Female leaders and financial inclusion: Evidence from microfinance institutions

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Mersland**

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Keywords: Female leadership, financial access, microfinance institutions, cross-country panel data.

JEL Classifications: G34; M12; M14

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ABSTRACT

This research advances the hypothesis that female leaders – chief executive officers (CEOs), chairs, and directors – of a microfinance institution (MFI) give more priority to the poorest families in loan provision than male leaders do. We differentiate between a depth and a width dimension of financial inclusion. The data set is a unique global panel of MFIs collected from MFI raters’ reports. Our sample is also unique in the sense that about one-third of all MFIs have a female CEO. The problem of endogeneity for the female leader is resolved by running Heckman’s two-step endogenous dummy variable estimation with an instrument for the female leader. We find evidence of greater depth financial inclusion (smaller average loans, more gender bias) with a female leader but not for width financial inclusion (credit client growth). Female leaders exhibit greater altruism and greater competition avoidance but not greater risk aversion than male peers.

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1. Introduction

Does female leadership better fulfil the social mission of microfinance institutions (MFIs) than male leadership? The MFI's social mission is to provide poor families and small businesses in developing countries access to financial services.¹ The leadership categories in this paper are the chief executive officer (CEO), the chair, and the directors. We employ a unique data set of MFIs to show that female leadership indeed allocates resources more consistently to poor households than male leadership does. Building on results from psychological experiments, we assume the female leader to be more outreach oriented than male peers due to different personality traits such as altruism (Andreoni & Vesterlund, 2001), competitiveness (Niederle & Vesterlund 2007), and risk aversion (Charness & Gneezy 2012; Eckel & Grossman 2008) or due to different competence-levels. An outreach oriented MFI can look for these personality traits, inducing an endogeneity problem in that outreach oriented MFIs select female leaders. We control for this by relating the choice of female leader to female personality traits. In this way, our paper contributes to the discussion on mission drift in microfinance, as well as the emerging literature on managerial traits, specifically, gender differences.

Microfinance provides an advantageous setting for studying the impact of female leadership on business outcomes. First, microfinance has a relatively high share of female leaders. In our sample, 29.3% of CEOs in MFIs are women and 25.5% of all directors are women. This means that we avoid the small samples that sometimes bias studies in settings where female leaders are few and far between. Second, female founders of MFIs are often prominent spokespersons for the

¹ We use the terms *access to financial services*, *financial inclusion*, and *outreach* interchangeably in this paper.

microfinance idea, that is, to include more poor households into formal financial institutions. Third, a large part of the MFIs' loan allocations are to women: Maes and Reed (2012) report that 82% of loans are allocated to women. A fourth reason is that microfinance is a fairly homogeneous business, building on the model set by the Grameen Bank in Bangladesh (Yunus 1998). The implication is that industry effects will not bias our results. On the other hand, heterogeneity could enter into play, since we use a data set spanning 73 countries in the developing world. We control for country heterogeneity by including the Human Development Index from the United Nations Development Programme and by benchmarking monetary variables to the average gross domestic product (GDP) in the relevant year.

Besides the microfinance mission, MFIs have a financial sustainability objective (Morduch 1999). Extending loans remains the MFI's chief financial service (Armendáriz & Morduch 2010). An MFI borrower often has little or no collateral and no credit history. Furthermore, the fixed costs of setting up a new loan contract and the ensuing monitoring can be very expensive. Microfinance has found innovative ways to overcome problems of repayment (Mersland & Strøm 2012). This ranges from the provision of small loans on short duration, most often less than a year, to demanding frequent repayments of the loan and to denying new loans if repayment fails. The client is thus able to build a credit history quickly and the MFI learns the borrower's type.

Microfinance has experienced formidable growth since the 1980s, reaching more than 200 million clients globally, but in recent years the fraction of loans allocated to the poorest segments – and, therefore, women – has fallen (Reed 2015). For many years, microfinance enjoyed high esteem in the public, culminating in the Nobel Peace Prize in 2006 to Muhammad Yunus and the Grameen Bank. However, microfinance has come under severe criticism, accused of charging a usurious lending rates, existing only for making money, being too vigilant in obtaining repayments on loans,

and consigning borrowers to a debt trap (Hudon & Sandberg, 2013). The Andhra Pradesh crisis in India in 2010 further tarnished microfinance's standing in the public eye, when it was claimed that an MFI client had committed suicide for not being able to meet repayment obligations. Despite these setbacks, microfinance continues to flourish and grow (Reed 2015), although Kaur and Dey (2013) show that the government-imposed regulations in Andhra Pradesh have severely curtailed activity there.

Few studies exist on the relationship between female leaders in the microfinance industry. Périlleux & Szafarz (2015) explore the leadership role of female directors and top management in 36 local cooperatives in Senegal. The panel data study reveals that social performance increases with female directors, but not with female top managers. In contrast, our study spans 73 countries around the world, and we find that a female CEO enhances the MFI's social performance. Hartarska, Nadolnyak, & Mersland (2014) find that MFIs' social performance in rural districts increases with a female CEO on similar data that we use. However, their study is limited to rural lending, while here we look at the social performance in all customer segments. None of these papers consider the possibility that the MFI's appointment of a female leader is endogenous.

In line with Schreiner (2002), we consider two dimensions to outreach, the width and depth. The depth concerns the poverty of the clients and the width is the number of clients reached. We follow much of the literature (e.g. Mersland & Strøm 2010) in using the average loan, the MFI's gender bias, and its lending to rural areas as measures of depth. Furthermore, the average lending rate enters as a depth measure. Thus, the lower the average loan, the greater the outreach. Similarly, depth outreach increases when the MFI prefers to lend to women and to rural areas. For width, we use the growth in the number of credit clients (Hartarska & Mersland 2012). The hypotheses are

that a female leader improves both width and depth outreach. Therefore, we provide a broad set of measures to the sometimes fuzzy picture of the MFI's outreach to the poorest.

Our unique data has a panel structure with about four observations per MFI, on average. The data are from third-party rating agencies (www.ratingfund2.org) that visit each MFI and collect both accounting and governance data, particularly the gender of the CEO, chair, and directors, as well as a range of financial and product mix data. This gives the data an on-site quality check, a verification of the data's validity. In all, we were able to collect about 1,500 observations from roughly 400 MFIs domiciled in 73 developing countries.

Outreach-oriented MFIs can endogenously choose female leaders. To resolve this endogeneity problem, we employ the Heckman (1979) endogenous dummy variable method (Wooldridge 2010). This is an instrumental variable method that aids in identifying the causal effect of a female leader. In the first step, we identify factors that help to explain why the MFI has a female CEO and/or female directors. In the second step, we explore the outreach effects from having a female CEO or female directors with instruments derived from the first step. In robustness tests, we check our results for the inverse Mills ratio (IMR) analysis and simultaneous equation analysis.

Mission drift is considered the tendency to change an MFI's loan allocation away from the poorest clients. We contribute to this literature by showing that a female CEO allocates more lending to customers with low incomes than a male CEO does. At the same time, the rate of loan extension to new customers is not significantly different between female and male CEOs. This implies that female CEOs are better able to avoid mission drift, especially in the depth dimension, and that female CEOs are better able to spot more credit-constrained customers. There is therefore gender differentiation in this important aspect of MFI policy. The former literature on mission drift does not consider this aspect but focuses instead on the trade-off between outreach and financial

inclusion (Cull & Morduch 2007; Hermes, Lensink, & Meesters 2011), the importance of cost (Mersland & Strøm 2010), macroeconomic conditions and competition (Ahlin, Lin, & Maio 2011), and the MFI's revealed preference for outreach (Salim 2013).

The way we handle the endogeneity problem contributes to the literature on managerial traits (Bertrand & Schoar 2003; Graham, Harvey, & Puri 2013; Malmendier & Tate 2005, 2008; Malmendier, Tate, & Yan 2011). A general result here is that gender or other personality characteristics (e.g. a CEO with military experience) have real effects on company policies and outcomes. We attribute the MFI's endogenous choice to a female leader's greater altruism, lower competitiveness, greater risk aversion, and competence. We confirm altruism and competitiveness but cannot find evidence of greater risk aversion among female managers in MFIs. The findings support earlier studies, in which managerial traits are important in MFIs. Randøy, Strøm, and Mersland (2013) find that outreach is greater if the founder of the MFI is still its CEO and Strøm, D'Espallier, & Mersland (2014) find that a female CEO exhibits better financial performance than a male CEO.

A female leader's competence can be considered another, more external personality trait. Strøm et al. (2014) argue that female leaders are better able to fulfil an MFI's goals because they better understand the needs of the MFI's clients. Similarly, Becker et al. (2013) find that female loan officers are more capable of building a trust relationship with clients. Since most of MFI clients are women, a female manager should therefore be able to design products that better answer the needs of the MFI's customers. We confirm this expectation.

