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Cutting Microfinance Interest Rates: An Opportunity Co-Creation Perspective

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Microfinance is a social innovation to alleviate poverty by providing small, unsecured loans to local indigent entrepreneurs. Many borrowers use microfinance loans to seed their small entrepreneurial businesses. However, high interest rates charged by microfinance institutions (MFIs) are likely to increase the financial burden of those borrowers. In this study, we adopt an opportunity co-creation perspective to analyze the factors that affect microfinance interest rates. We argue that new opportunities in a social venture could be co-created by multiple stakeholders, including MFIs, borrower communities, female borrowers, governments, MFI managers, and employees. We tested our hypothesis on interest rate setting of MFIs by using 4,187 organization-year observations from 2003 to 2011 across 93 countries, and the empirical results largely support the hypotheses. Our opportunity co-creation perspective extends the current understanding on microfinance and provides important managerial implications.

Introduction: Setting Microfinance Interest Rates

When the Mexican microfinance institution (MFI) Compartamos disclosed its initial public offering files in 2007, the public was shocked to learn that it was charging its clients—mostly the poor—an interest rate of 90% on microloans (Malkin, 2008). Muhammad Yunus, a Nobel Peace Prize laureate, labels this kind of profit-driven company as a “loan shark” (Yunus, 2007). He called on the government to enforce an interest rate cap of 10–15% over the MFIs’ costs of funds (Yunus, 2011). Other critics argue that the excessively high interest rates could create debt traps for the poor (Taylor, 2011) and undermine the important role of MFIs in providing opportunities for small entrepreneurs. Interestingly, although practitioners have raised many questions regarding how MFIs set their interest rates on microloans, researchers have not devoted adequate effort to examine this issue, which is essential to reducing the financial burden of the poor at the bottom of the pyramid around the world.

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However, scholars have conducted many empirical studies to understand two sides of microfinance. On the borrower side, past studies have investigated the poor's credit worthiness (Johnston & Morduch, 2008), peer screening, monitoring (Karlan, 2007), joint liability (Ahlin & Townsend, 2007), the empowerment of women (Hunt & Kasynathan, 2001), microfinance's role in poverty reduction (Khandker, 2005), entrepreneurship (Bruton, Khavul, & Chavez, 2011), and so on. On the lender side, many scholars have applied agency theory to explore the relationship between ownership and performance (Mersland & Strøm, 2008), outreach and financial sustainability (Hartarska & Nadolnyak, 2007; Quayes, 2011), corporate governance (Mersland & Strøm, 2009), and cost efficiency (Caudill, Gropper, & Hartarska, 2009). While a few studies have examined the relationship between interest rates and MFI performance (Cull, Demirgüç-Kunt, & Morduch, 2007; Dehejia, Montgomery, & Morduch, 2012), most research has paid undue attention to the interest of a single stakeholder (either the borrower or the lender), while ignoring the joint forces of other stakeholders, such as the government, managers, employees, and communities.

Based on the pioneering research on stakeholder theory (Donaldson & Preston, 1995; Freeman, 1984; Hart & Sharma, 2004) and entrepreneurship theory (Alvarez & Barney, 2014; Sarasvathy, 2001; Zahra, Newey, & Li, 2014), we develop an opportunity co-creation perspective and treat cutting microfinance interest rates as an opportunity co-creation process. Given the relationship between high interest rates and financial burdens on borrowers (Yunus, 2007), MFIs should create a way to lower the interest rate while they maintain financial sustainability to achieve both social and economic goals. We argue that the opportunity co-creation process is facilitated by the joint efforts of stakeholders to define and solve problems of poor borrowers. The stakeholders are individuals or groups with interests in the procedural and/or substantive aspects of microfinance activity. Through stakeholder involvement, engagement, and dialogue, each stakeholder can make a significant contribution to this social venture, especially in cutting the interest rate (Bebchuk, 2003; Cull, Demirgüç-Kunt, & Morduch, 2011). Thus, this study highlights that new opportunities of MFIs are co-created by multiple stakeholders, including borrower communities, female borrowers, governments, MFI managers, and employees. We examine our hypotheses using a sample that consists of 4,187 organization-year observations from the Microfinance Information Exchange (MIX). This sample covers an accumulated \$58.1 million worth of borrower activities from 1,154 MFIs across 93 countries over a 9-year period (2003–2011). The empirical results largely support our hypotheses that stakeholder interdependence generates intrinsic value in setting interest rates.

Our study makes several contributions. First, the opportunity co-creation perspective extends the current understanding of MFIs. Although agency theory can explain borrower and lender behaviors, including peer screening, monitoring, and joint liability (Stiglitz, 1990; Varian, 1990), it ignores other stakeholders' efforts in cutting interest rates. This study suggests that opportunities are co-created while various stakeholders engage together in reducing interest rates under a shared social mission. Second, we highlight the importance of mutual selection and mutual construction among stakeholders in lowering interest rates. While traditional entrepreneurship theory focuses on the processes of discovery, evaluation, and exploitation of opportunities (Shane & Venkataraman, 2000), this study emphasizes *opportunity co-creation* processes among stakeholders and could make a theoretical contribution in developing entrepreneurship research on this particular social venture. Third, our multilevel quantitative models control for variations at different levels and intragroup correlations (e.g., time and country levels). Finally, our findings offer significant managerial implications.

An Opportunity Co-Creation Perspective

Opportunities are a critical component of entrepreneurship research (Shane & Venkataraman, 2000). Prior research defines opportunities as situations in which entrepreneurs can make profit by introducing new goods, services, and ways of combining resources (Shane & Venkataraman). Following recent entrepreneurship theory on opportunities (Alvarez & Barney, 2007, 2010; Alvarez, Barney, & Anderson, 2013; Sarasvathy, 2001; Venkataraman, Sarasvathy, Dew, & Forster, 2012), we suggest that opportunities for social entrepreneurs can be created when they try to solve social problems by taking advantage of economic activities. In the case of the microfinance, opportunities may refer to situations in which MFIs alleviate poverty and make a moderate profit in a sustainable manner by providing financial services for the poor. Since interest rates significantly influence outreach of MFIs' services for the poor and financial performance (Cull et al., 2007; Hermes & Lensink, 2007; Yunus, 2007), cutting interest rates without hurting financial sustainability can be one of the ways for MFIs to create opportunities (Khavul, 2010). This effect could involve multiple stakeholders. Freeman defines stakeholders as "any group or individual who can affect or is affected by the achievement of the organization's objectives" (1984, p. 46). Stakeholder theory suggests that organizations can achieve better performance when they allocate resources to satisfy the needs of various stakeholders and include the stakeholders in their decision-making processes (Freeman, Harrison, & Wicks, 2007; Hargrave & Van De Ven, 2006).

Integrating the emerging entrepreneurship theory and stakeholder theory, we propose an *opportunity co-creation* perspective on social ventures like MFIs. We define the opportunity co-creation as the process in which multiple stakeholders jointly define and solve social problems by mutually selecting and constructing resources to generate both social and economic values. These stakeholders could include beneficiaries, customers, employees, donors, governments, investors, and so on (Alvarez & Barney, 2014).

