



Microfinance through non-governmental organizations and its effects on formal and informal credit

Evidence from rural China

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Abstract

Purpose – Internationally, microfinance run by non-governmental organizations (NGOs) is often considered an important approach to meeting the credit demand of rural households, particularly among the poor. However, the perceived competitions with formal financial institutions and concerns about financial risks in the rural economy have impeded the development of microfinance by NGOs in China. Despite these concerns about NGO microfinance, little empirical evidence has been brought to prove them. The purpose of this paper is to provide empirical evidence of the relationship between NGO microfinance and farmers' demand for formal and informal credit in rural China.

Design/methodology/approach – The study is based on a household longitudinal data set consisting of 749 households from 40 microfinance villages in rural China. This study draws evidence from China's largest NGO microfinance. Out of the five county branches where China Foundation for Poverty Alleviation has launched institutionalized microfinance since 2006, the authors selected two of them. A random sampling approach was applied in surveying villages and households. In an effort to create impact assessments, the authors surveyed the detailed information on household characteristics and credit access during the period 2006-2009. A panel data is thus structured for the analysis.

Findings – The authors found that the demand for credit in rural China is immense and rising, as formal financial institutions have gradually moved away from less developed regions in rural areas. In its place, informal lending has become a primary source of credit for the poor. However, where NGO microfinance has become available, both formal and informal credit has slowed down. The development and expansion of NGO microfinance did stand up as a substitution for institutional lenders and informal financial networks.

Research limitations/implications – The findings have profound policy implications. First, since the development of NGO microfinance fill the demand for credit in rural China and poses low financial risk, the intellectual bias against NGO microfinance is unwarranted. In particular, the regulations that hamper the development of NGO microfinance should be corrected. Second, informal networks do not appear to be costless. Where NGO microfinance can substitute for them, it can mitigate the financial stresses related to the informal credit market.

Keywords Rural development, Rural finance

Paper type Research paper



1. Introduction

Credit is essential for rural development in a variety of ways. Credit promotes seasonal agricultural investments and adoption of technology (Gine and Klöpper, 2005). Better access to credit smoothes consumption (Rosenzweig and Wolpin, 1993). In the presence of an underdeveloped formal insurance system, credit cushions the risks to agricultural households (Udry, 1994). The availability of credit access is therefore occupying a central place in development strategies (Conning and Udry, 2007).

However, the rural credit market is much less developed in developing countries. It was estimated that roughly 40-80 percent of the population in developing economies lack access to formal financial services (Cull *et al.*, 2009). In rural China, despite the immense credit demand, a large number of farmers were not able to access to credit services (Han *et al.*, 2007). A recent study showed that 37 percent of the sample households in rural China in 2004 were self-discouraged by the high transaction costs related to bureaucracy of formal financial institutions (Jia *et al.*, 2010).

Microfinance from Grameen Bank has been shown as an important approach that can help rural households, particularly among the poor, to meet their demand for credit. Through the “joint liability” contract practiced in Grameen’s microfinance, the poor can be well targeted. Since the 1980s, the Grameen Bank mode has been quickly replicated in many developing countries. By 2006, microfinance had served about 100 million poor households (Cull *et al.*, 2009). Recently, rising evidence shows that microfinance has been an effective method of outreach to the poor and, at the same time, maintained financial sustainability (Cull *et al.*, 2011; Hermes and Lensink, 2011).

Internationally, non-governmental organizations (NGOs) are the major type of institution delivering microfinance in developing countries. Evidence shows that 45 percent of microfinance institutions in developing countries are NGOs (Cull *et al.*, 2009). Moreover, they covered 51 percent of all microfinance clients and 73 percent of the female microfinance borrowers from 2003 to 2004. NGO microfinance institutions are apt to play an increasingly large role in serving those with low incomes.

The development of NGO microfinance is intricate in China. Microfinance was introduced in China through international aid programs for poverty alleviation in the mid-1990s (Sun, 2004; He, 2004), but it had not been significantly scaled up. Instead, Rural Cooperative Foundations (RCFs), quasi-government credit organizations run mostly by local townships or villages, grew rapidly in the early 1990s. By 1996, the RCFs pooled 100 billion Yuan (Cheng *et al.*, 1998). Nevertheless, the stress of emerged financial risks and priority of government’s control over financial resources through state-owned banks eventually led to a decision to close RCFs in the late 1990s (Holz, 2001). Once bitten, twice shy. Since then, the government has been very cautious about NGO financial institutions in rural China. In that atmosphere, NGO microfinance has been perceived as posing uncontrolled financial risks and of undermining the existing formal financial institutions (Zhang, 2006). As a result, NGO microfinance has not been recognized by the legal framework as a financial institution. By 2008, the total loans outstanding for all NGO microfinance in China was only about 24 million USD (Wu, 2009).

