WHAT LENDERS THINK BORROWERS THINK OF LENDING AND LENDERS: A PSYCHOGRAPHIC STUDY OF RURAL CREDIT COOPERATIVES IN SHANDONG, CHINA

A Thesis

Presented to the Faculty of the Graduate School

of Cornell University

In Partial Fulfillment of the Requirements for the Degree of

Master of Science

by

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August 2012

ABSTRACT

In this paper we conduct a field survey among 120 loan officers at Rural Credit Cooperatives (RCCs) in China's coastal Shandong province, to pair with an existing survey on identical questions to 394 farm households in the same region. Pairing lenders' perceptions towards borrowers regarding RCC microcredit lending mechanisms, against borrowers' perceptions towards lenders and how they themselves were perceived by lenders in the same regard, we observe a perceptual disconnect between them in the context of lenders' "care" towards borrowers, loan rejection, memberships of RCC and group guarantee, lending concerns, cost of borrowing, reasons for default, credit rationing, and lending preferences. With distinct cluster groupings based on their perceptions, we analyze the influence of demographics on the borrower and lender cluster memberships. We draw conclusions that policy initiatives should be put in place at RCCs that close the gap between the two parties in their credit relationship, concentrating on advocating RCCs' care and trust towards agriculture and farm households, while providing credit education to rural households; at the institutional level, effort should be extended to train a dedicated team of loan officers that specialize in servicing farm households with standardized lending practices. This research provides financial institutions with outreach mechanisms to borrowers, while also training lenders to borrowers' sensitivities.

BIOGRAPHICAL SKETCH

Xiaolan Xu is a second-year graduate student at Cornell University's Charles H. Dyson School of Applied Economics and Management, where her research concentration is agricultural finance.

Between her school years at Cornell, Xu interned in the summer of 2011 with Keefe, Bruyette & Woods, a financial institutions specialized investment bank, on the equity capital markets team in Hong Kong, where she gained exposure on the functioning of banks and insurance companies in the Asia region.

Prior to coming to graduate school, Xu spent six months working at CNN as an intern in the Beijing Bureau. There, she assisted with news reportage on a wide range of stories, including China's economic transformation and its impact on Chinese society, politics and the environment, and learned interview skills for field research.

Born and raised in Yunnan, China, Xu graduated from Renmin University in 2010 with an honors B.A. in Economics.

This thesis is dedicated to Professor Calum G. Turvey, my mentor in graduate school.

ACKNOWLEDGMENTS

I sincerely record my special thanks to Dr. Calum G. Turvey, my research supervisor, for his guidance, patience, encouragement, and support throughout this study. I extend my thanks to my advisory committee member, Dr. Joshua D. Woodard, for his insightful comments and suggestions.

I am grateful to the management and staff of Rural Credit Cooperatives in Cheng Wu, Cao Xian, and Shan Xian of China's Shandong province, who helped organize this field survey. I am particularly thankful to the 120 loan officers participated in this survey, and the 415 farm households in Shandong, China, as well as the 897 farm households in Shannxi, China, who participated in prior field surveys that I used for this research.

I would like to acknowledge the help, contributions and suggestions from Ying Cao and Jubo Yan, my fellow graduate students in the Dyson School of Applied Economics and Management, Professor Rong Kong and her students at Northwest Agricultural and Forestry University, Professor Jiujie Ma and his students at Renmin University, and Professor Guangwen He at China Agricultural University.

I acknowledge the encouragement and inspirations given by Haolan Hong, Zac Rosenberg, and Yiting Liu, my mentors during internships in journalism and finance.

My mother Libo Deng and father Depei Xu are the constant source of my strength. I thank them for their love and support.

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CHAPTER 1

INTRODUCTION

1.1 Background

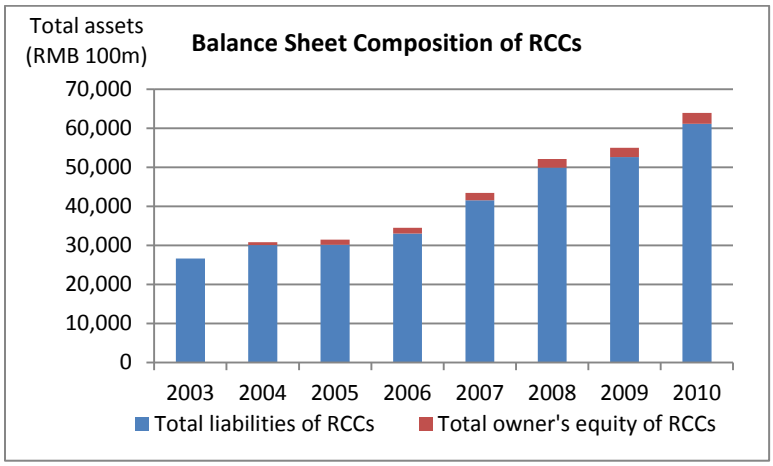
Rural Credit Cooperatives (RCCs) serve as one of the major government regulated sources of agricultural credit dedicated to providing loans to farm households and small and medium size enterprises (SMEs) in rural China[1]. As the largest microcredit practitioners in China in terms of formal financial institutions, RCCs play a significant role in supplying financial resources to rural economic development in China.

Rural China is traditionally an underserved market for credit resources. As of February 2012, the loan-to-GDP ratio was 49% in rural areas versus 224% in urban areas.[2] By the end of 2010, the outstanding balance of agriculture-related loans[3] reached RMB11.8 trillion, up RMB2.63 trillion or 28.8 percent from the beginning of the year. Such growth was 5.7 percentage points higher than the average growth among all types of loans. The proportion of agriculture-related loans to total loans witnessed a 1.6 percent year-on-year growth rate, which signified a powerful financial support to agricultural and rural development. As of 2010, China had 2,646 RCCs with 550,859 staff in total[4], while total assets of RCCs reached RMB6.4 trillion, representing a 13.4 percent compound annual growth rate (CAGR)[5] from RMB2.7 trillion in 2003; total liabilities reached RMB6.1 trillion, representing a 12.6 percent CAGR from RMB2.7 trillion in 2003; and total owner's equity reached RMB 279.3 billion, representing a 212.8

[1] The other two major sources are Postal Savings Banks and Agricultural Banks.
[2] According to an equity research report issued by Credit Suisse on Chongqing Rural Commercial Bank, 15 February 2012.
[3] Categorized as on the RCC book.
[4] Overall, Chinese banking institutions numbered 3,769, possessing 196,000 business outlets and 2.991 million employees as of 2010. (CBRC 2010 AR)
[5] Compound annual growth rate, calculated based on statistics from CBRC 2010 annual report.

percent CAGR from the negative RMB 13.7 billion in 2003[6] (See Figure 1.1 for breakdown, data from CBRC Annual Report 2010).

Figure 1.1: Change of RCC Balance Sheet Composition



1.1.1. Evolution of RCCs

RCCs have a long history and play a prominent role in China's rural financial system. The first RCC was founded in northern China in 1923 (Myers, 1970) and the idea and implementation spread to such an extent that by 1939 RCCs were being established by the government all over China (Fei & Chang, 1945).[7] Rural credit cooperatives underwent four main transitions, along with the decollectivization and market reforms in rural China. The first can be backdated to the collectivization in 1958 when the RCCs were incorporated into the People's Commune to mobilize capital for large-scale projects. From then on, "cooperative" has been standing for merely a literal meaning. Though the People's Commune collapsed after the three-year famine and was substituted by the "Production Team", a smaller unit, the cooperatives were still one of the components in the collectivized establishment. The second transition took place after

[6] The State Council enacted the "Pilot Plan to Deepen the Reform of Rural Credit Cooperatives" in 2003 in order to clarify the ownership of RCCs and to re-place them under the direct supervision of provincial governments instead of the hitherto existing joint involvement of the PBOC and the RCC County Union (Guo & Jia, 2009). One of the possible explanations for the negative equity in 2003 might be the policy environment that in the same year the State subsidized the recorded non-performing loans on RCCs' books.

[7] Guo and Jia (2009) provide an excellent review of the evolution and reforms of RCCs

the introduction of the Household Responsibility System (HRS)[8] in 1978. Agricultural production increased remarkably at that time. Degraded as one part of the Agricultural Bank of China (ABC), the RCCs were in fact under the control of provincial governments and played a critical role in developing the township and village enterprises (TVEs). In 1997, the central government decided to place RCCs back under the direct supervision of the People's Bank of China (PBOC), the central bank, because of the mounting non-performing loans on the RCC book. At the third stage, RCCs became independent from the ABC in 1997 and were placed under the supervision of the PBOC, which exerted rigorous influence on RCCs' operation, especially the loan business. Besides financial depression, the PBOC introduced the agriculture-embarked-on lending programs by providing cheap loans to RCCs in 1998, with a growth rate of 20 percent for agricultural loan portfolios (Cheng and Xu, 2004). Though RCCs were afraid to infringe on the regulations or directives from the central bank, they were more inclined to fund projects that had lower risks and higher capital return. During that period, the shortage of institutional lending in rural China was exacerbated. Meanwhile, a variety of informal financial institutions sprang up. However, informal finance was banned by the central government because of its illegal operations and accompanied financial unrest.

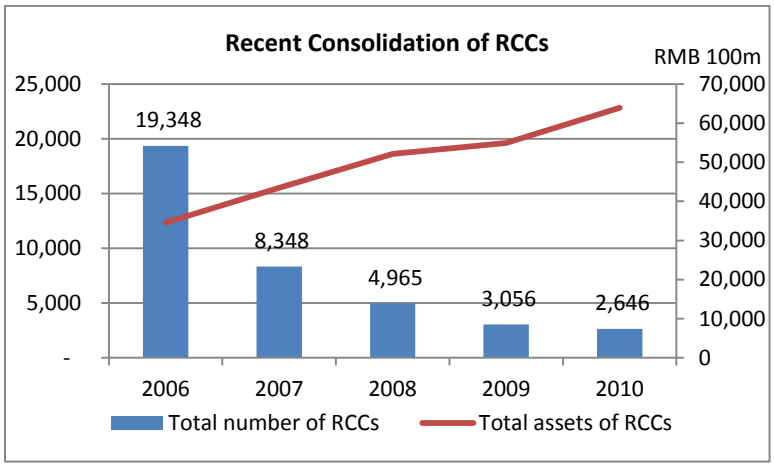
At the fourth stage, the poor services of RCCs, together with the depressed prices of agricultural products and the long-lasting downturn of rural households' income, forced the central government to deepen its RCC reforms. It is for these reasons that the State Council enacted the "Pilot Plan to Deepen the Reform of Rural Credit Cooperatives" in 2003 to clarify the ownership of RCCs and to re-place them under the direct supervision of provincial governments instead of the hitherto existing joint involvement of the PBOC and the RCCU (RCC County Union). A variety of ownership arrangements are recommended to allow regional difference in terms of local economic and social environment. The time-period of 1999-2004 earmarked the participation of formal financial institutions and the institutionalization of various projects. RCCs started to introduce microcredit loan and group loan businesses to rural households in 1999. The experimentation made by the various RCCs have seen much

[8] Under which individual farm households became the basic producing units.

success in provinces like Shaanxi, Sichuan, Yunnan, Hebei, Guangxi, and Guizhou which experienced faster microcredit growth.

In recent years, the policy has centered on restructuring of the highly fragmented rural banking sector. The number of RCCs dropped precipitously from 19,348 in 2006 to 2,646 in 2010, although their total assets increased steadily indicating that many of them have undergone consolidation. (See Figure 1.2, data from CBRC annual reports). This period was characterized by an RCC mergers and acquisitions spree encouraged, and in some cases financially sponsored, by the State, with the aim of restructuring high risk RCCs.

Figure 1.2: Consolidation of RCCs 2006 - 2010



The most recent RCC reform is geared towards transforming credit cooperatives into commercial banks[9], while optimizing RCC institutional operational procedures and risk management towards a commercial banking standard, with most notably the December 2010 IPO of Chongqing Rural Commercial Bank, the third-largest rural commercial bank in China, which was established through many amalgamations of rural credit cooperatives and unions at the village, township, county and municipal levels[10], becoming the first small- and medium-sized rural financial institution embarking on stock listing.

[9] CBRC 2010 Annual Report, p.36

[10] CRCB is the third largest rural commercial bank in China, following BRCB (Beijing Rural Commercial Bank) and SRCB (Shanghai Rural Commercial Bank), and the largest commercial bank in Chongqing. It was established through 39 rural credit unions and managed by the Chongqing Rural Credit Cooperative Union at the municipal

With Beijing Rural Commercial Bank, and Shanghai Rural Commercial Bank, its two strong competitors with identical background converting from RCCs and RCCUs in the Beijing and Shanghai areas respectively, actively preparing for IPOs at the moment[11], we conclude that the current RCC institutional effort as being pushed towards commercialization.

However, are these policies and reforms effective? Turvey and Kong (2010) argue that China needs a dedicated source of credit for farm households, and in a broader sense for agricultural economic activities. While the recent policy initiative, which pushes RCCs towards commercialization has improved the RCC governance and diversified their sources of funding, it does not address the needs of farm households per se. In an effort to develop rural areas, the central government has launched a number of initiatives to promote Sannong (agricultural, rural and farmer-related) business. For instance, financial institutions are exempt from paying business tax for interest income on small loans to agricultural households.[12] Banks are encouraged to expand their Sannong loans at a faster pace than overall loan growth and to maintain the percentage of their Sannong loans at higher levels than in the previous year. Besides this macroeconomic intermediation, RCCs seem to lag behind on their operational effort in lending to farm households.[13] Improvement in RCCs' institutional efficiency would lead to increased access to credit in this underserved market.

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level. In June 2008, CRCB was incorporated as a provincial-level rural commercial bank, the first one in Western China. With its legacy as a rural credit cooperative, the bank is primarily focused on the provision of financial services to SMEs and county-area corporates/households. CRCB is a market leader in SME lending in Chongqing, with 52% of its loan book dedicated to the SME sector in 2010. Similarly, it has a dominant position in county-area business and ranks #1 in county-area lending, with 26% loan market share as of June 2010. (CRCB 2010 Interim Report)

[11] Interviews with Yiting Liu and Bill Stacey, China bank analysts at Keefe, Bruyette & Woods, a financial institutions specialized research institution. And "Continuous development of new-type rural financial institutions" (CBRC 2010AR. p36, p48); "Improvement of rural finance" (CBRC 2010AR. p.49)

[12] CBRC No.209, 2010 http://www.cbrc.gov.cn/govView_01935BE69968470C8989847E5A9BF2FD.html

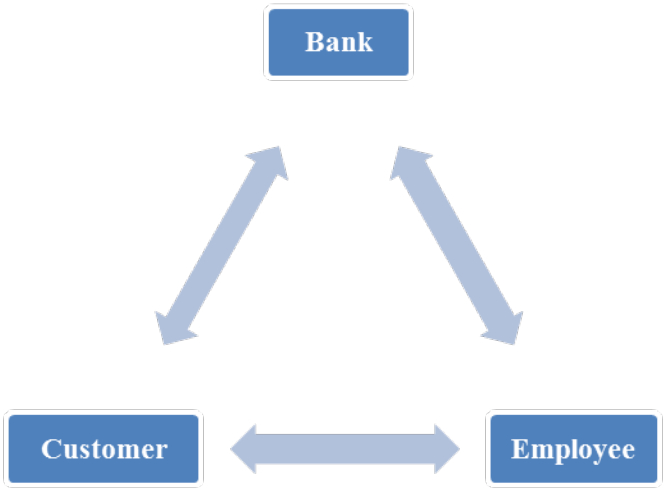
[13] Managers and loan officers at Shandong RCCs that we surveyed in September 2011 mentioned in interviews that, the current RCC lending environment is a "lenders' market". They also indicated that their RCCs have preference of lending to SMEs over farm households.

1.2 Diagonal relationship among financial institutions, their employees, and customers

One aspect of institutional efficiency that may well be overlooked is the relationship between lenders and borrowers.

To place this problem in context, we refer to Figure 1.3, in which the bank marketing effort is summarized in a triangle form, with the two diagonal lines representing the relationships the bank possesses with its customer, and with its employee, respectively, and the lower line representing the relationship between the customer and the bank employee. We find existing bank marketing literature focuses almost entirely on the two diagonal lines and illustrates how the bank interacts with the customer, and from the HR perspective how the bank interacts with the employees. This paradigm assumes that if both diagonals are known, then automatically the lower relationship between bank employees and borrowers is known by default; i.e. two equations and one unknown would allow the third to be identified. But is this true?

Figure 1.3: Triangle Relationship among Bank, Employee, and Customer



Source: Adapted from Christopher, Payne and Ballantyne (1991)

From the financial institutional perspective, previous literature focuses on the relationships between the customer and the bank (traditional product marketing), and between the employee and the

bank (human resource). On the bank-customer side, Harrison (1994) conducted a qualitative study on psychographic segmentation that uses variables such as the individuals' own perceived knowledge and understanding of financial services, the perceived confidence and ability in dealing with financial matters and the expressed level of interest (involvement) in financial services. With this study four distinct customer segments based on the level of knowledge and on the degree of the customers' financial maturity could be identified. The segments are labeled “financially confused”, “apathetic minimalists”, “cautious investors” and “capital accumulators” and are hence characterized by particular attitudes towards financial services provided by the bank. On the bank-employee side, Bennett and Durkin (2002) introduced the notion of relationship marketing and examined the optimal bank organizational culture within the bank-customer-employee triangle framework in Figure 1.3, and concluded that the outcome of a successful implementation of an organizational development program should be the re-establishment of high levels of internalized employee commitment (diagonal line on the right side) coupled with the development of an integrated and focused strategy for customer relationship management (diagonal line on the left side).

However, little research has covered the relationship between the customer and the employee of the bank. These inter-relationships between bank and customer, bank and employee, customer and employee are illustrated in Figure 1.3. In essence, to guarantee sufficient supply in the microcredit market, clear, harmonious, and two way relationships must exist between the three points of the triangle – the bank, the employee, and the customer, as shown in the figure by the direct connections between the three points (Bennett and Durkin, 2002).

We find little literature dealing with identical psychographic questions in general in China or elsewhere, and virtually none on rural microcredit market segmentation. We hence do not have a hypothesis except for the null, i.e., we assume there is no difference between lenders’ and borrowers’ perceptions towards microcredit lending.

This paper focuses on the psychographic side and examines lenders’ beliefs and biases towards borrowers and also borrowers’ beliefs, attitudes and biases towards lenders and lending activites. This

study combines two matched data sets. The first, collected by Dr. Rong Kong and her students in Shandong in 2009 queries farm households about their attitudes and belief's regarding RCC lenders and lending activities. In 2010 we took the opportunity to survey 120 front-line lenders in Shandong to query them on their attitudes regarding lending to farmers and agriculture. In this survey we reversed questions asked of the farm households in Dr. Kong's survey. By matching questions in both surveys we can investigate what lenders think borrowers think of lending and lenders, and vice versa. The overriding problem investigated in this paper is the disconnect between perceptions of front-line lenders and farm household borrowers with respect to RCC lending practices. Consequently the purpose of this paper is to provide recommendations to the financial institutions in those regards so as to inform corresponding policy initiatives in order to close the gap between the RCC employees and customers. This practice adds value as it optimizes credit allocation of formal microcredit in rural China, and minimizes the search cost for credit between formal institutions and farm households, hence benefiting agricultural economic development.

This study contributes to the literature by examining the direct relationship between lenders and borrowers on rural credit. Without a comprehensive understanding of the disconnection on the bottom of the triangle in Figure 1.3, implications on disconnections on the other two diagonal lines of the triangle drawn from previous literature cannot be fully justified.

1.3 Objectives

The main objective of this paper is to assess different degrees of attitudes of lenders and borrowers on various sets of identical questions regarding many aspects of RCC microcredit supply and farm household credit demand. The specific objectives are to discover and identify mismatches between the two parties, and to investigate both the objective side of their relationship, i.e., RCC lending mechanisms such as group guarantee, procedure of loan application, interest rates, collateral, etc., as well as the subjective side, such as the degree of satisfaction towards one another, belief of lenders' "care" and

"trust" towards borrowers, etc.. By comparing a lab survey among 120 RCC front-line lenders in three counties in China's Shandong province, with a field survey among 394 farm households in the same region, we examine the disconnect between lenders' and borrowers' perceptions on identical credit issues. These comparisons could lead to important outreach mechanisms to rural household borrowers while also training RCC lenders to borrowers' sensitivities.

1.4 Procedure

To achieve these objectives I use a variety of techniques. First, I pair frequencies of each of the five attitudinal responses from lenders and borrowers and test the statistical significance in their differences; the interpretation on these differences is then supplemented by comparison of mean scoring of each question from both perspectives. On a set of selected questions centering on perceptions, I conduct cluster analyses using the two-step method and identify two natural clusters of lenders with distinct attitudes and beliefs in the services that their RCCs and themselves provide to borrowers, as well as four natural clusters of borrowers with progressive attitudes regarding their favor towards RCC and the loan officers in the same regards. Based on these cluster memberships, I run regression analyses to investigate the influence of specific demographics on the borrower and lender group memberships. The uniqueness of this study is that we compare two sets of identical surveys from the opposite perspectives in the credit relationship, and particularly perception oriented questions, through which interesting results and meaningful inference can be drawn.

1.5 Organization of the thesis

In this chapter the importance of RCCs and rural credit to farm households have been discussed and the objectives of the study listed and justified. The background literature is reviewed, and the theoretical framework and concepts of psychographic segmentation are discussed, in the second chapter. The design and layout of the field survey, and the methods used to assess the disconnect between lenders

and borrowers, is specified in the third chapter. The results of comparing mean scores of borrower and lender attitudes are evaluated, and the cluster membership distinctions are assessed through discriminant analysis together with linear and Logit regressions in the fourth chapter. A summary and conclusion of this study is outlined in the fifth chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 Microcredit development in China

China has the second largest number (200 million) of poor people in the world. 0.9 Billion out of the 1.4 Billion Chinese population is rural, most of whom earn less than US$3 per day[14]. Introduced in 1993, microfinance is a relatively young industry in China. Since then the Chinese government has been providing loans for rural development through the three leading financial institutions – the Agricultural Bank of China (ABC), for larger farming units such as seed companies and marketing co-operatives, the Agricultural Development Bank of China (ADBC), for storing crops, distributing, marketing, or processing agricultural products, or for large-scale agricultural development projects, and lastly the Rural Credit Cooperatives (RCCs) for the township/village enterprises (TVEs), and middle-income farmers.