Following Donaldson and Preston (1995), we delineate three aspects of opportunity co-creation in the context of microfinance. First, in the descriptive aspect, opportunity co-creation is the process in which numerous diverse participants jointly define and solve social problems. The concept of co-creation was originally built by Prahalad and Ramaswamy (2004) on the joint creation of value between the firm and the customer. We extend this relationship to other stakeholders who could contribute to alleviating poverty issues under a shared social mission (Miller, Grimes, McMullen, & Vogus, 2012). Through stakeholder involvement, engagement, and dialogue, an MFI can find a better way to mobilize supporters and cut interest rates, which allows them to better serve the poor (Battilana & Dorado, 2010). In fact, simply cutting the dividend to investors or interest rates to creditors cannot be a solution because the high operating cost of delivering small loans is one of the main drivers of high microfinance interest rates (Gonzalez, 2011). Rather, MFIs need to improve management efficiency and cooperation between stakeholders, including managers and employees. For example, after stakeholders worked together to improve efficiencies, Compartamos passed the savings to its customers, which resulted in cutting the interest rate by 30% over the subsequent 5 years.¹

Second, in the instrumental aspect, opportunity co-creation is an avenue for stakeholder mutual selection and mutual construction. In a selection process, some stakeholders may share the same interest in serving the poorest in a distant community, while

1. Compartamos annual report and financial data: <http://www.compartamos.com/wps/portal/InvestorsRelationsBank/FinancialInformation>

other stakeholders may work together to focus on helping women entrepreneurs. Sarasvathy, Kumar, York, and Bhagavatula (2014, p. 74) argue that “(i)n the effectual process, stakeholders put ‘skin in the game’ because they see opportunity in co-creating the venture.” Although multiple stakeholders might have competing interests, they can negotiate, moderate, and finally construct new benefits and interests (Prahalad & Ramaswamy, 2004). Indeed, “the effectual process involves several cycles of interactions between stakeholders” (Sarasvathy et al., p. 80). In this iterative processes, new markets may be generated, and new knowledge—both technical and social—may be transferred and learned by stakeholders “who adopt the new opportunity to enable its use, resulting in new behaviors and routines by both those forming the opportunity and those adopting the opportunity” (Alvarez & Barney, 2014, p. 164). Therefore, in building these effectual partnerships (Sarasvathy et al., p. 74), social ventures like MFIs could adapt a pro-social cost–benefit analysis to set key performance measures (such as the interest rate and outreach in social impact assessments) and evaluate the roles played by various stakeholders (Alvarez & Barney; Sarasvathy, 2001; Zahra et al., 2014). For example, Grameen Bank elected its group leaders and even board members from its borrowers in Bangladesh. The experience of the leader positions provided these borrowers with a launching pad for their roles in public office. In 2003, in a local government (Union Porishad) election, 7,442 Grameen members ran for seats that were reserved for women, and 3,059 members were successfully elected (Grameen Bank, 2010). In this mutual selection and learning process, opportunity co-creation not only provides empowering avenues for women and the local community but also develops dense operating networks for MFIs (Bruton et al., 2011).

Third, in a normative aspect, opportunity co-creation generates an intrinsic value for every group of stakeholders (Donaldson & Preston, 1995). Alvarez and Barney (2014, p. 164) propose that “once the opportunity and the market are co-created, the entrepreneur will endeavor to capture as much value as possible.” If one group of stakeholders does not take undue advantage of the others and follows opportunity co-creation logic in “trade-offs” of interests with other stakeholders, every stakeholder could, like the entrepreneur, capture and share the value and benefit (Wheeler, Colbert, & Freeman, 2003). For example, MFIs can empower women to fight against poverty and promote gender equality (e.g., the practice of Grameen). The process is then likely to engage another stakeholder—the government—in adopting more supportive regulations for women. These interlocking effects could lead to a reduction in the microfinance interest rates and improvement of the financial environment for women. Therefore, stakeholder negotiation and consensus in opportunity co-creation could build a sustainable economic and social foundation for microfinance over time (Kochan & Rubinstein, 2000).

Traditionally, agency theory dominates the explanations of interest rates in microfinance. Although our opportunity co-creation perspective does not completely exclude agency theory, it builds on different theoretical assumptions, problem settings, and solutions from those of the agency theory. In Table 1, we summarize and compare the two. Agency theory assumes that information distribution among individuals is imperfect and agents pursue self-interest. In the context of microfinance, borrowers’ self-interest can cause moral hazard and adverse selection. Accordingly, peer monitoring and joint liability could reduce information asymmetries and mitigate the negative impacts of self-interest (Armendáriz de Aghion & Morduch, 2005; Cull et al., 2007). The opportunity co-creation perspective proposes that partial information is distributed even at the aggregate level and that new information is created through new means as well as new ends when a set of opportunities emerge (Sarasvathy, Dew, Velamuri, & Venkataraman, 2010). Thus, although borrowers can act in their own self-interest, stakeholders of MFIs can have

Table 1

A Comparison of Theoretical Foundations on Microfinance Between Agency Theory and Opportunity Co-Creation Perspective

	Agency theory	Opportunity co-creation perspective
Key idea	Lender–borrower relationship should reflect efficient organization of information and risk-bearing costs.	Multiple stakeholders jointly define/solve the social problem (e.g. poverty) and achieve the mission of a social venture.
Human assumptions	<ul style="list-style-type: none"> • Self-interest but feel social stigma in peer if missing repayment; • Bounded rationality; • Risk aversion 	<ul style="list-style-type: none"> • Care and compassion; • Prosocial motivation; • Altruism; • Social justice and fairness
Problem domain	<ul style="list-style-type: none"> • Lender and borrower have different goals and risk preferences 	Multiple stakeholder can learn each other through the process of mutual selection and construction.
Problem issue	<ul style="list-style-type: none"> • Borrower (moral hazard and adverse selection); • Risk sharing between lender and borrower 	<ul style="list-style-type: none"> • Borrower’s limited access to financial resources; • Barrier to exploit opportunity; • Gender-based hierarchies and stereotypes.
Information distribution	Information asymmetry between MFIs and borrowers	Partial information is distributed even at the aggregate level; Co-creation generates new information (through new means as well as new ends).
Solutions	<ul style="list-style-type: none"> • Peer screening and monitoring; • Joint liability; • Dynamic incentive repayment. 	<ul style="list-style-type: none"> • Empowerment of the poor and women; • Stakeholders’ involvement, engagement, communication; • Stakeholder learning and partnership.
Interest rate setting	<ul style="list-style-type: none"> • Necessity of raising interest rate because it is less cost-efficient for group lending; • MFIs might reduce the rate after borrower builds a credit history. 	<ul style="list-style-type: none"> • Mutual and voluntary acceptability of bargains; • Trade-offs between financial sustainability and social justice.
Sustainability	Based on cost-efficiency.	Based on stakeholders’ intrinsic value

Inspired from Eisenhardt (1989), Donaldson and Preston (1995), and Sarasvathy et al. (2010).

caring and compassionate feelings about them and pursue new means and ends for social justice and fairness (Hart & Sharma, 2004; Sarasvathy, 2001). To explain the phenomenon of microfinance, we believe that these “different assumptions can be set aside” (Mayer & Sparrowe, 2013, p. 918), since one stakeholder, even if motivated only by self-interest, could engage other stakeholders to build a mutual selection and construction relationship and pursue the intrinsic value. By combining stakeholder theory and entrepreneurship theory, we could better understand the relationships among multiple stakeholders who affect microfinance interest rate setting.

Key Stakeholders in Opportunity Co-Creation

In a microfinance setting, relevant stakeholders include governments, clients, donors, nongovernmental organizations, investors, managers, employees, communities, among others. For example, Compartamos, in its annual and sustainable report, lists “customers, employees, suppliers, authorities, the community, civil organizations, competitors, investors, and the future generation” as its important stakeholders (Compartamentos, 2011, p. 8).

Among the various stakeholders, our study focuses on female borrowers, borrower communities, managers, employees, and governments. They are key stakeholders in terms

of urgency, power, and legitimacy (Mitchell, Agle, & Wood, 1997), and their supports are critical for the survival of MFIs (Harrison, Bosse, & Phillips, 2010). Since they can provide necessary resources, including new knowledge, environments, and sufficient trust or power to construct partnership (Dess, Ireland, & Hitt, 1990; Freeman, 1984), their involvements and contributions would facilitate the process of opportunity co-creation.

Co-Creating Opportunities Among Stakeholders

Opportunity Co-Creation Between MFIs and Borrower Community

MFIs usually set their social mission as reaching the poor at the bottom of the pyramid with small loans (Mersland & Strøm, 2010), but they may need to charge a high interest rate on these loans. First, smaller loans are associated with higher transaction costs than larger loans (Mersland & Strøm) because it is difficult for MFIs to maintain a reasonable fee structure and practices (Johnston & Morduch, 2008). Second, poor borrowers often face multitudes of barriers to taking advantage of the loans and exploring entrepreneurial opportunities, which can hinder their ability to pay back the loans (Alvarez & Barney, 2014). Third, because poor borrowers generally do not have a credit history or collateral, MFIs have difficulty assessing credit worthiness of the borrowers. The high costs associated with providing small loans, the potentially high delinquency rates, and the moral hazard caused by information asymmetry could lead MFIs to charge higher interest rates to poor borrowers (Cull et al., 2007; Hermes, Lensink, & Meesters, 2011).

