Informal Lending Amongst Friends and Relatives: Can Microcredit Compete in Rural China?

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Since 2006 China's central government has opened up its financial markets to foreign Microfinance Institutions (MFI). The idea is that by allowing MFI's to operate, competition between Rural Credit Cooperatives (RCC), Postal Savings Banks, and Agricultural Banks would lead to increase access to credit, economic efficiencies and growth in rural agriculture, and efficiency within the financial system in underserved markets. Microfinance as it is understood today refers to a broad range of services-loans, savings, insurance, remittance transfers, and pensions offered to rural and urban poor through a variety of commercial banks, cooperatives, credit unions, specialized banks, post offices and retail chains (Meyer and Nagarajan 2006; Zeller 2006 provides a summary of the characteristics of different types of microfinance institutions). It is towards this broader definition that Chinese policy in the past few years has been directed. The formalization of microcredit in China started in 1994 when the Chinese Academy of Social Sciences piloted a Grameen-style NGO (Park and Ren, 2000; Tsai 2004). This quickly led to numerous new initiatives by at least 17 MFI reportedly making micro loans of 1,000 Yuan or less and with none exceeding 4,200 Yuan. The interest rates on these early models was about 12% when poverty alleviation loans could be obtained through RCC for about 2.88%., although the bulk of poverty loans did not reach the poor. The pilots were targeted to the poor, designed to maximize repayment rates through group liability, dynamic incentives, and regular repayment, and directed to bring net benefits to the poor while not crowding out other (formal) sources. Early models such as the Yucheng 'Funding the Poor' Cooperative obtained funds from international donors, including Grameen. By 1996 the Chinese Government established government run MFIs making micro-loans to 50,000 households, and by 1998 22 provinces had microfinance programs with about 600 million Yuan lent (Park and Ren, 2000; see also Tsai 2004, Pin 2003 and He 2006b). By January 2008 loans outstanding from all rural cooperative financial institutes in China were 1,226,000 million Yuan and amongst them, micro credit loans outstanding for farm households was 203,800 million Yuan, group lending outstanding was 135,100 million Yuan, and 7.742 million farm households were provided microloans loans(China Agriculture Department, 2009).

Whether or not current reforms will work as intended is an open question (Guo and Jia, 2009) . Several problems prevail. First as described in Meyer and Nagarajan (2006) there is a long history of microfinance and microcredit to which China is a late entry and may not have the necessary institutions to support large scale microcredit initiatives beyond what currently exists with RCCs. Second, in order for MFI's to operate in a sustainable way in China and elsewhere, they must establish interest rates that capture the marginal cost of capital to be lent; high transactions costs of dealing in rural areas; the probability of default which has been argued to be lower for poor farmers than wealthier farmers; and agricultural risks which would have greater residual liquidity effects for poor farmers than rich ones. Third, the allocation of user rights to common lands is haphazard at best with little opportunity for gains in size economies. The commune/collective mentality while obviously familiar to RCCs may be disconcerting to foreign MFI's that have a preference to lending to those with collateral, whether pledged or not. On this latter point Boucher et al (2008) argue that even the clarification of property rights and the titling of land, may not reach the desired results. For these poor farmers the collateral requirement would be so high, and the chance of losing title so great, that they would in essence be risk rationed out of the MFI market. Fourth, Hartarska and Holtmann (2006) raise the issue of competition, a point that we heed in this paper. But other obstacles such as the role of deposit taking rather than the predominant institutional structure for non RCC MFIs may not be trivial. Adverse selection can be discouraged with group lending, but in China the remoteness of farms makes monitoring of group behavior difficult. Likewise, moral hazard deals with the unobserved behavior of the borrower. In our focus on trust we view moral hazard contextually as an inverse function of trust so the more trustworthy an individual is the less likely strategic default of one form or another will take place. The microcredit activities of Rural Credit Cooperatives in China take this to an extreme. First they place few restrictions on how a microloan is used, which limits monitoring only to the sequencing and timing of repayment, and second the institutions of Village Credit Committees (VCC) ensure trustworthiness, address issues of non-payment through social means, and provide the basic structure for dynamic incentives such as future loans. The VCC also supply the basic mechanism for reputation-updating which is critical in a multi-period context

(Hartarska and Holtmann, 2006). By all accounts the local VCC are very effective and could provide RCCs with a competitive advantage over emerging MFIs in rural areas.

The fifth problem, which is more to the point of this paper, is that informal borrowing amongst farm household friends and relatives in rural areas is incredibly strong and culturally directed. For MFI's to be successful, they must find ways to tap into the indigenous trust of communities and exploit it through the formation of member-based institutions (Zeller 2006). Furthermore, the interest charged amongst friends and relatives is for the vast majority, 0%. This could be problematic. The socially beneficial interest rate that could be charged by MFIs' is where the marginal benefits as a function of household income or wealth equals the marginal costs. The rate of interest at this optimum crowds out usurious money-lenders but will likely be higher than centrally planned interest rates on microloans originating with RCCs (Turvey and Kong, 2008). Thus, one of the first obstacles is that RCCs given microcredit authority could crowd out MFIs in a given market. More important however, is that it is not entirely clear that informal lending amongst friends and relatives does not crowd out RCC lending? Most surely, if informal lending and borrowing amongst friends crowds out Rural Credit Cooperatives then most surely they would crowd out MFI's as well.

The relationship between informal and formal lending and their possible effects on the emerging MFI markets in China is the focus of this paper. More specifically this paper investigates the strength of trust and other factors in informal lending and formal lending. The paper employs results from an original survey (2007 and 2008) of over 1,500 farm households in , Shaanxi, Gansu and Henan Province in China that investigated credit choice and trust in relation to farm size and household income. We find that informal lending amongst friends occurs in more than 67% of households that have some form of debt. Only one in three households used formal lending with only a miniscule number using money-lenders and none using MFI credit.

The main conclusion as it relates to MFI's in China is that success should not be assumed as a matter of course. We believe from the analysis of the data thus far that the informal ties between friends and relatives not only crowds out Rural Credit Cooperatives

that make micro loans, but most surely these same ties will crowd out registered MFI's as well. In terms of microcredit policy, MFI executives should investigate the strength of informal lending between friends and relatives in rural areas as one of the key determinants of success or critical success factors.

Informal Lending in Rural China

Microcredit is not new in China, but its form has changed dramatically over the years. Formally, Microcredit in China agricultural sectors, as the term is currently understood, has been around since at least 1994, but prior to that gross inefficiencies in the allocation of credit to agriculture and the poor gave rise to a structure of informal finance that pervades Chinese rural culture. The first rural credit cooperative (RCC) was founded in northern China in 1923 (Myers 1970) and the idea and implementation spread to such an extent that by 1939 rural credit cooperatives were being established by the government throughout China (Fei and Chang 1945). During this time period also started the rural credit societies (RCF) which is described as a sort of savings society into which a member pays in order to receive a fixed sum in the future (e.g. 100 Yuan)[2]. Despite frequent failures and the characterization of RCFs by Tsai (2004) as latent Ponzi schemes, the RCFs can be viewed as the first efforts in China to advance a system of microcredit with group membership.

The reasons for the emergence of RCCs and RCFs cannot be overlooked. In much of rural china any form of formal credit was virtually nonexistent. Capital was held by government officials and moneylenders, and the internal circulation of money was more the rule than the exception. Buck (1937a,b) recorded on average that about 39% of farm

[2] Anyone in need of money could organize a society and collect 10 members. At the first meeting the organizer will collect a total of 100 Yuan in prescribed amounts from all members and over the subsequent 10 periods, will repay into the pool an amount exactly equal to 100 Yuan. At the second meeting a subscriber receives 100 Yuan and this is treated as a loan. Since it is held for the longest period the first subscriber will have to deposit more than all others. The third subscriber pays a little less to account for shorter loan duration (4.5 years) and so on. The last subscribers are actually contributing as savings and for this they have to pay in less. Thus the first subscriber who receives 100 Yuan in the second meeting might contribute a total of 145 Yuan over 5 years while the 10th subscriber would contribute only 55 Yuan in total to receive 100 Yuan in year 5 (an 81% simple return on savings). The organizer thus gets an interest free loan but must also provide a feast at each meeting. If any member defaults the organizer is responsible for making that member's payment so the RCFs had to rely on existing ties and trust (Fei and Chang, 1945).

households held some form of debt between 1929 and 1932. This matches reports summarized in Myers (1970) that found in 1934 that 43% of households in Hopei and 28% of households in Shangtung were in debt. Money lenders could earn more from lending than investing in land (Fei and Chang 1945; Perkins 1969) which suggests at that time that any farmer needing to borrow would end up paying an interest rate greater than the return on assets owned. Often the farmer would provide a deed to the land as security only to end up renting the land back. In fact It is little wonder that money lenders were among the largest landowners (Perkins 1969).