The time-period of 1999-2004 embarked the participation of formal financial institutions and the institutionalization of various projects. RCCs started to introduce microcredit loan and group loan businesses for rural households in 1999. The experimentation made by the various RCCs has seen much success in provinces like Shaanxi, Sichuan, Yunnan, Hebei, Guangxi, and Guizhou which experienced faster microfinance growth. At present, RCCs are the largest microfinance practitioners in China in terms of formal financial institutions.

[14] The exchange rate between US dollar and Chinese yuan as of 6 May 2012 is 1.00USD = 6.29300CNY.

In 2006, the China Banking Regulatory Commission (CBRC) permitted postal saving banks to gradually develop their collateral-based microloan services. Since 2007, the CBRC encouraged microloan institutions and all financial institutions to offer microcredit to traditional farming households, households in a variety of business, sole proprietors and rural micro and small enterprises. Additionally, CBRC permitted individual, corporate legal entities and other social organizations investment towards establishment of microloan companies in 2008. At present microloan companies are allowed to raise their funds from shareholders' capital, donated funds, and borrow from (not more than two) banking financial institutions. Since 2006 China's central government has also opened up its financial markets to foreign MFIs.

2.2 Economics study on microcredit demand and supply in China

The importance of microfinance in facilitating rural lending and credit supply to the poor has long been articulated by scholars. Karlan and Zinman (2001) examined credit elasticity in less-developed economies, and rejected hypotheses of price inelastic demand using randomized trials in South Africa. On Chinese microcredit demand specifically, Turvey et al. (2010) conducted surveys among 897 farm households in China's Shannxi and Gansu provinces to estimate individual household credit demand elasticity, and provided empirical evidence that credit policy may best be established as a marketing effort, through which RCCs may encourage greater farm household borrowing by simply marketing existing services and refining services to better meet farmer needs.

On rural credit in China, previous work has also examined a series of RCC institutional issues. Turvey and Kong (2010) looked at the competition in microcredit lending facing RCCs from informal sources such as friends and relatives. Tsai (2004) provided a political science perspective and argued that the microcredit market in rural China is run by informal sector money lenders and that money lending or political opportunism are adverse artifacts of rural lending. Cao and Turvey (2011) examined the incentive mechanisms and how the Personal Responsibility System (PRS) affects RCC front-line lenders'

loan decision behaviors. Vararuth and Turvey (2011) found the incidence of risk rationing in rural credit markets in China using data collected through a survey of 730 farm households in Shaanxi province in November 2010.

2.3 Psychographic segmentation in bank marketing and in agricultural markets

In the bank marketing literature, previous studies focus on the financial services customer and the perceptions, attitudes and motivations the customer has towards financial services. The concept of psychographic segmentation was described in Christopher et al. (1993) as the following: "Psychographic segmentation involves an analysis of lifestyle characteristics, attitudes and personality. Recent research in several countries suggests that the population can be divided into between ten and fifteen groups, each having an identifiable set of lifestyle, attitude and personality characteristics".

Psychographic segmentation addresses these issues since it purely assesses the way the customer thinks (Wills, 1985). Psychographics look at "the inner person rather than the outward expression of the person" (Beane and Ennis, 1987). However, the definition of psychographics remains controversial. To some researchers psychographics refer to basic personality characteristics, whereas other definitions include attitudes, values and beliefs (Ziff, 1971).

Ziff (1971) also stated that individuals have certain attitudes that are basic and influence their behavior in many different types of situations. Such attitudes can, therefore, provide useful information of a general nature, and a core of attitudes, needs, and values can be used to provide the basis for a meaningful segmentation (Ziff, 1971).

On customer segmentation specifically, Smith (1956) explained that companies try to segment their customers by identifying groups of persons with need structures that are as homogeneous as possible within each group and significantly heterogeneous between groups.

Existing marketing research also shows that successful, continuing relationships are characterized by trust and commitment (Shemwell et al., 1994; Strandvik and Liljander, 1994; Morgan and Hunt, 1994).

Commitment is promoted by satisfaction, lower quality alternatives and greater investment and can be developed by the provision of benefits superior to the alternatives, communication, shared values and goodwill (Bennett and Durkin, 2002).

When we examine the direct relationship between the bank lender and borrower, Levitt (1986) provided reference by pointing out that not all relationships can or need to be at the same level of intimacy or of the same duration, but rather that these characteristics depend on the extent of the actual or felt dependencies between the buyers and the sellers.

We also find literature that use psychographic assessment in agricultural markets. Funk and Hudon (1988) used psychographic clustering techniques in a survey study to segment the market for farm supplies in Ontario, Canada. Irish (2012) provides a framework for understanding the characteristics that influence the degree of indebtedness on farm businesses, based on a factor analysis of respondents mean ratings of 13 attitudinal statements. Both papers pioneered assessment of psychographic segmentation in agricultural markets.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Data collection

3.1.1 Survey design

To measure this disconnect between lenders and borrowers, we design the lender survey to mimic an existing borrower survey, by reverse writing the exact same questions but from the lenders' perspective, assessing loan officers' attitudes towards farm household borrowers, as well as their views towards borrowers viewing them in the same regards.

3.1.2 Scaling

The measurement of individual questions is based on the Likert scale (Likert, 1932). With such a scale the respondents are allowed to give ordinal values as an expression of their attitudinal evaluation of items; the scale included a neutral value which allows individuals to articulate their indifference towards a certain statement. Five answer categories (Strongly Disagree, Disagree, Neutral, Moderately Agree, and Strongly Agree) were used for the survey questions.

3.1.3 Layout

The field survey was conducted through 5 September 2011 to 10 September 2011 in Cheng Wu, Cao Xian, and Shan Xian, subsequently, with two days assigned to each and two sessions for each day, in the morning and afternoon at regular RCC work time. Participating loan officers were selected by RCC management from branches across the county, one or two days prior to the assessment date, based on staff availability. The participant sample is comprised of loan officers with diverse experiences and qualifications, ranging from fresh college graduates, staff internally transferred from other departments who had been practicing loan servicing for short periods, as well as widely respected and experienced loan officers with ten to twenty years loan servicing experience while receiving education at levels below college or associate degrees. Loan officers were compensated for their participation with cash equivalent of salary for one workday by local RCC standards. The survey was designed and conducted on computer, which allowed respondents to submit the survey only upon completing every question. Four agricultural economics professors and six graduate students were present to answer participants' questions regarding the survey. Before and at the end of each session, I conducted interviews to randomly selected loan officers to obtain qualitative understanding on lending practices, which proved to be helpful for data cleaning. The project schedule is listed in Table 3.1.

Table 3.1: Schedule of Field Survey in Shandong, China, September 2011

County	Date	Session	No. of Participants	Interview
Cheng Wu	5-Sep	S1	10	1 client manager, 1 director, 4 loan officers
		S2	10	
	6-Sep	S3	10	2 loan officers
		S4	10	
Cao Xian[1]	7-Sep	S5	10	3 loan officers
		S6	10	
	8-Sep	S7	10	
		S8	10	
Shan Xian	9-Sep	S11	10	1 loan officer
		S12	10	
	10-Sep	S9	10	1 loan officer
		S10	10	

Note: 1. Two of the RCC branches that we surveyed in Cao Xian were its two "boutique branches", a pilot program initiated by the Shandong RCCU, that staff these branches with the most educated loan officers who were all college graduates.

3.1.4 Sample

Both borrower and lender surveys were collected in Shandong province. We also compare the borrower survey with an existing data set from the same survey conducted in 2009 in Shannxi province, to ensure representativeness of the borrower results, given we have limited valid data points for certain sets of questions.

3.2 Methods

3.2.1 Comparing frequencies and tests of statistical significance

a. Independent samples t-test

To ensure that the differences we observe on the graphs are statistically significant, and that the disconnect between lenders and borrowers is “real”, we conduct the independent samples *t*-test for all question pairs. The independent samples *t*-test compares the mean scores of two groups on a given variable, with the underlying assumption that each of the two populations being compared should follow

a normal distribution. The null hypothesis is that the means of the two groups are not significantly different. We use the independent two-sample *t*-test with unequal sample sizes and unequal variances of the two populations, which is suitable for our data. The *t* statistic to test whether the population means are different can be calculated as follows, as adapted from Gujarati (1978):

$$t = \frac{\bar{X}_{1-}\bar{X}_2}{s_{\bar{x}_1-\bar{x}_2}}$$

where

$$s_{\bar{x}_1-\bar{x}_2} = \sqrt{\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}}$$

and where ${s_1}^2$ and ${s_2}^2$ are the unbiased estimators of the variances of the two samples, n_1 and n_2 are the numbers of observations in group one and group two. In the significance test, the distribution of the test statistic is approximated as being an ordinary Student's *t*-distribution with the degrees of freedom calculated as follows:

$$d.f. = \frac{({s_1}^2/n_1 + {s_2}^2/n_2)^2}{({s_1}^2/n_1)^2/(n_1-1) + ({s_2}^2/n_2)^2/(n_2-1)}$$

b. Mann-Whitney U test

For certain questions, most typically the set of questions on reasons that lenders reject a loan, the valid data points are very limited (for this set of questions we only have valid survey results from 14 farm household borrowers), in which case the T test alone may not be sufficient to serve our purpose of validating the mismatches. We therefore also take the non-parametric approach and back up the T-tests with the Mann-Whitney U test (also referred to as the Wilcoxon rank sum test)[15]. Similar results were observed from both tests, with only 17 pairs out of a total of 83 pairs not being significantly different at the 0.05 level, except that the U tests were "unable to compute" in 4 pairs.

[15] See brief discussion in Appendix on the comparison of the t test and Mann-Whitney U test.

As adapted from Wilcoxon (1945), the Mann-Whitney U test assumes that all the observations from both groups are independent, and that the responses are ordinal, i.e., it is observable which of the any given two observations is greater. The null hypothesis is that the distribution of both groups are equal, under which the probability of an observation from one population (X_1) exceeding an observation from the second population (X_2) equals the probability of an observation from X_2 exceeding an observation from X_1. The null hypothesis proposes a symmetry between populations with respect to probability of randomly drawing a larger observation, whereas under the alternative hypothesis, the probability of an observation from one population (X_1) exceeding an observation from the second population (X_2) (after exclusion of ties) is not equal to 0.5. The alternative may also be stated in terms of a one-sided test in which: P ($X_1 > X_2$) + 0.5 P ($X_1 = X_2$) > 0.5.

The test involves the calculation of the U statistic, which I describe as follows, as adapted from Sheskin (2003): 1) the first step in calculating the U is to arrange all the observations into a single ranked series, i.e., rank all the observations without regard to which sample they are in. 2) Add up the ranks for the observations which came from sample 1, and the sum of ranks in sample 2 follows by calculation. The sum of all the ranks therefore equals n (n+1)/2, where n is the total number of observations in both samples. U is then calculated as:

$$U_1 = R_1 - \frac{n_1(n_1 + 1)}{2}$$

where n_1 is the sample size for sample 1, and R_1 is the sum of the ranks in sample 1.

Since there is no specification as to which sample is considered sample 1, an equally valid formula for U is:

$$U_2 = R_2 - \frac{n_2(n_2 + 1)}{2}$$

When computing significances, the smaller value of $U_1$and U_2 is the one used. The sum of the two values is calculated as:

$$U_1 + U_2 = R_1 - \frac{n_1(n_1 + 1)}{2} + R_2 - \frac{n_2(n_2 + 1)}{2}$$

Plugging $R_1 + R_2 = n\frac{n+1}{2}, and\ n = n_1 + n_2$, into the above formula, we find that the sum is

$$U_1 + U_2 = n_1 n_2.$$

3.2.2 Cluster analysis

The aim of a cluster analysis is to identify possible homogeneous subsets from a heterogeneous sample of objects (in our case, lenders and borrowers). Thus it is an appropriate instrument for group segmentation.

SPSS offers three separate approaches to cluster analysis, namely, Hierarchical, K-Means, and Two-Step. The Hierarchical approach is chosen when little information is known on the data structure; the K-Means approach could be used if the number of clusters to be obtained is known; the Two-Step approach allows a combination of continuous and categorical variables which both hierarchical and K-means procedures do not cater for. Our survey data fits the third approach.

The two-step procedure can detect the number of clusters without pre-specification. In principle each cluster is distinguished from another by a maximum distance measure in such a way that each cluster is distinct and heterogeneous from another, while certain attributes are common to all members within a cluster. The clusters are defined and distinguished by the Mahalanobis distance, a statistical measure based on correlations between variables by which different patterns can be identified. It gauges similarity of an unknown sample set to a known one. The Mahalanobis distance is a multivariate effect size, given that it takes into account the correlations of the data set and is scale-invariant. As adapted from De Maesschalck et al. (2000), the Mahalanobis distance of a multivariate vector X from a group of values with mean μ and covariance matrix S is defined as:

$$d_s(x) = \sqrt{(x - \mu)^T S^{-1} (x - \mu)}$$

where $x = (x_1, x_2, x_3, \dots, x_n)^T$, and $\mu = (\mu_1, \mu_2, \mu_3, \dots, \mu_n)^T$

In our analysis, the clustering process is divided into two steps. One step is to compare the objects according to certain attributes (here, attitudinal dimensions) and the following step is to group them according to these attitudinal dimensions.

It also allows us to specify the number of clusters required or to let the program estimate the optimal number of clusters. The size of each cluster is an indication of its relative importance in determining the cluster group memberships.

In this thesis I use the 4 borrower clusters naturally defined by SPSS, and 2 lender clusters obtained through the same method. Considering the statistical inefficiency, i.e., loss in degree of freedom, resulting from forcing the number of clusters, I conduct the analyses based on the natural cluster numbers despite the disparity between lenders and borrowers.

3.2.3 Clusters included in regressions

The borrower and lender cluster membership variables were both incorporated in our regression analyses hereinafter, as the dependent variable in each to assess how a set of demographic predictors influence the cluster memberships of farm household borrowers and of front-line loan officers.

The Mahalanobis distance measure, which defines the cluster membership, allows us, in principle, to minimize the cross-covariances occurring in the four linear regression equations, and the binary logistic regressions that we run in order to back up the linear regressions with matched statistical significance for each coefficient.

3.2.4 Discriminant analysis

Given a set of independent variables, discriminant analysis attempts to find linear combinations of those variables that best separate the groups of cases. These combinations are called discriminant functions and have the form displayed in the equation below:

$$D = v_1X_1 + v_2X_2 + v_3X_3 + \cdots + v_iX_i + a$$

Where D = discriminate function,

v = the discriminant coefficient or weight for that variable

X = respondent's score for that variable

a = a constant

i = the number of predictor variables

This function is similar to a regression equation or function. The v's are unstandardized discriminant coefficients analogous to the beta's in the regression equation. These v's maximize the distance between the means of the dependent variable. Good predictors tend to have large weights. This function maximizes the distance between the categories, i.e. results in an equation that has strong discriminatory power between groups. After using an existing set of data to calculate the discriminant function and classify cases, any new cases can then be classified. The number of discriminant functions is one less the number of groups.

The procedure automatically chooses a first function that will separate the groups as much as possible. It then chooses a second function that is both uncorrelated with the first function and provides as much further separation as possible. The procedure continues adding functions in this way until reaching the maximum number of functions as determined by the number of predictors and categories in the dependent variable.

3.2.5 Regression analyses

To analyze the borrower and lender clusters and the determinants of membership groupings, I conduct Generalized Linearized Model (GLM) regressions with a set of predictor variables representing demographic information collected in the survey, and also conducted discriminant analyses to examine the specific contribution of each predictor in the total variances within the dependent group variable. The GLM is a flexible generalization of ordinary linear regression that allows for response variables that have

other than a normal distribution. Under GLM we report results from both the linear regression and the multinomial logistic regression. We consider the following GLM regression specification:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i + \mu$$

where X_i (i = 1, 2, …, 23) are the 23 independent variables we have specified in the GLM regression.

For the multinomial logistic regression, the logistic function is as follows:

$$E(Y_i|X_i) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i)}}$$

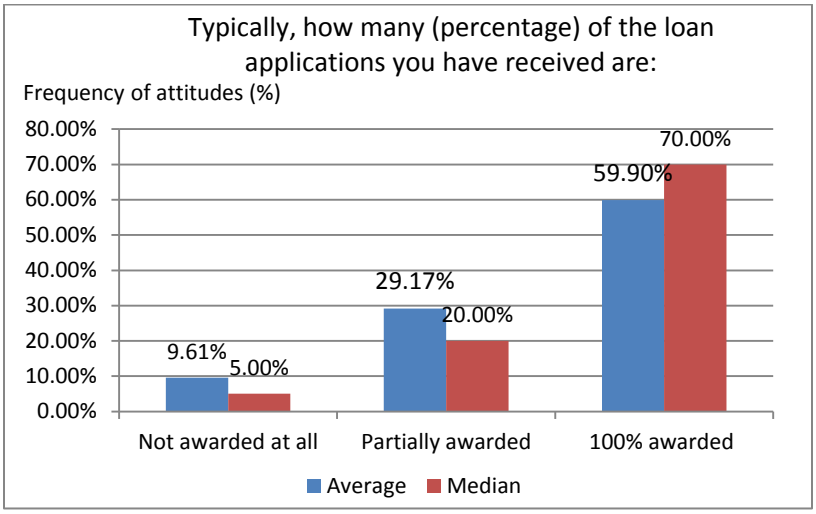
where X_i (i = 1, 2, …, n) are the independent variables we have specified in the logistic regression. We include n = 23 for the borrower regressions and n = 17 for the lender regressions.

3.3 Background on agriculture in Shandong

Located on the east coast of China, Shandong is an agriculture oriented province which is more affluent compared with inner China. Nationwide, Shandong RCCs have a high reputation in terms of lending practices, and hence are representative for our research purpose.

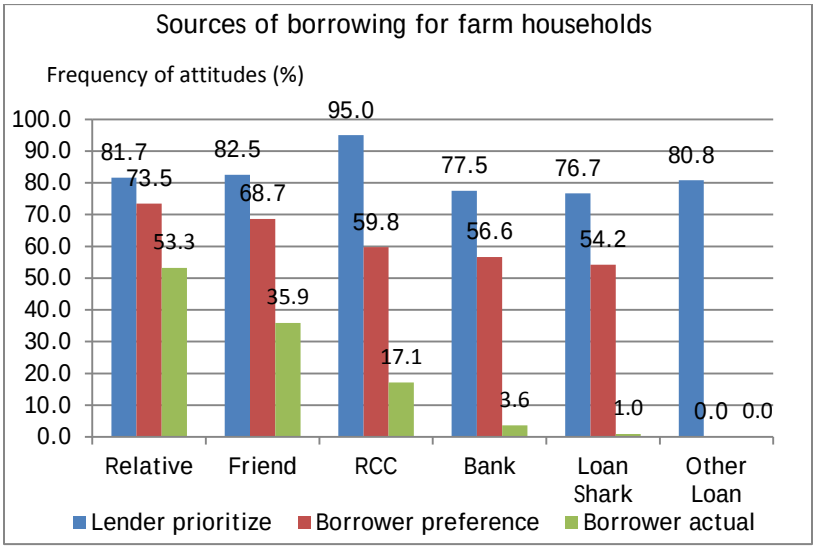
The graphs below provide a summary of loan supply at the surveyed RCCs.

Figure 3.1: Above 60% Borrowers and Lenders Received/Approved Full Loan Amount



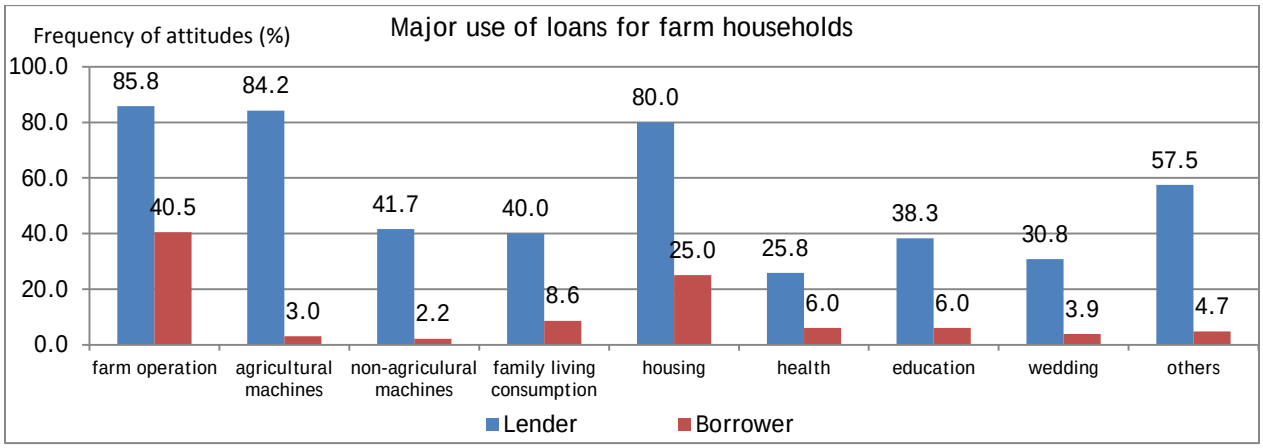
Both lenders and borrowers agree that the majority (above 60%) of loan applications were fully awarded.

Figure 3.2: Borrowers Obtain Loans More Frequently from Relatives and Friends than from RCC



While borrowers are eager for liquidity from all possible sources, including formal and informal, public and private, they are actually only able to borrow heavily from informal sources including friends and relatives (above 50 percent loans are from the two informal sources as shown in Figure 3.2 above). Lenders, however, assume borrowers view their RCCs as the top priority for liquidity, while assigning similar prioritization to different financial institutions.

