board's diversity.

3 Methodology

3.1 Estimation of economies of scope

Scope economies allow the determination of the optimal product mix both within and across a sample of firms. Scope economies were defined by Pulley and Humphrey (1993) as the percentage of cost savings from producing all outputs jointly as opposed to producing each output separately. In the empirical setting discussed here, only two outputs exist, q_1 and q_2, the \$ value of loans and deposits, respectively. Thus, scope economies are constructed as:

$$SCOPE = \frac{C(q_1, 0; r) + C(0, q_2; r) - C(q_1, q_2; r)}{C(q_1, q_2; r)} \quad (1)$$

where $C(\cdot)$ is the cost function, q_1 and q_2 are outputs and r is a vector of input prices. Given that the data used to estimate the cost function of MFIs represent a mix of MFIs exclusively offering loans and those that produce loans and deposits jointly, the use of standard cost functions in production econometrics is not suitable, e.g., translog (see Pulley and Braunstein, 1992; Hartarska et al., 2011).

Pulley and Braunstein (1992) proposed a cost function capable of admitting data from firms that may possess zero-valued outputs without requiring ad hoc data transformations. Their cost function was a modification of the multiplicatively separable cost function of Baumol et al. (1982). This cost function is quadratic (as opposed to traditional log-quadratic cost functions) in outputs. The importance of having outputs enter quadratically instead of log quadratically is the alleviation of the confusion surrounding the appropriate way to include firms with zero valued data when logarithmic transformations are desired. The composite cost model of Pulley and Braunstein (1992) is written succinctly as:

$$C(q, \ln r) = -F(q, \ln r) \times G(\ln r) + u. \tag{2}$$

With an additive error term, the composite model is:

$$C = \left[a_0 + \sum a_i q_i \; + \frac{1}{2} \sum \sum a_{ij} q_i q_j + \sum \sum g_{ik} q_i \ln r_k \right] \times \exp\left(b_0 + \sum b_k \ln r_k + \sum \sum b_k \ln r_k \ln r_l \right) + \varepsilon_i \tag{3}$$

where q_i represents output i, r_i is the price of input i, and a, b and g are parameters to be estimated. Equation (3) can be estimated using standard parametric econometric techniques such as nonlinear least squares or maximum likelihood after an appropriate distributional assumption. However, we argue next that a priori specification of $G(\,)$ is not required. In the current setup $G(\,)$ is assumed to be exponential. The composite cost function in equation (2) falls in the more general class of models known as smooth coefficient models. More importantly, by dispensing with a parametric assumption for $G(\,)$, we can develop a SPSC model, affording even more generality to our setting than just a simple parametrically specified smooth coefficient model. The SPSC models have a tractable, closed form solution, eschew unnecessary parametric specification of the scaling component of the cost function and, for a fixed set of input prices, can be interpreted as a parametric cost function. Given the generality of this approach and our desire to mitigate functional form assumptions on the estimated scope economies which is our target of interest, we adopt this flexible semiparametric modelling strategy.

3.2 A Semiparametric Smooth Coefficient cost function

The empirical cost function proposed by Pulley and Braunstein (1992) was recently estimated as a SPSC model by Hartarska et al. (2010, 2011). In the model, the functional form restrictions on $G(\ln r)$ are relaxed while retaining the general quadratic relationship between outputs and input prices apparent in $F(q, \ln r)$. This approach affords the researcher sufficient flexibility to model costs and investigate scope economies without concern that tenuous parametric specification issues are driving results. Moreover, Hartarska et al. (2011) document that the incorporation of environmental variables

is easily handled within the smooth coefficients and that additional structure of the underlying cost function can be discerned with relative ease in the SPSC model setting.

