

INFORMAL LENDING AND OTHER-REGARDING MOTIVES: FURTHER
EVIDENCE FROM CHOICE EXPERIMENT IN RURAL CHINA

A Thesis

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ABSTRACT

Though informal lending and borrowing are widely prevalent among close acquaintances in rural areas of developing economies, these informal transactions have not been extensively researched in agricultural communities. As it stands, a risk-sharing motive has been advanced as an important explanation of such informal exchanges. However, this fails to incorporate social preferences such as altruism, trust, reciprocity, and fairness. The primary contribution of this paper is to investigate fairness reciprocity as an important motive underlying informal financial transactions among friends and relatives. Evidence from our choice experiment in China suggests that fairness could be advanced as an important motive in informal financial transactions.

BIOGRAPHICAL SKETCH

Shichao Fang is a second-year master student at the Charles H. Dyson School of Applied Economics and Management, Cornell University, with her research concentration in agricultural economics.

She was born in Dongyang, Zhejiang, east China, a small city famous for woodcarving crafts. In 2013, she went to Zhejiang University (ZJU) with a major in economics. During her four years at ZJU, she attended courses of different majors with passion and explored life's possibilities with an open heart and mind. After graduating from ZJU, Shichao decided to continue her journey on economics in Cornell and explore a different lifestyle on the other side of the world from her hometown. The two-year experience there has become the most precious treasure she has in life.

This study is dedicated to Professor Calum G. Turvey, my advisor in graduate school.

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CHAPTER 1

INTRODUCTION

In rural regions of developing countries, formal credit and insurance markets are often unable to adequately meet farm households' financial needs due to transaction, information, and enforcement costs¹. Also, the lack of private land makes collateral-based lending especially difficult in China (Park, Ren 2001). In response to these imperfections, several institutional mechanisms such as sharecropping (Stiglitz 1974), informal lending, and insurance arrangements have developed (Udry 1994, Coate and Ravallion 1993, Ligon, Thomas, and Worrall 2002). In China, informal lending among rural households is an effective complement to the formal financial market. Gan (2016) found that in 2013, 40% of rural households participated in private lending, mainly from relatives and friends. A survey in 2017 and 2018 found that informal lending amongst friends occurred in more than 67% of households with some form of debt (Turvey, Kong 2010). Informal lending not only increases household income, but also plays an essential role in eliminating rural poverty and narrowing income disparity (Gan, Yin, and Tan 2016, Song 2005, Tang 2009). What is less understood are the motives, economic and otherwise, that cause these institutions to arise in the first place. A growing body of evidence suggests that individuals are also strongly motivated by social preferences such as altruism, trust, fairness, as well as reciprocity. These considerations do not fall neatly into the self-interested motivators normally considered in economic analysis that are based on outcomes and consequences, rather

¹ See Hoff, Braverman, and Stiglitz (1993) for more on this.

than the intentions behind the actions taken (Berg et al. 1995; Falk and Fischbacher 2006; Fehr and Schmidt 2006²; Falk et al. 2008; Blanco et al. 2010). Thus, risk sharing may only partly explain the motives behind informal, familial lending in rural communities. Some literature argues that the threat of severing social ties could enforce informal loans. If the underlying social capital is sufficiently large, informal loans might carry zero interest and collateral, and network connections between individuals could be used as social collateral instead (Karaivanov, Kessler 2018, Mobius, Rosenblat 2016, Karlan et al. 2009, Floro 2019). However, community pressure may not be that effective in the enforcement of informal lending. Therefore, the other part might best be explained by other-regarding motives. Other-regarding motives can include inequality aversion (Fehr and Schmidt 1999; Bolton and Ockenfels 2000; Blanco et al. 2010), which holds that agents care not only about their own material payoffs but also the distribution of payoffs of others. In the theory of reciprocity, Falk and Fischbacher (2006) investigate reciprocity as a complex behavioral response to perceived kindness and unkindness, with kindness embodying both the distribution and intentions of fairness. Thus, other-regarding motives that include fairness, kindness, trust, and reciprocity can go a long way in explaining the question considered in this paper, which is why farmers in poor regions such as China lend to each other informally, when lending comes at a cost?

To understand fairness and reciprocal exchanges such as familial lending, it is critical to recognize a full utility function that combines material payoffs and fairness payoffs. This hierarchy of beliefs includes what the borrower or lender thinks, what

² Fehr and Schmidt (2006) present a detailed review on social preferences.

they think about each other, what each believes the other thinks about them, and higher-order consideration about what other people, uninvolved in the transaction, think and so on. The concept of fairness, as presented in Rabin (1993), is in its simplest form, a state in which it is deemed fair that if someone is nice to you, you be nice to her; or if someone is unkind to you, you be unkind to him. In the specific case of informal lending, a familial loan requires the lender to give up a material interest so that the borrower can gain a material interest. The material interest may be permanently lost if the borrower is a rascal and never repays the loan or can be fully recovered if an interest rate is charged to cover the material loss, or partially recovered if the loan is repaid but without interest, as is the usual case in China.

Determining the complex interactions of social pressures and networks, as well as innate individual preferences, is a difficult task, largely because individual preferences, thoughts, and motives are unobservable. Previous efforts have relied on game theory and in-the-lab experimental techniques. However, these approaches can only assert intentions and other-regarding preferences within their own contexts and cannot answer questions about the motives behind seemingly cultural inducements such as informal familial lending in rural China. In addition, Rabin's model, which we follow, is comprised of multiple parts that need to be parsed to gain a fuller understanding of motives. In this paper, we take a different approach to in-the-lab experiments by using an in-the-field discrete choice experiment. More specifically, the purpose of this paper is to explore the relationship between informal or familial lending amongst friends and relatives from a social preferences point of view. We investigate the economics of informal lending between farm households in China. More generally, our paper makes

several significant contributions. The first is considering fairness and kindness in the context of agricultural economics. Second, from an empirical point of view, we are the first to use choice experiments to investigate other-regarding motives in informal lending.

In addition, the problem we address is of great practical and scholarly interest. From a scholastic point of view, we make some advances in the understanding of fairness and reciprocity in relation to informal/familial lending in rural communities as well as a better understanding of the utility theory that is the genesis behind social interactions. From a practical point of view, policymakers and formal lenders often have to make decisions based on practicalities at the farm or village level. For example, if informal lending amongst friends crowds out or slows the development of formal credit in rural communities, it is useful for stakeholders to understand the motives and social preferences of rural borrowers. A large number of studies have investigated various aspects of informal lending where ‘informal lending’ is broadly and loosely defined as any source of financing not obtained from the formal deposit or lending-only financial institutions³. However, very few studies have conducted research on

³ Timberg and Aiyar (1984) illustrated the advantage of informal credit in advancing loans with little or no collateral; Bhat (1986) observed that informal credit agencies functioned mainly on the basis of personal information and knowledge which provides advantages with respect to identifying profitable opportunities for credit transactions; Basu (1997), Basu (1993), Stiglitz (1993) and Bardhan and Udry (1999) emphasized the relationship between high interest rates on informal loans reflecting risk premiums and search costs. Coate and Ravallion (1993) view informal credit as efficient risk sharing arrangements in informal markets with the threat of future exclusion from the market ensuring that the borrower does not default on the repayment of loans. Aleem (1993), Basu and Bell (1991), and Hatlebakk (2000) argue that increased monitoring costs, increased marginal cost of funds and higher default rates lead to higher interest rates on loans advanced by informal credit agencies. Bell (1990) emphasizes the interactions between formal and informal credit institutions. His model shows that when formal credit is rationed, and the informal lender is able to offer a contract preferred by the borrower, there is a spill-over of demand in the market. Von Pischke et.al. (1983) observed that a large part of the informal credit goes to consumption and non-productive usages which enhances indebtedness problem of borrowers. Okten and Osili (2004) argue that social networks reduce informational asymmetries that

informal lending amongst friends and relatives in rural economies, even though it constitutes a sizable part of informal lending and borrowing. Informal financial transactions among close acquaintances such as friends and relatives are usually characterized by a lack of formal contracts, a lack of explicit interest rates, state-contingent repayment of loans⁴, role reversal of agents as borrowers and lenders, and a reduction in the importance of information asymmetry (Udry 1994, Lund and Fafchamps 2003, Turvey and Kong 2010). The investigation of these transactions is an evolving field of study, particularly in attempts to determine how social institutions and networks affect or impact economic outcomes. In the agricultural economic literature, risk sharing and consumption smoothing are given as important explanations (McPeak 2006, Santos and Barrett 2012, Turvey and Kong 2010). If risk sharing is a beneficial motive, then informal lending on a reciprocal basis is no more than an intertemporal insurance scheme. Risk-sharing as a singular motive can break down when farm households face catastrophic covariate risks, and the reciprocating party is unable to assist.

In game-theoretic frameworks and controlled experiments, there have been numerous explanations of sharing type behavior (See Charness and Rabin, 2002), including ‘difference aversion’ in which players take into consideration the equality of other players’ payoffs when they make monetary choices. Ultimatum games (Slonim and Roth, 1998), a voluntary contribution to public goods game (Fehr and Schmidt,

can lead to an increase in access to credit. Santos and Barrett (2012) argues that informal lending concentrates around the unstable wealth equilibrium in response to asset shocks, serving as a safety net, or insurance, against collapse into a poverty trap. They further argue that informal credit arrangements cannot function for the poorest members of a society if they are not part of the social networks from which credit networks are drawn.

⁴ State-contingent repayment refers to instances where money owed by the borrower may vary in the final period.

1999), and many variants of trust and investment games (Cox 2006, and Cox et al. 2001) have all proposed complex social interactions. Bowles and Gintis (1993) have further observed that in incomplete market transactions, outcomes depend on participants' levels of altruism, strategic behavior, sentiments, and other social and cultural preferences.

Such departures from pure self-interest (as in a typical Prisoner's Dilemma) have stimulated models of social preferences. Within the literature, there exist two approaches that incorporate social preferences, namely outcome, and intentions based approaches (Charness & Rabin, 2002). The outcome-based approach is one in which individuals are concerned with the payoffs of others and include inequity aversion preferences (Fehr and Schmidt, 1999), equity, reciprocity and competition preferences (Bolton and Ockenfels, 2000), and altruistic preferences and quasi-maximin preferences (Andreoni and Miller, 2002). Alternatively, the intentions-based approach is one in which the agent is concerned with intentions and reciprocates based on beliefs about whether the other player is treating him or her fairly⁵. Here an individual derives utility both from the material payoff and from a belief that they have been treated kindly. Moreover, the approach suggests that a client derives additional utility from their perceived freedom to treat others kindly or unkindly. In Rabin (1993), a fairness equilibrium is proposed that demonstrates intentions based on reciprocity for a simple two-player normal form game. Dufwenberg and Kirchsteiger (2004) and Falk and Fischbacher (2006) have extended Rabin's (1993) model behavior in sequential games.

⁵ For theoretical formalization see, Geanakoplos, Pearce and Stacchetti (1989).

It is likely that the basic elements of the games played amongst rural borrowers and lenders are more apt to be among the information-dependent games (Gilboa and Schmeidler, 1988) in which prior knowledge that the outcome will lie in a particular set of outcome space will determine utility. Some of these can be easily imagined. A person willing to lend to a friend must consider the lost utility from giving up current consumption for future consumption (a material loss) and balance that against the emotional gain from a kind act and the future potential of reciprocity (a material gain). For example, emotional reactions cannot generally be independent of expectations and interpretation of past experiences, i.e., they are endogenous. The logic of sequential rationality in psychological games is outlined in Geanakoplos et al. (1989). The willingness of a limited resource borrower to make a loan to a friend or relative is as much about what the potential lender has learned through the repetition of a sequence of borrowing and lending prior to the decision point. Furthermore, belief-dependent psychological considerations such as surprise, confidence, gratitude, disappointment, embarrassment, and so on can shift the nature of the game. The psychological game is that the players' payoffs (borrower and lender) depend not only on what other people do but also on what they think.

The paper proceeds as follows. In the next section, we discuss social preferences, fairness, kindness, and reciprocity in the context of existing theories. This is followed by a review of data collection methods, choice experiment design, survey design. The logit model results are compared and discussed. And follow up survey results facilitate a better understanding of experiment results. The paper is then concluded.

CHAPTER 2

SOCIAL PREFERENCES, FAIRNESS, AND ECONOMIC TRANSACTIONS

Economic analysis most commonly follows models of self-utility maximization without accounting for others' material payoffs, behaviors, or intentions. This assumption allows for parsimonious models with tractable solutions, and when markets are competitive and transaction costs are ignorable, it predicts behavior well. However, self-utility maximization does not provide a satisfactory explanation of rural credit markets such as those in China where upwards of 60% of the credit outstanding comes from friends or relatives rather than formal sources. The simplest rationale is that as a result of incomplete or even absent rural credit markets farmers have no choice but to borrow and lend from each other, but this too is unacceptable, or at least not convincing, when one considers the complexity of social interactions that must arise in order for entire local economies to be reliant on each other for credit. Even more puzzling is that such lending behavior persists even when formal credit is available.

Most important is that to understand fairness and reciprocal exchanges such as familial lending it is critical to recognize a full utility function that combines material payoffs and fairness payoffs. This hierarchy of beliefs includes what the borrower or lender thinks, what they think about each other, what each believes the other thinks about them and higher order consideration about what other people, uninvolved in the transaction, think and so on. The concept of fairness as presented in Rabin (1993) is in its simplest form a state in which it is deemed fair that if someone is nice to you, you

be nice to her; or if someone is unkind to you, you be unkind to him. The choice set normally requires one or the other, or even both, at one time or another to make a decision and comes at a material cost or is otherwise not in the set of self-interest choices. In the specific case of informal lending a familial loan requires the lender to give up a material interest so that the borrower can gain a material interest. The material interest may be permanently lost if the borrower is a rascal and never repays the loan, or can be fully recovered if an interest rate is charged to cover the material loss, or partially recovered if the loan is repaid but without interest as is the usual case in China.

A consequence of this type of social structure is that mutual utility maximizing outcomes generates kind feelings that then generate positive reciprocation (mutual-max). Alternatively it may generate hostile feelings that in turn result in negative reciprocation (mutual-min). On social interactions of this type Rabin (1993) raises three points:

- (i) people are willing to sacrifice their own material well-being to help those who are being kind;
- (ii) people are willing to sacrifice their own material well-being to punish those who are being unkind;
- (iii) Both motivations have a greater effect on behavior as the material cost of sacrificing becomes smaller⁶.

⁶ The equilibrium outcome is further characterized in the game-theoretic framework as adhering to the following rules. Any Nash equilibrium that is either a mutual-max outcome or mutual-min outcome is also a fairness equilibrium. Moreover, if material payoffs are small, then an outcome is a fairness equilibrium if and only if it is a mutual-max or a mutual-min outcome. Finally, if material payoffs are large, then an outcome is a fairness equilibrium if and only if it is a Nash equilibrium.

In this framework, Rabin (1993) proposes that informal transactions can be considered the outcomes of fairness games, implying that individuals prefer to reciprocate in a manner which is mutual-max or mutual-min. Rabin (1993) concludes that every mutual-max or mutual-min Nash equilibrium is a fairness equilibrium. Rabin's framework defines reciprocity, provides insights into behaviors and outcomes, formalizes and demonstrates the existence of a fairness equilibrium and is analytically tractable in that it leads to the description of beliefs and notions of reciprocity required to analyze equilibrium outcomes.

Before proceeding further, we define the social preferences that Rabin (1993) uses to formalize the fairness equilibrium . Altruism is defined as a form of unconditional kindness (Andreoni and Miller ,2002; Charness and Rabin, 2002) while a conditional form of altruism, envy is described as inequity aversion (Fehr and Schmidt 1999; Bolton and Ockenfels 2000; Charness and Rabin 2002). An individual is defined as inequity averse if he derives utility not only from changes in his material self-interest but from perceptions of reciprocity, whether they are positive or negative. Positive reciprocity is defined as the motivation to respond kindly if others have treated one kindly. Conversely, negative reciprocity is defined as the motivation to respond unkindly, to the extent of even harming oneself if another person's intentional behavior was perceived to be harmful. Underlying this is an element of trust which is derived from an agent's subjective belief about the behavior of the other person.

2.1 Theoretical Development of a Fairness Equilibrium in Rural Credit

In this section we sketch out the theoretical foundation for a fairness equilibrium in an informal rural credit market. We start with a classical setup from which we can investigate the intentions of borrowing households in a two-period interaction between households 1 and 2. Suppose in period 0 household 1's endowment is $y_0^1 (y_0^1 < \bar{y}^1)$ while household 2's endowment is $y_0^2 (y_0^2 > \bar{y}^2)$. To smooth consumption, household 1 borrows from household 2 an amount x (assuming $y_0^2 > y_0^1$). In the next period, it is assumed that household 1 sees an improved endowment $y_1^1 (y_1^1 > \bar{y}^1)$. It is further assumed that $(y_0^2 > y_1^2, y_0^1 < y_1^1; y_0^2 > y_0^1, y_1^1 > y_1^2)$, or in other words at time 0 household 2 holds a higher endowment than household 1 but at time 1 the situation reverses. The household has two choices of action, to either repay ($a = R$) the loan amount plus interest if charged ($\alpha x (\alpha \geq 1)$) or default on the loan ($a = D$). Assuming for convenience that both households have well-behaved log utility functions the payoff over two periods is

$$\begin{aligned}
 1) \quad \pi_1 &= \{\ln(y_0^1 + x) + \beta \ln(y_1^1 - \alpha x); \alpha \geq 1 \text{ if } a = R \\
 &= \{\ln(y_0^1 + x) + \beta \ln(y_1^1) \text{ if } a = D \\
 \pi_2 &= \{\ln(y_0^2 - x) + \beta \ln(y_1^2 + \alpha x); \alpha \geq 1 \text{ if } a = R \\
 &= \{\ln(y_0^2 - x) + \beta \ln(y_1^2) \text{ if } a = D
 \end{aligned}$$

In a conventional one-shot game theoretic analysis the situation is similar to a continuous strategy prisoner's dilemma game. Household 1 chooses to default in period 1 and for $a = D$, household 2 maximizes its payoff by setting $x = 0$. So

$(a = D, x = 0)$ is a dominant strategy Nash equilibrium. Of course, in the real world outcomes with non-zero loans are frequent so a zero-loan outcome is not a universal Nash equilibrium and the question we seek to answer is why?

Rabin's approach provides the economic juice for this investigation because it considers in one way or other certain sensible facets including motives, non-material benefits, cooperation, altruism, kindness, guilt, and other considerations. The degree of kindness (Rabin (1993) defines a game-theoretic kindness function) depends on a number of factors. If the lender has savings in excess of consumption to lend then perhaps the kindness effect will diminish; if culture demands the loan be made then the lender may resent the loan but make it nonetheless, but with little gain in utility since kindness was not a motive. If the borrower was at some time mean to the lender or had previously exploited kindness by not repaying a previous loan, the lender could hurt the borrower by refusing the loan. The disutility of being unkind (guilt) may outweigh the utility from preserving consumption so that both are harmed; or if the motive is revenge the satisfaction of causing harm may in fact increase utility if the utility from revenge exceeds the disutility from being unkind.

The most general form of utility provided in Rabin (1993) is for a 2-player game:

$$2) \quad U_i(a_i, b_j, c_i) = \Pi_i(a_i, b_j) + [\phi + (1 - \phi)G(x)\tilde{f}_j(b_j, c_i)][1 + f_i(a_i, b_j)],$$

where ϕ captures altruism and $G(x)$ is scale. As we proceed we set $\phi = 0$ and $G(x) = 1$ as a matter of convenience but make reference to them later⁷. Given the

⁷ More credence is given to this in Charness and Rabin (2002; Appendix I where they define $g()$ as a hemi-continuous and convex valued correspondence from the set of strategies and demerits into the

existence of a complete set of strategies a_1, a_2 represent the strategies chosen by the players. In our context a_1 is the informal lender and a_2 is a friend or relative who borrows; b_1 and b_2 are the beliefs respectively of what the borrower believes about which strategy the lender will follow, and the lender's belief about what strategy the borrower will follow; c_1 and c_2 capture the psychological game: c_1 represents the lender's beliefs about what the borrower believes the lender's strategy will be. Likewise, c_2 is the borrower's belief about what the lender believes the borrower's strategy will be.