Figure 3.3: Majority of RCC Loans are for Agriculture and Housing Use



Lenders and borrowers basically agree that the majority of loans to farm households were used for farm operations, followed by other purposes, including housing and consumption. Lenders also believe the majority of the loans were used to purchase agricultural machines, while borrowers indicate that this was minor.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Disconnect observed from mean scoring

The mean scoring method gives us an accurate, consistent, and immediate idea how a typical lender or borrower places his or her opinion among a set of attitudinal answers. We calculate the mean score as follows:

$$\text{Mean score} = \frac{\sum_{i=1}^{5} i \times Valid\ percentage(i)}{100} - \frac{\sum_{i=1}^{5} i}{5},$$

where i = 1, 2, 3, 4, 5, represents scores assigned for the attitude of “strongly disagree” “disagree” “agree” “moderately agree” and “strongly agree”, respectively.

For illustration, for the question “If your farm household borrower is a member of a Group Guarantee, you will lend him/her a larger loan than other borrowers could get, because of his/her Group Guarantee membership?”, we rank the three attitudinal answers as: “1. strongly disagree” “2. disagree” “3. agree” “4. moderately agree” and “5. strongly agree”. Mean score for this lender is calculated by 1) taking the sum product of the scores 1, 2, 3, 4, 5, and the valid percentage for each of the corresponding ranking: 15.0, 72.5, 6.7, 5.0, and 0.8 , 2) divided by 100, and 3) minus the mean of the three scores, which equals sum of the five scores divided by the number of scores, 3 = (1+2+3+4+5)/5 in this question. This

gives a mean score of - 0.95833 for this question, which we interpret as an average lender (out of the 120 surveyed) strongly disagrees that he or she will lend the borrower a larger loan because the borrower joins a Group Guarantee.

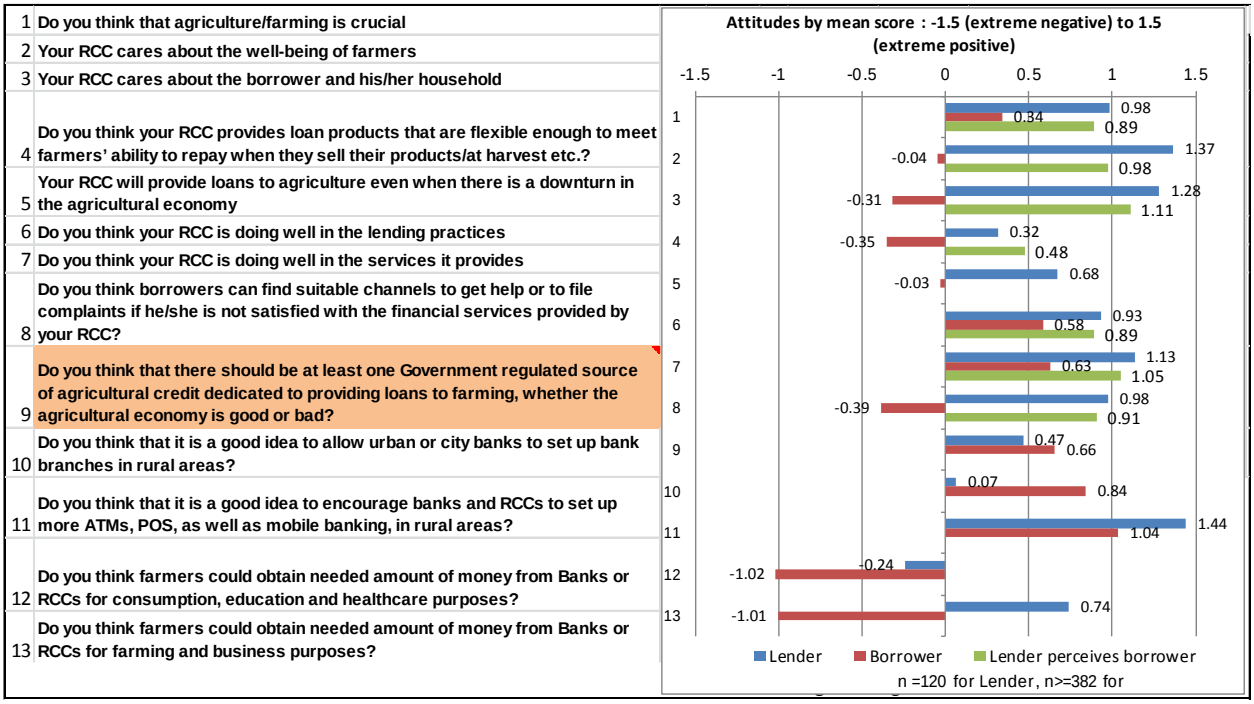
For simplicity, we group the survey questions to lenders with the corresponding questions to borrowers into ten sets of dimensions, denoted as "a, b, ..,, f", to measure their attitudes within separate concepts. We interpret each question group as below (significance test results attached in Appendix).

a. Care

As shown in Figure 4.1, we find few significant disagreements between lenders and borrowers in this group regarding lenders' and their RCCs' attitudes towards lending. While lenders are fairly confident that RCCs lend sufficient amounts of money to farm households for farming and business purposes (scoring 0.74), the borrowing households appear to hold a strongly opposite view (scoring -1.01, representing a gap of 1.75, p=0.000). Both lenders and borrowers disagree that RCCs lend needed amount of money for consumption, education, and healthcare purposes either, but borrowers' views again appear to be much stronger (scoring -1.02 as opposed to -0.24 for lenders, representing a gap of 0.78, p=0.001). Borrowers also disagree that they could find suitable channels for help or complain if the financial services provided by RCCs are not satisfactory (scoring -0.39), nor do they agree with their lenders that RCCs care about them and their households (scoring -0.31), or that RCCs' loan products are flexible enough to meet their ability to repay when they sell products at harvest (scoring -0.35), while lenders tend to agree on the three questions (scoring 0.98, 1.28, and 0.32 respectively, representing a gap of 1.37, 1.59, and 0.67 respectively, with P values of 0.000, 0.000, and 0.000 respectively). More interestingly, when asked about their views towards how borrowers might think of them viewing these questions, lenders' answers are highly consistent with previous answers which are positive (scoring 0.91, 1.11, and 0.48, respectively). I therefore conclude that a strong disconnect exists between the two groups, in contrast with lenders' views being constant towards borrowers, as well as towards themselves being viewed by borrowers.

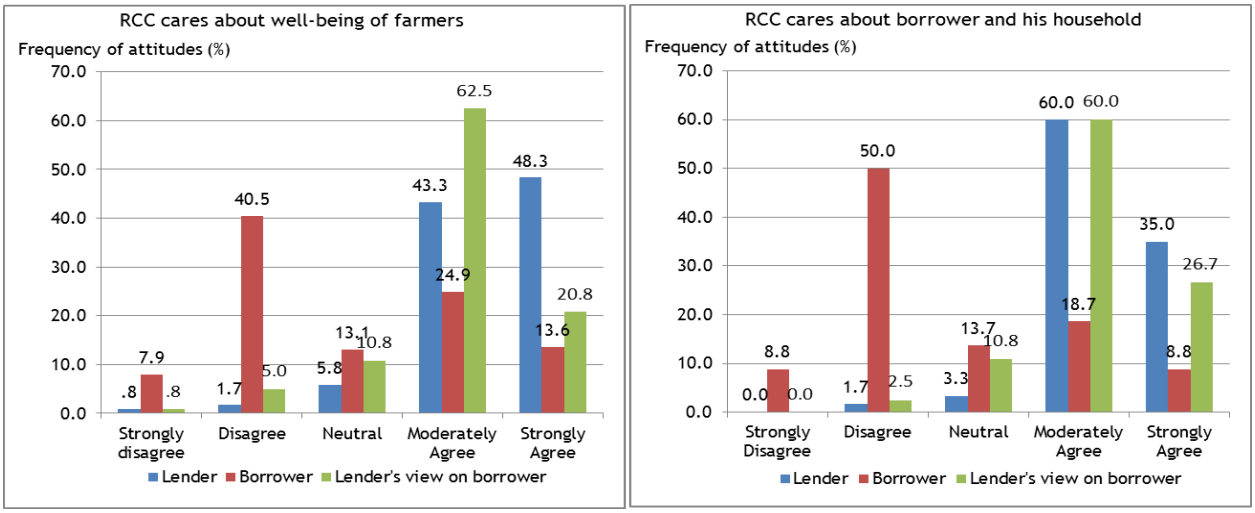
Both agree that RCCs are doing well in their lending practices (scoring 0.58 for borrowers, 0.93 and 0.89 for lenders and lenders towards borrowers view themselves, representing a 0.35 gap between borrowers and lenders, p=0.002) and services (scoring 0.63 for borrowers, 1.13 and 1.05 for lenders and lenders' reversed questions, representing a 0.5 gap, p=0.000). Furthermore, both agree that there should be at least one Government regulated source of agricultural credit dedicated to providing loans to farming despite fluctuations of the agricultural economy (scoring 0.66 for borrowers and 0.47 for lenders, representing a gap of 0.19, p =0.144 for *t*-test and 0.193 for non-parametric test).

Figure 4.1: Disconnect on RCCs' Care about Farm Households Well-Being and Agriculture



Note: Highlighted pair is NOT significant by t-test and U-test at the .05 level.

Figure 4.2: "RCC Cares": Lenders Agree and Think Borrowers Agree, while Borrowers Disagree



Note: Both pairs are significant by *t*-test and U-test at the .05 level.

Both groups agree that the lenders view agriculture/farming as being crucial (scoring 0.34 for borrowers, 0.98 and 0.89 for lenders and reversed, respectively), representing a gap of 0.68 (p=0.000). While results show slight disagreement among borrowers on RCCs' care towards farmers' well-being (scoring -0.04), lenders are very confident that their RCC cares about the borrower and his/her household (scoring 1.37, representing a 1.41 gap with borrowers, p=0.000), and that borrowers would agree with this view (scoring 0.98). In comparison with the strong agreement displayed among lenders that RCCs will provide loans to agriculture even when there is a downturn in the agricultural economy (scoring 0.68), slight disagreement once again is shown among borrowers (scoring -0.05, representing a 0.73 gap, p=0.000).

In terms of RCC branching strategies, borrowers highly agree that it is a good idea to allow urban or city banks to set up bank branches in rural areas (scoring 0.84), while lenders are much less inclined to agree (scoring 0.07, representing a 0.77 gap, p=0.000). Both agree that it is good idea to encourage banks and RCCs to set up more ATMs, POS, as well as mobile banking, in rural areas (scoring 1.04 for borrowers and 1.44 for lenders, representing a 0.4 gap, p=0.000).

In summary, more extensive marketing efforts should be conducted by local RCCs to deliver to customers the notion that, as the loan supplier, they indeed care about farm households' well-being and about agriculture in particular, to mitigate the gap in their perceptions as indicated in Figure 4.2.

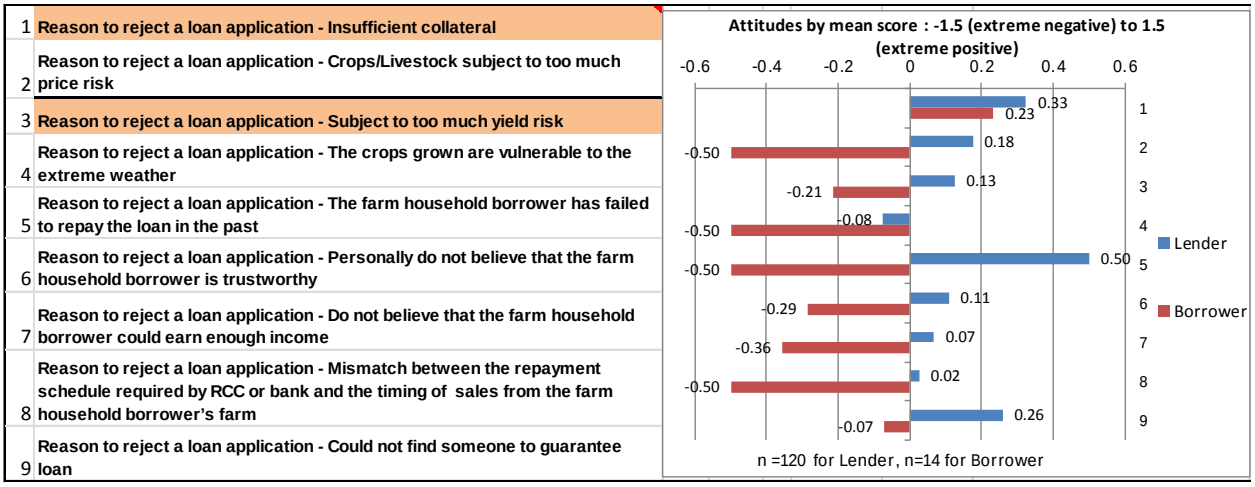
b. Loan rejection

As suggested by Figure 4.3, a disagreement exists on borrowers' repayment record, when the two groups were asked the reasons that lenders reject a loan, or that borrowers being rejected a loan. While borrowers strongly disagree (scoring -0.50) that disapproval of their loan applications is due to past failures in repayment, lenders hold equally strong agreement on this argument (scoring 0.50, representing a gap of 1.0, p=0.000).

While the two groups disagree that a loan rejection results from reasons such as whether the farm household grows crops that are vulnerable to the extreme weather (borrower -0.50, lender -0.08,

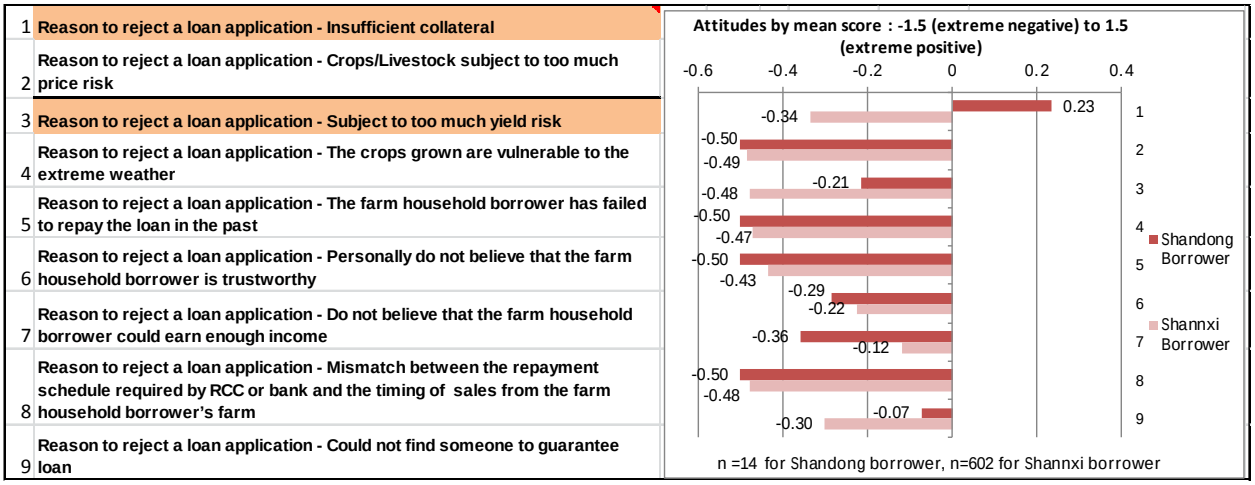
representing a 0.42 gap, p=0.000), both agree on the item regarding insufficient collateral (borrower 0.23, lender 0.33, representing a 0.1 gap, P=0.130 for T test, and 0.129 for Non-parametric test). Furthermore, both groups appear to hold different attitudes regarding other reasons for loan rejection, such as lack of a guarantee (borrower -0.07, lender 0.26, a 0.33 gap, p=0.002), mismatch between RCC loan repayment schedules and the timing of farm product sales (borrower -0.50, lender 0.02, representing a 0.52 gap, p=0.000), borrower trustworthiness (borrower -0.29 and lender 0.11, with a 0.4 gap, p=0.014), ability to earn enough income (borrower -0.36, lender 0.07, with a 0.43 gap, p=0.000), and the risks associated with crops price (borrower -0.50, lender 0.18, with a 0.68 gap, p=0.000) and yield (borrower -0.21, lender 0.13, with a 0.34 gap, P=0.164 for T-test, and 0.163 for Non-parametric). In general, borrowers agree on a majority of the surveyed reasons, while lenders generally disagree.

Figure 4.3: Disconnect on Borrower Repayment Record: Distrust of Lender



Note: Highlighted pairs are NOT significant by t-test and U-test at the .05 level.

Figure 4.4: Similar Attitudes between Borrowers in Shangdong and Shannxi: Borrowers are Overconfident about Their Repayment Record



Note:

a. Highlighted pairs are NOT significant by t-test and U-test at the .05 level.

b. For this set of questions on loan rejections, we only obtain 14 valid observations for borrowers in Shandong. To ensure that the results from paring is representative, we use a prior identical survey to farm households in Shannxi (602 valid observations out of 897 surveyed households) and compare with responses from Shandong borrowers. As shown in Figure 4.4., borrowers have similar negative attitudes for most of the listed reasons for a loan rejection, except for the reason that the borrower has insufficient collateral, for which households in Shandong have positive attitudes whereas households in Shannxi hold negative attitudes.

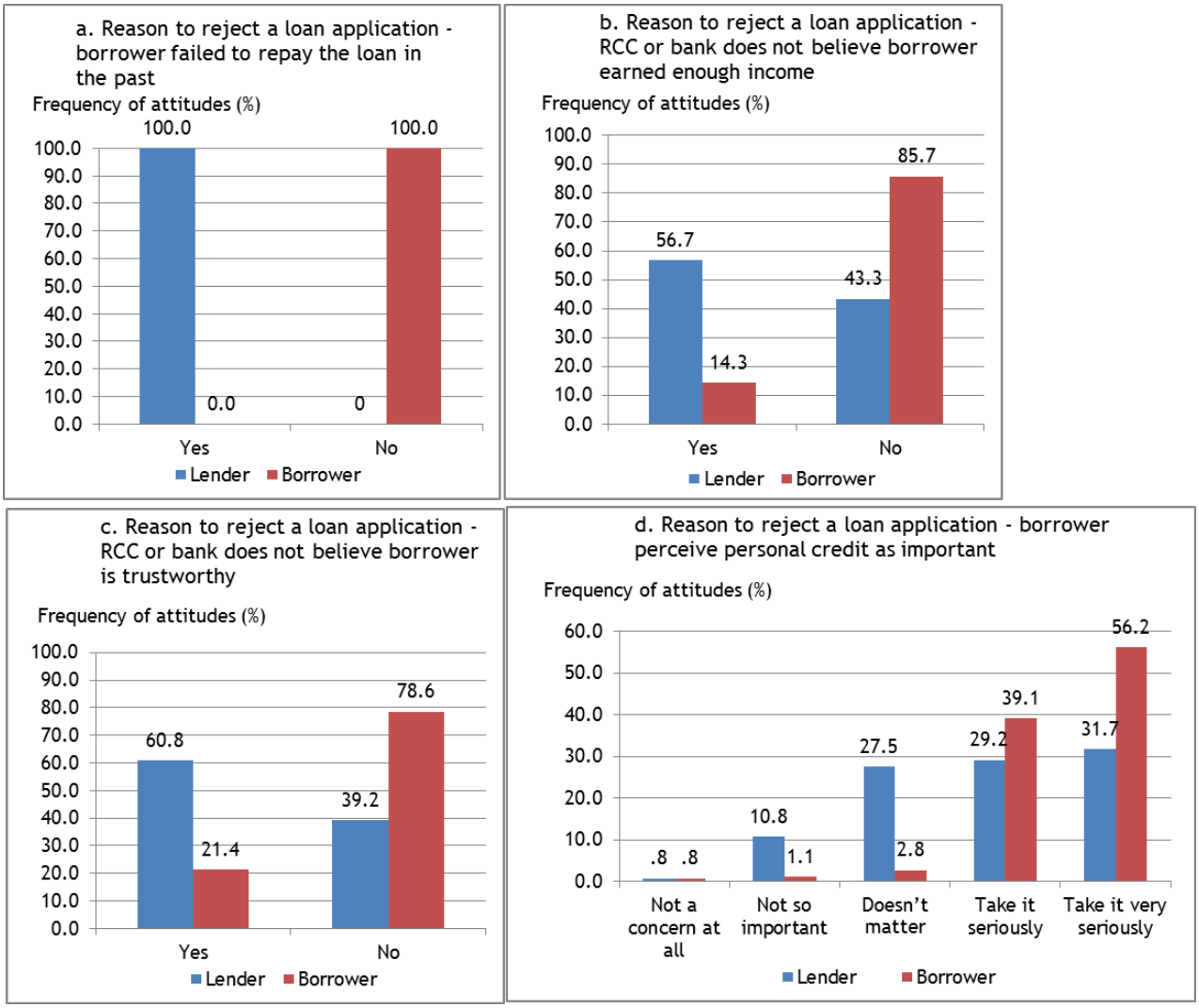
In summary, we observe a radical disconnect in lenders' and borrowers' views towards reasons for loan rejection, and in particular in their understanding of borrowers' repayment records, as highlighted in Figure 4.3. Consistent with Turvey and Kong (2009), the results suggests that farmers do understand their credit worthiness relies upon repayment but they tend to be casual in timing of repayment. Hence, the RCC may be wise to advertise good credit worthiness practices among rural household customers. We also suggest that RCCs provide loan contracts with clearly stated terms, and perhaps more flexible terms regarding the timing of payments throughout the year, and that loan officers provide instructions on reading contracts to farm household borrowers.

Table 4.1: Chinese Farmers are for the Most Part Honest

	Ever Been Late		Ever Defaulted	
	No	Yes	No	Yes
loan from friends	71.10%	28.90%	98.90%	1.10%
loan from relatives	61.90%	38.10%	96.00%	4.00%
loan from Community Mutual Fund/Loan	99.80%	0.20%	100.00%	0.00%
loan from NGO	99.70%	0.30%	100.00%	0.00%
loan from Money Lenders	100.00%	0.00%	100.00%	0.00%
loan from Pawn Shop	99.70%	0.30%	100.00%	0.00%
loan from RCC (including Rural Commercial Banks, Rural Cooperative Bank etc	81.80%	18.20%	99.30%	0.70%
loan from ABC	98.60%	1.40%	100.00%	0.00%
loan from Postal Savings	99.80%	0.20%	100.00%	0.00%
loan from Commercial bank other than RCC, ABC, Postal Savings	99.00%	1.00%	100.00%	0.00%
loan from Credit Only Loan Company (non-deposit) Institution	99.80%	0.20%	100.00%	0.00%
Other loan	99.80%	0.20%	100.00%	0.00%

To ensure generalization of our interpretation on the Shandong results for this specific set of questions on loan rejection, for which we pair 14 valid borrower data points against 103 valid lender data points, we compare Shandong borrowers' answers with a previous identical survey conducted among 897 rural households in Shannxi province (with 602 data points being valid) and find that, as shown in Figure 4.4, other than for the "insufficient collateral" item, , the two groups of borrowers hold similar disagreements, even though in various degrees for each specific reason proposed, on all remaining reasons of loan rejection. We hence believe the interpretation drawn from Shandong is representative.

