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Board Size, Composition, and Scope Economies in Microfinance Institutions

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Abstract:

This paper explores the relation between board size and composition and estimated cost SCOPE? economies from offering both voluntary savings and loans by Microfinance Institutions. In the first stage, we estimate scope economies from a cross-country sample using a semiparametric smooth coefficient method. It uniquely permits us to include observations with zero savings output and thus include all MFIs in the sample since the majority are lending-only. More importantly, this methodology allows us to incorporate the impact of direct and indirect (via input price interactions) factors related to the external environment in which MFIs operate, and which are not controlled by management. In the second stage, we study differences in estimated scope economies that are can be attributed to management and thus differ by various governance structures.

We find some support for the hypotheses that internally generated information, due to employee representation on MFI boards, may increase the likelihood and magnitude of scope economies. However, the CEO-Chairman duality is associated with equal and even slightly larger probability of negative scope economies, a result consistent with previous work. A complementary finding is that representation by other types of stakeholders such as clients, international directors, and creditors, as well as gender and international diversity, are not

associated with better scope economies. These results seem to support the notion that in high uncertainty environments group cohesion may be an advantageous mechanism of control.

Key words: Microfinance Institutions, Governance, Board of directors, Board size, Board Composition, Group Cohesion, Scope Economies, Intermediation

JEL code: G21, G3, O16, L31, L25

* author order is alphabetic, does not reflect contribution, January 6th, 2011

Board Size, Composition, and Scope Economies in Microfinance Institutions

The literature on the role of governance in microfinance is relatively recent and much remains to be learned about what constitutes good governance for Microfinance Institutions (MFIs). Studies have focused on exploring possible relations between internal and external governance mechanisms and MFIs' performance, with the goal of identifying the mechanisms that could promote better performance (Labie, 2001; Hartarska 2005; Mersland and Strøm, 2009). Recently, Hartarska and Mersland (forthcoming) explored the impact of governance mechanisms on outreach efficiency – the estimated technical efficiency from a cost function which incorporates both cost minimization and outreach goals of MFIs. The present paper uses somewhat similar approach following the suggestion by Berger and Humphrey (1997) that efficiency estimates in banks are likely affected by management which in turn differs by governance structures. Therefore, the relation between governance mechanisms and estimated efficiency measures needs to be explored further.

Another line of literature in microfinance estimates the scope economies from providing both voluntary savings and loans rather than just lending. The findings suggest that, unlike the majority, some MFIs (could) experience significant scope diseconomies from offering savings as well as loans. Among the factors that affect the magnitudes of scope (dis)economies predicted by cost function estimates are the environment in which MFIs operate, such as geography, demographic and economic conditions as well as MFI-specific characteristics. We argue that these factors cannot be affected by the governance structure and thus belong directly in the cost function used to determine the scope economies. We therefore explore the link between internal governance mechanisms that can be decided by the MFI, such as the board size and composition, and the estimated cost economies from collecting deposits as well as lending.

We first estimate scope economies from a cross-country sample with a semiparametric smooth coefficient method. It uniquely accommodates two important specificities of MFIs. The first one is the zero output values for savings which lending-only MFIs have. The method allows us to include data from the MFIs that do not take voluntary deposits, which are the majority in the sample and worldwide. More importantly, however, we can also 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 (Armedariz and Szafarz, 2009; Ahlin et al., forthcoming). This approach is important because previous papers found that estimated scope economies with environmental variables are preferable to estimates without environmental factors (Hartarska, et al., 2010a; Hartarska, et al., 2011; and Hartarska et al., 2010b). Moreover, if external environmental factors affect costs directly or via interaction with the input prices, the scope economies actually achieved may be attributable to management which would likely differ by various internal governance structures.

Therefore, we look at differences in board size and composition between MFIs with scope economies and scope diseconomies, to see if these factors which, unlike the external environment can be controlled by management, differ across MFIs. In the second stage of the empirical analysis we use simple mean differences comparison across groups with estimated scope economies and diseconomies and then use a panel probit model to study if there are differences in governance characteristics that affect probability of an MFI having scope (dis)economies. We also estimate the impact of various governance mechanisms directly on the scope economies using panel data regressions. In addition, we study possible differences in board size and composition between MFIs providing savings alongside lending with lending

only MFIs using differences in means because, for some characteristics, the number of observations is not sufficient to do separate regressions by groups.