Table 1: interaction between a lender and a borrower

| | Strategy | Belief | Higher order factors |
|----------|----------|--------|----------------------|
| Lender | a_1 | b_1 | c_1 |
| Borrower | a_2 | b_2 | c_2 |

The set of strategies facing the lender ($a_1 \in \mathcal{S}$) includes making the loan today and the cost of decreased consumption or savings, in the present. The borrower's strategy set ($a_2 \in \mathcal{S}$) includes accepting the loan in the present and either repaying the loan in full at some future date or defaulting on the loan. Broken down, the relationship between lenders and borrowers in this setup involves actions, beliefs, and

$\{0,1\}$ set. $g()$ in their context can measure the degree by which the player (in our case the borrower) has pursued the social good in the past and can reinforce reciprocity.

perceptions. Actions, that is the strategies chosen, are therefore endogenous so we can write $a_1(b_2, c_1)$ and $a_2(b_1, c_2)$.

It should be noted that c_1, c_2 can also include higher order factors including, for example, how other family or friends within the social network would perceive the kindness of the lender in helping a villager and, or the borrower's perception of how he would be viewed by villagers if he purposely defaulted on the loan; or c_1 might capture the lender's recall of the borrower at a previous date being mean or unkind which might release any guilt associated with refusing the loan, even if the lender believed the borrower's sincerity to repay. Likewise c_2 might include the borrower's recall of how the lender was previously kind to him or another person known to him; and so on.

For convenience we will denote $a_1 \geq 0, a_2 \geq 0$ representing a positive strategy, $a_2 < 0$ as a negative strategy. $b_1 \geq 0, b_2 \geq 0$ represent beliefs about the other's strategy that are favorable, while $b_1 < 0, b_2 < 0$ are unfavorable. Likewise $c_1 \geq 0, c_2 \geq 0$ denote favorable perceptions while $c_1 < 0, c_2 < 0$ represent negative perceptions. Further we can characterize endogeneity as $b_2(c_1)$, and $a_1(b_2) \rightarrow a_1(b_2, c_1)$. For example, the lender may set $a_1 = 0$, refusing the loan even if it is believed the borrower will repay ($b_2 > 0$) but was previously unkind ($c_1 < 0$).

Most likely the borrower's strategy will have little to do with b_1 because the a_1 strategy (to lend) is ex ante and so will be revealed one way or another before the borrower's strategy is in play. Hence $b_2 = 0$. So the borrower's strategy is largely going to be determined by higher order terms. If the lender was previously unkind or in one way or another was a rascal, including perhaps not repaying a previous loan, then $c_2 < 0$ may drive $a_2 < 0$. But much is going on in the C_2 sphere that can conflict the strategy choice. Social norms, for example, might dominate personal animus forcing $a_2 > 0$.

To capture these socio-psychological-economic effects Rabin (1993) introduced the notion of the kindness function of which there are two portioned by beliefs, $f_i(a_i, b_j)$, and perception $\tilde{f}_j(b_j, c_i)$. The first captures player i 's kindness to player j . The second captures player i 's belief about how kind player j is being to him, although as we have interpreted this c_i can have many higher order terms.

Rabin (1993) defines

$$5) \quad f_1(a_1, b_2) = \frac{\pi_2(b_2, a_1) - \pi_2^e(b_2)}{\pi_2^h(b_2) - \pi_2^{\min}(b_2)}$$

Where the $\pi(\)$ function represents payoffs, and superscripts e, h and min capture an equitable payoff (e.g. receives a loan such that a casual observer would view the final payoff not too high or not too low, just about right), the highest payout possible (does not repay the loan), and the minimum payout. We assume that π^e is simply

based on a loan amount x^* , which can be higher or lower than what the borrower actually requires.

The second kindness function $\tilde{f}_2(b_2, c_1)$ is more ubiquitous and abstract than the first. It is qualitative and captures the psychological game aspects of the problem, and exists only to the extent that beliefs and perception form cognitive dissonance that affects utility. On the point of cognition one might look upon $f_1(\cdot)$ as being a rational response and $\tilde{f}_2(\cdot)$ as an emotional response.

In our setup we define the utility of the lender with the subscript L and use the subscript B for the borrower. Assuming that $a=R$, that is the loan is intended to be repaid, and also assuming $\pi_L^e(\cdot, \cdot) = \frac{1}{2}(\pi_L^h(\cdot, \cdot) + \pi_L^{\min})$ then

$$(3) \quad \tilde{f}_B = \frac{\pi_L(\cdot, \cdot) - \pi_L^e(\cdot, \cdot)}{\pi_L^h(\cdot, \cdot) - \pi_L^{\min}(\cdot, \cdot)} = \frac{\pi_L^h(\cdot, \cdot) - \frac{1}{2}(\pi_L^h(\cdot, \cdot) + \pi_L^{\min})}{\pi_L^h(\cdot, \cdot) - \pi_L^{\min}(\cdot, \cdot)} = \frac{1}{2}$$

And when $a=D$, or default

$$(4) \quad \tilde{f}_B = \frac{\pi_L(\cdot, \cdot) - \pi_L^e(\cdot, \cdot)}{\pi_L^h(\cdot, \cdot) - \pi_L^{\min}(\cdot, \cdot)} = \frac{\pi_L^{\min}(\cdot, \cdot) - \frac{1}{2}(\pi_L^h(\cdot, \cdot) + \pi_L^{\min})}{\pi_L^h(\cdot, \cdot) - \pi_L^{\min}(\cdot, \cdot)} = -\frac{1}{2}$$

So that $\tilde{f}_B \in \left\{ -\frac{1}{2}, \frac{1}{2} \right\}$.

To illustrate the mechanisms of fairness algebraically we further define

$$(5a) \quad \pi_B(\cdot, \cdot) = \left\{ \ln(y_0^B + x) + \beta \ln(y_1^B - \alpha x) \right\}; a = R$$

$$(5b) \quad \pi_B^h(\cdot, \cdot) = \left\{ \ln \left(y_0^B + \frac{1}{2}(y_0^L - y_0^B) \right) + \beta \ln \left(y_1^B - \frac{\alpha}{2}(y_0^L - y_0^B) \right) \right\}; \alpha \geq 1$$

$$(5c) \quad \pi_B^{\min}(\cdot, \cdot) = \left\{ \ln(y_0^B) + \beta \ln(y_1^B) \right\}; x = 0$$

(5d)

$$\pi_B^e = \frac{1}{2} \left\{ \left(\ln(y_0^B + (y_0^L - y_0^B)/2) + \beta \ln\left(y_1^B - \frac{\alpha}{2}(y_0^L - y_0^B)\right) \right) + \left(\ln(y_0^B) + \beta \ln(y_1^B) \right) \right\}; a = R$$

and

$$(5e) \quad \pi_B^e = \frac{1}{2} \left\{ \left(\ln\left(y_0^B + \frac{1}{2}(y_0^L - y_0^B)\right) + \beta \ln(y_1^B) \right) + \left(\ln(y_0^B) + \beta \ln(y_1^B) \right) \right\}; a = D.$$

Substituting (5a-d) into the kindness function yields

$$(7) \quad f_L(\cdot, \cdot | a = R) = \frac{\pi_B(\cdot, \cdot) - \pi_B^e(\cdot, \cdot)}{\pi_B^h(\cdot, \cdot) - \pi_B^{\min}(\cdot, \cdot)} = \frac{\ln(y_0^B + x) + \beta \ln(y_1^B - \alpha x) - \pi_B^e}{\ln\left(\frac{y_0^B + \frac{1}{2}(y_0^L - y_0^B)}{y_0^B}\right)}$$

And substituting this again into the utility function (2) gives lender utility

(8)

$$U_L = \ln(y_0^L - x) + \beta \ln(y_1^L + \alpha x) + \tilde{f}_B \left[1 + \frac{\ln(y_0^B + x) + \beta \ln(y_1^B - \alpha x) - \pi_B^e}{\ln\left(\frac{y_0^B + \frac{1}{2}(y_0^L - y_0^B)}{y_0^B}\right)} \right]; a = R.$$

Differentiating (8) with respect to x is

$$(9) \quad \frac{\partial U_L}{\partial x} = \frac{-1}{(y_0^L - x)} + \frac{\beta\alpha}{(y_1^L + \alpha x)} + \gamma \left[\frac{1}{(y_0^B + x)} - \frac{\beta\alpha}{(y_1^B - \alpha x)} \right] = 0$$

where $\gamma = \frac{\tilde{f}_B}{\ln \left(\frac{y_0^B + \frac{1}{2}(y_0^L - y_0^B)}{y_0^B} \right)}$.

Marginal utility is comprised of two parts which we separate in (10). The first part captures the marginal utility associated with profits while the second captures marginal utility associated with kindness. A fairness equilibrium results when the marginal utility from lending equals the marginal utility from kindness,

$$(10) \quad \frac{\beta\alpha}{(y_1^L + \alpha x^*)} - \frac{1}{(y_0^L - x^*)} = \gamma \left[\frac{\beta\alpha}{(y_1^B - \alpha x^*)} - \frac{1}{(y_0^B + x^*)} \right]$$

The existence of an interior solution is guaranteed by the necessary and sufficient conditions

$$(11a) \quad \frac{\partial U_L(LHS)}{\partial x} = - \left(\frac{\beta\alpha^2}{(y_1^L + \alpha x)^2} - \frac{1}{(y_0^L - x)^2} \right) < 0, \text{ which holds generally and}$$

$$(11b) \quad \frac{\partial U_L(RHS)}{\partial x} = \gamma \left[\frac{\beta\alpha^2}{(y_1^B - \alpha x)^2} + \frac{1}{(y_0^B + x)^2} \right] > 0, \text{ which holds globally for } a=R$$

and $\gamma > 0$.

We can further narrow the range of solutions for x^* by solving for x when the marginal utility of lending (RHS) equals zero and separately when the marginal utility

from kindness (LHS) equals zero. These boundaries are given by $x_D \leq x^* < x_k$ or

$$\frac{\beta\alpha y_0^L - y_1^L}{\alpha(1+\beta)} \leq x^* < \frac{y_1^B - \beta\alpha y_0^B}{\alpha(1+\beta)}. \text{ Said differently, the lower bound represents the}$$

informal loan when the utility from material self-interest dominates the utility from kindness while the upper bound arises when maximization of utility from kindness dominates utility from material self-interest. Loosely speaking where utility is maximized across this range depends on the altruism and scale effects characterized in Eq (2) (e.g. $\phi, G(x)$). We also note that x_D and x_k are neutral with respect to γ but

$$\text{not } \alpha \text{ or } \beta. \text{ For these, } \frac{\partial x_D}{\partial \beta} = \frac{\alpha y_0^L + y_1^L}{\alpha(1+\beta)^2} > 0 \text{ and } \frac{\partial x_D}{\partial \alpha} = \frac{y_1^L}{\alpha^2(1+\beta)} > 0; \text{ and,}$$

$$\frac{\partial x_k}{\partial \beta} = \frac{-y_1^B}{\alpha(1+\beta)^2} < 0 \text{ and } \frac{\partial x_k}{\partial \alpha} = \frac{-y_1^B}{\alpha^2(1+\beta)} < 0. \text{ In words, as the lender has higher}$$

consumption utility for period 2 over period 1 he will be willing to increase the loan amount, and if non-zero interest can be charged to the loan greater utility can be achieved from material self-interest and so too will the loan amount increase. But if any weight is given to kindness, an increase in interest rate, or over lending because of time preferences, reduces the well-being of the borrower in the second period.

The lower bound, x_D , is the utility maximizing solution for $\gamma = 0$. The condition

$\gamma = 0$ can arise from two factors. The first is that $\lim_{\frac{y_0^L}{y_0^B} \rightarrow \infty} \gamma \rightarrow 0$ which is a relative

income condition. The second, and that which is most important to us, is the sign and

magnitude of $\tilde{f}_B \in \left\{-\frac{1}{2}, \frac{1}{2}\right\}$. We have in the above assumed that $\tilde{f}_B = \frac{1}{2}$ as an honest declaration of the borrower, but the lender for one reason or another (did not previously repay a loan; is not trustworthy) might not believe this or for some other reason (spite or envy) purposefully discounts it. Here $\tilde{f}_B = 0$ is a separating equilibrium between an increasing ($\tilde{f}_B > 0$) and non-increasing ($\tilde{f}_B \leq 0$) kindness function. A downward sloping kindness function captures unkindness. Unkindness gives rise to a property that utility increases as $x^* \rightarrow 0$ over $0 \leq x^* < x_D$. Under this circumstance neither fairness nor reciprocity are motivating factors in informal lending.

A fairness equilibrium arises from the additive and separable utilities (or disutility) from lending plus the gain in utility from being kind. The nature of this equilibrium is sketched in Figures 1 (for marginal utilities) and 2 (for total utility)⁸.

⁸ The total utilities in Figure 2 were obtained by summing the marginal utilities and exclude the constants of integration.

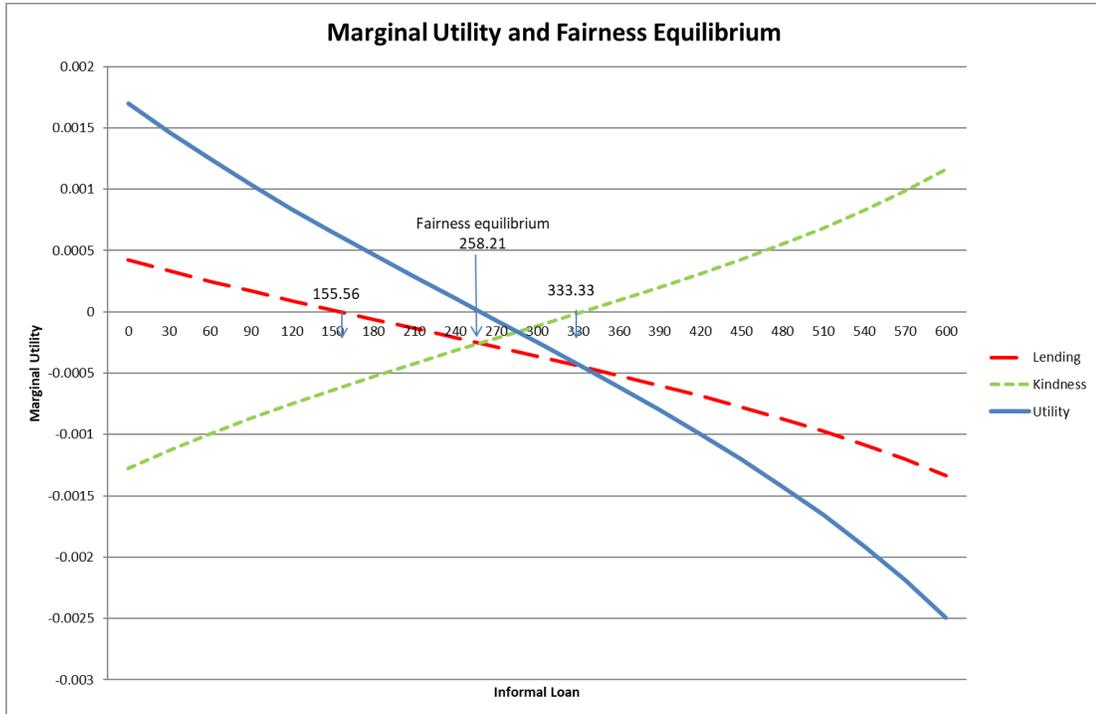


Figure 1: Fairness Equilibria.

This figure shows the fairness equilibria defined by Equations 11a and 11b. It is assumed for illustration that

$$y_0^L = 1,100, y_1^L = 600, y_0^B = 500, y_1^B = 1,000, \beta = 0.8, \alpha = 1.0, \gamma = 1.0638.$$

To the left of the intersection the marginal utility from profits dominates kindness. Utility is maximized with lending at 258.21. Utility from lending is maximized at 155.56. Lending below this reduces utility and is a mutual-min outcome. Utility from being kind is maximized at 333.33. Lending more than this is altruistic since doing so reduces overall utility.

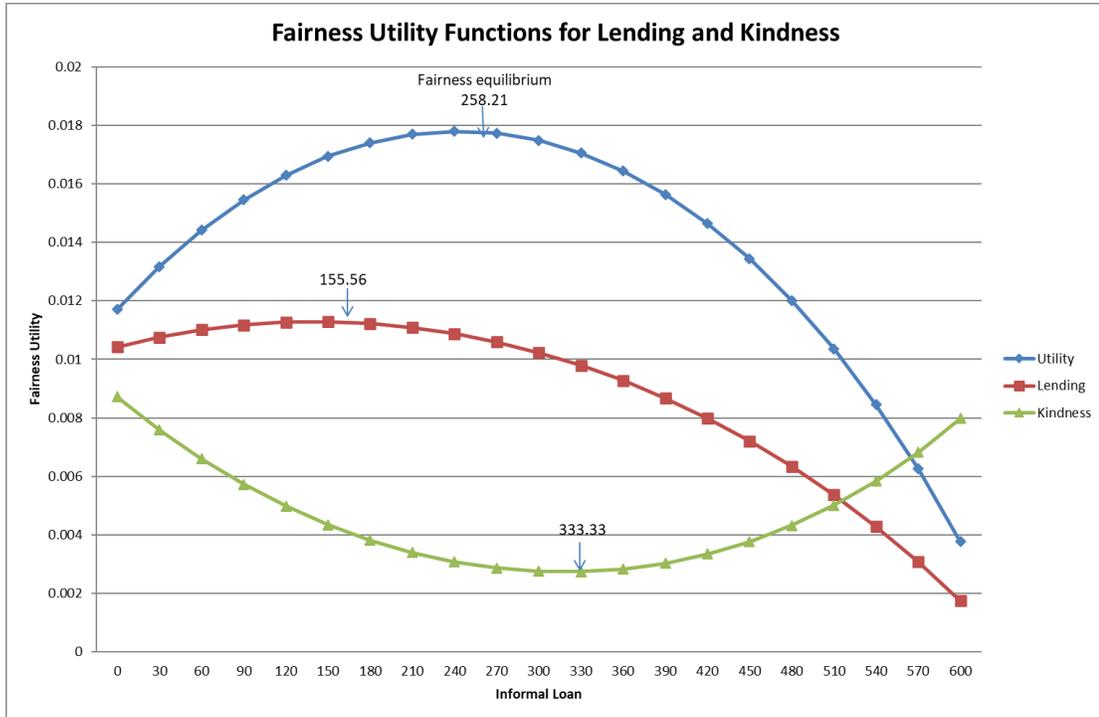


Figure 2: Fairness Utility.

This figure shows the utility function defined by Equations 11a and 11b. Utility is comprised of lending and kindness. It is assumed for illustration that

$y_0^L = 1,100, y_1^L = 600, y_0^B = 500, y_1^B = 1,000, \beta = 0.8, \alpha = 1.2, \gamma = 1.0638$. To the left of the intersection the marginal utility from profits dominates kindness. Utility is maximized with lending at 258.21. Utility from lending is maximized at 155.56. Lending below this reduces utility and is a mutual-min outcome. Utility from being kind is maximized at 333.33. Lending more than this is altruistic since doing so reduces overall utility.

As a theoretical proposition people are willing to sacrifice their own material well-being to help those who are being kind; This is evident in Figures 1 and 2 in which the fairness equilibrium is a mutual max outcome. The horizontal axis records the loan amount. Utility is maximized (marginal utility = 0) when the loan at zero interest is 258.21. This fairness equilibrium balances utility from lending and utility from kindness. If profit were the dominant motive the lender would lend only 155.56 which maximizes utility from lending (Eq. 11a). Lending less than 155.56 is a mutual min outcome in the sense that lending less than this amount reduces marginal and

overall utility. Thus, according to Rabin's second proposition, people are willing to sacrifice their own material well-being to punish those who are being unkind. In Figures 1 and 2, $x=0$ is a mutual-min equilibrium. The lender gains utility from not having to forgo current consumption to lend to the borrower, while simultaneously punishing the borrower with low utility. By not making a loan, i.e. being unkind, the potential lender is at a lower state of utility than could otherwise be achieved. On the other hand, if kindness is the motive the utility from kindness is maximized when Eq. 11b =0. This occurs when 333.33 is lent. Altruism can be defined in this context to the right of 333.33. Here, the lender continues to lend even if doing so reduces overall utility. Under this definition, it can be seen that altruism is a mutual-max outcome, but not all mutual-max outcomes are altruistic. Finally, both mutual-min and mutual-max motivations have a greater effect on behavior as the material cost of sacrificing becomes smaller. Of course, this operates in many different forms. The lender can outright refuse to lend, or if the culture is to lend without interest, punish the borrower by charging interest⁹.