Prior to 1939 interest could be based in terms of money or grain. For example a 100 Yuan loan may be based on a stipulated interest of 40 Piculs of grain (2 metric Tonnes). If the price of the grain was 0.80 Yuan/ Picul then a grain quantity equivalent to 32 Yuan would be provided the creditor, but if the price rose to 2.80 Yuan/Picul then the grain equivalent would be 112 Yuan or 112% interest (Fei and Chang, 1945). An alternative form of deeding was that the borrower actually hand over the deed to the creditor who would then cultivate the land and pocket the profits until the debt was cleared.

Money interest varied wildly both within communities and between communities. In surveys conducted by Buck (1937a,b) across 15,212 households and 22 provinces, it was found that by far the majority of lending was between family and friends. This was 39% but when farmers and neighbors are added the percentage increases to 52%. Interest rates varied with the average being about 2.6% /month for productive assets and 2.7% for nonproductive assets. In fact the majority of borrowing, 76%, was for nonproductive expenditures such as weddings, birthdays, the birth of a ‘boy’, funerals etc. However, much of the borrowing also came for bare necessities, especially in times of crop or market failures in which households would have to borrow to purchase inputs and grain for consumption often in a vicious cycle with debt being used to repay debt (Myers 1970)The highest recorded rate by Buck (1937a) was 10.7%/month in Wuwei/Kansu of which 82% cane from friends and relatives. In Kaolan/Kansu with 100% of loans coming from friends and relatives the interest rates were only 2%/month. In Tangyi/Shantung 86% of loans came from wealthy individuals at a rate of 4%/month, but in Anshun/Kweichow with 100% from friends and relatives the monthly interest was only 0.8%/month. Myers

(1970) reports documented evidence from 1934 Shantung that money lender rates competed with merchants and shops but were always a bit higher. From various sources the money lender rates ranged from 2.3%/month to 2.8% /month and rarely exceeded 40%/year (Myers 1970; Buck 1937b; Fei and Chang 1945). We find it interesting in the context of the present paper the degree by which friends and relatives would lend at interest, although Fei and Chang (1945) do provide a case where a friend offered a loan at zero interest. However the subject of this case was also charged 32% on a loan from a brother in law and 32% and 41% on loans from two other friends.

While Chinese culture transitioned from a state of civil war and the declaration of the Peoples Republic of China, through the Great Leap Forward and the Cultural Revolution little is known about how informal markets transitioned to their present day forms. The Rural Credit Cooperatives that emerged to offset the moneylenders in the 1920s and 1930's were eventually incorporated in 1958 into the Peoples Commune to mobilize capital for large scale projects. After dismal performance they were resurrected under the Household Responsibility System in 1978 which started to de-collectivize the communes. Again with mounting losses they were separated from the Agricultural Bank of China and put under the supervision of the PBC in 1997 (Guo and Jia, 2009) What has been retained is the general fabric of intra-community finance but long gone is the economic fortitude of the money lender and other usurious forms of informal lending, at least to the extent of its previous existence. In modern day China, the evidence suggests, and quite overwhelmingly, that friends and relatives no longer charge interest on loans. He (2006a) reports on 3 studies that indicate the extent of lending amongst friends. In Zhejiang, Jiangsu, Hebei, Henan and Shaanxi province 61.57% (N=365) of farm households used informal finance; In Anhui province it was 79% (N=217) and in Sichuan 66.5%. He and Li (2005) studied 720 households in Guizhou and found that 47.36% borrowed from RCC and 57.22% from friends or relatives. These numbers are very much in line with the numbers reported in the current study and underscore the significance of lending amongst friends.

It is perhaps folly to lump lending amongst friends as microcredit as we understand the term today, but much of the characteristics are the same, the most obvious being that informal loans are small loans made to individuals, with limited

collateral and flexible terms, and at a stated interest rate which is overwhelming zero. The essential ingredient is trust, and like modern day microcredit which is centered on group lending, repayment is virtually guaranteed through social pressure. The economics behind zero-interest loans should not be viewed through the lens of expected utility as so many economic models do, but through the notion of reciprocity, fairness, and dynamic incentives (Zeller 2006, Kropp et al 2008). That is today's lender may be tomorrow's borrower. The time value of money is not measured in terms of giving up present consumption for future consumption, but in terms of ensuring a source of future liquidity.

The common understanding of informal finance as described by Ayaggari et al (2008) is "*that informal financial institutions play a complementary role to the formal financial system by servicing the lower end of the market - informal financing typically consists of small, unsecured, short term loans restricted to rural areas, agricultural contracts, households, individuals or small entrepreneurial ventures. Informal financial institutions rely on relationships and reputation and can more efficiently monitor and enforce repayment from a class of firms than commercial banks and similar formal financial institutions can… By informal financial institutions, we refer to the entire gamut of non-market institutions such as credit cooperatives, moneylenders, etc. that do not rely on formal contractual obligations enforced through a codified legal system*. (page 2)" . Guo and Jia (2009) provide a similar definition. In this paper, unless otherwise stipulated, we will use the term 'informal finance' exclusively to characterize the lender-borrower relationship between friends and relatives and for the most part we will use the terms friends and relatives interchangeably. But we also believe that using the term 'informal lending' is disingenuous to what in fact lending amongst friends truly represents. Guo and He (2005) estimate that informal financing of Chinese agriculture runs between 2,001 and 2,750 Billion Yuan, most of it between friends and relatives. Likewise, since credit only microfinance institutions (MFI) transcend formal and informal markets as defined above we urge development economists to segregate them and study the underlying economics accordingly.

The New Era of Microfinance in China

Prior to 2002 NGO's wishing to establish an MFI had to partner with a sponsoring government agency but three actions changed the nature of microlending. First, In December of 2001 the PBC issued guidelines for microfinance at Rural Credit Cooperatives and implemented the 'social guarantee' or trust-based lending used by NGO MFIs to provide credit services for middle and low income households lacking collateral and guarantees. The micro loans have very few, if any, restrictions and have flexible repayment plans that are linked to the household production cycle (He 2006b). Second, the Peoples Bank of China (PBC) initiated a pilot project in 8 counties to examine the liberalization of rural credit allowing interest rates to float from the poverty alleviation plan to the official rate (Pin 2003). Third, the Central Committee of the Communist Party of China (CPC) starting in 2003 promulgated laws to encourage private capital and foreign capital to set up multi-owner companies to serve agriculture, farmers and rural areas. This included the establishment of credit-only MFIs, community financial organizations as well as a competitive funds market (Guo and Jia 2009). In May of 2005 the PBC using technical assistance from the Asian Development Bank initiated the new-form microfinance in Guizhou, Inner Mongolia, Shaanxi, Shanxi, and Sichuan (He 2006a). One of the new institutions, Quan Li Microcredit in Guangyuan, Sichuan reported micro loans (including group lending) ranging from as low as 2,000 Yuan to 400,000 Yuan, with an average of 40,221 Yuan. (These loans are going predominantly to innovative enterprises and not primary agriculture or the typical farmer. The average farm debt of our survey, for example, is only 13,336 Yuan. Only 17% went to agriculture) The average interest rates on micro-loans was 16.396% ranging from 9.396% to as high as 23.40% which is higher than the typical rate charged by the RCC (between 8% and 10%) but lower than other MFI rates (20.05% average) and rates charged at local pawn shops which, with rates ranging as high as 60% with an average of 42%, are usurious (He 2006a). He and Li (2005) found use of money lenders sporadic, (as high as 34.17% in one county, but as we find in the present study generally minimal), but of those farm households that used money lenders only 19.3% paid interest rates below 40%, and 23.11% paid interesting excess of 100%. On the agricultural side, by the end of 2002 93% of RCCs had implemented some form of microcredit lending with 50%

implementing some form of group lending. Nearly 26.7% of rural households received some form of microloan from RCCs. By the end of 2004, micro loans outstanding were 154.8 billion Yuan and group loans were 76.3 billion Yuan (He 2006b). In two counties studies by He (2006b) non-performing loans were 2.9% and 3.4% and microloans from RCC were 90.2% and 99% of all loans outstanding.

