

Commercialization and Mission Drift

Evidence from a Large Chinese Microfinance Institution

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Abstract

Front-line loan officers of microfinance institutions are important in acquiring information on potential borrowers and selecting them in accordance with the microfinance institution's mission. This study uses a unique data set on loan officers and their loan portfolios from China's largest nongovernmental organization microfinance institution to test whether officers' personal characteristics affect the size and quality of their loans. The analysis uses a period in which the institution shifted from reliance on government donations and subsidies to commercial sources of

funding. Imposing more commercial incentives on loan officers could affect how they balance potentially competing objectives to serve the poor and pursue profitability. The paper finds that loan officers who were formerly farmers or worked in local government were better able to maintain lending to poorer borrowers, without incurring substantially lower repayment rates on their loans. In short, it appears that the career backgrounds of loan officers did play a role in preventing mission drift.

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**Commercialization and Mission Drift:
Evidence from a Large Chinese Microfinance Institution**

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1. Introduction

Since its inception, observers have speculated about the potential of microfinance to lift individuals and households out of poverty (Morduch, 1999). The “joint liability” contracts pioneered by the Grameen Bank were quickly replicated in many developing countries and, by 2006, microfinance loans had been received by over 100 million households in developing countries (Daley-Harris, 2007). Under these joint liability contracts, often referred to as group lending, members of the group use borrowed funds for their own purposes but all members are severally liable in the event of a default. Group members therefore have incentives to communicate with and monitor one another, and most group lending methods involve regular meetings. While these methods have achieved very high repayment rates on loans, borrowers may find them time consuming and not always well suited to their credit needs. We refer to these methods as ‘group liability loans’ in the rest of the paper.

Grameen founder Muhammad Yunus’s original vision was that group liability loans would provide credit to support micro-entrepreneurs that would lift households out of poverty. While early research findings based on non-experimental methods indicated that use of microcredit brought about reductions in poverty (Pitt and Khandker, 1998), subsequent research based on field experiments suggests a more nuanced view. For example, based on analysis of six recent microcredit experiments designed to measure the same outcomes (but in different country contexts), Banerjee et al. (2015) find no evidence of transformative effects in terms of lifting households out of poverty.¹ However, the studies did show modest gains in the profitability and investment of microenterprises that were offered credit, and increased flexibility of choice in terms of occupation (wage labor or business owner), business scale, consumption (with a shift toward durables), female decision power, and improved risk management. These findings and conclusions echo those from a previous survey that covered a broader set of experimental papers (Banerjee, 2013). Moreover, research based on financial

¹ Those authors acknowledge that failure to find significant effects could stem from the design of the experiments themselves. Take-up of microcredit products was low and unpredictable (in a statistical sense). The resulting lack of statistical power to detect potentially significant effects remains an important challenge in field experiments designed to identify microcredit impacts on poor households (Banerjee, et al., 2015).

diaries (which track the financial lives of poor households at short intervals) indicates strong demand for microcredit, but as part of a patchwork portfolio of products from formal and informal providers that are stitched together because the incomes of the poor are small and irregular, and needs to access reasonably large sums (for health emergencies, weddings, funerals) inevitably arise (Collins, et al., 2009). In short, while microcredit might not be a magic bullet in alleviating poverty, generally it has been shown to be a useful tool for poor households in managing their financial lives.²

While microcredit products have proved useful to poor households, the industry (or at least a sizable part of it) has moved beyond the relatively rigid group liability products introduced by Grameen. For example, Beck et al. (2011) note that African MFIs have shifted away from group liability lending mechanisms and, in West Africa, only individual liability loans are used. The trend toward individual liability lending has also coincided with greater reliance on commercial sources of funding (see discussion of commercialization in Morduch, 2000; Yunus, 2007; Cull et al., 2009, 2011a). While there is little direct evidence, it stands to reason that the market-based returns that commercial funding requires provide a strong incentive for MFIs to make larger loans to somewhat wealthier borrowers. Those loans are more cost-effective per dollar lent and thus contribute to greater financial sustainability for the commercially-oriented MFIs that specialize in them (Cull et al., 2009).

The increasing commercialization of microfinance has fueled debates about mis-targeting and mission drift, from serving the poor and promoting social inclusion to pursuit of profitability (Yunus, 2007). While there is some evidence that MFIs benefit somewhat wealthier households rather than the poorest in some developing country contexts (Coleman, 2006; Kondo, et al., 2008; Takahashi, et al., 2010),³ evidence from studies that use larger data sets from MFIs in many developing countries emphasize the diversity of approaches to outreach and profitability within the industry (Cull et al., 2007, 2009). In particular, NGO-based MFIs place greater

² And experimental evidence on microsavings products has shown them to be effective in helping poor entrepreneurs to protect profits and grow their businesses (see, e.g., Dupas and Robinson, 2013 for evidence from Kenya).

³ For example, Coleman (2006) finds that participants in a credit program run by two NGO microfinance institutions in Northeast Thailand were significantly wealthier than nonparticipants prior to the program intervention. The difference in wealth was largely explained by the value of female-owned land across households.

emphasis on outreach and rely relatively heavily on donated funds to subsidize those efforts, in large part because operating expenses (per dollar lent) tend to be higher for institutions that make smaller loans and lend more to women, since those market segments are harder to reach.⁴ Outreach-oriented MFIs are also more likely than commercially-oriented MFIs to continue to make smaller loans and to lend to women when confronted with greater competition (Cull et al., 2014) or increased costs associated with regulatory compliance (Cull et al., 2011b). But while the tension between the financial sustainability and depth of outreach of microfinance programs has long been a topic of interest and concern among researchers (Hermes and Lensink, 2007), the largest empirical study of mission drift found little evidence that average loan sizes had increased over time for a sample of 379 MFIs in 74 countries from 1998 to 2008 (Mersland and Strøm, 2010).

Under the microfinance model that we study, loans are uncollateralized and applicants have limited (or no) credit histories. MFI loan officers therefore obtain client information through site visits to the home or business of a prospective applicant, and through interviews with applicants and their references. MFI loan officers therefore rely heavily on their own judgment and expertise based on the “soft” information (Schoar, 2012) that they glean from interviews and repeated interactions with borrowers over time in evaluating potential clients. Our working assumption, therefore, is that the backgrounds of individual loan officers (on which we have extensive information) could influence the way they evaluate applicants and the characteristics of the loans they extend.

Our research is related to an emerging strand of the literature on how incentive compensation schemes affect the lending decisions of microfinance loan officers. Aubert et al. (2009) discuss the widespread introduction of incentive wage schemes among MFIs, and develop a theoretical model in which non-profit (‘pro-poor’) MFIs are unable to obtain a selection of only poor borrowers with loan officer incentives based on loan repayment. Because borrower wealth and the likelihood of repayment

⁴ We follow this strand of the literature and use average loan size as our proxy for depth of outreach to poorer borrowers since the poor are likely to demand and receive smaller loans than wealthier borrowers. While this measure has limitations (see, e.g., Armendáriz and Szafarz, 2011), it is less likely to be misleading in a study of a single MFI over time (such as ours) than in a study comparing many MFIs located in different countries.

are positively correlated, loan officers have an incentive to switch their focus to wealthier borrowers, unless that incentive is checked by others that compel them to seek out information on whether applicants are poor (such as random audits on the wealth of borrowers selected by agents). Based on hypothetical comparisons by loan officers between loan applicants with different personal characteristics, empirical evidence from Burundi confirms that the poor are only slightly more likely to receive a micro loan, and that the lending preferences of loan officers from non-profit and for-profit MFIs are remarkably similar in terms of the characteristics of applicants that tend to be approved (Sagamba et al., 2013).

