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Microfinance, self-employment, and entrepreneurs in less developed areas of rural China

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ABSTRACT

China is experiencing a transformation, as vast numbers of rural laborers move toward off-farm employment. In such a transformation, the role of credit is unclear. The overall goal of this study is to examine the impact of access to credit by rural households on employment decision-making by rural laborers in China. Based on longitudinal data concerning 1992 rural households in China, this study finds that the use of credit is immense in rural China. Among different types of credit, access to microfinance significantly increased farmers' time working on self-employment activities, especially for the poor households. Credit from formal financial institutions and informal networks had no such effect.

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1. Introduction

Economic transformation around the world has been a remarkably uniform process of movement of agricultural laborer to off-farm employment. The declining share of output and labor force in agriculture is pervasive in both developed and developing countries. Development in many aspects is defined by the transformation of the labor force — from agriculture to non-agriculture (Huffman, 1991). Available off-farm employment creates job opportunities, promotes entrepreneurs, and contributes to poverty reduction by enabling engagement in income-generating activities in developing countries (Kijima, Matsumoto, & Yamano, 2006; Zhang et al., 2006).

The expansion of off-farm employment has clearly been happening in China. The exact numbers vary perhaps due, in part to the exact definition of off-farm labor. However, during the 1980s and 1990s, approximately 200 million in the rural labor force found jobs off the farm, with the increased number at more than 6 million per year (NBS, 2010). Estimates of the rise in the share of the rural labor force employed in off-farm sectors range from 35% to 40% during that time. By the mid-2000s, of China's more than 500 million-strong rural labor force, 265 million (more than 50%) had off-farm employment (Zhang, Huang, Li, & Rozelle, 2008).

Off-farm laborers in China are employed mainly in wage earning and self-employment. Between the early 1980s and 2000, the number of rural laborers who left home and found wage-earning jobs in the city (or another rural area) rose from 9.3 million to 56 million (de Brauw, Huang, Rozelle, Zhang, & Zhang, 2002). During that time, the number of rural laborers who began small in self-employing enterprises rose from 26.1 million to 79.5 million. While self-employment expanded quickly in the 1980s and

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1990s, it was falling by the 2000s. At the same time, wage-earning migration increased steadily and became the primary off-farm employment in rural China (Wang, Huang, Zhang, & Rozelle, 2011).

While the share of self-employment decreases as an economy grows, its role in poor areas is important. In poor economies, more than one billion people run their own businesses. Most of them do this because they have no other option. Some of them do this well enough to survive and self-employment incubates the nascence of entrepreneurs (Banerjee & Duflo, 2011). Self-employment should not be regarded as an inferior sector, as it functions as a self-help safety net in less developed areas (Woodruff, 2007). Huang, Wang, Zhi, Huang, and Rozelle (2011) found that the probability of losing jobs during the financial crisis in 2008 was 10% higher for wage-earning laborers than for self-employed laborers. Self-employment can cushion a crisis when the economy is depressed.

While off-farm employment plays an important role in agricultural transformation, credit constraint has been considered a primary obstacle. Knight and Li (1997) examined the rural industrialization in rural villages of China and concluded that capital market imperfections caused unequal opportunities for off-farm employment. The costs associated with the search for a job and initial moving expenses could present barriers to migration for poor farmers (Rozelle, Li, Shen, Hughart, & Giles, 1999; Zhao, 1999). Investing in self-employment also demands capital funds (Li, Rozelle, & Zhang, 2004). The lack of credit has been found to be the primary constraint to the empowerment of the poor through engaging in off-farm employment during agricultural transformation.

Credit rationing is pervasive in rural China, particularly for the poor. The state-owned formal financial institutions play dominant roles in providing institutionalized loans in the rural economy. However, these programs, target primarily rural industry and entrepreneurs (Han, 2007). Empirical studies reveal that credit programs of formal financial institutions provide credit mainly to the wealthy (Jia, Heidhues, & Zeller, 2010). Given the large unmet demand for credit in rural China, the rural poor heavily depend on informal credit networks (i.e. friends, relatives, and usurers).

Alongside the constraints in both formal and informal credit markets, the development of microfinance in China is just developing. Microfinance was introduced in China in the mid-1990s, through international aid programs for poverty alleviation (Sun, 2004), but it had not been significantly scaled up. The stress of emerged financial risks and the priority of government's control over financial resources through state-owned banks caused depression of microfinance in the late 1990s (Holz, 2001). Since the early 2000s, China's government has started to promote microfinance through formal financial institutions and non-governmental organizations (NGOs). Governmental microfinance has performed poorly in targeting, financial sustainability and program impacts (Park & Ren, 2001). NGO microfinance is expected to be pro-poor.