The mechanism of microcredit through RCCs is quite a simple matter. Once an economic assessment has been completed a file is opened on the farm household. Each household is then provided a credit rating , and based on this credit rating a note is provided to the household with a stipulated amount. The farmer then takes the note/certificate and identification to the RCC and is issued the funds up to but not exceeding the stipulated amount. Central to this is the Village Credit Committee (VCC). The VCC is a volunteer organization of farm households that regulates and manages credit behavior. The VCC assists farmers in obtaining loans, assists the RCC in assigning a credit rating, and if need be uses moral suasion to ensure that the loan is repaid. The VCC therefore acts to minimize both adverse selection and moral hazard. For example if the VCC does not deem a farmer trustworthy it will not sign a certificate, and without the certificate farmers are forced into the regular lending market place. There may however be a small farm bias. He and Li (2005) found that 77.98% of upper income, 68.8% of middle income and 52.23% of lower income households received loans. There may also be insufficient funding. 58.27% of He an Li's (2005) sample indicated that the loans made available did not meet their needs and this could explain the use of money lenders. Boucher and Guirkinger (2007) argue that the role of the money lender is to capture the spillover demand due to credit rationing. This is particularly true in rural areas for which insurance and credit markets are incomplete. While the emergence of money lenders and pawn broking may be a result of spillover demand, in China, and by our observations, the spillover is largely accommodated by lending amongst friends.

Conceptual Framework, Data and Survey Methods

We are interested in the relationship between formal and informal lending amongst friends and relatives. There are certain aspects of the problem that require understanding. Predominant is the role of trust. Turvey and Rong (2008) present a framework by which an MFI can set an interest rate. Their model explicitly assumes that there are varying degrees of trust tied to measures of wealth. The reasoning is largely anecdotal from MFI observations on borrower behavior. Yunus (1999) for example is quite explicit in stating that the poor are more trustworthy than the rich. Experiments in the United States and China by Kropp et al (2008) show evidence of this relationship, and other documentary evidence also supports the notion. Park and Ren's (2000) results suggest that Government run programs were skewed in favor of wealthier individuals and the performance of loans in government run programs was far poorer than the loan performance on NGO or mixed NGO-government MFIs that were skewed more heavily towards the poor. In fact they show that programs with the highest proportion of poor measured on an asset metric had the highest repayment rates. Tsai (2004) suggests that wealthier defaulters may do so because they hold political power within the CPC and dominate the VCC in some areas, handing out loans and grants to friends, and offering corrupted loans to others (To be clear, our study finds no evidence of corruption in RCCs). The behavioral argument is that as wealth increases the utility value of the next loan becomes smaller and for some portion of the population the temptation to renege on the loan increases (Turvey and Kong 2008). Microfinance institutions will therefore establish conditions of 'poorness' below which microcredit loans will be made on a no-to-low collateral basis. These are essentially 'trust'-based loans.

Our analysis therefore focuses on the relationships between trust and borrowing behavior. As alluded to in the introduction the moral hazard associated with any loan is inversely proportional to the degree of trust between the borrower and the lender. The assumption is a positive relationship between trust and informal borrowing; that is the more trust in a community or amongst its members the greater the likelihood that loans can be made without collateral. Furthermore, one of the greater premises of microfinance is that trust is bred in the community, and this is largely why self help groups have

become so successful in other countries. Thus, given the extent of informal lending trust cannot be discounted as an important economic variable.

Another issue is whether informal borrowing is a result of spillover effects as suggested in Boucher et al (2007). Credit rationing could very well be a source of this conjecture, but not all poor farms are credit rationed. The absence of debt is a necessary condition for credit rationing but it is not sufficient. Furthermore, credit rationing can take many forms. A lender can refuse debt altogether or provide less credit than is required at the farm, or for many farms the cost of debt may be out of reach. Both of these conditions are blurred by the strength of informal lending amongst friends and relatives. Inter- familial transactions may have originally arisen out of necessity, but it in the present day it may be so entrenched in rural Chinese culture that strong evidence of informal lending is only weak evidence of credit rationing.

To address these issues we use a variety of methods. First we provide basic frequency data on the sample and use the Bonferroni adjustment to against the null that the four samples are equivalent. Second, we recognize that for a variety of reasons individuals have different attitudes towards trust and borrowing and to collect relatively homogenous groups we run Two-Step cluster analysis on specific trust and specific borrowing related questions. Third, to identify multivariate interrelationships we run a number of General Linear Model (GLM) regressions with heteroscedasticity correction and include among the independent variables the cluster groupings.

The data used were obtained through the survey of 1565 farm households in Yangling (Shaanxi Province, October 2007), Henan (July 2008), Gansu (September 2008) and Qianyang (Shaanxi Province, October 2008). The survey form was prepared in English, translated into Chinese, and then back-translated into English. The English and Chinese surveys were then compared line by line by two independent bilingual graduate students, with the English speaking investigator present. This document was then forwarded for final review to the Chinese speaking investigator for a final check. With the exception of the Gansu survey, the survey was conducted by 30-40 graduate students from the Northwest Agriculture and Forestry University. The Gansu survey was conducted by undergraduate students as part of a course in statistics and was overseen and monitored by experienced graduate students. In each survey a target of 400

respondents was set and met, although 43 surveys were eliminated from the Gansu survey because of incomplete or missing data. The protocol, which was IRB reviewed by the host USA university allowed for respondents to refuse any questions or drop out of the survey at any time. The completion rate was actually 100% with very few problems. There was some evidence, particularly in Gansu, where respondents were getting restless. The questions referred to in this study relate to questions in the first half of the survey and are not suspect. The survey took between 40 minutes and one hour and 20 minutes with the student reading the question to the farmer and filling in a paper questionnaire[3].

Results

In Table 1 we illustrate the commonalities and differences amongst the four samples in terms of demographics and borrowing behaviour. Pairwise comparisons using the Bonferroni Correction for pairwise comparisons against the null of no difference between samples (alpha=0.05) are also provided. There is no difference in the years farmed between the groups (x=27.39), but there are significant differences amongst the regions in terms of farm size and other variables. Across all four regions there are n(n-1)/2 =12 possible pairwise comparisons so there are at most 6 pairwise indicators in the Table. Thus, what we refer to as the Bonferroni count indicates the number of symmetric comparisons that are significantly different across the groups. Years Farming with a Bonferroni count of 0 indicates a failure to reject the null of no difference for all pairwise comparisons. In comparison Farm size, which averages 5.52 mu across all respondents has a count of 6 which indicates that the null hypothesis of no difference in farm size between all pairs can be rejected at the 5% level. We use the Bonferroni count in Tables 1 to 4 as an indicator of heterogeneity across respondents. The average household income is 11,477 Yuan but income ranges from 6,177 in Henan to 15,308 in Qianyang. In Henan

[3] In only one instance was there evidence that a respondent was untruthful. Respondents were offered two bags of soap powder for participating in the survey. In Qianyang the brand of soap used was 'Tide ®". In this one instance the respondent suspected that the interviewer, a female student, was actually working as a soap marketer and was being deceptive with the academic research claim. Faculty showed staff identification from two universities to convince the respondent who then proceeded to respond honestly. However, this survey was discarded and replaced with another.

71.17% of household income comes from farming but in Gansu it is only 45.3%. This income is distributed amongst 4.38 people living in each household. With a Bonferroni count of 3, this is fairly homogenous with only Henan having a mean household size different from the others. As a percentage of sample, more Gansu farmers have debt outstanding (62%) than the other regions. Qianyang at 46% has the lowest but there is relative homogeneity amongst the pairs. On average (including farms with no debt) Xian farms have the lowest amount of debt at 6,973 Yuan while Qianyang at 20,314 Yuan has the most, however when disaggregated into farms with only informal debt, only formal debt, and only a combination of formal and informal there are no significant differences amongst the regions, although by observation variance is high. The average asset value (if all assets were sold) with a Bonferroni count of 4 is different amongst 8 of 12 pairs. With an average of 52,287 Yuan the lowest asset value is within Henan (27,230 Yuan) and highest for Qianyang (70,284 Yuan). Combined, the debt to asset ratios range from a low of 0.17 in Yangling to a high of 0.67 in Henan.

Table 1: Summary of Farm Household Attributes

	Region Province					
	Gansu Mean	Henan Mean	Qianyang Mean	Yangling Mean	All Mean	Bonferroni Count
Years farming	26.88	27.42	26.98	28.23	27.39	0
Farm size (1 mu= 1/6 acre)	7.82	3.43	6.11	4.90	5.52	6
Total household income (Yuan)	11,186.68	6,176.88	15,308.25	13,214.01	11,477.46	4
Percent of income from farming(%)	45.33	71.17	48.29	68.58	58.71	4
Number of people living in house	4.57	4.03	4.34	4.60	4.38	3
have debt outstanding	0.62	0.53	0.46	0.49	0.52	2
amount of debt (Yuan)	19,711.76	12,433.49	20,314.21	6,972.50	13,336.86	4
Asset Value (Yuan)	54,879.21	27,230.00	70,284.24	60,021.74	52,286.82	4
Informal Loan Value (only use informal) (Yuan)	8,830.00	9,261.83	8,587.50	13,337.69	10,395.32	0
Formal Loan Value (only use formal) (Yuan)	29,081.40	21,166.67	15,081.63	11,420.00	22,003.01	0
Informal AND Formal Loan Value (use both) (Yuan)	23,680.82	51,500.00	34,529.85	18,531.25	28,796.77	0
Debt to Asset Ratio	0.60	0.67	0.30	0.17	0.40	5

Table 2 reports the late and default frequencies self-reported by respondents and by binned income groups (deciles). Analysis of Variance indicates some difference

among income groups for 'late' on payments for family (p=0.06), Friends (p=0.03) and RCC (p=0.02) but there is no difference amongst borrowers across income groups for loan defaults. In other words different income groups may take advantage of the flexibility amongst family and friends but ultimately loans are repaid. Interestingly, there is no discernable pattern in Table 2 to suggest that lower income households were any more likely to default on any form of debt than higher income households.