While the exposition above is convenient as a point of theory the real issue is whether its implications are found to reasonably explain informal lending in rural communities. The empirical investigation is discussed in the next section.

⁹ For example, if the interest rate were raised from 0% (as assumed in Figures 1 and 2) to 20% a new fairness equilibrium will result (not shown) but with the lender achieving some material gain by maximizing material utility with a loan size of 211.11 (vs 155.56) but reducing the optimum loan from 258.21 to 229.04. At a 20% interest rate kindness is also affected. Utility from kindness is maximized at 240.74, which is lower than 333.33 at 0% interest. Thus if interest rates are at 0% altruism is established for loan sizes in excess of 333.33 but when interest rates are at 20% (and more for the lender to lose, altruism starts at a lower loan amount of 240.74. As interest rates go up the lender will increase lending on profit motive but decrease lending on kindness motive with a net reduction in lending at higher rates at the fairness equilibrium. At the higher interest rate the borrower must give up more of 2nd period consumption while lender gives up first period consumption.

CHAPTER 3

DATA AND METHODS

We approximate Rabin's utility specification using a utility centric discrete choice experiment supplemented with a short survey. The DCE includes 9 attributes, each developed to capture a particular element of familial lending and other-regarding preferences. These include the nature of the relationship between lender and borrower (a1 and a2 in Eq 2); beliefs from previous interactions about what action the borrower might take (b2 in EQ 2); and higher order interactions such as social and peer pressures to make familial loans (c1 and c2 in EQ 2). To capture rational kindness under $f_i(a_i, b_j)$ we include the loan amount, repayment terms and interest rates and likelihood of payoff (based on borrower reputation) as provided in Eq 5 and to capture emotional kindness including inequity aversion, $\tilde{f}_2(b_2, c_1)$, we include attributes related to relative financial position, and loan purpose. The objective is to determine whether a fairness equilibrium as depicted in Figure 1 can exist; that is, whether there is a balance or tradeoff between decreasing marginal utility from income foregone, and a gain in marginal utility from kindness.

3.1 Choice experiment design

The choice experiment has 10 attributes, with 2-6 levels for each attribute. Table 2 shows the attributes and levels of choice experiments in the two rounds including pretest. (A slight adjustment of levels was made following the pretest round for the attribute "relationship with the borrower", in which the influence of guarantor was

removed as an irrelevant alternative.) Attributes include, as indicated above, characteristics of the loan, and factors related to other-regarding motives influencing lenders' choice. As the size and complexity of choice experiments grow exponentially with increase in the number of attributes, we choose attributes carefully and literally (Crouch & Louviere, 2004). These attributes were presented to farmers in the form of card images as illustrated in Table 3 to make the choice experiment more visual and easier for farmer respondents to understand. And 5 of the attributes are randomly chosen to be fixed to make it easier for farmers to compare different choices. The actual presentation of cards to farmers was based on a D-optimal 6 blocks, 9 cards per block, 3 choices per card design (Carson et al. 1994¹⁰) using JMP software. This provided 27 (3x9) binary choice observations per respondent. Because our theoretical frame of reference lies behaviorally on the rational and emotional kindness curves in Figure 1, we did not provide an opt-out choice.

Based on this block design the minimum sample size of the main effect choice experiment required that $N \geq 500 \left(\frac{l^*}{T \cdot A} \right)$, where T is the number of choice tasks presented to each respondent (9 in our case), J is the number of alternatives per choice task (3 in our case), and l^* is the largest number of levels of any of the attributes (6, for purpose) (Orme 1998, Johnson, Orme 2003, Rose, Bliemer 2013). Thus, the experiment required at least N=111 farmers in our sample to achieve significance at the 5% level.

¹⁰ Carson, R. T., Louviere, J. J., Anderson, D. A., Arable, P., Bunch, D. S., Hensher, D. A., ... & Timmermans, H. (1994). Experimental analysis of choice. *Marketing letters*, 5(4), 351-367.

The choice experiment design and the follow-up surveys were reviewed by the Internal Review Board (IRB) of Cornell University, with full disclosure and no deception. Identical surveys were conducted in the local language. The original survey was translated from English, and then back translated from the local language to English by different translators. Changes were then sent back to translators for final verification. Chinese surveys were conducted by graduate students from Nanjing Agricultural University (pretest), Northwest Agricultural and Forestry University in Shaanxi, Shandong University of Finance and Economics, and Zhejiang University. Principal researchers were in attendance. All surveying groups were trained on how to deliver and complete the survey forms by either one of the authors and local professors. The protocol was that the surveyors completed the survey on behalf of the respondent.

Table 2: Attributes and levels in the choice experiments

| Attributes | # of levels | Levels |
|--------------------------------|--------------------|--|
| loan amount (yuan) | 5 | 1000, 5000, 10000, 25000, 50000 |
| repayment period | 4 | 1 month, a half year, 1 year, 2 years |
| relationship with the borrower | 3 (4) | relatives, friends, other community members (neither a friend nor a relative), <i>other community members with a guarantor (only in the pretest)</i> |
| previous interaction | 3 | lent to me before, has never lent to me before because I did not ask, refused to lend to me before |
| financial position | 3 | poorer than me, similar as me, richer than me |
| purpose | 6 | tuition fee, house construction, agriculture production, household consumption and leisure consumption, emergency (crop loss, livestock loss, major sickness), health/medicine (chronic disease, except for emergency) |
| borrower's reputation | 3 | known to always pay back promptly, known to always repay a loan but be late, often default on a loan |
| interest | 4 | no interest rate, bank deposit rate (3%), bank lending rate (5%), 10% |
| sacrifice | 2 | lend without giving up anything meaningful, lend with giving up something meaningful |
| community pressure | 2 | No pressure, feel pressure |

Table 3: sample card in the second experiment

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|---|--|--|
| loan amount (yuan) | 25000 | 50000 | 10000 |
| repayment period | a half year | 1 month | 1 year |
| relationship with the borrower | other community members (neither a friend nor a relative) | other community members (neither a friend nor a relative) | other community members (neither a friend nor a relative) |
| previous interaction | refused to lend to me before  | refused to lend to me before  | refused to lend to me before  |
| borrower's financial position | richer than me  | poorer than me  | similar to me  |
| purpose | agriculture production  | agriculture production  | agriculture production  |
| borrower's reputation | known to always repay a loan but be late  | known to always pay back promptly  | often default on a loan  |
| interest rate | 10% | 10% | 10% |
| sacrifice | lend without giving up sth meaningful  | lend with giving up sth meaningful  | lend without giving up sth meaningful  |
| community pressure | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 |
| your choice | | | |

3.2 Survey design

In addition to the DCE, farmers were asked to complete a short survey following the experiment. The survey was designed to capture basic household and farming conditions and to supplement the choice experiment with further insights into rural credit generally, and informal credit specifically. The survey was designed based on the survey regarding informal lending in rural China in 2007 and 2008 (Turvey and Kong 2010) and the surveys related to agricultural finance in rural areas of China in 2018 led by professor Turvey. The survey was shortened after pretest to make it easier to complete for respondents. Compared to previous surveys, the final version of our survey was more focused on factors related to other regarding motives in informal lending. Ultimately, the survey was comprised of seven parts, including demographic and farm characteristics (part A), sources of risk and risk perceptions (part B), precautionary savings (part C), credit history (part D), guilt questions (part E), attitude towards informal lending among friends and relatives (part F), and interviewer review (part G).

3.3 Field implementation

In the August of 2019, the pretest of the choice experiment and the survey was held in Jiangsu China (N=48). The pretest worked quite well (Table 1). Therefore, only slight modification was made to the choice experiment and survey in the second round.

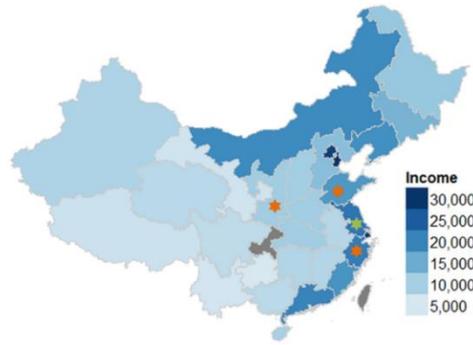


Figure 3: Regional Distribution of Income in China¹¹

Then, in October and November, 2019, the choice experiment and survey were replicated in three other provinces (Shaanxi, Shandong, and Zhejiang) in China (N=395×27). These three provinces were diversified in economic levels. In each province, 4-5 villages were selected under the assistance of local administrators. As the local administrators knew the area very well, the villages were quite representative of the area. Our restriction was that the villages had to be truly rural with farming as a primary industry with cultivation concentrated in the production of wheat, corn and rice, although this turned out not to be the case in all regions (particularly Zhejiang). This ensured respondents could know farming well enough to answer questions related to risk perceptions in farming. Local administrators assisted in contacting village leaders. The village leaders assisted in assuring farmers that we were university researchers and information would be kept confidential and so on. Village leaders did not interfere in the actual survey.

¹¹ Income refers to real GDP per capita in 2010. The figure (marked provinces visited in the pretest and the second round) is from Li, Hengyun & Chen, Jason & Li, Gang & Goh, Carey. (2016). Tourism and regional income inequality: Evidence from China. *Annals of Tourism Research*. 58. 81-99. 10.1016/j.annals.2016.02.001.

CHAPTER 4

RESULTS

The primary objective of this research is obtained from conditional and mixed logit regressions of the DCE.

4.1 Demographic characteristic and farm characteristics

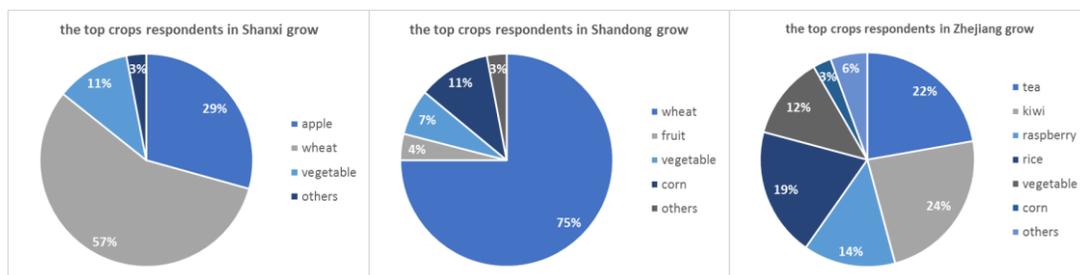
Table 4 shows the summary statistics of the samples. We find that demographic characteristics among different locations are similar, whereas households' level of engagement in farming are different. 92% Respondents in Shaanxi are engaged in agriculture, which is much higher than others. But for those in agricultural industry, respondents in Shandong obtained 51% of their total income from farm activities while Zhejiang obtained only 20% with only 1/3 farm size compared to average. In addition, Shaanxi has a significant lower mean annual household income of 40,054 RMB, which is about 2/3 of the average level of the three provinces.

Table 4: Summary Statistics of Important Socio-Economic Variables

| Variable | Total (N=395) | | Shaanxi (N= 144) | | Shandong (N=145) | | Zhejiang (N= 106) | |
|-----------------------------|---------------|-----------|------------------|-----------|------------------|-----------|-------------------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Female (%) | 0.45 | 0.50 | 0.47 | 0.50 | 0.43 | 0.50 | 0.44 | 0.50 |
| Age (years) | 55.28 | 12.69 | 55.77 | 11.69 | 53.79 | 13.95 | 56.64 | 12.11 |
| Household Size | 4.46 | 1.74 | 4.45 | 1.55 | 4.62 | 1.83 | 4.25 | 1.86 |
| # of Members in Farm | 1.61 | 1.10 | 1.85 | 0.94 | 1.61 | 1.28 | 1.28 | 0.93 |
| # of Members outside Farm | 1.35 | 1.17 | 1.16 | 1.01 | 1.39 | 1.28 | 1.57 | 1.19 |
| Engage in Farming (%) | 0.77 | 0.42 | 0.92 | 0.28 | 0.69 | 0.46 | 0.69 | 0.46 |
| Farm income (%)* | 0.34 | 0.33 | 0.27 | 0.28 | 0.51 | 0.34 | 0.20 | 0.30 |
| Primary decision maker (%)* | 0.97 | 0.69 | 0.75 | 0.57 | 1.08 | 0.73 | 1.10 | 0.72 |
| Work in Government (%) | 0.12 | 0.33 | 0.13 | 0.33 | 0.10 | 0.31 | 0.14 | 0.35 |
| Education (1-6) | 2.57 | 1.01 | 2.47 | 1.00 | 2.69 | 0.95 | 2.53 | 1.07 |
| Years of Farming* | 33.67 | 14.76 | 32.65 | 13.34 | 35.05 | 14.11 | 33.62 | 17.85 |
| Farm Size (mu) * | 8.11 | 20.20 | 8.95 | 24.94 | 10.63 | 19.90 | 3.14 | 2.97 |
| Optimism for Agri (1-3) * | 1.86 | 0.81 | 1.67 | 0.78 | 2.16 | 0.81 | 1.80 | 0.75 |
| Agricultural income(RMB) * | 20,800 | 117,462 | 14,934 | 39,527 | 37,277 | 198,202 | 8,172 | 14,546 |
| Household Income (RMB) | 60,246 | 125,425 | 40,054 | 51,856 | 73,100 | 187,844 | 65,271 | 58,124 |
| Production cost (RMB) | 10,109 | 51,425 | 10,857 | 49,407 | 13,402 | 68,148 | 4,864 | 13,245 |
| Living cost (RMB) | 25,987 | 25,362 | 19,744 | 18,729 | 25,549 | 24,954 | 33,551 | 30,144 |
| Retained income (RMB) | 24,279 | 88,794 | 9,641 | 47,794 | 34,149 | 129,272 | 27,179 | 44,084 |

* The farm income, primary decision maker, years of farming, farm size, optimism for agricultural industry, and agricultural income are investigated among respondents who are engaged in farming.

The top crops that respondents grow vary in provinces, whereas wheat accounts for a large proportion in Shaanxi, and Shandong Province, like rice in Zhejiang. The graphs below show the top crops in the three provinces respectively.

**Figure 4: Top crops in Shaanxi, Shandong, and Zhejiang Province**

4.2 Credit history and conditions

Table 5 provides characteristics of credit history of respondents. Most of the statistics are similar between different locations. We find that 81% of the respondents have credit history. Specifically, 66%, 51%, 21%, 3%, and 29% of the respondents

have ever borrowed from relatives, friends, other community members (acquaintances except for friends and relatives), money lenders, and banks and RCC respectively, which indicate that our samples are quite familiar with informal lending. In contrast to the theory of social capital, default is most common among close acquaintances like relatives and friends, which indicates the threat of severing social ties is not reliable in enforcing informal loans. Figure 5 presents the distributions of loan sources in the credit market and default situations. Figure 6 shows that house construction, health emergency, and wedding arrangement are the three most common purposes when respondent borrowed last time. And nearly 43% respondents choose to pay back to banks and RCC first (Figure 7).

Table 5: Summary Statistics of credit history of respondents

| <i>Variable</i> | <i>Total (N=395)</i> | | <i>Shaanxi (N= 144)</i> | | <i>Shandong (N=145)</i> | | <i>Zhejiang (N= 106)</i> | |
|-----------------------------|----------------------|------------------|-------------------------|------------------|-------------------------|------------------|--------------------------|------------------|
| | <i>Mean</i> | <i>Std. Dev.</i> | <i>Mean</i> | <i>Std. Dev.</i> | <i>Mean</i> | <i>Std. Dev.</i> | <i>Mean</i> | <i>Std. Dev.</i> |
| Borrowed from others (%) | 0.81 | 0.40 | 0.80 | 0.40 | 0.75 | 0.43 | 0.89 | 0.32 |
| from relatives (%) | 0.66 | 0.47 | 0.74 | 0.44 | 0.61 | 0.49 | 0.63 | 0.48 |
| from friends (%) | 0.51 | 0.50 | 0.56 | 0.50 | 0.41 | 0.49 | 0.58 | 0.50 |
| from community members | 0.21 | 0.41 | 0.21 | 0.41 | 0.22 | 0.42 | 0.21 | 0.41 |
| from money lenders (%) | 0.03 | 0.16 | 0.01 | 0.12 | 0.04 | 0.20 | 0.02 | 0.14 |
| from banks and RCC (%) | 0.29 | 0.45 | 0.37 | 0.48 | 0.08 | 0.28 | 0.46 | 0.50 |
| Still have debt outstanding | 0.26 | 0.44 | 0.21 | 0.41 | 0.15 | 0.36 | 0.47 | 0.50 |
| Defaulted on loans | 0.14 | 0.35 | 0.10 | 0.30 | 0.14 | 0.35 | 0.19 | 0.39 |
| from relatives | 0.08 | 0.27 | 0.06 | 0.23 | 0.10 | 0.30 | 0.09 | 0.29 |
| from friends (%) | 0.05 | 0.21 | 0.05 | 0.22 | 0.02 | 0.14 | 0.08 | 0.28 |
| from community members | 0.02 | 0.13 | 0.01 | 0.12 | 0.03 | 0.16 | 0.01 | 0.10 |
| from money lenders (%) | 0.01 | 0.09 | 0.01 | 0.12 | 0.00 | 0.00 | 0.01 | 0.10 |
| from banks and RCC (%) | 0.04 | 0.20 | 0.03 | 0.16 | 0.02 | 0.14 | 0.08 | 0.28 |

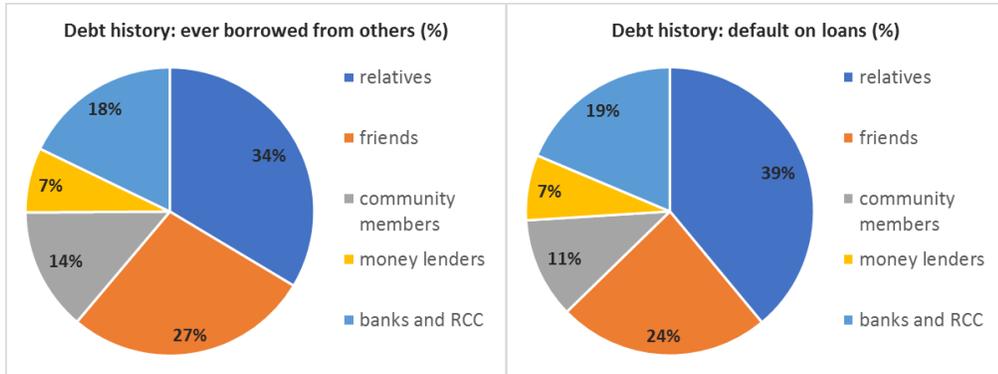


Figure 5: distribution of loan source in borrowing and default

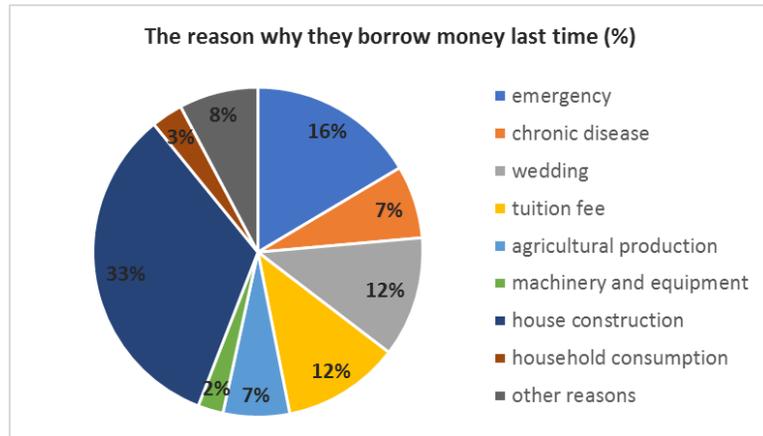


Figure 6: Purposes of borrowing last time

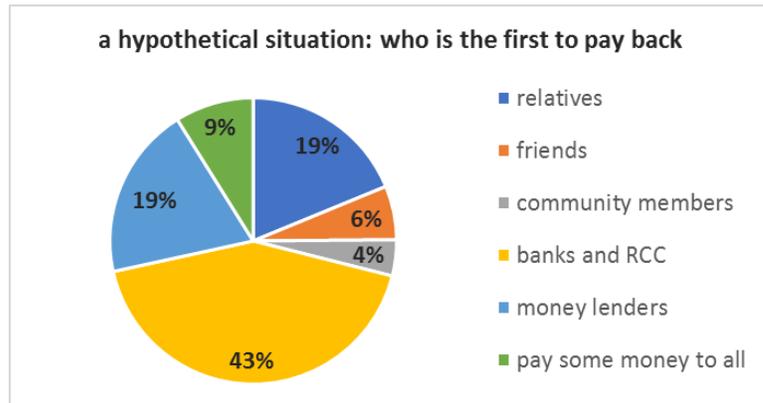


Figure 7: Answer to the hypothetical question

Table 6: Important Aspects of Informal Financial Transactions

| <i>Variable (note: mean value shows the average level of agreement to the question: 1=strongly disagree, 5=strongly agree)</i> | <i>Mean Value</i> | <i>Standard Deviation</i> |
|--|-------------------|---------------------------|
| Gift transactions among friends and relatives (1=yes) | .32 | .59 |
| Loan transactions among friends and relatives (1=yes) | .74 | .44 |
| Gift for emergency purposes (1-5) | 3.62 | 1.29 |
| Loan for emergency purposes (1-5) | 4.48 | .77 |
| Prefer loan for emergency purposes (1-5) | 4.10 | .89 |
| Prefer loan for general purposes (1-5) | 4.29 | .88 |
| Community pressure helps in reducing default | 3.06 | 1.30 |

Table 6 presents some important aspects of informal financial transactions under overall data. Obviously, among friends and relatives, loan transaction is much more popular than gift ones regardless of whether there is emergency or not. And loan is preferred in both cases. Besides, community pressure has little impact on default.

