Household Access to Nongovernmental Microfinance, Formal Credit and Informal Credit in Rural China[1]

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*A*bstract: There has been a rising concern that microfinance is abandoning its mission to serve the poor. Based on a longitudinal dataset, this paper examines rural households' credit access to all the sources in less developed areas in China, and analyzes its relationship with household wealth. It is found that nongovernmental microfinance has expanded rapidly by serving a mixture of poor and wealthy clients. Meanwhile, formal financial institutions have gradually reduced their loan services in poor areas and have targeted more on the wealthy. In the presence of a large unmet demand for credit in rural China, informal network became the primary source of credit to smallholders.

JEL Classifications: I39, O29, Q12
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1. Introduction

Credit constraint has been recognized as one of the primary obstacles to improving the livelihood for the poor. However, government-oriented credit programs in many developing countries have failed to meet the demand. Ample evidence shows that many seemingly preferential credit programs (e.g., subsidized interest rates and earmarked utilization) have discouraged institutional lenders and eventually excluded the poor (Adams et al., 1984; Yaron, 1994). It was estimated that roughly 40-80 percent of the population in most developing economies lack access to formal credit (World Bank, 2007).

Non-governmental microfinance becomes a backbone for delivering loans to the poor in less-developed economies. Evidence shows that three-quarters of microfinance institutions in developing countries are non-governmental organizations (NGOs) and nonbank financial institutions (Cull et al., 2009). Indeed, NGO microfinance covered 51 percent of the entire microfinance clients, and 73 percent of the female borrowers by 2005. These NGO microfinance institutions have played an important role in poverty alleviation in developing countries.

In China, formal financial institutions dominate in rural financial markets, but the immense demand of rural households for credit is unmet. The institutional lenders have received governmental support and have expanded rapidly in rural China (Jia & Guo, 2008). Nonetheless, the demand for credit is enormous and a large number of farmers in rural China are credit rationed (Han, 2007). Jia et al. (2010) found that 37 percent of their sample households in rural China were discouraged by the transaction costs related to the bureaucracy of formal financial institutions.

Early microcredit programs in China were piloted through a number of international aid projects on poverty alleviation in the early- and mid-1990s (Sun, 2004).[2] When the group lending scheme of microfinance was acknowledged, formal financial institutions – firstly RCC and then PSBC – introduced microfinance in their loan business in rural China.[3] Meanwhile, commercial microfinance developed fast. By 2012, 6,000 micro-lending companies had been established and outstanding loans amounted to 600 billion RMB (He, 2013). Nevertheless, China's governmental and commercial microcredit institutions and programs very seldom targeted individuals, particularly the poor. For example, the micro loan services of PSBC targeted more the entrepreneurs of the rural economy (Xie, 2010). Several other studies investigated micro credit of formal financial institutions and showed that the poor in rural China were excluded (Han, 2007; Jia et al., 2010).

Internationally, microfinance is being commercialized, which has fueled debates about mis-targeting and mission drift in developing countries. Specifically, there was worry about the microfinance industry abandoning its mission to serve the poor (Christen & Drake, 2002). Indeed, there is evidence that microfinance tends to benefit wealthier households rather than poorer ones (Coleman, 2006; Kondo et al., 2008; Takahashi et al., 2010). For example, Cull et al. (2009) examined the profile of 346 microfinance institutions worldwide in 2003 and 2004 and found that commercial microfinance banks played an increasing role in serving low-income areas. The beneficiary group, however, are not the poorest. Resulting debates were fueled by Muhammad Yunus, who openly criticized the high interest rate and mis-targeting of commercial microfinance banks in Mexico (Yunus, 2007).

When examining these relatively new trends (seemingly a crossroad for the microfinance industry), a basic understanding is required to get the facts right, both globally and locally. Though China is the world's largest transition economy, little is known about the status of its microfinance industry and how the poor are served. Some attention in the literature has been given to the development of microfinance and the increased income gap in China (Chen & Ahmed, 2008; Park & Ren, 2001; Sun, 2006). However, these studies are mostly based on anecdotal evidence and case studies. Surprisingly, despite concerns about the mission drift of poverty-oriented microfinance, little empirical evidence has been brought forth to prove them.

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[2] For example, the World Bank, United Nations Development Program, International Fund for Agricultural Development, Australian Government's Overseas Aid Program, Canadian International Development Agency, German Agency for International Cooperation, and the Ford Foundation.

[3] Since 2008, the Postal Saving Bank of China (PSBC) started micro loan services in China and overtook RCCs as the largest formal financial institution providing micro loans to individuals in rural economy (Zhang, 2011).

The goal of this paper is to examine the targeting of microfinance, and to compare with formal and informal credits in rural China, especially two objectives. First, we present the profile of credit access from various sources for the sampled rural households. Second, we analyze how household wealth and other indicators affect farmers' access to credit from microfinance, and formal and informal credit, and thus examine the differences of targeting these three categories of lenders.

Because of the ambitious nature of the goals but constrained resources, it is necessary to narrow the scope of this paper. In particular, in this study we examine only China's largest NGO microfinance institution, the China Foundation of Poverty Alleviation Microfinance (CFPA microfinance). The lack of a full profile for the microfinance industry hindered us from drawing a representative sample of China's NGO microfinance, non-bank microfinance, and commercial microfinance. Second, we examine mostly farm-level credit access, and we did not survey micro-lending for enterprises and non-farmers. Third, although there are a set of indicators that measure targeting (Henry et al., 2003), in this study we mainly focus on household's wealth and demography-based indicators.