For each income level we separate the total sample into current debt status, that is those respondents who indicated that they had some form of debt at the time of the survey (Yes). Those that indicated 'No' might have had debt at some previous time, but a portion of the 'No' group might never have borrowed at all. For family and friends the group with current debt was more likely to have been late on a loan (44% to 29% and 32% to 25%). The 'Yes' group was also more likely to default on a RCC loan (18% to 8%) but at 98% repayment both were equal, but the differences on default were slight. 36% of respondents indicated that they had at some point be late on repaying a loan from a family member but only 3% indicated default. Likewise 29% had been late on repaying a friend with only 2% defaulting. There is a clear difference between borrowing amongst friends and borrowing from money lenders, RCC, or banks. Although very few of respondents borrowed from a money lender, lateness and default were very low. !3% of respondents stated that they had been late repaying an RCC loan but ultimately 98% claimed they had never defaulted on a loan and while only 3% stated that they had been late on a bank loan, virtually 100% was repaid.

Table 2: Loan Repayment

	Debt	Family		Friend		Money Lender		RCC		Bank	
	Status	Late	Default	Late	Default	Late	Default	Late	Default	Late	Default
ANOVA p-Value		0.06	0.88	0.03	0.30	0.18	0.35	0.02	0.17	0.73	0.63
Total Household Income											
<= $3,000.00	No	0.33	0.01	0.32	0.01	0	0	0.02	0.01	0.01	0
	Yes	0.44	0.05	0.32	0.02	0.01	0	0.12	0.04	0.04	0
	Total	**0.39**	**0.03**	**0.32**	**0.01**	**0**	**0**	**0.07**	**0.03**	**0.03**	**0**
$3,000.01 - $5,000.00	No	0.29	0.02	0.26	0.04	0.03	0.01	0.06	0	0.01	0.01
	Yes	0.45	0.05	0.34	0.03	0.01	0	0.17	0.01	0.02	0
	Total	**0.37**	**0.04**	**0.3**	**0.04**	**0.02**	**0**	**0.12**	**0**	**0.01**	**0**
$5,000.01 - $6,000.00	No	0.21	0.05	0.18	0.04	0.02	0	0.07	0.04	0	0
	Yes	0.38	0.06	0.17	0.04	0	0	0.26	0	0.02	0.02
	Total	**0.29**	**0.06**	**0.17**	**0.04**	**0.01**	**0**	**0.16**	**0.02**	**0.01**	**0.01**
$6,000.01 - $7,000.00	No	0.38	0.04	0.31	0.02	0.02	0.02	0.09	0.04	0.04	0
	Yes	0.43	0.04	0.25	0.04	0.07	0.04	0.14	0.04	0.04	0.04
	Total	**0.4**	**0.04**	**0.29**	**0.03**	**0.04**	**0.03**	**0.11**	**0.04**	**0.04**	**0.01**
$7,000.01 - $9,500.00	No	0.27	0.04	0.23	0.03	0	0	0.09	0	0.01	0
	Yes	0.47	0.05	0.38	0.03	0.05	0	0.2	0	0.05	0
	Total	**0.37**	**0.05**	**0.3**	**0.03**	**0.03**	**0**	**0.15**	**0**	**0.03**	**0**
$9,500.01 - $10,000.00	No	0.32	0.02	0.29	0.02	0.02	0.01	0.1	0.02	0.04	0
	Yes	0.44	0.04	0.35	0.01	0.01	0.01	0.18	0.04	0.02	0.01
	Total	**0.38**	**0.03**	**0.32**	**0.01**	**0.02**	**0.01**	**0.14**	**0.03**	**0.03**	**0**
$10,000.01 - $12,000.00	No	0.37	0	0.33	0	0	0.03	0.03	0	0.03	0
	Yes	0.49	0.03	0.32	0	0.03	0	0.22	0	0.05	0
	Total	**0.43**	**0.01**	**0.33**	**0**	**0.01**	**0.01**	**0.13**	**0**	**0.04**	**0**
$12,000.01 - $15,000.00	No	0.23	0.01	0.21	0.01	0	0.01	0.06	0.02	0.04	0
	Yes	0.37	0.03	0.25	0	0	0	0.11	0	0.02	0
	Total	**0.3**	**0.02**	**0.23**	**0.01**	**0**	**0.01**	**0.08**	**0.01**	**0.03**	**0**
$15,000.01 - $20,000.00	No	0.34	0.03	0.23	0.02	0	0.01	0.17	0.02	0.04	0
	Yes	0.53	0.03	0.41	0	0	0	0.24	0.04	0.04	0
	Total	**0.43**	**0.03**	**0.31**	**0.01**	**0**	**0.01**	**0.2**	**0.03**	**0.04**	**0**
$20,000.01+	No	0.17	0.01	0.14	0	0.01	0.01	0.09	0.01	0.01	0
	Yes	0.38	0.07	0.28	0.02	0.02	0	0.23	0.05	0.03	0.02
	Total	**0.26**	**0.04**	**0.2**	**0.01**	**0.01**	**0.01**	**0.15**	**0.03**	**0.02**	**0.01**
Total	No	0.29	0.02	0.25	0.02	0.01	0.01	0.08	0.02	0.02	0
	Yes	0.44	0.04	0.32	0.02	0.02	0	0.18	0.02	0.03	0.01
	Total	**0.36**	**0.03**	**0.29**	**0.02**	**0.01**	**0.01**	**0.13**	**0.02**	**0.03**	**0**

Table 3 reports responses related to a series of questions dealing with attitudes about trust with a score of 1.0 indicating strongly agree and 5.0 indicating strongly disagree and 3.0 indicating 'agree'. Interestingly, attitudes towards trust, while generally better than simple agreement are not homogenous across samples. For example when asked if the respondent trusts family or friends to repay, or whether family trusts the respondents to pay, the average score around 2.0 indicates moderate agreement with the statement, but Gansu and Yangling, while not significantly different from each other, are significantly different from Henan and Qianyang; but Henan and Qianyang are not statistically different from each other. Respondents from Henan and Qianyang show higher trustiness than Gansu or Yangling, including a stronger belief that trust within a community is conducive to informal lending. There is no statistical difference between regions when asked if the respondent would lend to a friend or relative even if they did not believe the recipient was trustworthy (x=3.01 'agree'). Attitudes towards trust and formal lending differ considerably across regions. Henan and Yangling in particular do not agree that without collateral either RCC or banks would trust them to repay. Interestingly, Rural Credit Cooperatives while mandated to provide microcredit to low income farm households, follow the guidelines to varying degrees. When the authors met with the RCC in Qianyang in October 2008, it was evident that the notion of microcredit was embraced by management which explains the agreeable score of 3.13 reported in the Table. In Contrast we have also met with Rural Credit Cooperatives who openly admit that they would not provide microcredit to the poor without collateral. Although few of our respondents borrowed from money lenders and money lending is not a focus of this paper, we include in Table 3 a question of trustiness and moneylenders, to illustrate that in Henan and Yangling respondents feel that they would be more trusted by money lenders than banks and in the case of Henan, RCCs as well.

Table 3: Survey Responses to Issues of Trust

	Region Province					
	Gansu Mean	Henan Mean	Qianyang Mean	Yangling Mean	All Mean	Bonferroni Count
You Trust Family/Relative To Repay	2.25	1.9	1.89	2.13	2.04	4
You Trust Friend To Repay	2.18	1.93	1.9	2.16	2.04	4
Family/Relative Trusts You To Repay	2.10	1.87	1.84	2.05	1.96	4
Friend Trusts You To Repay	2.08	1.92	1.86	2.07	1.98	2
In Community Lending Occurs Because Of Trust	2.14	1.72	1.78	1.91	1.88	4
You Would Lend Friend/Relative Even If You Did Not Trust Them	3.06	2.9	3.06	3.02	3.01	0
Even If You Had No Collateral RCC Will Lend Because They Trust You	3.37	4.5	3.13	3.91	3.73	6
Even If You Had No Collateral BANK Will Lend Because They Trust You	3.58	4.54	3.54	4.17	3.97	5
Even If You Had No Collateral MONEY LENDER Will Lend Because They Trust You	3.69	4.38	3.88	3.93	3.98	5

Table 4 presents the results from yes/no (1,0) questions on whether the respondent had ever been denied a loan and the reasons they believed the loan was denied. On average 44% of respondents declared that they had been denied a loan at some time with the highest of 54% in Henan. This is significantly different from respondents in Gansu, Qianyang and Yangling. The leading causes for which there is general agreement in magnitude are due to collateral (51%), not enough income (41%), trust worthiness (34%) and failure to repay a previous loan (13%). Risks from market prices (4%), crop yield variability (3%), weather risk (2%), or ability to meet the terms of the loan repayment schedule (1%) do not appear to be important factors. Although by the Bonferroni count there are differences among regions for cause, the relative degree of agreement is quite consistent.