We find some support for the hypothesis that internally generated information, due to employee representation on MFI boards, may increase the likelihood and magnitude of scope economies. However, CEO-Chairman duality is associated with equal and even slightly larger probability of negative scope economies consistent with previous work. A complementary finding is that representation by other types of stakeholders such as clients, international directors, and creditors, as well as gender and international diversity, are not associated with better 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, Kahwajy and Bourgeois, (1997) and Kanter (1977).

The remainder of the paper is organized as follows. Section Two reviews the related literature and lays out the hypotheses to be tested. Section Three describes the empirical methodology. Section Four summarizes the data. The results are discussed in Section Five, while Section Six offers conclusions.

2. Literature Review

Governance and MFI performance literature

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

There are several studies that explore the impact of governance mechanisms and board size and composition in particular on MFIs. In the first published empirical study Hartarska (2005) uses a small-sample 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, MFIs having boards with a higher proportion of donors were found to have lower financial sustainability but to reach poorer borrowers, while MFIs with client representation have better sustainability but serve less 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 and several aspects of governance mechanisms such as the CEO/chairman duality, female CEOs, international directors, board size, and external factors affect financial performance and poverty outreach. They also 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, they find that MFIs with female CEOs have better ROA, that MFIs with dual CEO/chairman positions have a higher portfolio yield and serve more clients but show no other measurable performance differences. They further find that MFIs with larger boards distribute smaller loans, and that external factors play a limited role at best.

Closest to this paper is a paper studying the impact of governance on another efficiency aspect - technical efficiency. In this paper, Hartarska and Mersland (forthcoming) 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' presence 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 organized their internal governance relatively successfully.

2.2 Board Size and Composition as an internal governance mechanism.

Internal governance includes control mechanisms defined by the firm, such as the MFI board. 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 minimize the risk of its damage (Handy, 1995). 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 MFIs' managers strive to achieve poverty outreach and financial sustainability, they reveal more information to their boards than what would have been revealed under a single profit maximization 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.*, 2007). 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. Galema et al. (forthcoming) find similar evidence for MFI boards. This might be because of the importance of communicating stability to customers in an MFI. When it comes to board size and financial and poverty outreach performance the empirical evidence is mixed. Hartarska (2005) did not find consistent evidence of a positive impact of larger boards on a 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 the targeting of poorer clients. Hartarska and Mersland (forthcoming) found a non-linear relationship with an optimal size of about 9 members.

Since the association between board size and scope economies of the MFIs has not been explored, we propose the following hypothesis in its null form. ***Hypothesis 1. H0: Board size has no impact on (probability of positive) scope economies.*** We also test for a quadratic relation between size and (probability of) scope economies to determine if there are non-linear relation between board size and performance.

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 1/ *independent directors* and 2/ *separated CEO/Board Chair roles* are the most studied (Bhagat and Jefferie, 2002).¹

¹ Some authors have argued that with endogenously chosen boards, differences in performance may be attributed to specification issues (Hermalin and Weisbach, 2003). Recently, however, a study by Cornett and Tehranian (2008)

Empirical research, however, has found 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 high uncertainty environment with less divergence between the CEO and owners objectives, when the firm's financing is out of retained earnings, and when 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).

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 (forthcoming) 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 ability to understand both savers and borrowers incentives and

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.

preferences, it is important to study whether presence of insiders on the board will affect scope economies. Therefore, we form *Hypothesis 2. H0: The proportion of insiders on the board, measured as the proportion of employees on the board, does not affect performance/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 Chairmen 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, a CEO-chairman 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 Mersland, however, found that duality is associated with less outreach efficiency. The next hypothesis in null form is *Hypothesis 3, H0: MFIs in which the positions of CEO and board chair are split do not 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 the agency costs (Gorton and Schmidt, 2000). Unlike most other boards, the MFI board may also include representatives of social investors (when the organization 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 other 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 (forthcoming) find that creditors may improve outreach efficiency. Therefore, we formulate several other hypotheses stated jointly and in null form as Hypotheses 4, 5, and 6: *the proportions of each group of creditors, clients, and donors on the board do not affect performance.*

Board diversity is another aspect of governance that has attracted attention. MFIs often target female customers (Armendariz de Aghion and Morduch, 2005). A female CEO may be better at obtaining information from predominantly female customers compared to a male CEO, and this could affect scope economies. 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 Strøm 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 maximization (Brancato and Patterson, 1999; Westphal and Milton, 2000; Carter, Simkins and Simpson, 2003). For non-profits, evidence shows that women directors spend more time on monitoring activities but better performing organizations do not have proportionally more women and minorities on the boards (Oster and O'Reagan, 2004).