For a long time, restructuring the rural financial market has been viewed as the central policy in China's rural development strategy. The No.1 State Council document for each year between 2004 and 2010 highlighted a liberalized and diversified rural financial market. While these policy initiatives clearly encouraged a shift in the structure of the rural financial market, it is unclear what the role of the rural credit market is, in affecting the rural labor market. Specifically, we would like to know how farmers' access to different forms of credit affects their decision-making about employment. Does credit from different sources—institutional lender or formal credit, informal credit network or microfinance—have different impacts on farmers' length of employment in farming, wage earning, and self-employment? Which credit source has a larger effect on farmers' off-farm employment, particular self-employment?

The overall goal of this paper is to fill the gap. Specifically, we focus on two objectives. First, we examine farmers' credit access from various sources and their time allocation to different activities. Second, we analyze and compare the effects of credit access from different sources on farmers' off-farm employment in the wage-earning and self-employed sector.

Because of the ambitious nature of the goals and the high cost of data collection for the entire microfinance sector, we necessarily must limit the scope of the paper. In particular, in this study we examine mostly farm-level credit access in the North and Northeastern sections of China; we did not survey enterprises and non-farm residents. Second, this is not a study of all microfinance in China. We focus on China's NGO microfinance, as it has more implications for the rural poor. Third, as an ex post evaluation study, we could not create a baseline survey, a well-defined control group, or other means of identification. Instead, based on fundamental events of the credit history of surveyed households, retrospective panel data were relied on.[1]

To meet the goals and objectives of the study, the rest of the paper is organized as follows: To begin with, we introduce data collection and sampling. The next section describes the dynamics of farmers' credit access and off-farm employment in the sample villages. We precede the multivariate analyses with a conceptual basis of self-employment. Then we estimate the impacts of credit access on farmers' off-farm employment time. In the final section, we draw our conclusions.

2. Data and research design

To compare farmers' credit access from various sources, we needed study areas that had both microfinance and other forms of financing. A random sampling strategy might have kept us from having enough samples of microfinance, due to its small coverage and regional differences. Therefore, we selected areas where China's largest NGO microfinance—CFPA microfinance—operated.[2]

As the largest NGO dealing in microfinance, CFPA microfinance was transformed from a governmental pilot program to an institutionalized NGO. From 2000 through 2004, CFPA piloted microfinance services in poor rural areas of Sichuan, Shanxi, Guizhou, and Fujian provinces. During those five years, it was by nature 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

[1] Although some studies evaluate the effectiveness of microfinance ex ante to implementation (Kaboski & Townsend, 2011; Karlan & 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, Villaran, & Wydick, 2011).

[2] CFPA is registered with the Ministry of Civil Affairs and under the superintendence of the State Council Leading Group Office of Poverty Alleviation.

(from the government) and was institutionalized as an NGO microfinance institution to provide loan services in poor areas of China. Its legal status was identified as a not-for-profit nongovernmental organization. By 2010, CFPA microfinance delivered services in 39 counties of 11 provinces and its gross loan portfolio accounted for 53% of the total NGO microfinance in China (www.mixmarket.org).

Counties were selected in areas where CFPA microfinance had operated since becoming an independent microfinance institution. During its first year of being institutionalized in 2006, microfinance services were implemented in five counties in two provinces. From the five county branches, we selected two for our study, as we wanted to control the heterogeneity of branches established in different years. That also allowed us to make more observations over the period from 2006 to 2009. We selected counties that met the following criteria: 1) they operated group lending between 2006 and 2009, one of the major characteristics of microfinance; and 2) each was a nationally designated poverty county, as this study focuses on poor areas of rural China. Eventually, we chose *Huaian* (HA) in *Hebei* province and *Xinbing* (XB) in *Liaoning* province for this study.

Clusters and households were selected on a random basis. From the CFPA client database, we selected 20 villages where CFPA operated microfinance (henceforth, *microfinance villages*). To construct a control group for comparison, we also expected to select equal numbers of villages where there were no clients of CFPA microfinance (*non-microfinance villages*). In each of the microfinance villages, we randomly selected 20 CFPA microfinance clients. If the number of clients was fewer than 20, we selected all of them. In total, there were 746 households from 38 microfinance villages with an average of nearly 20 samples per village. In each of the non-microfinance villages, we increased our samples per village to 30 households so that we had more non-microfinance households as a comparison group. In the end, 1246 households were randomly selected from 42 non-microfinance villages with an average of nearly 30 samples per village. Our total sample is 1992 households from 80 villages.