An opportunity co-creation perspective suggests that MFIs and the borrowers in a borrower community can jointly define and solve this problem of information asymmetry and create opportunities to serve poor borrowers with lower interest rates while pursuing moderate levels of profit. As explained above, MFIs should obtain specific information on potential and existing borrowers (e.g., ability to repay the loan and wealth) to better target and manage their loans. However, it is costly to do so. MFIs can address this problem by taking advantage of a large borrower community. When such a community is clearly identified, MFIs are able to mobilize and acquire information and knowledge about borrowers more efficiently by encouraging information exchange (Conning & Kevane, 2002; Rai, 2002). With the acquired knowledge, MFIs can control some part of the risk with regard to borrowers and reduce the costs of targeting and managing loans. These benefits help them lower interest rates.

A large borrower community characterized by geographical proximity, interaction, and identity is beneficial for borrowers as well (Dunham, Freeman, & Liedtka, 2006). They can learn the means of exploiting loans by observing and communicating with other borrowers in the community because spatial proximity and social linkage increase information flows (Pierce & Aguinis, 2013). In addition, a well-developed community enables the poor to gain access to bank information on market prices and loan opportunities (Uzzi, 1999) and to share their values and experiences in repaying loans and building credit (Dunham et al.). This type of learning not only reduces the delinquency rates of the microloans but also reduces information asymmetry between MFIs and the poor. The learning also improves the confidence of borrowers in controlling their financial plans and repayment obligations and increases their bargaining power with lenders. Last, the learning effects could be diffused further and deeper as the borrower community grows (Ferrary & Granovetter, 2009).

Overall, in a larger borrower community, borrowers can learn more about how to exploit the loans for higher income and share more information with other borrowers and

MFIs (Alvarez & Barney, 2014). This cooperative process can lead to opportunity co-creation, which reduces risks for MFIs and interest rates for borrowers. Therefore, we argue:

Hypothesis 1: An MFI has a lower interest rate in a larger borrower community.

Stakeholder Relationship Between MFIs and Women

As seen in the case of Grameen Bank, which invests 94% of its assets in loans for women (Yunus, 2007), many MFIs emphasize financial services for women. Indeed, they seem to be a good target because they are more willing than male borrowers to invest loans in productive activities and repay the loans (Brau & Woller, 2004; Yunus, Moingeon, & Lehmann-Ortega, 2010). Also, they are eager to fight against poverty and increase social status of their families by exploiting loans from MFIs. These suggest that female borrowers may contribute to opportunity co-creation activities of MFIs.

However, women have some disadvantages in this mutual selection process in comparison with men and have limitations in participating in the opportunity co-creation process. First, gender-based hierarchies in many developing economies where most MFIs operate inhibit women from gaining access to material, human, and social resources (Cheston & Kuhn, 2002). Gender stereotypes and the traditional division of labor at home (e.g., domestic and child care responsibilities) constrain women's choices for income generation, thus making it more difficult for them to make weekly loan repayments than men (Milgram, 2001). Second, gender-based hierarchies give women little power in a financial-contract negotiation. In most developing economies, men dominate and control the resources of credit, money, and social capital. Also, male lending officers may have some difficulty understanding women's businesses and spending modes, which are different from those of their male counterparts (Bruton et al., 2011). Third, because women borrowers generally have less education and knowledge of financial contracts than male borrowers, they may end up paying higher interest rates than men even though some have argued that female borrowers have better records of repayment than men (Cull et al., 2007; Hermes & Lensink, 2007; Yunus, 2007). In-depth interviews conducted by Bruton et al.) show that some women were still unable to explain the terms of their loans even after they received loans from loan officers. Therefore, we suggest:

Hypothesis 2a: The proportion of women borrowers of a MFI is positively related to the interest rate.

Opportunity Co-Creation Among MFIs, Women, and Government

Although female borrowers have potential for contributing to the opportunity co-creation process, their roles are constrained by systematic barriers in a society. To address this issue, as an important stakeholder, government can make policies and regulations that affect both MFIs and borrowers (Funk, 2014). And, well-established institutional supports from government could improve the construction process of opportunity creation for female borrowers. This study focuses on the rule of law, which reflects government's role in contract enforcement, property rights protection, and the implementation of laws and regulations (Kaufmann, Kraay, & Mastruzzi, 2009). Given the close relationship between government and financial services for the female poor (Funk, 2014), the rule of law can intervene in the opportunity co-creation process between MFIs and women borrowers (Alvarez & Barney, 2014).

First, the rule of law that facilitates women's rights and opportunities could help women to challenge gender-based hierarchies and stereotypes (Cheston & Kuhn, 2002; Hunt & Kasynathan, 2001) and encourage them to participate in more entrepreneurial activities (Jullien, 2004). Second, the rule of law that promotes client protection in areas such as effective dispute-resolution procedures (Cheston & Kuhn, 2002) gives women more bargaining power and rights in contract negotiation. Third, the rule of law that requires transparency in pricing and accounting protects women borrowers who do not have education and knowledge to request and understand financial terms. The benefits of the rule of law for women, such as increased rights, fair legal procedures, and transparent information on MFIs, could help female borrowers to engage in productive activities to repay their loans (Prahalad & Ramaswamy, 2004) and to join the opportunity co-creation process. The rule of law also encourages MFIs to provide at least equal service for female borrowers. Therefore, we propose:

Hypothesis 2b: The rule of law moderates the relationship between the proportion of women borrowers of an MFI and the interest rate such that the positive effect of the proportion of women borrowers of an MFI on the interest rate becomes weaker in a country with a stronger rule of law.

Opportunity Co-Creation Between MFI Managers and Borrowers

MFI managers can influence various decisions on loan management such as delinquency rate. They manage MFIs' risks and contracts with borrowers. We argue that MFI managers and borrowers could be mutually selected into the opportunity co-creation process. For commercial banks, default risk in loan portfolio management is related to increased interest rates (Angbazo, 1997). However, portfolio risk of MFIs, defined as a 90-day late payment in this study, is different. Most of the loans offered by MFIs are based on short-term contracts and require quick and frequent loan repayment. When a loan is behind its repayment schedule, MFIs can choose to write off the loan as being in default, but in such cases, MFIs are likely to incur a loss because microfinance loans often do not have collateral to recoup the loan loss.

Alternatively, MFIs can choose to keep the loan active and help the borrowers to repay the loan by extending the payment period and reducing the interest rate subsequently charged on the loan.² MFIs can charge lower interest rates to borrowers behind the payment schedule particularly when they are engaged in iterative interaction processes with the borrowers. Through this relationship, they can obtain latest and accurate information about the borrowers, including willingness for repayment, and can adjust previous policies on payment schedule and interest rates (Alvarez & Barney, 2014). Indeed, there are increasing needs for flexible decision making on payment schedule and interest rate (Meyer, 2002) because the flexibility allows borrowers to have more time to exploit their loans and improve repayment ability, reducing a loan default risk (Ahlin & Townsend, 2007; Field & Pande, 2008).³ For example, in the evolving Grameen II system, if a

2. We should differentiate between *ex ante* and *ex post* charges on the interest rate here. In this section, the fact that MFIs subsequently lower the interest payments for the potential default borrower belongs to the case of the latter. We thank one reviewer for pointing this out.

3. For example, China Commercial Credit Inc. (CCCC), the first Chinese MFI listed on the NASDAQ Stock Exchange, recently disclosed its flexible payment policy in its initial public offering prospectus: "when a borrower fails to make a scheduled payment, we attempt to cure the deficiency by personally contacting the borrower. Initial contacts typically are made seven days after the date the payment is due, and warning letters

borrower's repayment is 6 months behind the schedule, managers will take it as an early warning signal and convert the borrowers' loan from a fixed schedule to a flexible payment loan that may even give the borrower up to 20 years to repay the loan, setting the maximum penalty to the size of the loan and maximum interest collection to the original principal (Armendáriz de Aghion & Morduch, 2005; Yunus, 2007). Therefore, MFI managers and borrowers jointly create opportunities by addressing the default risk. Overall, we suggest:

Hypothesis 3a: An MFI's loan portfolio 90-day delinquency rate is negatively related to the interest rate that it charges subsequently.