Organizational 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, Kahwajy and Bourgeois, 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, 2004). Dutta and Nose (2006) also find inconsistent result on the relation between women representation on the board and bank 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 equity point of view, it is still unknown if in MFIs it is effective given the high level of uncertainty that exists in organizations 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: *H0: Scope Economies are unaffected by board's diversity.*

3. Methodology Estimation of economies of scope

Scope economies are important to study because their presence allows to discern an optimal product mix across a set of firms. Pulley and Humphrey (1993) define overall economies of scope as the percentage of cost savings from producing all outputs jointly as opposed to producing each output separately. There are only two outputs in this analysis (q_1 and q_2), \$ value of loans and deposits or the total number of borrowers and savers. In this setting, 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 r is a vector of input prices, and $C(\cdot)$ is the cost function. Given that the data used to estimate the cost function of MFI will represent a mix of both MFI producing loans and deposits jointly and MFI specializing in the production of loans exclusively, the use of standard cost functions in production econometrics are not suitable (see Pulley and Braunstein, 1992; Hartarska *et al.*, 2010).

To estimate a cost function that may possess zero-valued outputs without resorting to data transformations, Pulley and Braunstein (1992) suggest using the multiplicatively separable cost function of Baumol *et al.* (1982). This cost function is quadratic (as opposed to log-quadratic) in outputs, thus alleviating the empirical issue of zero-valued outputs in applied data sets. The composite cost model of Pulley and Braunstein (1992) can be written succinctly as:

$$C(q, \ln r) = F(q, \ln r) \cdot G(\ln r) + u. \quad (2)$$

With an additive error term, the composite model is:

$$C = [a_0 + \sum a_i q_i + 1/2 \sum \sum a_{ij} q_i q_j + \sum \sum g_{ik} q_i \ln r_k] \cdot \exp(b_0) + \sum b_k \ln r_k + \sum \sum b_{kl} \ln r_k \ln r_l + \varepsilon_i, \quad (3)$$

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 (maximum likelihood or nonlinear least squares estimation). However, we argue next that a priori specification of $GG(\cdot)$ is not required to estimate this cost function as the model can be cast as a more general smooth coefficient model. Therefore, we are open to flexible semiparametric modelling.

3.1. A semiparametric smooth coefficient cost function

The empirical model of Pulley and Braunstein (1992) reflects a composite structure suitable for estimating scope economies. Asaftei *et al.* (2009), Hartarska *et al.* (2010a) and Hartarska *et al.* (2010b) propose a semiparametric smooth coefficient (SPSC) cost function that takes a similarly representative form but relaxes the specific functional form restrictions on $G(\ln r)$. This setup, with the same type of cost structure for $F(q, \ln r)$, affords the researcher sufficient flexibility to model costs and investigate scope economies. Moreover, the incorporation of environmental variables is easily handled within the smooth coefficients without restrictive parametric specification. To describe the process to estimate our cost function via smooth coefficient estimation, we first introduce some basic concepts.

Let the function $G(\ln r) \equiv \exp(b_0 + \sum b_k \ln r_k) + \sum \sum b_{kl} \ln r_k \ln r_l$. Equation 3 can be written as²:

$$C = [\tilde{a}_0 + \sum \tilde{a}_i q_i + 1/2 \sum \sum \tilde{a}_{ij} q_i q_j + \sum \sum g_{ik} q_i \ln r_k], \quad (4)$$

where \tilde{a}_i , \tilde{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 \tilde{a}_{ij} and g_{ik} as functions of $G(\ln r)$ and an additional series of covariates that can be thought of as capturing the environment in which the MFI operates (V_i).

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 our setup. We argue that the strength of the semiparametric smooth coefficient model is that 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 model changes as the variables that enter the smooth coefficient change, thus allowing the cost function to be more flexible than any given parametric specification. We note here that the exact cost function of Pulley and Braunstein (1992) is also a smooth coefficient model that for fixed input prices is a linear in parameters cost function. The difference with our

approach is that no a priori specification of $G(\ln r)$ is required.

We can write equation (2) in the following SPSC specification:

$$Y_i = \alpha(z_i) + \beta(z_i) x_i + \varepsilon_i \quad (5)$$

where $y_i = C_i$, $x_i = [1 \ q_i' \ q_i' \ q \ln r_i']'$, $z_i = [\ln r_i \ V_i]$ and where q_i represents the vector of outputs for the i th firm, r_i is the vector of input prices and V_i contains our environmental variables.² The semiparametric smooth coefficient model can be specified as quadratic in output, as recommended by Baumol *et al.* (1982), but can be more/less general in the input price structure, due to the lack of specification on the $\beta(z_i)$ and $\alpha(z_i)$.