Figure 4.5: Disconnect on Borrower Creditworthiness: Lenders' Distrust towards Borrowers



Note: All the four pairs are significant by t-test and U-test at the .05 level.

a. Lenders are ABSOLUTELY firm that the borrower has previously failed to repay a loan, while borrowers are EQUALLY firm that they never default on a loan. This gap in their perceptions, as we understand, is due to their different understanding towards "default" and "late payment".

b. More than 50 percent of lenders reject a loan application because they do not trust the borrower's ability to earn enough income, while 86 percent of borrowers disagree.

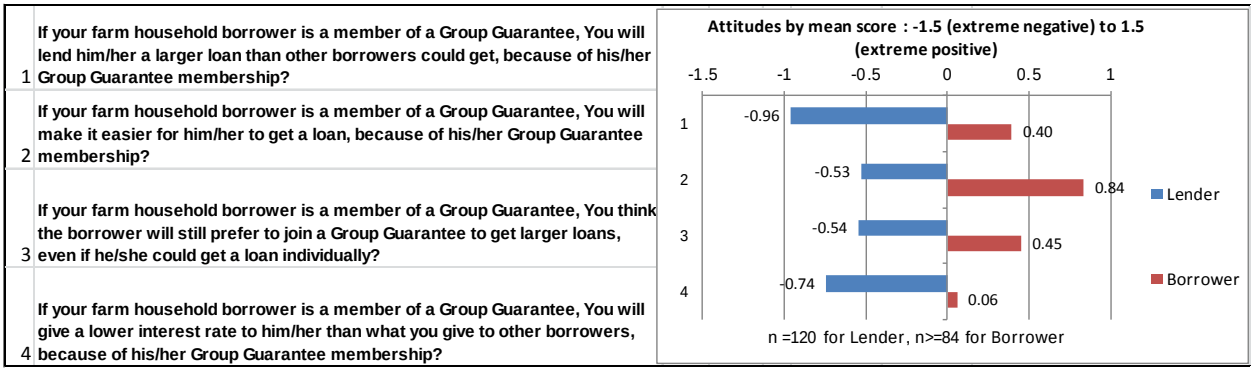
c. More than 60 percent of lenders reject a loan application because they do not believe the borrower is trustworthy, while 79 percent of borrowers object.

d. While more than 50 percent of borrowers respond that they take their personal credit very seriously, only 32 percent of lenders agree and another 28 percent of lenders believe the borrower does not perceive their personal credit as important.

c. Member of group guarantee

When asked about the importance of group guarantee membership in loan approvals, lenders have negative attitudes in every regard, while borrowers have positive attitudes, as suggested by Figure 4.6. The survey results suggest that lenders disagree on the role that group guarantee membership plays in their decisions to offer loan approval (lender -0.53 while borrower 0.84, a 1.37 gap, p=0.000), to approve larger loan amounts (lender -0.96 while borrower 0.40, a 1.36 gap, p=0.000), to approve larger loan amounts due to the borrower having secured a group guarantee (lender -0.54 while borrower 0.45, a 0.99 gap, p=0.000), and to offer lower interest rates (lender -0.74 while borrower 0.06, a 0.8 gap, p=0.000). These results may be explained by their insights on lending regulations provided in interviews. The loan interest rates are decided and regulated by the PBOC (although RCCs do have limited flexibility to decide the rate), and most recently, whether loan officers approve a loan largely depends on the loan to deposit ratio (LDR) of their RCC. By CBRC regulation, RCCs must ensure a maximum 75% LDR on a daily basis, and surveyed Shandong loan officers indicated that their RCCs adjust LDR on a daily basis to maintain a constant 70% level[16].

Figure 4.6: Group Guarantee is NOT as Important in Lenders' View



Note: All pairs are significant by t-test and U-test at the .05 level.

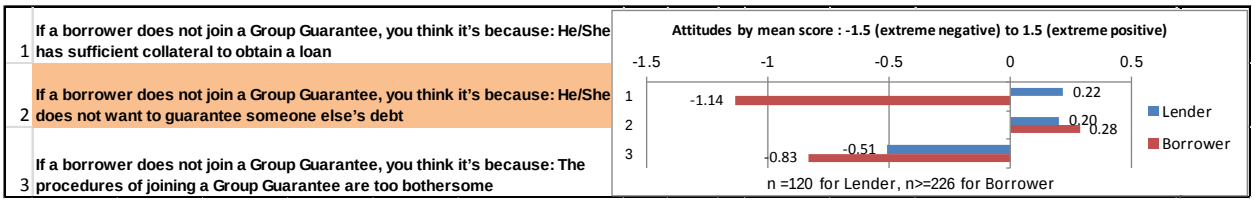
16 Per our interviews with loan officers in Chengwu County during Session 1 on Sep 5, 2011.

In summary, borrowers generally agree about the importance of group guarantees, while RCC lenders do not. We conclude that RCCs need to make marketing efforts to ease the concern of credit rationed borrowers about group guarantee requirement.

d. Non-member of group guarantee

As shown in Figure 4.7, when asked about the reason that a borrower not being a member of a Group Guarantee, the two groups disagree on the proposed reason that the borrower has sufficient collateral to obtain a loan, with agreement displayed among lenders (scoring 0.22) in contrast to the strong disagreement observed among borrowers (scoring -1.14, representing a 1.36 gap, p=0.000). Consistent agreements were shown between the two groups on the proposed reason that the borrower does not want to guarantee someone else's debt (lender 0.20 and borrower 0.28, representing a 0.48 gap, P = 0.193 for T-test and 0.788 for Non-parametric test). They appear to disagree, in a consistent manner, on the proposed reason that the procedures of joining a Group Guarantee are too bothersome (lender -0.51 and borrower -0.83, representing a 0.32 gap, p=0.000).

Figure 4.7: Farmers are NOT Willing to Guarantee Someone Else's Debt



Note: Highlighted pair is NOT significant by t-test and U-test at the .05 level.

Summary: Borrowers see it as being more difficult to join a group guarantee to satisfy RCC requirements. Combined with results in the previous "loan rejection" section, we conclude that the reason for borrowers not being a guarantee group member is that farmers do not want to guarantee someone else's debt, while it's also hard to find a counterparty farm household to form a guarantee group. We recommend RCCs, and more likely the agricultural banking regulators, to educate farmers and ease the tension of credit risk arising from group guarantee.

e. Lending concerns

We observe opposite yet strong views from the two groups in a few aspects on lenders' concerns when they make lending decisions, as suggested by Figure 4.8 and Figure 4.9. While the lenders strongly agree (scoring 0.86) that they are concerned about borrowers' unpaid debts on previous loans from RCC or banks, as well as borrowers not being willing to have to guarantee another villager's debts (scoring 0.38), borrowers strongly disagree on these concern of lenders (scoring -1.17 and -0.40 respectively, representing gaps of 2.03 and 0.78, with p value of 0.000 for each).

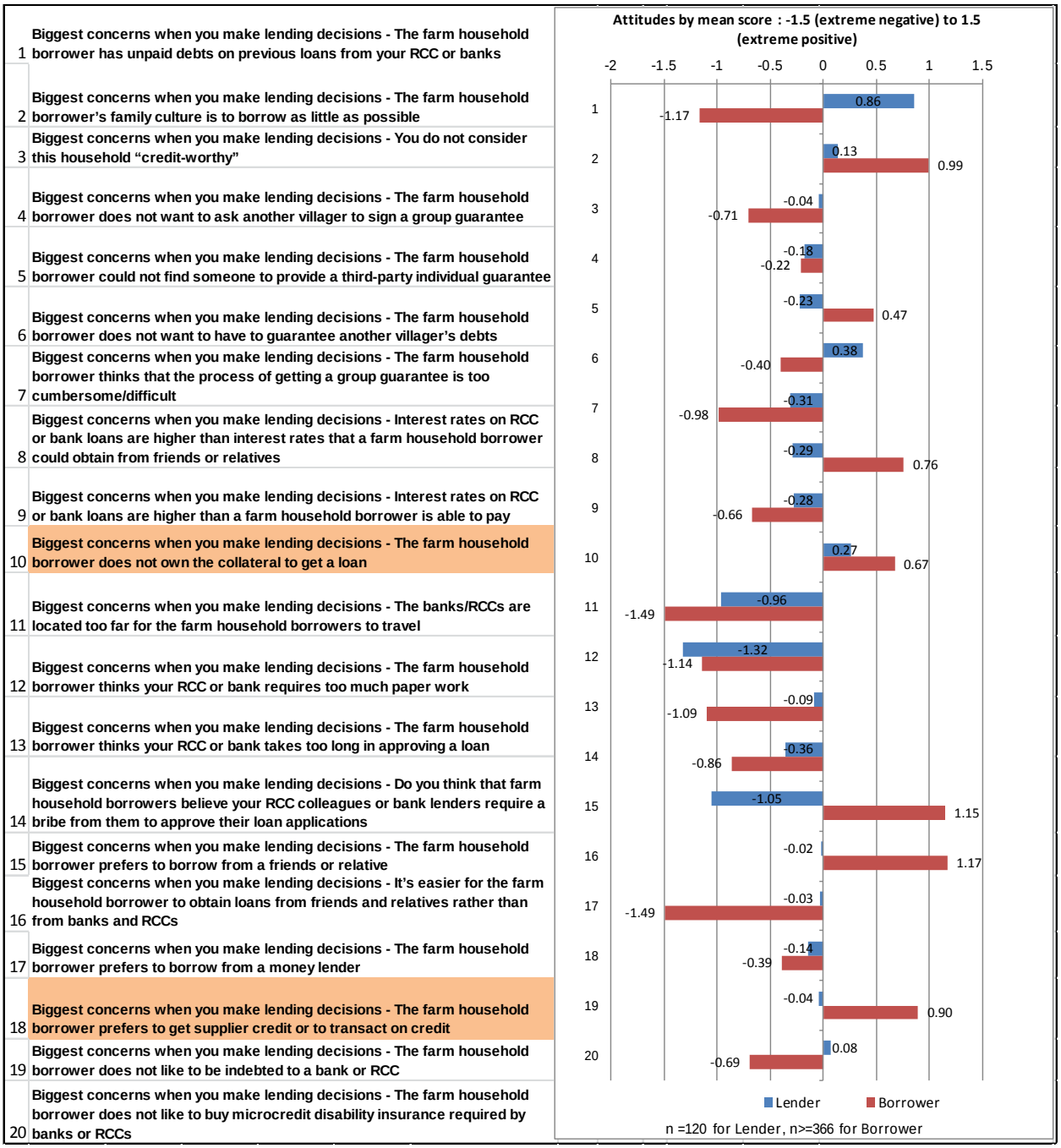
While little concern is observed among lenders that borrowers could not find someone to provide a third-party individual guarantee (scoring -0.23), and that interest rates on RCC or bank loans are higher than interest rates that a farm household could obtain from friends or relatives (scoring -0.29), that borrowers prefer to (scoring -1.05), and find it easier to borrow from friends and relatives (-0.02), as well as that borrowers do not like to be indebted to RCCs and banks (-0.04), borrowers appear to have more agreements on these issues (scoring 0.47, 0.76, 1.15, 1.17, and 0.90, respectively, representing a gap of 0.7, 1.05, 2.2, 1.19, and 0.94, respectively, with p values of 0.005 for the first question and 0.000 for each of the remaining four questions).

The two groups both have positive attitudes on proposed lender concerns such as borrowers' family culture is to borrow as little as possible (lender 0.13 and borrower 0.99, representing a 0.86 gap, p=0.000), and that the farm household does not own the collateral to get a loan (lender 0.27 borrower 0.67, representing a 0.4 gap, P=0.202 for T-test and 0.330 for Non-parametric). They both have negative attitudes on proposed concerns such as lenders do not consider the borrower being "credit-worthy" (lender -0.04 borrower -0.71, representing a 0.67 gap, p=0.000), the borrower does not want to ask another villager to sign a group guarantee (lender -0.18, borrower -0.22, representing a 0.04 gap, p=0.003), the borrower considers the process of getting a group guarantee too cumbersome/difficult (lender -0.31 borrower -0.98, representing a 0.67 gap, p=0.000), interest rates on RCC or bank loans being higher than a farm household is able to pay (lender -0.28 borrower -0.66, representing 0.38 gap, p=0.020), RCCs are located too far for borrowers to travel (lender -0.96 borrower -1.49, representing a 0.53 gap, p=0.000),

RCCs require too much paper work (lender -1.32 borrower -1.14, representing a 0.18 gap, p=0.001), RCCs take too long in approving a loan (lender -0.09 borrower -1.09, representing a 1.0 gap, p=0.000), or require a bribe to approve a loan (lender -0.36 borrower -0.86, representing a 0.5 gap, p=0.000), and that farm households prefer to borrow from money lenders (lender -0.03 borrower -1.49, representing a 1.46, p=0.000), or borrowers prefer supplier credit than borrowing a loan (lender -0.14 borrower -0.39, representing a 0.53 gap, P=0.569 for T-test and 0.131 for Non-parametric test).

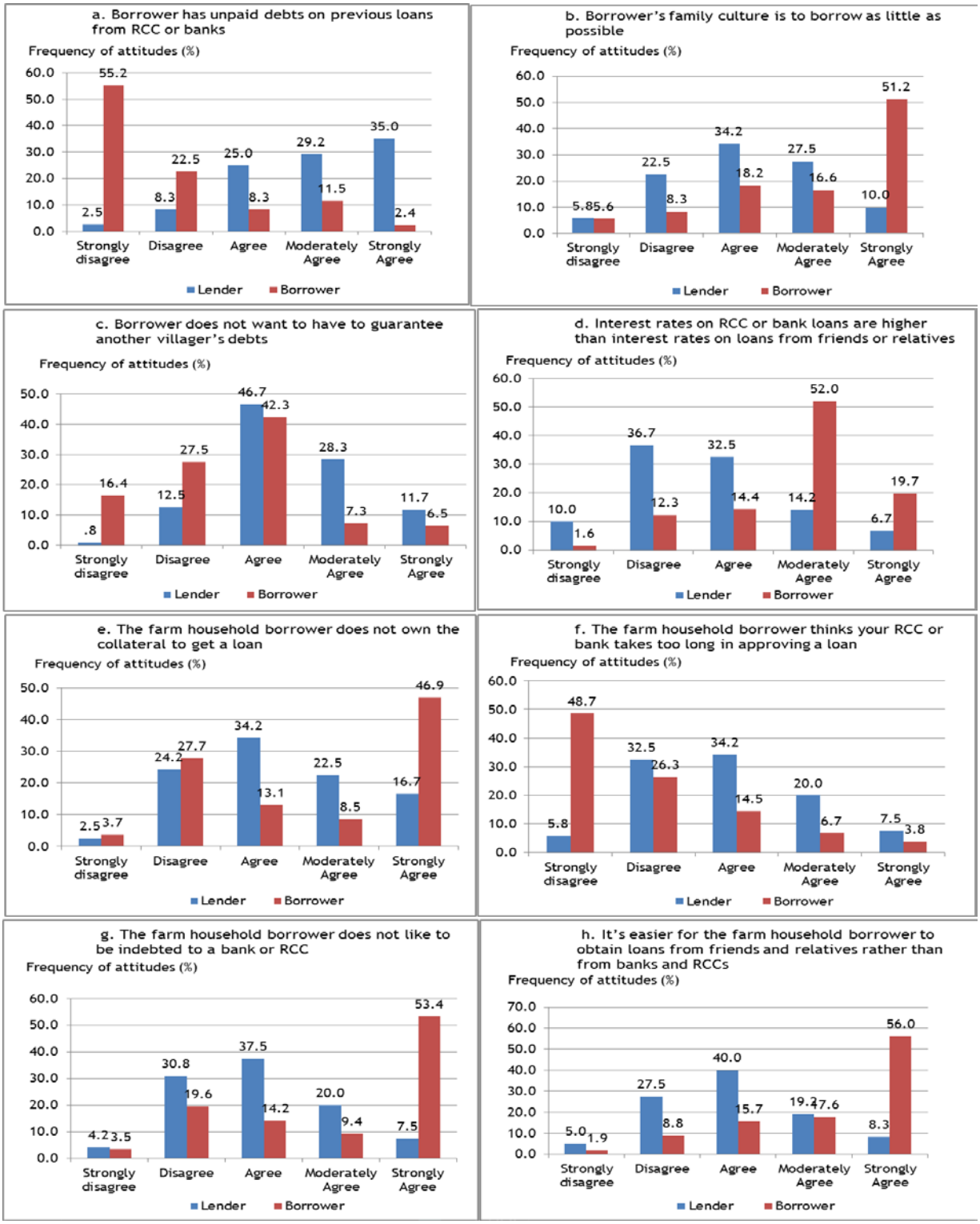
Summary: Borrowers find it easier to obtain a loan from informal sources such as relatives and friends than from RCCs, in terms of both loan application procedures and the cost of borrowing. We advise that RCCs educate front-line officers in providing standardized loan approving procedures, and in educating borrowers in understanding loan terms.

Figure 4.8: Borrowers Favor Credit from Informal Sources: Friends and Relatives in Particular



Note: Highlighted pairs are NOT significant by t-test and U-test at the .05 level.

Figure 4.9: Disconnect on Lending Concerns: Easier to Borrow from Friends and Relatives than from RCC or Bank

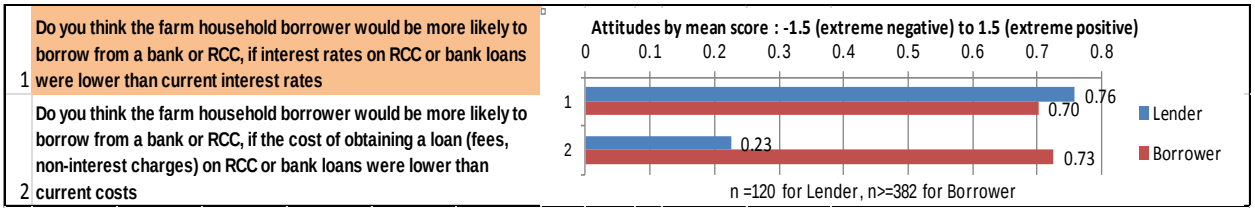


Note: Other than the pair in e, all other pairs are significant by t-test and U-test at the .05 level.

f. Cost of borrowing

Agreement is observed among both groups that a decrease in cost of borrowing, including loan interest rates (lenders scored 0.76 and borrowers 0.70, representing a 0.06 gap, P=0.367 for T-test and 0.609 for Non-parametric test), and fees to a less extent in the lenders' view (lenders scored 0.23 while borrowers 0.73, representing a 0.5 gap, p=0.000), would lead to increase in borrowers' willingness to borrow from RCCs and banks, as we observe in Figure 4.10.

Figure 4.10: Reducing Costs of Borrowing Will Enlarge Credit Access to Farm Households



Note: Highlighted pair is NOT significant by t-test and U-test at the .05 level.

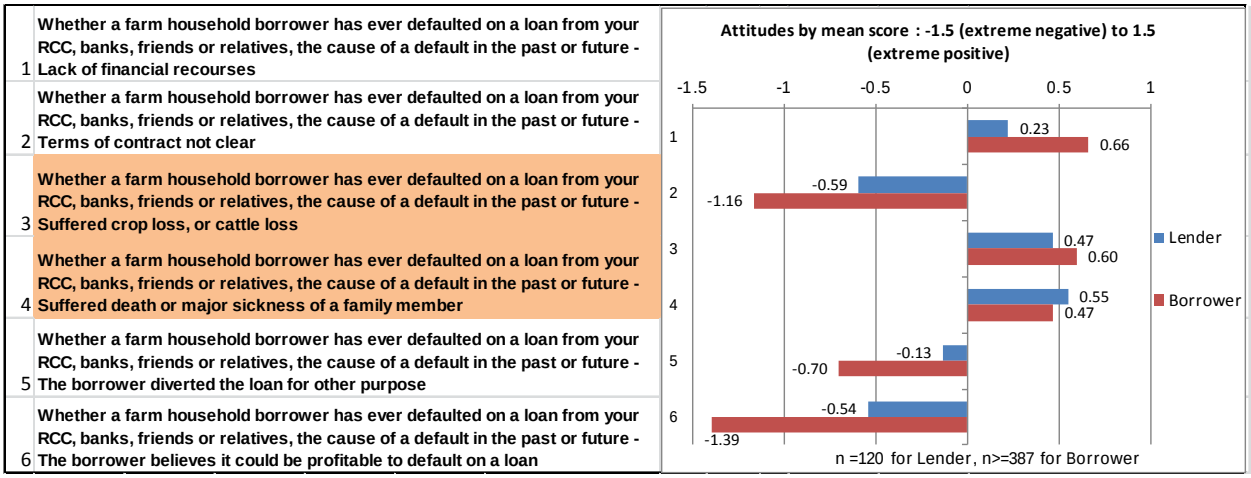
Summary: Both groups agree that reducing the cost of borrowing will enlarge credit access to farm households. Since RCCs are regulated by the CBRC to lend at a range of rates set by the PBOC and have limited flexibility to adjust that cost of borrowing, we advise RCCs work on cost reduction within the institutions, in administration expenses particularly, to provide room for reducing costs involved in loan approvals.

g. Reason for default

We observe consensus from the two groups on all questions with regards to the cause of borrower default, as indicated in Figure 4.11. Agreement is displayed among the two groups on causes including lack of financial resources (lender 0.23 and borrower 0.66, representing a 0.43 gap, p=0.001), borrower suffered crop loss or cattle loss (lender 0.47 and borrower 0.60, representing a 0.13 gap, P = 0.435 for T-test and 0.155 for Non-parametric test), or suffered death or major sickness of a family member (lender 0.55 and borrower 0.47, representing a 0.08 gap, P=0.571 for T-test and 0.855 for Non-parametric test). Disagreements (lenders less stronger than borrower) were observed among the two groups on causes

including terms of loan contract not being clear (lender -0.59 and borrower -1.16, representing a 0.57 gap, p=0.000), borrowers diverted the loan for other purpose (lender -0.13 and borrower -0.70, representing a 0.83 gap, p=0.000), and that the borrower believes it could be profitable to default on a loan (lender -0.54 and borrower -1.39, representing a 0.85 gap, p=0.000).