Opportunity Co-Creation Among MFI Managers, Borrowers, and Government

Although some true poor borrowers can benefit from a lower interest rate when they struggle to repay the loans, it could raise potential moral hazard issues and damage normal relationships between MFI managers and borrowers (Armendáriz de Aghion & Morduch, 2005; Khavul, 2010). In this case, the rule of law could serve as an antidote and help MFIs to build a cooperative, long-term, and trusting relationship with borrowers in evaluating client credit, designing repayment contracts, and implementing collateral substitutes (Morduch, 1999; North, 2005; Peng, Sun, Pinkham, & Chen, 2009). On the one hand, the rule of law as a formal institution can make MFIs reduce their transaction costs and the uncertainty associated with the relationship with borrowers. On the other hand, however, formal rules can also undermine a manager's ability to implement case-based renegotiation. For example, some laws may prevent managers from offering a particular clientele extensions or a reduced interest rate (Canales, 2014) because if the MFI's loan portfolio is at risk, the formal institution of the rule of law replaces the old solution based on informal stakeholder cooperation (e.g., group screening, monitoring, and joint liability) (Peng et al., 2009).

In addition, well-codified legal systems and enforcing mechanisms facilitate the opportunity co-creation by protecting the rights of creditors, lenders, and borrowers and helping managers to fairly enforce repayment and group lending obligations (Alvarez & Barney, 2014; Economist Intelligence Unit, 2012). MFI managers in a country with a better rule of law may have less incentive to develop a case-based approach and may depend more heavily on the rule of law to select their customers and reinforce the loan payment schedule than MFI managers in countries with a worse rule of law. The better rule of law could balance the cooperation between MFI managers and borrowers, making their relationship sustainable and productive (Canales, 2014). Therefore, we suggest:

Hypothesis 3b: The rule of law moderates the relationship between an MFI's loan portfolio 90-day delinquency rate and the interest rate such that the negative effect of

are sent by our legal counsel approximately 90 days after the default. In most cases, deficiencies are promptly resolved. If the outstanding amount cannot be collected within 180 days after the maturity date and the parties could not reach an agreement on a specific repayment program, we will initiate legal proceedings. . . . On loans where the collection of principal or interest payments is doubtful, the accrual of interest income ceases ('non-accrual' loans). Except for loans that are well secured and in the process of collection, it is our policy to discontinue accruing additional interest and reverse any interest accrued on any loan that is 90 days or more past due." From CCCR Form S-1/A SEC Filing, 2013. <http://marketbrief.com/china-commercial-credit-inc/s1-a/ipo-registration-amendment-/2013/8/12/10306384/filing>.

an MFI's loan portfolio 90-day delinquency rate on the interest rate becomes weaker in a country with a stronger rule of law.

Opportunity Co-Creation Between Loan Officers and Employees

Given that social ventures have relatively limited access to resources (Austin, Stevenson, & Wei-Skillern, 2006), MFIs should efficiently exploit existing resources. In particular, they should focus on human capital because skills and experiences of loan officers and employees are crucial for MFIs to increase efficiency and reduce costs associated with their services for the poor (Battilana & Dorado, 2010). The increased efficiency and cost reduction allow MFIs to lower interest rates. We argue that this opportunity can be co-created by loan officers and employees.

Loan officers sometimes take full responsibility for MFIs' activities regarding loans (Battilana & Dorado, 2010; Bruton et al., 2011), including marketing loans, evaluating clients, structuring loan terms (such as loan size and joint liability), and recouping defaulted loans (Canales, 2014). However, relying too much on them could weaken engagement and contributions of other employees to loan activities and customer services. Since employees influence MFIs by investing their human and intellectual capital (Ashta & Hudon, 2009; Hossain, 2013) and their impact can vary depending on how much they are empowered (Harrison et al., 2010), MFIs need to provide incentives and training to empower employees (Battilana & Dorado; Epstein & Crane, 2007). Yunus suggests that it is important for MFI employees to receive "market wages with better working conditions" and "do it with joy" (Kickul, Terjesen, Bacq, & Griffiths, 2012, p. 454). A decentralized organizational structure can be another productive way to empower employees.

A decentralized structure disperses decision-making authority throughout the organization, especially from loan officers (Dalton, Todor, Spendolini, Gordon, & Porter, 1980). This type of bottom-up structure motivates employees to improve knowledge about clients and effective communication skills and to maximize their contribution (Holcomb, Combs, Sirmon, & Sexton, 2010; Peterson, Arregle, & Martin, 2012). Thus, employees can participate in customer analysis and services (Herrenkohl, Judson, & Heffner, 1999) while only a few loan officers are fully responsible for lending activities. Also, under the decentralized structure, employees can share a vision of poverty alleviation with loan officers (Herrenkohl et al., 1999). Therefore, the loan officers and employees can have more chances to collaborate for opportunity co-creation.

In addition, MFIs with a decentralized structure can reduce the effects of loan officers' individual arbitrage and manipulation in loan activities. Based on agency theory, frontline loan officers as agents could maximize their own personal interests by charging high interest rates for a bonus when a top manager, as principal, has limited customer information (Eisenhardt, 1989). Loan officers could also transfer their responsibility and burden to the borrower group, which sometimes increases the interest rate and the likelihood of collusion or default (Armendáriz de Aghion & Morduch, 2005). However, our opportunity co-creation perspective suggests that active interactions between loan officers and employees in the decentralized structure could reduce the information asymmetries among these stakeholders (Saravathy et al., 2014). Therefore, we suggest:

Hypothesis 4: A MFI with a lower ratio of the number of loan officers to the number of employees has lower interest rates.

Data and Methods

Sample

We collected MFI data from the MIX. One of the strong features of the MIX data is that the numbers are adjusted by international accounting standards (Cull, Demircuc-Kunt, & Morduch, 2009). In addition, the data provide not only financial information but also information on the proportion of female borrowers, as well as the legal status of MFIs and their target markets. Although there might be concerns regarding a self-selection bias with the database because MFIs voluntarily report information regarding their activities, the data present leading MFIs' activities with rigorous reporting standards (Cull et al.; Krauss & Walter, 2009). Therefore, the MIX data are currently a popular data source on MFIs (Hermes et al., 2011).

Although the original MIX data set contains information about MFIs from 1995, we focus on a period of 9 years from 2003 to 2011 (inclusive) because of the data availability on the variables in our study. After a lag of one year for all independent variables, our final sample consists of 4,187 organization-year observations from 1,154 MFIs over 8 years across 93 countries. The total asset and equity (shareholder investment) of these MFIs at the end of 2011 are \$12.02 billion and \$2.34 billion, respectively. We also collect Hofstede's cultural scores (Hofstede, Hofstede, & Minkov, 2010) and Worldwide Governance Indicators data from the World Bank (Kaufmann, Kraay, & Mastruzzi, 2011).

As Figure 1 shows, the number of active borrowers increased dramatically during the research period, suggesting the important roles that MFIs have played. The cumulative active-borrower number is 58.1 million. In particular, South Asia has experienced a significant increase in the total number of active borrowers, which exceeds that of other regions. The success of the Grameen Bank, the most prominent MFI (Bruton et al., 2011), may explain the popularity of MFIs in South Asia. However, we also find that there is a big decline between 2010 and 2011, which could contribute to the overall drop in the number of active borrowers from 2010 to 2011. The reason could be the MFI collapse events that have occurred since 2010, especially in India (Polgreen & Bajaj, 2010).

We find that the average proportion of female borrowers in microfinance programs is 64.7% during the research period. This suggests that the majority of MFI customers are women. Like that of active borrowers, the proportion of women borrowers differs by region (Figure 2). For example, the portion is largest in South Asia, where female borrowers represent more than 80% of all borrowers. It indicates that mutual selection of the partnership between MFIs and female borrowers vary across the countries.

For our dependent variable, interest rates, although there was a moderate increase between 2007 and 2008, the overall trend shows that interest rates have been going down. In particular, the interest rates of MFIs in the East Asia and Pacific regions have decreased the most (Figure 3).