Li *et al.* (2002) and Li and Racine (2009) propose an estimation procedure for the SPSC defined in equation 5 based on local constant least squares. The estimation of equation 5 is as follows. Denote $\delta(z_i) = [\alpha(z_i), \beta(z_i)]$ and rewrite equation (5) as $y_i = \delta(z_i)X_i + \varepsilon_i$, where $X_i = [1 \ x_i]$. Our local constant least squares estimator of $\delta(z)$ becomes

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

where $\mathbf{K}(z)$ is a diagonal matrix with i th element $K_i = Kg(z_i, z)$ and \mathbf{X} is our matrix composed of X_i . K_i is constructed using the generalized product kernel of Racine and Li (2004) and g is a vector of bandwidths. We deploy a generalized kernel due to the fact that several of our environmental variables are discrete.

Bandwidth selection is considered the most salient aspect of all local smoothing methods, including semiparametric smooth coefficient modeling. To obtain bandwidths for the smooth coefficients of our cost function, we use least squares cross validation (LSCV), which is shown by Li and Racine (2009) to have desirable properties in the smooth coefficient setting. This

² The environmental variables we include are depth of financial markets development in the country, the population density, percentage of rural population, MFI lending type, region it operates in and year of operation

selection method chooses bandwidths to minimize a squared error criterion:

$$LSCV(h) = \min_h n^{-1} \sum_i (C_i - \hat{C}_{-i})^2, \quad (7)$$

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 minimum average prediction error for the entire sample.

3.2 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 across MFIs with estimated scope economies and diseconomies, across MFIs offering savings and loans and lending only MFIs and by these groups with scope economies and diseconomies. In addition, 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 presence of each type of stakeholders described in the literature review as well as on the proportion of these stakeholders on the board. Next we estimate a panel random effect model

$$\begin{aligned} \text{EstimatedScopeEconomies}_{it} = & \alpha + \beta_1 \text{BoardSize}_i + \beta_2 (\text{BoardSize}_i)^2 + \sum_{k=1}^K \beta_k \text{BoardComposition}_k \\ & + \sum_{m=1}^M \beta_m \text{Controls}_m + \varepsilon_{i,t} \end{aligned} \quad (8)$$

where the controls included here are 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 in that institution and environment (Caudill et al., 2009). *MFI age* is measured in years from the start of microfinance activity, *MFI size* measured in the log of the total assets.

4. Data

The dataset was constructed from publicly available data from www.ratingfund2.org. It 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-section of data for MFIs worldwide which not only contains up to 4 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 about 35-40 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 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 labor cost per worker, cost of financial capital, measured by the cost of all borrowed funds to their stock, and the cost of physical capital is the ratio of non-labor operating expense to fixed assets. The vector of environmental variables includes the depth of financial markets development in the country, the population density, percentage of rural population, MFI lending type, region it operates in and year of operation.

The governance variable *Board size* is 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 9 times a year. Stakeholder groups are included as members, but in small numbers only. For example, only six percent of boards have employee representation and two percent have creditor representation; 10 percent and 12 percent 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 would show link between stakeholders representation and scope economies. Finally, in 10 percent of cases, 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 percent, similar to scope economies estimates for the larger samples shown in the literature (Hartarska et al. 2010a&b for alternative estimates). When the results are broken down by MFIs offering savings and those lending only, we see substantial differences, again consistent with results from larger samples. Deposit collecting MFIs have negligible economies of scope of about one percent, depending on the sample used, while the potential scope economies for lending-only MFIs are much larger: about 16 percent (Table 2).

Within these groups we find that scope economies are of similar magnitude – 20 percent for savings and loans and 25 percent for lending-only MFIs. Within the group of MFIs experiencing scope diseconomies, we find twice larger scope diseconomies of 28% for savings and lending MFIs as compared to scope diseconomies of 14% for lending-only MFIs. Moreover, we find that within the MFIs offering voluntary savings half have scope economies and half have scope diseconomies while within the group of lending-only MFIs 77 percent could have scope economies and 23 scope diseconomies. The differences across these groups are statistically significant.