To describe the process used to estimate our cost function via smooth coefficient estimation, we first introduce some basic concepts. Let the function $G(\ln r)$ be defined as $\exp(b_0 + \sum b_k \ln r_k + \sum\sum b_{kl} \ln r_k \ln r_l)$. Equation (3) can then be written as:

$$C = \left[\bar{a}_0 + \sum \bar{a}_i q_i + \frac{1}{2} \sum\sum \bar{a}_{ij} q_i q_j + \sum\sum g_{ik} q_i \ln r_k \right], \tag{4}$$

where $\bar{a}_i$, $\bar{a}_{ij}$ and g_{ik} are the coefficients a_i, a_{ij}, and g_{ik} in equation (3) multiplied by $G(\ln r)$. Therefore, we can specify $\bar{a}_{ij}$ and g_{ik} as functions of $\ln r$ and an additional series of covariates that can be thought of as capturing the environment in which the MFI operates (V_i).

We can write equation (2) in canonical SPSC form as:

$$y_i = \alpha(z_i) + \beta(z_i) x_i + \varepsilon_i \tag{5}$$

where $y_i = C_i$, $x_i = [1 \; q_i' \; q_i' q_i \; q_i' \ln r_i]$, $z_i = [\ln r_i \; V_i]$ and where q_i represents the vector of outputs for the ith firm, r_i is the vector of input prices and V_i contains our environmental variables.[4] The SPSC model can be specified as quadratic in output, as recommended by Baumol et al. (1982), but given the lack of specification of $\beta(z_i)$ and $\alpha(z_i)$ can be more or less general in input prices.

Both Li et al. (2002) and Li and Racine (2010) propose an estimation procedure for the SPSC defined in equation (5). To implement their procedure, first, denote $\delta(z_i) = [\alpha(z_i), \; \beta(z_i)]$ and rewrite equation (5) as $y_i = \delta(z_i) X_i + e_i$, where $X_i = [1 \; x_i]$. The LCLS estimator of $\delta(z)$ becomes

$$\delta(z) = (\mathbf{X}'\mathbf{K}(z)\mathbf{X})^{-1} \mathbf{X}'\mathbf{K}(z) y \tag{6}$$

where $\mathbf{K}(z)$ is a diagonal matrix with ith element $K_i = K_h(z_i, z)$, constructed using the generalised product kernel of Racine and Li (2004) (see also Li and Racine, 2007), h is a vector of bandwidths and $\mathbf{X}$ is our matrix composed of X_i. The bandwidth vector determines the influence that 'nearby' observations have on the construction of $\delta(z)$. Nearby here is measured relative to z. Points further from z receive less weight and points closer, more weight. The notion of further and closer is determined by the bandwidth. We use a generalised kernel due to the fact that several of our environmental variables are discrete.

Having the ability to introduce environmental variables in a manner that imposes as little structure as possible on the cost function is a desirable feature of the SPSC model in general. The elegance of the SPSC model is the simple intuition that it affords to the researcher. If the variables which appear in the smooth coefficients are fixed, then the model 'becomes' a traditional parametric model. Thus, we can think of the SPSC model as a 'conditional' parametric model. A key benefit of this is that interpreting results becomes easier: if we 'fix' the variables inside the smooth coefficients, then this is just a linear in parameters quadratic cost function. The key feature to grasp is that the cost functions shape changes as the variables that enter the smooth coefficient change, thus allowing additional flexibility beyond any given parametric specification.

The selection of the smoothing parameters is commonly perceived as the most important issue when estimating the SPSC. An array of alternatives exist to construct bandwidths. For our purposes we use Least-Squares Cross-Validation (LSCV), which Li and Racine (2010) show produces bandwidths which perform well in small sample settings similar to our empirical setup. LSCV bandwidth selection determines bandwidths by minimising the squared distance between the observed outcomes (MFI costs) and the leave-one-out estimate of cost. Numerically, the criterion appears as:

$$\text{LSCV}(h) = \min_{h} n^{-1} \sum_{i=0}^{n} (C_i - \hat{C}_{-i})^2, \tag{7}$$

where $\hat{C}_{-i}$ is the leave-one-out estimator of cost for the *i*th MFI that is produced by dropping the *i*th MFI (observation) from our construction of costs in equation (5). Essentially, LSCV selects bandwidths that result in the best fitting cost function at each data point, without using that specific data point in the construction of the cost function. This form of bandwidth selection is common in applied work with numerous covariates. The use of a leave-one-observation out approach avoids the pathological case of interpolation of the data by setting all bandwidths to zero.