Evidence from field experiments also indicates that incentive-based compensation schemes affect the lending patterns of credit agents and could curtail outreach to poorer clients. From an experimental study with experienced commercial bank loan officers in India, Cole et al., (2015) find that incentive schemes that penalize officers for extending loans that become delinquent induce them to invest more effort in screening and make more profitable lending decisions, but by sanctioning significantly fewer loans.⁵ Similarly, in the Chinese context, Cao, et al. (2011) make use of an experimental design in which loan officers from rural Credit Cooperatives in Shandong were recruited to make lending decisions on randomly assigned loan files that had been previously evaluated. As in the Cole et al. experiment in India, the performance and repayment histories on the approved loans were already known. In addition to treatments that penalized loan officers for approving loans that had repayment problems (Type I errors), there were also treatments that penalized them for rejecting loans that were not delinquent (Type II errors). The findings confirm that loan rejection rates were unduly high when loan officers had only disincentives to commit Type I errors. Both experimental studies focused primarily on the incentive schemes imposed on loan officers rather than on their personal characteristics in making loan decisions, though they did use psychometric questions to assess the

⁵ Loan officers were recruited from leading private and public sector commercial banks in India to participate in an experiment to 'approve' or 'reject' loans that were drawn from a sample of small business loan applications from a large commercial lender to self-employed individuals who were first-time applicants for a formal loan. The approval decisions and repayment histories for these loans were already known, since they had occurred in the past. The experiment therefore compensated participating loan officers for correctly approving loans for which there were no repayment problems.

effects of personality traits such as confidence and risk aversion. In contrast, we focus on how the experience and career backgrounds of loan officers affect the size of the loans they make (our proxy for the wealth of the borrower) and the likelihood that they are repaid on time. Our underlying hypothesis is that loan officers could respond differently to the same incentive scheme depending on their backgrounds.

We study a specific episode in which the funding sources for the largest MFI organized as a non-governmental organization (NGO) in China became increasingly commercialized. The analysis is designed to shine a spotlight on loan officers in managing the tension between serving the poorest households and pursuing profitability. We address a number of specific questions: What are the personal characteristics and past employment histories of the loan officers, and how did the personal profile of CFPA loan officers evolve over time? Did officers tend to loan to poorer borrowers (as reflected in smaller loans) prior to commercialization, and how well did those loans perform in terms of repayment? Did commercialization coincide with larger average loan sizes over time, and were those effects dampened for loan officers that had certain career backgrounds? Finally, did any changes in the profile of borrowers affect the likelihood of repayment? In that sense we hope to offer fresh evidence on the impact of microfinance commercialization on mission drift. Our main findings are that loan sizes increased substantially during this period for most loan officers, but those with career backgrounds in local government or, especially, in farming were better able to resist that trend, and they did so while maintaining relatively high repayment rates on their loans. In short, our evidence is consistent with the notion that the backgrounds of loan officers can influence their knowledge of potential borrowers in poorer rural areas, and this in turn could help mitigate mission drift, even during a period of rapid commercialization.

The paper proceeds as follows. In the next section, we briefly describe the development of microfinance in China. Section 3 introduces the data, describing collection methods and definitions of key variables. Section 4 describes the MFI from which our data come in more detail and the average characteristics of its loan officers. Section 5 presents multivariate regressions to examine the relationships between loan

officer background and the characteristics of the loans they extend (in terms of size and likelihood of repayment) and discusses results. Section 6 places our results in the context of the literature and offers conclusions.

2. Microfinance in China and CFP Microfinance

2.1 Microfinance in China

Although state-affiliated financial institutions, such as Agricultural Bank of China (ABC), Rural Credit Cooperative (RCC), and the Postal Savings Bank of China (PSBC) were designed to meet the credit needs of Chinese rural economies (Guo and Jia, 2009), they tended to target business and government-oriented borrowers (Han, 2007; Zhang, 2011). Rural households therefore relied heavily on informal networks based primarily on lending between relatives and friends for credit (Jia, et al., 2010; Turvey and Kong, 2010).

To better meet the credit needs of rural households, microfinance was introduced in China through international aid programs for poverty alleviation in the mid-1990s (Sun, 2004). In subsequent years, formal financial institutions (such as RCC and PSBC) did introduce microfinance schemes for small and medium enterprises (SMEs) and some rural households. However, the microfinance programs of the formal financial institutions still tended to target wealthier entrepreneurs and exclude the poor (Park & Ren, 2001).

During that time, microfinance was being commercialized in China. To lower the barriers to credit access and diversify the lending of financial institutions in rural China, at the end of 2006, the China Banking Regulatory Commission (hereafter, the 'Commission') issued "Guidelines for Relaxing Access Policies for Rural Banking and Financial Institutions". Financial intermediaries such as village banks, finance companies, and rural mutual cooperatives were encouraged to form, and were included among officially supervised financial institutions. In 2008, the Commission and the Central Bank of China issued "Guidelines for Piloting Microcredit Companies" to energize the commercialization of microfinance. By 2012, the

outstanding loans of the 5,172 microfinance companies operating in China increased to 470 billion yuan (Jiao, 2013). However, these MFIs tended to be commercially oriented and thus did not operate on the basis of the lending approaches pioneered by Grameen.

As commercially oriented microfinance grew, many of the NGO microfinance programs in China ceased operations after donors removed their financial support. Because of concerns about financial risks, the legal framework in China does not recognize the legitimacy of NGO microfinance institutions as formal providers of financial services, which greatly constrains their ability to expand external sources of funding. The NGO microfinance institutions that remained in operation relied mostly on socially responsible donors (such as Oxfam, UNDP, and the Chinese Academy of Social Sciences) and the poverty programs of the Chinese government for their funding. According to the latest information from the MIX (Microfinance Information eXchange), there were 31 NGO microfinance institutions that provided financial services in China by 2012 and their outstanding loans totaled only 1.3 billion yuan.⁶ NGO microfinance therefore occupied a narrow niche in the Chinese financial landscape, even in rural areas.

2.2 CFPA Microfinance

CFPA Microfinance was transformed from a governmental pilot program into an independent non-governmental organization (NGO) and has since become China's largest NGO dealing in microfinance. From 2000 through 2004, CFPA Microfinance grew through government credit programs under the supervision of the State Council Leading Group Office of Poverty Alleviation and Development, a ministerial-level department directing national strategies on poverty alleviation. It piloted microfinance services in poor rural areas in Sichuan, Shanxi, Guizhou, and Fujian provinces.

⁶ In principle, comparisons with other NGO providers of microfinance in China during this period are possible. However, there are a relatively small number of them, they have smaller portfolios than CFPA (see Appendix A) and, more practically, we do not have loan- or loan-officer-level data for those institutions. Comparisons with the loan officers of banks might also be possible, though the lending approach for banks' loan officers (based on hard information about creditworthiness and/or collateral) differs substantially from that of CFPA. In addition, banks had a commercial orientation throughout the period that we study, while CFPA became more commercially oriented as the government relinquished control and funding from commercial sources became increasingly important. This shift provides an opportunity to identify changes in CFPA loan officer behavior in response to changes in sources of funding.

During those years, it was in essence a government charity project; capital was highly subsidized and the business was run as a government program. In 2005, CFPA Microfinance was approved to be independent (from the government) and was institutionalized as an NGO microfinance institution to provide lending services in poor areas of China. In 2008, to circumvent legal constraints on external fundraising, CFPA Microfinance registered itself as a company-like institution, which allowed it to expand its external funding from commercial banks.⁷ By 2010, CFPA Microfinance was delivering financial services in 39 counties across 11 provinces and its gross loan portfolio accounted for 53 percent of the total NGO microfinance portfolio in China (Appendix A).

In its first year after separation from the government, CFPA microfinance remained reliant on donations and government subsidies; commercial borrowing comprised 56 percent of its liabilities in 2006 (Table 1).⁸ In subsequent years, commercial borrowing increased dramatically, peaking at 96 percent of CFPA liabilities in 2010. The commercial funding came mainly from the China Development Bank, China Agricultural Bank, and Standard Chartered Bank. The annual rate of interest on these loans averaged around 6.5 percent, although rates varied across institutions over the years. Heavier reliance on commercial sources of funding coincided with changes in the breadth and depth of outreach of CFPA microfinance. Rural residents comprised a growing share of its clients and the number of counties served by a CFPA branch increased by almost a factor of four (from 10 in 2006 to 39 in 2010). As shown in Table 1, loan disbursement by CFPA Microfinance increased twelvefold (from 47 million yuan in 2006 to 569 million yuan in 2010), and its average loan size nearly quadrupled, from 2,259 yuan in 2006 to 7,212 yuan in 2010. As described above, loan size is often used in the literature to reflect the depth of outreach with larger loans indicating relatively wealthier borrowers, and thus Table 1 provides initial indications that the commercialization of CFPA microfinance funding coincided with mission drift.⁹

⁷ Its legal status, however, is still identified as a not-for-profit nongovernmental organization.