Table 3 presents the differences in governance characteristics between MFIs with scope economies and diseconomies. The governance characteristics explored are board size, board's meetings per year and board composition both in terms of whether a group is represented on the board and the proportion of the board that group representatives' constitute. Results show that there are various degrees of differences in governance mechanisms by these two criteria. For example, MFIs with scope economies have statistically smaller boards (with 6.8 members) which meet fewer times per year (8 times), have fewer women chair their boards (10%) and, although in 77 % of both groups women are represented on the boards, MFIs with scope economies have smaller proportion of women on the boards – 27% on average. MFIs with scope diseconomies have boards with 7.8 members on average, meeting on average 10 times a year with 31% of cases of a female chair. Further, compared to MFIs with scope diseconomies, fewer MFIs with scope economies have clients on the board (8% versus 21% in the group of scope diseconomies) and smaller proportion of their board members are creditors (0.3 % versus 2 percent). The composition of the board does not show statistically significant differences according to other characteristics.

Table 4 represents 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 and number of meetings with lending only MFIs having fewer members (7.1 vs. 7.9) meeting less often (7 vs. 11 times) and many times fewer MFIs with client representatives - 3% of lending-only MFIs versus 32% in MFIs collecting savings. However, many more lending-only MFIs have donor representatives on their boards (12 % versus 5 %) and have larger proportion (8% versus 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 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 is 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 sit 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, results are consistent with Hartarska and Mersland (forthcoming) who find non-linear board size impact on outreach efficiency with an optimal board size of about 9 members.

Results on board composition show that scope economies are twice less likely in MFIs where the CEO is also chairing the board. However, scope economies are twice more likely in MFIs who have employees (other than the CEOs) represented on the board. The magnitude of

the negative effect of CEO-Chairman dummy on the probability of scope economies is larger in magnitude 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 a dual position remains.

MFIs with international directors on the board are twice less likely to have scope economies (twice more likely to have diseconomies of scope), however the coefficient in front of the variable measuring the proportion of international directors on the board is 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 probability of scope diseconomies three times – which is a very large magnitude. The marginal impact of creditors on the proportion of creditors on the board is even higher at -6.08 per unit of change, presumably because creditors sit on the board 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 (possibly selection) may be an issue, therefore larger dataset in the future needs to be used to confirm the results.

Table 6 Panels A & B present panel random effect regression of actual scope economies and diseconomies on board size and composition. There are 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, suggesting that MFIs with employees on the board have on average 25-30% higher scope economies. Similarly, the proportion of board members who are employees also influences the value of scope economies. For the average board with about 1 client on the board replacing it

with two clients (11% change) is associated with 3 times higher percentage point of scope economies (0.28*11 percentage points). 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 women (3 instead of the average 2) is associated with about 3 times lower percentage points 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 & B, do now show statistically significant associations between scope economies and board size and 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. The impact of size is also negative – larger MFIs have smaller scope economies (larger scope diseconomies) but the association is not statistically significant.

6. Conclusions

This paper sets to explore possible links between estimated scope economies and several internal governance characteristics such as the board size and its composition. It brings together two lines of research. The first type of literature 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 performance measures (such as estimated scope economies) and various internal mechanisms of control.

We first estimate the magnitudes of scope economies with a semi-parametric smooth coefficient function that is proposed as a better methodology for analyzing our data and account for various environmental factors the MFIs cannot control. These factors are the depth of financial markets development in the country, the population density, the 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 percent.

The estimated scope economies are separated in several groups and further analyzed. We find that MFIs which actually offer (voluntary) savings have much smaller scope economies of about one percent compared to the estimated 17 percent scope economies for lending –only MFIs. In addition, there are significant differences in the cost savings by these two types of MFIs with 77% of the lending-only MFIs having scope economies, while only 50% of the MFIs actually providing savings operate with scope economies and 50 % have scope diseconomies. Further, the scope diseconomies from offering both savings and lending are 28%, while they are only 14% for lending-only MFIs. For the MFIs with scope economies (both groups–lending-only as well as savings-collecting MFIs), the magnitude of costs savings is about one fifth to one fourth and is thus significant.

The results on the links between board size and composition and the estimated scope economies are not very robust but, generally, 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 9 members consistent with the findings of Hartarska and Mersland (forthcoming) who also find that efficiency improves with up to 9 board members. We find that the (probability of positive) scope economies are positively associated with the presence of insider representatives such as MFI employees but negatively through the CEO-board chair

duality which, in magnitudes, slightly overwhelms 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 can translate into better decisions that bring cost savings while the presence of various outside stakeholders may not be conducive to scope cost savings.