4.3 Mutual-max and mutual-min

As we mentioned before, mutual-max refers to positive reciprocation generated by kind feelings due to mutual utility maximizing outcomes, while mutual-min means negative outcome of fairness equilibrium when everyone minimizes the other's material payoffs. To capture a mutual-min tendency, we designed 4 questions in part F, where the answer "Strongly Disagree" indicating a mutual-min tendency. And we also have 3 questions to capture mutual-max tendency and uses "Strongly Agree" to show it. For coding, 1 indicates "strongly disagree", and 5 indicates "strongly agree". We also have several questions to measure "being kind to others", and "others being kind to me".

| |
|--|
| <p>On Being Kind to Others</p> <ol style="list-style-type: none"> 1. If you had money available you would lend to a friend or a relative even though you MAY NOT TRUST them to repay the loan Have you ever given a money gift to a friend that he or she did not have to repay (Y/N) 2. Have you ever given a money gift to a relative that he or she did not have to repay (Y/N) 3. Have you ever lent money to a friend (Y/N) 4. Have you ever lent money to a relative (Y/N) 5. I allow the delay of loan repayment by friend and relatives, when they are not able to repay because of some emergency |
| <p>On Others Being Kind to You</p> <ol style="list-style-type: none"> 1. Have you ever received a money gift from a friend that you did not have to repay (Y/N) 2. Have you ever received a money gift from a relative that you did not have to repay (Y/N) 3. Have you ever borrowed money from a friend? (Y/N). 4. Have you ever borrowed money from a relative? (Y/N) 5. I am able to delay loan repayment to friend and relatives, when I am not able to repay because of some emergency. 6. I am able to get the reduction in the interest rate on loan repayment to friends and relatives, when I am not able to repay because of some emergency. |
| <p>Mutual Min</p> <ol style="list-style-type: none"> 1. I would lend money to a friend even if that friend had previously refused a loan to me. 2. I would be able to borrow from a friend even if I had previously refused to lend to that friend. 3. I would lend money to a relative even if that relative had previously refused a loan to me. 4. I would be able to borrow from a relative even if I had previously refused to lend to that relative |
| <p>Mutual Max</p> <ol style="list-style-type: none"> 1. I find it easier to borrow from friends and relatives if I have repaid loans on earlier occasions. 2. I am more willing to lend to friends and relatives when they have repaid earlier loans to me. 3. I am more likely to give loans to friends and relatives even at a low interest rate knowing that he may not repay fully, who have lent/ gifted/repaid money to me on earlier occasion. |

Figure 8: Questions to assess the mutual-max and mutual-min reciprocity

As the overall KMO (Kaiser-Meyer-Olkin) of mutual-min questions (7-10 in part F) is 0.61, and half of the questions have a KMO between 0.5-0.59, which is thought

to be “miserable” (Kaiser 1974)¹². The data is not suited for factor analysis. Thus, we take average of the scores, and get 3.07. The overall KMOs of “mutual-max” ones (0.56), “being kind to others” (0.58), and “others being kind to me” ones (0.54) are also too low to do the factor analysis. The average score of mutual-max questions (27-29 in part F) is 4.46, which is much higher than mutual min. Therefore, we find the vast majority of farm households are mutual max. And the mutual-min tendency is relatively weak.

Table 7: Summary Statistics of Important Social Preference Variables related to Informal Financial Transactions

| <i>Variable (note: mean value shows the average level of agreement to the question: 1=strongly disagree, 5=strongly agree)</i> | <i>Mean Value</i> | <i>Standard Deviation</i> |
|--|-------------------|---------------------------|
| Finds borrowing from friends or relatives convenient | 3.75 | 1.23 |
| Trusts that loans given to friends or relatives will be repaid | 4.16 | .96 |
| Would provide loans even with low trust that loan will be repaid | 2.95 | 1.40 |
| Agree to borrow or lend even if they have been refused earlier | 3.24 | 1.15 |
| Kindness to Others (1-5) | 2.09 | 0.45 |
| Kindness from Others (1-5) | 2.58 | 0.48 |
| Mutual-max reciprocity (1-5) | 4.01 | 4.12 |
| Mutual-min reciprocity (1-5) ¹³ | 1.93 | 1.10 |

¹² The Kaiser-Meyer-Olkin (KMO) test was first introduced by Kaiser (1970) later modified by Kaiser and Rice (1974). It is a Measure of Sampling Adequacy (MSA) and indicates how suited the data is for factor analysis. Specifically, it is a measure of the proportion of variance in our variables that might be caused by underlying factors. KMO can vary from 0 to 1. A value less than 0.6 indicates that the result of factor analysis probably might not be useful. Kaiser (1970) put the following values on the results for reference: 0.00 to 0.49 unacceptable, 0.50 to 0.59 miserable, 0.60 to 0.69 mediocre, 0.70 to 0.79 middling, 0.80 to 0.89 meritorious, 0.90 to 1.00 marvelous.

¹³ As “Strongly Disagree” shows the mutual-min tendency, we adjust “Strongly Disagree” to be coded as 5.

4.4 Cluster analysis

Metrics on risk aversion and prudence (e.g. precautionary savings) were obtained from a series of related questions in the survey. Rather than attempting to measure risk aversion or prudence directly from a utility function, we provide cluster ratings obtained from cluster analysis. Cluster analysis groups a sample of discrete objects in such a way that objects in the same group (a cluster) are more similar to each other, compared to those in other groups. Various approaches can be used to fulfill the task. In this paper, we used hierarchical cluster analysis with Ward's method (Joe H. Ward Jr. 1963)¹⁴, which is one of the most popular methods. It creates a hierarchical decomposition of the set of data by choosing the combination with minimum sum of squared Euclidean distance between points in all clusters.

4.4.1 Cluster analysis of risk perceptions

With answers¹⁵ to the 10 questions in Part B of the Survey, we get 10 indicators for each respondent that depicts their risk perceptions in different scenarios. Using cluster analysis to deal with the statistics, Farmers are divided into three groups in terms of levels of risk perception. The results are presented in Table 8. We find 22.5% of the total respondents are inclined to lower risk, 45.1% of the sample perceive risk in medium degree and 32.4% of the total respondents have strong risk perception.

Comparing the three provinces, 45.1% respondents in Shaanxi are in high risk group,

¹⁴ Ward, J. H., Jr. (1963), "Hierarchical Grouping to Optimize an Objective Function", *Journal of the American Statistical Association*, 58, 236–244.

¹⁵ Answers to the questions in Part B of the survey are coded as follows: 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree

while the majority in Shandong and Zhejiang is respondents with moderate risk perception.

To determine whether there are any unique characteristics defining each cluster we ran a multinomial logit regression (MNL). We find gender, family size, education level, income, and expense have significant positive impact on respondents' risk perception, while age, working in farm, being decision maker in farming more risk averse. Specifically, males tend to have strong risk perception. And there is a tendency that senior citizens are unwilling to take risks. *Ceteris paribus*, respondents with large family size are most likely to have medium level of risk perceptions, then high level. Also, work in farming generally makes people more likely to moderate attitude towards risk, and strong risk perception comes second. And for those work in farm, being the decision maker in farming improve the probability for them to be risk averse. Besides, with the increase of education levels, people are more willing to take risks to pursue higher profit. In addition, with other conditions equal, high-income respondents are most likely to have moderate risk perception, then strong risk perception. Meanwhile, people with high expense tend to favor risks.

Table 8. Cluster analysis of risk perceptions

| Bin | Total | | Shaanxi | | Shandong | | Zhejiang | |
|-----------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | <i>Freq.</i> | <i>Pct.</i> | <i>Freq.</i> | <i>Pct.</i> | <i>Freq.</i> | <i>Pct.</i> | <i>Freq.</i> | <i>Pct.</i> |
| weak | 89 | 22.5% | 25 | 17.4% | 40 | 27.6% | 24 | 22.6% |
| moderate | 178 | 45.1% | 54 | 37.5% | 73 | 50.3% | 51 | 48.1% |
| strong | 128 | 32.4% | 65 | 45.1% | 32 | 22.1% | 31 | 29.3% |

Table 9. MNL model of risk perceptions

| Risk Perceptions (weak=1, moderate=2, strong=3) | | | |
|---|-----------------|---------------------------|---------------------------|
| VARIABLES | weak | moderate | strong |
| Gender (male=1) | | 0.0663 (0.0610) | 0.410*** (0.0656) |
| Age | | -0.00799*** (0.00152) | -0.0198*** (0.00167) |
| Family Size | | 0.214*** (0.0154) | 0.152*** (0.0167) |
| Industry (farm=1) | | -0.547*** (0.0834) | -0.383*** (0.0902) |
| Head*Industry | base outcome | -0.226*** (0.0653) | -0.266*** (0.0720) |
| Education level | | 0.214*** (0.0249) | 0.283*** (0.0264) |
| Income | | 4.15e-06*** (7.78e-07) | 3.03e-06*** (7.81e-07) |
| Expense | | -1.28e-06 (1.10e-06) | 3.05e-06*** (1.05e-06) |
| Wald chi2(16) | | 1207.64 | |
| Prob > chi2 | | 0.0000 | |
| Log likelihood | | -9796.8633 | |
| AIC | | 19625.73 | |
| BIC | | 19740.46 | |
| Observations | | 9,612 | |

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

4.4.2 Cluster analysis of precautionary savings

Among all respondents, 30.4%, 32.7%, 37.0% of them are segmented into weak, moderate, and high precautionary groups respectively. Zooming into different locations, Shaanxi has higher portion of people with strong saving tendency. While Shandong, and Zhejiang have a relatively even distribution of respondents with various ideas on precautionary savings.

Table 10. Cluster analysis of precautionary savings

| Bin | Total | | Shaanxi | | Shandong | | Zhejiang | |
|-----------------|-------|-------|---------|-------|----------|-------|----------|-------|
| | Freq. | Pct. | Freq. | Pct. | Freq. | Pct. | Freq. | Pct. |
| weak | 120 | 30.4% | 36 | 25.0% | 48 | 33.1% | 36 | 34.0% |
| moderate | 129 | 32.7% | 50 | 34.7% | 51 | 35.2% | 28 | 26.4% |
| strong | 146 | 37.0% | 58 | 40.3% | 46 | 31.7% | 42 | 39.6% |

The multinomial regression results indicate that respondents with larger family size, working in farm, and larger expense have weaker awareness of savings. Meanwhile, in general, senior citizens who are decision maker in farming with higher education level, and higher income would have more consensus of saving money. But it should be noticed is that regression result only reveals the correlational relationship between demographic characteristics and precautionary savings, rather than causal relationship.

In detailed words, there is a tendency that senior citizens care less about saving money. *Ceteris paribus*, respondents with large family size are most likely to have medium level of awareness of precautionary saving, then high level. Also, work in farming generally makes people more likely to moderate attitude towards saving, and strong saving awareness comes second. And for those work in farm, being the decision maker in farming reduce the probability for them to be save money. In addition, with other conditions equal, high-income respondents are less likely to save money. Meanwhile, people with high expense tend to have strong precautionary saving.

Table 11. MNL model of precautionary savings

| Precautionary Savings (weak=3, moderate=2, strong=1) | | | |
|--|---------|----------------------------|----------------------------|
| VARIABLES | weak | moderate | strong |
| Gender | | 0.0160 (0.0590) | 0.0875 (0.0559) |
| Age | | -0.0105*** (0.00148) | -0.00361*** (0.00139) |
| Family Size | | 0.0725*** (0.0143) | 0.0481*** (0.0136) |
| Industry | base | 0.678*** (0.0775) | 0.253*** (0.0753) |
| Head*Industry | outcome | -0.577*** (0.0660) | -0.277*** (0.0652) |
| Education level | | -0.0574*** (0.0216) | 0.0104 (0.0209) |
| Income | | -4.64e-06*** (5.03e-07) | -1.22e-06*** (3.64e-07) |
| Expense | | 1.28e-05*** (1.12e-06) | 2.30e-06** (9.17e-07) |
| Wald chi2(16) | | 343.15 | |
| Prob > chi2 | | 0.0000 | |
| Log likelihood | | -10344.091 | |
| AIC | | 20720.18 | |
| BIC | | 20834.91 | |
| Observations | | 9,612 | |

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

4.5 Logit models of pretest

The discrete choice experiment is founded in random utility theory.¹⁶ Thus, we use conditional logit model and mixed logit model to investigate experiment results.

Let U_{ij} represent the value or utility of the j -th choice to the i -th individual.

For the Conditional Logit model, the utility function is $U_{ij} = \mathbf{x}'_{ij}\boldsymbol{\beta} + \varepsilon_{ij}$,

and the probability for individual i to choose choice j would be

$$P(y_i = j | \mathbf{x}_{ij}) = \frac{\exp(\mathbf{x}'_{ij}\boldsymbol{\beta})}{\sum_{k=1}^J \exp(\mathbf{x}'_{ij}\boldsymbol{\beta})}$$

¹⁶ Kjær, T. (2005). A review of the discrete choice experiment-with emphasis on its application in health care.

For the Mixed Logit Model¹⁷, the utility equation is $U_{ij} = \mathbf{x}'_{ij}\boldsymbol{\beta} + \mathbf{z}'_i\boldsymbol{\gamma}_j + \varepsilon_{ij}$ and the probability for individual i to choose choice j would be

$$P(y_i = j | \mathbf{x}_{ij}) = \frac{\exp(\mathbf{x}'_{ij}\boldsymbol{\beta} + \mathbf{z}'_i\boldsymbol{\gamma}_j)}{\sum_{k=1}^J \exp(\mathbf{x}'_{ij}\boldsymbol{\beta} + \mathbf{z}'_i\boldsymbol{\gamma}_j)}$$

The only difference between them is that the response parameter varies over individuals.

In pretest, the regression results are sensible. Due to a relatively small sample size ($N=48 \times 27$), the coefficients of some attributes are not significant, but still have reasonable signs. Later, we can have a further look at them in the second round with a much larger sample size.

The statistics of conditional logit model and mixed logit model are similar in terms of absolute values and signs, except for “interest rate”, “refused to help”, and “friends” which are insignificant in both models. Compared to Conditional Logit model, the Mixed Logit model has smaller AIC but larger BIC statistic and log likelihood, suggesting that the two logit models are both good in general. Since half the standard deviation of Mixed logit model are significant, implying heterogeneity among respondents, Mixed logit model would be better in this paper.

In detail words, respondents are more willing to help people poorer than themselves, which implies inequity aversion.

¹⁷ McFadden and Train (2002) developed the mixed Logit model. They show that a mixed Logit can approximate any Logit model to any degree of accuracy under benign conditions.

For previous interaction, farmers are more likely to provide people who previous helped them with informal loans, which is the evidence of mutual-max, positive reciprocity.

Keeping other conditions equal, respondents would be more likely to lend to relatives, compared to friends and other community members.

In terms of borrowers' reputation, those with high reputation for paying back promptly are most likely getting loans. And people that often default on their loans are least likely to succeed in borrowing. This is also discussed in rational kindness equation (Eq 5).

The purpose of borrowing also matters. Farmers are most likely to lend to borrowers that borrow to deal with emergency, following those in lack of tuition fee, lack of money for house construction, agricultural production, medicine for chronic disease and everyday consumption. Farmers' preference among purposes implies their kindness.

Table 12. CL and ML model under overall data in the pretest

| VARIABLES | <i>Conditional logit</i> | <i>Mixed logit Mean</i> | <i>Mixed logit SD</i> |
|--------------------|------------------------------|-----------------------------|---------------------------|
| loan amount | 0.00511 (0.00619) | 0.00488 (0.00977) | 0.0367*** (0.0107) |
| repayment period | 0.00532 (0.0106) | 0.0146 (0.0153) | -0.0160 (0.0315) |
| poorer | 0.720*** (0.212) | 0.998*** (0.342) | 1.136** (0.468) |
| richer | 0.211 (0.223) | 0.340 (0.311) | -0.458 (0.300) |
| lent to me before | 1.024*** (0.210) | 1.465*** (0.323) | 0.578* (0.328) |
| refuse to help | 0.116 (0.245) | -0.599 (0.479) | -1.497*** (0.428) |
| friends | 0.161 (0.291) | -0.167 (0.441) | 0.991*** (0.382) |
| relatives | 1.028*** (0.255) | 1.670*** (0.421) | 0.669 (0.436) |
| guarantor | 0.394 (0.252) | 0.242 (0.354) | -0.0564 (0.481) |
| late | 0.501* (0.260) | 0.683* (0.365) | -0.685** (0.280) |
| prompt | 1.681*** (0.251) | 2.685*** (0.426) | -1.291*** (0.387) |
| emergency | 2.368*** (0.412) | 3.908*** (0.769) | 3.088*** (0.747) |
| production | 1.460*** (0.417) | 2.235*** (0.655) | 0.454 (0.386) |
| tuition | 2.242*** (0.370) | 2.949*** (0.592) | 1.626*** (0.562) |
| construction | 1.232*** (0.417) | 2.240*** (0.613) | 0.104 (0.446) |
| medicine | 0.873** (0.412) | 1.373** (0.603) | 0.256 (0.420) |
| interest rate | 1.55 (2.56) | -0.196 (4.29) | 14.0*** (3.71) |
| sacrifice | -0.334 (0.203) | -0.377 (0.285) | 0.158 (0.387) |
| community pressure | 0.0622 (0.200) | 0.0759 (0.293) | -0.184 (0.359) |
| LR chi2(19) | 226.16 | 47.50 | 47.50 |
| Prob > chi2 | -361.52228 | -337.77342 | -337.77342 |
| Log likelihood | 0.0000 | 0.0003 | 0.0003 |
| AIC | 761.0446 | 751.5468 | 751.5468 |
| BIC | 859.2183 | 947.8943 | 947.8943 |
| Observations | 1,296 | 1,296 | 1,296 |

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

CHAPTER 5

DISCRETE CHOICE RESULTS OF THE SECOND EXPERIMENT

5.1 Overall results of the three provinces

In these logit models, 3 attributes (financial level, previous interaction, and reputation) were transformed into dummy variables (richer, poorer, lent to me before, refuse to help, late, and prompt).

The coefficients estimated with both conditional logit model and mixed logit model in the second experiment are shown in Table 13.

The regression results of mixed logit model and conditional logit model are very close. As is shown in the Table 13, we could find that only attribute “interest rate” is different between the conditional logit model and mixed logit model, in terms of coefficient, and significance levels. All the other statistics are nearly the same with respect to both absolute values and signs.