The remainder of the paper is organized as follows: We next present the theory and hypotheses. Then we outline Heckman's methodology and other methodological issues, followed by the data

and variable definitions, econometric evidence, and robustness checks, before concluding the paper.

2. Theory and hypotheses

We investigate the relation between the MFI's social mission, or its outreach to poor households and small businesses, and the gender of the CEO, the chair, and the directors. Thus, the main estimation we perform is:

$$outreach = \alpha + \beta(female\ leader) + \gamma'(other\ variables) + \varepsilon \quad (1)$$

Our main interest is to determine β , the coefficient for the female leader, which we expect to be positive. The regression is not straightforward, since the female leader variable is probably endogenous. In the methodology section, we explain in detail how we deal with this issue. From (1), it is evident we need to explain the meaning of outreach and explain why a female leader is better able to fulfil the MFI's social mission than a male leader. We prefer the term *leader*, since our leadership data contain the CEO, the chair, and the other directors.

The MFI has objectives for its social mission and its financial sustainability (Morduch 1999). We suppose the MFI's orientation is either towards its social mission or its profitability. The leader is motivated by either social mission or monetary rewards (Besley & Ghatak 2005). The social mission-motivated manager identifies with the MFI's outreach goals, while the monetarily motivated manager is interested in the monetary reward. An outreach-oriented MFI is likely to maximize outreach with a social mission-motivated leader. We argue that female leaders are, on average, more social mission motivated than male managers are. We therefore expect greater outreach with female managers. The endogeneity problem arises because the outreach oriented

MFI can choose a female leader in its search for “female” characteristics, such as altruism and caring for the poor.

The MFI’s social mission

Providing poor households and small enterprises in developing countries with financial services – that is, loans, first and foremost – remains the MFI’s main social mission (Reed 2015) and this is the area in which we have the best data resources. MFIs also accept deposits and offer various kinds of insurance. Schreiner (2002) divides outreach into depth and width dimensions. The MFI’s portfolio can be written as follows:

$$\text{loan portfolio} = (\text{average loan}) \times (\text{number of credit clients}) \quad (2)$$

The MFI’s social mission can be fulfilled along two dimensions. When the number of credit clients is fixed, the MFI is more likely to serve the poorest parts of the community the lower its average loan is, this is depth outreach. The other dimension is the number of credit clients served. Holding the amount of the average loan fixed, width outreach is increased when the number of credit clients increases. Salim (2013) uses the extension of MFIs’ branch offices in Bangladesh in a study of their preference for outreach. In this paper, width outreach is the increase in the number of credit clients.

The average loan size is commonly used in studies of mission drift (Abeysekera, Oguzoglu, & Le 2014; Bhatt & Tang 2001; Cull & Morduch 2007; Mersland & Strøm 2010). However, the average loan size and the growth in the number of credit clients have their own limitations, as discussed below. Therefore, we include the interest rate on loans, the MFI’s gender bias, and lending to rural customers as complements to outreach. The lower the interest rate charged to the customer, the better a poor household can meet its loan commitments and the better the MFI is at reaching low-

income households. Armendáriz and Morduch (2010) note that credit extended to the woman in the family has a beneficial effect for all the family members, while the effects of a loan to a man tend to stay with the man. De Mel, McKenzie, and Woodruff's (2009) randomized experiment on credit constraints in Sri Lanka underlines the importance of including female customers as an outreach measure. They find that male-led businesses grow faster following a capital injection.

2.1 THE MOTIVATIONS OF FEMALE LEADERS

Why do female leaders better create outreach than male leaders? We build upon the concept of a personality trait drawn from findings in the psychological literature as well as potential difference in competence by gender. In the psychological literature, the general result is that men and women differ in important respects. For instance, John and Srivastava (1999) record how psychologists have studied personality traits since the 1930s, arriving at five major categories (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism), the so-called Big Five Inventory (Benet-Martínez & John 1998). We underline three personality traits that have appeared in the corporate governance literature: altruism, competitiveness, and risk aversion. The difference in these categories of personality traits can have implications for social mission motivation.

In controlled laboratory experiments, researchers generally find that women are more selfless or altruistic than men and thus more concerned with equality and caring for the less well off (Andreoni & Vesterlund 2001; Eckel & Grossman 1998). Women's motivations tend towards benevolence and universalism rather than self-enhancement. The experimental evidence finds support in studies using other data as well. Adams and Funk (2012) report the same pattern from survey data. Matsa

and Miller (2013) uncover a more inclusive, stakeholder-oriented female management style from a natural experiment data, i.e. the mandated quota of at least 40% of each gender in the boards of directors in Norway. Therefore, it is plausible that a female CEO has stronger motivation to work for the poor than a male CEO does. She more strongly identifies with the MFI's social mission. Such identification should translate into greater weight on outreach goals in MFIs with female leadership. We suppose that this disposition leads female leaders to favour outreach to not only female borrowers, but poor people in general.

We next consider risk aversion. Eckel and Grossman's (2008) overview of studies using controlled laboratory experiments shows that women are generally more risk averse than men but that the experiment's context matters considerably. Charness and Gneezy's (2012) meta-study confirms that women are more risk averse. Investigations into the risk characteristics of firms led by women confirm the risk aversion results from experimental research. Exploiting data from the huge European Amadeus database, Faccio, Marchica, and Mura (2015) find that female-led firms tend to have a lower ratio of debt to assets and lower earnings volatility and are more likely to remain in business than firms run by men. Huang and Kisgen (2013) uncover greater risk aversion among female managers in their study of acquisitions and debt policy. On the other hand, Adams and Funk (2012) find that female board members in Sweden are less risk averse than their male peers in a survey of board members. The authors reason that women need to overcompensate regarding accepted male criteria for board membership to qualify as a director and, therefore, show lower risk aversion than their male peers. If a female leader has greater risk aversion than male leaders, we expect that she will choose to work for an MFI with a low loan default rate. In microfinance D'Espallier, Guerin, and Mersland (2013) find that female borrowing clients are more likely to repay their loans than male clients are. Therefore, favouring a low default rate is equivalent to

choosing an outreach goal. Risk aversion can also be important in the choice of loan size. A borrower has fewer problems meeting loan obligations, the smaller these obligations are. Then, a risk-averse female leader can choose to work for an MFI preferring smaller loans and, therefore, to work for outreach goals.

The third personality trait is avoidance of competition. In a controlled laboratory experiment, Gneezy, Niederle, and Rustichini (2003) show that women do worse than men when competing against men. Niederle and Vesterlund (2007) show that women tend to choose piece-rate payment rather than the more competitive winner-takes-all tournament system as a reward for fulfilling a task. The authors show that this also applies to women of the highest ability. Flory, Leibbrandt, and List (2014) set up a field experiment involving application to clerical jobs and find that women tend to shy away from competitive posts but men do not. Competitiveness also follows gender lines in young persons' choice of academic tracks (Almås, Cappelen, Salvanes, Sørensen, & Tungodden 2014; Buser, Niederle, & Oosterbeek 2014) and Reuben, Sapienza, & Zingales (2015) find that gender differences in competitiveness are manifest among post-graduate candidates from the top-ranking Booth School of Business.

Competitiveness can induce female leaders to choose a career in social mission-oriented MFIs instead of more profit-oriented MFIs. Social mission-oriented MFIs generally have lower wage levels than the profit oriented, which makes them less able to compete for management talent using monetary rewards. In a similar vein, Schaek et al. (2012) find that in risky community banks, executives are more rapidly dismissed. Therefore, if women shy away from competition, we should expect relatively more female hires in social mission-oriented MFIs than in profit-oriented MFIs. Competitiveness can therefore imply that female leaders tend to cluster in non-governmental organizations (NGOs) and cooperatives rather than in stock companies. Furthermore, female

leaders are more likely to choose an MFI with a low level of product market competition than a high one. In highly competitive markets, MFIs need to give higher priority to financial sustainability. Therefore, if a female leader shies away from competition, she will tend to choose outreach-oriented MFIs. In summary, we expect the personality traits of altruism, risk aversion, and competitiveness to imply that female leaders place greater weight on outreach goals than their male peers do.

An objection to this conclusion can be that gender differences in personality traits are country specific, so that the differences uncovered from experiments conducted on persons in rich, Western countries are not applicable to the realities of developing countries. However, evidence from cross-country studies indicates that gender differences persist across nations. Schmitt, Realo, Voracek, and Allik's (2008) study of personality traits from the Big Five Inventory and other dimensions show that gender differences are common in 55 developing and developed countries and become more pronounced the more developed the country is. The authors also find that this increasing difference is because men display more 'masculine' behaviour in developed countries, while differences among women across countries are less pronounced. Almås et al. (2014) find that gender differences in competitiveness are larger the more advanced the socioeconomic group is within a single country. The upshot for our study is that, although gender differences in personality traits are smaller, on average, in developing countries, it should be safe to assume that the differences are significant in the socioeconomic group where MFI leaders belong.