Surprisingly, despite the concerns about the financial risk of NGO microfinance and competition with formal financial institutions, little empirical evidence has been

brought to prove them. One relevant study was conducted by Park *et al.* (2003). It compared the performance of governmental and NGO microfinance in China and found that the former performed poorly in targeting, financial sustainability and program impacts. The results imply that NGO microfinance is probably a replacement of non-performing credit programs of formal financial institutions to fill the unmet demand for credit in rural China.

Nevertheless, there has been little attempt to measure the impact of microfinance on rural households' credit access from formal and informal sources. Specifically, scholars and policy makers would like to know whether farmers' access to NGO microfinance affects lending by other financial institutions, and how NGO microfinance affects informal credit, a source of credit that is often considered risky.

The overall goal of this paper is to fill the above gap in the literature and to examine the effects of farmers' access to microfinance on their credit behavior from others. Specifically, we provide empirical evidence of potential effects of farmers' access to NGO microfinance on their borrowings from formal financial institutions and informal network. The findings have great implications to China's policy makers to revisit the role of microfinance in rural finance and reconsider the current regulations on the microfinance industry. Because of the ambitious nature of the goals and the high cost of data collection for all microfinance institutions, it was necessary to limit 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, and other means of identification. Instead, based on fundamental events of credit history of surveyed households, retrospective panel data were used[1].

To meet the goal and objectives of the study, the rest of the paper is organized as follows: In the next section, we provide a brief background on China's rural financial system and a review of microfinance in China. We believe that such a description is helpful in understanding the discussion and analysis in the rest of the paper. The following section describes sampling method and data. The next section presents results of descriptive and multivariate analyses. The final section concludes.

2. Microfinance in China

Formal financial institutions are dominant in China's rural financial system. They include Agricultural Bank of China (ABC), Agricultural Development Bank of China (ADBC), Rural Credit Cooperatives (RCC), Postal Savings Bank of China (PSBC), Village and Township Bank (VTB), Rural Mutual Funds (RMF), and various micro-lending companies (Jia and Guo, 2008). As the backbone of the rural financial system, RCC and PSBC provide saving and lending services to rural households. The others more specifically target industry, business and government-oriented lending (Zhang, 2011). All the formal financial institutions are supervised and monitored by China Banking Regulatory Commission (CBRC) and People's Bank of China (PBOC).

Microfinance was introduced in China in the early and mid-1990s, through a number of international aid projects on poverty alleviation (Sun, 2004)[2]. This was piloted by the Chinese government and then adopted by formal financial institutions. In December 2001, the Central Bank (the People's Bank of China (henceforth, PBOC)

issued “Guidance for the Management of RCC’s Microfinance Program” (henceforth, the Guidance 2001) and asked all RCCs to open microfinance to rural villages and townships. The PBOC was in charge of supervision and asked RCCs to pilot microfinance to farmers as an agricultural on-lending support. With its low interest rate (2-3 percent per annum), microfinance was regarded as a subsidy to farmers (Sun, 2004). In 2003, the State Council of China enacted the “Pilot Plan to Deepen the Reform of Rural Credit Cooperatives” to decentralize the decision making of financial viability for RCC to local government and to stimulate financial innovation. In the subsequent years, RCCs offered “jointly guaranteed microloans” similar to the Grameen group lending scheme, for small and medium enterprises (SMEs) and rural households. Before 2008, RCCs were the major microfinance practitioners in the formal financial system (Chan, 2010). Since 2008, PSBC has offered microloan services in China and overtaken RCCs as the largest formal financial institution providing loan services to individuals in rural economies (Zhang, 2011).

However, the microfinance programs conducted by formal financial institutions target entrepreneurs and exclude the poor. Through a household survey of the North China Plain, Jia *et al.* (2010) examined rural households’ credit access from both formal and informal sources. The authors found that the credit program of RCCs favored the rural elite and the wealthy. Park and Ren (2001) compared the performance of governmental and NGO microfinance in China and concluded that the former performed poorly in targeting, financial sustainability, and program impacts. The recently established PSBC microfinance focusses more on rural enterprises and large farms (Xie, 2010). The poor population is credit rationed by formal financial institutions due to their mixed characteristics of being commercialized and policy oriented (Han *et al.*, 2007).