In general, all the statistics are rather significant except for attribute “poorer” in both models, and “interest rate” in the conditional logit model. However, the coefficient of attribute “poorer” is significant under the significant level of 15%, with a p-value of 13% in both models. The only problem is that the p-value of interest rate in the conditional logit model is 23.1%, which is a little high.

Having a closer look, farmers prefer to lend to the person asking for smaller loan amount with shorter repayment period, which demonstrates the decreasing utility on lender profit in Figure 1.

For the relative financial position of borrowers, they are less willing to lend to someone who is richer than themselves, while those poorer than themselves get preferential treatment. And this proves inequity aversion in informal lending

The analysis clearly shows that kindness begets kindness, receiving kindness before is a strong motive for farmers to help others in return. This shows reciprocity as a motive, and meanwhile, mutual-max outcomes could be obtained. Conversely, being treated unkindly does the opposite. Respondents are less willing to lend to borrowers that refused to lend a hand before, which indicating a mutual-min tendency.

Friends and relatives get more trust compared to other members in the community. Specifically, familial bonds are highest for relatives and lowest for more distant social relationship, like community members.

A good reputation of borrowers for paying back promptly gets significant preference This is the element of rational kindness under $f_i(a_i, b_j)$ as we state in Eq5.

The reasons for borrowing also matters, some reasons are more convincing than others. From strong to weak in terms of lenders' preference, the purposes are emergency reasons, tuition fees, buying medicine for chronic disease, house construction, agricultural production, and everyday consumption. Obviously, purposes generally inducing higher willingness to help are those that bring more sympathy and empathy with borrowers, such as emergency, issues about children (like tuition fees) and health problems.

Personal sacrifice makes respondents less likely to lend money to others. In other words, if a borrower's request goes beyond a lender's spare capital, making the lender have to ruin their money using plan to help, the lender would be less willing to lend

the money. This also partly explains why kindness utility function in Figure 2 diminishes as the amount of informal loan increases, when loan amount is larger than 333.33, implying that kindness also has its limits. But it remains unclear if respondents are less willing to lend if they have to sacrifice more, as we only have 2 levels (0=No, 1=Yes) in this attribute.

Community pressure plays a role in pushing farmers to lend to acquaintances, which shows influence of higher order of interactions to make familial loans (c_1 and c_2 in EQ 2).

Interest rate has a negative sign, which means farmers are less willing to lend at high interest rates. Though this would not be expected under classical utility maximization related to lending behavior, familial loans at 0% are a hallmark of Chinese culture. The negative coefficients on interest rates squarely place this aspect of social networks as other-regarding preferences and a community sense of kindness. In other words, the experimental evidence is that utility increases with lower interest rates revealing lenders' kindness to a borrower, and leading to an increase in $f_i(a_i, b_j)$, which ultimately improves the lender's well-being U_L . Thus, this is actually evidence of diminishing marginal utility on rational kindness in Figure 1

Table 13. CL and ML model comparison under overall data in the second experiment

| VARIABLES | <i>Conditional Logit</i> | <i>Mixed Logit Mean</i> | <i>Mixed Logit SD</i> |
|--------------------|--------------------------|-------------------------|-------------------------|
| Loan amount | -0.0115*** (0.00177) | -0.0135*** (0.00222) | -0.0130*** (0.00414) |
| Repayment period | -0.131*** (0.0435) | -0.128*** (0.0481) | -0.00421 (0.215) |
| poorer | 0.0999 (0.0659) | 0.116 (0.0770) | -0.0375 (0.171) |
| richer | -0.145** (0.0728) | -0.158* (0.0845) | 0.147 (0.155) |
| lent to me before | 0.508*** (0.0639) | 0.559*** (0.0814) | 0.691*** (0.114) |
| refuse to help | -0.307*** (0.0745) | -0.378*** (0.0952) | -0.316 (0.326) |
| friends | 0.195*** (0.0734) | 0.213** (0.0850) | -0.375*** (0.138) |
| relatives | 0.456*** (0.0737) | 0.474*** (0.0950) | 0.821*** (0.110) |
| late | 0.681*** (0.0812) | 0.752*** (0.0940) | 0.380** (0.168) |
| prompt | 1.541*** (0.0773) | 1.750*** (0.0949) | 0.694*** (0.120) |
| emergency | 2.238*** (0.121) | 2.506*** (0.148) | -0.978*** (0.165) |
| production | 0.704*** (0.128) | 0.673*** (0.154) | 0.825*** (0.202) |
| tuition | 1.555*** (0.128) | 1.710*** (0.142) | 0.0258 (0.708) |
| construction | 0.779*** (0.133) | 0.792*** (0.148) | -0.304 (0.336) |
| medicine | 1.040*** (0.119) | 1.167*** (0.137) | -0.383** (0.194) |
| interest rate | -0.934 (0.779) | -2.137** (0.978) | 7.298*** (1.908) |
| sacrifice(1=Yes) | -0.146** (0.0591) | -0.178*** (0.0672) | -0.142 (0.203) |
| community pressure | 0.125** (0.0608) | 0.122* (0.0721) | 0.317** (0.124) |
| LR chi2(18) | 1309.90 | | 131.50 |
| Log likelihood | -3250.6162 | | -3184.8646 |
| AIC | 6537.232 | | 6441.729 |
| BIC | 6668.177 | | 6703.619 |
| Observations | 10,665 | | 10,665 |

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

5.2 Logit models of each province

Next, we ran the conditional logit models and mixed logit models using data from different provinces respectively. For samples from different provinces, the signs of a certain statistics are nearly the same, while the significance levels might be different.

Table 14. Conditional Logit results for different provinces in the second round

| VARIABLES | <i>Conditional Logit</i> | | | |
|--------------------|--------------------------|-------------------------|-------------------------|-------------------------|
| | 3 Provinces | Shaanxi | Shandong | Zhejiang |
| loan amount | -0.0115*** (0.00177) | -0.0110*** (0.00284) | -0.0137*** (0.00311) | -0.0110*** (0.00344) |
| repayment period | -0.131*** (0.0435) | -0.0607 (0.0677) | -0.107 (0.0783) | -0.292*** (0.0873) |
| poorer | 0.0999 (0.0659) | 0.140 (0.105) | 0.158 (0.119) | -0.0281 (0.128) |
| richer | -0.145** (0.0728) | -0.0419 (0.114) | -0.0426 (0.132) | -0.405*** (0.141) |
| lent to me before | 0.508*** (0.0639) | 0.301*** (0.102) | 0.724*** (0.116) | 0.610*** (0.123) |
| refuse to help | -0.307*** (0.0745) | -0.333*** (0.118) | -0.341** (0.137) | -0.223 (0.140) |
| friends | 0.195*** (0.0734) | 0.0845 (0.116) | 0.103 (0.130) | 0.437*** (0.145) |
| relatives | 0.456*** (0.0737) | 0.393*** (0.115) | 0.438*** (0.130) | 0.586*** (0.148) |
| late | 0.681*** (0.0812) | 0.506*** (0.124) | 0.813*** (0.147) | 0.750*** (0.162) |
| prompt | 1.541*** (0.0773) | 1.208*** (0.119) | 1.939*** (0.139) | 1.600*** (0.155) |
| emergency | 2.238*** (0.121) | 1.626*** (0.179) | 3.008*** (0.226) | 2.376*** (0.249) |
| production | 0.704*** (0.128) | 0.458** (0.193) | 1.310*** (0.233) | 0.339 (0.270) |
| tuition | 1.555*** (0.128) | 1.236*** (0.190) | 1.715*** (0.237) | 1.903*** (0.263) |
| construction | 0.779*** (0.133) | 0.610*** (0.200) | 0.788*** (0.247) | 1.133*** (0.267) |
| medicine | 1.040*** (0.119) | 0.788*** (0.181) | 1.195*** (0.221) | 1.323*** (0.238) |
| interest rate | -0.934 (0.779) | -0.583 (1.253) | -1.062 (1.349) | -1.569 (1.528) |
| sacrifice | -0.146** (0.0591) | 0.00721 (0.0948) | -0.325*** (0.105) | -0.148 (0.112) |
| community pressure | 0.125** (0.0608) | -0.104 (0.0966) | 0.467*** (0.110) | 0.0295 (0.117) |
| Log likelihood | -3250.6162 | -1270.5167 | -1061.9134 | -856.17288 |
| AIC | 6537.232 | 2577.033 | 2159.827 | 1748.346 |
| BIC | 6668.177 | 2689.815 | 2272.733 | 1855.613 |
| Observations | 10,665 | 3,888 | 3,915 | 2,862 |

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 15. Mixed Logit results for different provinces in the second round

| VARIABLES | Shaanxi | | Shandong | | Zhejiang | |
|--------------------|-------------------------|---------------------|-------------------------|----------------------|-------------------------|------------------------|
| | Mean | SD | Mean | SD | Mean | SD |
| loan amount | -0.0110*** (0.00341) | 0.0106 (0.00813) | -0.0185*** (0.00398) | 0.00450 (0.00889) | -0.0189*** (0.00519) | 0.0236*** (0.00733) |
| repayment period | -0.0482 (0.0758) | 0.0490 (0.147) | -0.123 (0.0962) | 0.217 (0.174) | -0.452*** (0.122) | 0.534*** (0.166) |
| poorer | 0.188 (0.123) | -0.220 (0.204) | 0.144 (0.149) | -0.173 (0.360) | -0.0234 (0.173) | -0.567** (0.231) |
| richer | -0.0141 (0.133) | 0.132 (0.260) | -0.141 (0.164) | 0.223 (0.253) | -0.464** (0.191) | 0.452* (0.250) |
| lent to me before | 0.311** (0.130) | 0.675*** (0.193) | 0.878*** (0.165) | 1.036*** (0.208) | 0.794*** (0.162) | -0.455** (0.213) |
| refuse to help | -0.413*** (0.148) | 0.480* (0.277) | -0.494*** (0.190) | -0.725*** (0.241) | -0.316 (0.194) | 0.949*** (0.228) |
| friends | 0.122 (0.137) | -0.454* (0.273) | 0.172 (0.155) | 0.118 (0.282) | 0.446** (0.181) | 0.125 (0.192) |
| relatives | 0.435*** (0.166) | 1.079*** (0.191) | 0.435** (0.180) | 1.117*** (0.197) | 0.517*** (0.197) | 0.870*** (0.233) |
| late | 0.545*** (0.161) | 0.826*** (0.179) | 0.949*** (0.187) | -0.536* (0.285) | 0.981*** (0.198) | -0.239 (0.354) |
| prompt | 1.353*** (0.138) | -0.354 (0.236) | 2.432*** (0.196) | 0.736*** (0.172) | 2.116*** (0.224) | -0.969*** (0.206) |
| emergency | 1.936*** (0.212) | -0.405 (0.364) | 3.634*** (0.321) | -2.052*** (0.403) | 2.967*** (0.324) | 0.429 (0.318) |
| production | 0.467** (0.227) | 0.640* (0.374) | 1.570*** (0.288) | 1.129*** (0.385) | 0.0805 (0.412) | 1.622*** (0.410) |
| tuition | 1.364*** (0.215) | 0.279 (0.237) | 2.136*** (0.283) | 0.0177 (0.273) | 2.163*** (0.337) | 1.062*** (0.293) |
| construction | 0.640*** (0.232) | 0.583 (0.411) | 0.778*** (0.281) | -0.0698 (0.411) | 1.257*** (0.366) | 1.378*** (0.506) |
| medicine | 0.883*** (0.202) | 0.0622 (0.298) | 1.401*** (0.273) | 1.061*** (0.275) | 1.565*** (0.302) | -0.451 (0.356) |
| interest rate | -1.144 (1.462) | 3.040 (3.925) | -1.989 (1.714) | -5.776** (2.778) | -2.431 (2.105) | 10.99*** (2.976) |
| sacrifice | 0.00124 (0.109) | 0.137 (0.306) | -0.462*** (0.132) | -0.288 (0.192) | -0.165 (0.142) | 0.310 (0.249) |
| community pressure | -0.145 (0.119) | -0.435** (0.186) | 0.498*** (0.138) | -0.234 (0.205) | -0.0427 (0.144) | -0.00833 (0.253) |
| Log likelihood | -1244.375 | -1244.375 | -1017.9257 | -1017.9257 | -826.84082 | -826.84082 |
| AIC | 2560.75 | 2560.75 | 2107.851 | 2107.851 | 1725.682 | 1725.682 |
| BIC | 2786.313 | 2786.313 | 2333.664 | 2333.664 | 1940.216 | 1940.216 |
| Observations | 3,888 | 3,888 | 3,915 | 3,915 | 2,862 | 2,862 |

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

5.3 Logit models with interactions

Table 17 shows the conditional logit model with interaction, as the other interactions are not significant and have obvious impact on the coefficients of some attributes, which indicates multi-collinearity. Mixed logit models with interaction terms are also not robust.

The only interaction fit for the conditional logit model is the product of interest and precautionary saving tendency (strong=1, moderate=2, weak=3). The sign of the coefficient shows that respondents with weak awareness of precautionary saving are less likely to be attracted by the interest offered by borrowers.

Table 16. Condition Logit results with interaction under overall data

| VARIABLES | CL |
|--------------------|-------------------------|
| loan amount | -0.0116*** (0.00177) |
| repayment period | -0.131*** (0.0436) |
| poorer | 0.101 (0.0660) |
| richer | -0.144** (0.0728) |
| lent to me before | 0.508*** (0.0639) |
| refuse to help | -0.307*** (0.0745) |
| friends | 0.194*** (0.0734) |
| relatives | 0.457*** (0.0737) |
| late | 0.680*** (0.0812) |
| prompt | 1.542*** (0.0774) |
| emergency | 2.241*** (0.121) |
| production | 0.706*** (0.128) |
| tuition | 1.559*** (0.128) |
| construction | 0.782*** (0.133) |
| medicine | 1.045*** (0.119) |
| interest rate | 2.535 (1.890) |
| sacrifice | -0.146** (0.0591) |
| community pressure | 0.127** (0.0609) |
| interest*saving | -1.804** (0.900) |
| Log likelihood | -3248.6026 |
| AIC | 6535.205 |
| BIC | 6535.205 |
| Observations | 10,665 |

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

5.4 Willingness to lend and the kindness function

In discrete choice models, the ratio of coefficients usually provides economically meaningful information (Train 2009)¹⁸. Following the standard practice in Willingness to Pay (WTP) studies the Willingness to Lend (WTL) in our context uses the following equation.

$$WTL = - (\text{attribute parameter} / \text{price parameter})$$

In this way, the change in interest rate associated with a unit change in the attribute can be measured (Louviere & Hensher, 1982)¹⁹.

The WTL is not a willingness to Lend in the classical sense, but a kindness function as illustrated in Figures 1 and 2. It captures the blend of rational and emotional utility including altruism and inequity aversion. It reveals other-regarding preferences instead of respondents' concern of material payoffs.

From Table 18, we can see most signs of WTL are as expected, except for 5 statistics for single provinces, which is calculated from insignificant coefficients.

In detailed words, for a one-year increase in repayment period, the amount of money that respondents are willing to lend would decrease by 9,480 RMB according to Mixed Logit model. As repayment terms, and loan amount are both under rational kindness function $f_i(a_i, b_j)$, it shows the relationship between β and x . To keep the lender's utility constant, the change of acceptable loan amount and repayment terms are in opposite direction. Mutual-min and mutual max could also be seen in the Table below. Respondents' willingness to be kind (i.e. willingness to lend more money)

¹⁸ Train, K. E. (2009). Discrete choice methods with simulation. Cambridge university press. Page 39.

¹⁹ Louviere, J. J., & Hensher, D. A. (1982). On the design and analysis of simulated choice or allocation experiments in travel choice modelling. Transportation research record, 890(1982), 11-17.

would increase by 41,410 RMB if borrowers previously helped them. But it would decrease by 28,000 RMB instead if borrowers were mean to them before. This is consistent from our finding in the survey that we discussed in 4.2: Families in rural areas of China shows a much stronger mutual max preference than mutual min preference.

In terms of emotional kindness, $\tilde{f}_2(b_2, c_1)$, there is also evidence for inequity aversion. The willingness to be kind was positive when a borrower is poorer than the lender and was negative if a borrower has better financial position. In comparison with everyday consumption, other loan purposes all induced positive willingness to be kind. Emergency gets the highest, followed by tuition fee, chronic diseases, house construction, and agricultural production.

The familial bonds facilitate lenders willingness to be kind. And relatives get higher WTP than friends.

To put it in a shell, respondents' willingness to be kind (i.e. to lend more money) demonstrates that there is a limit to kindness. In other words, a fairness equilibrium in Figure 1 could exist as there is a balance between decreasing marginal utility from income foregone, and a gain in marginal utility from kindness.

Table 17. Willingness to Lend using Conditional Logit (CL) and Mixed Logit model (ML)

| | Total | | Shaanxi | | Shandong | | Zhejiang | |
|---------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | CL | ML | CL | ML | CL | ML | CL | ML |
| loan amount ²⁰ | -1.00*** | -1.00*** | -1.00*** | -1.00*** | -1.00*** | -1.00*** | -1.00*** | -1.00*** |
| repayment period | -11.39*** | -9.48*** | -5.52 | -4.38 | -7.81 | -6.65 | -26.55*** | -23.92*** |
| poorer | 8.69 | 8.59 | 12.73 | 17.09 | 11.53 | 7.78 | -2.55 | -1.24 |
| richer | -12.61** | -11.70* | -3.81 | -1.28 | -3.11 | -7.62 | -36.82*** | -24.55** |
| lent to me before | 44.17*** | 41.41*** | 27.36*** | 28.27** | 52.85*** | 47.46*** | 55.45*** | 42.01*** |
| refuse to help | -26.70*** | -28.00*** | -30.27*** | -37.55*** | -24.89** | -26.70*** | -20.27 | -16.72 |
| friends | 16.96*** | 15.78** | 7.68 | 11.09 | 7.52 | 9.30 | 39.73*** | 23.60** |
| relatives | 39.65*** | 35.11*** | 35.73*** | 39.55*** | 31.97*** | 23.51** | 53.27*** | 27.35*** |
| late | 59.22*** | 55.70*** | 46.00*** | 49.55*** | 59.34*** | 51.30*** | 68.18*** | 51.90*** |
| prompt | 134.00*** | 129.63*** | 109.82*** | 123.00*** | 141.53*** | 131.46*** | 145.45*** | 111.96*** |
| emergency | 194.61*** | 185.63*** | 147.82*** | 176.00*** | 219.56*** | 196.43*** | 216.00*** | 156.98*** |
| production | 61.22*** | 49.85*** | 41.64** | 42.45** | 95.62*** | 84.86*** | 30.82 | 4.26 |
| tuition | 135.22*** | 126.67*** | 112.36*** | 124.00*** | 125.18*** | 115.46*** | 173.00*** | 114.44*** |
| construction | 67.74*** | 58.67*** | 55.45*** | 58.18*** | 57.52*** | 42.05*** | 103.00*** | 66.51*** |
| medicine | 90.43*** | 86.44*** | 71.64*** | 80.27*** | 87.23*** | 75.73*** | 120.27*** | 82.80*** |
| interest rate (%) | -0.81 | -1.58** | -0.53 | -1.04 | -0.78 | -1.08 | -1.43 | -1.29 |
| sacrifice | -12.70** | -13.19*** | 0.66 | 0.11 | -23.72*** | -24.97*** | -13.45 | -8.73 |
| community pressure | 10.87** | 9.04* | -9.45 | -13.18 | 34.09*** | 26.92*** | 2.68 | -2.26 |

Standard errors in parentheses of attributes used to calculate WTP *** p<0.01, ** p<0.05, * p<0.1

²⁰ The unit of loan amount is thousand RMB.

CHAPTER 6

CONCLUSIONS

Research has found that families living in rural areas of China commonly engage in informal lending and borrowing with friends and relatives. For example, in China the role of familial lending is economically significant and should not be ignored by economists, especially those studying agriculture in a development context. But being economically significant poses a problem because in many instances, especially China, loans are made without interest or very low interest. With no obvious monetary advantage or cost to informal borrowing, alternative motives need investigation. In this study we investigated informal transactions through the lens of social interactions in general, and Rabin's fairness equilibrium. Along these lines we developed a theoretical model to investigate kindness and the conditions under which a fairness equilibrium in informal credit markets might operate. The key insights can be found in Equation 11 and Figures 1 and 2. The essential argument is that a fairness equilibrium results when the marginal utility from a profit motive equals the marginal utility from kindness. This equilibrium condition implies that informal lenders are willing to forgo the disutility of holding cash if there is an increase in utility from a kind act. Evaluating theoretical structures of this sort are important in applied economics, especially when non-market behavior such as informal lending at zero interest is so prevalent in developing agricultural economies.