Figure 4.11: Disconnect on Reasons for Default: Loan Contract and Terms should be Standardized



Note: Highlighted pairs are NOT significant by t-test and U-test at the .05 level.

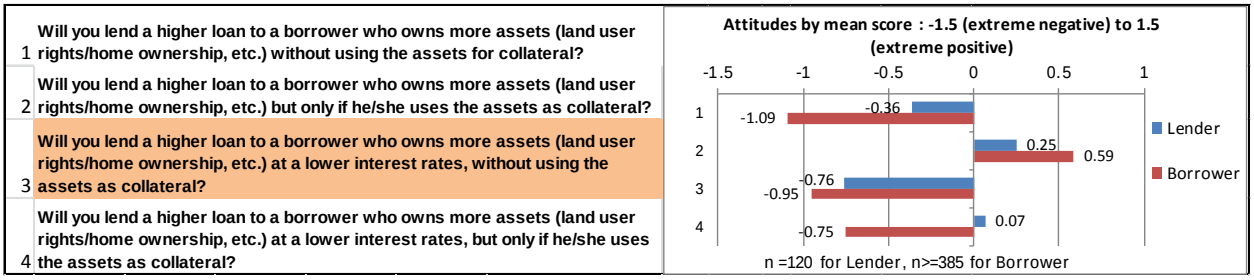
Summary: Borrowers have stronger agreement on past or future default resulting from lack of financial recourses, and natural reasons including crop or cattle loss, and death or major sickness of a family member. Strong attitudinal differences are observed for those questions where both groups hold disagreements, on various degrees. Borrowers hold much stronger disagreements than disagreeing lenders on reasons including terms of contract not being clear, borrowers diverted the loan for other purpose, and that borrowers believe it could be profitable to default on a loan. We suggest RCCs train lenders, again, in giving clear and standardized instructions to farm households upon loan approval, with emphasis on terms, the use of loan, and the procedure of servicing a loan through maturity.

h. Credit rationing (Bester).

We include two separate sets of questions on credit rationing, based on Bester's paper on the tradeoff between interest rates and collateral, and with more emphasis on collateral (Bester, 1985) and Stiglitz and Weiss' papers that emphasize more on adverse selection (1981) and moral hazard (1983).

In Figure 4.12, disagreements were observed among both groups on the proposed condition where the lender will lend a higher loan (lender -0.36 and borrower -1.09, representing a 0.73 gap, p=0.000), and even at a lower interest rates (lender -0.76 and borrower -0.95, representing a 0.19 gap, P=0.125 for T-test and 0.114 for Non-parametric test), to the borrower who owns more assets, without collateralizing the borrower's assets. We observe agreement among lenders on the same issue but under the condition that only if the borrower uses the assets as collateral (scoring 0.25). In this regard, borrowers tend to agree (scoring 0.59, representing a 0.34 gap, p=0.024), while they appear to hold strong disagreement that even with their assets being collateralized, they cannot obtain a lower interest rates for the higher loan (borrower -0.75 while lender 0.07, representing a 0.82 gap, p=0.000).

Figure 4.12: Lenders and Borrowers Agree on Roles of Various Loan Terms



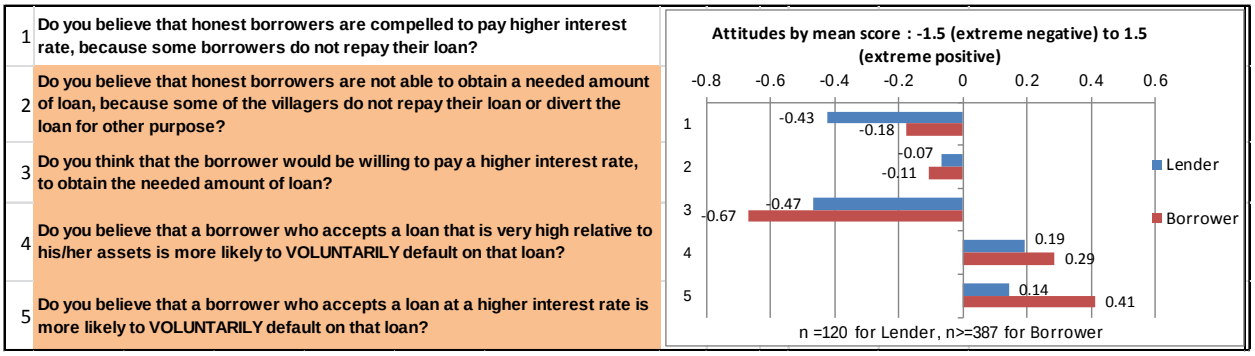
Note: Highlighted pair is NOT significant by t-test and U-test at the .05 level.

Summary: Both groups point out the limited flexibility in interest rates when RCCs approve a loan. Both agree on the importance of using borrowers' assets, including land user rights or home ownership, as collateral, to qualify for a higher loan amount.

i. Credit rationing (Stiglitz and Weiss)

In Figure 4.13, we observe disagreements among lenders and borrowers on how other borrowers' default (lender -0.43 and borrower -0.18, representing a 0.25 gap, p=0.11) or misuse of loans (lender -0.07 and borrower -0.11, representing a 0.04 gap, P=0.783 for T-test and 0.721 for Non-parametric test) would affect lending to an honest borrower. Both disagree, while the borrowers hold much stronger disagreement, that they are willing to pay a higher interest rate to obtain the needed amount of loan (lender -0.47 and borrower -0.67, representing a 0.2 gap, P=0.127 for T-test and 0.170 for Non-parametric test).

Figure 4.13: Lenders and Borrowers Agree on Potential Credit Rationing



Note: Highlighted pairs are NOT significant by t-test and U-test at the .05 level.

With regards to whether the borrower is more likely to VOLUNTARITY default on a loan of either higher loan amount (lender 0.19 and borrower 0.29, representing a 0.1 gap, P=0.881 for T-test and 0.665 for Non-parametric), or higher interest rate (lender 0.14 and borrower 0.41, representing a 0.27 gap, P=0.510 for T-test and 0.537 for Non-parametric), the two groups both agree in general, while the borrower tends to give stronger views.

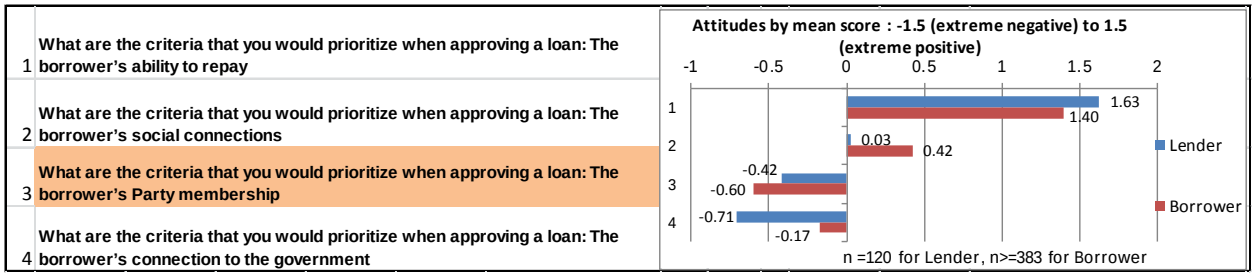
Summary: Lenders and borrowers agree on potential reasons for default, to various extents though; meanwhile, we do not observe any substantial difference in their understanding towards voluntary default.

j. Lending preference

In terms of lenders' criteria to prioritize a loan approval, both groups strongly agree on the borrower's ability to repay (lender 1.63 and borrower 1.40, representing a 0.23 gap, p=0.001). We also observe certain agreement (scoring 0.42) among borrowers on their social connections, on which slight agreement (scoring 0.03, representing a 0.39 gap, p=0.000) is shown among lenders.

When asked about government related issues such as the borrower's Party membership, both lenders and borrowers disagree on their role played in lenders' loan approving decisions (lender -0.42 and borrower -0.60, representing a 0.18 gap, P=0.764 for T-test and 0.415 for Non-parametric test); similar disagreement holds for their connection to the government (lender -0.71 and borrower -0.17, representing a 0.54 gap, p=0.000).

Figure 4.14: Ability to Repay is the First Principle Requirement in Loan Approval



Note: Highlighted pair is NOT significant by t-test and U-test at the .05 level.

Summary: Both groups agree that the borrower's ability to repay a loan is the first principle requirement in loan approval, rather than secondary criteria such as the borrower's social connections, Party membership, or connection to the government.

4.2 Segmentations of borrowers and lenders obtained from cluster analysis

With the cluster analysis on a set of selected perception questions, we herein examine the segmentations among Shandong lenders and borrowers, and explain the judgmental biases observed in each cluster membership.

4.2.1 Borrower clusters

We obtain four clusters for Shandong household borrowers, with each representing a different degree of agreement on their attitudes towards services and products provided by local rural credit cooperatives. As shown in Table 4.2, we define the four borrower clusters as follows based on their individual attributes measured by mean and median scores:

Cluster 1: "Uncaring" customers. This borrower cluster (n=5) has identical mean and median scores for all the questions upon which the cluster membership was decided. Customers in this cluster may not borrow as much from RCCs since they give the lowest scores among the four clusters for the questions that ask whether the borrower perceive that "local RCC or Bank cares about the welfare of farmers" "local RCC or Bank cares about me and my household" "loan products from RCC or Bank are flexible enough" "local RCC or Bank will provide loans to agriculture even when there is a downturn in the agricultural economy", and they can "find suitable channels to get help or to file complaints if not satisfied with the financial services provided by the RCC or Bank", as well as their ability to borrow needed amount of money from RCC for all different uses. We therefore define these 5 customers as being "uncaring".

Cluster 2: "Betweeners". This borrower cluster (n=85) has similar mean and median scores except for the question that asks whether the borrower can find suitable channels to get help or to file complaints if he or she is not satisfied with the financial services provided by the RCC or Bank, for which the median (4.00) is much higher than the mean (3.20), and the two questions that ask whether the borrower is able to borrow needed amount of money from Banks or RCC for consumption, education and health purposes, as well as for farming and business purposes, where the means (1.98 and 2.03 respectively) are much higher than the medians (1.00 and 1.00 respectively). We label customers in this cluster as in-betweeners since on average, the scores are roughly between Cluster 3 and Cluster 4 which represent the lowest and highest scores across the 4 clusters.

Cluster 3: Dissatisfied customers. This borrower cluster (n=62) has similar mean and median scores for all questions asked. This cluster has the lowest scores among the four clusters for all questions other than the two that ask the borrower whether allowing urban or city banks to set up bank branches in rural areas is a good idea, and that whether encouraging banks or RCCs to set up more ATMs, POS, cellphone banking in rural areas is a good idea, for which the dissatisfied customers in Cluster 3 give higher scores than the Pro-RCC customers that we will discuss shortly.

Cluster 4: Pro-RCC customers. This borrower cluster (n=80) has similar mean and median scores except for the two questions that ask whether the borrower perceive local the local RCC or Bank views agriculture/farming as being important, and that ask whether the borrower perceive the local RCC or Bank cares about the welfare of farmers, where both means (4.04 and 3.66 respectively) are higher than the medians (5.00 and 5.00 respectively). We label customers in Cluster 4 as being Pro-RCC since they give the highest scores for all the questions except for the two that ask the borrower whether having more bank branches of urban or city banks, and more ATMs, POS, and cellphone banking from banks or RCCs is a good idea, where the Pro-RCC customers give the lowest scores.

Based on the observations, we further group the four clusters into two groups, with one group representing the credit rationed borrowers (Cluster 1, 2, and 3 combined), and Cluster 4 representing the borrowers who are not credit rationed. While the credit rationed borrowers appear to hold attitudes of general disagreement and occasional, moderate agreement on that they are satisfied with the lending practices and services provided by the RCC or Bank, that local RCC or Bank cares about the welfare of them and their households, and that local RCC or Bank will provide loans to agriculture even when there is a downturn in the agricultural economy, as well as that it is a good idea to allow urban or city banks to set up bank branches and more ATMs, POS, and cellphone banking in rural areas, the group that is not credit rationed seem to hold strong agreement in these regards.

We do not observe obvious segmentations among borrowers on questions regarding whether local RCC or Bank views agriculture/farming as being important.

A strong attitudinal clash was observed between the two groups of borrowers on their ability to borrow needed amount of money from Banks or RCC for farming and business purposes and consumption, education and health purposes. While the credit rationed group responded with strong disagreement, the other group appear to agree in these two aspects.

We observe similar degrees of attitudes between two borrower groups on a few questions. Both groups tend to disagree that loan products from local RCC or bank are flexible enough to meet their ability to repay when they sell their products/at harvest, and disagree that they can find suitable channels to get help or to file complaints if they are not satisfied with the financial services provided by the RCC or Bank. Borrowers also tend to hold moderate agreement that there should be at least one Government regulated source of agricultural credit dedicated to providing loans to farming whether the agricultural economy is good or bad.

Do farmers not receiving credit resent RCC? There is a clear discourse between farmers who are not rationed and those who are rationed to some extent. Rationing has a residual effect on the psyche of farmers leading them to believe that lenders do not care about them or agriculture. As a strategic objective RCC lenders may do well by explaining to farmers why loans were denied and indicating how farmers can improve credit worthiness to obtain loans in the future. Extension efforts targeted to unqualified borrowers would improve the image of rural lenders.

Figure 4.15: Four Clusters of Borrowers with Distinct Attitudes towards RCC Lenders

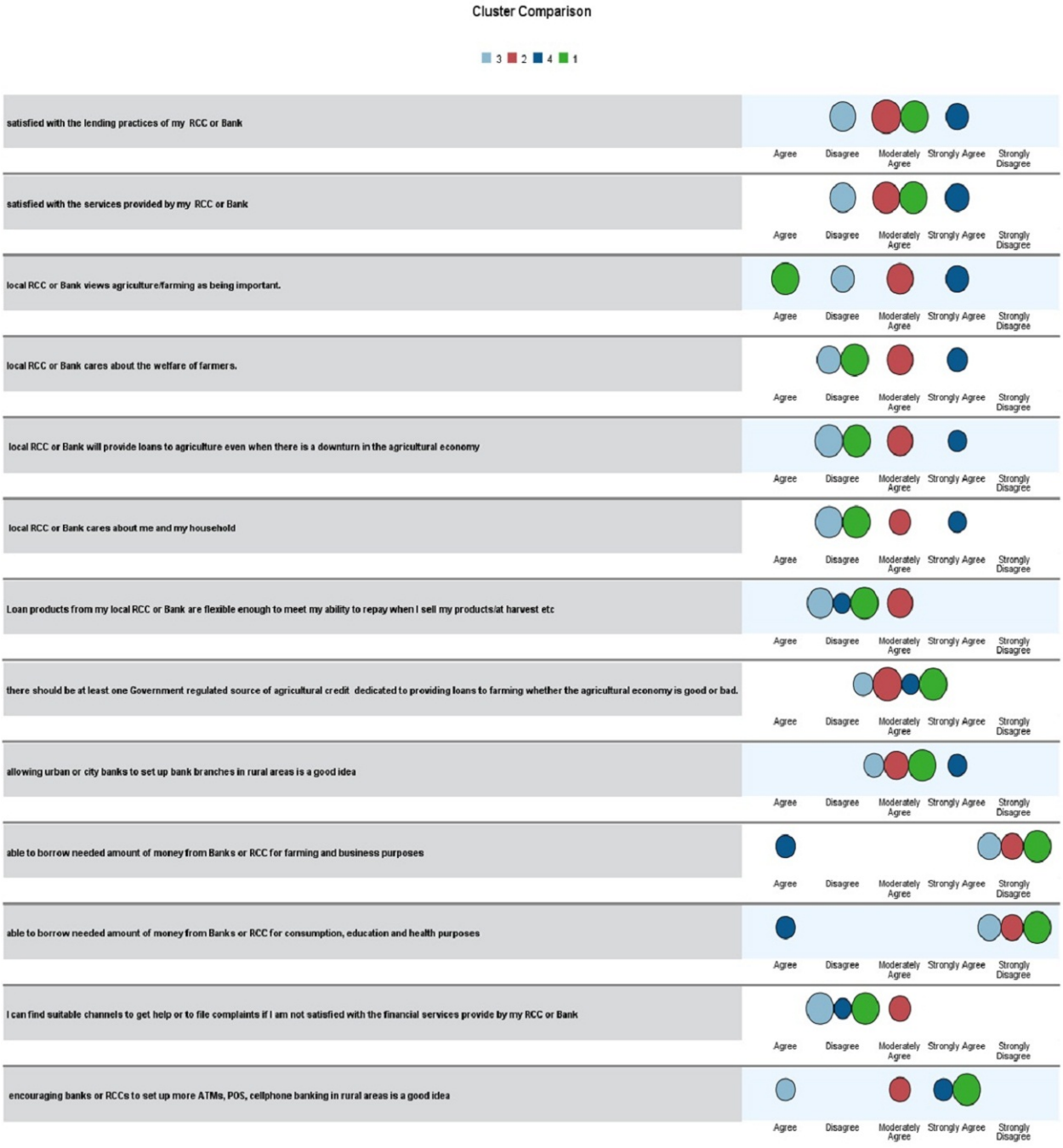


Table 4.2: Attributes of Four Borrower Clusters

	TwoStep Cluster Number							
	1		2		3		4	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Local RCC or Bank views agriculture/farming as being important.	3.00	3.00	3.82	4.00	2.65	2.50	4.04	5.00
Local RCC or Bank cares about the welfare of farmers.	2.00	2.00	3.64	4.00	2.38	2.00	3.66	5.00
Local RCC or Bank cares about me and my household	2.00	2.00	3.05	3.00	2.12	2.00	3.60	4.00
Loan products from my local RCC or Bank are flexible enough to meet my ability to repay when I sell my products/at harvest etc	2.00	2.00	3.46	4.00	2.31	2.00	2.45	2.00
Local RCC or Bank will provide loans to agriculture even when there is a downturn in the agricultural economy	2.00	2.00	3.51	4.00	2.22	2.00	3.94	4.00
Satisfied with the lending practices of my RCC or Bank	4.00	4.00	3.99	4.00	2.31	2.00	4.33	5.00
Satisfied with the services provided by my RCC or Bank	4.00	4.00	4.01	4.00	2.29	2.00	4.55	5.00
I can find suitable channels to get help or to file complaints if I am not satisfied with the financial services provided by my RCC or Bank	2.00	2.00	3.20	4.00	2.18	2.00	2.82	2.00
There should be at least one Government regulated source of agricultural credit dedicated to providing loans to farming whether the agricultural economy is good or bad.	4.00	4.00	3.96	4.00	2.95	3.00	3.83	4.00
Allowing urban or city banks to set up bank branches in rural areas is a good idea	4.00	4.00	4.16	4.00	3.44	4.00	3.70	3.00
Encouraging banks or RCCs to set up more ATMs, POS, cellphone banking in rural areas is a good idea	5.00	5.00	3.89	4.00	3.54	3.50	3.91	4.00
Able to borrow needed amount of money from Banks or RCC for consumption, education and health purposes	1.00	1.00	1.98	1.00	1.93	2.00	3.11	3.00
Able to borrow needed amount of money from Banks or RCC for farming and business purposes	1.00	1.00	2.03	1.00	1.78	2.00	3.24	3.00

Note: We define the four borrower clusters as follows based on their individual attributes:

Cluster 1: “Uncaring” customers (n=5)

Cluster 2: “Betweeners” (n=85)

Cluster 3: Dissatisfied customers (n=62)

Cluster 4: Pro-RCC customers (n=80)

4.2.2 Lender clusters

We obtain two clusters for Shandong RCC lenders, as shown in Figure 4.16. Based on the attributes of each, as shown in Table 4.3, we label them as follows:

Cluster 1: Indifferent lenders (n=65), with similar mean and median scores for all questions. Lenders in this cluster tend to be less pro-agriculture and have other lending preferences beyond farm households, as they give on average lower scores for all the questions than lenders in Cluster 2, except for the two questions that ask whether the lender thinks it is a good idea to allow urban or city banks to set up bank branches in rural areas, and to encourage banks and RCCs to set up more ATMs, POS, and mobile banking.

Cluster 2: Farmer-friendly lenders (n=55), with similar mean and median scores for all questions. Lenders in Cluster 2 tend to be pro-agriculture and are friendly to farm households, as we observe their scores are higher than Cluster 1 in all regards, except for the two questions regarding encouraging more branches to be set up by their competitors, where they give lower scores than lenders in Cluster 1.

Based on these observations, we therefore suggest the RCCs to train a team of lenders who specifically dedicate to farm household retail loans and separate their services from the broader agriculture related credit supply, to serve farm households customers exclusively.