The rest of the paper is organized as follows. Section 2 presents a brief background of microfinance in China and the CFPA microfinance. Section 3 introduces our survey design and sampling scheme. In the following two sections, after examining farmers' credit access in general, we explore and compare the effects of household wealth and several other targeting indicators on farmers' access to different sources of credit. The final section concludes.

2. Microfinance in China

2.1 Microfinance in China: An overview

Microfinance was introduced in China through poverty alleviation programs in the mid-1990s. The earliest microfinance program was piloted in China in 1993 through a research program of the Chinese Academy of Social Sciences (Sun, 2004). By 2002, international organizations (e.g., the World Bank, the United Nations Development Program (UNDP), the International Fund for Agricultural Development, etc.) and non-governmental organizations had established more than 300 microfinance institutions (MFIs) or programs in 200 counties in rural China. However, at present, most of these NGO MFIs have not been successful in their financial performance; only 50 MFIs remained in operation by 2011 (Jiao, 2013). The existing NGOs for microfinance mostly relied on socially-responsible donors (e.g., Oxfam, UNDP, and the Chinese government's anti-poverty programs).

Formal financial institutions have adopted microloans in their credit programs since the early-2000s. To improve rural credit, in 2003 the Rural Credit Cooperatives (RCCs), a state-controlled financial institution in rural China, began offering "jointly guaranteed microloans" similar to the Grameen group lending scheme, for small & medium enterprises (SMEs) and rural households. By 2012, outstanding RCC loans had reached 650 billion yuan. In 2008, other formal financial institutions such as PSBC, ABC, and CDB also started to provide micro loans in rural economies. Instead of persisting in group lending, individual loans have become the main products. By 2012, outstanding microloans for these financial institutions had exceeded 370 billion yuan.

In recent years, commercial microfinance has begun to emerge in China. In 2008, the People's Bank of China (the central bank) and the China Banking Regulatory Commission issued the "Guideline of Piloting Microcredit Company," (the Guideline) to energize the commercialization of microfinance. By 2012, more than 6,000 microcredit companies were registered in China and outstanding loans amounted to 600 billion yuan (He, 2013). Being completely market-based, these commercial companies received no subsidies. Although the Guideline encourages loan services to

rural households and small enterprise, the average outstanding per loan was 124,000 yuan in 2011 (Wu, 2013), which was about 17.8 times the average per capita income of rural households (6,977 yuan in 2011; NBSC, 2012). This indicates that commercial microfinance may not be supporting poor households

Notwithstanding the rapid transformation of microfinance in China, there are surprisingly few statistics about the outreach and financial performance of various MFIs. The financial data were voluntarily presented by MFIs and subject to little reliability. Neither are there rigorous evaluations about the impacts of different MFIs. The absence of statistics and data leads to dissonant voices on microfinance in China.

For reasons of prudential regulation, microfinance in China has been confined to delivering loans only; savings and insurance are not allowed according to the legal framework.[4] However, many poor households in developing countries would prefer the lower costs and great sense of security that saving brings (Rutherford, 2006). Poor households are able to access microloans from MFIs, but saving products are scarce and plagued with difficulties (Armendáriz, 2011). Microfinance clients form the lump sums of capital they need through either borrowing or saving. When poor households need a large sum urgently and they have not built up enough savings to cover their spending needs, they end up borrowing and thus find themselves on the repayment treadmill, making it even harder to save. As such, microfinancing has the potential to help poor households direct more of their spare cash-flow to saving deposits instead of the more expensive and stressful option of loan repayments (Rutherford, 2011). The policy bias against microsavings needs to be revisited in China.

2.2 CFPA Microfinance

The CFPA microfinance was a government program when it was officially approved as pilot service in 2001. From 2001-2005, CFPA microfinance was based on 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. This program's capital was highly centralized and the operation was directed by the government. In the first five years, the program was only piloted in a few counties in poor areas of Sichuan, Shanxi, Guizhou, and Fujian provinces.

CFPA microfinance became a not-for-profit NGO for microfinance in 2005. The United Nations designated 2005 as the "Year of Microcredit" and the Nobel Peace Prize was awarded to the Grameen Bank and Mohammad Yunus in 2006. International attention to microfinance quickly developed in China. In 2005, CFPA microfinance became independent (from the government) and was institutionalized as a NGO microfinance institution to provide loan services for households in poor rural areas. In its first year of operation, CFPA microfinance covered 5 counties in rural China. Since then, its loan business expanded rapidly. By 2010, CFPA microfinance had established branches in 31 counties in rural China. According to Microfinance Information eXchange (www.mixmarket.org), CFPA microfinance is the largest NGO microfinance in China and its gross loan portfolio accounted for more than 50 percent of all NGO microfinance in China.[5]

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[4] Worldwide it is quite common that savings are not allowed in microfinance institutions for reasons of prudential regulation (CGAP, 2006). However, it is well-documented that microfinance receivers, especially poor people, need access to savings before they need access to credit. We note that this is an important issue but not the focus of this study.

[5] As the MIX dataset does not include some small NGO microfinance institutions in China due to unavailable data, the share of CFPA microfinance might be slightly overestimated.