In this paper, we use an in-the-field discrete choice experiment to approximate Rabin's utility specification. The DCE includes 9 attributes, each developed to capture

particular elements of familial lending and other-regarding preferences. These include the nature of the relationship between lender and borrower (a_1 and a_2 in Eq 2); beliefs from previous interactions about what action the borrower might take (b_2 in EQ 2); and higher order interactions such as social and peer pressures to make familial loans (c_1 and c_2 in EQ 2). To capture rational kindness under $f_i(a_i, b_j)$ we include the loan amount, repayment terms and interest rates and likelihood of payoff (based on borrower reputation) as provided in Eq 5 and to capture emotional kindness including inequity aversion, $\tilde{f}_2(b_2, c_1)$, we include attributes related to relative financial position and loan purpose.

Using conditional logit model and mixed logit model, we find statistic support that mutual-max and mutual-min affect kindness in a way that is consistent with theory. In words, the analysis clearly shows that kindness begets kindness, receiving kindness before is a strong motive for farmers to help others in return, implying reciprocity as a motive. Conversely, the experience of being treated unkindly does the opposite. Respondents are less willing to lend to borrowers that refused to lend a hand before, which indicating a mutual-min tendency.

Also, the logit regression results provide us with evidence for emotional kindness under $\tilde{f}_2(b_2, c_1)$, including inequity aversion. For example, farmers are less willing to lend to someone who is richer than themselves, while those poorer than themselves get preferential treatment. And for borrowing reasons, purposes bringing more sympathy and empathy such as emergency, issues about children (like tuition fees) would lead to higher willingness to help. Besides, higher order elements (included in c_1 and c_2) are also considered. Community pressure plays a role in pushing farmers to lend to

acquaintances. Friends and relatives get more trust compared to other members in the community.

We also capture rational kindness in Eq 5. Specifically, farmers prefer to lend to the person asking for smaller loan amount with shorter repayment period, which depicts the decreasing utility on lender profit in Figure 1. Also, a good reputation of borrowers for paying back promptly, which indicates high possibility to get money back, obtains significant preference in farmers' choice.

The logit regression results also provide several evidences of diminishing marginal utility on rational kindness in Figure 1. First, if a borrower's request goes beyond a lender's spare capital, making the lender have to break their money using plan to help, the lender would be less likely to lend the money. This also explains why kindness utility function in Figure 2 diminishes as the amount of informal loan increases, when loan amount is larger than 333.33, implying that kindness also has its limits. Second, interest rate has a negative sign, which means farmers are less willing to lend at high interest rates. Though this would not be expected under utility function of lending, this could be expected as other-regarding preference and sensible under utility function of kindness. Giving up interest during informal lending in rural China significantly shows a lender's kindness to a borrower, and it would lead to an increase in $f_i(a_i, b_j)$ and a decrease in lender's profit, which ultimately improves the lender's well-being U_L .

Finally, we measure farmers willingness to be kind with statistics from logit models and get the amount of money that farmers are willing to lend to others for a certain change in attributes. This implies there exist a balance between decreasing

marginal utility from income foregone, and a gain in marginal utility from kindness. In other words, a fairness equilibrium as depicted in Figure 1 can exist.

REFERENCES

- Aleem, I. (1993). Imperfect Information, Screening, and the Cost of informal Lending: A Study of a Rural Credit Market in Pakistan, in Hoff and Stiglitz (1993). *The economics of rural organization; theory, practice, and policy*, Oxford University Press, Oxford, pp. 131-154
- Andreoni, J., and Miller, J. (2002). "Giving According to GARP: An Experimental Test of the Rationality of Altruism," *Econometrica*, 70,737-753.
- Bardhan, P. and Udry, C. (1999). *Development microeconomics*, Oxford University Press, Oxford, chapter 7 .
- Basu, K. (1994). *Agrarian Questions*. Oxford University Press, Oxford, pp. 1-17
- Basu, K. (1997). *Analytical Development Economics. The Less Developed Economy Revisited*. MIT Press, pp. 267-316
- Basu, K. and Bell, C., (1991). "Fragmented duopoly : Theory and applications to backward agriculture." *Journal of Development Economics*, Elsevier, vol. 36(2), pages 145-165.
- Bell, C. (1990). "Interactions between Institutions and Informal Credit Agencies in Rural India," *World Bank Economic Review*, 4, 3,297-327.
- Bhat, V.V. (1986). "Financial Innovation and Development: Rural Financial Markets in Developing Countries." In J.D. Von Pishke et. al. (eds.) *E D I John Hopkins University Press*, Baltimore, London.
- Bowles, S., and Gintis, H. (2000). "Reciprocity, Self-Interest, and the Welfare State," *Nordic Journal of Political Economy*, 26, 33-53.
- Charness, G. and Rabin, M.(2002) . "Understanding Social Preferences with Simple Tests," *Quarterly Journal of Economics*, 117,817-69.
- Coate, S. and Ravallion, M. (1993). "Reciprocity without Commitment: Characterization and Performance of Informal Insurance Arrangements," *Journal of Development Economics*, 40, 1-24.
- Cox, J.C. (2006). "Trust Fear, Reciprocity, and Altruism: Theory and Experiment," *Andrew Young School of Policy Studies Research Paper Series No. 07-16*.
- Cox, J.C., Sadiraj, K., and Sadiraj, V. (2001). "Trust, Fear, Reciprocity and Altruism," *University of Arizona Working Paper 01-06*.

- Crouch, G. I., & Louviere, J. J. (2004). The determinants of convention site selection: A logistic choice model from experimental data. *Journal of travel research*, 43(2), 118-130.
- Dufwenberg, M. and Kirchsteiger, G. (2004). "A Theory of Sequential Reciprocity," *Games and Economic Behavior*, 47, 268-98
- Falk, A. and Fischbacher, U. (2006). "A Theory of Reciprocity," *Games and Economic Behavior*, 54, 293-315.
- Falk, A., Fehr, E., & Fischbacher, U. (2008). Testing theories of fairness—Intentions matter. *Games and Economic Behavior*, 62(1), 287-303.
- Fehr, E., and Schmidt, K.M. (1999). "A Theory of Fairness, Competition and Cooperation," *Quarterly Journal of Economics*, 114, 817-68.
- Fehr, E., and Schmidt, K.M. (2006). "The Economics of Fairness, Reciprocity and Altruism – Experimental Evidence and New Theories," *Handbook of Economics of Giving, Altruism and Reciprocity*, Volume 1, Chapter 8.
- Floro, S. L. (2019). *Informal credit markets and the new institutional economics: The case of Philippine agriculture*. Routledge.
- Gan L., Yin Z., Tan J. (2016) *Rural Households' Private Lending*. In: *Report on the Development of Household Finance in Rural China (2014)*. Springer, Singapore
- Hoff, Karla, Braverman, A. and Stiglitz, J.. (1993). *The Economics of Rural Organization, Theory, Practice, and Policy*. Published for the World Bank. Oxford University Press, New York.
- Johnson, R. and Orme, B. 2003. *Getting the most from CBC*, Sawtooth Software Research Paper Series, Sawtooth Software, Sequim.
- Karaivanov, A., & Kessler, A. (2018). (Dis) advantages of informal loans—Theory and evidence. *European Economic Review*, 102, 100-128.
- Karlan, D., Mobius, M., Rosenblat, T., & Szeidl, A. (2009). Trust and social collateral. *Quarterly Journal of Economics*, 124(3), 1307–1361
- Ligon, E., Thomas, J.P., and Worrall, J. (2002). "Informal Insurance Arrangements with Limited Commitment: Theory and Evidence from Village Economies," *Review of Economic Studies*, 69, 209-244.

Louviere, J. J., & Hensher, D. A. (1982). On the design and analysis of simulated choice or allocation experiments in travel choice modelling. *Transportation research record*, 890(1982), 11-17.

Lund, S. and Fafchamps, M. (2003). "Risk-Sharing Networks in Rural Philippines," *Journal of Development Economics*, 71,261-287.

McPeak, J. (2006). Risk sharing and asset transfers: the role of livestock transfers in Northern Kenya. *Journal of Development Economics*.81: 415-437

Mobius, M., & Rosenblat, T. (2016). Informal transfers in social networks. In *The Oxford Handbook of the Economics of Networks*.

Orme, B. (1998). Sample size issues for conjoint analysis studies, Sawtooth Software Technical Paper, Sequim.

Park, A., & Ren, C. (2001). Microfinance with Chinese characteristics. *World Development*, 29(1), 39-62.

Rabin, M. (1993). "Incorporating Fairness into Game Theory and Economics," *The American Economic Review*, 83, 5, 1281-1301.

Rose, J.M. and Bliemer, M.C.J. 2013. Sample size requirements for stated choice experiments. *Transportation* 40: 1021-1041.

Santos, P., and C. B Barrett. (2011). Persistent poverty and informal credit. *Journal of Development Economics*, 96(2), 337-347.

Song Lei (2005). Research on Rural Informal Lending[J]. *China Business (Research on Economic Theory)*, 2005, (4):23-26. (in Chinese)

Stiglitz, J. E. (1974). "Incentives and Risk Sharing in Sharecropping," *Review of Economic Studies*, 41,219-55.

Stock, James H., Wright, J. H and Motohiro Y. (2002). "A survey of Weak Instruments and Weak Identification in Generalized Method of moments." *Journal of Business and Economics Statistics*, 20, 518-29

Tang Lizhi (2009). The Rural Informal Financial Impact on the Growth of Farmers' Income: Empirical Analysis in Fujian Province, Quanzhou City as An Example[J]. *Issues in Agricultural Economy*, 2009, (4):76-79. (in Chinese)

Timberg, T. and Aiyar C. V. (1980). "Informal Credit Markets in India." *Economic and Political Weekly*, 15, Annual Number, pp. 279-302.

Train, K. E. (2009). *Discrete choice methods with simulation*. Cambridge university press.

Turvey, C.G. and Kong R. (2010). “Weather Risk and the Viability of Weather Insurance in China’s Gansu, Shaanxi, and Henan Provinces,” *China Agricultural Economic Review* 2(1)

Turvey, C. G., Kumar, C., & Rong, K. (2015). *Fairness, Reciprocity and Informal Lending in Farming Communities: A Comparative Study of China and India*.

Udry, C. (1994). “Risk and Insurance in a Rural Credit Market: An Empirical investigation in Northern Nigeria,” *Review of Economic Studies*, 63,495-526.

Von Pischke, J.D., Adams, Dale W., and Donald, Gordon. (1983). *Rural Financial Markets in Developing Countries* . The Johns Hopkins University Press

APPENDIX

Example of the Choice Experiment

Card B1C1: Suppose there are 3 people who want to borrow from you. You are to choose one of them that you are most willing to lend money to. Please tick the box below the options you choose.

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|---|---|--|
| loan amount (yuan) | 25000 | 50000 | 10000 |
| repayment period | a half year | 1 month | 1 year |
| relationship with the borrower | other community members (neither a friend nor a relative) | other community members (neither a friend nor a relative) | other community members (neither a friend nor a relative) |
| previous interaction | refused to lend to me before  | refused to lend to me before  | refused to lend to me before  |
| borrower's financial position | richer than me  | poorer than me  | similar to me  |
| purpose | agriculture production  | agriculture production  | agriculture production  |
| borrower's reputation | known to always repay a loan but be late  | known to always pay back promptly  | often default on a loan  |
| interest rate | 10% | 10% | 10% |
| sacrifice | lend without giving up sth meaningful  | lend with giving up sth meaningful  | lend without giving up sth meaningful  |
| community pressure | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 |
| your choice | | | |

Card B1C2: Suppose there are 3 people who want to borrow from you. You are to choose one of them that you are most willing to lend money to. Please tick the box below the options you choose.

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|---|---|---|
| loan amount (yuan) | 50000 | 10000 | 25000 |
| repayment period | a half year | 2 years | 1 year |
| relationship with the borrower | other community members (neither a friend nor a relative) | other community members (neither a friend nor a relative) | a friend |
| previous interaction | has never lent to me before because I did not ask | has never lent to me before because I did not ask | has never lent to me before because I did not ask |
| borrower's financial position | poorer than me  | poorer than me  | poorer than me  |
| purpose | house construction  | tuition fee  | health/medicine (chronic disease, except for emergency)  |
| borrower's reputation | known to always pay back promptly  | known to always pay back promptly  | known to always pay back promptly  |
| interest rate | bank lending rate (5%) | bank lending rate (5%) | bank lending rate (5%) |
| sacrifice | lend with giving up sth meaningful  | lend with giving up sth meaningful  | lend with giving up sth meaningful  |
| community pressure | no pressure  随便你 我不在乎 | feel pressure  | no pressure  随便你 我不在乎 |
| your choice | | | |

Card B1C3: Suppose there are 3 people who want to borrow from you. You are to choose one of them that you are most willing to lend money to. Please tick the box below the options you choose.

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|--|--|---|
| loan amount (yuan) | 50000 | 50000 | 50000 |
| repayment period | 1 month | a half year | 2 years |
| relationship with the borrower | a friend | a friend | a friend |
| previous interaction | lent to me before  | refused to lend to me before  | has never lent to me before because I did not ask |
| borrower's financial position | poorer than me  | poorer than me  | Poorer than me  |
| purpose | household consumption, leisure consumption  | health/medicine (chronic disease, except for emergency)  | tuition fee  |
| borrower's reputation | known to always repay a loan but be late  | known to always repay a loan but be late  | known to always repay a loan but be late  |
| interest rate | bank deposit rate (3%) | bank lending rate (5%) | no interest rate |
| sacrifice | lend without giving up sth meaningful  | lend with giving up sth meaningful  | lend without giving up sth meaningful  |
| community pressure | feel pressure  | feel pressure  | feel pressure  |
| your choice | | | |

Card B1C4: Suppose there are 3 people who want to borrow from you. You are to choose one of them that you are most willing to lend money to. Please tick the box below the options you choose.

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|---|--|---|
| loan amount (yuan) | 25000 | 5000 | 10000 |
| repayment period | 2 years | 1 year | a half year |
| relationship with the borrower | other community members (neither a friend nor a relative) | other community members (neither a friend nor a relative) | a friend |
| previous interaction | refused to lend to me before  | refused to lend to me before  | refused to lend to me before  |
| borrower's financial position | richer than me  | poorer than me  | similar to me  |
| purpose | health/medicine (chronic disease, except for emergency)  | health/medicine (chronic disease, except for emergency)  | health/medicine (chronic disease, except for emergency)  |
| borrower's reputation | known to always pay back promptly  | known to always pay back promptly  | known to always pay back promptly  |
| interest rate | bank lending rate (5%) | bank deposit rate (3%) | 10% |
| sacrifice | lend with giving up sth meaningful  | lend with giving up sth meaningful  | lend with giving up sth meaningful  |
| community pressure | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 |
| your choice | | | |

Card B1C5: Suppose there are 3 people who want to borrow from you. You are to choose one of them that you are most willing to lend money to. Please tick the box below the options you choose.

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|---|--|---|
| loan amount (yuan) | 50000 | 50000 | 50000 |
| repayment period | 2 years | 2 years | 2 years |
| relationship with the borrower | other community members (neither a friend nor a relative) | a relative | other community members (neither a friend nor a relative) |
| previous interaction | has never lent to me before because I did not ask | lent to me before  | refused to lend to me before  |
| Borrower's financial position | poorer than me  | poorer than me  | poorer than me  |
| purpose | health/medicine (chronic disease, except for emergency)  | health/medicine (chronic disease, except for emergency)  | health/medicine (chronic disease, except for emergency)  |
| borrower's reputation | known to always pay back promptly  | known to always pay back promptly  | known to always pay back promptly  |
| interest rate | bank deposit rate (3%) | no interest rate | 10% |
| sacrifice | lend without giving up sth meaningful  | lend with giving up sth meaningful  | lend without giving up sth meaningful  |
| community pressure | no pressure  随便你 我不在乎 | feel pressure  | no pressure  随便你 我不在乎 |
| your choice | | | |

Card B1C6: Suppose there are 3 people who want to borrow from you. You are to choose one of them that you are most willing to lend money to. Please tick the box below the options you choose.

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|--|--|---|
| loan amount (yuan) | 1000 | 10000 | 5000 |
| repayment period | 1 month | 2 years | 1 year |
| relationship with the borrower | other community members (neither a friend nor a relative) | a relative | a friend |
| previous interaction | lent to me before  | lent to me before  | lent to me before  |
| Borrower's financial position | richer than me  | richer than me  | richer than me  |
| purpose | household consumption, leisure consumption  | emergency (crop loss, livestock loss, major sickness)  | house construction  |
| borrower's reputation | known to always pay back promptly  | known to always pay back promptly  | known to always pay back promptly  |
| interest rate | bank lending rate (5%) | no interest rate | 10% |
| sacrifice | lend with giving up sth meaningful  | lend with giving up sth meaningful  | lend with giving up sth meaningful  |
| community pressure | feel pressure  | feel pressure  | feel pressure  |
| your choice | | | |

Card B1C7: Suppose there are 3 people who want to borrow from you. You are to choose one of them that you are most willing to lend money to. Please tick the box below the options you choose.

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|---|---|---|
| loan amount (yuan) | 50000 | 1000 | 25000 |
| repayment period | 1 year | 1 year | 1 year |
| relationship with the borrower | a friend | other community members (neither a friend nor a relative) | a relative |
| previous interaction | lent to me before  | refused to lend to me before  | has never lent to me before because I did not ask |
| Borrower's financial position | richer than me  | poorer than me  | similar to me  |
| purpose | health/medicine (chronic disease, except for emergency)  | agriculture production  | tuition fee  |
| borrower's reputation | known to always repay a loan but be late  | known to always repay a loan but be late  | known to always repay a loan but be late  |
| interest rate | bank lending rate (5%) | bank lending rate (5%) | bank lending rate (5%) |
| sacrifice | lend without giving up sth meaningful  | lend without giving up sth meaningful  | lend without giving up sth meaningful  |
| community pressure | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 |
| your choice | | | |

Card B1C8: Suppose there are 3 people who want to borrow from you. You are to choose one of them that you are most willing to lend money to. Please tick the box below the options you choose.