Compared with the rapid expansion of commercial microfinance, the growth of not-for-profit NGO microfinance that targets the poor has stagnated in China. On May 4, 2008, the CBRC and PBOC jointly issued “Guidance for Piloting Micro-lending Companies” to direct capital into rural economy and to diversify the rural financial system, which has facilitated the development of commercial microfinance in China. By 2010, nearly 2,500 micro-lending companies had been established and the outstanding loan amounted to 197.5 billion RMB (Zhang, 2011). This accounted for approximately 8 percent of the total loan portfolio to rural households in China (Zhang, 2011)[3]. In comparison, by early 2010, the outstanding loans of NGO microfinance totaled only 0.34 billion Yuan in China (equivalent to 53.1 million dollar, Appendix 1), accounting for 0.2 percent of the household loans. NGO microfinance developed a narrow niche in China.

3. Data collection

The data used in this study are based on an impact assessment of China’s NGO microfinance. We selected research areas where microfinance by the China Foundation for Poverty Alleviation (CFPA microfinance, henceforth) was in operation. The CFPA microfinance was officially approved as a pilot service in 2001 and became independent (from the government) as a not-for-profit NGO institution in 2006, to provide microfinance in poor areas of rural China[4]. By 2010, the gross loan portfolio of CFPA microfinance accounted for more than 50 percent of the nongovernmental microfinance in China (Appendix 1, last row). CFPA microfinance is thus an interesting case for this study.

We took the following three steps to select the samples: First, out of the five county branches where CFPA has launched institutionalized microfinance since 2006, we selected two that were in nationally designated poverty counties and operate “group lending” practices. Second, based on the client database of CFPA microfinance, we selected 20 villages in each county where CFPA operated microfinance in early 2010 (henceforth, microfinance villages)[5]. Third, in each of the microfinance villages, we put all the clients into two groups, first-time borrower in 2006-2007 and first-time borrower in 2008-2009, and then randomly selected ten farmers in each of these two groups. If the number of clients was fewer than ten in one group, we selected all of them. In total, there were 749 households from 40 microfinance villages with an average of nearly 19 samples per village.

In an effort to create impact assessments, we surveyed the detailed information on household characteristics and credit access during the period 2006-2009. Our key interest was in determining the details of farmers’ credit access from various sources. In a questionnaire-based survey conducted in May 2010, we first asked farmers whether or not they had received loans in each of the past five years from: CFPA microfinance, formal credit institutions (i.e. ABC, ADBC, RCC, PSBC, VTB, RMF, and microfinance companies), and informal networks (i.e. usury, relatives, friends, and other individuals). If any credit was identified, we asked for further details of each individual loan by year (e.g. amount, utilization, maturity, interest rate, repayment, and other characteristics)[6]. For those years when household did not borrow from microfinance in later year(s), they are not identified as “microfinance” in that year(s).

Besides the quantitative information about farmers’ experience of credit access, we also surveyed their perception on the pros and cons of credit from different lending sources. These allowed us to study both farmers’ behavior and psychological perceptions. Lastly, we asked questions about farm size, crop, and livestock production, the value for all the durable consumption assets (namely, housing, furniture, electric appliances, and others), etc. Finally, we have a household data consisting of 749 households in each year of 2006-2009.

4. Credit access of rural households in China

The demand for credit is immense in rural China[7]. For example, more than 17 percent of households borrowed money from formal credit and 40 percent of microfinance clients borrowed money through informal networks during the period of 2006 and 2009 (Table I, column 1). Nearly a half of households had multiple sources of credit (row 5-7). The average amount of borrowing increased by almost three times from 2,143 Yuan in 2006 to 8,569 Yuan in 2009 (Table II). The demand for credit in rural China is immense.

CFPA microfinance expanded quickly and became the primary source of credit in the villages. As shown in Table I, only 10 percent of farmers participated in the CFPA microfinance program in 2006. The share increased to 43 percent in 2007 and then steadily rose to 57 percent in 2009. The average amount of borrowing from CFPA microfinance rose from 2,612 Yuan in 2006 to 5,695 Yuan in 2009 (Table II, row 6).

The dealing through formal financial institutions in the sample villages was stagnating. In 2006, approximately 7 percent of farmers received loans from formal financial institutions (Table I, row 1). This figure levels off until 2009 and the percentage of formal credit slightly increases to nine. Compared with the robust expansion of CFPA microfinance, farmers’ access to formal financial institutions in rural China was slack. This evidence is consistent with the findings in other studies

that show the diminishing service of formal financial institutions and the segmented credit market in rural China (Han *et al.*, 2007; Jia *et al.*, 2010).