For purposes of impact assessment, we designed surveys for both village leaders and households. The survey was conducted in May 2010. Village leaders surveyed included village characteristics (for example, size of land, population, average income, road infrastructure, village social capital, availability of formal financial institutions, etc.) in the period between 2006 and 2009. The household survey included questions about credit access from various sources, farm size, crop and livestock production, household investments in both agriculture and non-agriculture, and all the durable consumption assets (namely, housing, furniture, electric appliances and others) over the period of 2006 to 2009.[3]

At the individual level, we collected detailed information on employment of each laborer within each household between 2006 and 2009. For each member of the labor force in a household (older than 16 and younger than 65 in the year of 2006), we asked about his (or her) off-farm experience in the past five years. Once a wage-earning (in local or distant locations) or a self-employment was identified, we asked the type of work, location, and estimated days engaged in wage-earning or self-employment. In a similar way, we asked farmers to estimate their time locations for farming and unemployment.

Regarding credit, we focused our survey on sources and amount of farmers' credit. We first asked a farmer whether or not he/she had received any loan in the past 5 years from formal financial institutions, an informal credit network (i.e. relatives, friends, usury or a private person), or CFPA microfinance.[4] When credit was identified, we further asked the details of each individual loan (for example, utilization, maturity, interest rate, repayment, etc.).

Finally, the sample includes 5414 laborers from 1992 rural households. All the 5414 laborers had employment information for the entire 4 years between 2006 and 2009.[5] There were 1985 individuals from *microfinance villages* and 3429 from *non-microfinance villages* (Table 1, row 1).

Household characteristics presented no significant difference between household samples in microfinance and non-microfinance villages before CFPA started the microfinance program in the study area. For example, the farmers in two types of villages had nearly the same educational attainment (7 years; Table 1), and the size of their farms was small-scale (0.2–0.3 ha). Although the average net income per capita in microfinance villages (2600 Yuan) was slightly lower than that in non-microfinance villages (2800 Yuan), both belonged to the poor villages as the incomes were far below the national average (3255 Yuan) in 2006 (NBS, 2010). All these show that the microfinance clients and non-microfinance households were not distinct before CFPA microfinance started to operate in 2006. This allowed us to conduct a quasi-experimental impact assessment.

3. Household credit access in study areas

The use of credit is immense in rural China and the source of credit is diversified. As shown in Table 2, for all the household samples, 38% of them borrowed money in 2006, and the number rose to 62% in 2009. Farmers relied on more than one credit channel. For example, 7% of farmers ($=4+16+25-38$) relied on multiple sources in 2006, and the share increased to 12% in 2009. Not only the participation increased, the average loan size for any credit source also almost doubled between 2006 and 2009 (Table 2).

Microfinance expanded quickly in the sample villages. The participation rate for CFPA microfinance increased from 4% in 2006 to 21% in 2009 (Table 2). The average loan size for CFPA microfinance was small — only 2612 Yuan in 2006, about one fourth of a

[3] To reflect households' credit access prior to the commencement of microfinance, we also surveyed the record of credit in the year 2005 for all the surveyed households. This enables us to generate all credit variables by a one year lag, as shown in the estimations of multivariate analysis.

[4] In this study, the defined formal financial institutions include the 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 microfinance companies.

[5] We also constructed an unbalanced data panel. The results are not significantly different from the balanced one. The results are available upon readers' request.

Table 1
Characteristics of microfinance and non-microfinance villages in study areas in 2006.

	Microfinance villages	Non-microfinance villages
Samples	1985	3429
Average net income per capita in village (1000 Yuan)	2.6	2.8
Cultivated land area per household (hectare)	0.2	0.3
Average age of laborers (years)	42	43
Average education of laborers (years)	7.3	7.1

Source: authors' survey.

Table 2
Credit access of households in studied villages from 2006–2009.

	2006	2007	2008	2009
Percentage of households (%)				
All credit	38	51	56	62
CFPA microfinance	4	16	19	21
Formal credit	16	16	15	15
Informal credit	25	29	33	38
Average loan size (Yuan)				
CFPA microfinance	2612	3563	4836	5660
Formal credit	8542	9216	13047	14235
Informal credit	8928	9991	12941	17533

Source: authors' survey.

loan based on formal credit. The loan size increased by almost two times between 2006 and 2009 (from 2612 Yuan to 5660 Yuan, Table 2).