⁸ In addition, the balance sheet provided to us by CFPA indicates that a large share of those loans classified as commercial actually carried concessionary (below-market) interest rates.

⁹ Under CFPA guidelines, there is a maximum of 20,000 yuan for group liability loans and 50,000 for individual

From 2006 to 2010, the lending approach of CFPA microfinance also underwent changes. In 2006, all the loans in its portfolio were group liability loans (Table 1). In subsequent years, individual liability loans comprised a steadily increasing share of CFPA's portfolio, reaching 28 percent in 2010, though the short term maturity of all its lending remained unchanged. However, the average annual rate of interest charged on CFPA loans rose from 11.9 percent in 2007 to 20 percent in 2009 (though it did decline to 15.4 percent in 2010). While those interest rate movements likely reflect changing economic conditions, they could also reflect increased overhead costs associated with rapid expansion and the rising costs of commercial borrowing. Overall, CFPA's profitability improved as a result of commercialization. Its ROA was negative from 2006 to 2008, became positive in 2009 (0.7%) and reached 1.3% in 2010 (Table 1).¹⁰

2.3 Loan Officers at CFPA Microfinance

Loan officers are crucial in screening potential borrowers for CFPA microfinance. Each loan officer is assigned to a specific township to reduce commuting costs and, in each village in which CFPA operates, it establishes an office which is typically located in a grocery stand or an agro-chemical shop. There, the loan officers meet with applicants and ask about desired loan size, how the funds will be used, and sometimes describe alternative repayment schemes. Based on their evaluation of this information, they select creditworthy applicants and submit those cases to the central committee for approval. While final decisions are made by the central committee and can be influenced by factors such as the availability of capital, the recommendations of the loan officers regarding loan terms have influence on the committee. And clearly, the loan officers affect the pool of potential loans that come before the committee for

liability loans, and our data show that 99.99% of CFPA loans delivered from 2006 to 2010 were smaller than 50,000 yuan. Based on our data (which does not provide the identity of borrowers), we cannot ascertain whether some borrowers started with smaller group liability loans, demonstrated their creditworthiness, and graduated to larger individual liability loans that have more flexible terms, though this has been speculated about in the general literature on microfinance. It is likely that clients who demanded larger loans would have shifted to other commercial lenders. Therefore, CFPA potentially promoted entrepreneurs in rural areas during the early growth stages of their firms. But we know of no formal process by which CFPA handed off those clients to commercial banks. However, our presumption is that the 50,000 yuan limit on loans likely compelled those borrowers to look to alternative credit providers.

¹⁰ The low profitability levels from 2006 to 2008 coincided with the stripping-off of government assets, and thus was not solely a reflection of difficulties with the credit business.

review.¹¹

Loan officers play another important role at the enforcement stage for group liability loans. Depending on the terms of repayment, the loan officer contacts the head of the group and reminds him/her of the due dates of installments. They then typically meet again at the office in the village at some point, and in the case of overdue installment payments, the officer visits the client and negotiates repayment. During the negotiation, the loan officer also visits other members in the group and explains the likely impacts on them for non-repayment. Loan officers rely heavily on their social skills, experience, and prior knowledge of the clients and businesses in performing these tasks. In case of any delay or failure in negotiation, the loan officer is required to report it to the credit committee.

CFPA microfinance also introduced modest financial incentives to its loan officers, who were rewarded for high lending volumes and low shares of delinquent loans. Loan officers receive a flat base wage and a bonus for originating loans that perform well. Delayed installment payments therefore negatively affect their bonuses. The compensation scheme was designed to encourage loan officers to expand outreach, while avoiding loans to riskier clients that would become non-performing.

3. Data Sources and Variable Construction

We rely on data from three sources to undertake our analysis. We first use data on the inventory of loan disbursements and overdue repayments from 2006 to 2010. CFPA microfinance has developed a central database that documents the details of every loan disbursement undertaken at all the county branches, including disbursement date, loan size, interest rate, maturity, loan scheme (group guarantee or individual liability lending), purpose of the loan, and the corresponding loan officer. This information is maintained in CFPA's SQL server from which the inventory of loan disbursements were directly exported. For overdue repayments, scheduled and actual dates of

¹¹ We acknowledge that loan officers are not the only influence on mission drift. But to the extent that they have little or no influence on the committee's decisions, this biases our analysis against finding any significant results, and we find significant associations between loan officers' backgrounds and the size of their loans in the regressions that follow.

repayment and overdue amounts are documented. This allows us to generate both loan-specific data and aggregated data for each of the loan officers from 2006 to 2010.

As described above, we use average loan size to reflect the depth of outreach to poorer borrowers.¹² From the CFPA Microfinance central database, we rely on the size of each loan as a dependent variable in the loan-level regression analysis and the average size of the loans disbursed in each year by each loan officer from 2006 to 2010 for the loan-officer-level regression analysis.

Our second data source is derived from a questionnaire that was administered to all of the CFPA loan officers. CFPA Microfinance's inventory database provides information for 383 loan officers who extended loans at some point during the period 2006-2010. We first sent a questionnaire and an instruction letter through courier to each loan officer.¹³ We then conducted telephone interviews with each loan officer during which we reviewed with them the entire questionnaire and the instruction letter. In several sections of the survey each loan officer was asked for personal information (e.g., age, gender, education, and career background prior to working at CFPA microfinance). Loan officers then sent completed questionnaires back to us through e-mail or courier. In the end, we received completed questionnaires from 379 loan officers.

Third, we rely on a county-level per capita income variable taken from the best secondary sources available to reflect economic conditions near the branches where loan officers are located. Specifically, we surveyed the *Yearbook of Rural Social and Economic Statistics* and collected data on the annual income per capita among the rural population from 2006 to 2010.¹⁴

¹² We acknowledge that there are limitations in using changes in loan size to measure mission drift. Non-poor borrowers may still be attracted by small loans when larger loans are expected in the future, as part of dynamic repayment incentives (Christen, 2000; Hishigsuren, 2004). Non-poor borrowers can also take a multiplicity of small loans from different lenders (McIntosh & Wydick, 2005). Direct measures such as transaction costs in accessing loans and the wealth status of borrowers and non-borrowers are potentially better suited to reflect targeting. However, these measures are prohibitively costly to collect in most empirical studies and thus loan size remains widely used.

¹³ We very much thank CFPA microfinance for providing contact information for the loan officers. Under our confidentiality agreement with CFPA, the anonymity of loan officers is preserved in the presentation of results and the discussion throughout the paper.

¹⁴ While it is not possible for us to verify the accuracy of that data, we note that measurement error in the income variable reduces the likelihood that we find a significant coefficient for it. In point of fact, the per capita income variable is highly significant in the regressions that follow. In addition, our standard errors allow for clustering at the county level and we derive similar results when county level fixed effects replace loan officer fixed effects in

Finally, we construct loan-level and loan-officer-level data sets for use in the regression analyses. The loan-level data set is comprised of information on loan size, liability for repayment (group or individual), maturity, interest rate, incidence of overdue repayment, amount overdue, days overdue, characteristics of the loan officer who originated the loan, and the per capita income of the rural population in the county in which the loan was originated for 206,875 loans disbursed from 2006 to 2010. We also aggregate the loan-level data into calendar years for each loan officer and therefore generate an unbalanced longitudinal panel data set (since not all of the officers were at CFPA for all years from 2006 to 2010). As our key variable of interest, loan size is averaged over all the loans disbursed in a given year for each surveyed loan officer. Using the same approach, we generate the average maturity and average annual interest rate on loans disbursed in a given year for every loan officer. We construct measures of the summed amount of payments overdue (either by more than one day or by more than 30 days) relative to total loan disbursement in a year for each officer. In a similar way, we aggregate the amount of individual liability loans and loans used for various purposes and calculate ratios relative to the total amount of loans disbursed in each year for each officer. The yearly data for each loan officer are designed to help track changes in their lending behavior and the quality of their loans over time.

4. Data Analysis and Results

4.1. Recruitment of Loan Officers by CFPA Microfinance

In the process of expansion, CFPA microfinance increasingly recruited frontline loan officers from rural China. When CFPA microfinance became independent in 2006, 60 loan officers were employed in ten branches. They then recruited an additional 24 officers in 2007 for those branches. At that point, about eight loan officers were employed on average in each of the county branches. From 2008 onwards, as CFPA microfinance expanded quickly and established new county branches, the demand for

our regression (results not reported to conserve space). For all of these reasons, we doubt that measurement error for our county-level income variable has a substantial impact on our main findings.

frontline loan officers surged. In 2010, 163 new loan officers were recruited, many to supply new county branches and others to re-staff the established ones.