CFPA microfinance operates similarly to microfinance institutions in many other developing countries, though it also has its own special characteristics. Regarding similarities, CFPA is a credit-only institution and saving is not allowed.[6] The majority of loans were made through a solidarity group, which is also practiced in other developing countries (Armendariz & Morduch, 2005). In our case, the disbursed value of group lending accounted for 81 percent of its total loan disbursement from 2006-2009. Like MFIs in many other developing countries, a high repayment rate (99 percent) was also found for CFPA microfinance; CFPA reported positive net revenue in 2009, indicating financial sustainability. However, regarding repayment schedules, to reduce transaction costs, CFPA microfinance adopted monthly repayment rather than the weekly repayment scheme implemented in many other developing countries. While we do not have data to show the impacts of this difference on the performance of microfinance, it could very well have implications on its ability to target the poor.

3. Sampling and Data Collection

Among all 31 CFPA county branches that existed in 2010, we consider five counties that have launched institutionalized microfinance since 2006 because we wish to control the heterogeneity of being established in different years. We exclude the county branches established after 2006, as we would like to have more observations from the study period of 2006-2009. Among the five counties, we consider only the counties where group lending was the primary loaning service, and also the counties that belonged to national designated poverty counties, as this study is focused on poor rural China. Two counties, Huaian (HA) in Hebei province and Xinbing (XB) in Liaoning province, met the specified criteria and were eventually selected as our study sites.

The selection of townships and villages was conducted as follows. Within each county, we originally designed to select 20 villages (*microfinance villages*) where CFPA microfinance operated from 2006 to 2009. In total, we surveyed 40 villages with microfinance. Meanwhile, in each county, we also planned to construct a comparison group by including another 20 villages that were not covered by CFPA microfinance by 2009 (*non-microfinance villages*). In HA county, the size of townships was large and the coverage of CFPA microfinance was not high. Thus, we selected 2 townships and in each township we randomly selected 10 microfinance villages and 10 non-microfinance villages. We did not choose to cover more townships, as we wished to exercise better control of local production and consumption environments between microfinance villages and non-microfinance villages. Indeed, there were also not many townships that had both microfinance villages and non-microfinance villages in HA. In XB county, the size of townships was rather small (less than 12 villages per township, on average) and the average outreach of villages within a township for microfinance villages was large, ranging from 46 percent in 2007, to 75 percent in 2009. Accordingly, we randomly selected two townships with high microfinance service coverage, and then we randomly selected 10 microfinance villages from each of these two townships. We followed a similar approach and selected non- microfinance villages from the other 2 townships with low microfinance coverage; namely, 10 non-microfinance villages were randomly selected from each of these two townships.

Rural households were randomly selected in both microfinance villages and non-microfinance villages. In each of microfinance villages, we randomly selected 20 households. We firstly requested a client list from CFPA microfinance county branches. After grouping all the clients into two categories – first-time borrower in 2006-2007 and first-time borrower in 2008-2009 – we then

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[6] It is more precise to refer to it as a microcredit institution. However, to keep the term consistent with its official title, we retain the use of CFPA microfinance in this study.

randomly selected 10 farmers from each of these two categories. If the number of clients was fewer than 10, we selected all of them. In total, there were 749 households from microfinance villages with an average of nearly 19 samples per village. In each of the non-microfinance villages, we firstly requested a list of all the registered village households from the village committee office and randomly selected households from the list. We increased our samples per non-microfinance village to at least 30 households so that we were left with more non-microfinance households in the comparison group. In the end, 1,246 households were randomly selected from 40 non-microfinance villages, with an average of 31 samples per village. The total sample size is 1,995 households from 80 villages.[7]

In 2010, a group of enumerators were sent to the survey sites to conduct a face-to-face field survey. The enumerators were first trained by the research team to have a consistent understanding of the surveying questions. To ensure the reliability of multiple survey implementers, during a week-long training, the survey team made a pretest and each enumerator rehearsed the entire survey under the supervision. During the survey, each of the households was surveyed in private to avoid potential bias given the sensitivity of financial information. To the greatest extent of possible, the enumerators explained the questions in details to the respondents.

For each selected household, a questionnaire-based survey was conducted. We first asked each farmer whether or not his or her family received loans from the following sources: (a) CFPA microfinance; (b) formal credit institutions (i.e. ABC, ADBC, RCC, PSBC, VTB, RMF, and other formal credit institutions); or (c) informal network (i.e. relatives, friends, usury, cooperative, supplier, or other individuals who do not rely on formal contractual obligations enforced through a codified legal system). This definition of informal credit was used in existing studies (Guo & Jia, 2009; Turvey & Kong, 2010). Through these efforts, we are able to construct a longitudinal dataset that contains the information of credit access from various sources for each households over the period 2006-2009.

If any credit access was identified, we further asked for the details of each individual loan (for example, utilization, maturity, interest rate, repayment, etc.).[8] During the survey, we also surveyed details of household characteristics, housing and durable consumption assets. In this study, values of housing and durable consumption asset per capita (henceforth, asset per capita) is used to indicate the household wealth.[9]

Table 1 verifies that the randomly selected villages and households were comparable in many indicators prior to the service of CFPA microfinance. For example, when examining household

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[7] The response rate was high during the survey; only four rural households were not reached. There are several reasons for retaining a quality survey. First, in each village, we asked the village leader to coordinate the survey. This avoids large number rejections when knowing nobody in the village. Second, in each village, when farmers were selected but not being available at the moment, the enumerators usually reset the appointment and waited for additional days. Third, the microfinance borrowers are more accessible given the established network.