Informal networks became the primary source to meet farmers' demands for credit. As shown in Table 2, about 25% of farmers borrowed through informal networks (namely, relatives, friends, other individuals, or usury) in 2006. The number increased to 38% in 2009, with an annual increase of more than 4 percentage points from 2006 to 2009. The sizes of informal credit loans were relatively large. The average loan size of informal credit (8928 Yuan) was slightly larger than formal credit (8542 Yuan), and four times higher than that of the average microfinance loan in 2006 (2612 Yuan). It increased to 17,533 Yuan in 2009.

Unlike the robust expansion of microfinance and increased reliance on informal financial networks, farmers' access to formal credit was stagnating in sample villages during the period from 2006 to 2009. The incidence rate of formal credit stagnated at around 16% in 2006 and 2007 and then fell slightly to 15% in 2009. This suggests a diminishing outreach by formal financial institutions in less developed areas in rural China.

Loans from the three sources were different in loan maturity and repayment scheme. As shown in Table 3, microfinance and informal credit often had short maturity periods (less than one year), but microfinance loans specified greater repayment frequency (monthly or quarterly). Most transactions involving informal credit specified no repayment scheme at all. Being short term with low (or even no) interest rate, informal credit is less contract-based, relying instead on social norms. In comparison, formal credit is for relatively longer terms and specifies a term of repayment.

Credit from different sources had different usages. Informal credit, largely used to meet farmers' living expenses (namely, health care, education, housing, or social activities), accounted for 60% in 2006–2009 (Table 3). Loans from microfinance and formal financial institutions were used mostly for productive activities. For example, being small, microfinance loans provided farmers more flexible capital to invest in activities like rural wholesale or retail business or animal husbandry that usually require relatively small initial or working capital. More importantly, the frequent repayment scheme of microfinance requires that the investment be quickly turned over. Relatively longer term and fixed term formal credit is suited for farmers' investments with less periodic activities that demand lump-sum capital (e.g., transportation, crop farming and others). The different usage of credit from various sources suggests a segmented credit market in rural China.[6]

4. Off-farm employment in study areas

In this section we investigate farmers' time allocation and its likely relationship with farmers' credit. To do this, we divided farmers' time (days) into farming, off-farm employment and not working (or not engaged in any production activity). For off-farm employment we further disaggregated it into wage-earning and self-employment.

[6] The results are consistent with existing studies, suggesting that our sample is representative of the coverage of formal and informal credit. For example, Jia et al. (2010) found 11% of farmers on the north China plain borrowed money from formal financial institutions in 2004. The participation rate regarding informal credit was 30% in 2004. Loans involving formal credit were mostly used in productive utilization (67%) and those involving informal credit were used in consumption (61%).

Table 3
Characteristics of loans from different sources during the period 2006–2009, China.

	Microfinance	Formal credit	Informal credit
	(1)	(2)	(3)
Samples	1202	1238	2559
Annual interest rate (%)	18.3	10.2	12.1[a]
Loan maturity (month)	11.9	20.2	9.6 [a]
Repayment schedule (%)			
Monthly/quarterly repayment	97.4	4.9	0
Terminal repayment	2.6	95.1	19
No repayment scheme	0	0	81
Loan usage (%)			
Agriculture	69	56	21
Crop	32	39	11
Livestock	37	17	10
Non-agriculture	23	28	19
Wholesale and retail	13	11	6
Transportation	6	8	5
Others	4	9	8
Living expenses	8	20	60

Source: authors' survey.
[a] 93% of the recipients of informal credit did not specify duration and interest rate.

The survey results show that the amount of off-farm employment time was substantial and increased significantly from 2006 to 2009. As shown in Table 4 (column 1), rural laborers spent 34% of their time (123 days) on farming on average, and there was no change between 2006 and 2009. The average percentage of off-farm days, including both wage-earning and self-employment, was 26% in 2006 (=21 + 5; Table 4), and the figure increased to 29% (=23 + 6). Such an increasing trend is consistent with the national representative survey (NBS, 2010) and previous studies (Knight, Deng, & Li, 2011; Wang et al., 2011). For example, Wang et al. (2011) found that 45.3% of the rural labor force was either fully or partially employed in off-farm activities, and the figure increased to 62% in 2008. Obviously, off-farm employment became an important means for rural laborers to diversify their income in China.