The characteristics of loan officers recruited by CFPA microfinance evolved during the expansion process. In the initial year after separating from the government, the majority of loan officers were male. In subsequent years, CFPA microfinance began recruiting more female loan officers and, by the end of the period, the majority of the recruits were female. In addition, over time the loan officers recruited by CFPA tended to be better educated. The average educational attainment level for loan officers recruited in 2010 was 13 years of formal education, equivalent to a college degree; in 2006, the figure was 11 years of formal education.

Prior to joining CFPA microfinance, loan officers worked in diverse fields. As shown in Table 2 (column 1), of all the loan officers who worked for CFPA microfinance between 2006 and 2010, approximately half had experience in commercial business; 10 percent worked in local government (e.g., at the township or village committee level); and 36 percent were full-time farmers.

In the process of expansion and commercialization, CFPA microfinance began recruiting more loan officers with financial and government experience. In 2006, 52 percent of the recruited loan officers were farmers. However, that percentage declined sharply to 22 in 2010. The majority of the loan officers recruited in 2010 had previously worked in commercial businesses (66 percent, last row); 12 percent of loan officers recruited in that year were former government employees, a figure over twice as high as that in 2006 (5 percent).

CFPA microfinance provides an empirical setting that is well suited for studying how commercialization and loan officers' career backgrounds could contribute to mission drift within a single microfinance institution. First, CFPA microfinance introduced a centralized governance framework in that each county branch received the same guidelines and supervision from headquarters. Although loan officers had some flexibility in their approaches to screening applicants, they were guided by a uniform manual of loan underwriting. Second, loan officers were evaluated and rewarded

under the same compensation scheme, and county branches were not allowed to implement special compensation programs of their own.

4.2. Loan Size, Portfolio Quality, and Loan Officer Characteristics

Average loan size is correlated with many of the loan officers' personal characteristics. Female loan officers tended to extend larger loans than their male counterparts (9,100 yuan versus 6,500 yuan, Table 3), while younger loan officers (those below age 35) made larger loans than older ones (those over age 45), 8,500 yuan versus 6,000 yuan.

Interestingly, average loan sizes for young and old loan officers were not significantly different at the beginning of the period of study. In 2006, the youngest loan officers (again, below age 35) had loan sizes similar to those of loan officers in the oldest cohort (2,100 to 2,200 yuan). By 2010, the average loan size for the youngest loan officers had increased to 12,100 yuan while the figure for the older loan officers was substantially lower (8,200 yuan). Similar dynamics are observed between loan officers' educational attainment and average loan size. Loan officers with a college degree (or above) made substantially larger loans than officers with less formal education (11,000 yuan versus 6,900 yuan, Table 3), and again that disparity became evident only later in the period.

The career backgrounds of frontline loan officers also seemed to affect their depth of outreach to poorer borrowers. Loan officers who were farmers or worked in local government prior to working at CFPA microfinance tended to extend smaller loans than other loan officers. Their average loan sizes were 5,700 and 6,500 yuan, respectively (Table 3), compared with 9,800 yuan for loan officers with career backgrounds in commercial business. Again, these differences were much smaller in the first year after separating from the government and became significant as CFPA microfinance became increasingly reliant on commercial sources of funding.

From 2006 to 2010, experience gained by loan officers contributed to improvements in portfolio quality. As shown in Table 4A, 75 percent of loan officers had at least one overdue repayment in 2006, a figure that had declined to 27 percent in 2010. The average number of days that these payments were overdue also declined from 49 in

2006 to 15 in 2010. For our preferred measure of portfolio quality, we rely on the *ratio of total overdue payments to the face value of loans disbursed* in a year. We define two measures of overdue payments (more than one day overdue and more than 30 days). Using either measure, we observe similar trends in terms of improved portfolio quality. For example, in 2006 the ratio was 4.1 percent for payments overdue by at least one day, which had declined to 1.2 percent in 2010 (Table 4B). When using the loan portfolio quality measure based on payments overdue more than 30 days, the ratio itself becomes much smaller, but also displays a notable decline between 2006 and 2010.

Loan officer characteristics were also associated with the quality of their loan portfolios. As shown in Table 4A, both female and older loan officers were more likely to originate loans for which there were no repayment problems. For example, 69 percent of the loan officers who had payments overdue more than one day in 2006 were male. Males comprised 60 percent of the overall number of loan officers active at that time (Table 3). Similarly, 94 percent of the loan officers with overdue payments were younger than 45 (and they comprised 90 percent of total loan officers). Similar comparisons between male/female and younger/older loan officers continued to hold in 2010. In addition, though loan officers who obtained a college degree comprised 29 percent of the sample of active loan officers in 2010, they represented only 22 percent of the sub-sample with overdue repayments. We observe similar patterns when examining the ratio of total payments overdue to the face value of loans disbursed (Table 4B).

The relationships between portfolio quality and loan officers' career backgrounds prior to their employment at CFPA microfinance are also summarized in Table 4A. Among loan officers who had a payment overdue by more than one day in 2006, only four percent had experience working in local government and the average days that those payments were overdue was also significantly less than for those loan officers with farming or commercial business backgrounds. More than half of loan officers (58 percent) who had an overdue repayment in 2006 had farming backgrounds.¹⁵ In

¹⁵ Loan officers with farming backgrounds comprised 52 percent of the full sample of active loan officers in 2006

contrast, in 2010 loan officers with commercial backgrounds comprised the largest share of the sub-sample that had an overdue repayment (57 percent).¹⁶

The *ratio of total overdue payments to the face value of loans disbursed* indicates that loan officers with commercial business backgrounds tended to extend riskier loans than those with government or farming backgrounds (Table 4B). That ratio was high in the initial year of 2006 for loan officers of all backgrounds, though highest for those with a background in commercial business.¹⁷ In contrast, in 2010, loan officers with backgrounds in farming had the highest ratios of value overdue (by more than one day) relative to loan disbursement. However, when we use the measure based on payments more than 30 days overdue relative to loan disbursement, the differences across career backgrounds become insignificant.

5. Empirics

In this section, we specify a multivariate regression model that seeks to identify the impact of the individual characteristics of loan officers on average loan size and loan quality. We then present and discuss the results.

5.1. Model Specification

In estimating the impacts of loan officers' characteristics on their performance, our basic model is:

$$Y_{ijt} = a_0 + a_1 * EXP_{it} + \delta * DEMO + \beta * CAREER + a_2 * INCOME_{jt} + e_{ijt} \quad (1)$$

Y is either a measure of loan size (our proxy for depth of outreach) or of loan portfolio quality (based on repayment history). In the loan-level regressions that we present in Table 5, the dependent variable is the size of the loan or one of three measures of repayment history (a dummy variable indicating whether there was an overdue payment on the loan, the ratio of total overdue payments to the amount disbursed on the loan, and the number of days that the loan was overdue). The subscripts in the loan-level regressions stand for loan i , issued by loan officer j , in month t . In the

(Table 3).

¹⁶ For reference, loan officers with a commercial background comprised 57 percent of the full sample of active loan officers in 2010.

¹⁷ Admittedly, the differences across groups were not significant due to the small sample size in 2006.

results presented below, we cluster standard errors at the loan officer level.¹⁸

In the loan officer-level regressions presented in Tables 6 and 7, the dependent variables Y are yearly averages for each loan officer. *Average loan size*, the dependent variable in the regressions in Table 6, was generated by taking the average disbursement (loan size) across all loans issued in each year t by loan officer i in county j . To reflect the quality for each officer's loan portfolio, we divide the yearly sum of their *overdue repayments* by the sum of their loan disbursements in the same year. We rely on two definitions of overdue payment (by at least one day or by at least 30 days). The two measures of overdue payments are the dependent variables in the regressions in Table 7.

On the right side of our regressions, *DEMO* is a set of individual characteristics of the loan officers including *Age*, *Educational attainment*, and a dummy variable indicating whether the loan officer is *Female*. Finally, we rely on explanatory variables summarizing loan officers' career backgrounds. *Government experience (GOV)* and *Farmer experience (FARM)* are binary variables equal to one if the loan officer worked in local government or in farming prior to joining CFPA Microfinance. Experience in commercial business is the reference (omitted) category regarding career background in our regressions.