Table 4: Survey Responses to Loan Denial and Potential Reasons for Loan Denial (Percent)

	Region Province					
	Gansu Mean	Henan Mean	Qianyang Mean	Yangling Mean	All Mean	Bonferroni Count
Previously Denied Loan	0.44	0.54	0.38	0.38	0.44	3
Because Of No Collateral	0.61	0.50	0.34	0.59	0.51	3
Because Of Price Risk	0.08	0.02	0.06	0.02	0.04	1
Because Of Yield Risk	0.06	0.01	0.04	0.01	0.03	2
Because Of Weather Risk	0.05	0.00	0.05	0.00	0.02	4
Because Of Failed To Repay Loan	0.21	0.05	0.28	0.01	0.13	4
Because Of Not Trustworthy	0.34	0.36	0.31	0.36	0.34	0
Because Of Not Enough Income	0.32	0.40	0.54	0.38	0.41	3
Because Of Loan Schedule	0.00	0.00	0.03	0.02	0.01	0

Table 5 reports on a series of questions added to the 2008 surveys in Gansu and Qianyang to obtain some more insights into several aspects of credit rationing. Overall the results do not indicate wide spread credit rationing. On average respondents more than agree that they could borrow the needed amount of money for consumption (2.78) or farming (2.62). But 91% of respondents indicated that they had apprehensions about borrowing from a bank or RCC. Some were apprehensive because they already had unpaid debts (which we take to mean have outstanding loans already) (3.09). Most agree that loan rates from formal sources are higher than friends or relatives, which is interesting because those respondents who borrowed from friends or relatives did so at 0% interest. Nor is there overwhelming agreement that RCC rates are higher than the respondent could afford. While the score of 2.72 is between moderately agree and agree, affordability of credit as a reason for low formal debt use is not a strong indicator. Nor does it appear that collateral (3.15) is a strong indicator although the significant difference between Gansu and Qianyang may reflect the openness of the Qianyang RCC to provide collateral-free micro-loans. Convenience is also considered a factor in borrowing behavior, but there is not strong evidence that distance (4.14), paper work (3.68), length of time to obtain a loan (3.64), or corruption (bribery; 3.84) can explain behavior.

There is a preference for borrowing from a friend or relative (2.56) rather than a money lender (4.06), and also an aversion to being indebted to a bank or RCC (2.67). Even so, should a reduction in interest rates (2.42) or administrative costs (2.49) occur, there is not strong agreement that that would encourage borrowing. Nor, as indicated above, do farmers believe that collateral in assets restricts access to credit. In fact the difference between whether more assets

could not or could be used as collateral (3.29 and 3.25) are almost identical, although there is some stronger agreement that more assets could result in a lower interest rate if used as collateral (3.32 and 3.45).

There is less than agreement about the impact on interest rates from borrower behavior. Farmers do not 'agree' that dishonest borrowers lead to higher interest rates (3.52) or credit rationing (3.4). To bolster the argument that farmers are not credit rationed there is less than agreement that respondents would be willing to pay a higher rate (3.19) or post more collateral (3.05) to get more credit. Nor is there an overwhelming sense that farmers who borrow too much (2.97) or accepts a higher interest rate (3.07) more likely to voluntarily default on the loan. These arguments represent the standard signaling in a Stiglitz and Weiss framework, and it does not appear that these respondents' experience suggest that voluntary default is signaled as Stiglitz and Weiss predict.

Finally, we queried respondents on the impact of credit rationing. There is general agreement that credit rationing would force farmers to use less inputs (2.76), seek off-farm wage employment (2.38) but a general disagreement that credit rationing would limit education or health care for children (3.24) or cause food insecurity (3.96).

In discussing these results we are parsing 'strongly agree', 'moderately agree' and 'agree' with some subjectivity in relative scale which has made us conservative in our interpretation. For example we do not believe that a statement of agreement or even moderate agreement is strong enough evidence to conclude that farmers are credit rationed to the extent often discussed in the Chinese literature. While lack of formal credit is a necessary condition for credit rationing it is not a sufficient condition. Indeed, the results suggest a strong preference by many farmers to borrow from informal sources which may lead to a form of reverse rationing in which the borrowers ration the demand for credit.

Table 5: Mean Survey Responses to Beliefs and Attitudes about Informal and Formal Credit in Gansu and Qianyang

	Region Province			
	Gansu Mean	Qianyang Mean	Total Mean	Bonferroni Count
I Am Able To Borrow Needed Amount Of Money From Banks Or RCC For Consumption, Education And Health Purposes?	2.85	2.71	2.78	0
I Am Able To Borrow Needed Amount Of Money From Banks Or RCC For Farming And Business Purposes?	2.72	2.54	2.62	1
Do You Have Any Apprehension Of Obtaining A Loan From A Bank Or Rural Cooperative ? If So Indicate The Reasons As Following?	0.92	0.9	0.91	0
I Have Unpaid Debts On Previous RCC Or Bank Loans	3.25	2.94	3.09	1
Interest Rates On RCC Or Bank Loans Are Higher Than Interest Rates On Loans From Friends Or Relatives.	2.72	2.59	2.65	0
Interest Rates On RCC Or Bank Loans Are Higher Than I Am Able To Pay.	2.76	2.69	2.72	0
I Lack The Collateral To Get A Loan	2.93	3.36	3.15	1
The RCC Or Bank Is Too Far For Me To Travel.	4.05	4.21	4.14	1
RCC Or Bank Requires Too Much Paper Work	3.53	3.81	3.68	1
RCC Or Bank Takes Too Long In Approving Loan	3.43	3.83	3.64	1
RCC Or Bank Lender Requires A Bribe.	3.69	3.98	3.84	1
I Would Prefer To Borrow From A Friend Or Relative	2.53	2.59	2.56	0
I Would Prefer To Borrow From A Money Lender.	4.1	4.02	4.06	0
I Do Not Like To Be Indebted To A Bank Or RCC.	2.83	2.53	2.67	1
If Interest Rates On RCC Or Bank Loans Were Lower Than Current Interest Rates I Would Be More Likely To Borrow From A Bank Or RCC	2.34	2.49	2.42	0
If The Cost Of Obtaining A Loan (Fees, Non-Interest Charges) On RCC Or Bank Loans Were Lower Than Current Costs I Would Be More Likely To Borrow From A Bank Or RCC.	2.39	2.58	2.49	1
If I Had More Land (Assets), Then I Could Get A Higher Loan From A Bank Or RCC Without Using The Assets For Collateral.	3.4	3.18	3.29	0
If I Had More Land (Assets), Then I Could Get A Higher Loan From A RCC Or Bank But Only If I Use The Assets As Collateral.	3.2	3.29	3.25	0
If I Had More Land (Assets), Then I Could Get A Higher Loan From RCC Or Bank, At A Lower Interest Rate, Without Using The Assets As Collateral.	3.47	3.43	3.45	0
If I Had More Land (Assets), Then I Could Get A Higher Loan From RCC Or Bank, At A Lower Interest Rate, But Only If I Use The Assets As Collateral.	3.12	3.5	3.32	1
I Believe That Honest Borrowers Are Compelled To Pay Higher Interest Rate, Because Some Borrowers Do Not Repay Their Loan?	3.49	3.55	3.52	0
I Believe That Honest Borrowers Are Not Able To Obtain A Required Amount Of Loan, Because Some Of The Villagers Do Not Repay Their Loan Or Divert The Loan.	3.58	3.25	3.4	1
To Obtain A Required Amount Of Loan, I Would Be Willing To Pay A Higher Interest Rate.	3.19	3.18	3.19	0
To Obtain A Required Amount Of Loan, I Would Be Willing To Post More Collateral.	3.11	3.01	3.05	0