2.2 COMPETENCE OF FEMALE LEADERS

Besides looking at intrinsic personality traits such as altruism, risk aversion and competitiveness, we also consider gender differences in terms of competence as being another, more external personality trait. A female leader is likely to have better knowledge of the poorer segments of credit clients. Strøm et al. (2014) argue that female managers and directors understand the MFI's customer base better than their male peers do because most of the MFI's customers are themselves women. A female leader is able to identify the needs of their female customers and, thus, design a product strategy that is better suited to them. This matching argument mirrors the argument by Beck et al. (2013) who argue that women are able to build a better trust relationship with clients. A female leader should therefore be better at creating outreach than a male leader is. In our estimation we test for this by including business experience and formal business education as regressors in our female leadership regressions.

3. Data and variable definitions

The data set (downloaded from www.ratingfund2.org) is based on rating assessment reports gathered by specialized rating agencies. Information in the rating reports is collected during evaluators' on-site visits to the MFI and further screened by the rating committee at the main office. Ratings data are considered among the most representative available for the microfinance industry (Mersland & Strøm, 2009). We report on 329 MFIs operating in 73 different countries worldwide in 2001–2008. The rating agencies are supported by the Rating Fund of the Consultative Group to Assist the Poor (CGAP), a microfinance branch of the World Bank. At each rating, the raters collect

data for the rating year and the years immediately preceding it. Up to six years of data for an MFI are thus available for the period 1998–2008. The amount of detail varies in the reports, resulting in an average number of nearly four observations per MFI. No data set is perfectly representative of the microfinance field. In particular, our data set contains relatively few huge MFIs and does not cover the virtually endless numbers of small savings and credit cooperatives. The former are rated by such agencies as Moody's and Standard & Poor's, while the latter are not rated at all.

The rating of MFIs is one of the main transparency initiatives in the microfinance industry and has been actively supported by donors such as the Interamerican Development Bank and the European Union (Beisland, Mersland, & Randøy 2014). The four rating agencies M-CRIL, Microfinanza, Planet Rating, and Microrate have come to dominate the market and are approved by CGAP. The MFI rating assessments are much wider than traditional credit ratings, since they aim to measure MFIs' ability to reach their multiple sets of objectives (Beisland & Mersland 2012). The purpose of rating reports is to present independent information that stakeholders can use to make informed decisions. Even if a rating agency argues that its methodology differs from that of other agencies, the core information used in this study consists of standard indicators that are calculated similarly across the industry and by all rating agencies.

Starting as experimental development schemes in Asia and Latin America in the 1970s, microfinance has become a major industry today. As of 31 December 2010, more than 3,600 MFIs report their numbers to the Microcredit Summit (www.microcreditsummit.org). In 2013, MFIs provided 211 million people with credit (Reed, 2015). The number of poorest families with a microloan grew from 8 million in 1997 to 114 million in 2013 (Reed 2015). Still, Chaia et al. (2013) report that half the world is still unbanked. More than 100 international funds invest in microfinance offering equity, loans, bonds, and collateralized debt obligations

(www.mixmarket.org). The industry is young and entrepreneurial; the median age is eight years in our sample, with 25% regulated by the banking authorities. MFIs are diversely incorporated, covering ordinary shareholder-owned firms (32%), mutually held institutions (13%), NGOs² (53%), and state banks. We use a binary variable (*SHF*) to indicate whether the MFI is a stock company or not.

We define the variables for the estimations in Table 1, together with summary statistics. The table contains the definitions of female leadership and social mission and the set of MFI characteristics and country control variables.

Table 1

Social mission. For the depth dimension of outreach, we use more than one measure to obtain a full picture. An important depth variable is the average loan size. In discussing relation (1), a lower average loan is interpreted as greater outreach. However, the average loan measure has its drawbacks stemming from the mechanics and context of microfinance lending. First, MFIs usually practice conditional renewal with amount escalation, so that they grant higher loan amounts if the borrower repays the first loan. Bolton and Scharfstein (1990) show that such a lending scheme gives the borrower an incentive to build a credit history as a reliable borrower. MFI customers may also experience rising incomes, in common with a large proportion of citizens of developing countries, making them better able to repay a given loan amount. Both aspects can result in drift towards higher average loans with time. Higher average loans could also result from an MFI's internal allocations as it grows. It is possible that MFIs deliberately target higher-income customers to diversify their loan portfolios and thus reduce overall portfolio risk. Furthermore, by targeting

² MFIs incorporated as NGOs are not-for-profit firms where no particular group or person can legally claim its ownership or receive residual earnings from it (Mersland & Strøm, 2009).

higher-income customer segments, the MFI can cross-subsidize the poorest customers in its portfolio (Armendáriz & Szafarz 2011). Thus, the average loan is not a perfect measure of MFI outreach and, therefore, needs to be complemented with other measures. Table 1 reveals that the average loan is USD 734 and the median loan is USD 351. The median average loan is less than one-third of the domestic GDP per person in our sample, justifying the *micro* in microfinance.

We follow Mersland & Strøm (2010) in using the MFI's deliberate *gender bias* and the extent of its lending to rural clients as measures of depth outreach. The reason for these measures is simply that women are generally poorer than men and rural inhabitants are generally poorer than urban inhabitants. Targeting women and rural areas have been the main objectives of microfinance since its beginnings in the 1970s (Yunus 1998). In 41% of cases in our sample, rating agencies attest that MFIs have a female gender bias in their lending practices. Unfortunately, many MFIs do not report their percentage of female customers. For the 245 observations in the sample, the percentage of female customers is 71.1, which is close to that reported by Cull, Demirgüç-Kunt, and Morduch (2009). Therefore, the female fraction is high among MFIs on both the customer and leadership sides. However, although a woman obtains a loan, it is not certain that she keeps the resources. Roy, Ara, Das, and Quisumbing (2015) point out that this depends on the power distribution between husband and wife. The same reasoning goes for rural lending.

We also employ the MFI's lending rate as a depth measure. Supposedly, the lower the rate on loans, the easier poor people will find it to service a given loan size. However, this measure is problematic, since the fixed cost of setting up a loan is the same for a large loan and a small loan and small loans are more expensive to service. The MFI may therefore charge a fairly high rate on a small loan.

The width dimension concerns how many customers the MFI is able to reach. For many years, the microfinance industry experienced double-digit growth rates (Mersland & Strøm 2012). Our

measure is the MFI's growth rate of credit clients. The sign of this variable is uncertain for female leaders. For instance, De Mel et al. (2009) and Faccio et al. (2015) find that male CEOs expand their businesses faster than women and with greater risks. Thus, the tendency of male leaders to pursue growth could counterbalance female leaders' desire for outreach in the width dimension.

Female leadership. Table 1 shows the measures for the three female leadership categories: CEO, chair, and director. The female director is defined as a binary variable. In many cases, it is impossible to ascertain the fraction of female directors. When information on the number of female directors is missing, we often know the gender of the chair, in which case we are able to construct a binary variable showing whether women are on the board or not.

Proxies for motivation and competence. The proxy variable for altruism (*CEO founder*) is binary, indicating whether the CEO is the founder of the MFI or not. Some 48.5% of female CEOs are also the founder of their companies, compared to one-third of the male CEOs in our sample. Although from a corporate governance perspective a maximal separation between founders and owners versus management is preferred (Fahlenbrach, 2009), it's reasonable to assume founders have an altruistic motivation to start the MFI. To found an MFI should therefore be a good indicator of motivation to assist the poor in financial inclusion.

For competitiveness, we use a direct measure in the local product market competition for each MFI. The competition variable (*competition*) is the rater's assessment of the MFI's competitive challenge in its area. We also assume that ownership type is among the competitiveness variables. The ownership variable is potentially important, since women can more easily enter leadership positions in NGOs and cooperatives, which are often more mission-driven. In their study of risk aversion, Faccio et al. (2015) employ leverage defined as the ratio of total debt to total equity and we add a variable (*PaR30*) for portfolio at risk (30 days overdue). High leverage is indicative of a

firm that is in financial trouble or in a phase of rapid expansion. In either case, the firm is in a risky state, a situation that most women tend to avoid. A high *PaR30* means that the MFI's customers have difficulties in repaying their loans. This measure is especially relevant in microfinance, since loans are predominantly short term.

A leader's education can indicate whether the leader is capable of meeting customers' expectations. A female CEO has about the same business experience as a male CEO, about 11 years, but the male CEO is more likely to have a formal business education. We use the leader's formal business education as an indication of competence and assume that a leader without a formal business education has greater competence at identifying the needs of poor clients than a person with such an education, because such a leader has probably risen from experiences encountered as a microfinance practitioner.

MFI and country controls. We include a number of MFI variables for the governance and performance regressions to account for MFI heterogeneity. The firm-level controls are the return on assets (*ROA*), the MFI's age (*MFI age*), and the MFI's size (*MFI size*). Furthermore, we include two institutional variables, namely, an indicator variable (*International founder*) denoting whether an international organization founded the MFI and another indicator variable (*Regulated*) denoting whether the MFI is under local banking regulation.