Surprisingly, in the microfinance villages, farmers' reliance on informal credit seemed to be resilient. As shown in Table I (row 7), 15 percent of farmers borrowed from relatives, friends or other individuals in 2006 and the rate was higher than the borrowing from microfinance. Notwithstanding the robust expansion of the microfinance service, the percentage of borrowing through informal networks increases to 24 percent (row 7, Table I). When looking at the amount of credit portfolio, nearly half of farmers' borrowing were through informal networks during the period of 2006-2009 (Table II).

The breakdown of microfinance borrowers shows a likely synergistic of microfinance and others. The analysis shows that, although microfinance was the primary and sole source of borrowing to households in the village, the microfinance borrowers indeed searched for alternatives as complementaries at the same time. For example, in 2006, none of the microfinance clients borrowed from formal financial institutions at the same time (row 5 and 7, column 2, Table I). Nevertheless, the figure increased to six in 2009 (=4+2, row 5 and 7, column 5). The similar trend is observable for the combination of microfinance and informal credit; the figures show

	2006-2009 (1)	2006 (2)	2007 (3)	2008 (4)	2009 (5)
1. Formal credit	17	7	7	7	9
2. Informal credit	40	15	17	20	24
3. CFPA MF	100	10	43	50	57
		(0)	(5)	(20)	(34)
4. MF only	50	8	32	35	41
5. MF and formal only	10	0	3	2	4
6. MF and informal only	33	2	7	12	10
7. MF, formal, and informal	7	0	0	1	2

Notes: MF, CFPA microfinance. The total number of households is 749. The figures in the parentheses mean the percentage of households who borrowed from CFPA microfinance in the previous year(s)

Source: Authors' survey

Table I.
Percentage (%) of households with microfinance, formal credit, and informal credit in sample villages during 2006 and 2009

	2006	2007	2008	2009
<i>Household credit access (Yuan)</i>	2,143	3,884	6,857	8,569
CFPA MF	265	1,518	2,409	3,232
Formal credit	643	741	1,638	1,195
Informal credit	1,234	1,625	2,810	4,142
<i>Average loan size (Yuan)</i>	6,848	7,986	13,960	11,972
CFPA MF	2,612	3,563	4,836	5,695
Formal credit	9,450	10,889	22,726	12,789
Informal credit	8,483	9,507	14,318	17,431

Note: The number of household sample is 749

Source: Authors' survey

Table II.
Amount of credit access in sample villages during 2006 and 2009

a steady increase of borrowers with multiple borrowing from both microfinance and informal credit at the same time (row 6 and 7, column 2 and 5, Table I).

5. Multivariate analysis

Because other factors might also affect the observed association between the CFPA microfinance and farmers' borrowing from formal financial institutions and informal networks, multivariate analysis is needed. In this section, we first specify a multivariate model and explain the definitions of variables. We then present and discuss the results.

The model

The basic model of estimating the effects of microfinance on farmers' borrowing from other sources is specified as follows:

$$Credit_{ikt} = a_0 + a_1^*MF_{it/(t-1)} + a_2^*Year + Z + e_{it} \quad (1)$$

where the dependent variable, $Credit_{ikt}$ in Equation (1), is one case-specific variable ($k = 1, 2, 3$ and 4 for having formal credit only, having informal credit only, having both formal and informal credit, and no credit, respectively) for household i in year t ($t = 2006, 2007, 2008$, and 2009). As the dependent variable is a multiple choice variable, the Equation (1) is estimated by multinomial Logit model (MLOGIT). Such a model is estimated under a system that simultaneously considers different credit choices for farmers in a given time.

As the key variables of interest, MF_{it} is measured as a dummy variable and it equals 1 if household i received loans from the CFPA microfinance in year t , otherwise it equals 0. It is possible that access to microfinance in one year may have continued effects so that farmers substitute microfinance for alternatives in future borrowing, or farmers convert to other sources after the needs are cultivated by granted microfinance loans. As such, an alternative specification is to include the lagged version of the variable, $MF_{it(t-1)}$. The variables equal 1 in the case of receiving microfinance in year $t-1$, and equal 0 otherwise.

To explore the dynamics of farmers' credit behavior over time, we add a vector variable $YEAR$ that includes three dummy variables for years 2007, 2008, and 2009. This enables us to examine the general trend of farmers' changing behavior regarding credit while holding others constant. We also include several variables to control for household and village characteristics, such as age and education status of household head, female headed household, asset value per capita in 2006 and cultivated land area per capita in 2006, village passed by concrete paths in 2006.