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|--|--|--|
| loan amount (yuan) | 10000 | 50000 | 25000 |
| repayment period | 1 month | a half year | 1 year |
| relationship with the borrower | other community members (neither a friend nor a relative) | other community members (neither a friend nor a relative) | other community members (neither a friend nor a relative) |
| previous interaction | lent to me before  | lent to me before  | lent to me before  |
| borrower's financial position | richer than me  | richer than me  | richer than me  |
| purpose | household consumption, leisure consumption  | household consumption, leisure consumption  | household consumption, leisure consumption  |
| borrower's reputation | often default on a loan  | known to always pay back promptly  | known to always repay a loan but be late  |
| interest rate | bank lending rate (5%) | bank deposit rate (3%) | no interest rate |
| sacrifice | lend with giving up sth meaningful  | lend without giving up sth meaningful  | lend with giving up sth meaningful  |
| community pressure | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 | no pressure  随便你 我不在乎 |
| your choice | | | |

Card B1C9: Suppose there are 3 people who want to borrow from you. You are to choose one of them that you are most willing to lend money to. Please tick the box below the options you choose.

| | Borrower A | Borrower B | Borrower C |
|---------------------------------------|--|--|--|
| loan amount (yuan) | 10000 | 10000 | 10000 |
| repayment period | 1 month | a half year | 2 years |
| relationship with the borrower | other community members (neither a friend nor a relative) | other community members (neither a friend nor a relative) | a relative |
| previous interaction | has never lent to me before because I did not ask | lent to me before  | refused to lend to me before  |
| Borrower's financial position | similar to me  | similar to me  | similar to me  |
| purpose | household consumption, leisure consumption  | household consumption, leisure consumption  | household consumption, leisure consumption  |
| borrower's reputation | often default on a loan  | known to always pay back promptly  | known to always repay a loan but be late  |
| interest rate | bank deposit rate (3%) | bank deposit rate (3%) | bank deposit rate (3%) |
| sacrifice | lend with giving up sth meaningful  | lend with giving up sth meaningful  | lend with giving up sth meaningful  |
| community pressure | no pressure  随便你 我不在乎 | feel pressure  | no pressure  随便你 我不在乎 |
| your choice | | | |

Example of the Choice Experiment (in Chinese)

卡片 B1C1: 假设有三个人向您借钱, 您必须也只能借给他们其中的一个人, 您最倾向于借给谁呢? (请在选项下方一栏中打勾标出您的选择)

| | 借钱人 A | 借钱人 B | 借钱人 C |
|-----------------|--|--|--|
| 借多少钱 | 25000 | 50000 | 10000 |
| 借多久 | 半年 | 1 个月 | 1 年 |
| 与您的关系 | 其他村民 | 其他村民 | 其他村民 |
| 您找他/她借钱过吗? | 之前找他/她借钱, 不肯借给我  | 之前找他/她借钱, 不肯借给我  | 之前找他/她借钱, 不肯借给我  |
| 对方经济水平 | 比我好  | 比我差  | 跟我差不多  |
| 借钱目的 | 用于农业生产  | 用于农业生产  | 用于农业生产  |
| 借钱人诚信水平 | 会还钱, 但是会拖一段时间  | 会准时还钱  | 经常不还钱  |
| 利息 | 10% | 10% | 10% |
| 我的手头宽紧 (来找我借钱时) | 来找我借钱时, 我手头宽松  | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头宽松  |
| 我不借的话, 其他人会怎么看我 | 其他人不在乎  随便你 我不在乎 | 其他人不在乎  随便你 我不在乎 | 其他人不在乎  随便你 我不在乎 |
| 您的选择 | | | |

卡片 B1C2: 假设有三个人向您借钱, 您必须也只能借给他们其中的一个人, 您最倾向于借给谁呢? (请在选项下方一栏中打勾标出您的选择)

| | 借钱人 A | 借钱人 B | 借钱人 C |
|-----------------|--|---|--|
| 借多少钱 | 50000 | 10000 | 25000 |
| 借多久 | 半年 | 2 年 | 1 年 |
| 与您的关系 | 其他村民 | 其他村民 | 朋友 |
| 您找他/她借钱过吗? | 我没问他/她借过钱 | 我没问他/她借过钱 | 我没问他/她借过钱 |
| 对方经济水平 | 比我差  | 比我差  | 比我差  |
| 借钱目的 | 用于造房子  | 学费  | 平时吃药 (慢性疾病)  |
| 借钱人诚信水平 | 会准时还钱  | 会准时还钱  | 会准时还钱  |
| 利息 | 银行贷款利率 (5%) | 银行贷款利率 (5%) | 银行贷款利率 (5%) |
| 我的手头宽紧 (来找我借钱时) | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头比较紧张  |
| 我不借的话, 其他人会怎么看我 | 其他人不在乎  随便你 我不在乎 | 其他人会看不起我  | 其他人不在乎  随便你 我不在乎 |
| 您的选择 | | | |

卡片 B1C3: 假设有三个人向您借钱, 您必须也只能借给他们其中的一个人, 您最倾向于借给谁呢? (请在选项下方一栏中打勾标出您的选择)

| | 借钱人 A | 借钱人 B | 借钱人 C |
|-----------------|---|---|--|
| 借多少钱 | 50000 | 50000 | 50000 |
| 借多久 | 1 个月 | 半年 | 2 年 |
| 与您的关系 | 朋友 | 朋友 | 朋友 |
| 您找他/她借钱过吗? | 之前借过钱给我  | 之前找他/她借钱, 不肯借给我  | 我没问他/她借过钱 |
| 对方经济水平 | 比我差  | 比我差  | 比我差  |
| 借钱目的 | 用于家庭日常消费, 或休闲消费  | 平时吃药 (慢性疾病)  | 学费  |
| 借钱人诚信水平 | 会还钱, 但是会拖一段时间  | 会还钱, 但是会拖一段时间  | 会还钱, 但是会拖一段时间  |
| 利息 | 银行存款利率 (3%) | 银行贷款利率 (5%) | 无利息 |
| 我的手头宽紧 (来找我借钱时) | 来找我借钱时, 我手头宽松  | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头宽松  |
| 我不借的话, 其他人会怎么看我 | 其他人会看不起我  | 其他人会看不起我  | 其他人会看不起我  |
| 您的选择 | | | |

卡片 B1C4: 假设有三个人向您借钱, 您必须也只能借给他们其中的一个人, 您最倾向于借给谁呢? (请在选项下方一栏中打勾标出您的选择)

| | 借钱人 A | 借钱人 B | 借钱人 C |
|-----------------|--|---|--|
| 借多少钱 | 25000 | 5000 | 10000 |
| 借多久 | 2 年 | 1 年 | 半年 |
| 与您的关系 | 其他村民 | 其他村民 | 朋友 |
| 您找他/她借钱过吗? | 之前找他/她借钱, 不肯借给我  | 之前找他/她借钱, 不肯借给我  | 之前找他/她借钱, 不肯借给我  |
| 对方经济水平 | 比我好  | 比我差  | 跟我差不多  |
| 借钱目的 | 平时吃药 (慢性疾病)  | 平时吃药 (慢性疾病)  | 平时吃药 (慢性疾病)  |
| 借钱人诚信水平 | 会准时还钱  | 会准时还钱  | 会准时还钱  |
| 利息 | 银行贷款利率 (5%) | 银行存款利率 (3%) | 10% |
| 我的手头宽紧 (来找我借钱时) | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头比较紧张  |
| 我不借的话, 其他人会怎么看我 | 其他人不在乎  随便你 我不在乎 | 其他人不在乎  随便你 我不在乎 | 其他人不在乎  随便你 我不在乎 |
| 您的选择 | | | |

卡片 B1C5: 假设有三个人向您借钱, 您必须也只能借给他们其中的一个人, 您最倾向于借给谁呢? (请在选项下方一栏中打勾标出您的选择)

| | 借钱人 A | 借钱人 B | 借钱人 C |
|-----------------|--|---|--|
| 借多少钱 | 50000 | 50000 | 50000 |
| 借多久 | 2 年 | 2 年 | 2 年 |
| 与您的关系 | 其他村民 | 亲戚 | 其他村民 |
| 您找他/她借钱过吗? | 我没问他/她借过钱 | 之前借过钱给我  | 之前找他/她借钱, 不肯借给我  |
| 对方经济水平 | 比我差  | 比我差  | 比我差  |
| 借钱目的 | 平时吃药 (慢性疾病)  | 平时吃药 (慢性疾病)  | 平时吃药 (慢性疾病)  |
| 借钱人诚信水平 | 会准时还钱  | 会准时还钱  | 会准时还钱  |
| 利息 | 银行存款利率 (3%) | 没利息 | 10% |
| 我的手头宽紧 (来找我借钱时) | 来找我借钱时, 我手头宽松  | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头宽松  |
| 我不借的话, 其他人会怎么看我 | 其他人不在乎  随便你 我不在乎 | 其他人会看不起我  | 其他人不在乎  随便你 我不在乎 |
| 您的选择 | | | |

卡片 B1C6: 假设有三个人向您借钱, 您必须也只能借给他们其中的一个人, 您最倾向于借给谁呢? (请在选项下方一栏中打勾标出您的选择)

| | 借钱人 A | 借钱人 B | 借钱人 C |
|-----------------|--|---|--|
| 借多少钱 | 1000 | 10000 | 5000 |
| 借多久 | 1 个月 | 2 年 | 1 年 |
| 与您的关系 | 其他村民 | 亲戚 | 朋友 |
| 您找他/她借钱过吗? | 之前借过钱给我  | 之前借过钱给我  | 之前借过钱给我  |
| 对方经济水平 | 比我好  | 比我好  | 比我好  |
| 借钱目的 | 用于家庭日常消费, 或休闲消费  | 紧急情况  | 用于造房子  |
| 借钱人诚信水平 | 会准时还钱  | 会准时还钱  | 会准时还钱  |
| 利息 | 银行贷款利率 (5%) | 没利息 | 10% |
| 我的手头宽紧 (来找我借钱时) | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头比较紧张  |
| 我不借的话, 其他人会怎么看我 | 其他人会看不起我  | 其他人会看不起我  | 其他人会看不起我  |
| 您的选择 | | | |

卡片 B1C7: 假设有三个人向您借钱, 您必须也只能借给他们其中的一个人, 您最倾向于借给谁呢? (请在选项下方一栏中打勾标出您的选择)

| | 借钱人 A | 借钱人 B | 借钱人 C |
|-----------------|--|---|--|
| 借多少钱 | 50000 | 1000 | 25000 |
| 借多久 | 1 年 | 1 年 | 1 年 |
| 与您的关系 | 朋友 | 其他村民 | 亲戚 |
| 您找他/她借钱过吗? | 之前借过钱给我  | 之前找他/她借钱, 不肯借给我  | 我没问他/她借过钱 |
| 对方经济水平 | 比我好  | 比我差  | 跟我差不多  |
| 借钱目的 | 平时吃药 (慢性疾病)  | 用于农业生产  | 学费  |
| 借钱人诚信水平 | 会还钱, 但是会拖一段时间  | 会还钱, 但是会拖一段时间  | 会还钱, 但是会拖一段时间  |
| 利息 | 银行贷款利率 (5%) | 银行贷款利率 (5%) | 银行贷款利率 (5%) |
| 我的手头宽紧 (来找我借钱时) | 来找我借钱时, 我手头宽松  | 来找我借钱时, 我手头宽松  | 来找我借钱时, 我手头宽松  |
| 我不借的话, 其他人会怎么看我 | 其他人不在乎  随便你 我不在乎 | 其他人不在乎  随便你 我不在乎 | 其他人不在乎  随便你 我不在乎 |
| 您的选择 | | | |

卡片 B1C8: 假设有三个人向您借钱, 您必须也只能借给他们其中的一个人, 您最倾向于借给谁呢? (请在选项下方一栏中打勾标出您的选择)

| | 借钱人 A | 借钱人 B | 借钱人 C |
|-----------------|--|---|--|
| 借多少钱 | 10000 | 50000 | 25000 |
| 借多久 | 1 个月 | 半年 | 1 年 |
| 与您的关系 | 其他村民 | 其他村民 | 其他村民 |
| 您找他/她借钱过吗? | 之前借过钱给我  | 之前借过钱给我  | 之前借过钱给我  |
| 对方经济水平 | 比我好  | 比我好  | 比我好  |
| 借钱目的 | 用于家庭日常消费, 或休闲消费  | 用于家庭日常消费, 或休闲消费  | 用于家庭日常消费, 或休闲消费  |
| 借钱人诚信水平 | 经常不还钱  | 会准时还钱  | 会还钱, 但是会拖一段时间  |
| 利息 | 银行贷款利率 (5%) | 银行存款利率 (3%) | 没利息 |
| 我的手头宽紧 (来找我借钱时) | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头宽松  | 来找我借钱时, 我手头比较紧张  |
| 我不借的话, 其他人会怎么看我 | 其他人不在乎  随便你 我不在乎 | 其他人不在乎  随便你 我不在乎 | 其他人不在乎  随便你 我不在乎 |
| 您的选择 | | | |

卡片 B1C9: 假设有三个人向您借钱, 您必须也只能借给他们其中的一个人, 您最倾向于借给谁呢? (请在选项下方一栏中打勾标出您的选择)

| | 借钱人 A | 借钱人 B | 借钱人 C |
|-----------------|--|---|--|
| 借多少钱 | 10000 | 10000 | 10000 |
| 借多久 | 1 个月 | 半年 | 2 年 |
| 与您的关系 | 其他村民 | 其他村民 | 亲戚 |
| 您找他/她借钱过吗? | 我没问他/她借过钱 | 之前借过钱给我  | 之前找他/她借钱, 不肯借给我  |
| 对方经济水平 | 跟我差不多  | 跟我差不多  | 跟我差不多  |
| 借钱目的 | 用于家庭日常消费, 或休闲消费  | 用于家庭日常消费, 或休闲消费  | 用于家庭日常消费, 或休闲消费  |
| 借钱人诚信水平 | 经常不还钱  | 会准时还钱  | 会还钱, 但是会拖一段时间  |
| 利息 | 银行存款利率 (3%) | 银行存款利率 (3%) | 银行存款利率 (3%) |
| 我的手头宽紧 (来找我借钱时) | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头比较紧张  | 来找我借钱时, 我手头比较紧张  |
| 我不借的话, 其他人会怎么看我 | 其他人不在乎  随便你 我不在乎 | 其他人会看不起我  | 其他人不在乎  随便你 我不在乎 |
| 您的选择 | | | |

Example of the Survey

**Cornell University/Northwest Agriculture and Forestry University
Survey of Villagers to Assess Informal Lending among Friends and Relatives**

NARRATIVE TO BE READ TO RESPONDENTS: First of all I would like to thank you for taking the time to meet with us. This survey should take approximately 30 minutes and again I thank you for your time. The survey we are conducting is a joint product between Cornell University in the United States andUniversity. We are interested in collecting information about informal lending among your friends and relatives. Your responses will be completely confidential and under no circumstances will your responses be identifiable. In addition, we understand that you may not have all of the precise information available. In these cases, all we ask is that you provide us with your best estimates or best judgments. Finally, you have the right to refuse to answer any question we might ask.

Given these objectives are you willing to participate in this survey?

Yes No

If NO then “Ok, that is fine. For our records can you tell us why you do not want to participate?”

NOTE to interviewer: If answer above is because respondent does not feel they have the information we need then ask why and explain again that we only require a best effort on their part, and that we expect that not all respondents will have precise information. And then ask if they will reconsider.

NOTE to interviewer: If answer above is related to privacy issues, then remind respondent that their participation will be most helpful to our research and that they will remain anonymous and that their privacy is guaranteed. And then ask if they will reconsider.

IF YES....” *Thank you very much for your consent. Let us begin. We would like to start off by asking some general questions about your farm household”..... Go to question 1.*

Part A Farm Characteristics

| Number | Question | Unit | Response |
|--------|---|---|----------|
| A1 | Gender | 0=Female, 1=Male | |
| A2 | Age | | |
| A3 | Including yourself how many people live in this house | Number of people | |
| A4 | What industry are you in? | a. farming b. breeding industry c. off-farm work | |
| A5 | How many members of your household are primarily involved in agricultural work | Number of people | |
| A6 | How many members of your household earn off-farm wages | Number of people | |
| A7 | Are you the primary decision maker in agricultural affairs | 0=No, 1=Yes, 2=N/A | |
| A8 | Do any household members work for village leader, village committee, state government, county government, state enterprise, and RCC or banks) | 0=No, 1=Yes | |
| A9 | What is your education level | 0=Never Went to School, 1=At least elementary school, 2=At least middle school, 3=At least high school, 4=Some University or college, 5=Completed College or University | |

If you are farming, answer the following questions; else, start with A15.

| | | | |
|-----|--------------------------------------|--|--|
| A10 | How many years have you been farming | | |
|-----|--------------------------------------|--|--|

| | | | |
|-----|---|---|--|
| A11 | What is the total size of your household farm (Mu, including land rented in) | Mu | |
| A12 | In general, how would you describe the current agricultural business in your area compared to last year | 1=Getting worse, 2=About the same, 3=Getting better | |
| A13 | Please list the top three crops you have grown in the past 12 months from the most valuable to the least valuable | 1 | |
| | | 2 | |
| | | 3 | |
| A14 | Farm income | Yuan | |

If you are not farming, start here; if you are farming, continue to answer questions.

| | | | |
|-----|----------------------------------|------|--|
| A15 | Total income | Yuan | |
| A16 | Productive expenditure | Yuan | |
| A17 | Household expenditures | Yuan | |
| A18 | Gross Incomes minus Expenditures | Yuan | |

Part B. Sources of Risk and Risk Perceptions

Whether or not you are farming now (If you are not farming now, please suppose that you were farming), please indicate if you are willing or not willing to take risks and how important you believe each item to be in terms of risk management of your farm.

| | | | |
|----|---|---|--|
| B1 | Accepting greater production risks to increase the chance of higher profits is important to me | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| B2 | I am more likely to take risks with new crop variety before I see good results on other farms | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| B3 | I am willing to take risks with new management practices before I see good results in other farms | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately | |

| | | | |
|-----|--|---|--|
| | | Agree, 5=Strongly Agree | |
| B4 | Diversifying my crop (including livestock) mix in order to reduce risk is important to me | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| B5 | Having different Fields or farms at different locations (geographic diversification) is important to me | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| B6 | I would consider growing more risky crops to earn more money | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| B7 | Using contracts to market your crop in advance at a fixed price | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| B8 | I have (or would if I could) done some non-farm work, in order to diversify household income. | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| B9 | I am willing to ACCEPT more risk in all aspects of life relative to my peers (other farmers that you know) | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| B10 | In general, I believe that I TAKE more risks in all aspects of life than my peers. | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |

Part C Precautionary Savings

| | | | |
|----|---|---|--|
| C1 | What proportion of Household income (define income here as revenues minus productive expenses minus consumption and other non-productive expenditures) are you able to save in a year | 1=none, 2=less than 5%, 3=3%-5%, 4=more than 10% | |
| C2 | I save (or would save if I had money) in case my house needs repair | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| C3 | I save (or would save if I had money) in case my automobile (e.g. car, motorcycle, tractor) breaks down. | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| C4 | I save (or would save if I had money) in case I cannot repay a loan from earnings. | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| C5 | I save (or would save if I had money) for unexpected medical emergency | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| C6 | I save (or would save if I had money) in case I lose my source of income (e.g. lose my job). | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| C7 | I save for unanticipated loss in business (e.g. crop loss). | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| C8 | In your opinion, do you think saving is important? | 1=Strongly unimportant, 2=Moderately unimportant, 3=important, 4=Moderately important, 5=Strongly important | |

Part D. Debt

1. Have you **ever** borrowed money? Yes ___ No ___
If YES, choose all below that you have borrowed money from?
 - a. Relatives _____
 - b. Friends _____
 - c. Other community members _____
 - d. Money lender _____
 - e. Banks and RCC _____
 - f. Other _____
2. Do you have any debt outstanding now? YES ___ NO ___
3. Have you ever defaulted (that is not repaid) on a loan? (INTERVIEWER: By defaulting we mean that loan was NEVER repaid as agreed upon by the lender) Yes ___
No ___
If yes, whose debt have you defaulted? (choose all that apply) _____
 - a. Relative
 - b. Friend
 - c. Other community members
 - d. Money Lender
 - e. RCC and Commercial Bank
 - f. Others
4. Relatives are more flexible in repayment terms than RCC.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
5. Friends are more flexible in repayment terms than RCC.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
6. Other members in the community are more flexible in repayment terms than RCC.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
7. Borrowing from relatives or friends causes them hardship.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
8. Recalling the last time you borrowed money. What was it for ?.(INTERVIEWER read the following list)
 - a. Health/medicine _____ (if yes, it is) emergency _____ chronic disease _____
 - b. Wedding _____
 - c. Funeral _____
 - d. School tuition _____
 - e. Production agriculture (fertilizer, seed, hired labour etc) _____

- f. Machinery and equipment _____
 - g. House construction. _____
 - h. Household consumption _____
 - i. Holiday/vacation _____
 - j. Other (Interviewer to write down item) _____
9. If you make a loan to a family member or relative, you TRUST the family member/relative to pay it back within a reasonable period of time
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
 10. If you make a loan to a friend, you TRUST the friend to pay it back within a reasonable period of time.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
 11. If you make a loan to a community member, you TRUST them to pay it back within a reasonable period of time.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
 12. If a family member or relative makes a loan to you the family member does so because the family member/relative TRUSTS that you will pay it back in a reasonable period of time.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
 13. If a friend makes a loan to you the friend does so because the friend TRUSTS that you will pay it back in a reasonable period of time.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
 14. If a community member makes a loan to you the friend does so because the friend TRUSTS that you will pay it back in a reasonable period of time.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
 15. In your community informal lending between friends and relatives occurs because you **TRUST** one another.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
 16. If you had money available you would lend to a friend or a relative even though you **MAY NOT TRUST** them to repay the loan.
Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___
 17. INTERVIEWER: *This is the last question. It is a hypothetical situation. Suppose that you owed 1,000 RMB to each of a financial institute (RCC or commercial bank), Money*

lender, friend, relative for a total indebtedness of 5,000 RMB. Now suppose that you had available \$1,000 RMB to repay the loans. Which of the following is most likely to occur (select only 1)?