[8] Most informal credit were reciprocal credit through social network (relatives and friends) that specified no interest and repayment schemes. However, some informal credit (about 7 percent) requested interest. We did not investigate the identification of these private moneylenders and their rules of operation, as they are very sensitive topics that interviewees did not want to address. We find no rotating savings and credit associations and informal savings clubs.

[9] Durable consumption assets include furniture, electric appliances and others worth more than 500 yuan in 2005.

demographics (land size, age and education of household head) and village characteristics (e.g., average income per capita in village and road infrastructure), we find no significant difference between the microfinance villages and the non-microfinance villages in 2005, prior to the launch of the CFPA microfinance.

Table 1 Characteristics of sampled households and villages in 2005

	Microfinance villages	Non-microfinance villages
Observations	749	1246
Household level average		
Area of cultivated land (ha)	0.23	0.25
Household head's age (years)	46.8	49.3
Household head's education (years)	7.5	7.2
Village level average		
Income per capita (yuan)	2,744	2,830
Village with paved road (1=yes; 0=no)	0.5	0.7

Source: Authors' survey.

4. Credit Access of Rural Households

In Table 2, for farmers in both the microfinance and non-micro-finance villages, we divided all the samples into four categories according to their credit history from 2006 to 2009. For the farmers in the microfinance villages, these categories are: a1) microfinance only; a2) microfinance and formal credit; a3) microfinance and informal credit; and a4) microfinance together with both formal and informal credit. For the farmers in the non-microfinance villages, these categories are: b1) null credit; b2) formal credit only; b3) informal credit only; and b4) both formal and informal credit. Table 2 shows several interesting findings.

Table 2 Comparison of household's wealth in microfinance and non-microfinance villages in 2005[a]

	Microfinance villages				Non-microfinance villages			
	Microfinance only	Microfinance and formal credit	Microfinance and informal credit	Microfinance, formal and informal credit	Null credit[b]	Formal credit only	Informal credit only	Formal credit and informal credit
	(a1)	(a2)	(a3)	(a4)	(b1)	(b2)	(b3)	(b4)
Number (Percentage)	378 (50)	73 (10)	243 (32)	55 (7)	300 (24)	150 (12)	544 (44)	252 (20)
Asset per capita in 2005 (1,000 yuan)	29.3	33.4	22.8	29.4	18.5	30.9	15.5	23.0

[a] The columns refer to farmers' receiving loans from various sources from 2006 to 2009.
[b] Null credit refers to a situation when a rural household had no any credit access from a financial source in a year during 2006-2009.
Source: Authors' survey.

Microfinance came to villages where households were credit rationed by both formal financial institutions and informal credit network. For example, half of the microfinance clients did not receive credit from any other sources (column a1, Table 2). If we exclude microfinance, only 50% (10+32+7, columns a2+a3+a4, Table 2) of households received formal and/or informal credit. In other words, half of the households in the microfinance villages would be credit constrained during 2006 to 2009 if microfinance had not been delivered in these villages. As a comparison, only 24% of households in the non-microfinance villages were "null credit" households (column b1).

Formal financial institutions tend to target the rich rather than the poor. For example, in the microfinance villages, microfinance clients with formal credit but without informal credit (column a2) had the highest asset per capita (33.4 thousand yuan). Households with both formal and informal credit (column a4) had the second highest assets per capita (29.4 thousand yuan, column a4). The average assets per capita for microfinance clients who had no access to formal financial institutions were lower – 29.3 thousand yuan (column a1) for microfinance–only households and 22.8 thousand yuan (column a3) for microfinance clients who borrowed through informal network.

The poor were associated with informal credit more. The value of asset per capita was the lowest for those who accessed informal credit only. This fact held in both microfinance villages (22.8 thousand yuan, column a3, Table 2) and non-microfinance villages (15.5 thousand yuan, column b3, Table 2).

Without microfinance, the demand for credit in non-microfinance villages was largely met by informal credit. As shown in Table 2, nearly two-thirds (=44+20, column b3 and b4) of households sought loans through informal network. This may also imply that in microfinance villages, some households partially replaced informal credit with microfinance after CFPA microfinance began its operations in these villages.
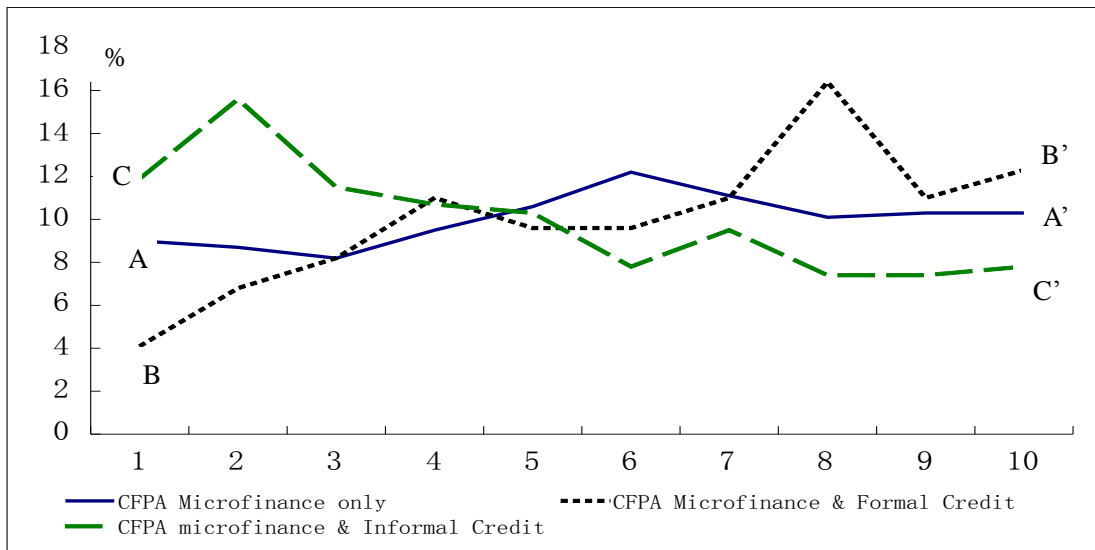