Because of the nature of the dependent variables, in two sets of regressions, we use Logit model to account for this fact. Specifically, in the set of regressions that is trying to explain the correlation of microfinance and farmers' borrowing from other sources, we use a Logit model that includes the key independent variables of interest and the control variables (results are shown in columns 1 and 2, Tables IV and V). Nevertheless, it is possible that there are a number of non-time varying unobservable factors that could be correlated with the variable of interest (namely, $MF_{it/(t-1)}$). To account for this fact, we take the advantage of the panel nature of the data and include a set of regression (columns 3 and 4, Tables IV and V) that are estimated with fixed effect estimator to account for unobserved, non-time varying heterogeneity. Because MLOGIT does not have estimations of fixed effect, we estimate formal and informal

credit in two separate Logit models of fixed effects. In all these different specifications, the estimations are stable and robust.

The multivariate results

The estimated results of an examination of the relationship between the probability of accessing formal credit and microfinance show that microfinance did substitute for formal credit. The coefficients are negative but not significant (row 1, Table III), which suggests that *Ceteris paribus* farmers' decision making of borrowing from formal financial institutions is not simultaneous with the decision making of borrowing from CFPA microfinance. However, when a farmer borrowed from the microfinance in previous year, the probability for him or her of borrowing from formal financial institutions decreased in the current year – the coefficient is significant and negative (row 2, column 4, Table III). The results are robust using the fixed effect estimation, the substituting effects are 12 percent and the coefficient is significant (row 2, column 2, Table IV). The access to microfinance obviously substituted for formal credit in an intertemporal scenario.

Interestingly, when looking at the simultaneous correlation between the probability of borrowing from informal financial network and microfinance, we observe a synergistic relationship. As shown in Table IV (row 1, column 3), the coefficient of fixed-effects estimation is significant and positive, and this shows that *Ceteris paribus* farmers' decision of borrowing from microfinance institutions is positively correlated with borrowing through informal financial networks. In other words, when farmers in the sample villages were not able to fully fund their investments by using microfinance loans given the small amount, they searched for additional loans through the informal financial network instead from formal financial institutions.

From aspects of intertemporal choice, the analysis shows that the borrowing from microfinance in one year reduced the probability of formal credit in a later year. The coefficient of fixed-effect estimation is significant and negative (row 2, column 4, Table IV). This implies that *Ceteris paribus* farmers' borrowing from CFPA microfinance in a year reduced the probability of informal credit by 8 percent. In other words, once a farmer in the sample villages received microfinance loans, he (or she) was less likely to borrow through informal financial networks (such as friends and relatives) in the later years.

The coefficients of the year dummies reveal steady increases of informal borrowing and farmers' stagnating access to informal credit in the study area. The coefficients are not significant (row 3 and 4, Table III), implying null changes of accessing to formal credit amount the sampled farmers. This is consistent with existing studies which disclose that formal financial institutions gradually move away from individual loans to rural households but more often target rural industries (Han *et al.*, 2007). In comparison, the coefficients of estimating farmers' informal credit are positive and significant (rows 3-5, Table IV) and this demonstrates a steady increase of farmers' reliance on informal financial networks in the study area.

While there are several controlling variables in different sets of regressions, only several variables are shown to have a statistically significant effect on farmers' decision making of borrowing from formal and informal channels. The estimated coefficients of Village passed by concrete paths are significant and positive (row 11, Table III) and this means that the better access to road infrastructure in the sample villages, the higher possibility of farmers' borrowing from formal financial institutions. The institutional lenders in rural China targeted communities with better access to

Table III.
Marginal effects of multivariate analysis estimating the relationship between farmers' access to microfinance and to other credits during 2006 and 2009 using multinomial logistic models