The two MFI goals of social mission and financial sustainability indicate a relation, or trade-off, between the two. Hermes et al. (2011) find that the relation is negative in an investigation utilizing a stochastic frontier approach³. In this paper, we simply insert a variable for financial sustainability as one of the control variables in the base case regression and then employ simultaneous equations

³ An introduction on SFA can be found in Coelli, Rao, O'Donnell, & Battese (2005).

in robustness checks. For financial sustainability, we use *ROA*. Market performance measures are impossible, since no MFI in our sample is listed. The *ROA* numbers are taken directly from the raters' reports. Table 2 shows that, on the whole, microfinance is not a lucrative business. As Hermes et al. (2011), we expect the relation between the two goals to be negative.

The size specification is the natural logarithm of total assets. We expect that the larger the MFI, the more difficult it becomes to uphold former growth rates and the more interest the MFI gains in diversifying its portfolio. We therefore expect both depth and width dimensions of outreach to weaken as the MFI grows. A total of 36% of the MFIs in our sample have an international founder. MFIs with such a background are probably founded out of a concern for their social mission. We expect this variable to be positively related to outreach.

Aguilera and Jackson (2003) point out that country-specific traditions and institutions can be important in corporate governance studies. We employ two procedures to adjust for country differences. First, monetary variables are adjusted with the respective country's GDP per person. Thus, we consider the size of the average loan relative to the average income per person. The second procedure is to include the UN Human Development Index (*HDI*) in the regressions. The *HDI* variable is a summary welfare measure covering levels of income, education, and health and *HDI* data for each country are readily available for all the years in our sample.

Table 2

Table 2 reveals that 29.3% of all MFIs have a female CEO. Similarly, the fraction of female directors is, on average, 25.5%. These numbers mean that women take an active role in the development of microfinance. The number of credit clients and MFI assets show that the dispersion of MFI size is substantial. We also note the change in the number of credit clients at 42.2% in the

sample period. The average loan is small, only 0.57, conditioned on the country's level of GDP per person. Thus, the average loan is a little more than half the average income level in the country. The table also reveals the variation in the MFI's background variables: 33.1% of MFIs are incorporated as a shareholder firm, 28.6% are regulated by a local banking authority, and 38.9% have an international founder. This variation means that we are able to filter out much background noise in the interesting relationship of female leaders and MFI outreach.

Table 3 shows bivariate associations between *female CEO* and measures of the MFI's social mission. In Panel A, we look at the continuous variables *average loan* and *credit client change* and, in Panel B, the binary variables *rural* and *gender bias*. Note the definition of *average loan* from Table 1, that is, *average loan* standardized by the GDP per person.

Table 3

We find that female CEOs allocate lower average loans than men do, with significance at the 3.1% level. We find no significant difference in *credit client change*. Male and female CEOs pursue an equally expansionary policy of attracting new credit clients. The differences in lending rates are small yet significant at the 10% level for the rating agencies' lending rates, but not for rates calculated from fundamentals. The rates are higher in female-led MFIs. This is probably due to the higher costs of small loans in MFIs with female CEOs. Male and female CEOs differ significantly for *rural* and *gender bias*, but male CEOs give greater priority to rural clients than female CEOs do. In fact, male-led MFIs have a rural bias in 72.0% of cases, compared to 66.3% for female-led MFIs. On the other hand, gender bias is stronger in female-led MFIs, at 57.0%, versus 41.2% for male-led MFIs. Table 3 thus gives a first indication that the CEO's gender matters for the MFI's choice of social mission, but it also shows that the relationships are not unequivocal. A female CEO is not better than a male CEO for all social mission measures.

Table 4 shows our variables to have simple bivariate correlations. It serves as a guide to the relationships among the outreach and covarying variables and as a check for potential multicollinearity.

Table 4

We see that the correlations between the various female leader categories are relatively high and significant. This suggests female leadership clustering to certain MFIs. A number of the correlations are significant at the 5% level, indicating both significant relationships in a multivariable panel data setting, but also signs of multicollinearity among the right-hand-side variables. Concerning multicollinearity, Kennedy (2008) states that partial correlations above 0.70–0.80 are in the danger zone of multicollinearity. None of the correlations are close to this level, the highest being 0.49 between the variables *regulated* and *SHF*. The relatively high correlation is both expected and surprising. It is expected because shareholder MFIs also need to be regulated in many jurisdictions, but it is surprising that the percentage is low, indicating that there is not a one-to-one correspondence between shareholder MFIs and regulation. The upshot is that we carry out regressions in the faith that multicollinearity will not disturb our results.

4. Methodology

The discussion so far indicates that female leaders are endogenous to MFIs. We follow Strøm et al. (2014) in using Heckman's (1979) endogenous dummy variable model to account for the endogeneity, employing the two-step procedure laid out by Wooldridge (2010, pp. 937–945). This approach requires that we first estimate the probability of a woman being a leader ($\text{Pr}(\text{FM})$) from

a probit regression with the proxies for altruism, competitiveness, and risk aversion as explanatory variables as follows:

$$\Pr(FM) = \alpha + \beta(altruism) + \gamma(competitiveness) + \delta(risk\ aversion) + \theta'(controls) + \epsilon \quad (3)$$

In this step, an instrument for each female leadership indicator variable is generated from (3). This is the probability that a given MFI has a female manager. The extracted probability is then used in the second step random effects model as an instrument for the endogenous indicator variable for a female manager. The extracted instrument is supposed to be related to a female manager but not to outreach variables. The two-step methodology has the advantage that the specification of relationship (3) does not need to be perfect; a credible relationship will do. We then estimate the main relationship of outreach in (1) using the Balestra and Varadharajan-Krishnakumar's (1987) two-stage least squares random effects estimator.

The methodology means that we control for a leader's altruism, competitiveness, risk aversion, and education. Conditioned on these controls, the effect of being a female or male leader should be negligible. If the *female CEO* variable is still significant, we can conclude that a gender trait does exist for the MFI's social mission. This methodology compares well to Andreoni and Vesterlund's (2007) procedure, where the female effect persists in regressions, even after controlling for personality traits.

In robustness analyses, we first check our results against other econometric methodologies. First, we perform an IMR analysis (Wooldridge, 2010, pp. 809–812). The idea is to first calculate the IMR defined as the ratio of the probability density function and the cumulative density function of the normal distribution evaluated at 'predicted' outcomes and then add the new variable in a

second-stage regression. This is seen as a bias correction term because it takes into account the probability that a female CEO was initially selected into the observed sample.

Second, we undertake system analysis with the seemingly unrelated regression (SUR) framework (Zellner, 1962). Outreach variables such as the average loan and the lending rate could be interdependent. The lower the lending rate, the more poor people can afford to take out a loan and the more willing the MFI is to lend small amounts to the poorest. Consequently, we run SUR regressions for the lending rate and average loan, as well as for the lending rate and the change in the number of credit clients. In another robustness analysis, we investigate whether the findings for *female CEO* generalize to female directors and the female chair.

5. Econometric evidence

We perform rigorous testing of the relationships set out above. First, we establish relationships between *female CEO*, *female chair*, and *female director*, on the one hand, and the motivation and competence variables on the other. Second, we turn to estimations of different forms of outreach and *female CEO*. The main objective of the first regressions is to generate an instrument for the final estimations, but the relationships are interesting in their own right. We generate an instrument that is the probability that the MFI has a female leader.

5.1 FEMALE LEADERS

Table 5 shows the results from the probit regressions of a female leader and variables that are linked to the presence of a female leader.

Table 5

The regressions have a rather low R^2 value but the Wald chi-squared tests are all strongly significant. We take this finding to indicate that the regressions yield valid results for our discussions. In the following, we concentrate our comments on the variable *female CEO*.

Table 5 shows that the MFI's altruism, measured as *CEO founder*, is positively linked to *female CEO*. We also find that the MFI's competition avoidance is important, since the ownership type variable *SHF* is negative and significant for all leadership positions. The direct measure *competition* is, however, only significant in the director regression. Thus, MFIs that shy away from competition, especially when the MFI is organized as a shareholder-owned company, tend to have a female CEO. On the other hand, the MFI's risk aversion seems to play only a minor role, since only *PaR30* is significant for the chair and the director, both negatively, as hypothesized. The insignificant risk aversion result for *female CEO* is in line with the survey findings of Adams and Funk (2012), who show that female Swedish directors are less risk averse than men are. Finally, *CEO business education* is negative and significant. Thus, all in all, there is evidence that outreach-oriented MFIs tend to select women into leadership positions based on firm characteristics that are related to female personality traits.

We use the probability of being a female CEO for each regression as an instrument for *female leader* in regressions on outreach.

5.2 FEMALE LEADERSHIP AND THE MFI'S SOCIAL MISSION

Table 6 gives an overview of the relationship between an MFI's outreach to its credit clients, measured as the change in the number of credit clients, average loan, the MFI's gender bias, and its rural bias.