3.3 Scope economies and board size and composition

After estimating scope economies from a cost function that also includes environmental variables, we look for statistically significant differences across several groups using a simple means test. We are interested in differences in board size and composition between MFIs with estimated scope economies and/or diseconomies, and between MFIs offering savings and loans and MFIs lending only. We create a dummy variable taking the value of one if the MFI has estimated positive scope economies and 0 if it has negative scope economies and regress it on variables measuring board size and composition, namely the presence of each type of stakeholders described in the literature review as well as on the proportion of these stakeholders on the board. This model offers insights on the impact of governance mechanisms in MFIs which should lend and collect deposits rather than only lend. To gain insight on the link of governance and the overall range of scope diseconomies and economies, we also estimate a panel random effect regression:

$$\begin{aligned}\text{Scope Economies}_{it} = {} & \alpha + \beta_1 \text{Board Size}_i + \beta_2 (\text{Board Size}_i)^2 \\ & + \sum_{k-1}^{K} \beta_k \text{Board Composition} + \sum_{m=1}^{M} \beta_m \text{Controls} + \varepsilon_{i,t}\end{aligned} \tag{8}$$

where the controls included MFI age and size, as we expect that learning occurs over the life of the MFI and that, with the passage of time, managers gain experience within both the institution and the environmental setting (Caudill et al., 2009). *MFI age* is measured in years from the start of microfinance activity, *MFI size* is measured as the log of the total assets.

4 Data

The dataset was constructed from publicly available data (from www.ratingfund2.org and several other sources) and consists of all available risk assessment reports conducted by five major rating agencies (MicroRate, Microfinanza, Planet Rating, Crisil, and M-Cril), as of June 2007. To date, the dataset analysed here remains the highest-quality, publicly available cross-country data for MFIs worldwide which not only contains up to four years of financial data necessary to estimate scope economies but also data for various governance mechanisms including the board of directors. The rating reports in the database are from 2000 to 2007, with the majority coming from the last four years.

The final dataset analysed here consists of MFIs from approximately 35–40 developing countries. While the main database is large, not all MFIs have complete information that can be used to estimate scope economies, and since not all of them provide detailed information on their governance, the data used consist of between 350–450 annual observations from 90 MFIs to 160 MFIs depending on the model specification.

In the cost function, the dependent variable is the total costs, which are the sum of operating and financial costs, input prices are the annual labour cost per worker, cost of financial capital, measured by the cost of all borrowed funds to their stock, and the cost of physical capital, measured as the ratio of non-labour operating expense to fixed assets. The vector of environmental variables includes the depth of financial market development in the country, population density, percent rural population, MFI lending type, the region it operates in and the year of operation.

Governance variables are *Board size*, measured by the number of board members, and the square term is also calculated and included to capture the possible non-linear impact of this variable. Other internal governance variables include dummies for the presence of clients, employees, donors, creditors, and women on the board as well as women-CEOs and Chairwomen. In addition, variables measuring the proportion of clients, employees, donors, and debt holders on the board are also used in alternative regressions.

The average board in the sample consists of seven members that meet about nine times a year (see Table 1). Stakeholder groups are included as members, but in small numbers only. For example, only 6% of boards have employee representation and 2% have creditor representation; 10% and 12% have donor and client representation, respectively. This *ex-ante* knowledge indicates that stakeholder representation is not very common in MFI boards, but this representation has been recommended, and it is important to find out if the results show links between stakeholders representation and scope economies. Finally, in 10% of the data, the CEO is also the chairman of the board, indicating that there may be a reasonable separation of management and control (Table 1).

5 Results

For the sample analysed here, results from the first stage semi-parametric smooth coefficient model show overall scope economies of 13% similar to scope economies estimates for the larger samples (Hartarska et al., 2010, 2011). When the results are broken down by MFIs offering lending and savings and lending only, we see substantial differences, again consistent with results from larger samples. Deposit collecting

MFIs have negligible economies of scope of about 1%, depending on the sample used, while the potential scope economies for lending-only MFIs are much larger, about 16% (Table 2).