	Formal credit only (1)	Informal credit only (2)	Both formal and Informal credit (3)	Formal credit only (4)	Informal credit only (5)	Both formal and Informal credit (6)
1. CFPA MF_t (Yes = 1; No = 0)	-0.00 (0.21)	0.01 (0.75)	-0.00 (0.24)	-0.02** (2.04)	-0.00 (0.20)	0.00 (0.24)
2. CFPA MF_{t-1} (Yes = 1; No = 0)						
3. Year dummy of 2007 (Yes = 1; No = 0)	0.00 (0.03)	0.02 (1.17)	0.00 (0.03)	0.00 (0.13)	0.03 (1.40)	-0.00 (0.03)
4. Year dummy of 2008 (Yes = 1; No = 0)	0.00 (0.14)	0.05** (2.22)	0.00 (0.53)	0.01 (0.77)	0.05** (2.46)	0.00 (0.40)
5. Year dummy of 2009 (Yes = 1; No = 0)	0.01 (0.49)	0.07*** (3.28)	0.02** (2.45)	0.02 (1.26)	0.07*** (3.53)	0.02** (2.27)
6. Age of household head (Year)	-0.00* (1.77)	0.00 (0.64)	0.00 (0.16)	-0.00* (1.73)	0.00 (0.64)	0.00 (0.15)
7. Education of household head (Year)	-0.00 (0.81)	0.01** (2.40)	-0.00 (1.61)	-0.00 (0.78)	0.01** (2.42)	-0.00 (1.62)
8. Female headed household (Yes = 1; No = 0)	0.05 (0.10)	0.09 (0.06)	-0.20 (0.02)	0.05 (0.12)	0.09 (0.07)	-0.19 (0.03)
9. Cultivated land area in 2006 (hectare)	-0.00 (0.05)	0.05*** (4.78)	-0.00 (0.55)	-0.00 (0.06)	0.05*** (4.77)	-0.00 (0.54)
10. Consumption asset per capita in 2006 (1,000 Yuan)	0.00 (0.89)	-0.00*** (3.31)	0.00 (0.36)	0.00 (0.89)	-0.00*** (3.31)	0.00 (0.35)
11. Village passed by concrete paths in 2006 (Yes = 1; No = 0)	0.03*** (3.51)	-0.02 (1.33)	0.01 (1.41)	0.03*** (3.50)	-0.02 (1.32)	0.01 (1.40)

Notes: The number of observations is 2,996. Absolute values of *t*-ratio are shown in parentheses. *, **, ***Statistical significant at 10, 5, and 1 percent level, respectively

Source: Authors' survey

	Formal credit (Yes = 1, No = 0)		Informal credit (Yes = 1, No = 0)	
	(1)	(2)	(3)	(4)
1. CFPA MF_t (Yes = 1; No = 0)	-0.02 (0.29)		0.07** (2.20)	
2. CFPA MF_{t-1} (Yes = 1; No = 0)		-0.12* (1.69)		-0.08* (1.85)
3. Year dummy of 2007 (Yes = 1; No = 0)	0.01 (0.08)	0.01 (0.08)	0.06 (1.27)	0.09** (2.12)
4. Year dummy of 2008 (Yes = 1; No = 0)	0.04 (0.51)	0.08 (1.03)	0.12*** (2.78)	0.19*** (4.52)
5. Year dummy of 2009 (Yes = 1; No = 0)	0.17** (2.41)	0.22*** (3.11)	0.22*** (5.69)	0.29*** (7.38)
n	420	420	968	968
Pseudo R^2	0.028	0.037	0.064	0.062

Notes: Absolute values of t -ratio are shown in parentheses. *, **, ***Statistical significant at 10, 5, and 1 percent level, respectively

Source: Authors' survey

Table IV. Results of multivariate analysis estimating the relationship between farmers' access to microfinance and to other credits during 2006 and 2009 using Logit fixed-effects models

infrastructure of road and information. In comparison, the coefficients are not significant (row 11, Table IV) and this reflects a neutral effect of road infrastructure on farmers' borrowing through informal financial networks.

Besides the village characteristics, we also observe the heterogeneous effects of household demographics on farmers' decision making of borrowing from both formal and informal channels. For example, none of the household characteristics is significant (Table III) but several variables (Education of household head, Cultivated land area, and Consumption asset per capita, Table IV) are significant. This suggests that the effects of household demographics on farmers' borrowing from formal financial institutions were neutral. Nevertheless, those farmers who borrowed through informal financial networks in the sampled villages were relatively poor and in larger farm size.

Discussion

The relationship between microfinance and farmers' demand for credit from other sources can be explained by the characteristics of loans through different channels. As shown in Table V, being small and rapidly accessible, CFPA microfinance meets farmers' demand for small-sized investments in farming (purchases of seed, fertilizer, or feedstuffs for livestock farming) and small business in non-agriculture (wholesale and retail). The average maturity of a microfinance loan was less than one year; formal credit was generally for mid- or long-term investments. In addition, microfinance was extremely handy as it took 4.5 days on average to receive the cash after application. The figure was much longer for formal credit (21 days in average). Where the delivery of formal credit is slack, microfinance (like CFPA microfinance) can be substituting and complementary.