Figure 4.16: Two Clusters of Lenders with Similar Attitudes towards RCC Borrowers

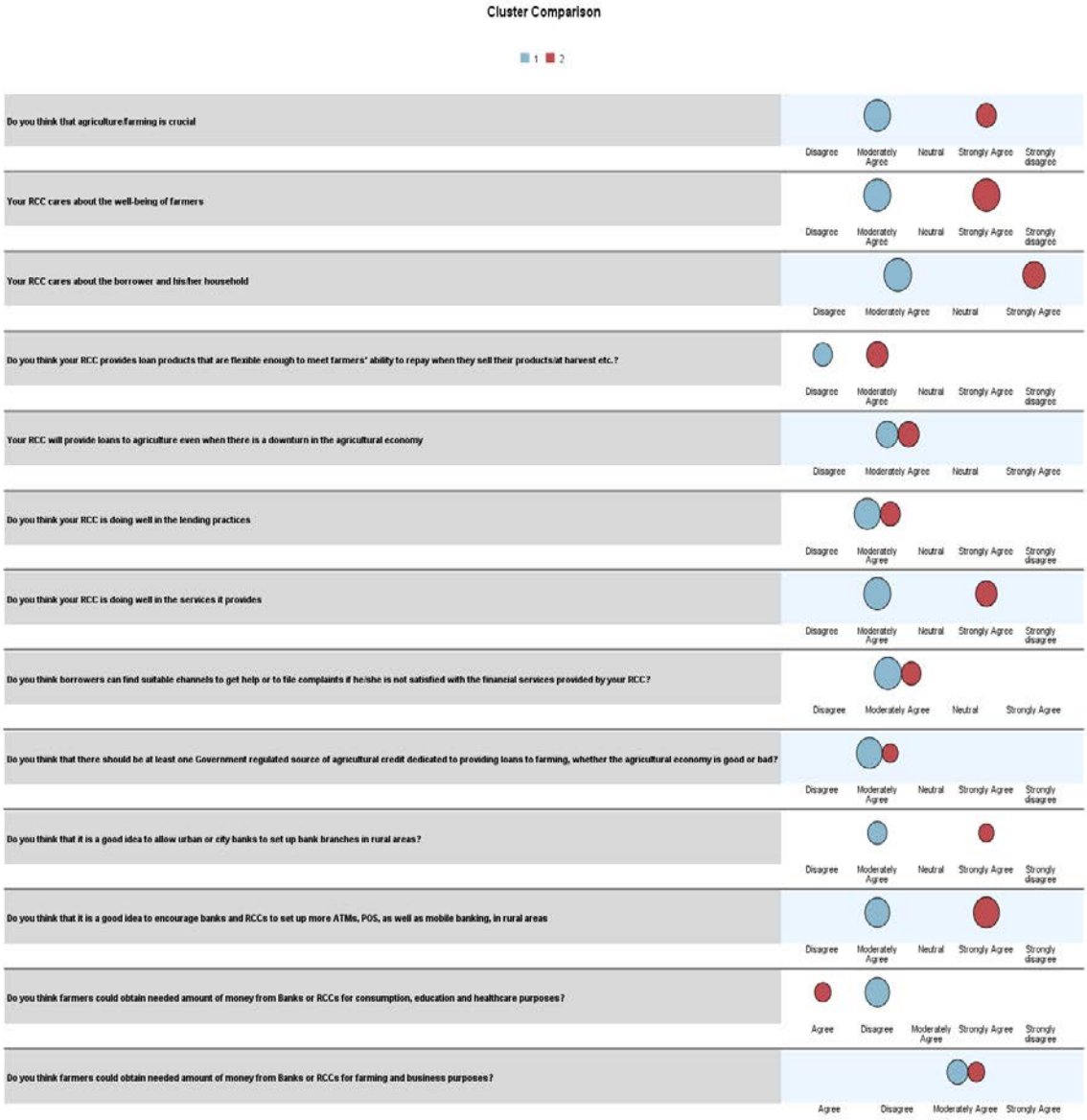


Table 4.3: Attributes of Two Lender Clusters

	TwoStep Cluster Number			
	1		2	
	Mean	Median	Mean	Median
Do you think that agriculture/farming is crucial?	3.69	4.00	4.33	4.00
Your RCC cares about the well-being of farmers	3.98	4.00	4.82	5.00
Your RCC cares about the borrower and his/her household	4.00	4.00	4.62	5.00
Do you think your RCC provides loan products that are flexible enough to meet farmers' ability to repay when they sell their products/at harvest etc.?	2.89	3.00	3.82	4.00
Your RCC will provide loans to agriculture even when there is a downturn in the agricultural economy	3.11	3.00	4.35	4.00
Do you think your RCC is doing well in the lending practices?	3.55	4.00	4.38	4.00
Do you think your RCC is doing well in the services it provides?	3.77	4.00	4.56	5.00
Do you think borrowers can find suitable channels to get help or to file complaints if he/she is not satisfied with the financial services provided by your RCC?	3.77	4.00	4.22	4.00
Do you think that there should be at least one Government regulated source of agricultural credit dedicated to providing loans to farming, whether the agricultural economy is good or bad?	3.58	4.00	3.33	4.00
Do you think that it is a good idea to allow urban or city banks to set up bank branches in rural areas?	3.15	3.00	2.96	3.00
Do you think that it is a good idea to encourage banks and RCCs to set up more ATMs, POS, as well as mobile banking, in rural areas?	4.20	4.00	4.73	5.00
Do you think farmers could obtain needed amount of money from Banks or RCCs for consumption, education and healthcare purposes?	2.48	2.00	3.09	3.00
Do you think farmers could obtain needed amount of money from Banks or RCCs for farming and business purposes?	3.52	4.00	4.00	4.00

Note: We define the two lender clusters as follows based on their individual attributes:

Cluster 1: Indifferent lenders (n=65)

Cluster 2: Farmer-friendly lenders (n=55)

4.3 Shandong borrowers

To assess the influence of demographics on the four borrower cluster membership, I run discriminant analysis together with regressions to examine these aspects.

4.3.1 Discriminant analysis: summary of canonical discriminant functions

Table 4.4: Borrower Discriminant Analysis: Eigenvalues

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	7.669	87.6	87.6	.941
2	1.021	11.7	99.3	.711
3	.063	.7	100.0	.243

A canonical correlation of .941, .711, and .243 for Function 1, 2 and 3 respectively, suggests the three functions explain 88.46%, 50.51%, and 5.90% of the variation (calculated as the square of the canonical correlation) in the grouping variable, i.e. the four borrower clusters with distinct attitudes towards RCC.

Table 4.5: Borrower Discriminant Analysis: Wilks' Lambda

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 3	.054	793.880	69	.000
2 through 3	.466	207.518	44	.000
3	.941	16.521	21	.740

Wilks' lambda indicates the significance of the discriminant function. This table indicates a highly significant function ($p < .000$) and provides the proportion of total variability not explained, i.e. we have 5.4%, 46.6%, and 94.1% unexplained in Function 1, 2, and 3.

Table 4.6: Borrower Discriminant Analysis: Standardized Canonical Discriminant Function Coefficients

Standardized Canonical Discriminant Function Coefficients

	Function		
	1	2	3
Sex of respondent	.170	-.131	.312
Age of respondent	-.026	.278	.071
Family size	.008	.034	-.253
Farm labor	-.048	-.119	.360
Worked outside	-.054	-.114	.364
Number of old people older than 65	.007	.204	.340
Number of children younger than 12	.044	-.186	.273
Education level of respondent	.167	-.177	.155
How many years have been farming	.124	-.203	-.127
Total land size hold (mu)	.176	.103	-.441
Income per mu from main plants	.066	.084	-.379
What was the total household income in the past 12 months from all sources including part time labor and remittances?	.498	.307	.581
Whether farming is the household's major operation?	.215	.391	.062
How much will you get (in RMB) if you sell all your assets (home, land, livestock, agriculture produce, etc.)	.048	.238	-.207
Are you a member of RCC	-.054	.025	-.460
Are you a member of a Group Guarantee?	.291	.349	.220
Loan from fomal institutions	-.161	.232	.097
Loan from friends and relatives	-.047	.095	.337
Land quality	.804	-.188	.139
Borrow relative	.668	-.278	-.216
Borrow friends	.273	-.317	-.219
Borrow RCC	.291	-.192	-.266
Borrow Bank	.244	-.290	-.184

The interpretation of the discriminant coefficients (or weights) is like that in multiple regressions. This table provides an index of the importance of each predictor like the standardized regression coefficients (Beta's) did in multiple regression. The sign indicates the direction of the relationship. Across the three functions, land quality (scoring .804 in Function 1 and -.188 and .139 in Function 2 and 3 respectively), source of credit including borrowing from relatives (scoring .668, -.278, and -.216 in Function 1, 2, and 3 respectively), friends (scoring .273, -.317, and -.219 in Function 1, 2, and 3

respectively), RCC (scoring .291, -.192, and -.266 in Function 1, 2, and 3 respectively), and Bank (scoring .244, -.290, and -.184 in Function 1, 2, and 3 respectively), total household income in the past 12 months (scoring .498, .307, and .581 in Function 1, 2, and 3 respectively), whether farming is household's major operation (scoring .215, .391, and .062 in Function 1, 2, and 3 respectively), and group guarantee membership (scoring .291, .349, and .220 in Function 1, 2, and 3 respectively)were the strongest predictors while the rest were less important as predictors in determining variances within the dependent group variable.

Table 4.7: Borrower Discriminant Analysis: Structure Matrix

Structure Matrix

	Function		
	1	2	3
Land quality	.532	-.378	.004
What was the total household income in the past 12 months from all sources including part time labor and remittances ?	.304	.487	.243
Borrow relative	.261	-.333	.006
Total land size hold (mu)	.259	.359	-.237
Whether farming is the household's major operation?	.230	.542	-.164
Are you a member of a Group Guarantee?	.156	.536	.070
Borrow friends	.146	-.330	-.219
Borrow RCC	.110	.295	-.091
Income per mu from the main plants	.106	.423	-.237
How many years have been farming	.072	-.095	-.216
Education level of respondent	.069	.045	-.038
Are you a member of RCC	.062	.122	-.359
Number of children younger than 12	.055	-.119	.185
Borrow Bank	.047	-.067	-.027
Age of respondent	-.044	.023	-.091
How much will you get (in RMB) if you sell all your assets (home, land, livestock, agriculture produce, etc.)	.035	.270	-.008
Loan from friends and relatives	.032	.042	.068
Number of old people older than 65	.030	.017	.186
Sex of respondent	-.028	-.178	.411
Loan from fomal institutions	.015	.104	.009
Farm labor	-.014	.147	.227
Worked outside	-.013	.033	.324
Family size	-.001	.222	.255

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions. Variables ordered by absolute size of correlation within Function 1.

Structure Matrix correlations are another way of indicating the relative importance of the predictors. The results suggest that the same pattern holds as in the Standardized Canonical Discriminant Function Coefficients. The Structure Matrix table shows the correlations of each variable with each discriminant function. These Pearson coefficients are structure coefficients or discriminant loadings. They serve like factor loadings in factor analysis. Generally, just like factor loadings, 0.30 is seen as the cut-off between important and less important variables.

The same pattern was observed in the Structure Matrix as in the Coefficient table above. These variables were chosen from Function 1 through 3, given their relative contribution to the discrimination between cluster groups. We rank variables in the order of their respective absolute size of correlation within Function 1, which suggests that land quality (scoring .532 in Function 1 and -.378 and .004 in Function 2 and 3 respectively) and total household income in the past 12 months (scoring .304, .487, and .243 in Function 1, 2, and 3 respectively) are the strongest predictors, while family size (scoring -.001, .222, and .255 in Function 1, 2, and 3 respectively) and family labor type that specifies farm labor (scoring -.014, .147, and .227 in Function 1, 2, and 3 respectively) or working outside (scoring -.013, .033, and .324 in Function 1, 2, and 3 respectively) are the poorest predictors. We provide detailed interpretations for the same variables in the following regression results.

4.3.2 Regression results

We report summary statistics for all independent variables used in the regressions in Table 4.8 and Table 4.9. Among the 286 included observations, the average age of borrowers is 49, with the oldest respondent being 77 years old and the youngest being 20 years old. 53 percent of the respondents (151 persons) are male, and 47 percent (135 persons) are female. The respondents have been farming for 23 years on average, with the maximum and minimum being 60 years and no farming experience. Respondents will get 160,570 yuan (USD25,516) on average if they sell all the assets (home, land,

livestock, agriculture produce, etc.), with the maximum and minimum being 800,000 yuan (USD127,125) and 10 yuan (USD1.6). The 286 farm households on average have 3.3 mu[17] (0.6 acre) of land, with the maximum and minimum being 30 mu (4.9 acre) and not owning any land. They hold on average 22,867 yuan (USD3,634) of loan borrowed from formal financial institutions, with the maximum and minimum being 5,050,000 yuan (USD802,479) and not having any debt outstanding. They also hold on average 2,206 yuan (USD351) of loan borrowed from friends and relatives, with the maximum and minimum being 200,000 yuan (USD31,781) and not owning any debt to friends and relatives. On average, respondents receive 4,100 yuan (USD652) per mu from main crop, with the maximum and minimum being 45,000 yuan (USD7,151) per mu and not receiving any income from main crop. The households receive 23,373 yuan (USD3,714) income in the past 12 months from all sources including part time labor and remittances, with the maximum and minimum being 80,000 yuan (USD12,713) and not having any income in the past 12 months.

The 286 households have on average 4.2 persons in the family, with the maximum and minimum being 7 persons and 1 person. They have on average 2 farm labors in the family, with the maximum and minimum being 6 farm labors and not having any farm labor. In an average farm household there is 1 non-farm labor working outside, with the maximum and minimum being 4 non-farm labors and none in a household. On average there is 0.4 person in one family that is older than 65 years old, and 0.8 person that is younger than 12 years old, with the maximum and minimum being 3 above-65-year-old family members and 4 below-12-year-old children, and none, respectively.

In terms of education, 129 respondents (45.1 percent of the 286 respondents) completed high school, 41 respondents (14.3 percent) received some high school education, 35 respondents (12.2 percent) completed elementary school, 31 respondents (10.8 percent) received some elementary school education, 23 respondents (8.0 percent) never went to school, 21 respondents (7.3 percent) received some university or college education, while 6 respondents (2.1 percent) completed university or college education.

[17] Chinese measurement for a unit of area. 1 mu = 6.070284634 acres.

For 121 households (42.3 percent of the 286 observations), farming is their major household operation, while it is not so for the remaining 165 households (57.7 percent). 23 households (8 percent) are members of the RCC while the other 263 households (92.0 percent) are not RCC members. 81 households (28.3 percent) are members of group guarantee while the other 205 households (71.7 percent) do not belong to a guarantee group.

In terms of the quality of their land, 135 respondents (47.2 percent) have moderate quality land, while 73 respondents (25.5 percent) have high quality land and 10 respondents (3.5 percent) have low quality land, and the remaining 68 households (23.8 percent) do not know the quality of their land.

In terms of the sources of credit, 138 respondents (48.3 percent) have borrowed from relatives while the remaining 148 respondents (51.7 percent) have not; 77 respondents (26.9 percent) have borrowed from friends while the remaining 209 (73.1 percent) have not; 56 respondents (19.6 percent) have borrowed from the RCC while the remaining 230 (80.4 percent) have not; 13 respondents (4.5 percent) have borrowed from a bank while the remaining 273 (95.5 percent) have not.

We report results from both the GLM linear and multinomial logistic regressions in Table 4.10, where identical statistical inference can be drawn as in the previous discriminant analysis. We interpret the same set of predictors that were of statistical significance, in the order of their respective importance in predicting the cluster membership as observed in previous analyses.

Table 4.8: Summary Statistics for Borrower Categorical Variables

Variable	Description		N	Percent
Gender	Female		135	47.2%
	Male		151	52.8%
	Total		286	100.0%
Education	Completed university/college		6	2.1%
	Some university/college		21	7.3%
	Completed high school		129	45.1%
	Some high school		41	14.3%
	Completed elementary school		35	12.2%
	Some elementary school		31	10.8%
	Never went to school		23	8.0%
	Total		286	100.0%
Farming major operation	Whether farming is the major household's operation or not?	Yes	121	42.3%
		No	165	57.7%
		Total	286	100.0%
Member RCC	Are you a member of RCC?	Yes	23	8.0%
		No	263	92.0%
		Total	286	100.0%
Member Group Guarantee	Are you a member of a Group Guarantee?	Yes	81	28.3%
		No	205	71.7%
		Total	286	100.0%
Quality of land	Do not know		68	23.8%
	High		73	25.5%
	Moderate		135	47.2%
	Low		10	3.5%
	Total		286	100.0%
Relatives_loan	Have borrowed from relatives	Yes	138	48.3%
		No	148	51.7%
		Total	286	100.0%
Friends_loan	Have borrowed from friends	Yes	77	26.9%
		No	209	73.1%
		Total	286	100.0%
RCC_loan	Have borrowed from RCC	Yes	56	19.6%
		No	230	80.4%
		Total	286	100.0%
Bank_loan	Have borrowed from Bank	Yes	13	4.5%
		No	273	95.5%
		Total	286	100.0%

Sample: 394; included observations: 286

Table 4.9: Summary Statistics for Borrower Continuous Variables

Variable	Description	N	Percent	Mean	Std. Dev.	Min	Max
Age		286	100.0%	48.6	10.7	20.0	77.0
Year farming	How many years have been farming	286	100.0%	23.0	14.4	0.0	60.0
Assets if sell (×1000)	How much will you get (in RMB) if you sell all your assets (home, land, livestock, agriculture produce etc.)	286	100.0%	160,570.0	152,968.2	10.0	800,000.0
Total land size (mu)		286	100.0%	3.3	3.2	0.0	30.0
Loan from FI (×1000)	Loan from formal institutions	286	100.0%	22,867.1	298,645.5	0.0	5,050,000.0
Loan from FR (×1000)	Loan from friends and relatives	286	100.0%	2,206.3	14,457.3	0.0	200,000.0
Income/mu of main crop (×1000)	The income per mu of the main plants	286	100.0%	4,099.9	7,726.7	0.0	45,000.0
Household income in past 12m (×1000)	What was the total household income in the past 12 months from all sources including part time labor and remittances ?	286	100.0%	23,373.4	20,768.7	0.0	80,000.0
Family size		286	100.0%	4.2	1.3	1.0	7.0
Farm labor		286	100.0%	2.0	0.9	0.0	6.0
Labor work outside		286	100.0%	0.9	0.9	0.0	4.0
No. ppl older than 65	Number of old people, age over 65	286	100.0%	0.4	0.7	0.0	3.0
No. ppl younger than 12	Number of children, age less than 12	286	100.0%	0.8	0.9	0.0	4.0

Sample: 394; included observations:286

Table 4.10: Regression Results: Influence of Demographics on Four Borrower Clusters

Parameter	Cluster 1				Cluster 2				Cluster 3				Cluster 4			
	Moderately agree				Moderately agree				Disagree				Strongly agree			
	Linear		Logistic		Linear		Logistic		Linear		Logistic		Linear		Logistic	
	B	p-value	B	p-value	B	p-value	B	p-value	B	p-value	B	p-value	B	p-value	B	p-value
Age	-0.000235	.830	-0.526055	.000	-0.003065	.301	-0.033889	.149	-0.001768	.475	-0.014851	.548	0.005068	.026	0.076526	.011
Gender	-0.040755	.052	1.152238	.294	-0.007650	.885	-0.041611	.916	0.079186	.113	0.677295	.130	-0.030781	.470	-0.642236	.229
Year farming	-0.001088	.266	1.774440	.000	0.002392	.144	0.036329	.046	0.001140	.514	0.016184	.462	-0.002445	.110	-0.031895	.086
Assets if sell (×1000)	-0.000040	.480	-0.000125	.000	-0.000093	.584	-0.000001	.650	-0.000232	.096	-0.000003	.068	0.000365	.021	0.000006	.002
Total land size (mu)	-0.007723	.087	-6.713524	.000	0.012601	.356	0.065108	.437	-0.016708	.182	-0.105966	.248	0.011829	.316	0.058346	.620
Loan from FI (×1000)	0.000073	.000	0.000051	.000	-0.000150	.000	-0.000001	.002	-0.000065	.033	-0.000023	.320	0.000142	.000	0.000001	.000
Loan from FR (×1000)	0.000004	.994	0.000608	.000	-0.002621	.181	-0.000012	.324	0.001446	.468	0.000009	.489	0.001171	.540	0.000016	.360
Inc./mu of main crop (×1000)	-0.001872	.292	0.001065	.000	0.004609	.239	0.000040	.185	-0.005047	.067	-0.000209	.050	0.002310	.535	0.000017	.702
Hh inc. in past 12m (×1000)	-0.004462	.000	-0.000179	.000	-0.004209	.033	-0.000021	.127	0.002309	.191	0.000032	.061	0.006362	.000	0.000054	.003
Family size	-0.004105	.628	-4.053776	.000	0.022789	.401	0.093134	.593	-0.019527	.490	-0.147844	.530	0.000842	.968	0.357275	.352
Farm labor	0.008518	.374	10.515320	.000	-0.023183	.486	-0.053918	.798	0.039159	.264	0.271953	.348	-0.024494	.328	-0.692124	.096
Labor work outside	0.013256	.232	10.536775	.000	-0.030977	.376	-0.211312	.421	0.042216	.175	0.306746	.268	-0.024495	.378	-0.428753	.281
No. ppl older than 65	-0.002211	.859	18.084608	.000	-0.070619	.061	-0.439015	.079	0.011452	.765	0.044336	.874	0.061378	.040	0.531355	.165
No. ppl younger than 12	-0.008345	.372	-8.558979	.000	0.001356	.962	0.037133	.815	0.047045	.130	0.382741	.072	-0.040055	.044	-0.468361	.248
Edu_completed univ/college	-0.369373	.000	-50.585076	.000	0.535859	.030	3.623945	.036	0.178955	.334	2.029513	.113	-0.345441	.002	-22.701412	.000
Edu_some univ/college	-0.097746	.033	-71.538665	.000	0.027760	.831	0.711868	.534	0.188592	.099	1.713199	.074	-0.118606	.309	-0.947413	.460
Edu_completed highschool	-0.033033	.293	-55.329646	.000	0.065894	.463	0.851320	.353	0.062745	.402	0.749739	.358	-0.095606	.210	-1.066331	.205
Edu_some highschool	-0.074258	.059	-39.641914	.000	0.078399	.441	0.900637	.358	0.089475	.356	0.693480	.480	-0.093617	.296	-0.743834	.401
Edu_completed elementary	-0.053814	.058	-54.081341	.000	0.158998	.135	1.343923	.146	-0.012347	.891	-0.010160	.991	-0.092837	.252	-1.146560	.180
Edu_some elementary	-0.039443	.202	-59.267552	.000	0.088881	.371	0.932244	.362	0.049943	.596	0.311222	.766	-0.099381	.205	-0.786087	.501
Edu_never school	0.000000	.	0.000000	.	0.000000	.	0.000000	.	0.000000	.	0.000000	.	0.000000	.	0.000000	.
Farming major operation	-0.099338	.001	-51.561702	.000	-0.090097	.248	-0.415748	.382	-0.044615	.571	0.081066	.861	0.234050	.000	2.311141	.000
Member RCC	0.016107	.564	-8.106643	.037	0.148613	.169	0.733207	.288	-0.153552	.051	-1.656155	.067	-0.011169	.909	0.087858	.935
Member Group Guarantee	-0.116884	.000	32.534802	.000	-0.102144	.243	-0.492113	.403	-0.015652	.815	0.386016	.528	0.234679	.001	1.637748	.011
Quality of land	-0.220801	.000	-30.383973	.000	0.093796	.012	0.781810	.002	0.119921	.001	1.130729	.001	0.007083	.853	0.361828	.316
Relatives_loan	-0.255791	.000	-80.843948	.000	0.244192	.000	1.630152	.001	0.093395	.134	1.069920	.021	-0.081796	.189	-0.532137	.363
Friends_loan	-0.096819	.000	-35.807602	.000	0.184728	.012	0.899276	.045	0.056778	.404	0.178451	.676	-0.144686	.004	-2.426026	.000
RCC_loan	-0.132815	.002	-45.809835	.000	0.204592	.003	1.253004	.014	0.020279	.786	0.355386	.570	-0.092056	.165	-1.035497	.097
Bank_loan	-0.167597	.026	-67.577979	.000	0.342580	.019	2.051901	.025	0.080185	.555	0.460930	.579	-0.255168	.015	-1.278399	.264

Obs. Total 394, excluded 108, effective 286. Likelihood Ratio Chi-Square = 644.8 and 322.8 for linear and logit regressions with Cluster 1; 105.9 and 100.5 with Cluster 2, 77.4 and 84.9 with Cluster 3, 230.0 and 192.3 with Cluster 4, all significant at the .05 level.