Table 1 Summary statistics of governance related data

Variable	*Obs.*	*Mean*	*St. dev.*	*Min*	*Max*
Board size (number of members)	556	7.1	3.9	2	33
CEO is Chair of the board (dummy =1 if CEO is Chair,–0 otherwise)	501	12%	0.309	0	100%
Female CEO (dummy=1 if CEO is female, zero otherwise)	499	26.9%	44.4%	0	100%
Female Chairwoman (dummy=1 if yes, 0 otherwise)	403	24.3%	43.0%	0	100%
Dummy Donors Represented (dummy=1 if yes, 0 otherwise)	453	9.1%	28.7%	0	100%
Dummy International Representatives dummy = 1 if yes, zero otherwise)	457	21.2%	40.9%	0	100%
Dummy Employee Representatives (dummy = 1 if yes, zero otherwise)	450	5.6%	22.9%	0	100%
Dummy Clients–Representatives (dummy = 1 if yes, zero otherwise)	452	11.9%	32.5%	0	100%
Dummy Creditors–Represented	450	1.8%	13.2%	0	100%
Dummy Female Board Members (dummy = 1 if yes, zero otherwise)	306	77.1%	42.1%	0	100%
Donor representatives on the board (%)	453	5.8	20.4	0	100
International board members on the board (%)	457	9.2	21.6	0	100
Employee representatives on the board (%)	450	4.0	18.8	0	100
Client representatives on the board (%)	452	10.9	30.8	0	100
Creditor representatives on the board (%)	450	0.9	8.5	0	100
Female board members on the board (%)	306	28.4	25.1	0	100

Table 2 Scope economies by lending only and lending and collecting savings (% of sample)

	Savings and loans MFIs	*Loans–only MFIs*
Overall scope economies (%)	1	16
Scope economies (%)	20	25
Scope diseconomies (%)	–28	*–14*

When we split MFIs by lending only and lending and deposit mobilisation we see that similar magnitudes in (positive) scope economies: 20% for savings and loans and 25% for lending-only MFIs. Within the group of MFIs with scope diseconomies, we find twice larger scope diseconomies of 28% for savings and lending MFIs compared to scope diseconomies of 14% for lending-only MFIs. Further, we find that, within the MFIs

collecting deposits, half have scope economies and half have scope diseconomies while, within the group of lending-only MFIs, 77% could have scope economies if they were to collect savings and 23% could have scope diseconomies. The differences across these groups are statistically significant.

Table 3 presents the differences in governance characteristics between MFIs with scope economies and with scope diseconomies. The governance characteristics explored are board size, and composition both in terms of whether a group is represented on the board and the proportion of the board that the group's representatives constitute. This is done because studies have shown that the presence of a group and that group's relative proportion affect the decision making process differently (Konrad et al., 2008).

Table 3 Board characteristics by MFIs with scope economies and MFIs with scope diseconomies

Variables	*Scope diseconomies*	*Scope economies*
Board size (members)	7.8	6.8***
CEO is Chair of the board	18	10*
Female Chairwoman	31	23
Female CEO	25	20
Dummy donors represented	9	9
Proportion of board members that are donors	6	7
Dummy international representatives	19	22
Proportion of international board members	7	10
Dummy employee represented	3	6
Proportion board members that are employees	3	5
Dummy clients represented	21	8**
Proportion board members that are clients	21	7***
Dummy creditors represented	2	1
Proportion board members that are creditors	2	0.3**
Dummy women represented	77	77
Proportion of female board members	33	27*
Total number of observations	*121*	*246*

*Mean difference is statistically significant at the 10% level.

**Mean difference is statistically significant at the 5% level.

***Mean difference is statistically significant at the 1% level.

Results show that there are various degrees of differences in governance mechanisms by MFIs with scope economies and diseconomies. For example, MFIs with scope economies have statistically significant (at least on the 10% level) smaller boards (average of 6.8 compared to 7.8 members), fewer women chair their boards (10% vs. 31%) and, although in 77% of both groups women are represented on the boards,

MFIs with scope economies have a smaller proportion of women on the board: 27% on average.[5] Further, compared to MFIs with scope diseconomies, fewer MFIs with scope economies have clients on the board (8% vs. 21%) and a smaller proportion of their board members consists of creditors (0.3% vs. 2%). The composition of the board does not show statistically significant differences according to other characteristics.