Not-for-profit NGO microfinance can substitute for informal credit to some extent. Farmers in poor areas of China rely heavily on rapidly accessible and flexible informal networks, to meet their credit demand for weddings, funerals, tuition fees, health care and housing expenditures. As shown in Table V, 63 percent of informal credit was used

Table V.
Characteristics of credit by
sources in sample villages
in 2006-2009

	Microfinance	Formal financial institutions	Informal financial network
Sample	1,202	226	566
<i>Characteristics</i>			
Loan maturity (month)	11.9	11.1	10.5*
Waiting days since application until received the loan (days)	4.5	21	5.1
Specified repayment rate (%)	100	100	1.9
Overdue repayment (%)	0.1	5.3	30.7 ^a
<i>Usage of credit (%)</i>			
Agriculture	77	64	42
Non-agriculture	21	20	14
Living expenses	10	27	63

Notes: ^aApproximately 94 percent inform credit did not specify duration
Source: Authors' survey

for such living expenses. This channel is indeed easily accessible (5.1 days on average from application to receipt of loans) and flexible (specifying no repayment date). The indigenous trust and social ties of rural communities in China was found to be an important driving force that may crowd out microcredit in other studies. For example, Turvey and Kong (2010) found that the significance of informal borrowing between friends and relatives (67 percent) reflects a overarching role of social trust for informal lending; formal credit and microfinance cannot compete with informal lending. However, we in this study disclose that the use of informal credit was by no means costless. Such a reciprocal loan through informal networks always implied the obligation of returning favors. When we asked farmers what advantages they perceived from microfinance, as opposed to informal credit, 37 percent in the microfinance villages said that credit through an informal network committed them to psychological and physical costs (Table VI). Some had to farm for the lenders as an expression of gratitude. Others had to make every effort to deliver a thankful message to the lenders. The presence of NGO microfinance was thus being welcomed by 65 percent of farmers who consider it the foremost lending source.

The financial risk related to NGO microfinance was low. As shown in Table V, the percentage of overdue repayment for CFPA microfinance was only 0.1 percent. The figure was much higher with formal and informal credit (5.3 percent and 30.7 percent, respectively). More importantly, the size of NGO microfinance was rather small. The overall loan outstanding of the entire NGO microfinance was only 53.1 million dollars by early 2010 (Appendix 1). Considering that the total loan portfolio to rural households was 26.5 billion dollars by the end of 2010 (Zhang, 2011), NGO microfinance contains low financial risks in the rural financial system, when it is well designed and regulated.

6. Conclusion

This study examined the relationship between microfinance and farmers' demand for credit from other sources in poor areas in rural China. We found that the demand for credit in rural China is immense and rising, as formal financial institutions have gradually moved away from less developed regions in rural areas. In its place, informal

	CFPA MF only (1)	CFPA MF and formal credit ^a (2)	CFPA MF and informal credit only (3)
Number of samples	378	128	243
<i>To whom you will first go for loans</i>			
CFPA microfinance	80	56	45
Formal credit institutions	1	15	1
Informal network	17	29	54
<i>Advantages of CFPA microfinance</i>			
Being fast and convenient	89	80	77
No obligation of owing others	37	46	31

Notes: ^aColumn (2) refers to households who received any loans from formal financial institutions over the period of 2006 and 2009, including those who received loans from both CFPA microfinance and informal sources or those who received loans all the three sources (CFPA microfinance, formal financial institutions, and informal networks)

Source: Authors' survey

Table VI.
Farmers' perception of
applying for credit from
various sources (%)

lending has become a primary source of credit for the poor. However, where NGO microfinance has become available, both formal and informal credit has slowed down. The development and expansion of NGO microfinance did stand up as a substitution for institutional lenders and informal financial networks.

The findings have profound policy implications. First, since the development of NGO microfinance fill the demand for credit in rural China and poses low financial risk, the intellectual bias against NGO microfinance is unwarranted. In particular, the regulations that hamper the development of NGO microfinance should be corrected. Second, informal networks do not appear to be costless. Where NGO microfinance can substitute for them, it can mitigate the financial stresses related to the informal credit market.

Internationally, the trend is toward the commercialization of microfinance. (Christen and Drake, 2002; Cull *et al.*, 2009). There is rising concern that such a process may exclude poor populations. This study of NGO microfinance is important because commercial microfinance is developing and expanding rapidly but not-for-profit NGO microfinance is confined in China. This case study sheds light on the performance of China's NGO microfinance by drawing evidence from household survey data. So far there are very few empirics that compare the outreach of the NGO and commercial microfinance. Future study on this would have great value. It can enrich the current literature and guide the policies.

Notes

1. Although some studies evaluate the effectiveness of microfinance ex ante to implementation (Kaboski and Townsend, 2011; Karlan and Zinman, 2010, 2011), recent research on microfinance shows that, when designed appropriately, retrospective panel data are able to provide accurate measures of the impacts (McIntosh *et al.*, 2011).
2. These projects were mainly from the World Bank, United Nations Development Program, International Fund for Agricultural Development (IFAD), Australian Government's Overseas Aid Program (AUSAID), Canadian International Development Agency (CIDA), German Agency for International Cooperation (GTZ), and Ford Foundation.