Figure 1 Outreach of microfinance, formal credit and informal credit
by household wealth of 10 deciles in microfinance villages

More interesting observations are presented in Figures 1 and 2. In microfinance villages, CFPA microfinance indeed covered households quite equally across different stratum of wealth. To simulate the targeting issues of different lending sources in microfinance villages, we plot the outreach of the three lending sources (i.e. microfinance, formal credit, and informal credit) against household wealth (in Figure 1). On axis X, we equally divide asset value per capita into 10 deciles.

Axis Y represents the percentage of households who received loans from the three sources. If the distribution is equal in each of the 10 deciles, the line stays at 10 percent horizontally. As shown in Figure 1, the solid line of microfinance is more flat at 10 percent (AA'), suggesting that rural households in each of the 10 deciles (in microfinance villages) had almost equal access to the microfinance. The dot dash line (BB') is steeper and the percentage indicated by BB' on the right-hand side of the chart is higher than the microfinance one (AA') and the informal credit one (CC'), suggesting that formal financial institutions target the wealthy. When looking at the left part of Figure 1, for the poorest 40% of rural households, the coverage of microfinance was nearly flat at the level of 10 percent (AA'). In comparison, informal network were primarily relied upon by the poorest 40 percent, as the grid dash line (CC') presents at the highest level on the left-hand side of Figure 1, and formal financial institutions are inclined to exclude the poor (BB').
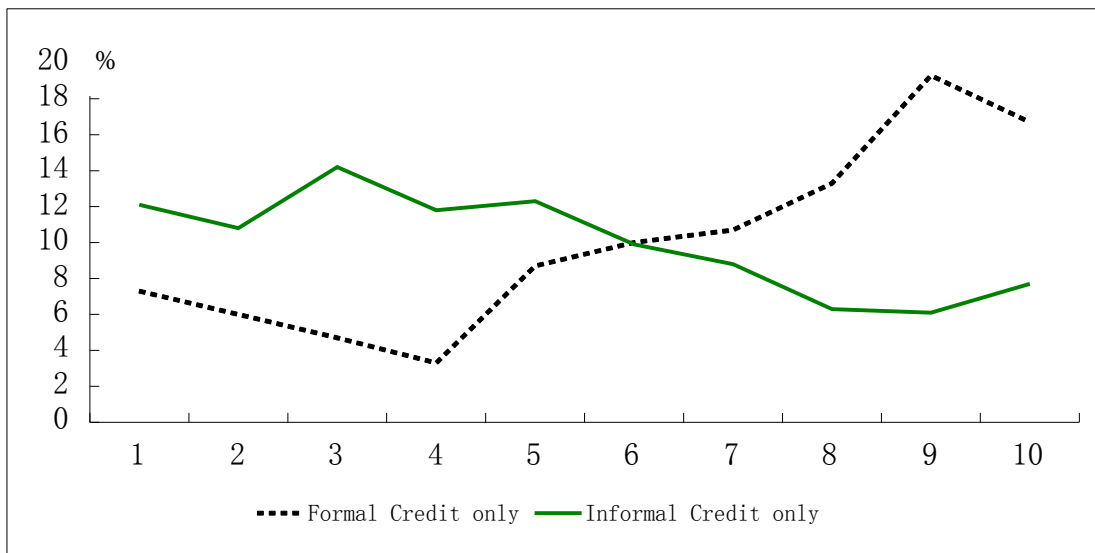

Figure 2 Outreach of microfinance, formal credit and informal credit
by household wealth of 10 deciles in non-microfinance villages

The distinct targeting strategy of formal financial institutions is also evident in the non-microfinance villages (Figure 2). The upward dash line shows that formal financial institutions excluded the poor (as the figures on the left-hand side of the chart are lower than 10 percent) and targeted more on the rich (as the figures on the right-hand side of the chart are higher than the solid line). The solid line of informal credit is downward and this means that poor farmers tended to borrow money through informal network.

During the survey, we also asked farmers about their perceived advantages of microfinance over informal credit; 37 percent of farmers in the microfinance villages said that credit through an informal network committed them to psychological and physical costs. Some farmers admitted that they often also assisted lenders in farming or other activities as an expression of gratitude. Others mentioned that to please the lenders they made every effort to deliver a thankful message to them. The indigenous trust and social ties of rural communities in China was found to be an important driving force that may crowd out microcredit (Turvey & Kong, 2010). Our study, however, finds that informal credit, even without interest, is by no means cost-free. Such a reciprocal loan through informal credit from friends and relatives always implies the obligation to returning favors.