Table 4 shows differences in the governance characteristics of MFIs who actually offer savings and those that only lend. The statistically significant differences here are also in terms of board size with lending only MFIs having fewer members (7.1 vs. 7.9) and much fewer MFIs with client representatives: 3% of lending-only MFIs vs. 32% in MFIs collecting savings. However, many more lending-only MFIs have donor representatives on their boards (12% vs. 5%) and in larger proportion (8% vs. 4%) as well as more international board members (29% vs. 18% for the savings collecting MFIs) reflecting MFIs' funding source preferences and the need of donors to control the MFIs better.

Table 4 Board characteristics by MFIs offering savings and loans and lending only

Variables	*Savings and loans*	*Lending only*
Board size (members)	7.9***	7.1
CEO is Chair of the board	10	20
Female Chairwoman	20	20
Female CEO	20	20
Dummy donors represented	5**	12
Proportion of board members that are donors	4**	8
Dummy international representatives	18***	29
Proportion of international board members	9	12
Dummy employee represented	9	7
Proportion board members that are employees	6	5
Dummy clients represented	32***	3
Proportion board members that are clients	31**	2
Dummy creditors represented	3	2
Proportion board members that are creditors	1	1
Dummy women represented	71	77
Proportion of female board members	30	27
Total number of observations	*92*	*275*

*Mean difference is statistically significant at the 10% level.

**Mean difference is statistically significant at the 5% level.

***Mean difference is statistically significant at the 1% level.

Table 5 presents results from a panel probit model which aims to determine what board size and composition are associated with (positive) scope economies. Several models are presented because data for each type of board composition are represented by various sample sizes. Limited data are available for women representatives on the board in

general, as well as whether they serve as CEOs and chairwomen. In addition, fewer MFIs have data on whether creditors are represented on their boards. Therefore, three to five specifications with various sample sizes are estimated. Panel A represents the results across various board types in terms of whether they have some type of board representatives while Panel B represents results from regressions of the proportion of representatives on the board. In terms of board size, our results are consistent with Hartarska and Mersland (2012) who find non-linear board size impact on outreach efficiency with an optimal board size of about nine members.

Table 5 Panel probit regression of probability of positive scope economies on various governance characteristics

Variables	(*1*)	(*2*)	(*3*)
Panel A			
MFI size (total assets $)	–0.283	–0.263	–0.137
	(0.22)	(0.219)	(0.292)
MFI age (in years)	–0.243***	–0.248***	–0.280***
	(0.0581)	(0.0591)	(0.076)
CEO is Chair of the board	–2.244***	–2.160**	–2.576**
	(0.855)	(0.85)	(1.048)
Board size (members)	–0.692*	–0.723*	–0.843
	(0.366)	(0.369)	(0.604)
Board size (members)^2	0.0394**	0.0409**	0.0566
	(0.0199)	(0.0201)	(0.0378)
Dummy donors represented	0.299	0.256	0.897
	(0.962)	(0.956)	(1.314)
Dummy international representatives	–1.118	–1.163	–2.247**
	(0.746)	(0.746)	(0.975)
Dummy employees representatives	2.036*	2.088*	1.912
	(1.219)	(1.201)	(1.592)
Dummy client representatives	–1.145	–1.174	–2.661**
	(0.896)	(0.892)	(1.239)
Dummy creditor representatives		–1.809	
		(1.808)	
Female CEO			0.534
			(0.85)
Female Chairwoman			–1.326
			(0.885)
Constant	10.87***	10.78***	9.871**
	(3.615)	(3.604)	(4.864)
Observations	367	367	279
Number of MFIs	120	120	93
Chi^2	73.62	72.43	63.04

Table 5 Panel probit regression of probability of positive scope economies on various governance characteristics (continued)