Quality of land: Better land quality, less favor RCC. Across Cluster 1, 2 (moderately agree) and Cluster 3 (disagree), the likelihood of borrower being in the cluster increased from a negative 22.0801 percentage to a positive 9.3796 percentage, to a positive 11.9921 percentage.

Major source of farm household credit[18]*:*

- *Loan from relatives*: Similar impacts of loans from relatives and friends on attitudes towards RCC, given same signs for both dummies across all clusters, except for Cluster 4 which is statistically not significant. In Cluster 1, 2 (moderately agree) and Cluster 3 (disagree), the likelihood of borrower being in the cluster returns a negative 25.5791 percentage, a positive 24.4192 percentage, and a positive 9.3395 percentage respectively.
- *Loan from friends:* Better access to loans from friends, less favor towards RCC. In Cluster 1, 2 (moderately agree) and Cluster 4 (strongly agree), the likelihood of borrower being in the cluster returns a negative 9.6819 percentage, a positive 18.4728 percentage, and a negative 14.4686 percentage respectively.
- *Loan from RCC*: Similar impacts of loans from RCC and banks on attitudes towards RCC, given same signs for both dummies across all clusters. In Cluster 1 and 2 (moderately agree), the likelihood of borrower being in the cluster returns a negative 13.2815 percentage, and a positive 20.4592 percentage respectively.
- *Loan from Bank*: More access to bank loans, less favor RCC. In Cluster 1, 2 (moderately agree) and Cluster 4 (strongly agree), the likelihood of borrower being in the cluster returns a negative 16.7597 percentage, a positive 34.2580 percentage, and a negative 25.5168 percentage respectively.

Loan from Formal Institutions[19] *(×1000):* Stronger agreement attitude towards RCC is positively associated with loan amount from formal institutions. Across Cluster 3 (disagree) to Cluster 4 (strongly

[18] We include in the regression model both dummy variables that specify five distinct sources of farm household credit, i.e., loan from relatives, friends, RCC, Bank, and money lender/other sources/no debt, as well as three continuous predictors that specify the loan amount from Formal Institutions, the loan amount from Friends and Relatives, and the loan amount from Informal Sources.

agree), the likelihood of borrower being in the cluster increased from a negative 0.0065 percentage to a positive 0.0142 percentage.

Household income in past 12 months (×1000): Stronger agreement attitude towards RCC is positively associated with household income from all sources in the past 12 months. An 1000 yuan incremental increase in income is associated with a 0.6362 percentage increase in the likelihood of borrower being in Cluster 4 (strongly agree), a 0.4462 percentage decrease and a 0.4209 percentage decrease in the likelihood of borrower being in Cluster 1 and 2 respectively (both moderately agree), and a 0.2309 percentage increase in the likelihood of borrower being in Cluster 3 (strongly agree).

Whether farming is household's major operation: Households with farming being major operation tend to favor RCC. Across Cluster 1 (moderately agree) to Cluster 4 (strongly agree), the likelihood of borrower being in the cluster increased from a negative 9.9338 percentage to a positive 23.4050 percentage.

Member of Group Guarantee: Being a group guarantee member is associated with positive attitudes towards RCC. Across Cluster 1 (moderately agree) to Cluster 4 (strongly agree), the likelihood of borrower being in the cluster increased from a negative 11.6884 percentage to a positive 23.4679 percentage.

Total amount obtained if sell all household assets (home, land, livestock, agriculture produce, etc.) (×1000): Assets amount has strong positive correlation with favor towards RCC; an 1000 yuan incremental increase in total assets sold is associated with a 0.0232 percentage decrease in the likelihood of borrower being in cluster 3 (disagree), a 0.0040 percentage decrease in the likelihood of borrower being in cluster 1 (moderately agree), and a 0.0365 percentage increase in the likelihood of borrower being in cluster 3 (strongly agree).

Level of education: For Cluster 1 and 4 that favor RCCs, the negative coefficient signs across all the seven different levels of education indicate that higher educated borrowers have less favor towards

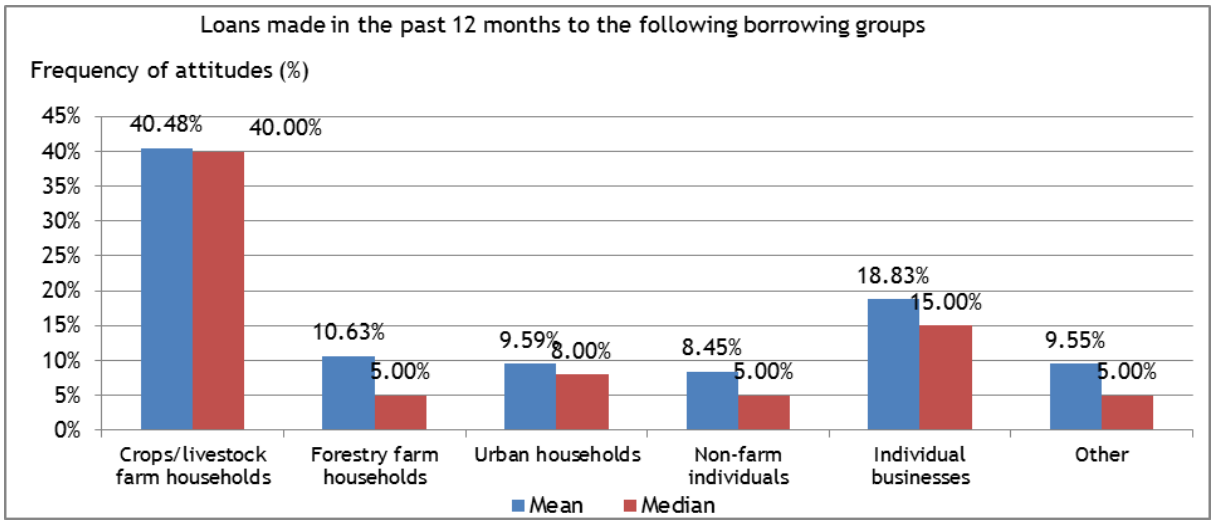
[19] We specify in the survey that Formal Institutions include RCC, ABC, Postal Savings bank, and commercial banks excluding the previous three types of financial institutions; Informal Sources include Community Mutual Fund/Loan, NGO, Money lenders, Pawn shop, Credit Only Loan Company (non-deposit) Institution, and other loan sources.

RCC, likely due to their limited demand for RCC credit. The absolute value of coefficients in Cluster 1 increased progressively as the education level advances. As shown in Table 4.10, for borrowers in Cluster 1 (moderately agree), the likelihood of them being in this cluster declined sharply from a 5.3814 percentage decrease for "completed elementary", to a 7.4258 percentage decrease for "some high school" and a 9.7746 percentage decrease for "some university/college", which was followed by a 36.9373 percentage drop for "completed university/college". This was consistent with the trend in Cluster 4 (strongly agree), where a borrower who completed university/college degree is associated with a 34.5441 percentage decrease in the likelihood of him/her being in this group.

4.4 Shandong lenders

Similarly, I conduct discriminant analysis and regressions to assess how demographics influence the two cluster membership of the loan officers. We specified on the survey to lenders that all the questions target credit extension to farm households, in order to match with the survey to farm household borrowers.

Figure 4.17: Above 40 Percent Loans Made in the Past 12 Months were to Farm Households for Crops/Livestock Use



4.4.1 Discriminant analysis: summary of canonical discriminant functions

Table 4.11: Lender Discriminant Analysis: Eigenvalues

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.229[a]	100.0	100.0	.432

a. First 1 canonical discriminant functions were used in the analysis.

A canonical correlation of .432 for the Function suggests the Function explain 18.66% (square of the canonical correlation) of the variation in the grouping variable, i.e. whether the lender belongs to Cluster 1 or 2.

Table 4.12: Lender Discriminant Analysis: Wilks' Lambda

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.813	19.204	16	.258

Wilks' lambda indicates an insignificant discriminant function (p >.05) and provides the proportion of total variability not explained, i.e. we have 81.3% unexplained in the Function.

Table 4.13: Lender Discriminant Analysis: Standardized Canonical Discriminant Function Coefficients

Standardized Canonical Discriminant Function Coefficients

	Function 1
Approximated percentage loans made in past 12 months to: Farm households for crops/livestock	.763
Approximated percentage loans made in past 12 months to: Individual businesses	.506
County	.311
Age	.311
Approximated percentage loans made in past 12 months to: Farm households for forestry	.266
Percentage loans acquainted loan officers rejected among all received applications	-.266
Your monthly after-tax income (including bonus, subsidy, etc)	.259
Percentage loans you rejected among all received applications	.257
Percentage loans your RCC rejected among all received applications	-.176
Your highest education level	.169
Approximated percentage loans made in past 12 months to: Non-farm individuals (professional like lawyers, doctors, etc.)	.163
Years of formal training in agriculture related area	.111
Years working as a loan officer	-.092
Gender	-.084
Percentage loan amount actually lent to borrower/total amount requested in latest quarter	.083
Average loan amount held by typical client borrowed from friends, relatives, or other informal sources	.023

Variables re-ordered by absolute size of coefficient value.

Despite the weak explanatory power indicated by the Canonical Correlation value and Wilks' Lambda, we provide interpretation of the discriminant coefficients for consistency. Among 16 predictors, percentage of loans made in past 12 months to farm households for crops/livestock (scoring .763) and to individual businesses (scoring .506) as well as to farm households for forestry (scoring .266), county, age, percentage of loans acquainted loan officers rejected among all received applications (scoring -.266), and monthly after-tax income (including bonus, subsidy, etc.) are the most important predictors in that order. The remaining predictors were less important determining variances within the lender cluster membership.

Table 4.14: Lender Discriminant Analysis: Structure Matrix

Structure Matrix

	Function 1
County	.521
Approximated percentage loans made in past 12 months to: Farm households for crops/livestock	.503
Years working as a loan officer	.376
Percentage loans acquainted loan officers rejected among all received applications	-.354
Your monthly after-tax income (including bonus, subsidy, etc)	.322
Percentage loan amount actually lent to borrower/total amount requested in latest quarter	.321
Years of formal training in agriculture related area	.311
Gender	-.284
Approximated percentage loans made in past 12 months to: Individual businesses	.272
Age	.234
Percentage loans your RCC rejected among all received applications	-.233
Approximated percentage loans made in past 12 months to: Urban households[a]	.227
Approximated percentage loans made in past 12 months to: Farm households for forestry	.227
Percentage loans you rejected among all received applications	-.175
Approximated percentage loans made in past 12 months to: Non-farm individuals (professional like lawyers, doctors, etc.)	-.136
Your highest education level	-.112
Average loan amount held by typical client borrowed from friends, relatives, or other informal sources	.007

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions. Variables ordered by absolute size of correlation within function.
a. This variable not used in the analysis.

The same pattern of predictor importance was observed in the Structure Matrix, as in the Coefficient table above. We again rank variables in the order of their respective absolute value of correlation within Function 1. Given the .30 threshold for the importance measurement, we observe that county (scoring .521), percentage of loans made in past 12 months to farm households for crops/livestock (scoring .503), years working as a loan officer (scoring .376), percentage loans acquainted loan officers rejected among all received applications (scoring -.354), monthly after-tax income (including bonus, subsidy, etc., scoring .322), percentage of loan amount actually lent to borrower out of total amount requested in last quarter (scoring .321), as well as years of formal training in agriculture related area

(scoring .311) were the strongest predictors, while average loan amount held by typical client borrowed from friends, relatives, or other informal sources (scoring .007) was the poorest predictor. We provide detailed interpretations for these variables in the following regression results.

4.4.2 Regression results

Again we run GLM (General Linearized Model) regressions and report summary statistics for all independent variables in Table 4.15 and Table 4.16. Among the 103 observations, we have 35, 35, and 33 loan officers from Shan Xian, Cao Xian, and Cheng Wu counties, respectively. 38 of the 103 observations (36.9 percent) are female and 65 (63.1 percent) are male. The average age among the 103 lenders is 34, with the maximum and minimum being 48 and 21. They have been working as a loan officer for an average of 4.6 years, with the maximum and minimum being 25 years and zero (those who just started the job as a loan officer). They have received an average of 2.8 years' agriculture related formal training, with the maximum and minimum being 25 years and no training at all.

In terms of education, 67 lenders (65.0 percent out of the 103 observations) have an associate degree, 24 lenders (23.3 percent) have a University bachelor degree, 9 lenders (8.7 percent) have a high school degree, 2 lenders (1.9 percent) received graduate school degrees, and 1 lender (1.0 percent) received a middle school degree.

We obtain lenders' compensation measured by their monthly after-tax income. 49 lenders (47.6 percent) receive after-tax income of RMB3,000 – 5,000 (USD477 – 795) per month, 47 lenders (45.6 percent) receive after-tax income less than RMB3,000 (USD477) per month, 6 lenders (5.8 percent) receive after-tax income of RMB5,000 – 7,000 (USD795 - 1,112) per month, and 1 lender (1.0 percent) receives after-tax income higher than RMB9,000 (USD1,430).

In terms of their lending performance, on average, the average loan amount held by their typical client borrowed from friends, relatives, or other informal sources is 139,806 yuan (USD22,216), with the maximum and minimum being 3,400,000 yuan (USD540,283) and not having any debt outstanding to

friends, relatives, or other informal sources. Among all received applications, on average the 103 lenders rejected 0.1 percent of the loans, with the maximum and minimum being 0.8 percent and zero; on average their RCC rejected the same 0.1 percent, with the maximum and minimum being 0.9 percent and zero; on average their acquainted loan officers also rejected 0.1 percent of the filed loan applications, with the maximum and minimum being 0.9 percent and zero.

On average, the 103 lenders actually lent out 50 percent of the requested loan amount to the borrower in the latest quarter, with the maximum and minimum being 100 percent and zero. In terms of the use of loans, an approximate 39 percent of loans made in the past 12 months were to farm households for crops and livestock use, 10 percent to far households for forestry use, 10 percent to urban households, 8 percent to non-farm individuals (professionals like lawyers, doctors, etc.), and 19 percent to individual businesses.

We report results for both Linear and Multinomial Logistic regressions in Table 4.17, in the same way as we conducted the analyses for the borrowers' four cluster membership. The difference in the lender membership analysis from the borrower analysis turns out to be, the two lenders clusters are each the baseline to the other when we include each as a dummy variable in regression equations. This explains the exact same significance level for very predictor in both clusters, and the exact same absolute value of each coefficient, though obviously opposite signs.

We interpret an identical set of predictors that were of statistical significance, in the order of their respective importance in predicting the cluster membership as observed in the determinant analyses.

Credit allocation:

- *Approximated percentage loans made in past 12 months to Farm households for crops/livestock use*: Higher percentage of loans to farm households for crops/livestock use is associated with stronger attitudes of the lender agreeing that RCC serves the credit demand of borrowers well and is favored by clients. One unit increase in the percentage of this kind of loans is associated with a 57.7702 percentage increase in the likelihood of lender being in Cluster 2 (strongly agree) instead of being in Cluster 1 (moderately agree).

- *Approximated percentage loans made in past 12 months to Individual businesses*: Similarly, higher percentage of loans to individual businesses is associated with stronger attitudes of the lender agreeing that RCC serves the credit demand of borrowers well and is favored by clients. One unit increase in the percentage of this kind of loans is associated with a 68.7392 percentage increase in the likelihood of lender being in Cluster 2 (strongly agree) instead of being in Cluster 1 (moderately agree).

Monthly after-tax income (including bonus, subsidy, etc.): Higher income for the lender seems to be associated with more caution towards RCC performance. We observe that between a lower income (and hence likely to be junior) loan officer whose monthly after-tax income is within the RMB3,000-5,000 range, and a higher income (and hence likely to be senior) loan officer whose monthly after-tax income is higher than RMB9,000, the difference in cluster membership is a 17.5302 percentage increase in the likelihood of lender being in Cluster 2 (strongly agree) instead of being in Cluster 1 (moderately agree), versus a 33.4232 percentage increase in the likelihood of lender being in Cluster 1 rather than Cluster 2.

Level of education: The coefficient signs for all the five levels of educations are positive for Cluster 1 (moderately agree), while the absolute coefficient value increases as the education level advances. Across loan officers with highest education being high school, associate degree, University bachelor degree, and graduate school, the associated likelihoods of them being in Cluster 2 (strongly agree) rather than in Cluster 1 gets higher, ranging from a percentage increase of 63.5348, 52.6873, 56.7034, and 85.8180, respectively.

Table 4.15: Summary Statistics for Lender Categorical Variables

Variable	Description	N	Percent
County	Shan Xian	35	34.0%
	Cao Xian	35	34.0%
	Cheng Wu	33	32.0%
	Total	103	100.0%
Gender	Female	38	36.9%
	Male	65	63.1%
	Total	103	100.0%
Education	Graduate school	2	1.9%
	University bachelor degree	24	23.3%
	Associate degree	67	65.0%
	High school	9	8.7%
	Middle school	1	1.0%
	Total	103	100.0%
Monthly after-tax income	Higher than RMB9,000	1	1.0%
	RMB5,000 - 7,000	6	5.8%
	RMB3,000 - 5,000	49	47.6%
	Less than RMB3,000	47	45.6%
	Total	103	100.0%

Sample: 120; included observations: 103.

Table 4.16: Summary Statistics for Lender Continuous Variables

Variable	N	Percent	Mean	Std. Dev.	Min	Max
Age	103	100.0%	34.0	7.4	21.0	48.0
Years of formal training in agriculture related area	103	100.0%	2.8	5.0	0.0	25.0
Years working as a loan officer	103	100.0%	4.6	5.5	0.0	25.0
Average loan amount held by typical client borrowed from friends, relatives, or other informal sources (×1000)	103	100.0%	139,805.8	446,382.5	0.0	3,400,000.0
Percentage loans YOU rejected among all received applications	103	100.0%	0.1	0.2	0.0	0.8
Percentage loans YOUR RCC rejected among all received applications	103	100.0%	0.1	0.2	0.0	0.9
Percentage loans ACQUAINTED LOAN OFFICERS rejected among all received applications	103	100.0%	0.1	0.2	0.0	0.9
Percentage loan amount actually lent to borrower/total amount requested in latest quarter	103	100.0%	0.5	0.3	0.0	1.0
Approximated percentage loans made in past 12 months to: Farm households for crops/livestock	103	100.0%	0.4	0.3	0.0	1.0
Approximated percentage loans made in past 12 months to: Farm households for forestry	103	100.0%	0.1	0.1	0.0	1.0
Approximated percentage loans made in past 12 months to: Urban households	103	100.0%	0.1	0.1	0.0	1.0
Approximated percentage loans made in past 12 months to: Non-farm individuals (professional like lawyers, doctors, etc.)	103	100.0%	0.1	0.1	0.0	1.0
Approximated percentage loans made in past 12 months to: Individual businesses	103	100.0%	0.2	0.2	0.0	1.0

Sample: 120; included observations: 103.