Further break-down demonstrates that wage-earning becomes the primary type of off-farm employment. As shown in Table 4, the rural labor force spent 21% of the time on wage-earning and only 5% of labor time on self-employment in 2006. The wage-earning time increased by 2% from 2006 to 2009. An interesting observation is that, although the increase was small, self-employment time also increased by 1% during that time. Given the booming demand for wage earning laborers in urban China, particularly in coastal areas, and given that the majority of self-employment occurred locally (see discussion later), the jobs created or work time expanded through self-employment in poor regions has had important implications, not only for farmers' income but also for farmers' entrepreneurship.

Although wage-earning is the primary off-farm employment, it increased mostly among rural households who received no credit or among borrowers through the informal network. As shown in Table 5, over the period from 2006 to 2009, wage-earning time increased by 9 days for informal borrowers (in column 4) and by 11 days for non-borrowers (in column 5). The increase was modest for microfinance (only 5 days). This suggests that fewer laborers went for wage earning when the household received loans from microfinance. The design of microfinance might explain this. For microfinance borrowers, given the short term of maturity, they might find that the regular repayment (monthly or quarterly) is costly for a wage-earning migrant.

Self-employment time increased significantly for microfinance clients. As shown in Table 5 (column 1), the time rural laborers' spent in self-employment increased by 8 days from 2006 to 2009. The figure was two times as high as that for borrowers using formal financial institutions or an informal network (column 2 and 3). Small microfinance loans provided farmers with more flexible capital to invest in activities such as rural wholesale, retail business or animal husbandry that usually require relatively small initial or working capital. More importantly, the frequent repayment scheme of microfinance requires that the investment be quickly turned over.

Self-employment was indeed different from wage-earning in terms of industry and location. As shown in Table 6, wholesale and retail were the primary industry that self-employed laborers engaged in, while wage-earning laborers were mostly hired in

Table 4
Time allocation (%) of household laborers in 2006 and 2009.

	2006	2009
Farming	34	34
Wage-earning	21	23
Self-employment	5	6
Not working	40	37

Source: Authors' survey.

Table 5
Changes of time allocation (days) of household laborers by different credit sources.

	Microfinance	Formal credit	Informal credit	None-credit
	(1)	(2)	(3)	(4)
Farming	0	1	−1	1
Wage-earning	5	7	9	11
Self-employment	8	4	4	3
Not working	−13	−12	−13	−14

Note: the figures are based on calculations over the period of 2006 and 2009.
Source: authors' survey.

construction, mining, and the service industry. Meanwhile, the percentage of wage workers hired outside the home counties (38%, column 2, Table 6) was higher than that of self-employed laborers — only 12% went outside the home county (column 3). Most of the self-employment took place within local townships. That difference remained the same in 2009.

Self-employed laborers were also different from wage-earning migrants in individual and household characteristics. As shown in Table 6, while there was no significant difference of age and attained education between self-employed and wage-earning laborers, for self-employed laborers, the percentage (42%, column 3, Table 6) of female laborers in the household was higher than those wage-earning migrants (30%, column 2). This implies that in female labor-dominated households in rural China, self-employment has become their major off-farm opportunity. Meanwhile, we also find that the average household assets per capita were higher for self-employed laborers than for wage-earning laborers. This implies that the relatively rich people in the poor area in rural China engaged more in self-employment.

5. Multivariate analysis of self-employment and credit access

5.1. Model specification

Because there are many different factors that might be simultaneously affecting the observed association between rural households' labor decisions of time use and credit access from different channels, a multivariate analysis is needed. In this section, first, we specify a multivariate model that seeks to isolate the impact of credit access on farmers' time allocation. Second, we present the results.

Table 6
The characteristics of off-farm employment in 2006 and 2009 in HA and XB, China.