5. Multivariate Analysis

In order to analyze how wealth and other demographic indicators affect households' access to different credit, a multivariate analysis is needed. In this section we first specify a multivariate model and define the variables. We then present and discuss the results.

5.1 Econometric Model

An econometric model of households' access to credit is specified as follows:

$$Y_{ijtk} = a_0 + a_1 * Asset_{ijt(t=2005)} + a_2 * Ind_{ijt(t=2005)} + \gamma * T + e_{ijtk}$$

where the dependent variable, Y_{ijkt} is household i who received credit k (microfinance, formal credit, informal credit, or zero credit – null credit) from village j in year t (2006, 2007, 2008 and 2009). The variable Y_{ijkt} is measured in two alternative ways: 1) whether or not the household received credit k (yes=1, no=0); 2) amount of credit received from k (in thousand yuan).

Our key independent variables of interest are: 1) $Asset_{ijt(t=2005)}$, which is the value of housing and durable consumption asset per capita (or asset per capita in thousand yuan) at the end of 2005; 2) $Ind_{ijt(t=2005)}$ represents other targeting indicators at both household and village levels prior to 2006 when the CFPA started the microfinance services in sampled areas. At the household level, we include *Age and Education* (years) of household head and *Cultivated Land* (hectare) of household. At the village level, we include two variables: *Average income per capita in village* measured in thousand yuan, and a dummy variable of *Village with paved road* (yes=1, no=0).

We also include three year dummies (T) to examine the general trend of credit access from 2006 to 2009. The year 2006 is dropped as the reference category. The symbol e_{ijtk} is the error term that includes all unobserved variables and the random noises. Descriptive statistics on all variables used in the regression are presented in Appendix A.

Different estimators are used to estimate the effects of household wealth and other targeting indicators on household's credit access from different sources. When the dependent variable Y_{ijtk} is a dichotomous choice, we use a Logit model. When the dependent variable is measured as the amount of credit received, we use a Tobit model because the variable contains censored values of zero.

Because all households in our samples in the non-microfinance villages did not receive any microfinance, during the estimation we separate the whole sample into two sub-samples and run the regression separately. That is, in the microfinance village, we run four equations of Y, namely microfinance, formal credit, informal credit, and null credit. In the non-microfinance villages, there are only three groups of households (formal credit, informal credit, and null credit).

5.2 Results of Estimations

The results of the multivariate analysis on microfinance villages are presented in Tables 3 and 4, and the results for non-microfinance villages are shown in Table 5. Estimated results show several interesting findings.

In the microfinance villages, the households' wealth status had no effects on access to microfinance. As shown in Table 3 (row 1 and column 1), the coefficient is not statistically significant, implying that ceteris paribus, wealth status does not affect farmers' receiving or refusing microfinance loans. The results hold when examining the effects of asset value on credit amount, as the coefficient is also not statistically significant (row 1, column 1, Table 4). These results suggest that the microfinance neither targeted the poor nor excluded them; rather, microfinance is neutral to the poor and the rich.

Contrary to microfinance, rich households had better access to and borrowed more from formal financial institutions in microfinance villages, which is consistent with the findings in other studies (Han, 2007; Jia et al., 2010). The coefficients of asset per capita are positive and statistically significant (0.001 and 0.006; row 1, column 2, Tables 3 and 4), suggesting that rich households tended to receive formal credit and to obtain more.

Table 3 Results of multivariate analysis on farmers' credit from different sources in microfinance villages during 2006 - 2009 (Logit model)

		CFPA microfinance	Formal credit	Informal credit	Null credit
		(1)	(2)	(3)	(4)
1.	Asset per capita	0.001	0.001[**]	-0.001[***]	0.001
	(1,000 yuan)	(0.19)	(2.21)	(3.84)	(0.75)
2.	Age (years)	0.001	-0.001	0.001	-0.001
		(0.35)	(1.06)	(0.03)	(1.05)
3.	Education (years)	0.003	-0.002	0.003	-0.002
		(0.84)	(1.25)	(1.00)	(0.45)
4.	Cultivated Land (ha)	-0.03	0.001	0.07[**]	-0.03
		(0.67)	(0.01)	(2.33)	(0.61)
5.	Average income per capita in	0.01	0.02[***]	-0.05[***]	0.01
	village (1,000 yuan)	(1.41)	(4.09)	(7.89)	(1.13)
6.	Village with paved road	-0.00	0.03[***]	0.02	-0.02
	(1=yes, 0=no)	(0.10)	(2.61)	(1.55)	(1.04)
7.	Year Dummy 2007	0.39[***]	-0.001	0.03	-0.25[***]
		(14.60)	(0.00)	(1.37)	(11.24)
8.	Year Dummy 2008	0.45[***]	0.004	0.05[***]	-0.31[***]
		(17.72)	(0.31)	(2.65)	(13.94)
9.	Year Dummy 2009	0.51[***]	0.02[*]	0.09[***]	-0.41[***]
		(21.10)	(1.80)	(4.61)	(19.69)
	Pseudo-R^2	0.113	0.029	0.046	0.077
	N	2,996	2,996	2,996	2,996

Notes: Absolute values of t-ratio in parentheses; *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.
Source: Authors' estimation.

The poor were inclined to borrow through informal network. The estimate coefficients of asset per capita are negative and statistically significant (row 1, column 3, Tables 3 and 4). This implies that when the poor need credit, they tend to borrow money from relatives/friends or usury.