Table 6

Table 6 contains regressions both without and with the generated instrument for *female CEO* from Table 5. In both cases, the explanatory power is satisfactory for *average loan*, but somewhat low for *credit client change*. In all regressions, the Wald chi-squared value is highly significant. We note that R^2 is higher in the regressions with instruments than in random effects regressions without instruments, and that more results are significant. The price of using instruments is a decrease in sample size. We perform the analysis without instruments on a same-sample basis (results not tabulated here) and find that the coefficients' signs and statistical properties are close to those in Table 6.

We find that *female CEO* generates greater depth outreach in terms of *average loan* and *gender bias* but has no relation to *rural bias* or to *credit client change*. A female CEO will give priority to poorer credit clients and to women. The conclusion from Table 6 is that female CEOs have a superior record in reaching out to the poorest customer segments and are on par with their male peers in reaching more clients. With the instrument for *female CEO* in place, we are able to identify the relation as a causal one; that is, MFIs with a female CEO reach poorer segments of customers to a greater extent than MFIs with a male CEO.

The control variables have signs comparable to the evidence of Mersland and Strøm (2010), lending further credibility to the results of *female CEO*. The variable *ROA* is only related to the

outreach variable *gender bias*. In this setting, the two MFI objectives of outreach and financial sustainability are largely set up independently of each other. Furthermore, the relationship between *ROA* and *gender bias* is positive, unlike the main findings of Hermes et al. (2011), indicating that the trade-off between outreach and financial sustainability may not apply to all forms of outreach.

Let us look closer at the average loan results. The variable *average loan* increases with *MFI size* and *regulation* but decreases with *MFI age*, *international founder*, and *HDI*. In particular, the results for *MFI age* confirm the main findings of Hermes et al. (2011). A higher *average loan* with greater *MFI size* means that the scale pulls the MFI towards higher-income households. This result could also be due to a portfolio effect, that is, diversification of the customer base with increasing scale. At the same time, the negative sign for *HDI* indicates that the MFI concentrates more of its lending among poor people as the country develops. This result confirms the findings of Ahlin et al. (2011) in that microfinance specializes more in the poorer segments of credit clients the deeper the financial sector, especially banking, is in a country. The question of mission drift is therefore multifaceted, depending upon the outreach variable studied and the independent variable in question.

Next, we consider another outreach variable, the lending rate, specified first as published by the rating bureaus and then as estimated by our own calculations.

Table 7

It turns out that *female CEO* is positively related to *lending rate* in the rating bureau regressions, but this significance disappears in the two-stage least squares regression, where the calculated lending rate enters into play. Therefore, we can only state that there is some evidence of a

significant and positive relationship which is not surprising given that the small loans prevalent for female-led MFIs are relatively costlier to service.

The results for the control variables produce some interesting insights for the mission drift debate. The variables *MFI size* and *MFI age* are both negative and significant at the 5% level. This result indicates that, as the MFI grows and ages, the lending rate comes down. This finding is contrary to the claim that MFIs charge usurious lending rates and thus consign borrowers to a debt trap.

6. Robustness checks

We run two methodological robustness checks for the *female CEO* results. The first is to apply the IMR to the regression. The IMR statistic uncovers endogeneity in the relationships if it is significant in regressions. The results of the regressions with IMR included are shown in Table 8.

Table 8

The IMR statistic is only significant at the 10% level in the regression of *lending rate* but not for *lending rate constructed*. We conclude that the IMR does not reveal endogeneity and, thus, that a female CEO increases the MFI's depth outreach. We also note that the coefficient signs and sizes are about the same as in Table 6. Therefore, inclusion of the IMR hardly perturbs the original relationships, confirming the absence of endogeneity in the relationships.

The second robustness check involves simultaneous equation estimations involving *average loan*, *lending rate*, and *change credit clients*. We specify two estimations and employ the SUR framework.

Table 9

We can establish dependence between two variables in the regression from the Breusch–Pagan chi-squared statistic at the bottom of the table. In the first SUR estimation with *average loan* and *lending rate* as the dependent variables, the Breusch–Pagan statistic shows strong significance, signifying that the two are related. This does not happen for the second SUR estimation containing *change credit clients* and *lending rate*. The effect of running an SUR estimation for *average loan* is that the R^2 value increases by about three percentage points over the singular estimation with the instrument and that all explanatory variables are now significant. Thus, we conclude that SUR estimations have improved the estimations somewhat.

The variable *female CEO* is significant in the average loan estimation, as before. The conclusion that a female CEO creates more outreach is supported. We also note that the sign on the lending rate is now negative but no longer significant. The negative sign implies that the lending rate is lower for MFIs with a female CEO at the average loan level of the MFI. We underline that the relationship is not significant, but it is noteworthy that the positive and significant result is now gone.

In the last robustness check, we investigate if the female CEO results carry over to a female chair and female directors. We use the same set of explanatory variables as before and perform single equation regressions with instruments for *average loan* and *credit client change*.

Table 10

We find that *female chair* has no significant relationship with *average loan* but is positively and significantly related to *gender bias*. The variable *female director* is related to *average loan* and *gender bias* in the same way as *female CEO* is. In line with earlier results, the new leadership categories are not related to an MFI’s rural bias or its change in the number of credit clients. Thus,

the findings for better outreach are not limited to special circumstances surrounding the female CEO, but extend to other leadership categories as well, especially board-membership. Furthermore, the regressions confirm the earlier results in Table 6 for the control variables. The regressions of *female director* have fewer significant results which is probably due to the limited number of observations in this leadership category. Taken together, we suggest that female board-members positively influence outreach in the depth dimension, which is of interest to the broader governance literature studying the impact of board composition and board effectiveness on firm-outcomes and behaviour (Acharya and Volpin 2010; Nguyen et al., 2016).

6. Conclusion

We investigate whether an MFI with a female leader is better able than male-managed MFIs to supply the poorest families with microfinance loans. We find that a female leader has this ability when we approximate the poorest families with the average loan size and with gender. However, we are not able to confirm that female leaders favour lending to rural areas more than male leaders, nor do we find that female leaders are better able to grow an MFI's credit client base than male leaders are. Thus, we confirm that female leaders are superior in depth outreach (i.e. reaching the poorest) but not in width outreach (i.e. reaching more clients). The results parallel the finding of Strøm et al. (2014), that female leaders generate better financial performance for their MFIs.

We also contribute insight on governance in the microfinance sector, showing that a female leader can reverse the downward trend in outreach to the poorest customers. A female CEO seems better at achieving both an MFI's social mission and its financial sustainability.

Furthermore, we contribute to the general literature on managerial traits (Bertrand & Schoar, 2003; Graham et al., 2013; Malmendier & Tate, 2005, 2008; Malmendier et al., 2011), particularly the impact of gender on firm outcomes (Adams & Ferreira, 2009) in a business that has about one-third female CEOs.

We control for the possibility that outreach-oriented MFIs choose female leaders when stressing “female” personality traits, so that the female leader variable is endogenous. To control for this, we estimate with instrument for a female leader. The instrument is the probability of being a female leader, given that women tend to choose altruism (Andreoni & Vesterlund, 2001), shy away from competition (Niederle & Vesterlund, 2007), and show risk aversion (Charness & Gneezy, 2012; Eckel & Grossman, 2008) more than men do. In the process, we confirm greater altruism and greater competition avoidance but cannot confirm greater risk aversion among MFIs with female leaders. Together with the significant result for CEO business education, the results show that personality traits can have important explanatory power in the microfinance context.

Finally, we find similar patterns for female board-membership which suggests the results extend to other female leadership roles besides the CEO-role. We find that female board-members positively influence the depth of outreach contributing to corporate governance literature investigating the role of board composition and effectiveness on firm-outcomes and behaviour (Acharya and Volpin 2010; Nguyen et al., 2016).