These findings add to previous scope estimates which separate cost economies into cost complementarities and fixed cost economies. Previous results show that overall cost economies are realized 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) because of the significant negative cost complementarities, suggesting that borrowers and savers are likely different groups (Hartarska, et al., 2011). We find that, given these particularities, the information shared by employees on the board 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 this and other datasets could bring about better understanding of how governance affects scope economies by various types of MFIs.

Table 1. Summary Statistics of the Governance Data

| | Obs. | Mean | Std. Dev. | Min | Max |
|--|-------------|-------------|----------------------|------------|------------|
| Board size | 556 | 7.1 | 3.9 | 2 | 33 |
| Number board meets per year | 347 | 8.9 | 10.9 | 1 | 100 |
| CEO is Chair of the board | 501 | 12% | 0.309 | 0 | 100% |
| Female CEO | 499 | 26.9% | 44.4% | 0 | 100% |
| Female Chairwoman | 403 | 24.3% | 43.0% | 0 | 100% |
| % MFIs with donors reps on the board | 453 | 9.1% | 28.7% | 0 | 100% |
| % MFIs with international reps on the board | 457 | 21.2% | 40.9% | 0 | 100% |
| % MFIs with employee reps on the board | 450 | 5.6% | 22.9% | 0 | 100% |
| % MFIs with clients reps on the board | 452 | 11.9% | 32.5% | 0 | 100% |
| % MFIs with creditors reps on the board | 450 | 1.8% | 13.2% | 0 | 100% |
| % MFIs with women reps on the board | 306 | 77.1% | 42.1% | 0 | 100% |
| Proportion of board members that are donors | 453 | 5.8% | 20.4% | 0 | 100% |
| Proportion international board members | 457 | 9.2% | 21.6% | 0 | 100% |
| Proportion board members that are employees | 450 | 4.0% | 18.8% | 0 | 100% |
| Proportion board members that are clients | 452 | 10.9% | 30.8% | 0 | 100% |
| Proportion board members that are creditors | 450 | 0.9% | 8.5% | 0 | 100% |
| Proportion of board members that are women | 306 | 28.4% | 25.1% | 0 | 100% |

Table 2. Scope Economies by MFIs actually collecting savings and lending only MFIs

| | Savings & loans MFIs | Loans only MFIs |
|-------------------------------------|-------------------------------------|----------------------------|
| Overall scope economies* | 1% | 16% |
| Scope economies | 20% | 25% |
| Scope diseconomies | -28% | -14% |

Table 3. Board Characteristics by MFIs with scope economies and MFIs with scope diseconomies.

| | Overall | Scope Diseconomies | Scope Economies |
|--|---------|-----------------------|--------------------|
| Board size (members) | 7.1 | 7.8 | 6.8*** |
| Number board meets per year | 8.9 | 10.9 | 8.0** |
| CEO is Chair of the board | 10% | 18% | 10% * |
| Female Chairwoman | 20% | 31% | 23% |
| Female CEO | 25% | 25% | 20% |
| % MFIs with donors reps on the board | 9% | 9% | 9% |
| Proportion of board members that are donors | 6% | 6% | 7% |
| % MFIs with international reps on the board | 21% | 19% | 22% |
| Proportion of international board members | 9% | 7% | 10% |
| % MFIs with employee reps on the board | 6% | 3% | 6% |
| Proportion board members that are employees | 4% | 3% | 5% |
| % MFIs with clients reps on the board | 12% | 21% | 8% ** |
| Proportion board members that are clients | 11% | 21% | 7% *** |
| % MFIs with creditors reps on the board | 2% | 2% | 1% |
| Proportion board members that are creditors | 1% | 2% | 0.3% ** |
| % MFIs with women reps on the board | 77% | 77% | 77% |
| Proportion of female board members | 28% | 33% | 27% * |

*** mean difference is statistically significant at the 1 % level, ** mean difference is statistically significant at the 5 % level, * mean difference is statistically significant at the 10 % level.