In addition to past work experience, we control for loan officers' work experience at CFAP Microfinance (EXP in equation 1). To do so, we create the variable cumulative *Months as a CFPA loan officer*. This is a continuous variable equal to one in a loan officer's first month at CFPA microfinance, which increases by one in each of the subsequent months through December 2010.

It is likely that several other factors affect the average loan size and repayments for loan officers. We control, for example, for additional characteristics of the loans themselves including the nature of the attached liability (group or individual), maturity, interest rate, and loan purpose (consumption, trade, etc.).¹⁹ Further and as

¹⁸ In unreported regressions, we also clustered standard errors at the county level and found very similar results to those that we present.

¹⁹ Expected profits and the costs of extending a loan likely factor into its size. However, it is not possible to ascribe profit and costs to individual officers and to loans (the two levels of aggregation used in our regressions)

noted above, in 2008, to circumvent the constraints of the legal framework in obtaining external funding, CFPA microfinance registered itself as a ‘company-like institution.’ After this transformation, CFPA was allowed to receive loans from commercial banks. To capture changes in portfolio quality and average loan size associated with this switch, we include the variable *Year 2008 and after* as a control variable. It is a binary variable that equals one in years 2008, 2009, and 2010. Lastly, to control for social and economic differences across branches, we include *Annual income per capita of rural households* measured at the county level.

It is possible that work experience prior to joining CFPA Microfinance influenced loan officers’ lending behavior. To explore this issue, we estimate the following alternative specification:

$$Y_{ijt} = a_0 + a_1*(EXP_i \times GOV_i) + a_2*(EXP_i \times FARM_i) + a_3*EXP_{it} + a_4*INCOME_{it} + e_{ijt} \quad (2)$$

In addition to the variables that are included in equation (1), in equation (2) we include two interaction terms (*Months as a CFPA loan officer* \times *GOV* and *Months as a CFPA loan officer* \times *FARM*). The coefficients a_1 and a_2 measure the additional effect of CFPA experience for loan officers with government or farming backgrounds relative to all other CFPA loan officers.

A number of time-invariant unobservable factors could also be correlated with the independent variables of interest. To account for those factors, we exploit the longitudinal nature of our data and include a set of regressions that are estimated with loan officer fixed effects (columns 2 and 3 in Table 6; columns 2, 3, 5 and 6 in Table 7). Those fixed effects are intended, therefore, to summarize an officer’s suitability for the job based on characteristics that we do not necessarily observe.²⁰ As such,

based on CFPA data. That said, our regressions do rely on explanatory variables that can be seen as proxies for those concepts. For example, the revenue derived from a loan is tied closely to the likelihood that it is repaid. At the most basic level, loan officers’ selection of applicants that are highly likely to be creditworthy contributes to high repayment rates among loan recipients. Within the pool of applicants deemed creditworthy, the interest rate and maturity of the loan further account for potential risk and provide additional information about the amount and timing of repayment. Regarding costs, many of the administrative costs incurred to support CFPA lending are pooled across loan officers, and thus it is not possible to ascribe them to an individual officer or a loan. Officers’ salaries would be easier to allocate, but we lack the necessary data. We argue, however, that these salaries are likely to fall within a relatively tight band and, in any event, the loan officer fixed effects regressions help account for any differences in salary costs across officers.

²⁰ As a robustness check, we also ran regressions that used county fixed effects, and found results very similar to

inclusion of the fixed effects models is important for demonstrating the robustness of our main findings.²¹

5.2. Results

5.2.1 Loan-level regressions

Loan-level regressions that use the full set of 206,785 loans extended through CFPA loan officers from 2006 to 2010 appear in Table 5. In column 1, the dependent variable is the size of each loan, our proxy for depth of outreach to poorer borrowers. Again, larger loans signify wealthier borrowers.²² The coefficient for *Year 2008 and after* is positive and highly significant indicating that loans were 1,710 yuan larger after CFPA separated from the government and began relying more heavily on commercial sources of funding. The pattern is consistent with loan officers drifting from their mission to serve the poor as commercial incentives took hold.

The tendency to make larger loans over time was more pronounced for loan officers with a career background in commercial business (the omitted category) than those with a background in local government. This is reflected in the significant positive coefficient for *Months as a CFPA loan officer* and the significant negative coefficient for its interaction with the government background dummy (*GOV*) in column 1. In fact, the negative coefficient for the interacted variable is larger (in absolute value) than that for *Months as a CFPA loan officer*, indicating that officers with local government experience made smaller loans over time (controlling for the other explanatory variables in the regression, including *Year 2008 and after*). In contrast, loan officers with farming backgrounds increased their typical loan size at the same rate as those with commercial business backgrounds, as indicated by the insignificant coefficient for the interaction between months of CFPA experience and the dummy

those presented in the paper. In part, county fixed effects could help control for any differences in the way that the credit committees of the different branches operate (though again, lending guidelines are uniform throughout CFPA). To conserve space, we present only models that use the more restrictive loan officer fixed effects.

²¹ A similar approach is to run regressions after taking first differences of the dependent and explanatory variables, which we undertook as a robustness check. Results are almost identical for the two approaches when average loan size is the dependent variable in the regression. Results are also similar when the portfolio quality measures based on the ratio of delinquent payments to total disbursements are used as dependent variables, though coefficients in the first differences models are estimated less precisely and thus larger standard errors imply less significance for some explanatory variables.

²² As shown in Appendix B, a handful of loans were much larger than the typical ones made by CFPA Microfinance. In an unreported robustness check, we therefore replaced loan size with the log of the loan amount to test whether outliers (very large loans) were driving our results. The sign and significance of the explanatory variables were very similar to those that we present here.

variable for farming background.

In columns 2-4, we use our measures of loan portfolio quality based on the repayment history for each loan as dependent variables. Column 2 relies on a dummy variable indicating that at least one repayment was overdue on a given loan. Column 3 uses the ratio of the total overdue repayments to the disbursement value of the loan as the dependent variable. Column 4 uses the number of days that a repayment is overdue on delinquent loans as the dependent variable.²³ Regressions results are qualitatively similar across all three measures of loan quality.

Specifically, repayment performance improved after CFPA became more commercialized as reflected in the negative coefficients for *Year 2008 and after*, which are significant in models 2 and 4. This indicates that CFPA's changed orientation led both to larger loan sizes (less outreach to the poor) and improved portfolio quality. However, countervailing influences on portfolio quality emerge when we consider the length of loan officers' employment at CFPA. The positive significant coefficient for *months as a CFPA loan officer* in all three models (2-4) indicates that portfolio quality declined over time, though the effects are relatively modest. For example, in column 2, a one standard deviation increase in months as a CFPA loan officers implies a .026 increase in the likelihood of having an overdue repayment on a loan. For reference, the mean for the overdue payment dummy variable is 0.18. In part, this modest trend emerges because repayment problems take time to emerge, and thus loan officers that recently joined CFPA are likely to have portfolios with fewer delinquencies.

Loans officers with farming backgrounds showed the same modest decline in portfolio quality as those with backgrounds in commercial business, as reflected in the insignificant coefficients for the farming background dummy variable and its interaction with months as a CFPA loan officer. However, the repayments patterns for loan officers with backgrounds in local government differ. The negative significant coefficients for the government background dummy variable in models 2-4 indicate that those loan officers had significantly fewer repayment problems than others at the

²³ For loans with no repayment problems, the value for that variable is zero.

start of their CFPA careers. However, the coefficient for the interaction between that dummy variable and months of CFPA service is positive and significant, indicating that repayment problems grew worse for loan officers with career backgrounds in local government as their CFPA careers progressed.

In fact, for loan officers with roughly 25 months of service (or more) the coefficients in models 3 and 4 imply that those with backgrounds in local government had more repayment problems than others. At the same time, because our sample starts in 2006, any loans extended through an officer with at least 25 months of CFPA experience must have been issued in 2008 or after. Thus the coefficients for CFPA experience and a background in local government should also be viewed in the context of the coefficient on *Year 2008 and after*, which is negative and significant. The patterns indicate that, with the exception of a small group of loan officers with the longest tenures at CFPA, those with career backgrounds in government have portfolio quality no worse than that of loan officers with other backgrounds, and better than other loan officers early in their careers. In all, career background does not play a large role in affecting loan repayment for most loan officers.