	2006			2009		
	All off-farm laborers	Wage-earning only	Self-employed only	All off-farm laborers	Wage-earning only	Self-employed only
	(1)	(2)	(3)	(4)	(5)	(6)
Samples	2293	1874	368	2526	2016	448
By industry (%)						
Service industry	25	27	19	27	29	21
Construction and mining	22	26	4	21	25	3
Wholesale and retail	11	2	51	12	3	47
Transportation and communication	8	7	13	9	7	14
Agri-related industry	19	21	8	17	19	8
Others	16	17	6	16	18	6
By location (%)						
Local township	57	51	79	55	49	78
Other townships within the county	10	11	8	10	11	8
Outside the county	33	38	12	35	41	14
Individual and household characteristics						
Age of laborer (years)	40	39	41	38	38	40
Education of laborer (years)	8	8	8	8	8	8
Percentage of female laborers (%)	32	30	42	33	31	42
Asset value per capita (1000 Yuan)	7	7	10	10	9	16

Note: Column (2), (3), (5) and (6) do not include off-farm laborers who engaged in wage-earning and self employment; there were 51 laborers in 2006 and 62 laborers in 2009, respectively.
Source: authors' survey.

The basic model we use to examine the relationship between credit access and off-farm employment is specified as follows:

$$Y_{ijt} = a_0 + a_1 * MF_{i(t-1)} + a_2 * FF_{i(t-1)} + a_3 * INF_{i(t-1)} + \gamma Z + e_{it} \quad (Model\ 1).$$

Where the dependent variable, Y_{ijt}, represents the days that the i^{th} household spent on farming ($j = 1$), wage-earning ($j = 2$), self-employment ($j = 3$), and unemployment ($j = 4$) in t^{th} year (t = 2006, 2007, 2008 or 2009).

As the key independent variable of interest, on the right side of equations, $MF_{i(t-1)}$ refers to the i^{th} household's access to CFPA microfinance in $t-1$ year (i.e., 2005, 2006, 2007, 2008). It is a binary variable and equals 1 when farmers received loans from CFPA microfinance in year $t-1$; otherwise it equals 0. In a similar way, $FF_{i(t-1)}$ and $INF_{i(t-1)}$ are also binary variables and indicate the i^{th} household's access to formal and informal credit in $t-1$ year, respectively. We specify all credit variables by a one year lag, because we try to reduce the likely endogeneity of these variables.[7]

It is possible that farmers' credit access through various channels affects employment time for different scales of wealth (that is asset value and land size) Therefore, we also included a set of interaction terms of credit access with two variables (*Asset value per capita in 2006* and *cultivated land area per capita in 2006*).

To capture the general trend of labor time used in different activities, we included three year dummies (for the years 2007, 2008, and 2009) and omitted 2006, as it is set as the reference category. Importantly, the year dummies are used to capture the dynamics of wages over the years and the impacts on laborers' employment decision-making. Individuals with some innate entrepreneurial ability in the labor market are assumed to maximize their income by finding a trade-off between wage-earning and self-employment (Wang et al., 2011). This implies that if wages are rising, people may choose to work more in the wage earning sector.

Finally, it is possible that there are a number of non-time varying unobservable factors that could be correlated with the independent variables of interest (namely credit access), and may have an independent effect on farmers' employment time. To account for this, we take advantage of the panel nature of the data and specify the regressions that are estimated with fixed-effects estimators.[8]

5.2. Multivariate analysis of self-employment and credit access: the empirical findings

The results of the multivariate analysis for the correlation between credit access and rural individuals' employment time are mostly consistent with descriptive statistics (Table 5). The results are also logically compatible with expectations. The major findings are summarized in the rest of this section.

The regression results show that CFPA microfinance increased rural households' labor inputs into self-employment. The coefficient is positive and significant (Table 7, row 1, column 3), implying that ceteris paribus accessing to microfinance led to increased self-employment time for rural households in the study area. The estimated coefficients between access to microfinance and the interaction terms (household wealth and land size) are negative but not statistically significant (though they are nearly significant).

Similar evidence is observed for the employment time in farming of microfinance borrowers. The estimated coefficient is positive but not significant (Table 7, row 1, column 1). Nevertheless, the positive and significant coefficient on the interaction between microfinance and asset value per capita demonstrates that the increase in farming time for CFPA microfinance borrowers comes mainly from the poor farmers.

Such heterogeneous effects of borrowers' wealth are observed for formal and informal credit as well. The significant coefficients on the interaction terms (row 6 and column 3) suggest that *ceteris paribus* smallholder farmers with less cultivated land per capita increase self-employment time. In comparison, relatively wealthy farmers employ themselves when borrowing through informal credit networks.

The coefficients of the year dummies demonstrate that off-farm employment steadily increased in the study areas over the period of 2006 and 2009. For example, the coefficients increase from 3.92 in 2007 to 7.82 in 2008 and eventually to 8.71 in 2009 (Table 7, column 2), suggesting robust wage-earning migration in the study area. Similar upward trends can be observed for self employment, but the magnitude was smaller (column 3). The coefficients were negative (and significant for dummy 2009), suggesting that, compared with 2006 and holding others constant, farming time kept dropping from 2006 to 2009.