- a. You would pay back a family member or relative before anyone else
- b. You would pay back a friend before anyone else
- c. You would pay back other community members before anyone else
- d. You would pay back the *financial institute* (*RCC or commercial bank*) before anyone else
- e. You would pay back the money lender before anyone else.
- f. You would pay some money to all of the lenders

Part E. Guilt questions

| | | | Not guilty | | | | Very guilty |
|---|---|--------------------|------------|---|---|---|-------------|
| | | | 0 | 1 | 2 | 3 | 4 |
| 1 | How much guilty would you have felt if you had defaulted on a loan from | a relative | | | | | |
| 2 | | a friend | | | | | |
| 3 | | a community member | | | | | |
| 4 | | RCC/ bank | | | | | |
| 5 | | a moneylender | | | | | |

Part F. Informal Lending among Friends and Relatives

1. Have you **ever** lent money to a **friend**. Yes_____ No_____.
 2. Have you **ever** lent money to a **relative** . Yes_____ No_____.
- money gift**
3. Have you ever received a money gift from a **friend** that you did not have to repay
Yes_____ No_____.
 4. Have you ever received a money gift from a **relative** that you did not have to repay.
Yes_____ No_____.
 5. Have you ever given a money gift to a **friend** that he or she did not have to repay.
Yes_____ No_____.
 6. Have you ever given a money gift to a **relative** that he or she did not have to repay.
Yes_____ No_____.
- Previously refused**
7. I would lend money to a friend even if that **friend** had previously refused a loan to me

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

8. I would lend money to a relative even if that **relative** had previously refused a loan to me.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

9. I would be able to borrow from a friend even if I had previously refused to lend to that **friend**.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

10. I would be able to borrow from a relative even if I had previously refused to lend to that **relative**.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

emergency (such as crop loss, cattle loss, major sickness etc.)

11. I am able to get a money *gift* from a **relative** when I face emergencies.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

12. I am able to get a money *gift* from a **friend** when I face emergencies.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

13. I am able to get a *loan* from a **relative** when I face emergencies.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

14. I am able to get a *loan* from a **friend** when I face emergencies.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

15. I am willing to give a money *gift* to a **relative** when they face emergencies.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

16. I am willing to give a money *gift* to a **friend** when they face emergencies.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

17. I am willing to give a *loan* to a **relative** when they face emergencies.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

18. I am willing to give a *loan* to a **friend** when they face emergencies.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

19. I prefer **giving** loan rather than a money gift to friends and relatives *in case of emergency*.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

20. I prefer **getting** a loan rather than a money gift from friend and relatives *in case of emergency*.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

21. I would rather give a loan rather than a money gift to friends and relatives for cases *not related to emergency*.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

22. I would rather get a loan rather than a money gift from friends and relatives for cases *not related to emergency*_____.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

23. I am able to delay loan repayment to friend and relatives, when I am not able to repay because of some emergency.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

24. I allow the delay of loan repayment by friend and relatives, when they are not able to repay because of some emergency.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

Loan amount

25. The more amount I lend to a friend or relative, the more likely it is that they will default on the loan.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

26. I am able to borrow more when my friend's and relatives' income are higher.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

Doing good

27. I find it easier to borrow from friends and relatives if I have repaid loans on earlier occasions.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

28. I am more willing to lend to friends and relatives when they have repaid earlier loans to me.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

29. I am more likely to give loans to friends and relatives knowing that he may not repay fully, who have lent/ gifted/repaid money to me on earlier occasion.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

Community pressure

30. The community/village pressure makes it easier to borrow from friends and relatives Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

31. The community/village pressure makes me more willing to lend to friends and relatives

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

32. The community/village pressure helps in the repayment of loans between friends and relatives and lowers default.

Strongly Disagree ___ Disagree ___ Agree ___ Moderately Agree ___ Strongly Agree ___

Part G Interviewer Part

Answered by interviewer only

| | | | |
|----|---|---|--|
| G1 | Do you think the respondent was engaged in this survey and answered truthfully all questions | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |
| G2 | Do you think the quality of answers provided in this survey is adequate to include in any written reports | 1=Strongly Disagree, 2=Moderately Disagree, 3=Agree, 4=Moderately Agree, 5=Strongly Agree | |

Example of the Survey (in Chinese)

编号 Block: _____ 受访者编号: _____

关于非正式借贷的问卷

第一部分 受访者需知

采访者需告诉受访者：首先，感谢您花费宝贵的时间接受我们的问卷采访。此次问卷采访需要花费您大约 30 分钟左右的时间。本次调研是中央财经大学“111 计划”获得政府资助的项目，是由西北农林大学的孔荣教授，山东财经大学的付红教授，浙江大学的张跃华教授主导的针对非正式借贷科研项目的实地调研。我们想了解的是您是如何通过向亲戚朋友熟人之间非正式借款来解决您的信贷问题，以及您是如何应对他人的非正式借款请求的。对于上述行为中存在的风险，以及您判断借款与否的原因，我们都很想知道。

我们承诺：调查只涉及科学研究，不涉及商业活动，**您的答案将会是保密的**，而且绝对不会被辨认出来。另外，有些问题您可能不知道确切的答案，如果是这样，我们希望您能做出合理猜测或预估。如果您参与并完成了整份问卷，您将获得 30 元的奖励。最后，我们尊重您不参与调查的权利。

谢谢您的合作。祝您工作顺利，万事如意！

考虑到上述情况，你愿意参与我们的调查吗？ 愿意_____ 不愿意_____

如果不愿意，也没有关系。请告诉我们不愿意的理由。

采访者须知：如果受访者不愿参与调查，是担心不能给出您们需要的信息，那么应再次确认并重新解释“您们只需您做出最合理回答，并不要求您提供最精确信息”。随后请再次确认受访者意愿。

采访者须知：如果受访者不愿参与调查，是担心本次问卷涉及到个人隐私，请再次向其强调“本次调研完全匿名，并对获取信息保密，且您的参与对您们的调查极为重要”。随后请再次确认受访者意愿。

若受访者同意参与调查：非常感谢您的参与。下面我们将先完成 9 道选择题(答题卡位于问卷背面)。

采访者：_____ 采访日期：_____ 采访地点：_____ 省_____ 县_____ 镇_____ 村_____

答题卡

编号: Block: _____ 受访者编号: _____

| 卡片序号 | 选项 A | 选项 B | 选项 C |
|------|------|------|------|
| 卡片 1 | | | |
| 卡片 2 | | | |
| 卡片 3 | | | |
| 卡片 4 | | | |
| 卡片 5 | | | |
| 卡片 6 | | | |
| 卡片 7 | | | |
| 卡片 8 | | | |
| 卡片 9 | | | |

第二部分：基本信息

A. 人口及经济状况

| 序号 | 问题 | 单位 | 回答 |
|----|-------------------------------------|---|----|
| A1 | 性别 | 0=女, 1=男 | |
| A2 | 年龄 | 岁 | |
| A3 | 总人数 (户籍人数) | 人数 | |
| A4 | 您从事什么行业 | a. 种植业 b. 养殖业 c. 非农业 (则 A7=2) | |
| A5 | 主要在家务农人数 | 人数 | |
| A6 | 主要在外打工人数 | 人数 | |
| A7 | 您是否为家中农业事务上的第一决策者 | 0=否, 1=是, 2=不适用 (如果受访者不从事农业) | |
| A8 | 您家中成员是否参与村干部、村委会、农村信用合作社等银行、县市政府的工作 | 0=否, 1=是 | |
| A9 | 您的受教育程度 | 1=未上学, 2=小学, 3=初中, 4=高中, 5=职业学校或大学, 6=已完成本科 | |

如果您还在从事农业, 请回答以下问题。如果您已不再从事农业, 请跳到 A15 开始。

| 序号 | 问题 | 单位/选项 | 回答 |
|-----|---------------------------------------|------------------|----|
| A10 | 您从事农业生产已经多少年 | 年 | |
| A11 | 您用于农业生产土地总面积 | 亩 | |
| A12 | 您觉得目前本地区的农业产业形势和去年相比 (农产品市场价格, 政策导向等) | 1=变差, 2=持平, 3=变好 | |
| A13 | 请您列举去年内所耕种的 3 种作物, 按价值从高到低 | 1 | |
| | | 2 | |
| | | 3 | |
| A14 | 农业收入/户, 年 | 元 | |

如果您已不再从事农业, 请从此开始。如果您还在从事农业, 请继续回答。

| 序号 | 问题 | 单位 | 回答 |
|-----|----------------------|----|----|
| A15 | 总收入 | 元 | |
| A16 | 生产支出 | 元 | |
| A17 | 生活消费开支 ²¹ | 元 | |
| A18 | 收入盈余 ²² | 元 | |

²¹ 主要包括衣食住行、子女教育、医疗支出日常生活所涉及的支出, 以及人情往来 (红白喜事) 等

²² 收入盈余=总收入-总支出

B. 风险来源与风险意识

不论您目前是否从事种植业（如果您目前不从事种植，请假设您现在从事种植）请回答以下问题来告诉我们您愿意承担风险的程度，以及您对下列风险管理手法的看法。

| 序号 | 问题 | 程度 | 回答 |
|-----|---------------------------------------|------------------------------------|----|
| B1 | 您愿意接受更高的生产风险去增加更高收益的可能性 | 1=非常不愿意，2=比较不愿意，3=一般，4=比较愿意，5=非常愿意 | |
| B2 | 您愿意接受更高的风险首先尝试新的农业品种 (和同村其他人相比) | 1=非常不愿意，2=比较不愿意，3=一般，4=比较愿意，5=非常愿意 | |
| B3 | 您愿意接受更高的风险去首先尝试新的农业经营理念 (和同村其他人相比) | 1=非常不愿意，2=比较不愿意，3=一般，4=比较愿意，5=非常愿意 | |
| B4 | 您愿意通过种植多样化品种来降低风险 | 1=非常不愿意，2=比较不愿意，3=一般，4=比较愿意，5=非常愿意 | |
| B5 | 您愿意通过分散种植区域（地理多样化）来降低种植风险 | 1=非常不愿意，2=比较不愿意，3=一般，4=比较愿意，5=非常愿意 | |
| B6 | 您愿意种植更多的较高风险作物（去增加更高收益的可能性） | 1=非常不愿意，2=比较不愿意，3=一般，4=比较愿意，5=非常愿意 | |
| B7 | 您愿意采用合同以固定的价格预售农作物（来降低风险） | 1=非常不愿意，2=比较不愿意，3=一般，4=比较愿意，5=非常愿意 | |
| B8 | 您愿意从事一些非农工作来降低收入单一化的风险 | 1=非常不愿意，2=比较不愿意，3=一般，4=比较愿意，5=非常愿意 | |
| B9 | 相对于同村其他人，您更能够接受风险 | 1=非常不同意，2=比较不同意，3=一般，4=比较同意，5=非常同意 | |
| B10 | 相对于同村其他人，您承担了更多的风险 | 1=非常不同意，2=比较不同意，3=一般，4=比较同意，5=非常同意 | |

C. 储蓄及预防意识

| 序号 | 问题 | 选项 | 回答 |
|----|--|---|----|
| C1 | 您储蓄的份额占您纯收入的多少 | 1=不存钱, 2=少于 5%, 3=5%-10%, 4=多于 10% | |
| C2 | 您会因为担心住房需要整修而存款 (如果您有钱可存) | 1=非常不同意, 2=比较不同意, 3=一般, 4=比较同意, 5=非常同意 | |
| C3 | 您会因为担心交通工具需要维修而存款 (如果您有钱可存) | 1=非常不同意, 2=比较不同意, 3=一般, 4=比较同意, 5=非常同意 | |
| C4 | 您会因为担心紧急医疗事故而存款 (如果您有钱可存) | 1=非常不同意, 2=比较不同意, 3=一般, 4=比较同意, 5=非常同意 | |
| C5 | 您会因为担心收入不足以支付贷款而存款 (如果您有钱可存) | 1=非常不同意, 2=比较不同意, 3=一般, 4=比较同意, 5=非常同意 | |
| C6 | 您会因为担心失去经济来源而存款 (如果您有钱可存) | 1=非常不同意, 2=比较不同意, 3=一般, 4=比较同意, 5=非常同意 | |
| C7 | 您会因为担心预料外的生产损失 (如作物病虫害等) 而存款 (如果您有钱可存) | 1=非常不同意, 2=比较不同意, 3=一般, 4=比较同意, 5=非常同意 | |
| C8 | 在您看来, 存款储蓄是否重要 | 1=非常不重要, 2=比较不重要, 3=一般, 4=比较重要, 5=非常重要 | |

第三部分：非正规借贷

D. 农户借款情况与借款环境

1. 您是否曾经借过钱吗? 有_____ 没有_____

如果有, 请选出下列所有您借过钱的对象 (打钩)

- a) 亲戚 是_____ 否_____
- b) 朋友 是_____ 否_____
- c) 其他村民 是_____ 否_____
- d) 放贷者 是_____ 否_____
- e) 银行或农村信用社 是_____ 否_____

2. 您目前有尚未偿还的债务吗? 有_____ 没有_____

3. 您有还不上借款的时候吗 (指的是一直没还上的情况)? 有_____ 没有_____

如果有, 请选出下列所有您曾没还过贷款的对象 (打钩)

- a) 亲戚 是_____ 否_____
- b) 朋友 是_____ 否_____
- c) 其他村民 是_____ 否_____

- d) 放贷者 是_____ 否_____
- e) 银行或农村信用社 是_____ 否_____
4. 在贷款偿还方面, **亲戚**要比农村信用合作社更加通融(灵活)一点
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
5. 在贷款偿还方面, **朋友**要比农村信用合作社更加通融(灵活)一点
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
6. 在贷款偿还方面, **其他村民**要比农村信用合作社更加通融(灵活)一点
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
7. 从亲戚朋友那儿借钱会给他们带来经济困难
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
8. 您上一次借钱是为了什么?
a) 健康/医疗_____(如果是, 具体是) 急症_____ 慢性病_____
b) 结婚_____
c) 葬礼_____
d) 学费_____
e) 农业生产(肥料、种子、雇工等等)_____
f) 机械和设备_____
g) 修建房屋_____
h) 家庭消费_____
i) 旅游度假_____
j) 其他_____
9. 如果你**借钱给家人或亲戚**, 你信任他们会在一个合理的期限内偿还。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
10. 如果你**借钱给朋友**, 你信任他们会在一个合理的期限内偿还。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
11. 如果你**借钱给其他村民**, 你信任他们会在一个合理的期限内偿还。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
12. 你的**家人或亲戚借钱给你**, 是因为他们信任你会在合理的期限内偿还。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
13. 你的**朋友借钱给你**, 是因为他们信任你会在合理的期限内偿还。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
14. 如果**其他村民借钱给你**, 是因为他们信任你会在合理的期限内偿还。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
15. 你所在的社区中, 亲戚、朋友发生借贷关系是因为双方互相信任。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
16. 如果你有多余的钱, 即使你不信任朋友、亲戚会归还给你, 你也会借给他们。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____

17. 采访者：“该问题需要一个假设条件，假如你分别欠金融机构（农村信用合作社或商业银行）、放贷者、亲戚、朋友和其他村民各 1000 元钱，合计 5000 元，而现在你只有 1000 元钱可用于偿还贷款，下列各个选项中你将选择哪个？”（只能选择一个）

- a) 你会先偿还家人或者亲戚的钱
- b) 你会先偿还朋友的钱
- c) 你会先偿还其他村民的钱
- d) 你会先偿还金融机构的钱（农村信用合作社或商业银行）
- f) 你会先偿还放贷者的钱
- g) 你会付给每方一部分钱

E. 内疚问题

如果您向以下借款对象借钱没有还，请说明您感受到的内疚程度。（其中，0 表示不内疚，4 表示非常内疚）。

| | 内疚程度 | 不内疚 | | | | 非常内疚 |
|---|------------|-----|---|---|---|------|
| | 借款对象 | 0 | 1 | 2 | 3 | 4 |
| 1 | 亲戚 | | | | | |
| 2 | 朋友 | | | | | |
| 3 | 其他村民 | | | | | |
| 4 | 农村信用合作社和银行 | | | | | |
| 5 | 放贷者 | | | | | |

F. 亲戚朋友间的非正规借贷

1. 您是否曾经借钱给朋友？ 是_____ 否_____
2. 您是否曾经借钱给亲戚？ 是_____ 否_____

不必还的资助

3. 你是否曾经从你的朋友那得到一笔你不必还的资助？ 是_____ 否_____
4. 你是否曾经从你的亲戚那得到一笔你不必还的资助？ 是_____ 否_____
5. 你是否曾经送给你的朋友一笔他不必还的资助？ 是_____ 否_____
6. 你是否曾经送给你的亲戚一笔他不必还的资助？ 是_____ 否_____

之前的拒绝

7. 即使我的**朋友**曾经拒绝借钱给我，我也愿意借钱给他。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
8. 即使我的**亲戚**曾经拒绝借钱给我，我也愿意借钱给他。
非常不同意_____ 不同意_____ 一般_____ 比较同意_____ 非常同意_____
9. 即使我曾经拒绝借钱给我的**朋友**，我也能从他那借到钱。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

10. 即使我曾经拒绝借钱给我的**亲戚**，我也能从他那借到钱。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

紧急情况（如作物损失、家畜死亡、重大疾病等）

11. 当面临紧急情况时，我能够从**亲戚**那儿得到一笔**赠款**(无须偿还)。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

12. 当面临紧急情况时，我能够从**朋友**那儿得到一笔**赠款**(无须偿还)。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

13. 当面临紧急情况时，我能够从**亲戚**那儿**借到一笔钱**。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

14. 当面临紧急情况时，我能够从**朋友**那儿**借到一笔钱**。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

15. 我**愿意给亲戚一笔赠款**(无须偿还)当他们面临紧急情况时。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

16. 我**愿意给朋友一笔赠款**(无须偿还)当他们面临紧急情况时。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

17. 我**愿意借给亲戚一笔钱**当他们面临紧急情况时。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

18. 我**愿意借给朋友一笔钱**当他们面临紧急情况时。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

19. 在紧急情况下，我**更愿意借给朋友和亲戚一笔钱**而不是给他们一笔赠款。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

20. 在紧急情况下，我**更愿意从朋友和亲戚那借到一笔钱**而不是从他们那得到一笔赠款。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

21. 在**非紧急情况下**，我**更愿意借给朋友和亲戚一笔钱**而不是送给他们一笔钱。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

22. 在**非紧急情况下**，我**更愿意从亲戚朋友那借到一笔钱**而不是从他们那得到一笔赠款。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

23. 当由于一些紧急情况我不能偿还的时候，我能够推迟对亲戚朋友的贷款偿还期。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

24. 当亲戚朋友遇到紧急情况不能按时偿还的时候，我允许他们推迟贷款期限。

非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

借款数额

25. 我借给亲戚朋友的数量越大，他们就越可能拖欠贷款。
非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

26. 当我的朋友和亲戚的收入更高时，我能够借到更多的钱。
非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

之前的良好表现

27. 我发现如果我提前偿还从朋友和亲戚那儿借的钱，以后会更容易再从他们那借到钱。
非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

28. 如果我的朋友和亲戚提前偿还了以前的借款，我更愿意再借给他们钱。
非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

29. 我更有可能以借钱给那些曾经借给我钱/曾送给我钱/提前还钱的朋友和亲戚，即使我知道他们可能不能全额偿还。
非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

社区舆论

30. 来自村民的舆论压力有助于我向亲戚朋友借到钱。
非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

31. 来自村民的舆论压力会促使我借钱给亲戚朋友。
非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

32. 来自村民的舆论压力有助于亲戚朋友间的还款和减少违约
非常不同意____ 不同意____ 一般____ 比较同意____ 非常同意____

第四部分 采访者评价

G. 采访者回答

| | | | |
|----|-------------------------|------------------------------------|--|
| G1 | 在您看来，受访者有认真参与调查，并真实回答问题 | 1=非常不同意，2=比较不同意，3=同意，4=比较同意，5=非常同意 | |
| G2 | 在您看来，以上问卷结果可以用于正式研究报告 | 1=非常不同意，2=比较不同意，3=同意，4=比较同意，5=非常同意 | |