References

- Abeysekera, S., Oguzoglu, U., & Le, T. T. (2014). Sustainability and mission drift: Do microfinance institutions in Vietnam reach the poor? In R. Mersland & R. Ø. Strøm (Eds.), *Microfinance institutions: Financial and social performance* (pp. 99–118). Basingstoke, UK: Palgrave Macmillan.
- Acharya, V. V., & Volpin, P. F. (2010). Corporate Governance Externalities. *Review of Finance*, 14(1), 1–33. doi: 10.1093/rof/rfp002.
- Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2), 291–309. doi: <http://dx.doi.org/10.1016/j.jfineco.2008.10.007>
- Adams, R. B., & Funk, P. (2012). Beyond the glass ceiling: Does gender matter? *Management Science*, 58(2), 219–235. doi:10.1287/mnsc.1110.1452
- Aguilera, R. V., & Jackson, G. (2003). The cross-national diversity of corporate governance: dimensions and determinants. *Academy of Management Review*, 28(3), 447–465. doi:10.5465/AMR.2003.10196772.
- Ahlin, C., Lin, J., & Maio, M. (2011). Where does microfinance flourish? Microfinance institution performance in macroeconomic context. *Journal of Development Economics*, 95(2), 105–120. doi.org/10.1016/j.jdeveco.2010.04.004.
- Almås, I., Cappelen, A. W., Salvanes, K. G., Sørensen, E., & Tungodden, B. (2014). Willingness to compete: Family matters. NHH, Bergen, Norway: <http://ssrn.com/abstract=2382589>.
- Andreoni, J., & Vesterlund, L. (2001). Which is the fair sex? Gender differences in altruism. *Quarterly Journal of Economics*, 116(1), 293–312. doi:10.2307/2696450
- Armendáriz, B., & Morduch, J. (2010). *The Economics of Microfinance* (2nd ed.). Cambridge, MA: MIT Press.
- Armendáriz, B., & Szafarz, A. (2011). On mission drift in microfinance institutions. In B. Armendáriz & M. Labie (Eds.), *The Handbook of Microfinance* (pp. 341–366). London: World Scientific Publishing.
- Balestra, P., & Varadharajan-Krishnakumar, J. (1987). Full information estimations of a system of simultaneous equations with error component structure. *Econometric Theory*, 3(2), 223–246. doi:10.1017/S0266466600010318
- Beck, T., Behr, P. & Guettler, A. (2013). Gender and Banking: are women better loan officers? *Review of Finance*, 17(4), 1279–1321. doi: 10.1093/rof/rfs028.
- Beisland, L. A., & Mersland, R. (2012). Do microfinance rating assessments make sense? An analysis of the drivers of MFI ratings. *Nonprofit & Voluntary Sector Quarterly*, 41(2), 213–231.
- Beisland, L. A., Mersland, R., Randøy, T. (2014). Transparency and disclosure in the global microfinance industry: Implications for practice and policy makers. In J. Forssbaeck & L. Oxelheim (Eds.), *Oxford Handbook of Political, Institutional and Corporate Transparency*. Chap. 21, 434–455. New York: Oxford University Press.
- Benet-Martínez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait-multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, 75(3), 729–750.
- Bertrand, M., & Schoar, A. (2003). Managing with style: The effect of managers on firm policies. *Quarterly Journal of Economics*, 118(4), 1169–1208. doi:10.1162/003355303322552775
- Besley, T., and Ghatak, M. (2005). Competition and incentives with motivated agents. *American Economic Review*, 95(3), 616–636. doi: 10.1257/0002828054201413.

- Bhatt, N., & Tang, S.-Y. (2001). Delivering microfinance in developing countries: Controversies and policy perspectives. *Policy Studies Journal*, 29, 319-333.
- Bolton, P., & Scharfstein, D. (1990). A Theory of predation based on agency problems in financial contracting. *American Economic Review* 80(1), 93-106.
- Buser, T., Niederle, M., & Oosterbeek, H. (2014). Gender, competitiveness, and career choices. *Quarterly Journal of Economics*, 129(3), 1409–1447. doi:10.1093/qje/qju009.
- Chaia, A., Dalal, A., Goland, T., Gonzalez, M. J., Morduch, J., & Schiff, R. (2013). Half the world is unbanked. In R. Cull, A. Demirgüç-Kunt, & J. Morduch (Eds.), *Banking the world: Empirical foundations of financial inclusion* (pp. 19–42). Cambridge, MA: MIT Press.
- Charness, G., & Gneezy, U. (2012). Strong evidence for gender differences in risk taking. *Journal of Economic Behavior & Organization*, 83(1), 50–58.
- Coelli, T. J., Rao, D. S. P., O'Donnell, C. J., & Battese, G. E. (2005). *An Introduction to Efficiency and Productivity Analysis* (2nd ed.). New York: Springer.
- Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2009). Microfinance meets the market. *Journal of Economic Perspectives*, 23(1), 167–192. doi: 10.1257/jep.23.1.167
- Cull, R., & Morduch, J. (2007). Financial performance and outreach: A global analysis of leading microbanks. *Economic Journal*, 117(517), F107–F133.
- D’Espallier, B., Guerin, I., & Mersland, R. (2013). Focus on women in microfinance institutions. *Journal of Development Studies*, 49(5), 589–608. doi:10.1080/00220388.2012.720364
- De Mel, S., McKenzie, D., & Woodruff, C. (2009). Are women more credit constrained? Experimental evidence on gender and microenterprise returns. *American Economic Journal: Applied Economics*, 1(3), 1–32. doi:10.1257/app.1.3.1.
- Eckel, C. C., & Grossman, P. J. (1998). Are women less selfish than men?: Evidence from dictator experiments. *Economic Journal*, 108(448), 726–735. doi:10.1111/1468-0297.00311
- Eckel, C. C., & Grossman, P. J. (2008). Men, women and risk aversion: Experimental evidence. In C. R. Plott & V. L. Smith (Eds.), *Handbook of Experimental Economics Results* (Vol. 1, pp. 1061–1073). Amsterdam: North-Holland.
- Faccio, M., Marchica, M.-T., & Mura, R. (2015). CEO gender, corporate risk-taking, and the efficiency of capital allocation. doi.org/10.2139/ssrn.2021136
- Fahlenbrach, R. (2009). Shareholder rights, boards and CEO compensation. *Review of Finance*, 14(1), 81-113. DOI: 10.1093/rof/rfn011.
- Flory, J. A., Leibbrandt, A., & List, J. A. (2014). Do competitive workplaces deter female workers? A large-scale natural field experiment on job-entry decisions. *Review of Economic Studies*. doi:10.1093/restud/rdu030.
- Gneezy, U., Niederle, M., & Rustichini, A. (2003). Performance in competitive environments: Gender differences. *Quarterly Journal of Economics*, 118(3), 1049–1074. doi:10.1162/00335530360698496
- Graham, J. R., Harvey, C. R., & Puri, M. (2013). Managerial attitudes and corporate actions. *Journal of Financial Economics*, 109(1), 103–121.
- Hartarska, V., & Mersland, R. (2012). Which governance mechanisms promote efficiency in reaching poor clients? Evidence from rated microfinance institutions. *European Financial Management*, 18(2), 218–239. doi:10.1111/j.1468-036X.2009.00524.x
- Hartarska, V., Nadolnyak, D., & Mersland, R. (2014). Are Women Better Bankers to the Poor? Evidence from Rural Microfinance Institutions. *American Journal of Agricultural Economics*, 96(5), 1291-1306. doi:10.1093/ajae/aau061

- Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica*, 47(1), 153–161. doi:10.2307/1912352
- Hermes, N., Lensink, R., & Meesters, A. (2011). Outreach and efficiency of microfinance institutions. *World Development*, 39(6), 938–948. doi:10.1016/j.worlddev.2009.10.018.
- Huang, J., & Kisgen, D. J. (2013). Gender and corporate finance: Are male executives overconfident relative to female executives? *Journal of Financial Economics*, 108(3), 822–839.
- Hudon, M., & Sandberg, J. (2013). The ethical crisis in microfinance: Issues, findings, and implications. *Business Ethics Quarterly*, 23(04), 561–589.
- John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102–138). New York: Guilford Press.
- Kaur, P., & Dey, S. (2013). Andhra Pradesh Microfinance Crisis and its Repercussions on Microfinancing Activities in India. *Global Journal of Management and Business Studies*, 3(7), 695–702.
- Kennedy, P. (2008). *A Guide to Econometrics* (6th ed.). Malden, MA: Blackwell Publishing.
- Maes, J. P., & Reed, L. R. (2012). *State of the Microcredit Summit Campaign Report 2012*. Washington, DC: Microcredit Summit Campaign.
- Malmendier, U., & Tate, G. (2005). CEO overconfidence and corporate investment. *Journal of Finance*, 60(6), 2661–2700.
- Malmendier, U., & Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics*, 89(1), 20–43.
- Malmendier, U., Tate, G., & Yan, J. (2011). Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies. *Journal of Finance*, 66(5), 1687–1733.
- Matsa, D. A., & Miller, A. R. (2013). A female style in corporate leadership? Evidence from quotas. *American Economic Journal: Applied Economics*, 5(3), 136–169. doi: 10.1257/app.5.3.136.
- Mersland, R., & Strøm, R. Ø. (2009). Performance and governance in microfinance institutions. *Journal of Banking & Finance*, 33(4), 662–669. doi:http://dx.doi.org/10.1016/j.jbankfin.2008.11.009.
- Mersland, R., & Strøm, R. Ø. (2010). Microfinance mission drift? *World Development*, 38(1), 28–36. doi: 10.1016/j.worlddev.2009.05.006
- Mersland, R., & Strøm, R. Ø. (2012). The past and future of innovations in microfinance. In D. Cumming (Ed.), *The Oxford handbook of entrepreneurial finance* (pp. 859–891). Oxford, UK: Oxford University Press.
- Morduch, J. (1999). The microfinance promise. *Journal of Economic Literature*, 37(4), 1569–1614. doi:10.2307/2565486
- Nguyen, D.D., Hagedorff, J., & Eshraghi, A., (2016). Can bank boards prevent misconduct? *Review of Finance*, 20(1), 1-36. DOI: 10.1093/rof/rfv011.
- Niederle, M., & Vesterlund, L. (2007). Do women shy away from competition? Do men compete too much? *Quarterly Journal of Economics*, 122(3), 1067–1101. doi:10.1162/qjec.122.3.1067
- Périlleux, A., & Szafarz, A. (2015). Women Leaders and Social Performance: Evidence from Financial Cooperatives in Senegal. *World development*, 74, 437–452. doi:<http://dx.doi.org/10.1016/j.worlddev.2015.05.011>