In sum, the results of our analysis suggest that microfinance did play a role in increasing rural households' self-employment in China's less developed areas. Furthermore, the findings of the fixed effects regression show that such an effect is more evident and larger for small farmers. Although informal networks became the primary source for meeting farmers' demand for credit in poor areas, the informal borrowers who had more self-employment time were relatively rich. In fact, the findings suggest that microfinance is effective at creating entrepreneurs in less developed areas of rural China.

The distinct effects of credit access on farmers' off-farm employment can be explained by the loan characteristics from different sources. Being small, rapidly accessible, and with flexible collateral (group formation), microfinance meets demands for

[7] We recognize that even using these lagged variable specifications, interpretations of the estimated coefficients should be taken with caution.

[8] Vast empirical studies show that rural households' engagement in self-employment is endogeneously determined by individuals' entrepreneurial abilities, which vary with such characteristics as gender, age, educational attainment, and wealth (McKernan, 2002; Menon & Rodgers, 2011; Wang et al., 2011; Woodruff, 2007; Zhang et al., 2006). These results suggest that there are heterogeneities for individuals' occupational choices. It also implies that, in the case of an absent or imperfect labor market, the profit function of self-employment (or the decision making of occupational choice) is nonseparable from household utility considerations. Nevertheless, in this study, these factors and other non-time varying observables are controlled in fixed effects estimations.

Table 7
Results of multivariate analysis estimating the effect of credit access on household laborer's time allocation in 2006–2009 by using fixed-effect OLS models.

		Labor time (days)			
		Farming	Wage earning	Self-employment	Not working
		(1)	(2)	(3)	(4)
1	$Microfinance_{t-1}$ (yes = 1; no = 0)	1.62	−1.01	4.23[a]	−4.84[b]
		(1.38)	(0.47)	(3.24)	(2.40)
2	$Microfinance_{t-1}$ * asset value per capita in 2006	−0.18[a]	−0.05	−0.13	0.36[a]
		(2.60)	(0.35)	(1.64)	(2.94)
3	$Microfinance_{t-1}$ * cultivated land area per capita in 2006	0.61	1.67	−6.30	4.02
		(0.18)	(0.26)	(1.64)	(0.67)
4	Formal credit $_{t-1}$ (yes = 1; no = 0)	1.89	−2.31	2.18	−1.76
		(1.49)	(0.99)	(1.55)	(0.81)
5	Formal $credit_{t-1}$ * asset value per capita in 2006	−0.10	0.17	0.04	−0.11
		(0.95)	(0.88)	(0.34)	(0.61)
6	Formal $credit_{t-1}$ * cultivated land area per capita in 2006	−4.88	0.42	−13.96[a]	18.42[a]
		(1.44)	(0.07)	(3.71)	(3.16)
7	Informal credit $_{t-1}$ (yes = 1; no = 0)	0.27	−0.61	−0.89	1.23
		(0.24)	(0.31)	(0.74)	(0.66)
8	Informal $credit_{t-1}$ * asset value per capita in 2006	0.04	−0.20	0.20[b]	−0.04
		(0.52)	(1.26)	(2.07)	(0.29)
9	$Informalcredit_{t-1}$ * cultivated land area per capita in 2006	−0.95	0.09	0.99	−0.13
		(0.34)	(0.02)	(0.32)	(0.03)
10	Year dummy of 2007	0.17	3.92[a]	1.00[b]	−5.09[a]
	(yes = 1; no = 0)	(0.38)	(4.80)	(2.03)	(6.67)
11	Year dummy of 2008	−0.25	7.82[a]	2.32[a]	−9.88[a]
	(yes = 1; no = 0)	(0.55)	(9.29)	(4.56)	(12.57)
12	Year dummy of 2009	−0.83[c]	8.71[a]	4.37[a]	−12.25[a]
	(yes = 1; no = 0)	(1.80)	(10.21)	(8.48)	(15.35)
13	Constant	123.42[a]	76.72[a]	17.83[a]	147.03[a]
		(340.82)	(115.08)	(44.28)	(235.88)
	N	21656	21656	21656	21656
	adj. R^2	−0.333	−0.323	−0.323	−0.308

Note: The figures in parentheses are absolute t ratios of estimates.
Source: authors' survey.
[a] Statistically significant at 1%.
[b] Statistically significant at 5%.
[c] Statistically significant at 10%.

small-amount investments in small self-run businesses. As revealed in this study and many others (Han, 2009; Jia et al., 2010), formal financial institutions gradually move away from individual loans to rural households but more often target rural industries. Informal credit is mostly used for consumption (weddings, funerals, health care, tuition, or housing expenditures). This helps us understand the insignificant correlation between farmers' off-farm employment and credit access through formal and informal credit channels.