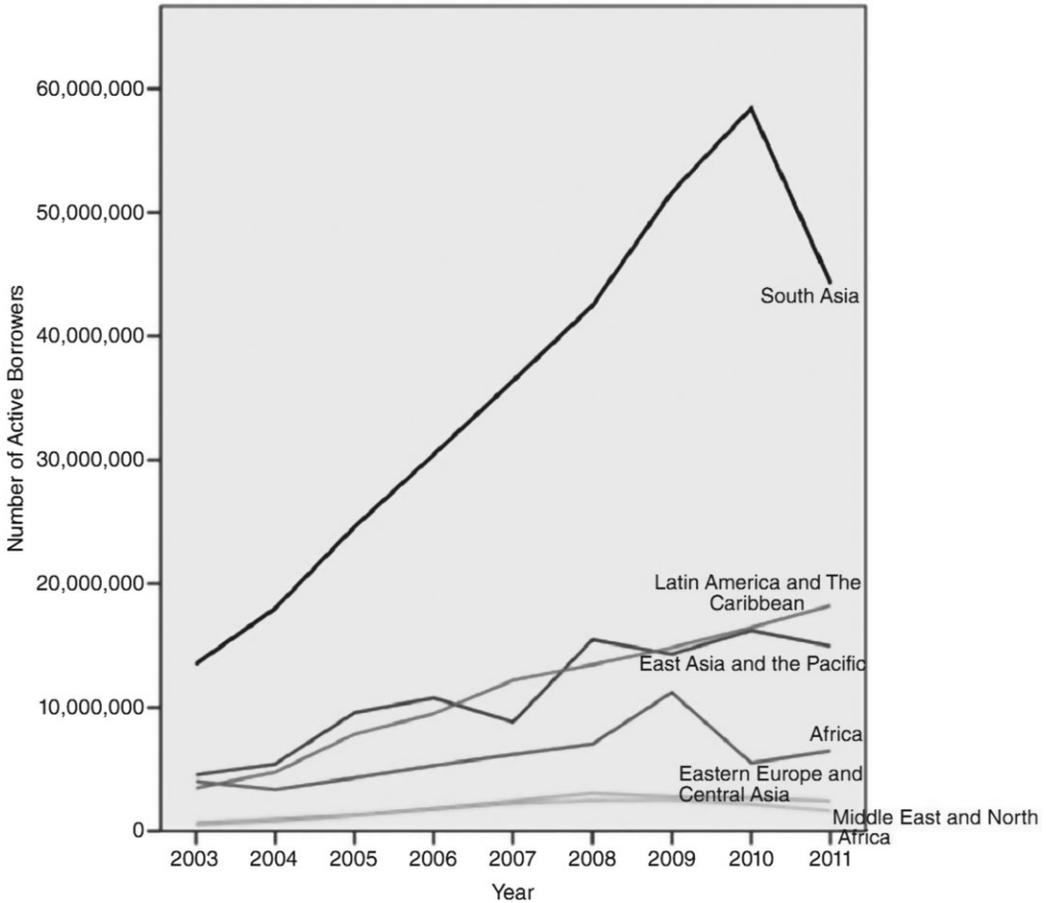
Measures

We summarize all variables' definitions in Table 2.

Dependent Variable. *Interest rate* is an MFI-level variable and is measured by the nominal yield on the gross portfolio, which includes both direct interest charges and penalties, commissions, and other fees charged on loan portfolios (MIX, 2005, p. 56). MFIs need more financial resources when they provide microfinance services on a small scale and in a large number of regions. Thus, MFIs' interest rates should cover both financial and nonfinancial costs (Robinson, 1996).

Figure 1

The Number of Active Borrowers by Region

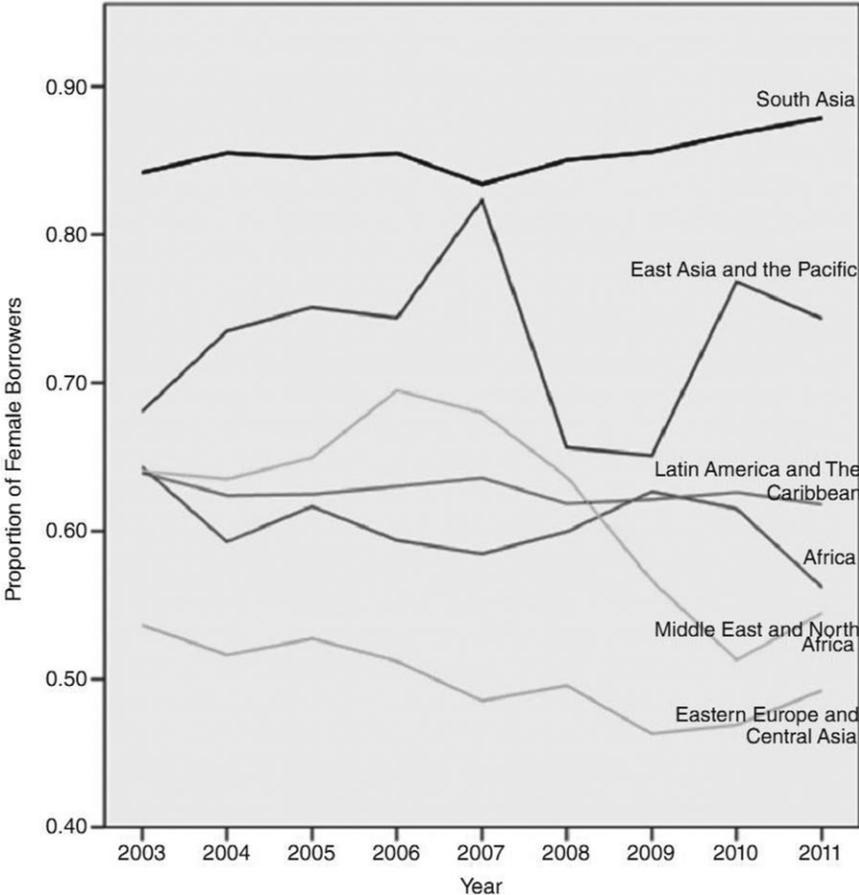


Independent Variables. Our independent variables include both MFI-level variables and country-level variables. (1) *Borrower community* is a country-level variable that captures the number of borrowers in a given country. It is measured by the ratio of the number of active borrowers in a given country to its total population. Higher values for this measure signify that the country has a larger borrower community relative to the overall population. (2) *Female borrowers* is an MFI-level variable that represents the ratio of the number of active female borrowers to the total number of active borrowers. (3) *Loan portfolio at risk* is an MFI-level variable measured by the outstanding balance of loans in which repayments are more than 90 days behind schedule divided by the gross loan portfolio. Although this is not default risk, it can be a good warning sign of impending default (Cull et al., 2009). (4) *Loan officer/employee* is an MFI-level variable that represents the number of loan officers relative to the total number of employees, with loan officers being defined as personnel who mainly manage loan portfolios (Galaskiewicz & Wasserman, 1989).

Moderator Variable. *Rule of law* is a country-level variable, measured by the World Governance Indicators developed by Kaufmann et al. (2009). Several country-level