Variables	(*1*)	(*2*)	(*3*)
Panel B			
MFI size (total assets $)	–0.334	–0.312	–0.226
	(0.219)	–0.214	–0.293
MFI age (in years)	–0.231***	–0.239***	–0.266***
	(0.057)	(0.058)	(0.075)
CEO is Chair of the board	–1.926**	–1.560*	–2.126**
	(0.829)	(0.809)	(1.025)
Board size (members)	–0.679*	–0.809**	–0.774
	(0.367)	(0.379)	(0.662)
Board size (members)^2	0.0389*	0.0452**	0.0517
	(0.020)	(0.021)	(0.042)
Proportion of board members that are donors	1.254	1.153	1.369
	(1.636)	(1.608)	(2.270)
Proportion of international board members	–1.354	–1.435	–2.347
	(1.438)	(1.425)	(1.830)
Proportion of board members that are employees	1.698	1.781	0.807
	(1.540)	(1.515)	(2.070)
Proportion of board members that are clients	–1.278	–1.214	–3.046**
	(0.937)	(0.910)	(1.375)
Female CEO			0.557
			(0.881)
Female Chairwoman			–1.356
			(0.897)
Proportion of board members that are creditors		–6.079*	
		(3.219)	
Constant	11.33***	11.59***	10.64**
	(3.610)	(3.630)	(4.910)
Annual observations	367	367	279
Number of MFIs	120	120	93
Chi^2	74.56	68.98	64.07

Robust standard errors in parentheses, *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

The results on CEO-Chairperson duality are also consistent with previous work and show that scope economies are more than half as likely in MFIs where the CEO is also chairing the board (P-value < 0.01 in M1, M2 and M3, Table 5(A)). However, scope economies are nearly twice as likely in MFIs that have employees (other than the CEOs) represented

on the board (*P*-value < 0.10 in Models 1 and 2, Table 5(B)). The magnitude of the negative effect of the CEO-Chairperson dummy on the probability of scope economies is larger than the positive effect of having employees on the board. However, higher proportion of employees on the board does not affect the probability of (positive) scope economies as the results in Table 5 Panel B show positive but not statistically significant association, while the negative impact of the dual position remains.

MFIs with international directors on the board are twice less likely to have scope economies (twice as likely to have diseconomies of scope, *P*-value < 0.05 Model (2, Table 5(A)); however, the variable measuring the proportion of international directors on the board is positive but not statistically significant. Similarly, MFIs with clients on the board are more than twice more likely to have scope diseconomies – each additional percent change in the proportion of clients increased the probability of scope diseconomies three times – which is a very large magnitude probably due to the very small number of MFIs with client representation on the board (*P*-value < 0.05). The marginal impact of the proportion of creditors on the board is even higher at –6.08 per unit of change (*P*-value < 0.10), presumably because creditors are also rarely represented on the board usually when the MFI is experiencing problems. It is very important to note, however, that these results are not statistically significant for each of the regressions, suggesting that sample composition may be an issue, and suggesting that a larger dataset may be required to confirm or reject these results in the future.

Table 6, Panels A and B, present panel random effect regression of actual scope economies and diseconomies on board size and composition. There are a few similarities with the results of the panel probit regression of positive scope economies. In two of the samples, the coefficient on the dummy for employee representation on the MFI's board is positive and statistically significant(*P*-value < 0.05 in M5, *P*-value < 0.1 in M4, Table 6(A)), suggesting that MFIs with employees on the board have on average 27–30% higher scope economies compared to those without employees on the board. Similarly, the proportion of board members who are employees also influences the value of scope economies. For the average board with about one client on the board, adding one more employee (11% change due to one more employee on the board) is associated with three times higher percentage point of scope economies (0.276×11 or 0.302×11, with *P*-value < 0.1 and *P*-value < 0.05, respectively, according to Models 4 and 5 in Table 6(A)).

We further find that, while the presence of women, clients, and creditors on the board does not have statistically significant impact on scope economies, the proportion of these on the board does (Table 6 Panel B). In particular, an MFI with a board with one more woman (3 instead of the average 2) is associated with a 3% point (*P*-value < 0.1) lower estimate of scope economies (or larger scope diseconomies). It is again important to note that these results are not robust to alternative specifications and thus they cannot be taken in isolation. For example, the replacement of one board member to increase the proportion of a stakeholder group likely decreases the proportion of another stakeholder group that is represented on the board, so the total effect may be neutral.