- Randøy, T., Strøm, R. Ø., & Mersland, R. (2013). The impact of entrepreneur-CEOs in microfinance institutions: A global survey. *Entrepreneurship Theory and Practice*, 39(4), 927–953.
- Reed, L. R. (2015). *Mapping pathways out of poverty: The State of the Microcredit Summit Campaign Report*. Washington, DC: Microcredit Summit Campaign.
- Reuben, E., Sapienza, P., & Zingales, L. (2015). Taste for competition and the gender gap among young business professionals. National Bureau of Economic Research Working Paper Series 21695. doi:10.3386/w21695.
- Roy, S., Ara, J., Das, N., & Quisumbing, A. R. (2015). “Flypaper effects” in transfers targeted to women: Evidence from BRAC’s “Targeting the Ultra Poor” program in Bangladesh. *Journal of Development Economics*, 117, 1–19. doi.org/10.1016/j.jdeveco.2015.06.004.
- Salim, M. M. (2013). Revealed objective functions of microfinance institutions: Evidence from Bangladesh. *Journal of Development Economics*, 104, 34–55.
- Schaeck, K., Cihak, M., Maechler, A., & Stolz, S. (2012). Who disciplines Bank Managers? *Review of Finance*, 16(1), 197–243. doi: 10.1093/rof/rfr010.
- Schmitt, D. P., Realo, A., Voracek, M., & Allik, J. (2008). Why can’t a man be more like a woman? Sex differences in big five personality traits across 55 cultures. *Journal of Personality and Social Psychology*, 94(1), 168–182. doi:10.1037/0022-3514.94.1.168.
- Schreiner, M. (2002). Aspects of outreach: A framework for discussion of the social benefits of microfinance. *Journal of International Development*, 14(5), 591–603. doi:10.1002/jid.908
- Strøm, R. Ø., D’Espallier, B., & Mersland, R. (2014). Female leadership, performance, and governance in microfinance institutions. *Journal of Banking & Finance*, 42, 60–75. doi:http://dx.doi.org/10.1016/j.jbankfin.2014.01.014
- Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). Cambridge, MA: MIT Press.
- Yunus, M. (1998). *Banker to the poor. The story of the Grameen Bank*. London: Aurum Press.
- Zellner, A. (1962). An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. *Journal of the American Statistical Association*, 57(298), 348–368.

Table 1: Variable definitions.

Variable name	Definition
Social mission	
Credit client change	Number of credit clients in period t divided by the number of credit clients in period t - 1, minus 1
Average loan	Total loan portfolio divided by credit clients and divided by the country's GDP per person
Rural	Binary: 1 if emphasized area is rural
Gender bias	Binary: 1 if emphasized focus on female clients
Lending rate	Portfolio yield that the rating agency imputes
Lending rate constructed	Financial revenues from the portfolio divided by the total loan portfolio (outliers winsorized at 0.86 = 2% top percentile)
Female leadership	
Female CEO	Binary: 1 if a female CEO
Female chair	Binary: 1 if a female chair
Female director	Binary: 1 if one or more female directors
General characteristics	
CEO founder	Binary: 1 if the CEO founded the MFI
CEO education	Binary: 1 if the CEO has a formal business education
Chair education	Binary: 1 if the chair has a formal business education
MFI size	Total assets (USD 1,000) divided by the country's GDP per person
ROA	Return on assets
PaR30	Fraction of loan portfolio 30 days overdue
MFI age	Number of years in operation as an MFI
Regulated	Binary: 1 if regulated by a local banking authority
International founder	Binary: 1 if internationally initiated
SHF	Binary: 1 if type is a shareholder company
Competition index	Index from no competition (1) to high competition (7)
HDI	Human Development Index

Table 2: Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max	Obs
Female CEO	0.293	0.455	0	1	1422
Female chair	1.797	1.972	0	16	745
Female director	0.255	0.436	0	1	1107
CEO founder	0.371	0.483	0	1	1317
CEO business education	0.864	0.342	0	1	635
Chair business education	0.658	0.474	0	1	539
Chair business experience	0.840	0.363	0	1	301
CEO founder	0.334	0.471	0	1	635
Credit clients	12728	26644	0	394462	1524
Credit client change	0.422	0.901	-0.894	17.850	1110
Average loan	681.523	845.897	20.000	8776.000	1474
Gender bias	0.460	0.499	0	1	1572
Rural lending	0.697	0.459	0	1	1580
Lending rate	0.388	0.198	0.023	1.825	1509
Lending rate constructed	0.324	0.176	0.001	0.860	1501
Competition	4.377	1.522	1	7	1543
Shareholder MFI	0.331	0.471	0	1	1612
Leverage	4.045	45.725	-880.408	1340.563	1575
ROA	0.008	0.126	-0.990	0.342	1514
MFI assets (USD 1,000)	6375	13300	19	248000	1578
PaR30	0.064	0.097	-0.271	0.973	1461
MFI age	9.301	6.765	0	79	1604
International founder	0.389	0.488	0	1	1600
Regulated	0.286	0.452	0	1	1583
HDI	0.608	0.135	0.270	0.807	1606

Table 3: The female CEO and the MFI's social mission.

Panel A: Differences between female and male CEOs with respect to average loan and credit client change

	Mean	std	Min	Median	Max	N
<i>Average loan</i>						
Male CEO	0.600	1.020	0.014	0.324	12.847	925
Female CEO	0.483	0.844	0.009	0.255	6.434	390
Total	0.565	0.972	0.009	0.298	12.847	1315
<i>t</i> -Test <i>p</i> -value	0.031					
<i>Credit client change</i>						
Male CEO	0.444	0.972	-0.894	0.241	17.85	701
Female CEO	0.425	0.859	-0.672	0.240	9.615	294
Total	0.439	0.939	-0.894	0.241	17.85	995
<i>t</i> -Test <i>p</i> -value	0.758					
<i>Lending rate</i>						
Male CEO	0.381	0.199	0.023	0.331	1.251	932
Female CEO	0.402	0.190	0.040	0.376	1.277	395
Total	0.387	0.197	0.023	0.344	1.277	1327
<i>t</i> -Test <i>p</i> -value	0.074					
<i>Lending rate constructed</i>						
Male CEO	0.319	0.181	0.001	0.278	0.86	939
Female CEO	0.335	0.168	0.014	0.306	0.86	385
Total	0.324	0.177	0.001	0.285	0.86	1324
<i>t</i> -Test <i>p</i> -value	0.124					

Panel B: *Female CEO* and outreach measured as rural and gender bias

	CEO		
	Male	Female	Total
<i>Rural bias?</i>			
No	28.0%	33.7%	414
Yes	72.0%	66.3%	980
Total	982	412	1394
Pearson χ^2 (1)	0.033		
<i>Gender bias?</i>			
No	58.6%	42.2%	749
Yes	41.2%	57.0%	640
Total	980	409	1389
Pearson χ^2 (1)	0.000		

Table 4: Variable correlations. The variables are the transformed variables used in the regressions. Boldface indicates that the correlation is significant at the 5% level.

	1	2	3	4	5	6	7	8	9	10
1 Female CEO										
2 Female chair	0.34									
3 Female director	0.30	0.39								
4 Credit client ch.	-0.02	-0.03	-0.03							
5 Average loan	-0.09	-0.06	-0.03	-0.08						
6 Gender bias	0.15	0.26	0.23	0.00	-0.37					
7 Rural lending	-0.06	-0.12	-0.06	0.00	0.01	-0.04				
8 Competition	-0.06	-0.15	-0.09	-0.08	0.14	-0.11	0.05			
9 Shareholder	-0.14	-0.26	-0.04	0.06	0.20	-0.25	0.08	-0.04		
10 Leverage	-0.03	-0.01	0.00	0.20	-0.02	0.01	0.03	0.05	0.00	
11 ROA	0.01	-0.01	0.04	0.00	0.09	-0.02	-0.07	0.03	-0.03	-0.02
12 MFI size	-0.11	0.03	-0.02	-0.07	0.49	-0.06	0.11	0.14	0.25	0.05
13 PaR30	-0.04	0.00	-0.03	-0.14	0.19	-0.11	-0.04	0.06	-0.05	-0.01
14 MFI age	-0.04	0.04	-0.03	-0.17	0.06	-0.02	0.05	0.07	-0.11	-0.01
15 Int. founder	-0.06	-0.03	0.01	-0.10	-0.02	0.18	0.03	-0.10	0.06	-0.04
16 Regulated	-0.10	0.00	0.00	-0.02	0.32	-0.23	0.09	-0.05	0.49	-0.02
17 HDI	0.07	0.01	-0.01	0.03	-0.32	-0.11	-0.12	0.07	-0.16	-0.03
	11	12	13	14	15	16				
12 MFI size	0.13									
13 PaR30	-0.25	0.00								
14 MFI age	0.08	0.23	0.20							
15 Int. founder	-0.03	0.12	-0.17	-0.15						
16 Regulated	0.00	0.31	0.01	0.03	-0.03					
17 HDI	0.20	-0.46	-0.08	0.00	-0.10	-0.26				

Table 5: A female leader and MFIs, competition avoidance, and risk aversion, with probit regressions for a female CEO, a female chair, and female directors.