Table 4. Board Characteristics by MFIs offering savings and loans and lending only.

| | Overall for the sample | Savings & loans MFIs | Loans only MFIs |
|--|---------------------------|-------------------------|--------------------|
| Board size (members) | 7.3 | 7.9*** | 7.1 |
| Number board meets per year | 8.2 | 11.3*** | 7.0 |
| CEO is Chair of the board | 0.1 | 0.1 | 0.2 |
| Female Chairwoman | 0.2 | 0.2 | 0.2 |
| Female CEO | 0.2 | 0.2 | 0.2 |
| % MFIs with donors reps on the board | 10% | 5%** | 12% |
| Proportion of board members that are donors | 6% | 4%** | 8% |
| % MFIs with international reps on the board | 26% | 18%*** | 29% |
| Proportion of international board members | 11% | 9% | 12% |
| % MFIs with employee reps on the board | 8% | 9% | 7% |
| Proportion board members that are employees | 5% | 6% | 5% |
| % MFIs with clients reps on the board | 12% | 32%*** | 3% |
| Proportion board members that are clients | 11% | 31%** | 2% |
| % MFIs with creditors reps on the board | 3% | 3% | 2% |
| Proportion board members that are creditors | 1% | 1% | 1% |
| % MFIs with women reps on the board | 76% | 71% | 77% |
| Proportion of female board members | 27% | 30% | 27% |

*** mean difference is statistically significant at the 1 % level, ** mean difference is statistically significant at the 5 % level, * mean difference is statistically significant at the 10 % level.

Table 5 Panel A. Panel Probit regression of Probability of Positive Scope Economies on various governance characteristics.

| VARIABLES | Pr(scope>0) | Pr(scope>0) | Pr(scope>0) |
|--|-------------|-------------|-------------|
| 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) |
| % MFIs with donor reps on the board | 0.299 | 0.256 | 0.897 |
| | (0.962) | (0.956) | (1.314) |
| % MFIs with international reps on the board | -1.118 | -1.163 | -2.247** |
| | (0.746) | (0.746) | (0.975) |
| % MFIs with employees reps on the board | 2.036* | 2.088* | 1.912 |
| | (1.219) | (1.201) | (1.592) |
| % MFIs with cleint reps on the board | -1.145 | -1.174 | -2.661** |
| | (0.896) | (0.892) | (1.239) |
| Female CEO | | | 0.534 |
| | | | (0.85) |
| Female Chairwoman | | | -1.326 |
| | | | (0.885) |
| % MFIs with creditor reps on the board | | -1.809 | |
| | | (1.808) | |
| Constant | 10.87*** | 10.78*** | 9.871** |
| | (3.615) | (3.604) | (4.864) |
| Observations | 367 | 367 | 279 |
| Number of case | 120 | 120 | 93 |
| chi2_c | 73.62 | 72.43 | 63.04 |
| ll_c | -180.2 | -179.1 | -135.5 |
| p-value | 0.00647 | 0.0115 | 0.035 |
| chi2 | 22.88 | 22.81 | 20.85 |
| ll | -143.4 | -142.9 | -103.9 |

Table 5 Panel B. Panel Probit regression of probability of positive scope economies on various governance characteristics

| VARIABLES | Pr(scope>0) | Pr(scope>0) | Pr(scope>0) |
|---|----------------------|----------------------|----------------------|
| MFI size (total assets \$) | -0.334 (0.219) | -0.312 -0.214 | -0.226 -0.293 |
| MFI age (in years) | -0.231*** (0.057) | -0.239*** (0.058) | -0.266*** (0.075) |
| CEO is Chair of the board | -1.926** (0.829) | -1.560* (0.809) | -2.126** (1.025) |
| Board size (members) | -0.679* (0.367) | -0.809** (0.379) | -0.774 (0.662) |
| Board size (members)2 | 0.0389* (0.020) | 0.0452** (0.021) | 0.0517 (0.042) |
| Proportion of board members that are donors | 1.254 (1.636) | 1.153 (1.608) | 1.369 (2.270) |
| Proportion of international board members | -1.354 (1.438) | -1.435 (1.425) | -2.347 (1.830) |
| Proportion of board members that are employees | 1.698 (1.540) | 1.781 (1.515) | 0.807 (2.070) |
| Proportion of board members that are clients | -1.278 (0.937) | -1.214 (0.910) | -3.046** (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*** (3.610) | 11.59*** (3.630) | 10.64** (4.910) |
| Observations | 367 | 367 | 279 |
| Number of case | 120 | 120 | 93 |
| chi2_c | 74.56 | 68.98 | 64.07 |
| ll_c | -181.5 | -176.6 | -137.1 |
| p | 0.00672 | 0.0111 | 0.0377 |
| chi2 | 22.78 | 22.9 | 20.6 |
| ll | -144.2 | -142.1 | -105.1 |
| sigma_u | 2.225 | 2.115 | 2.661 |