In contrast, county-level income per capita (of rural households) is significantly positively linked to loan size and negatively linked to repayment difficulties. Presumably, borrowers from high-income areas require larger loans and are better able to repay them. As expected, loans that carry individual liability are significantly larger than those that carry group liability, by 16,630 yuan (compared to a mean loan size of 5,200 yuan for our full sample). Controlling for income level and loan liability type, individual characteristics beyond loan officers' career backgrounds are also significantly associated with loan size and, especially, repayment. Older female loan officers with college degrees have significantly fewer overdue payments than other loan officers in models 2-4. Older loan officers also tend to make larger loans (model 1). Because time-invariant individual characteristics of loan officers appear to play a large role in explaining loan size (outreach) and likelihood of repayment, and because not all of the characteristics that affect those outcomes are likely to be observable, we devote greater attention to officer-level regressions that incorporate loan officer fixed

effects in the next sub-section.

5.2.2 Loan officer level regressions

Table 6 provides regression results that use average loan size in each year for each loan officer as the dependent variable. The OLS results in column 1 indicate that average loan size is larger for officers located in high income counties who extend relatively large shares of individual liability loans. Those findings reinforce those from the loan-level regressions in Table 5. However, the coefficients for the other explanatory variables are estimated with less precision and thus are not statistically significant. In part, this could be due to the smaller sample size for the yearly loan officer-level regressions, but it could also be because of unobservable characteristics of the loan officers and the environments in which they operate. We therefore put greater stock in the regressions that incorporate loan officer fixed effects (models 2-3).

In our simplest FE model in column 2, experience as a CFPA loan officer is positively associated with average loan size. This is consistent with loan officers drifting from CFPA's mission to serve poor borrowers and reinforces the findings from the loan-level regressions in Table 5. However, the interactions between months of CFPA experience and loan officers' career backgrounds in farming or local government are negative and highly significant. Although those coefficients are smaller (in absolute value) than the one for months as a CFPA loan officer, they indicate that the increase in average loan size was slower for loan officers with backgrounds in either local government or farming.

That conclusion is further underscored when we include time-varying controls for county income per capita and the average features of the loans extended by officers in each year (model 3). Indeed, the respective size of the coefficients for months of CFPA experience and its interaction with experience in local government suggests almost no drift toward making larger loans for those loan officers. For officers with farming backgrounds, model 3 indicates that CFPA experience increased average loan size at a substantially slower rate than it did for loan officers with commercial

business backgrounds.

In model 3, the coefficient for county per capita income is positive and significant as it was in the loan-level regressions in Table 5, as are those for some of the average loan characteristics (maturity, interest rate, individual liability). This pattern indicates that, controlling for the types of loans that a loan officer typically extends and the incomes of the borrowers that he/she routinely interacts with, loan officers with backgrounds in farming and local government increased their loan sizes at slower rates than other loan officers as CFPA Microfinance became increasingly commercialized. We view this as our strongest evidence that the career backgrounds of loan officers had an impact on mission drift at CFPA.

The loan officer level regression results in Table 7 are less conclusive than those for loan size regarding the effects of commercialization and career background on loan quality. In columns 1-3, the yearly ratio of loan repayments overdue at least one day to the value of total disbursements is the dependent variable; in columns 4-6, the dependent variable is similar, except that the numerator is the sum of repayments overdue more than 30 days. Some of the results are similar to those from the loan-level regressions in Table 5. For example, the OLS models in Table 7 (1 and 4) show that older female loan officers with college degrees had significantly lower overdue repayments than other loan officers. The coefficient for county income is negative, as it was in the loan-level regressions (though it does not quite achieve significance). Finally, *months as a CFPA loan officer* is positive and significant as it was in the loan-level regressions. Again, however, that coefficient is small and could reflect the tendency for repayment problems to emerge over time.²⁴

What is different in the loan officer-level OLS regressions is the positive coefficient for *Year 2008 and after*, which is significant in model 4. In the loan-level regressions for loan quality in Table 5, that coefficient was negative and sometimes significant. The loan officer-level result casts doubt on the notion that portfolio quality improved

²⁴ Repayment problems might be quicker to materialize for a variable based only on the quality of new loans, but as is recognized in the literature, since all new loans are by definition performing loans (at least until the first payment comes due), focusing only on the performance of recent loans can be a misleading indication of subsequent portfolio quality.

as CFPA became more commercially oriented. The OLS regressions also suggest that the career backgrounds of loan officers had little effect on portfolio quality over time, as neither the farming or government dummy variables nor their interactions with months as a CFPA loan officer, are significant in models 1 and 4.

When we include loan officer fixed effects, the interaction between farming experience and months employed by CFPA is positive and significant in models 2 and 3. We speculate that this could be because repayments on loans in agricultural areas that are one or a few days late are more common than for other types of loans. And indeed, when the portfolio quality indicator is based on repayments more 30 days overdue, the farming background variable is insignificant in the fixed effects regressions (models 5 and 6). In all, the loan officer-level regressions in Table 7 provide less support for the notion that repayment performance improved as CFPA became more commercialized than the summary statistics and the loan-level regressions, or the notion that portfolio quality was strongly tied to the career backgrounds of loan officers.

6. Conclusion

Does increased reliance on commercial sources of funding compel microfinance institutions to drift from their mission to serve the poorest? We study this issue in the context of the commercialization of China's largest NGO microfinance institution. We find that during that process the personal characteristics of loan officers, including their career backgrounds, influenced how well they maintained outreach to poorer borrowers. More specifically, we find that while most loan officers tended to make larger loans (our proxy for the wealth of borrowers) as commercialization took hold, those with career backgrounds in farming or local government were better able to resist those tendencies. And they did so without incurring substantial declines in loan portfolio quality.

To our knowledge, this is the first evidence on how the personal characteristics of microfinance loan officers affect their response to stronger commercial incentives. In our context, the compensation scheme provided uniform financial incentives across

loan officers. However, in future work, it could be valuable to explore the effects of varying compensation schemes across loan officers with different characteristics (such as work experience), similar to the pioneering experiment with loan officers in commercial banks in a developing country in Cole et al. (2015). In this way, researchers could begin to better understand how the personal characteristics of microfinance loan officers interact with their incentive environment to influence their lending decisions.

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Table 1. Institutions and loan disbursement of CFPA Microfinance, 2006-2010.

Year	2006	2007	2008	2009	2010
1 Number of county branches (SSCOP)	10	10	17	26	39
2 Total number of loan officers ¹	60	84	97	169	337
3 Total number of loans disbursed	20,930	38,040	38,052	41,376	69,215
4 Total value of loans disbursed (million yuan)	47	118	188	276	569
5 Used for agriculture production (%)	85	79	71	61	55
6 Used for trade business (%)	7	11	17	22	22
7 Used for operating small workshops (%)	8	10	12	18	22
8 Used for consumption (%)	0	0	0	0	1
9 Percentage of group lending in value (%)	100	98	92	81	72
10 Loan size (yuan) ²	2,259	2,956	4,443	6,072	7,212
11 Loan maturity (months)	11.4	11.0	11.4	11.9	12.0
12 Real rate of annual interest (%) ³	14.7	11.9	13.8	20.0	15.4
13 Commercial borrowing to liabilities (%)	55.6	91.4	97.2	94.3	96.3
14 Returns on assets (ROA), %	-0.2	-0.6	-0.2	0.7	1.3
15 Operating expense to assets, %	7.96	6.94	8.02	8.54	7.93

Source: Authors' own calculations (for Row 1-12) and CFPA financial statement (for Row 13 and 15).

¹ In total, 383 CFPA microfinance loan officers extended loans between 2006 and 2010. The authors successfully surveyed 99% of those loan officers, leaving only five not surveyed.

² To adjust for inflation, the figures are deflated by the consumer price index.

³ The real rate of annual interest is calculated by subtracting inflation from the nominal rate of interest charged on loans.

Table 2. Characteristics of loan officers recruited by CFPA microfinance from 2006 to 2010.