Figure 2

The Proportion of Female Borrowers by Region



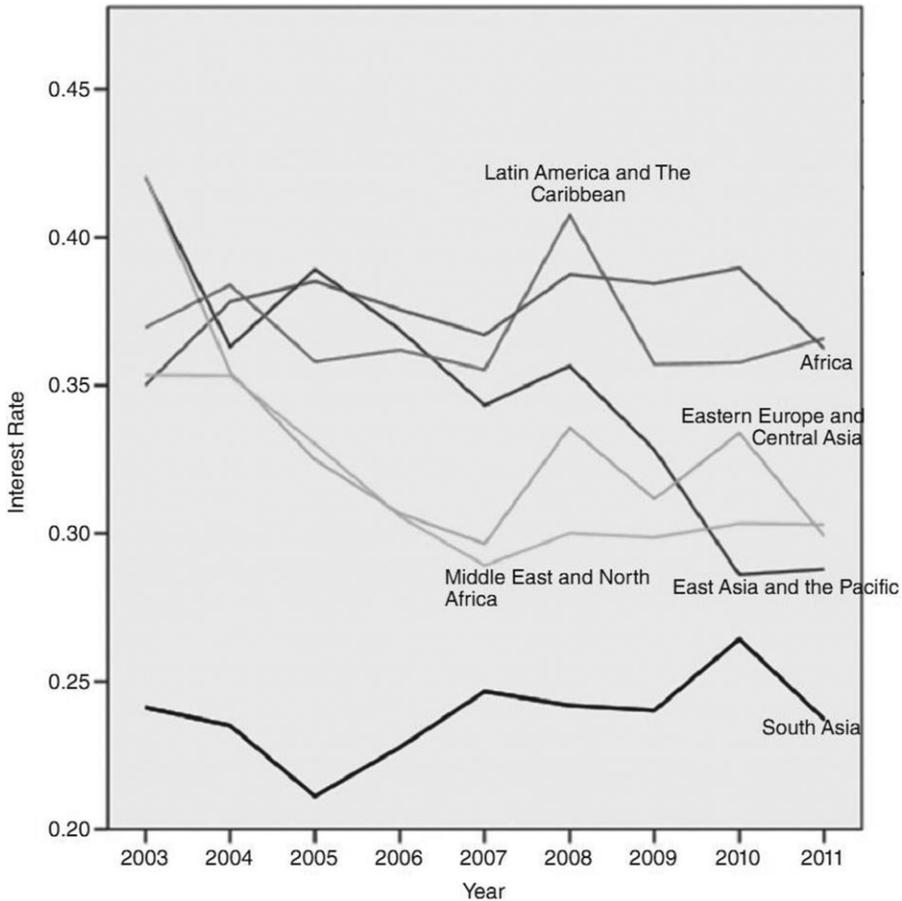
variables obtained from 31 data sources were aggregated and normalized to produce six composite indicators of institutional dimensions (Kaufmann et al., 2011). The rule of law reflects “perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence” (Kaufmann et al., 2009, p. 8). This measure ranges from -2.5 to 2.5.

Control Variables. We control for *regulated MFIs*, *MFI history*, *average loan balance* (adjusted by gross national income [GNI] per capita), *debt-to-asset ratio*, *nonprofit dummy*, *operation efficiency*, *administrative costs*, *employee productivity*, *GDP per capita*, *performance*, *inflation*, *concentration*, *MFI status*, *MFI scale*, *MFI target*, and *MFI age*, following previous research (Cull et al., 2007; Galaskiewicz & Wasserman, 1989; Krauss & Walter, 2009; Lamin, 2013).

Analysis and Model Estimation Strategy. Multilevel quantitative research has gained wide attention in the field of management research (e.g., special issues in the *Academy of*

Figure 3

Interest Rates by Region



Management Review and the *Academy of Management Journal*) and international business (e.g., special issues in the *Journal of International Business Studies*) (Hitt, Beamish, Jackson, & Mathieu, 2007; Klein, Tosi, & Cannella, 1999; Peterson et al., 2012). Multilevel quantitative research has the advantage of accurately modeling higher-level context constructs and lower-level theoretical variables (Holcomb et al., 2010; Peterson et al., 2012). In this study, we have a three-level nested data structure. Specifically, hypothesis 2a, hypothesis 3a, and hypothesis 4 focus on the firm-level variables, and hypothesis 2b and hypothesis 3b are related to interactions between firm level and country level. MFIs nested within a country share similar institutional structures, regulation environments, economic development stages, and cultures (Caudill et al., 2009). The common practices, such as peer screening, monitoring, joint liability, and local sanctions, are all deeply embedded in local culture (Ahlin & Townsend, 2007). Therefore, the microfinance interest rate in the same year or in the same country may be more similar than firms from different years and different countries. Cross-year, cross-country, and within-country similarities can potentially lead to intraclass (or intracountry) correlations. In other words, our 8-year, longitudinal cross-country data can lead to intratemporal and intracountry correlations.

Table 2

Variable Definitions

Variable name	Description	Data sources
Interest rate	Interest and fees on loan portfolio/loan portfolio, gross, Winsorized.	MIX
Borrower community [†]	The accumulated number of individuals or entities who currently have an outstanding loan balance with MFIs in the focal country, adjusted by country population, log- transformed.	MIX
Female borrower	Number of active female borrowers/number of active borrowers (%), Winsorized.	MIX
Loan portfolio at risk	Portfolio at risk >90 days/loan portfolio, gross.	MIX
Loan officer/employee	The number of loan officers/the number of total employees. A loan officer is a staff member of record who is directly responsible for arranging and monitoring client loans, Winsorized.	MIX
Rule of law [†]	Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	World Bank
Regulated MFIs (regulated)	A dummy variable measured whether MFIs are regulated by government or not.	MIX
MFI history [†]	The number of years since the first MFI was created in the given country, log-transformed.	MIX
Average loan balance	Average loan balance per borrower/GNI <i>per capita</i> .	MIX
Debt/asset	Debt/equity ratio.	MIX
Non profit	Registered as a non-profit institution.	MIX
Operation efficiency (operating expense/loan)	Operating expense/loan portfolio, gross.	MIX
Administrative expense	(Administrative expense + depreciation)/ assets, average.	MIX
Employee productivity (borrowers per staff)	Number of active borrowers/staff member, Winsorized.	MIX
MFI status	Categorical variable: registered as a bank, credit union, NBFI, rural bank, and others.	MIX
Performance	(Net operating income, less taxes)/equity, Winsorized.	MIX
MFI scale (loan portfolio scale)	Categorical variable: large, medium, and small scale of gross loan portfolio.	MIX
MFI target market (MFI target)	Categorical variable: target market: low end, broad, high end, and small business.	MIX
MFI age [†]	Categorical variable: new (1–4 years), young (5–8 years), and mature (more than 8 years).	MIX
Concentration [†]	Measured by the four-firm industry concentration in the focal country to capture the market structure and competition.	MIX
Inflation [†]	Inflation based on consumer price index.	World Bank
GDP <i>per capita</i> [†]	Total GDP is divided by the resident population on a country, log-transformed.	World Bank

A brief measure in parentheses; [†]Data in country level.

Methodologically, addressing the existence of an intracountry correlation is necessary because it changes the error variance in traditional linear regression models and violates the assumption of observation independence, thus increasing the probability of type I and type II errors (Hox, 2010; Kreft & Leeuw, 1998). Our sample shows an intraclass correlation of 0.110, suggesting that 11.0% of the variation of interest rate is explained by the intra-country correlation.⁴

4. An intraclass correlation value above 0.10 indicates the importance of such correlations and necessitates multilevel analysis (Bliese & Ployhart, 2002).

To control for cross-year, intra-country correlation, as well as cross-country variation, we build and estimate a series of multilevel mixed models with the “xtmixed” command in Stata version 10 (Holcomb et al., 2010; Rabe-Hesketh & Skrondal, 2008). Specifically, level 1 is within MFIs across time periods, level 2 is within MFIs across countries, and level 3 is within MFIs intra-countries.

Findings

To reduce the effect of possible spurious outliers, we winsorize the highest value (99.5%) and the lowest value (0.5%) of the *interest rate*, *female borrower*, *loan officer/employee*, and *performance* (return on equity [ROE]), and replace them with the next value counting inwards from the extremes. Descriptive statistics are presented in Table 3. The mean for the interest rate of all MFIs is 33.7% between 2003 and 2011. The standard deviations of some variables, such as *borrowers per staff*, are very high, indicating the highly unbalanced distribution of mutual selection between MFIs and borrowers. In addition, governments regulate a majority of MFIs, and approximately 63% of all MFIs are made up of nonprofit organizations. The table also shows that, on average, MFIs have approximately 10 years of history at the country level. We further test the variation inflation factor (VIF) in the regression with the main and control variables. The highest VIF of all variables is 9.04, with the average being 2.05.

Table 4 displays our multilevel mixed-model estimations on the nominal interest rate. Model 1, as the baseline model, includes all control variables. Step-by-step, we add *borrower community* in model 2, *female borrowers* in model 3, *loan portfolio at risk* in model 4, and *loan officer/employee* to present the decentralized organizational structure in model 5. An interaction between *female borrowers* and *rule of law* is included in model 6, and an interaction between *loan portfolio at risk* and *rule of law* is included separately in model 7. Model 8 is the full model.