	Region Province			
	Gansu Mean	Qianyang Mean	Total Mean	Bonferroni Count
I Believe That A Borrower Who Accepts A Loan That Is Very High Relative To His Farm Assets Is More Likely To VOLUNTARILY Default On That Loan.	3.03	2.92	2.97	0
I Believe That A Borrower Who Accepts A Loan, At A Higher Interest Rate Is More Likely To VOLUNTARILY Default On That Loan.	2.97	3.16	3.07	1
If I Faced A Borrowing Constraint I Would Use Less Input Than Is Required For Maximizing Farm Income.	2.71	2.79	2.76	0
If I Faced A Borrowing Constraint I Would Need Wages From Off-Farm Employment.	2.49	2.29	2.38	1
If I Faced A Borrowing Constraint I Would Not Be Able To Provide A Strong Education And Adequate Health Care For My Children.	3.16	3.32	3.24	0
If I Faced A Borrowing Constraint My Family Members (Including Me) Would Not Be Able To Get Adequate Food Throughout The Year.	3.94	3.99	3.96	0

Cluster Analyses

Because of the multivariate responses in different categories of interest, two-step cluster analyses was used to create discrete cluster groupings for a series of questions on trust and a separate series of questions on borrowing. These are listed in Tables 6 and 7. All categories were discrete except for the informal to formal variable which was calculated as the ratio of informal debt to total debt for those respondents who indicated debt usage. For both the trust variables and the borrowing variables distinctive clusters emerged around the informal to formal centroid, with clusters 1, 2, and 3 in both cases ordered from lowest to highest proportion of informal credit. Each respondent was then identified with a cluster grouping. The trust variables were available on all four surveys (N=810), but the borrowing variables were available only in the last two surveys for Gansu and Qianyang (N=370) conducted in September and October 2008.

In terms of trust, the results in Table 6 indicate that cluster 3 is the most trustworthy in terms of how they perceive the trustworthiness of friends and relatives and how friends and relatives perceive them. While most respondents agreed to some extent on trust issues, the clusters are differentiated by degrees of agreement. For example 'Friends trust you to repay' indicates that 92.4% of Cluster 3 respondents strongly agreed (SA) with this statement, while 94,3% of Cluster 1 only agreed (A) and 77.8% of cluster 2 moderately agreed (MA) or strongly agreed (SA) in that reverse order. Thus we can conclude, on margin, that cluster 3 is more

trusting than cluster 2, and cluster 2 is more trusting than cluster 1. The loan ratio is in agreement with this ordering (0.600, 0.639, and 0.684; see also Figure 5), an important observation because it provides support for the conjecture that informal lending increases with trust.

The three clusters centered around borrowing preferences and conditions are similar. Questions 1 and 2 indicate respondent's ability to borrow from banks or RCC for consumption or production. Cluster 1 is most agreement with 50.4% and 62% indicating strong or moderate agreement. In contrast 85.2% and 76.5% of respondent in cluster 2 either agree or moderately disagree. Cluster 1 is also the least likely to be rationed as a result of collateral indicating moderate to strong disagreement with query (5). Cluster 1 also indicates greater disagreement on whether RCC loan rates are higher than from friends or relatives (query 3) and are the least likely of the three clusters to be constrained by the price of the loan (query 4). In comparison member of cluster 3 are more likely to be constrained by the loan rates on RCC loans, while members of cluster 2 are more likely to be constrained by collateral.

Cluster 3 members have a clear preference for borrowing from friends or relatives, while cluster 2 members are least likely to have these preferences. There are also differences in attitudes towards formal indebtedness (query 7). 56.8% of cluster 3 members have a strong or moderate agreement to "I do not like to be indebted to a bank or RCC", while 84.3% moderately disagree or agree with the statement. Cluster 1 is similar in attitude to cluster 3. The difference between cluster 1 and cluster 3 however, is that while cluster 1 members do not like being indebted to an RCC or bank, if either interest rates (query 8) or costs (query 9) were reduced they would borrow more.

The informal to formal variable (Figure 6) indicates that cluster 1 members are more likely to favor obtaining credit from formal sources (0.370) , while cluster 3 members are more likely to obtain credit from informal sources (0.518), with cluster 2 members between the extremes (0.442) As can be expected, the multivariate nature of credit choice decisions and heterogeneity of utility and preferences, makes an obvious categorization difficult, although it is somewhat evident that cluster 1 would be more favorable and would have more access to formal credit than clusters 2 and 3. Cluster 2 members are least likely to have the collateral for a formal loan but also have an aversion to borrowing from friends or relatives, so this group would likely have a greater balance between formal and informal sources. Cluster 3 has a strong aversion to formal sources, as well as a strong belief in borrowing amongst friends and while not completely

adverse to formal borrowing of costs go down, are more likely to hold proportionately more informal credit than formal credit in their financing mix.

Table 6: Table summarizes Two-Step Clusters on survey trust questions. Except for Informal to formal which is the ratio of informal credit to total credit (mean and standard deviations respectively) response are based on 5-point Likert Scale. SA=Strongly Agree; MA=Moderately Agree; A=Agree; MD=Moderately Disagree; D=Disagree. Agreement labels listed in order of highest frequency first, and next highest to its adjacent left or right, unless single response was overwhelming

	Cluster 1 Agreement	Cluster Frequency	Cluster 2 Agreement	Cluster Frequency	Cluster 3 Agreement	Cluster Frequency
You trust family/relative to repay	A	0.948	MA/A	0.745	SA	0.986
You trust Friend to repay	A	0.964	MA/A	0.778	SA	0.962
Family/relative trusts you to repay	A	0.943	MA/SA	0.775	SA	0.948
Friend trusts you to repay	A	0.943	MA/SA	0.778	SA	0.924
In community lending occurs because of trust	A /MA	0.753	MA/SA	0.738	SA/MA	0.935
You would lend to friend/relative even if you did not trust them	MD/A	0.773	A/MA	0.566	SA/MA	0.522
Informal to Formal (Mean, Std)	0.600	0.433	0.639	0.423	0.684	0.415

Table 7: Table summarizes Two-Step Clusters on survey trust questions. Except for Informal to formal which is the ratio of informal credit to total credit (mean and standard deviations respectively) response are based on 5-point Likert Scale. SA=Strongly Agree; MA=Moderately Agree; A=Agree; MD=Moderately Disagree; D=Disagree. Agreement labels listed in order of highest frequency first, and next highest to its adjacent left or right, unless single response was overwhelming

	Cluster 1		Cluster 2		Cluster 3	
	Agreement	Cluster Frequency	Agreement	Cluster Frequency	Agreement	Cluster Frequency
I Am Able To Borrow Needed Amount Of Money From Banks Or RCC For Consumption, Education And Health Purposes?	SA/MA	0.504	A/MD	0.852	MA/A	0.737
I Am Able To Borrow Needed Amount Of Money From Banks Or RCC For Farming And Business Purposes?	SA/MA	0.620	A/MD	0.765	MA/A	0.797
Interest Rates On RCC Or Bank Loans Are Higher Than Interest Rates On Loans From Friends Or Relatives.	SA/MA	0.562	A/MD	0.835	MA/SA	0.703
Interest Rates On RCC Or Bank Loans Are Higher Than I Am Able To Pay.	SA/MA	0.555	A/MD	0.930	MA/SA	0.644
I Lack The Collateral To Get A Loan	MD/SD	0.504	A/MD	0.904	MD/A	0.585
I Would Prefer To Borrow From A Friend Or Relative	SA/MA	0.569	A/MD	0.878	SA/MA	0.720
I Do Not Like To Be Indebted To A Bank Or RCC.	SA/MA	0.562	MD/A	0.843	SA/MA	0.568
If Interest Rates On RCC Or Bank Loans Were Lower Than Current Interest Rates I Would Be More Likely To Borrow From A Bank Or RCC	SA/MA	0.876	A/MD	0.887	MA/A	0.593
If The Cost Of Obtaining A Loan (Fees, Non-Interest Charges) On RCC Or Bank Loans Were Lower Than Current Costs I Would Be More Likely To Borrow From A Bank Or RCC.	SA/MA	0.832	A/MD	0.904	MD/A	0.593
Informal to formal (Mean/Std)	0.370	0.402	0.442	0.402	0.518	0.416