Table 6 Panel A. A random effects regression of estimated scope economies on various governance characteristics

| VARIABLES | scope | scope | scope | scope | scope |
|--|-----------|-----------|------------|-----------|-----------|
| MFI size (total assets \$) | -0.100*** | -0.098*** | -0.0955*** | -0.105*** | -0.108*** |
| | (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) |
| % MFIs with donor reps on the board | -0.00772 | -0.0172 | 0.0161 | -0.0152 | -0.0121 |
| | (0.100) | (0.100) | (0.118) | (0.113) | (0.114) |
| % MFIs with international reps on the board | -0.0104 | -0.0191 | -0.0154 | -0.00848 | -0.0088 |
| | (0.074) | (0.073) | (0.085) | (0.085) | (0.086) |
| % MFIs with employees reps on the board | 0.142 | 0.166 | 0.137 | 0.276* | 0.302** |
| | (0.113) | (0.113) | (0.126) | (0.150) | (0.151) |
| % MFIs with cleint reps on the board | -0.0932 | -0.0984 | -0.147 | -0.114 | -0.129 |
| | (0.089) | (0.089) | (0.109) | (0.112) | (0.113) |
| % MFIs with creditor reps on the board | | -0.268 | | -0.504 | |
| | | (0.180) | | (0.312) | |
| Female CEO | | | 0.0424 | 0.0855 | 0.0883 |
| | | | (0.077) | (0.080) | (0.081) |
| Female Chairwoman | | | -0.0728 | 0.00242 | 0.00473 |
| | | | (0.080) | (0.082) | (0.083) |
| % MFIs with women reps on the board | | | | -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 case | 120 | 120 | 93 | 73 | 73 |
| R^2 | 0.113 | 0.122 | 0.124 | 0.213 | 0.188 |
| chi2 | 53.06 | 55.29 | 39.58 | 46.54 | 43.62 |

Table 6 Panel B. A random effects regression of estimated scope economies on various governance characteristics

| VARIABLES | scope | scope | scope | Scope | Scope |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| MFI size (total assets \$) | -0.101*** (0.019) | -0.099*** (0.019) | -0.098*** (0.023) | -0.096*** (0.022) | -0.117*** (0.027) |
| MFI age (in years) | -0.011*** (0.004) | -0.012*** (0.004) | -0.00695 (0.005) | -0.00818 (0.005) | -0.00473 (0.006) |
| Ceochair | 0.0161 (0.086) | 0.0486 (0.087) | 0.0833 (0.092) | 0.12 (0.093) | -0.087 (0.122) |
| Board size (members) | -0.0128 (0.035) | -0.0232 (0.035) | 0.0184 (0.042) | 0.00207 (0.042) | -0.00538 (0.057) |
| Board size (members)2 | 0.00109 (0.002) | 0.00156 (0.002) | -0.00061 (0.002) | 0.000124 (0.002) | 0.000497 (0.003) |
| Proportion of board members that are donors | 0.0229 (0.153) | 0.0144 (0.151) | 0.0421 (0.196) | 0.0269 (0.193) | 0.0328 (0.189) |
| Proportion of international board members | 0.0152 (0.137) | 0.00236 (0.136) | 0.046 (0.162) | 0.0259 (0.160) | 0.0558 (0.158) |
| Proportion of board members that are employees | 0.228 (0.147) | 0.23 (0.145) | 0.264 (0.172) | 0.263 (0.169) | 0.403** (0.182) |
| Proportion of board members that are clients | -0.108 (0.094) | -0.105 (0.093) | -0.192* (0.116) | -0.18 (0.115) | -0.138 (0.123) |
| Proportion of board members that are creditors | | -0.563* (0.288) | | -0.606** (0.297) | |
| Proportion of women board members | | | | | -0.267* (0.147) |
| Female CEO | | | 0.0412 (0.0763) | 0.0434 (0.075) | 0.122 (0.082) |
| Female Chairwoman | | | -0.0749 (0.078) | -0.08 (0.076) | 0.0214 (0.084) |
| Constant | 1.766*** (0.296) | 1.788*** (0.294) | 1.543*** (0.348) | 1.600*** (0.346) | 1.914*** (0.391) |
| Observations | 367 | 367 | 279 | 279 | 217 |
| Number of case | 120 | 120 | 93 | 93 | 73 |
| r2_o | 0.121 | 0.142 | 0.147 | 0.175 | 0.208 |

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