As shown in Table 4, the results pertaining to most of the hypotheses are robust across all models. Model 1 reveals that several control variables have a significant relationship with an MFI’s interest rate. For example, the coefficient for *average loan balance* is negatively significant at $p < .01$. This implies that MFIs increase the interest rate when they serve low-amount borrowers. *Debt/asset* has a significant negative relationship with the interest rate. We also find that MFIs’ operation efficiency measures, *operating expense/loan*, *administrative expense*, and *borrowers per staff*, have a very significant relationship with the interest rate. Although MFI performance significantly affects the interest rate, the significant level of estimations regarding various stakeholders—e.g., government (*regulated*), clients (the poor and women), creditors, owners (*debt/asset*), managers (*operating expense/loan*, *administrative expense*), employees (*borrowers per staff*), and different banks (e.g., *community-based rural bank*)—indicates that MFI stakeholders can also play an important role in cutting interest rates for the poor.

Hypothesis 1 suggests that borrowers in larger borrower communities will have lower interest rates. The results of model 2 indicate that the coefficient of *borrower community* is significantly negative on the interest rate ($\beta = -.0674$; $p < .001$). Therefore, hypothesis 1 is strongly supported. For every 1% increase in the size of the borrower community, the interest rate of the following year decreases by 0.0674%. Hypothesis 2a posits that the portion of female borrowers (*female borrowers*) is

Table 3

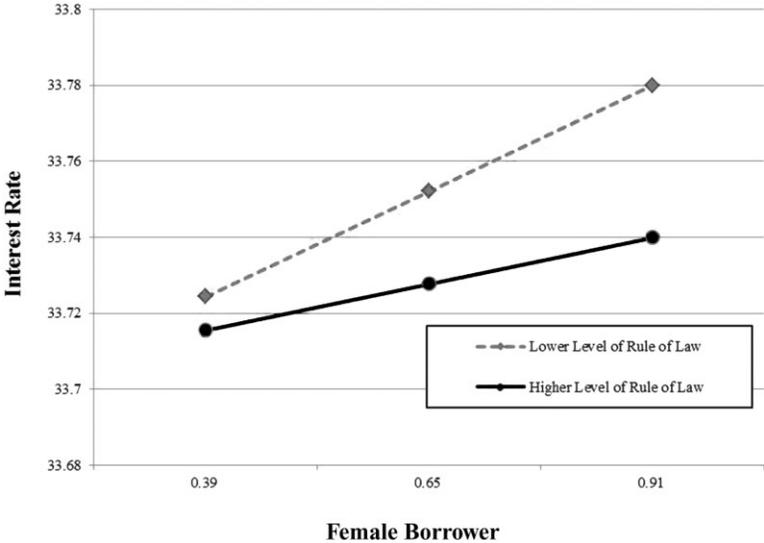
Descriptive Statistics and Correlation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Interest rate	1.000																	
2. Borrower community	-0.123	1.000																
3. Female borrower	0.237	0.062	1.000															
4. Loan portfolio at risk	-0.107	0.003	-0.090	1.000														
5. Loan officer/ employee	0.113	-0.016	0.279	-0.074	1.000													
6. Rule of law	-0.016	-0.126	0.078	-0.005	0.149	1.000												
7. Regulated	-0.160	-0.025	-0.187	-0.051	-0.056	-0.070	1.000											
8. MFI history	-0.086	0.383	0.189	0.067	-0.092	0.089	-0.082	1.000										
9. Average loan balance	-0.153	-0.022	0.295	0.038	-0.199	-0.145	0.176	-0.112	1.000									
10. Debt/asset	-0.184	0.093	0.007	0.051	-0.027	-0.037	0.177	0.204	0.057	1.000								
11. Non profit	-0.109	0.054	0.078	0.021	0.034	0.007	-0.462	-0.028	-0.115	-0.151	1.000							
12. Operating expense/loan	0.549	-0.149	0.166	0.010	0.066	-0.007	-0.133	-0.137	-0.115	-0.156	-0.023	1.000						
13. Administrative expense	0.559	-0.142	0.133	0.006	0.048	-0.002	-0.132	-0.145	-0.108	-0.106	-0.028	0.802	1.000					
14. Borrowers per staff	-0.077	-0.011	0.205	0.020	0.191	0.135	-0.009	0.069	-0.163	0.036	-0.002	-0.066	-0.033	1.000				
15. GDP <i>per capita</i>	0.115	0.031	-0.168	-0.035	-0.124	0.310	-0.219	0.152	-0.170	-0.083	0.081	-0.022	0.005	-0.069	1.000			
16. Performance	-0.041	0.023	0.006	-0.074	0.024	0.008	0.060	0.054	0.018	0.066	-0.035	-0.229	-0.238	0.013	0.022	1.000		
17. Inflation	0.041	-0.124	0.000	-0.032	-0.053	-0.127	0.088	-0.093	0.055	0.031	-0.065	0.025	0.014	-0.013	-0.199	0.012	1.000	
18. Concentration	0.002	-0.218	-0.188	0.003	-0.032	0.140	0.066	-0.404	0.081	-0.197	0.010	0.085	0.089	-0.062	0.015	-0.084	0.025	1.000
Mean	0.337	0.033	0.647	0.041	0.510	-0.610	0.549	9.807	0.594	0.667	0.626	0.274	0.084	140.592	7.505	0.078	0.073	0.096
Standard deviation	0.174	0.032	0.260	0.071	0.181	0.447	0.498	2.745	1.189	0.256	0.484	0.291	0.075	167.765	0.995	0.668	0.057	0.082
Minimum	0.041	0.000	0.000	0.000	0.044	-2.110	0.000	1.000	0.001	0.000	0.000	0.009	0.000	2.000	4.795	-4.767	-0.132	0.021
Maximum	1.121	0.162	1.000	0.965	1.000	1.370	1.000	15.000	33.926	2.146	1.000	6.702	1.179	7578.000	9.539	4.655	0.534	0.648

Correlations above |.20| and significant at the .05 level are in bold.

Figure 4

The Interacting Effect Between Female Borrowers and Rule of Law



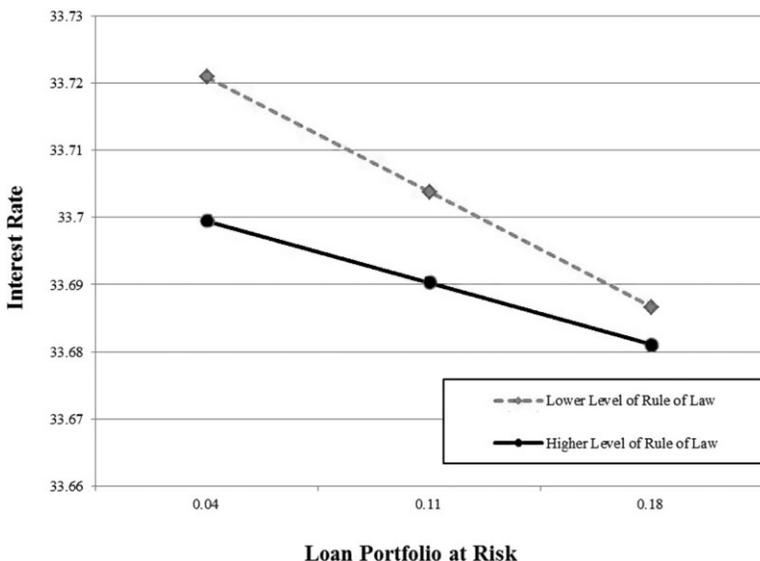
positively related to the interest rate. In model 3, the coefficient of *female borrowers* is positive and significant ($\beta = .086$; $p < .001$) and supports the hypothesis. Thus, MFIs increase the interest rate by 0.086% for every 1% increase in the proportion of female borrowers they serve. Hypothesis 2b argues that the interaction between *women borrowers* and *rule of law* will be negatively related to the interest rate. As shown in model 6, the coefficient for the interaction term is significantly negative ($\beta = -.067$; $p < .001$), which implies that the relationship between interest rates and female borrowers depends on the country’s rule of law. Although MFIs serving more female borrowers charge higher interest rates than those serving fewer women borrowers, the differences are smaller in the countries with stronger rule of law than in countries with weaker rule of law. Figure 4 depicts this interaction effect.