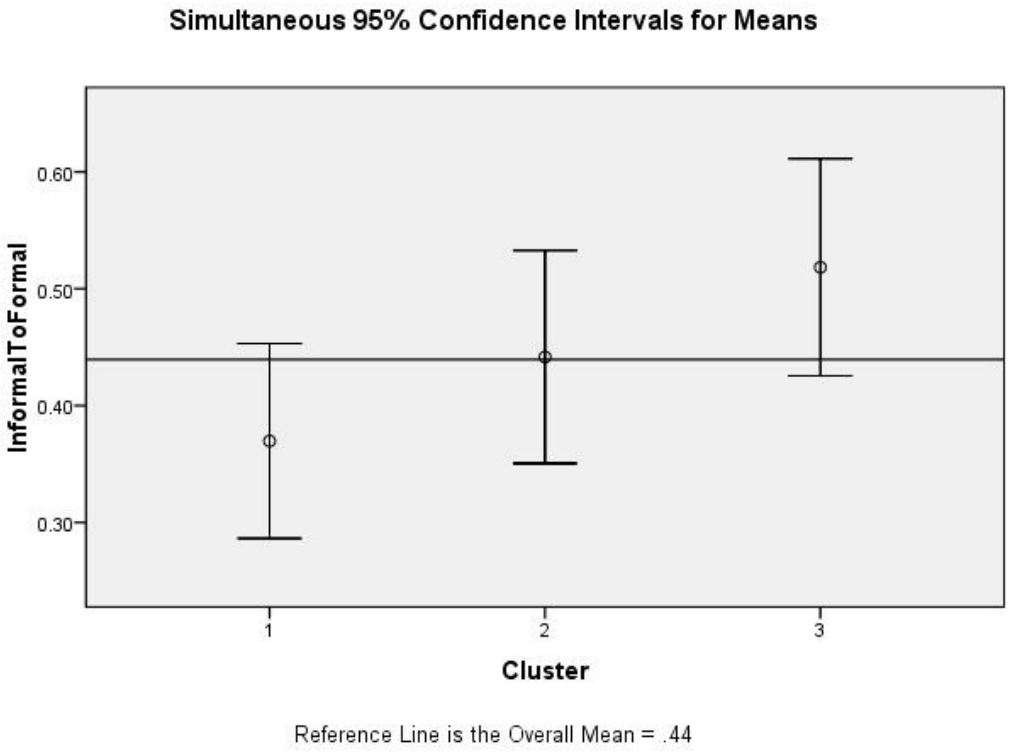

Figure 1: Confidence Intervals for Borrowing Clusters on Ratio of Informal to Total Loans . The Borrowing clusters represent common attributes or beliefs about certain aspects of borrowing. The Intervals show on average that cluster 3 members are more likely to use informal credit than formal credit.

Figure 2: Confidence Intervals for Trust Clusters on Ratio of Informal to Total Loans . The Trust clusters represent common attributes or beliefs about trust. The Intervals show on average that cluster 3 members are more likely to use informal credit than formal credit.

Cross-tabulations for the Trust and Borrowing clusters are found in Table 8 (N=370). The cross tabulations show that borrowing cluster 1 is populated most often by Trust cluster 3 (59.1%). Recall that Trust cluster 3 was determined to be the most trustiness. Borrowing cluster 2 is most likely to be populated by Trust cluster 1 (58.3%) and borrowing cluster 3 is most likely to be populated by trust cluster 2. Thus while we can say that a respondent who is trusting will most likely use a greater proportion of informal credit (cluster 3) and that a borrower with a collateral advantage and less inhibition about formal borrowing, will use proportionately less informal credit (cluster 1), we cannot so easily draw a line stating that the most trusting borrowers are less likely to use formal credit or that borrowers who use proportionately more formal credit are less trustworthy or trusting than those who use proportionately less.

Table 8: Cross Tabulation between Trust and Borrowing Cluster Groupings

	Trust Cluster Number			
Borrow Cluster Number	1	2	3	Total
1	0.066	0.343	0.591	1.000
2	0.583	0.278	0.139	1.000
3	0.212	0.534	0.254	1.000
Total	0.273	0.384	0.343	1.000

Regression Analyses

Table 9 provides a number of multivariate regressions designed to better understand the relationship between key explanatory variables and credit use. All equations are estimated using the General Linear Model (GLM) robust estimator with correction for heteroscedasticity. The reasoning behind so many regressions is to gain an understanding of how farm attributes influence different decision criteria. For example a (1,0) binary variable indicating that a farm has some form of debt (a likelihood) requires a different explanation than the amount of debt a farm has, the debt to asset ratio, or the ratio of informal to total (% Informal) debt. For each of these dependent variables we need to extract systemic factors which may be correlated with regional differences. Thus the regressions are estimated in pairs with the second including regional dummy variables measured relative to Yangling.

A linear probability model for the likelihood that a farm will hold some form of debt did increases with the number of people in the household ($p=0.001$) but decreases with household

income (p=0.142). Much of the variance can be attributed to Gansu which has a higher likelihood of 0.079 (p=0.057). The amount of debt (Yuan) is positively related to farm asset value (p=0.081) when regional variables are excluded and asset value (p=0.073) and household income (p=0.092) when regional dummy variables are included. Again the significance of the regional variables reflects previous discussions about differences between regions. The debt to asset ratio is influenced most by years farming (p=0.18), people in household (p=0.23), asset value (p=0.000). When controlled for regional differences a substantial improvement is found for % income from farming (p=0.037). The more interesting and intuitive results is found with the % Informal regression. As the percent of income from farming increases the proportion of informal credit also increases (p=0.00), but the use of informal credit as a percentage of the total decreases as asset values (p=0.00), household income (p=0.021) and debt to asset ratio (p=0.017) increase. In other words, this regression suggests that poorer, more limited resource households whose income is derived primarily from farming are more likely to borrow informally from friends and relatives. Part of this is explained by regional difference because the significance on % farm income disappears when the regional variables are added. But even when regional differences are controlled, higher income and asset households with greater debt to assets are more likely to have a lower percentage of their total debt financed by friends and/or relatives.

Table 9: GLM Robust Estimates of Credit Use

	Some form of Debt (1,0)		Some form of Debt (1,0)		Amount of Debt		Amount of Debt		Debt Asset		Debt Asset		% Informal		% Informal	
Likelihood Ratio P-Value	0.613		0.588		0.000		0.000		0.000		0.000		0.031		0.000	
N	1390		1390		872		872		870		870		726		726	
	Para-meter	P-value	Para-meter	P-value	Para-meter	P-value	Para-meter	P-value	Para-meter	P-value	Para-meter	P-value	Para-meter	P-value	Para-meter	P-value
(Intercept)	0.423	0.000	0.379	0.000	7,861	0.027	-4,000	0.367	0.436	0.000	0.109	0.439	0.686	0.000	0.821	0.000
Year Farming	0.000	0.395	0.000	0.433	-40.272	0.491	-40.068	0.464	0.003	0.183	0.004	0.170	0.001	0.367	0.002	0.101
% Income from Farming	0.000	0.389	0.000	0.432	-25.441	0.273	18.768	0.442	0.001	0.391	0.002	0.037	0.002	0.000	0.000	0.762
People in Household	0.030	0.001	0.030	0.002	245.832	0.607	273.538	0.546	0.025	0.230	0.021	0.256	-0.010	0.357	0.000	0.951
Asset Value	2.3E-07	0.343	3.88E-07	0.081	0.122	0.087	0.126	0.092	-4.71E-06	0.000	-4.13E-06	0.000	-1.83E-06	0.000	-8.90E-07	0.006
Household Income	-2.31E-06	0.142	-1.51E-06	0.300	0.087	0.327	0.143	0.073	-5.84E-07	0.804	1.63E-06	0.284	-3.24E-06	0.021	-2.59E-06	0.057
Debt/ Asset	-	-	-	-	-	-	-	-	-	-	-	-	-0.041	0.017	-0.035	0.005
Gansu			0.079	0.057			13,403	0.000			0.422	0.000			-0.392	0.000
Henan			0.060	0.148			10,663	0.003			0.345	0.001			0.148	0.000
Qianyang			-0.039	0.340			11,919	0.000			0.163	0.000			-0.249	0.000

We examine how the clusters on trust and borrowing affect credit choice in Table 10. The first set of 3 equations regress the independent variables including dichotomized cluster variables which enter the model as intercept shifters. Excluding regional and borrowing cluster variables in the first equation the proportion of informal to total loans increases with years of farming (p=0.132), decreases with farm size (p=0.00), and increases with the percent of income from farming. As the proportion of debt to assets increases informal lending falls (p=0.11). Trust cluster 3 is excluded from the regression to avoid singularity. Relative to cluster 3, trust-cluster 1 has a lower informal loan proportion (B=-0.073, p=0.066) than both trust-cluster 2 (B=-0.020, p=0.543) and trust-cluster 3, but trust cluster 2 is not significantly different from trust cluster 3. The difference between the trusts clusters disappear when the four regions (relative to Yangling) are included. As previously discussed there is enough heterogeneity between the regions to account for much of the significance in the use of informal loans which largely lose significance. In equation 3, which includes data only from Gansu and Qianyang, the borrowing clusters are added to the equation. As with equation 1, trust-cluster 1 (B=-0.099, p=0.099) has the lowest informal to total loan ratio, and there is not a significant difference between trust-cluster 2 (B=-0.061, p=0.252) and trust cluster 3. Borrowing cluster 1 also has the lowest informal to total loan ratio (B=-0.164, p=0.003) but there is no significant difference between borrowing clusters 2 and 3. All other things held equal, the analysis of covariance indicated by equation 3 shows that members in trust-cluster 3 and borrowing-cluster 3 will have the highest informal to total loan ratio (0.662) while those in trust-cluster 1 and borrowing cluster 1 have the lowest (0.662-0.99-0.164=0.399). The complete covariance, normalized to a percentage basis, is presented in panel 1 of Table 11.Thus all other things being equal a member of trust cluster 1 and borrowing cluster 2 will have an informal to total loan ratio equal to 60.77% of the cluster 3 pair.