The results for the scope economies regressions in Table 6, Panels A and B, do not show statistically significant associations between scope economies and board size and the CEO-Chair duality. However, the inverse relationship between the control variables of MFI age and scope economies is preserved: an additional year of existence is associated with one percent point lower scope economies.

Table 6 A random effects regression of scope economies on governance characteristics

Variables	(*1*)	(*2*)	(*3*)	(*4*)	(*5*)
Panel A					
MFI size (total assets $)	–0.10***	–0.10***	–0.10***	–0.11***	–0.11***
	(0.020)	(0.020)	(0.023)	(0.027)	(0.027)
MFI age (in years)	–0.012***	–0.012***	–0.009*	–0.008	–0.007
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
CEO is Chair of the board	0.00524	0.0119	0.0692	–0.0499	–0.122
	(0.088)	(0.088)	(0.096)	(0.130)	(0.123)
Board size (members)	–0.0176	–0.0212	0.00786	–0.0263	–0.016
	(0.035)	(0.035)	(0.042)	(0.057)	(0.057)
Board size (members)^2	0.00134	0.00149	0.00035	0.00192	0.0014
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Dummy donor represented	–0.00772	–0.0172	0.0161	–0.0152	–0.0121
	(0.100)	(0.100)	(0.118)	(0.113)	(0.114)
Dummy international representatives	–0.0104	–0.0191	–0.0154	–0.00848	–0.0088
	(0.074)	(0.073)	(0.085)	(0.085)	(0.086)
Dummy employees represented	0.142	0.166	0.137	0.276*	0.302**
	(0.113)	(0.113)	(0.126)	(0.150)	(0.151)
Dummy client represented	–0.0932	–0.0984	–0.147	–0.114	–0.129
	(0.089)	(0.089)	(0.109)	(0.112)	(0.113)
Dummy creditor represented		–0.268		–0.504	
		(0.180)		(0.312)	
Female CEO			0.0424	0.0855	0.0883
			(0.077)	(0.080)	(0.081)
			–0.0728	0.003	0.005
			(0.080)	(0.082)	(0.083)
Dummy women represented				–0.136	–0.107
				(0.091)	(0.090)
Constant	1.781***	1.772***	1.575***	1.907***	1.875***
	(0.299)	(0.297)	(0.357)	(0.398)	(0.401)
Observations	367	367	279	217	217
Number of MFIs	120	120	93	73	73
R^2	0.113	0.122	0.124	0.213	0.188
Chi^2	53.06	55.29	39.58	46.54	43.62

Table 6 A random effects regression of scope economies on governance characteristics (continued)

Variables	(*1*)	(*2*)	(*3*)	(*4*)	(*5*)
Panel B					
MFI size (total assets $)	–0.101***	–0.099***	–0.098***	–0.096***	–0.117***
	(0.019)	(0.019)	(0.023)	(0.022)	(0.027)
MFI age (in years)	–0.011***	–0.012***	–0.00695	–0.00818	–0.00473
	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)
CEO–Chair	0.0161	0.0486	0.0833	0.12	–0.087
	(0.086)	(0.087)	(0.092)	(0.093)	(0.122)
Board size (members)	–0.0128	–0.0232	0.0184	0.00207	–0.00538
	(0.035)	(0.035)	(0.042)	(0.042)	(0.057)
Board size (members)^2	0.00109	0.00156	–0.00061	0.000124	0.000497
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Proportion of board members that are donors	0.0229	0.0144	0.0421	0.0269	0.0328
	(0.153)	(0.151)	(0.196)	(0.193)	(0.189)
Proportion of international board members	0.0152	0.00236	0.046	0.0259	0.0558
	(0.137)	(0.136)	(0.162)	(0.160)	(0.158)
Proportion of board members that are employees	0.228	0.23	0.264	0.263	0.403**
	(0.147)	(0.145)	(0.172)	(0.169)	(0.182)
Proportion of board members that are clients	–0.108	–0.105	–0.192*	–0.18	–0.138
	(0.094)	(0.093)	(0.116)	(0.115)	(0.123)
Proportion of board members that are creditors		–0.563*		–0.606**	
		(0.288)		(0.297)	
Proportion of women board members					–0.267*
					(0.147)
Female CEO			0.0412	0.0434	0.122
			(0.0763)	(0.075)	(0.082)
Female Chairwoman			–0.0749	–0.08	0.0214
			(0.078)	(0.076)	(0.084)
Constant	1.766***	1.788***	1.543***	1.600***	1.914***
	(0.296)	(0.294)	(0.348)	(0.346)	(0.391)
Observations	367	367	279	279	217
Number of MFIs	120	120	93	93	73
R^2	0.121	0.142	0.147	0.175	0.208