	CEO			Chair	Dir.
CEO founder	0.243**	0.209*	0.212*	0.132	-
CEO business education	-0.469***	-0.523***	-0.509***	0.049	-
Competition	0.031	0.035	0.051	-0.039	-0.260***
Shareholder MFI	-0.682***	-0.841***	-0.801***	-0.388***	-0.948***
Leverage	-0.005	-0.004	-0.003	-0.003	-0.002
ln(Par30)	-0.117	0.390	0.291	-1.149*	-2.429***
MFI and country controls					
MFI age	-0.008	0.004	0.009	-0.009	-0.031
International founder	-0.156	-0.379***	-0.409***	0.068	0.245*
ln(MFI size)	-0.089*	-0.112**	-0.136***	-0.061*	0.059
ln(HDI)	-0.234	1.221**	1.231**	-0.252	-1.408**
Constant	0.436	1.703	1.847	0.524	2.463***
Regional dummies	no	yes	yes	yes	yes
Time dummies	no	no	yes	yes	yes
Observations	635	628	627	759	627
Wald χ^2	52.19***	76.55***	77.11***	54.64***	100.56***
R ²	0.078	0.121	0.131	0.061	0.175
Method	probit	probit	probit	probit	probit

The Wald χ^2 values are calculated with Balestra and Varadharajan-Krishnakumar's (1987) procedure.

Table 6: Depth and width outreach and the female CEO.

	Depth outreach				Width outreach	
	Avgl	Avgl	Gender	Rural	ΔCC	ΔCC
Female CEO	-0.256***	-0.219**	2.974***	0.014	-0.035	-0.020
Return on Assets	-0.021	-0.194	2.294**	-0.102	-0.240	-0.247
ln(MFI size)	0.183***	0.223***	0.505**	0.328	0.003	-0.019
ln(PaR30)	0.262	0.069	0.033	-2.528	-0.665***	-0.883***
MFI age	-0.033***	-0.034***	0.133***	0.041	-0.013***	-0.009***
International founder	-0.172	-0.306**	1.557**	-0.442	-0.108***	-0.084*
Regulated	0.405***	0.245***	-4.108***	0.901	0.009	0.065
ln(HDI)	-0.797***	-1.072***	-4.973***	-3.218	-0.021	-0.025
Constant	-2.696***	-3.093***	-8.095***	0.867	0.503***	0.568***
Observations	1186	593	1203	1210	923	473
MFIs	325	146	324	323	302	143
Wald χ^2	120.64***	112.00***	27.62***	34.60***	33.65***	30.19***
R^2	0.238	0.300			0.061	0.078
Instrument?	no	yes	no	No	no	yes
Estimation method	RE	RE	Probit	Probit	RE	RE

In this table, Avgl stands for *average loan* and ΔCC for *credit client change*; RE stands for a random effects model. The instrument for *average loan* is the probability that the CEO is female, derived from Table 5. The instrument for *credit client change* is also derived from Table 5.

Table 7: A female CEO and the lending rate, without and with instruments.

	Lending rate		Lending rate constructed	
Female CEO	0.041**	0.037**	0.031*	0.026
Return on Assets	0.242**	0.242***	0.286***	0.298***
ln(MFI size)	-0.017**	-0.018***	-0.013**	-0.014***
ln(PaR30)	0.017	0.018	0.171*	0.167***
MFI age	-0.003**	-0.003**	0.001	-0.001
International founder	0.034*	0.021	0.042**	0.031*
Regulated	-0.039	-0.047**	-0.041**	-0.048***
ln(HDI)	0.034	0.005	0.067	0.035
Constant	0.537***	0.551***	0.423***	0.438***
Instrument?	<i>no</i>	<i>yes</i>	<i>no</i>	<i>yes</i>
Observations	1217	1182	1193	1152
MFIs	329	312	331	312
Wald χ^2	42.87***	100.59***	61.84***	89.99***
R^2	0.082	0.091	0.066	0.068
Estimation method	RE	RE	RE	RE

Table 8: Female CEO and social performance, modelling self-selection with the IMR.

	Avgl	Change CC	lending rate	lending rate constructed
Female CEO	-0.282***	-0.014	0.039**	0.028(*)
Return on Assets	-0.088	-0.207	0.245**	0.298***
ln(MFI size)	0.202***	-0.001	-0.020***	-0.016**
ln(PaR30)	0.231	-0.623***	0.021	0.167
MFI age	-0.032***	-0.012***	-0.004***	-0.001
International founder	-0.231***	-0.084**	0.023	0.031*
Regulated	0.384***	0.027	-0.061**	-0.056***
ln(HDI)	-0.958***	0.08	0.038	0.053
Constant	-2.695***	0.445***	0.531***	0.428***
IMR	-0.053	0.017	0.021*	0.012
Observations	1142	896	1183	1152
MFIs	304	289	312	312
Wald χ^2	133.02***	30.65***	52.09***	66.59***
R^2	0.251	0.057	0.093	0.072
Estimation method	RE	RE	RE	RE

* Very close to 10% significance.

Table 9: Simultaneous equation estimations of the average loan and lending rate and of the credit client change and lending rate using the SUR framework.

	Average loans system		Change in credit clients system	
	<i>average loan</i>	<i>lending rate</i>	<i>change credit clients</i>	<i>lending rate</i>
Female CEO	-0.106**	-0.004	-0.062	-0.007
Return on Assets	0.740***	0.136**	-0.961***	0.305***
ln(MFI size)	0.298***	-0.032***	-0.033	-0.038***
ln(PaR30)	2.787***	-0.309***	-1.538***	-0.271***
MFI age	-0.013***	-0.003***	-0.019***	-0.003***
International founder	-0.136**	0.016	-0.207***	0.021
Regulated	0.492***	-0.042***	0.072	-0.037**
ln(HDI)	-0.311**	-0.043	-0.076	-0.093***
Constant	-4.377***	0.654	1.235***	0.726***
time-dummies	yes	yes	yes	yes
Observations	1171	1171	914	914
Wald χ^2	590.77***	169.87***	67.21***	164.82***
R^2	0.330	0.126	0.068	0.152
Breusch-Pagan χ^2	245.30***		0.457	
Estimation method	SUR		SUR	

Table 10: Female chair/directors and social performance.

	Female chair				Female director			
	Depth		Width		Depth		width	
	average loan	Gender	Rural	Δ CC	Avgl	Gender	Rural	Δ CC
Female leader	-0.051	3.307***	-0.621	-0.018	-0.289***	8.617**	1.157	-0.020
Return on Assets	-0.067	1.167	0.407	-0.394**	-0.289*	5.871**	0.875	0.062
ln(MFI size)	0.195***	0.466**	0.234	0.012	0.229***	1.053	0.202	0.025*
ln(PaR30)	0.189	-0.177	-1.193	-0.559**	-0.256	4.586	-1.945	-0.424*
MFI age	-0.043***	0.092*	0.014	-0.009***	-0.038***	0.033	0.024	-0.009**
International founder	-0.156	0.781	0.357	-0.098**	-0.096	-1.327	1.298	-0.061
Regulated	0.496***	-3.078***	1.109	0.038	0.513***	-4.044*	1.541	0.008
ln(HDI)	-1.261***	-3.915**	-0.723	0.151	-1.431***	0.599	2.275	0.234*
Constant	-2.817***	-6.359***	3.844	0.454***	-2.882***	-12.339**	2.845	0.301***
Observations	722	951	953	565	591	648	655	476
MFIs	199	265	264	193	160	173	174	161
Wald χ^2	121.24***	54.33***	11.56	34.59***	138.59***	388.05***	19.54**	17.28**
R^2	0.239	-	-	0.071	0.294	-	-	0.041
Instrument?	yes	no	no	yes	yes	no	no	yes
Estimation method	RE	Probit	Probit	RE	RE	Probit	Probit	RE