Equation 4 (N=118) includes only those farmers who indicated that 100% of loans were from formal sources. Households with higher assets (B=0.092, p=0.023) and debt to asset (B=11,256, p=0.045) with the remaining variables not significantly different from zero. The two sets of cluster variables are not statistically different from zero. Nonetheless, taking the coefficients at value, the analysis of covariance is provided in the second panel of Table 10. All other things being equal members of trust-cluster 3 and borrowing cluster 3 have the lowest amount of formal debt ($1,410) while members of trust cluster 2 and borrowing cluster 1 have

the highest (1,410+22,650+26,224= 50,285 Yuan). Thus, with respect to the second panel in Table 11, the cluster 3 pair will have formal credit equal to 2.81% of the 1-2 cluster.

Equation 4 examines the subset that used 100% informal debt. The more years farmed the more informal credit would be used. Farmers with higher assets would borrow more informally, but as household income increased informal borrowing will fall. Trust-cluster 2 and borrowing-cluster 1 are statistically different from zero and the cluster-3 pair that is bundled into the intercept. The relative proportion of informal to formal debt is provided by the analysis of covariance in the third panel of Table 11. The 3-3 cluster pair has the highest amount of informal credit, which is consistent with the results in panel 1. Members of the 1-2 clusters who hold only informal credit will hold only 33.3% of the average amount of informal debt held by the 3-3 cluster pair.

Finally, the 6th regression is estimated for respondents who used both formal and informal credit. As the % of income from farming increases ((B=-522.9, p=0.126) combined borrowing falls, and as household income increases, combined borrowing increases. There is no significant difference amongst the clustering variables. However, taking the values as stated the analysis of covariance shows that, all other things being equal, members of the 2-2 cluster pair will hold the highest amount of combined debt.

An interesting difference between the cross tabulations in Table 8 and the relative proportions in Table 11 is that the cross tabulations provide the mean informal to total loan proportions in each cluster pair. In comparison the first panel in Table 11 standardizes or controls for differences in farm attributes. Thus a farmer with a 2-2 cluster pair on average will have an informal to total loan ratio of 0.278 which is 47% of the highest proportion located at the 1-3 cluster pair. This comparison includes differences across farms. Table 11 in contrast assumes that all farm households are equivalent in all respects except their cluster membership. Thus a farm equivalent in all respects to a second farm except that it has a 1-1 cluster pair membership will have an informal to total loan ratio equal to 60.3% of an identical farm with a 3-3 cluster membership, while the second farm with a 2-2 cluster pair membership will have an informal loan ratio equal to 83.5% of the 3-3 cluster pair. That the 3-3 clusters pair has the highest relative use of informal credit relative to total credit is also consistent with the confidence intervals in Figures 5 and 6.

Table 10: GLM Robust Estimates of Credit Use with Cluster Groups

	Informal to Formal		Informal to Formal		Informal to Formal		Formal Loans Only (Yuan)		Informal Loans Only (Yuan)		Informal and Formal Loans (Yuan)	
Likelihood Ratio P-Value	**0.025**		**0.000**		**0.945**		**0.000**		**0.000**		**0.000**	
N	**722**		**722**		**355**		**118**		**92**		**125**	
	B	p-Value	B	p-Value	B	p-Value	B	p-Value	B	p-Value	B	p-Value
Parameter					Gansu and Qianyang		Gansu and Qianyang		Gansu and Qianyang		Gansu and Qianyang	
(Intercept)	0.747	0.000	0.840	0.000	0.662	0.000	1,411	0.855	-3,440	0.314	-4,330	0.482
Years Farming	0.002	0.132	0.002	0.106	0.001	0.452	-158	0.469	71.489	0.050	8.272	0.922
Farm Size (mu)	-0.022	0.000	0.000	0.886	0.000	0.905	725	0.326	206.149	0.254	-522.934	0.126
% Farm Income	0.002	0.000	0.000	0.776	0.001	0.420	-156	0.343	11.400	0.679	-18.227	0.616
Household Size	0.001	0.912	0.000	0.941	0.004	0.816	-2,921	0.300	618.135	0.137	-330.238	0.607
Asset Value	0.000	0.000	0.000	0.004	0.000	0.010	0.092	0.023	0.119	0.000	0.265	0.000
Household Income	0.000	0.103	0.000	0.074	0.000	0.446	-0.252	0.460	-0.098	0.110	0.255	0.127
Debt To Asset	-0.039	0.011	-0.035	0.005	-0.050	0.003	11,256	0.045	11,705	0.000	31,555	0.000
Gansu	-	-	-0.388	0.000	-0.133	0.002	13,575	0.162	45.112	0.974	-3,949	0.059
Henan	-	-	0.147	0.000	-	-	-	-	-	-	-	-
Qianyang	-	-	-0.248	0.000	a		a		a		a	
Trust Cluster 1	-0.073	0.066	-0.023	0.517	-0.099	0.099	2,927	0.687	-8.579	0.996	75.904	0.979
Trust Cluster 2	-0.020	0.543	-0.030	0.316	-0.061	0.252	22,650	0.215	-2,494	0.080	723.771	0.760
Borrow Cluster 1	-	-	-	-	-0.164	0.003	26,224	0.212	-4,385	0.008	-104.693	0.961
Borrow Cluster 2	-	-	-	-	-0.048	0.394	10,167	0.182	-1,305	0.390	1,848	0.452

Table 11 Analysis of Covariance

	Trust		
	1	2	3
Borrowing	Informal to Total		
1	0.603	0.660	0.752
2	0.778	0.835	0.927
3	0.850	0.908	1.000
	Only Formal Credit		
1	0.608	1.000	0.550
2	0.288	0.681	0.230
3	0.086	0.478	0.028
	Only Informal Credit		
1	0.439	0.333	0.440
2	0.724	0.475	0.725
3	0.998	0.580	1.000
	Formal and Informal Credit		
1	0.403	0.474	0.396
2	0.731	1.000	0.708
3	0.413	0.487	0.406

Conclusions

With the aim of providing increased access to credit, the Chinese government and the Peoples Bank of China are opening up the country to foreign MFIs . This process started around 2006 and has been accelerating in recent years. To understand microcredit in China one must also understand the role of trust and the strength of informal lending in rural areas. The current study found that approximately two-thirds of farm households with debt had borrowed from friends or relatives with the remainder coming from rural credit cooperatives. Usurious money lending is virtually non-existent.

This paper focused on the role of trust and factors affecting informal markets. Community trust is extraordinary strong in these areas and repayment of informal or formal loans is in excess of 97%. These repayment rates are well in line with repayment rates reported at MFIs across the world. For the most part the farms surveyed were poor, with annual household income approximately 13,000 Yuan/year and less than 4,000 Yuan per capita. Turvey and Kong provide a framework for assessing MFI loan rates that is based on the proposition that the poor

are more trustworthy than the rich. We do not find evidence of this in the current study principally because the majority of our households were very poor and likely below the threshold where reneging on loans and losing the advantage of dynamic incentives was 'profitable'. Nonetheless we find very strong evidence that trust is manifest across the Chinese agricultural economy, so much so that an MFI could enter the market on the strength of social trust alone. This is critically important for few farmers have adequate collateral to pledge against collateral loans. Furthermore, the social networks are sufficiently strong that, Zeller (2006) claims, MFIs can tap into and exploit the existing social fabric to mutual advantage.

It is evident that in order to understand the role that microcredit could play in rural China, we needed to fully understand the cultural dimensions of trust and informal lending between friends and relatives. This paper is part of that effort. Our results suggest that MFI's targeting rural and agricultural areas should do so with caution and prudence. Our results support the conjecture of an inverse relationship between trust and moral hazard. We find strong evidence that the more trusting/trustworthy farmers are, the more likely that they would defer to informal credit amongst friends. Thus the very groups that formal lenders would target are probably the least likely to use MFI credit. In fact the evidence suggests that informal borrowing is not a result of spillover effects from credit rationing at all, but rather the opposite. That is, the strength of the informal bonds and a general preference for informal borrowing can actually crowd out formal credit. Our analysis on the ratio of informal loans to total loans supports this conjecture. The implication is that if informal lending can crowd out existing facilities offered by RCCs, and RCC rates are between 5% and 15% below MFI rates, micro credit may not be an easy sell in rural China.

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