Robust standard errors in parentheses, *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

6 Conclusions

Stakeholders of MFIs encourage lending-only institutions to lower costs by becoming deposit-mobilising institutions. We are the first to identify which governance mechanisms are associated with MFIs with scope economies (lower costs) from jointly lending and collecting savings. This work brings together two lines of research. The first deals with obtaining the best estimates of the magnitudes of costs savings from providing both savings and loans as opposed to lending-only. The second line of research explores associations between various MFI efficiency measures such as the estimated scope economies and various internal mechanisms of control.

We estimate the magnitudes of scope economies with a semi-parametric smooth coefficient function that was recently proposed as a better methodology for analysing our data and accounts for various environmental factors outside of the control of MFIs governance mechanisms. These factors are the depth of financial markets development in the country, population density, percentage of rural population, MFI lending type, region it operates in, and year of operation. We find that, on average, MFIs have positive scope economies of 13% but that there are significant differences in estimated scope economies by MFI types – those offering savings products and those that only lend.

The results on the links between board size and composition and the estimated scope economies are interesting. We first find a non-linear relationship between board size and the probability that the MFI has positive scope economies, and estimate that the optimal board size is about nine members, consistent with the findings of Hartarska and Mersland (2012) who find that scale efficiency improves with up to nine board members. We find that the (probability of positive) scope economies are positively associated with the presence MFI employees but negatively associated with CEO board Chairperson duality. The magnitude of the latter impact is larger than the positive impact of employees on the board. Consistent with these findings are the results that board diversity measured by the presence of women and international directors, as well as the presence of various stakeholders on the board, are associated with smaller scope economies and inversely related to the probability of positive scope economies. These results seem to support the notion that, in high risk environments, employees' (but not CEOs') insider information, presumably about the preferences and incentives of savers and borrowers, translates into better decisions that bring cost savings.

The findings add to previous research which shows that overall cost economies are realised due to shared infrastructure (large fixed costs) and not from learning from one group (e.g., borrowers) that can be used in serving another group of clients (e.g., savers), likely because borrowers and savers are different groups (Hartarska et al., 2011). We find that, given these particularities, the information employees on the board bring may be helpful in improving decision making which could translate into cost savings. Given the limitations of the dataset, it is expected that further data collection and analysis with larger datasets could bring about better understanding of how governance affects performance in various types of MFIs.

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Notes

[1]Hartarska and Mersland (2012) summarize the theoretical contributions that have motivated the empirical microfinance governance literature.

[2]Some authors have argued that with endogenously chosen boards, differences in performance may be attributed to specification issues (Hermalin and Weisbach, 2003). However, a study by Cornett and Tehranian (2008) shows that if a firm's performance is adjusted for earning management, the measured importance of governance variables increases and the impact of incentive-based compensation on corporate performance decreases; thus, the presence of independent outside directors, the institutional ownership of shares, and representation on the board of directors can have a direct impact on performance.

[3]Vieito (2012), summarises the tournament and behavioural theories' implications for CEO gender related differences and company performance.

[4]The environmental variables we include are depth of financial markets development in the country, the population density,–percent of rural population, MFI lending type, region it operates in and year of operation.

[5]*P*-value of all comparisons is at least 0.10, typically >0.05.