	Total (N=379)	2006 (N=60)	2007 (N=24)	2008 (N=27)	2009 (N=78)	2010 (N=163)
Age	36	34	38	41	38	34
Female (%)	47	40	50	52	54	48
Education attainment (years)	12	11	12	11	11	13
Career background (%)						
Government	10	5	25	4	5	12
Farmers	36	52	62	48	44	22
Commercial business	54	43	13	48	51	66

Source: Authors' survey.

Table 3. Average loan size (1,000 yuan) of CFPA microfinance loan officers during 2006-2010.¹

	2006-2010 (N=747)	2006		2010	
		Sample, % (N=60) ²	Loan size	Sample, % (N=337) ²	Loan size
Total	7.8		2.1		10.7
Loan officer: Gender					
Male	6.5***	60	2.2	50	8.7***
Female	9.1	40	2.1	50	12.7
Loan officer: Age					
Below 35	8.5**	50	2.1	45	12.1
35-45	7.6**	40	2.2	45	9.8
Above 45	6.0	10	2.2	10	8.2
Loan officer: Education					
No degree	6.9	85	2.2	71	9.5
College degree and above	11.0***	15	2.1	29	13.6***
Loan officer: Career background					
Government	6.5**	5	2.2	10	9.0
Farmers	5.7***	52	2.1	33	8.1***
Commercial business	9.8	43	2.2	57	12.5

Source: Authors' survey.

Note: ¹ t-tests are conducted by comparing average values in each row to the values for the last row in each subsection. For example, the t-tests in the sub-section for loan officer age compare the average loan size for officers younger than 35 (and between 35 and 45) with the average for the reference category: loan officers more than 45 years old. * indicates significance at the $p < 0.10$ level, ** at the $p < 0.05$ level, and *** at the $p < 0.01$ level. Loan size is adjusted for inflation using the consumer price index. All loan sizes are expressed in constant 2006 yuan.

² Sample breakdown by the loan officers of the year.

Table 4A. Incidence and delinquent days for CFPA microfinance loan officers, 2006-2010.

	2006 (N=60)		2010 (N=337)	
	Loan officers with overdue repayments (%)	Avg. number of days overdue on delinquent loans	Loan officers with overdue repayments (%)	Avg. number of days overdue on delinquent loans
Total	75	49	27	15
<i>Those loan officers with overdue loans, breakdown by</i>				
Gender				
Male	69	45	52	13
Female	31	59	48	16
Age				
35 below	58	53	40	19
35-45	36	39	49	12
45 above	7	76	11	13
Education				
No degree	93	52	78	14
College degree or above	7	11	22	17
Career background				
Government	4	6	6	15
Farmers	58	60	37	12
Commercial business	38	39	57	17

Source: Authors' survey.

Table 4B. Yearly ratio of total payments overdue to the face value of loans disbursed (in that year) for CFPA microfinance loan officers, 2006-2010 (%).

	Overdue more than one day		Overdue more than 30 days	
	2006	2010	2006	2010
Total	4.1	1.2	1.6	0.1
Loan officer: Gender				
Male	4.4	1.5	1.3	0.1
Female	3.7	0.8	2.0	0.1
Loan officer: Age				
35 below	5.2	1.1	2.7	0.1
35-45	3.3	1.3	0.5	0.03
45 above	2.0	1.1	0.4	0.01
Loan officer: Education				
No degree	4.6	1.5**	1.9	0.05
College degree and above	1.1	0.3	0.1	0.1
Loan officer: Career background				
Government	1.6	1.0	0.02	0.15
Farmers	3.6	1.9**	1.4	0.05
Commercial business	5.0	0.7	2.0	0.05

Note: t-tests are conducted by comparing average values in each row to the values for the last row in each subsection. For example, the t-tests in the sub-section for loan officer age compare the average value for officers younger than 35 (and between 35 and 45) with the average for the reference category: loan officers more than 45 years old. * indicates significance at the $p < 0.10$ level, ** $p < 0.05$ at the level, and *** at the $p < 0.01$ level.

Source: Authors' survey.

Table 5. Results of loan-level multivariate analysis using average loan size and multiple measures of delinquency on loans extended by CFPA microfinance officers as dependent variables, 2006-2010. ¹

	Loan size (1,000 yuan) ²	Overdue repayment (Yes=1; No=0)	Ratio of overdue payments to total disbursemen t of loan (%)	Days overdue on delinquent loans
	(1)	(2)	(3)	(4)
1 Government background (<i>GOV</i>) (Yes=1; No=0)	0.21 (0.76)	-0.16* (1.94)	-24.51*** (2.73)	-50.87** (2.55)
2 Interaction of <i>GOV</i> and Experience (months as a CFPA loan officer)	-0.02* (1.98)	0.01*** (4.57)	0.80*** (4.47)	2.05*** (3.16)
3 Farmer background (<i>FARM</i>)	-0.35 (1.50)	-0.01 (0.20)	-1.68 (0.20)	20.55 (0.76)
4 Interaction of <i>FARM</i> and Experience (months as a CFPA loan officer)	0.00 (0.56)	0.00 (1.13)	0.25 (1.11)	0.39 (0.79)
5 Months as a CFPA microfinance loan officer	0.01*** (2.78)	0.001*** (3.27)	0.22** (2.13)	0.49* (1.96)
6 Loan officer: Female (Yes=1; No=0)	0.01 (0.11)	-0.05** (1.99)	-7.90* (1.78)	-21.50* (1.77)
7 Loan officer: Age	0.03*** (3.36)	-0.01*** (2.62)	-1.04** (2.47)	-3.53* (1.77)
8 Loan officer: College degree (Yes=1; No=0)	0.07 (0.57)	-0.07** (2.57)	-12.34** (2.06)	-26.55* (1.84)
9 Year 2008 and after	1.71*** (8.07)	-0.13* (1.89)	-12.38 (1.46)	-43.65** (2.08)
10 County-level annual income per capita of rural households (1,000 yuan)	0.001** (2.60)	-0.001*** (4.45)	-0.01*** (2.87)	-0.03** (2.04)
11 Individual loan (Yes=1; No=0)	16.63*** (16.27)	-0.04 (0.88)	-0.41 (0.08)	4.91 (0.31)
12 Loan maturity (months)	0.12** (2.07)	0.02 (1.48)	-1.72 (1.27)	4.89 (1.21)
13 Interest rate on loan (% , annual)	0.11 (1.33)	0.02*** (3.08)	1.49 (1.64)	4.22* (1.67)
14 <i>USAGE</i> : Loans used for trade	0.89*** (5.17)	-0.02 (1.04)	-5.12 (1.27)	-21.08 (1.26)

	business (Yes=1; No=0)				
15	<i>USAGE</i> : Loans used for operating small workshops (Yes=1; No=0)	0.37 (1.29)	0.02 (0.84)	2.28 (0.59)	-10.24 (0.65)
16	<i>USAGE</i> : Loans used for consumption (Yes=1; No=0)	-0.64 (0.35)	-0.15*** (4.20)	-30.75*** (2.79)	-89.87 (1.58)
	Constant	-2.49* (1.72)			
	R-squared or pseudo-R-squared	0.654	0.292	0.090	0.098

¹ The number of observations is 206,875. Model 1 is estimated via OLS regression. Model 2 is estimated via Logit limited dependent variables regressions; Models 3 and 4 are estimated via Tobit limited dependent variables regressions. Marginal effects are reported for Models 2, 3 and 4. t-tests are shown in parentheses. * indicates significance at the p<0.10 level, ** at the p<0.05 level, and *** at the p<0.01 level. In all models, standard errors are clustered at the county level.

² For loan size we adjust for inflation using the consumer price index. Loan sizes are expressed in constant 2006 yuan.