In the non-microfinance villages, the effects of household wealth on credit access from both formal and informal sources are similar to that in microfinance villages. The coefficients are statistically significant and positive for asset per capita (0.001 and 0.03; row 1, columns 1 and 4, Table 5), suggesting that formal financial institutions targeted more wealthy households. The negative sign of asset per capita in the equation of informal credit (column 2, Table 5) illustrates that, in non-microfinance, poor farmers were more inclined to borrow through informal network, as the credit policies of the formal financial institutions were more preferential to the rich.

Table 4 Results of multivariate analysis on credit amount (1,000 yuan) from different sources in microfinance villages during 2006 - 2009 (Tobit model)

		CFPA microfinance	Formal credit	Informal credit	Null credit
		(1)	(2)	(3)	(4)
1.	Asset per capita	0.001	0.006[*]	-0.01[*]	0.001
	(1,000 yuan)	(0.46)	(1.96)	(1.96)	(0.75)
2.	Age (years)	0.002	-0.01	0.01	-0.001
		(0.39)	(0.90)	(0.35)	(1.09)
3.	Education (years)	0.02	-0.04	0.09	-0.002
		(0.85)	(0.74)	(1.18)	(0.58)
4.	Cultivated Land (ha)	-0.16	-0.16	1.72	-0.03
		(0.73)	(0.26)	(1.82)	(0.58)
5.	Average income per capita in	0.12[**]	0.39[***]	-1.21[***]	0.01
	village (1,000 yuan)	(23.13)	(3.60)	(6.78)	(1.01)
6.	Village with paved road (1=yes,	-0.07	0.71[**]	0.25	-0.02
	0=no)	(0.69)	(2.76)	(0.61)	(1.11)
7.	Year Dummy 2007	2.19[***]	0.04	0.78	-0.23[***]
		(13.96)	(0.11)	(1.32)	(9.86)
8.	Year Dummy 2008	2.78[***]	0.35	1.71[**]	-0.29[***]
		(17.76)	(1.02)	(2.96)	(12.10)
9.	Year Dummy 2009	3.28[***]	0.63	2.93[***]	-0.41[***]
		(20.97)	(1.87)	(5.18)	(16.34)
	Pseudo-R^2	0.060	0.012	0.015	0.051
	N	2,996	2,996	2,996	2,996

Notes: Absolute values of t-ratio in parentheses; *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.
Source: Authors' estimation.

The estimated results show that rural households' access to CFPA microfinance was also neutral to other household and village characteristics. For example, the coefficients are not statistically significant for all household characteristics (row 2-4, column 1, Tables 3 and 4), which means that the microfinance did not discriminate against households in terms of age, education and farm size. For village characteristics, except for average income per capita in the Tobit model (row 5, Table 4), all other coefficients are not statistically significant (rows 5-6, column 1, Tables 3 and 4). The microfinance did not differentiate between farmers who lived in distant villages. Nevertheless, while the average wealth of villages is not a factor that affects the operation of microfinance, when the households received microfinance, they did receive a larger amount of credit in wealthy villages (row 5, column 1, Table 4).

In the non-microfinance villages, we found that both formal and informal credit tended to target young and less educated farmers. For examples, the estimated coefficients are negative and statistically significant for age in both formal and informal credit equations in the non-microfinance villages (row 2, Table 5). The estimated negative coefficients for education in both formal and informal equations are surprising (row 3, Table 5), and may benefit from further investigation.

Targets of formal and informal credit differ in villages. The estimated coefficients are statistically significant and positive for average income of village and village with a paved road in the formal credit equation, while they are negative and mostly statistically significant in the

informal credit equation (rows 5 and 6, Tables 3, 4 and 5). These are expected, as formal financial institutions are normally located in relatively rich areas with solid infrastructure.

Our results further show that, while microfinance expanded rapidly in microfinance villages from 2006-2009, formal credit stagnated during the same time in the non-microfinance villages, and informal credit increased steadily. For example, the coefficients of the three-year dummies are positive and significant (row 7-9, column 1, Table 3). This means that, compared with 2006 and holding others constant, the percentage of farmers' borrowing from microfinance increased by 39 percent in 2007, 45 percent in 2008, and 51 percent in 2009; this implies a robust expansion of microfinance. Nevertheless, when examining the growth of formal credit in the non-microfinance villages, we found that formal financial institutions gradually withdrew their loan services to farmers in the studied areas, as the coefficient is negative for 2008 and 2009, and statistically significant and negative for 2009 (-0.03, row 9, column 1, Table 5). The estimated coefficient implies that the participation rate in formal credit programs in non-microfinance villages decreased by 3 percent in 2009 compared to 2006.