3. By December 2010, the total outstanding loans (from all sources) to rural households was 2,604 billion RMB. This figure accounted for 5 percent of the loan portfolio in the entire rural economy (Zhang, 2011).
4. In the first four years, the program was a charity project and was only piloted in poor rural areas of Sichuan, Shanxi, Guizhou and Fujian provinces. Capital was subsidized and the business was run as a government project.
5. As a large initiative of impact assessment, in the study area, we also selected 20 villages where there were no clients of the CFPA microfinance (non-microfinance villages) to construct a control group for comparison. Nevertheless, given the objective of this study (namely, the relationship between microfinance and formal and informal credit), we confine the samples to rural households in the microfinance villages.
6. We asked regarding the period of 2005-2009 as CFPA microfinance was started in 2006. The year prior to 2006 is lagged to capture the effects of credit access in a previous year.
7. Given the sampling strategy, the immense demand for credit by the households might be overstated in this study. In fact, there is much heterogeneity in credit demand in rural China. For example, Turvey *et al.* (2012) found that nearly 20 percent of farmers had inelastic demands for credit. The authors concluded a full spectrum of targeted credit policies that consider differences across farms.

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Table A1.
Gross loan portfolio of the
major nongovernmental
microfinance institutions
in China, 2003-2009
(million USD)

Microfinance institutions ^a	2003	2004	2005	2006	2007	2008	2009
Association for Rural Development of Poor Areas in Sichuan (ARDPAS)			0.3	0.4	1.1		
China Foundation for Poverty Alleviation (CFPA-MFI)		1.6	2.0	3.6	9.6	15.7	27.5
Shaanxi Chunhua Women Development Association (CHWDA)						0.1	
Chifeng Zhaowuda Women's Sustainable Development Association (CZWSDA)	0.4	0.5	0.6	0.8	1.0	1.2	1.6
Dingxi Anding Microfinance Center (DAMC)						0.6	
Harbin Bank							6.4
Jia Xian Women's Sustainable Development Association (JXWDA)						0.2	
MicroCred – CHN							9.0
Ningxia HuiMin Micro-Finance (NHMCL)					0.9	1.2	
Opportunity International China (OI China)		0.1	0.2	0.2	0.4	0.5	0.5
PATRA Hunchun		0.1	0.2	0.2	0.3	0.2	0.3
PATRA Yanbian							
Shaanxi Pucheng Women Sustainable Development Association (PCWDA)					3.7	0.3	
Rishenglong						4.5	5.1
Sichuan Yilong Huimin County Bank						1.0	
XI Xiang Women's Development Association (XXWDA)						0.3	
Shaanxi Yuyang Women Development Association (YYWDA)						0.3	
Total	0.4	2.3	3.2	5.2	17.0	27.9	53.1
Percentage of CFPA microfinance for gross loan outstanding (%)	0	70	61	69	56	56	52

Notes: ^aWe do not include PSBC (Postal Savings Bank of China) and Heman-Puyong, which are listed in the MIX database. While the former has been commercialized as a state bank, the latter – wrongly spelled by MIX and the correct one is Hanan-Puyang – is affiliated to Rural Credit Cooperatives, a backbone of rural formal financial institution in China

Source: Microfinance information exchange (www.mixmarket.org/)

	Mean	SD
Formal $Credit_t$ (Yes = 1; No = 0)	0.08	0.26
Informal $Credit_t$ (Yes = 1; No = 0)	0.19	0.39
CFPA MF_t (Yes = 1; No = 0)	0.40	0.49
CFPA MF_{t-1} (Yes = 1; No = 0)	0.26	0.44
Year dummy of 2007 (Yes = 1; No = 0)	0.25	0.43
Year dummy of 2008 (Yes = 1; No = 0)	0.25	0.43
Year dummy of 2009 (Yes = 1; No = 0)	0.25	0.43
Age of household head (Year)	46.80	9.29
Education of household head (Year)	7.47	2.62
Female headed household (Yes = 1; No = 0)	0.04	0.20
Cultivated land area in 2006 (hectare)	0.78	0.63
Consumption asset per capita in 2006 (1,000 Yuan)	7.58	9.88
Village passed by concrete paths in 2006 (Yes = 1; No = 0)	0.54	0.50

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Table AII.
Descriptive statistics of
major variables

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