Table 6. Results of multivariate analysis using average yearly loan size of CFPA microfinance loan officers as the dependent variable, 2006-2010. ¹

	OLS	Fixed-effects	
	(1)	(2)	(3)
1 Government background (<i>GOV</i>) (Yes=1; No=0)	-1.00 (0.74)		
2 Interaction of <i>GOV</i> and Experience (months as a CFPA loan officer)	-0.01 (0.74)	-0.09*** (2.89)	-0.05** (2.35)
3 Farmer background (<i>FARM</i>)	-0.18 (0.27)		
4 Interaction of <i>FARM</i> and Experience (months as a CFPA loan officer)	0.00 (0.16)	-0.06*** (3.95)	-0.03*** (2.86)
5 Months as a CFPA loan officer	-0.01* (2.02)	0.18*** (14.67)	0.07*** (5.00)
6 Individual loan (%)	0.18*** (4.66)		0.12*** (15.08)
7 Loan maturity (months)	-0.15 (0.50)		0.21* (1.91)
8 Interest rate on loan (%)	0.61 (1.64)		0.27*** (3.90)
9 Loans used for trade business (%)	-0.01 (0.32)		-0.00 (0.24)
10 Loans used for operating small workshops (%)	-0.00 (0.14)		0.00 (0.47)
11 Loans used for consumption (%)	-0.02 (0.16)		0.33*** (4.75)
12 County-level annual income per capita of rural households (1,000 yuan)	0.002* (1.99)		0.002** (1.98)
13 Loan officer: Female (Yes=1; No=0)	0.50 (1.04)		
14 Loan officer: Age	-0.01 (0.25)		
15 Loan officer: College degree (Yes=1; No=0)	0.98 (1.15)		
16 Year 2008 and after	-0.49 (0.40)		
Constant	-9.02 (1.42)	3.88*** (16.73)	-5.73*** (2.86)
R^2	0.619	0.475	0.776

¹ The number of observations is 747. t-tests are shown in parentheses. * indicates significance at the $p < 0.10$ level, ** at the $p < 0.05$ level, and *** at the $p < 0.01$ level.

For loan size we adjust for inflation using the consumer price index. Loan sizes are expressed in constant 2006 yuan. Standard errors are clustered at the county level in OLS model.

Table 7. Results of multivariate analysis using the ratio of yearly payments overdue (sum) to yearly loan disbursement (sum) for CFPA microfinance loan officers (2006-2010) as dependent variables: OLS and OLS regressions with loan officer fixed-effects.¹

	Overdue more than one day			Overdue more than 30 days		
	OLS (1)	FE (2)	FE (3)	OLS (4)	FE (5)	FE (6)
1 Government background (<i>GOV</i>) (Yes=1; No=0)	-1.17 (0.84)			0.08 (0.11)		
2 Interaction of <i>GOV</i> and Experience (months as a CFPA loan officer)	0.08 (1.09)	0.06 (0.41)	0.11 (0.76)	0.01 (0.40)	-0.03 (0.27)	-0.00 (0.01)
3 Farmer background (<i>FARM</i>)	-0.89 (0.98)			-0.36 (0.47)		
4 Interaction of <i>FARM</i> and Experience (months as a CFPA loan officer)	0.11 (1.68)	0.19** (2.57)	0.23*** (3.20)	0.06 (1.05)	0.06 (1.03)	0.07 (1.27)
5 Months as a CFPA loan officer	0.06*** (2.84)	0.05 (0.82)	-0.04 (0.43)	0.03** (2.63)	0.03 (0.77)	0.06 (0.76)
6 Individual loan (%)	0.12* (1.81)		0.08 (1.52)	0.11** (2.54)		0.03 (0.63)
7 Loan maturity (months)	-2.90** (2.08)		-4.41*** (6.15)	-1.88*** (3.25)		-2.03*** (3.46)
8 Interest rate on loan (%)	-2.79 (1.63)		0.18 (0.40)	-2.81** (2.51)		-0.35 (0.97)
9 Loans used for trade business (%)	-0.03 (1.56)		-0.02 (0.36)	-0.02 (1.05)		0.02 (0.45)
10 Loans used for operating small workshops (%)	-0.01 (0.15)		0.00 (0.01)	-0.04 (1.15)		-0.00 (0.07)
11 Loans used for consumption (%)	-0.12 (1.46)		-0.32 (0.69)	-0.02 (0.33)		-0.12 (0.33)
12 County-level annual income per capita of rural households (1,000 yuan)	-0.00 (1.66)		0.00 (0.93)	-0.00 (1.42)		-0.00 (0.16)
13 Loan officer: Female (Yes=1; No=0)	-1.14* (1.84)			-0.70* (1.94)		
14 Loan officer: Age	-0.16** (2.39)			-0.08 (1.19)		
15 Loan officer: College degree (Yes=1; No=0)	-2.21*** (3.12)			-0.84* (1.79)		

16	Year 2008 and after	9.26			9.08**		
		(1.64)			(2.37)		
	Constant	88.87**	-0.88	42.64***	73.55***	-0.57	29.49***
		(2.07)	(0.85)	(3.25)	(2.82)	(0.70)	(2.75)
	R^2	0.230	0.061	0.160	0.161	0.017	0.051

¹ The number of observations is 747. t-tests are shown in parentheses. * indicates significance at the p<0.10 level, ** at the p<0.05 level, and *** at the p<0.01 level. Standard errors are clustered at the county level in OLS models.

APPENDIX A

Gross loan portfolio of the major NGO microfinance institutions in China,
2003-2009 (Million USD)

Microfinance Institutions ¹	2003	2004	2005	2006	2007	2008	2009	2010
ARDPAS			0.3	0.4	1.1			
CFPA-MFI		1.6	2.0	3.6	9.6	15.7	27.5	59.0
CHWDA						0.1		
CZWSDA	0.4	0.5	0.6	0.8	1.0	1.2	1.6	1.8
DAMC						0.6		
Harbin Bank							6.4	8.1
JXWDA						0.2		
MicroCred - CHN							9.0	20.5
NHMCL						1.2		
OI China					0.9	1.7	2.7	3.9
PATRA Hunchun		0.1	0.2	0.2	0.4	0.5	0.5	0.6
PATRA Yanbian		0.1	0.2	0.2	0.3	0.2	0.3	0.4
PCWDA						0.3		
Rishenglong					3.7	4.5	5.1	11.6
Sichuan Yilong Huimin County Bank						1.0		
XXWDA						0.3		
YYWDA						0.3		
Hebei Laishui						4.0	4.8	0.9
Hebei Yixian								3.1
Guangxi Baise						1.8	1.9	0.3
Ningxia Microfinance							5.6	
Renrendai								0.7
Total (Million USD)	0.4	2.3	3.3	5.2	17.0	33.6	65.4	110.9
Percentage of CFPA-MFI (%)	0	70	61	69	56	47	42	53

Source: Microfinance Information eXchange (www.mixmarket.org/).

Note : ¹ We do not include PSBC (Postal Savings Bank of China) and Henan-Puyong that are listed in the MIX database. While the former has been commercialized as a state bank (Guo & Jia, 2009), the latter – wrongly spelled by MIX (Correct spelling is Hanan-Puyang) – is affiliated to Rural Credit Cooperatives, a backbone of rural formal financial institution in China.

APPENDIX B

Descriptive of variables used in analysis

Variable	Sample	Mean	Std. Dev.	Min	Max
Government background (Yes=1; No=0)	379	0.10	0.30	0	1
Farmer background (Yes=1; No=0)	379	0.36	0.48	0	1
Business background (Yes=1; No=0)	379	0.54	0.50	0	1
Months as a CFPA microfinance loan officer	379	34.75	26.45	1	109
Loan officer: Female (Yes=1; No=0)	379	0.47	0.50	0	1
Loan officer: Age	379	36.48	7.14	21	56
Loan officer: College degree (Yes=1; No=0)	379	0.27	0.44	0	1
Loan size (1,000 yuan)	206,875	5.2	5.44	0.1	200
Overdue repayment (Yes=1; No=0)	206,875	0.18	0.38	0	1
Ratio of overdue payments to total disbursement of loan (%)	38,070	17.81	23.77	0	100
Days overdue on delinquent loans	38,070	41.721	80.83	0	947
Individual loan (Yes=1; No=0)	206,875	0.04	0.20	0	1
Loan maturity (months)	206,875	11.64	1.78	1	36
Interest rate on loan (% , annual)	206,875	18.36	2.29	4.6	26.93
<i>USAGE</i> : Loans used for agriculture (Yes=1; No=0)	206,875	0.75	0.43	0	1
<i>USAGE</i> : Loans used for trade business (Yes=1; No=0)	206,875	0.14	0.34	0	1
<i>USAGE</i> : Loans used for operating small workshops (Yes=1; No=0)	206,875	0.03	0.18	0	1
<i>USAGE</i> : Loans used for consumption (Yes=1; No=0)	206,875	0.00	0.04	0	1
County-level annual income per capita of rural households (yuan)	39	4767.62	1565.77	1863	12672