Hypothesis 3a, predicting a negative relationship between *loan portfolio at risk* and the interest rate, is supported in model 4 ($\beta = -.178$; $p < .001$). Every 1% increase in the 90-day delinquency rate is associated with a 0.178% decrease in interest rates. Hypothesis 3b suggests a positive effect of the interaction between *loan portfolio at risk* and *rule of law* on the interest rate, and as model 7 shows, the prediction is supported ($\beta = .124$; $p < .05$). The interaction effect is presented in Figure 5. Model 8 includes two interaction terms, and the results are robust to support both hypothesis 2b and hypothesis 3b.

Hypothesis 4 suggests a positive relationship between the loan officer/employee ratio and the interest rate. The coefficient for the ratio of *loan officer/employee* is positive and significant ($\beta = .046$; $p < .001$) in model 5. It suggests that if an MFI hires loan officers 1% more than employees, it will increase the interest rate by 0.046% in the next year. Because lower values for the ratio of *loan officer/employee* indicate that MFIs have a more bottom-up structure, the positive coefficient shows that hypothesis

Figure 5

The Interacting Effect Between Loan Portfolio at Risk and Rule of Law



4 is supported. We run some robustness tests, and these hypotheses are still supported.⁵

Discussion

Contributions

Our study makes several contributions. First, we propose an opportunity co-creation perspective to explain interest-rate setting of MFIs. This approach, which presents a holistic view of the world, embraces the importance of every stakeholder's role in achieving a shared mission—alleviating poverty. As we find in the empirical results, all stakeholders can jointly define and solve social problems, which result in cutting the interest rate for the poor. Our opportunity co-creation approach complements agency theory, which previous studies have applied to explain the peer screening, monitoring, and joint liability between lenders and borrowers (Stiglitz, 1990; Varian, 1990). However, agency theory ignores other stakeholders' efforts in cutting interest rates. We believe that our opportunity co-creation perspective, drawn from stakeholder theory and entrepreneurship theory, can help to capture the holistic complexity of such social ventures and lead to novel insights (Eisenhardt, 1989). We highlight the evident disparities between the two

5. Our robustness tests (1) controlled for the women's equality level (measured by the Gender Inequality Index) to capture human development in the focal country and (2) applied two-stage least squares (2SLS) multilevel, mixed, instrumental variable regressions to further test the endogenous issue, using masculinity or uncertainty avoidance in Hofstede's cultural dimension and the female labor force from the World Bank as instrument variables. The detailed results are available upon request.

theories, and an integration of the two could lead to a more complete picture of the microfinance phenomenon (Mayer & Sparrowe, 2013).

Second, our opportunity co-creation perspective highlights the importance of mutual selection and mutual construction among stakeholders in a social venture. For example, hypothesis 1 suggests that borrowers could mutually learn and build social capital together and that countries could build borrower communities to reduce the transaction costs involved in microfinance. This supports Yunus's (2007, p. 58) argument on the power of community to "encourage people to achieve things they might otherwise find impossible." Hypothesis 4 suggests that managers and employees can actively interact with each other through a decentralized structure, which leads to improved efficiency and coverage under a mutual construction. While agency theory focuses on how powerful actors (e.g., managers and investors) protect their interests (Stiglitz, 1990; Varian, 1990), our opportunity co-creation perspective explores the contributions and joint effects of other important but less known stakeholders (e.g., female borrowers and employees) (Hart & Sharma, 2004). Our findings on hypothesis 1 and hypothesis 2b strongly indicate that if these "fringe" stakeholders are empowered by supportive institutions, community, and social infrastructure, they could understand financial tools, actively manage the relationships with MFIs, and gain more power in bargaining over interest rates (Bruton et al., 2011). Therefore, as shown in Table 1, setting the interest rate is based on mutual selection and mutual construction among stakeholders.⁶ In this process, a social venture needs to "persuade, incentivize, and guide the ecosystem stakeholders through a process of change" (Zahra et al., 2014, p. 144).

Third, we contribute to the growing multilevel quantitative research in entrepreneurship literature (Hitt et al., 2007; Holcomb et al., 2010; Klein et al., 1999; Peterson et al., 2012). Our multilevel mixed models are more effective at mapping out the effects at the time, country, and firm levels, as well as their interactions than previous research focusing solely on the firm level (Cull et al., 2007, 2009; Mersland & Strøm, 2009, 2010). These models are linked together by a high-level model, in which the regression coefficients of the low-level models are regressed on high-level explanatory variables. As such, we can more robustly describe how multiple stakeholder relationships in setting interest rates varies across countries over time (Holcomb et al.), especially for the moderating effect of the rule of law.

Fourth, our study offers significant managerial implications. For example, governments can help MFIs to cut interest rates by building MFI communities and social infrastructure and improving the rule of law. In particular, the rule of law alleviates problems faced by female borrowers and provides a more favorable environment for them. Also, it enables MFI managers to better deal with risks. In rule-based countries, well-codified legal systems and enforcement of laws reduce uncertainty regarding microfinance transactions and build cooperative, long-term, trusting relationships among stakeholders. Well-specified loan contracts in these countries could protect female borrowers' and lenders' rights and reduce the risk of adverse selection, thereby encouraging cooperation and trust between stakeholders (Poppo & Zenger, 2002). In contrast, to develop a co-creation stakeholder relationship in a country with a weak legal system, all stakeholders face high transaction costs and uncertainty, even with a strong social mission (Alvarez & Barney, 2014). Social ties and group lending could help avoid an exchange hazard, but they also cause costs for group monitoring and possible risks

6. For example, to solve the collapse issue, the microfinance industry in India created a fund to help restructure the 20% loans of the borrowers in the same regions (Polgreen & Bajaj, 2010).

arising from the joint liability (Peng et al., 2009). Our hypothesis 2b and hypothesis 3b promote the proposition that government's effect on the rule of law could relieve the interest rate burden on both women and MFIs.

We also recognize the stakes and demand of specific stakeholders in the microfinance ecosystem. Our opportunity co-creation perspective can help every stakeholder in microfinance to (1) identify the actual or potential harm and the benefits of their actions for other stakeholders, (2) consider the joint effects with other stakeholders, and (3) create new opportunities under a shared social mission.

Future Directions

To the best of our knowledge, this is the first study that explores MFIs' interest rate setting under the opportunity co-creation perspective. Our study opens many doors for future research, including the following research questions. What is the best way to empower borrowers with regard to bargaining for lower interest rates? How do different formal or informal institutions help borrowers to gain access to loans and manage entrepreneurial businesses? How do MFIs structure loan contracts and payment schedules to reduce default risks? MFI management teams, boards, government policies, and borrower group dynamics are also potential research topics. We also should note that our sample is on the firm level, so future research that uses individual-level data could further identify multiple-stakeholder relationships and verify our findings.

With regard to the debate on MFIs' self-sustainability, our opportunity co-creation perspective suggests balancing financial sustainability and social justice. On the one hand, MFIs that place too much emphasis on financial sustainability and the interest of single stakeholder (i.e., financial investors) might hurt their social mission and block contributions of other stakeholders, such as social investors and poor borrowers, in the opportunity creation (Taylor, 2011). From the MIX data, we find a significant decline in the number of active borrowers between 2010 and 2011 (Figure 1), which could be the result of the collapse of MFIs in South Asia (Polgreen & Bajaj, 2010). On the other hand, MFIs that put too much stress on their products may not be able to attract enough financial resources (Cull et al., 2009). The topic of how to balance MFIs' sustainability and social mission in opportunity co-creation is worth further exploration (Battilana & Dorado, 2010).

Finally, supporters of MFI commercialization argue that the poor are not sensitive to interest rates. However, many cases show an opposite story (Taylor, 2011). We encourage future researchers to examine how microfinance interest rates relate to the depth and outreach of the services and how the rates, as well as repayment schedules, affect opportunity co-creation, such as borrower's ability to start and run a sustainable business. A multilevel quantitative method, combining country- or regional-level data, could provide a better explanation about depth and outreach of MFIs or their collapse.

Conclusion

Based on an opportunity co-creation perspective, this study suggests that every stakeholder of MFIs could contribute to cutting the interest rate and accomplishing their social mission. Through empowering fringe stakeholders, embracing other stakeholder interests, and combining different resources, MFIs, as social ventures, could generate new opportunities and turn a social mission into a sustainable business. The opportunity co-creation among these stakeholders fosters intrinsic social value.

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