Table 5 Results of multivariate analysis on farmers' credit access and credit amount from different sources in non-microfinance villages during 2006 - 2009 (Logit and Tobit models)

	Received credit (Yes=1;No=0)			Credit amount (1,000 yuan)		
	Formal credit	Informal credit	Null credit	Formal credit	Informal credit	Null credit
	(1)	(2)	(3)	(4)	(5)	(6)
1. Asset per capita	0.001***	-0.002***	0.001	0.03***	-0.01	0.001
(1,000 yuan)	(3.56)	(4.66)	(0.80)	(5.83)	(1.50)	(0.86)
2. Age (years)	-0.003***	-0.004***	0.01***	-0.06***	-0.06**	0.01***
	(4.44)	(4.52)	(5.84)	(4.76)	(2.83)	(5.76)
3. Education (years)	-0.004*	-0.01***	0.01***	-0.02	-0.07	0.01**
	(1.94)	(2.71)	(3.24)	(0.36)	(0.97)	(3.24)
4. Cultivated Land (ha)	0.08***	-0.08**	-0.01	1.46***	-1.17	-0.004
	(3.81)	(2.36)	(0.20)	(3.30)	(1.37)	(0.14)
5. Average income per	0.11***	-0.05***	-0.02**	2.05***	-1.15***	-0.02*
capita in village (1,000	(15.31)	(5.25)	(2.56)	(11.81)	(4.41)	(2.56)
yuan)						
6. Village with paved road	0.09***	-0.04**	0.02	1.47***	-0.07	0.02
(1=yes, 0=no)	(5.26)	(2.51)	(0.95)	(4.21)	(0.15)	(0.92)
7. Year Dummy 2007	0.001	0.06***	-0.05***	0.06	1.43**	-0.05*
	(0.05)	(2.83)	(2.63)	(0.19)	(2.60)	(2.55)
8. Year Dummy 2008	-0.01	0.10***	-0.09***	-0.04	3.01***	-0.09***
	(0.73)	(5.35)	(4.62)	(0.13)	(5.53)	(4.54)
9. Year Dummy 2009	-0.03**	0.15***	-0.13***	-0.14	5.22***	-0.13***
	(2.08)	(8.05)	(6.53)	(0.42)	(9.70)	(6.42)
Pseudo-R^2	0.106	0.031	0.014	0.037	0.007	0.009
N	4,984	4,984	4,984	4,984	4,984	4,984

Notes: Absolute values of t-ratio in parentheses; *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.
Source: Authors' estimation.

6. Conclusion

In this study we examined and compared the relationship between household wealth (and other indicators) and farmers' access to nongovernmental microfinance, formal finance, and informal credit in rural China. The results show that, where nongovernmental microfinance has become available in less developed areas in rural China, it can expand rapidly. Although the clients of the NGO microfinance institutions are on average poorer than clients of formal financial institutions, they are a mixture of both the poor and the wealthy. Formal financial institutions, however, have not been able to meet the rapid growth of households' demand for credit in rural China. Indeed, there is evidence of gradual decreases in their loan service to households in poor areas. In the presence of large unmet demand for credit in rural China, an informal network becomes the primary credit source for individual households.

Recently, disputes have arisen about whether, as the global microfinance industry comes of age, it is abandoning its mission to serve the poor, something referred to as "mission drift" by Dichter and Harper (2007). Such a worry is by no means unwarranted, as ample evidence shows that microfinance brings benefits to wealthier households rather than poorer ones (Coleman, 2006; Kondo et al., 2008; Takahashi et al., 2010). This study presents evidence of a mixture in China, where its largest NGO for microfinance is neutral to all households without favoring any individual groups. As a non-for-profit MFI, the CFPA microfinance faces challenges in targeting the poor and particularly the ultra-poor. Nevertheless, when comparing formal financial institutions, NGO microfinance does help the poor who are rationed by formal financial institutions and the informal credit network.

The results of this study have two major policy implications. China should continue to support the NGO microfinance institutions as it has been mainly implemented in poor regions and can largely meet the rising demand for credit on the part of rural households. Second, poverty-oriented NGO microfinance should be supported based on the extent of its ability to target the poor. There is a global trend for microfinance to become commercialized, and China's microfinance industry is fueled by this trend (Cull et al., 2009; Zhang, 2011). Future study invites further exploration in commercialized microfinance and its possible "mission drift". More thorough evidence are needed to examine the financial practices for NGO microfinance that prevent from being pro-poor and inclusive. Future examination of these topics would have great value to donors, policy-makers and practitioners in microfinance.

Lastly, because of the ambitious nature of the goals but the high costs of data collection for all microfinance institutions, it is necessary to narrow the scope of the paper. In particular, this is not a study of the entire NGO microfinance in China, but of the largest NGO microfinance institutions, due to unavailable data about others. Moreover, since this is an ex post facto evaluation study, we could not create a baseline survey, a well defined control group, or other means of identification. Although retrospective panel data document fundamental events of credit history of rural households (McIntosh et al., 2011), more rigorous instruments of survey are crucial in discovering microfinance and their impacts.

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Appendix:

Descriptive statistics of major variables in the analysis

Variables	Mean	Std. Dev.	Observations
Microfinance (1=yes, 0=no)	0.14	0.36	1,995
Formal credit (1=yes, 0=no)	0.15	0.36	1,995
Informal credit (1=yes, 0=no)	0.31	0.46	1,995
Null Credit (1=yes, 0=no)	0.47	0.49	1,995
Amount of microfinance (1,000 yuan)	0.69	1.96	1,995
Amount of formal credit (1,000 yuan)	1.73	10.26	1,995
Amount of informal credit (1,000 yuan)	4.05	15.22	1,995
Asset per capita (1,000 yuan)	22.63	27.71	1,995
Age (years)	48.37	9.03	1,995
Education (years)	7.33	2.68	1,995
Cultivated Land (ha)	0.25	0.23	1,995
Average income per capita (1,000 yuan)	2.80	1.03	1,995
Village with paved road (1=yes, 0=no)	0.65	0.48	1,995

Source: Authors' survey and calculation.

Note: The total sample size is 1,995 households from 80 villages in the sample area.