6. Conclusions

This study examined farmers' credit access in rural China and its impacts on labor decisions concerning off-farm employment. Based on longitudinal data consisting of individuals from 1992 rural households over the period between 2006 and 2009, the research finds that the use of credit has increased rapidly in rural China. While off-farm employment is rising and wage-earning migration is the primary form of off-farm employment, self employment increased significantly for microfinance clients. Institutional lending and credit through informal networks, however, had no such effect.

China has been experiencing an agricultural transformation as vast numbers of rural laborers have moved to off-farm employment, which has promoted entrepreneurship and contributed to poverty reduction. However, the lack of credit has become a primary constraint for the poor who want to start up and engage in off-farm activities, tapping economic gains through diversifying income sources. NGO microfinance can be an effective tool to link the poor to off-farm employment, and especially to build up the entrepreneurs by promoting self employment. This case study sketches such a scenario.

The findings of this study have important policy implications. Indeed, NGO microfinance has been perceived by the Chinese government as containing high risks, and thus its development in China is regulated and depressed (Zhang, 2006). In recognition of the large potential of NGO microfinance to promote farmer's entrepreneurship and other off-farm engagement (as shown in this study), the intellectual bias and regulations against NGO microfinance should be re-visited. Many rural labors may find difficulties in migrating to urban for wage-earning and the majority of rural self-employment by the poor is small business. NGO microfinance, being small, is effective in promoting agricultural transformation in rural China.

Internationally, microfinance is being commercialized in developing countries. Such a transformation has great implications in rural development as these new lending modalities played an increasing role in low-income areas (Cull, Demirguc-Kunt, &

Morduch, 2009). However, there is also worry about the commercialization of microfinance as this might abandon its mission to serve the poor (Christen & Drake, 2002). In China, microcredit companies and non-bank financial institutions are also emerging and the loan outstanding reached 470 billion Yuan in 2012 (He, 2013). However, these financial innovations are motivated by commercial interests and targeted mainly on rural enterprises (Jiao, 2013). While the comparison between the impacts of NGO and commercial microfinance on the poor is interesting, it is beyond the scope of this study.

Finally, the findings of this study are not sufficient to confirm or disprove the dynamism of self employment in rural China. Indeed, the paper provides evidence that the self-employed in rural China are young, educated and entrepreneurial. A small amount of loans can promote rural households' engagement in self employment. On the other hand, we find that much of the self employment in sample villages was by own-account workers and some of the businesses run by the poor had low profitability. There is a stark difference between own-account workers whose businesses are basically a self-help safety net and the self-employed who hire paid workers, implying great and genuine entrepreneurship. A notable observation from field work is, although credit access helps the poor to start businesses that can be profitable, the small business owner is by no means a natural entrepreneur. Some of the self-employed remain small and are doomed to be unprofitable. As Banerjee and Duflo (2011) pointed out, entrepreneurship is too hard in poor economies and financing is not the only barrier.

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Appendix A. Descriptive statistics of all variables used in the regression analysis

	Mean	Std. Dev.
Farming time (days)	123	107
Wage-earning time (days)	81	127
Self-employment time (days)	20	72
Not working time (days)	141	115
Microfinance $_{t-1}$ (Yes = 1; No = 0)	0.09	0.29
Microfinance $_{t-1}$*asset value per capita in 2006	0.68	3.44
Microfinance $_{t-1}$*cultivated land area per capita in 2006	0.02	0.09
Formal credit $_{t-1}$ (Yes = 1; No = 0)	0.15	0.35
Formal credit $_{t-1}$ * asset value per capita in 2006	1.01	3.73
Formal credit $_{t-1}$ * cultivated land area per capita in 2006	0.03	0.13
Informal credit $_{t-1}$ (Yes = 1; No = 0)	0.28	0.45
Informal credit $_{t-1}$ * asset value per capita in 2006	1.26	3.89
Informal credit $_{t-1}$ * cultivated land area per capita in 2006	0.07	0.16
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

Source: authors' survey.

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