Table 4.17: Regression Results: Influence of Demographics on Two Lender Clusters

Parameter	Cluster 1				Cluster 2			
	Moderately agree				Strongly agree			
	Linear		Logistic		Linear		Logistic	
	B	p-value	B	p-value	B	p-value	B	p-value
County: Shan Xian	-0.143731	.317	-0.694348	.339	0.143731	.317	0.694348	.339
County: Cao Xian	0.049260	.723	0.231465	.751	-0.049260	.723	-0.231465	.751
County: Cheng Wu	0.000000	.	0.000000	.	0.000000	.	0.000000	.
Gender: Female	0.067244	.564	0.380230	.508	-0.067244	.564	-0.380230	.508
Gender: Male	0.000000	.	0.000000	.	0.000000	.	0.000000	.
Education: Graduate school	-0.858180	.004	-24.549604	.	0.858180	.004	24.549631	.
Education: University bachelor degree	-0.567034	.000	-22.845761	.	0.567034	.000	22.845788	.
Education: Associate degree	-0.526873	.000	-22.644738	.	0.526873	.000	22.644765	.
Education: High school	-0.635348	.003	-23.255667	.	0.635348	.003	23.255694	.
Education: Middle school	0.000000	.	0.000000	.	0.000000	.	0.000000	.
Monthly after-tax income: Higher than RMB9,000	0.334232	.052	21.884223	.000	-0.334232	.052	-21.884223	.000
Monthly after-tax income: RMB5,000 - 7,000	-0.150111	.497	-0.817929	.500	0.150111	.497	0.817929	.500
Monthly after-tax income: RMB3,000 - 5,000	-0.175302	.091	-0.892436	.083	0.175302	.091	0.892436	.083
Monthly after-tax income: Less than RMB3,000	0.000000	.	0.000000	.	0.000000	.	0.000000	.
Age	-0.001874	.845	-0.004739	.925	0.001874	.845	0.004739	.925
Years of formal training in agriculture related area	-0.001933	.860	-0.007046	.910	0.001933	.860	0.007046	.910
Years working as a loan officer	0.004667	.694	0.024159	.692	-0.004667	.694	-0.024159	.692
Average loan amount held by typical client borrowed from friends, relatives, or other informal sources (×1000)	-0.000030	.790	-0.000143	.	0.000030	.790	0.000143	.
Percentage loans YOU rejected among all received applications	-0.343306	.346	-1.828894	.331	0.343306	.346	1.828894	.331
Percentage loans YOUR RCC rejected among all received applications	0.095415	.812	0.785526	.711	-0.095415	.812	-0.785526	.711
Percentage loans ACQUAINTED LOAN OFFICERS rejected among all received applications	0.346647	.412	1.340847	.565	-0.346647	.412	-1.340847	.565
Percentage loan amount actually lent to borrower/total amount requested in latest quarter	-0.017890	.898	-0.127281	.867	0.017890	.898	0.127281	.867
Approximated percentage loans made in past 12 months to: Farm households for crops/livestock	-0.577702	.001	-3.457237	.002	0.577702	.001	3.457237	.002
Approximated percentage loans made in past 12 months to: Farm households for forestry	0.095681	.754	0.146946	.959	-0.095681	.754	-0.146946	.959
Approximated percentage loans made in past 12 months to: Urban households	-0.063789	.754	-1.452520	.558	0.063789	.754	1.452520	.558
Approximated percentage loans made in past 12 months to: Non-farm individuals (professional like lawyers, doctors, etc.)	-0.263041	.526	-1.710591	.474	0.263041	.526	1.710591	.474
Approximated percentage loans made in past 12 months to: Individual businesses	-0.687392	.086	-4.235054	.077	0.687392	.086	4.235054	.077

Obs. Total 120, excluded 17, effective 103. Likelihood Ratio Chi-Square = 28.8 and 29.7 for linear and logit regressions, respectively. Significant at the .05 level only for Cluster 2.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

In this thesis I analyzed the disconnects between lenders' and borrowers' perceptions on various sets of identical questions regarding RCC lending practices. The specific objectives investigated were: RCCs' care towards farm household borrowers and their demand for agricultural credit, reasons that farm households loan applications are rejected by an RCC, the role of group guarantee membership in RCC lending, loan officers' concerns during loan reviews, cost of borrowing for RCC credit, reasons for borrower default, credit rationing, and loan officers' preferences towards borrowers. Key findings include that there are mismatches between lenders' and borrowers' understandings regarding the role of "trust" and "care" towards borrowers, guarantee mechanisms, and the timing of repayments.

Generally, I discover that there is a fundamental disconnect between how farmers perceive lenders and how lenders perceive farmers and agriculture. Much of this appears to be a matter of communication between the lender and the borrower, as well as a borrower and lender education issue. I therefore recommend that RCCs embark on policy initiatives to close this gap in order to better align expectations of lenders and borrowers. The recommendations are outlined as follows.

Referring to Figure 1.3, the triangle relationship between the RCC as a financial institution, the loan officer as the employee, and the farm household as the customer, I have identified specific strategies for each of the branches, representing relationship between the institution and its employee, the institution and its customer, as well as the direct relationship between the employee and the customers.

Recommendation 1: RCC – customer relationship: RCCs should work on marketing and delivering to farm households the idea that they care about agriculture and the well-being of farm households.

Recommendation 2: RCC – customer relationship: RCCs should invest resources in educating rural households about best credit practices. These marketing efforts should also emphasize credit education to borrowers regarding understanding loan contracts and terms.

Recommendation 3: RCC – employee relationship: RCCs should have a devoted team of loan officers who specialize in farm household loans vis-à-vis broader agriculture related loans, which is the current categorization on RCC loan books regarding agricultural credit but in fact a large part of which comprises of loans to small-and-medium sized enterprises engaging in agriculture related businesses. Compared with the usual rural team, this farm team should have different incentives, in terms of both compensation and performance measurement, to reward their specialization in farm retail loans.

Recommendation 4: Employee – customer relationship: RCCs should invest in marketing efforts to ease the tensions between loan officers and farm households regarding their different understanding towards the role of group guarantees, procedure and cost of borrowing in approving a loan, as well as in loan servicing.

Recommendation 5: Employee – RCC relationship: RCCs should provide regular training to loan officers to ensure enforcement of lending practices and standardization of loan servicing.

For future research, I propose that borrower data that exactly matches up with the lenders be collected for analyses. In this study I used borrower data from a prior survey conducted in 2009 to farm households in the same province, but not likely matched up to the identical three counties. Particularly, I have in total 14 valid borrower data points to pair with the 120 lenders for the question on reasons that borrowers being rejected a loan, since on the 2009 survey, that was followed by a previous question asking if the borrower has borrowed from local RCCs and if yes (15 farmers), what the reasons are for being rejected a loan. To ensure representativeness, I compare results from this Shandong borrower survey with an identical survey to 897 farm household in Shannxi province conducted in 2009, and found borrowers' attitudes were consistent. It would be intriguing to obtain sufficient data from farm households who are the usual customers of our surveyed RCCs.

Future research should also investigate specific issues that we observed in this study, such as the role of group guarantee membership in RCC lending. My conjecture from paring perceptions of the borrower and the lender is that the borrower tends to overemphasize the importance of being a group guarantee member in loan approval, while the lender takes group guarantee requirement less seriously. Studying this particular issue in the rural lending regime will help examine the unintended policy rationing effect that lead to insufficient credit supply in rural China.

This study opens the doors for future research to employ quantitative methods to study RCCs and the RCC system. These include credit subsidies to rural financial institutions and target credit extension to farm households in forms of government subsidies on interest rates, and taxes to the institutions.

APPENDIX

1. Non-parametric test: Mann-Whitney U test (independent 2 samples)

The Mann–Whitney *U* test (also called the Mann–Whitney–Wilcoxon (MWW) or Wilcoxon rank-sum test) is a non-parametric statistical hypothesis test for assessing whether one of two samples of independent observations tends to have larger values than the other.

Compared to Student's t-test, the U test is usually suitable for small sample sizes (less than 15 samples). The major differences between the two tests are:

Ordinal data: U remains the logical choice when the data are ordinal but not interval scaled, so that the spacing between adjacent values cannot be assumed to be constant.

Robustness: As it compares the sums of ranks, the Mann–Whitney test is less likely than the *t*-test to spuriously indicate significance because of the presence of outliers – i.e. Mann–Whitney is more robust.

Efficiency: When normality holds, *MWW* has an (asymptotic) efficiency of $3/\pi$ or about 0.95 when compared to the *t* test. For distributions sufficiently far from normal and for sufficiently large sample sizes, the *MWW* can be considerably more efficient than the *t.*

2. Results from parametric and non-parametric tests

2.1 Results of T-tests

<Table AI Group Statistics for *t*-Test>

<Table AII Independent Samples Test for *t*-Test>

2.2 Results of non-parametric U tests

<Table AIII Hypothesis Test Summary for U-Test>

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Table 4.18: Borrower Descriptive Statistics

Descriptive Statistics for All Borrowers

	N	Minimum	Maximum	Mean	Std. Deviation
Age of respondent	394	20	77.00	48.25	10.97
Sex of respondent	394	0	1.00	0.50	0.50
How many years have been farming	387	.00	60.00	23.52	14.37
How much will you get (in RMB) if you sell all your assets (home, land, livestock, agriculture produce, etc.)	385	10.00	900,000.00	151,818.21	153,248.49
Total land size hold (mu)	390	.00	30.00	3.18	3.07
Loan from formal institutions	394	.00	5,050,000.00	17,050.76	254,538.50
Loan from friends and relatives	394	.00	200,000.00	1,708.12	12,391.76
Income per mu from main plants	333	.00	130,000.00	4,436.76	10,571.50
What was the total household income in the past 12 months from all sources including part time labor and remittances ?	388	0	150,000.00	24,881.15	22,190.73
Family size	391	1	9.00	4.03	1.44
Farm labor	393	0	6.00	1.80	1.02
Worked outside	391	0	4.00	0.92	0.89
Number of old people older than 65	390	0	3.00	0.44	0.69
Number of children younger than 12	391	0	4.00	0.92	1.01
Education level of respondent	392	0	6.00	3.09	1.50
Whether farming is the household's major operation?	388	0	1.00	0.38	0.49
Are you a member of RCC?	390	0	1.00	0.08	0.28
Are you a member of a Group Guarantee?	378	0	1.00	0.23	0.42
Land quality	387	.00	3.00	1.41	0.85
Borrow relative	394	.00	1.00	0.56	0.50
Borrow friends	394	.00	1.00	0.37	0.48
Borrow RCC	394	.00	1.00	0.17	0.38
Borrow Bank	394	.00	1.00	0.04	0.19
Borrow Money Lender or none or others	394	.00	1.00	0.24	0.43
Valid N (listwise)	300				

Table 4.19: Lender Descriptive Statistics

Descriptive Statistics for All Lenders

	N	Minimum	Maximum	Mean	Std. Deviation
County	120	1	3.00	2.00	0.82
Gender	120	1	2.00	1.37	0.48
Your highest education level	120	1	5.00	3.13	0.66
Your monthly after-tax income (including bonus, subsidy, etc)	120	1	5.00	1.67	0.70
Age	120	21	48.00	34.44	7.46
Years of formal training in agriculture related area	120	0	25.00	2.57	4.77
Years working as a loan officer	119	0	30.00	4.81	6.07
Average loan amount held by typical client borrowed from friends, relatives, or other informal sources	116	0	3,400,000.00	130,534.48	421,695.35
Percentage loans you rejected among all received applications	118	0	0.80	0.14	0.16
Percentage loans your RCC rejected among all received applications	118	0	0.90	0.14	0.16
Percentage loans acquainted loan officers rejected among all received applications	118	0	0.90	0.15	0.17
Percentage loan amount actually lent to borrower/total amount requested in latest quarter	114	0	0.99	0.51	0.35
Approximated percentage loans made in past 12 months to: Farm households for crops/livestock	118	0	0.99	0.39	0.29
Approximated percentage loans made in past 12 months to: Farm households for forestry	119	0	0.70	0.10	0.12
Approximated percentage loans made in past 12 months to: Urban households	120	0	0.60	0.10	0.11
Approximated percentage loans made in past 12 months to: Non-farm individuals (professional like lawyers, doctors, etc.)	120	0	0.70	0.08	0.12
Approximated percentage loans made in past 12 months to: Individual businesses	120	0	0.92	0.19	0.17
Approximated percentage loans made in past 12 months to: Other	120	0	0.60	0.09	0.12
Valid N (listwise)	103				

Table AI: Group Statistics for t-Test

Group Statistics

	Lender or borrower	N	Mean	Std. Deviation	Std. Error Mean
How well do you think the available amount of bank/RCC loans can serve the credit demand of farm households	1.00	120	1.78	.476	.043
	.00	168	1.58	.594	.046
If you reject a loan application, where do you think the farm household borrowers will likely obtain the loan?	1.00	120	2.42	1.274	.116
	.00	203	6.67	9.825	.690
Reason to reject a loan application - Insufficient collateral	1.00	120	1.83	.382	.035
	.00	11	1.64	.505	.152
Reason to reject a loan application - Crops/Livestock subject to too much price risk	1.00	120	1.68	.470	.043
	.00	10	1.00	.000	.000
Reason to reject a loan application - Subject to too much yield risk	1.00	120	1.63	.486	.044
	.00	10	1.40	.516	.163
Reason to reject a loan application - The crops grown are vulnerable to the extreme weather	1.00	120	1.43	.496	.045
	.00	10	1.00	.000	.000
Reason to reject a loan application - The farm household borrower has failed to repay the loan in the past	1.00	120	2.00	.000	.000
	.00	10	1.00	.000	.000
Reason to reject a loan application - The farm household borrower has old debt outstanding	1.00	120	1.89	.312	.028
	.00	0	.	.	.
Reason to reject a loan application - Personally do not believe that the farm household borrower is trustworthy	1.00	120	1.61	.490	.045
	.00	10	1.20	.422	.133
Reason to reject a loan application - Do not believe that the farm household borrower could earn enough income	1.00	120	1.57	.498	.045
	.00	10	1.00	.000	.000
Reason to reject a loan application - Do not believe that the farm household borrower has stable income	1.00	120	1.51	.502	.046
	.00	0	.	.	.
Reason to reject a loan application - Do not believe that the farm household borrower could properly manage his income to repay a loan	1.00	120	1.55	.500	.046
	.00	0	.	.	.
Reason to reject a loan application - Mismatch between the repayment schedule required by RCC or bank and the timing of sales from the farm household borrower's farm	1.00	120	1.53	.501	.046
	.00	10	1.00	.000	.000
Reason to reject a loan application - Could not find someone to guarantee loan	1.00	120	1.76	.430	.039
	.00	10	1.30	.483	.153
Reason to reject a loan application - Other	1.00	120	1.77	.425	.039
	.00	0	.	.	.
Do you think your farm household borrower perceive his/her personal credit as important?	1.00	120	3.80	1.034	.094
	.00	282	4.50	.717	.043
Does your RCC only lend loans when borrowers provide "Group Guarantee"?	1.00	120	1.63	.486	.044
	.00	123	1.00	.000	.000
Do you think it is hard for a borrower to get a loan?	1.00	120	3.61	.892	.081
	.00	199	3.20	1.214	.086

Table AI: Group Statistics for t-Test (Continued)

Do you think the procedure is complicated for a farm household borrower to apply for a loan?	1.00	120	2.56	.924	.084
	.00	200	2.96	1.017	.072
Do you think a loan application takes very long?	1.00	120	2.11	.632	.058
	.00	198	1.96	.667	.047
If your farm household borrower is a member of a Group Guarantee, You will lend him/her a larger loan than other borrowers could get, because of his/her Group Guarantee membership?	1.00	120	2.04	.703	.064
	.00	73	3.42	1.013	.119
If your farm household borrower is a member of a Group Guarantee, You will make it easier for him/her to get a loan, because of his/her Group Guarantee membership?	1.00	120	2.48	.916	.084
	.00	73	3.75	.910	.106
If your farm household borrower is a member of a Group Guarantee, You think the borrower will still prefer to join a Group Guarantee to get larger loans, even if he/she could get a loan individually?	1.00	120	2.46	.986	.090
	.00	73	3.51	1.345	.157
If your farm household borrower is a member of a Group Guarantee, You will give a lower interest rate to him/her than what you give to other borrowers, because of his/her Group Guarantee membership?	1.00	120	2.26	.912	.083
	.00	73	3.18	.991	.116
If a borrower does not join a Group Guarantee, you think it's because: He/She has sufficient collateral to obtain a loan	1.00	120	3.22	1.055	.096
	.00	215	1.92	.903	.062
If a borrower does not join a Group Guarantee, you think it's because: He/She does not want to guarantee someone else's debt	1.00	120	3.20	.949	.087
	.00	215	3.37	1.387	.095
If a borrower does not join a Group Guarantee, you think it's because: The procedures of joining a Group Guarantee are too bothersome	1.00	120	2.49	.935	.085
	.00	194	2.04	1.035	.074
If your borrower could borrow more debt from money lenders, you think they will:	1.00	120	1.50	.580	.053
	.00	271	1.20	.444	.027
Do you think that agriculture/farming is crucial	1.00	120	3.98	.898	.082
	.00	291	3.37	1.168	.068
Your RCC cares about the well-being of farmers	1.00	120	4.37	.744	.068
	.00	291	3.02	1.266	.074
Your RCC cares about the borrower and his/her household	1.00	120	4.28	.611	.056
	.00	289	2.79	1.195	.070
Do you think your RCC provides loan products that are flexible enough to meet farmers' ability to repay when they sell their products/at harvest etc.?	1.00	120	3.32	1.195	.109
	.00	289	2.60	1.108	.065
Your RCC will provide loans to agriculture even when there is a downturn in the agricultural economy	1.00	120	3.68	1.030	.094
	.00	290	3.06	1.210	.071
Do you think your RCC is doing well in the lending practices	1.00	120	3.93	.896	.082
	.00	286	3.61	1.070	.063
Do you think your RCC is doing well in the services it provides	1.00	120	4.13	.788	.072
	.00	286	3.64	1.114	.066

Table AI: Group Statistics for t-Test (Continued)

Do you think borrowers can find suitable channels to get help or to file complaints if he/she is not satisfied with the financial services provided by your RCC?	1.00	120	3.98	.825	.075
	.00	285	2.62	1.074	.064
Do you think that there should be at least one Government regulated source of agricultural credit dedicated to providing loans to farming, whether the agricultural economy is good or bad?	1.00	120	3.47	1.181	.108
	.00	286	3.65	1.078	.064
Do you think that it is a good idea to allow urban or city banks to set up bank branches in rural areas?	1.00	120	3.07	1.364	.125
	.00	290	3.79	1.088	.064
Do you think that it is a good idea to encourage banks and RCCs to set up more ATMs, POS, as well as mobile banking, in rural areas	1.00	120	4.44	.754	.069
	.00	285	3.97	1.105	.065
Do you think farm household borrowers would be willing to pay more than the current interest rate to obtain a larger loan?	1.00	120	2.36	1.019	.093
	.00	290	2.57	1.296	.076
What proportion of household income do you think the farmers are able to save in a year (in RMB)?	1.00	120	3.58	.717	.065
	.00	189	2.44	.717	.052
Do you think farmers could obtain needed amount of money from Banks or RCCs for consumption, education and healthcare purposes?	1.00	120	2.76	1.061	.097
	.00	287	2.32	1.294	.076
Do you think farmers could obtain needed amount of money from Banks or RCCs for farming and business purposes?	1.00	120	3.74	.815	.074
	.00	287	2.34	1.274	.075
Biggest concerns when you make lending decisions - The farm household borrower has unpaid debts on previous loans from your RCC or banks	1.00	120	3.86	1.071	.098
	.00	275	1.95	1.095	.066
Biggest concerns when you make lending decisions - The farm household borrower's family culture is to borrow as little as possible	1.00	120	3.13	1.061	.097
	.00	275	3.71	1.265	.076
Biggest concerns when you make lending decisions - You do not consider this household "credit-worthy"	1.00	120	2.96	1.103	.101
	.00	277	2.12	.985	.059
Biggest concerns when you make lending decisions - The farm household borrower does not want to ask another villager to sign a group guarantee	1.00	120	2.83	1.074	.098
	.00	273	2.47	1.185	.072
Biggest concerns when you make lending decisions - The farm household borrower could not find someone to provide a third-party individual guarantee	1.00	120	2.78	1.134	.103
	.00	269	3.15	1.356	.083
Biggest concerns when you make lending decisions - The farm household borrower does not want to have to guarantee another villager's debts	1.00	120	3.38	.880	.080
	.00	274	2.51	1.133	.068
Biggest concerns when you make lending decisions - The farm household borrower thinks that the process of getting a group guarantee is too cumbersome/difficult	1.00	120	2.69	.960	.088
	.00	273	2.22	1.265	.077
Biggest concerns when you make lending decisions - Interest rates on RCC or bank loans are higher than interest rates that a farm household borrower could obtain from friends or relatives	1.00	120	2.71	1.048	.096
	.00	277	3.74	1.038	.062

Table AI: Group Statistics for t-Test (Continued)

Biggest concerns when you make lending decisions - Interest rates on RCC or bank loans are higher than a farm household borrower is able to pay	1.00	120	2.73	.935	.085
	.00	277	2.47	1.051	.063
Biggest concerns when you make lending decisions - The farm household borrower does not own the collateral to get a loan	1.00	120	3.27	1.083	.099
	.00	276	3.43	1.369	.082
Biggest concerns when you make lending decisions - The banks/RCCs are located too far for the farm household borrowers to travel	1.00	120	2.04	.965	.088
	.00	277	1.64	.775	.047
Biggest concerns when you make lending decisions - The farm household borrower thinks your RCC or bank requires too much paper work	1.00	120	1.68	.917	.084
	.00	274	2.05	1.083	.065
Biggest concerns when you make lending decisions - The farm household borrower thinks your RCC or bank takes too long in approving a loan	1.00	120	2.91	1.029	.094
	.00	274	2.09	1.111	.067
Biggest concerns when you make lending decisions - Do you think that farm household borrowers believe your RCC colleagues or bank lenders require a bribe from them to approve their loan applications	1.00	120	2.64	1.011	.092
	.00	271	2.19	1.011	.061
Biggest concerns when you make lending decisions - The farm household borrower prefers to borrow from a friends or relative	1.00	120	1.95	.798	.073
	.00	278	3.96	1.101	.066
Biggest concerns when you make lending decisions - It's easier for the farm household borrower to obtain loans from friends and relatives rather than from banks and RCCs	1.00	120	2.98	1.004	.092
	.00	278	3.99	1.121	.067
Biggest concerns when you make lending decisions - The farm household borrower prefers to borrow from a money lender	1.00	120	2.97	1.037	.095
	.00	277	1.63	.827	.050
Biggest concerns when you make lending decisions - The farm household borrower prefers to get supplier credit or to transact on credit	1.00	120	2.86	.990	.090
	.00	275	2.79	1.179	.071
Biggest concerns when you make lending decisions - The farm household borrower does not like to be indebted to a bank or RCC	1.00	120	2.96	.991	.090
	.00	276	3.60	1.359	.082
Biggest concerns when you make lending decisions - The farm household borrower does not like to buy microcredit disability insurance required by banks or RCCs	1.00	120	3.08	1.109	.101
	.00	275	2.34	1.129	.068
Do you think the farm household borrower would be more likely to borrow from a bank or RCC, if interest rates on RCC or bank loans were lower than current interest rates	1.00	120	3.76	1.037	.095
	.00	288	3.65	1.268	.075
Do you think the farm household borrower would be more likely to borrow from a bank or RCC, if the cost of obtaining a loan (fees, non-interest charges) on RCC or bank loans were lower than current costs	1.00	120	3.23	1.080	.099
	.00	288	3.68	1.233	.073
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - Lack of financial recourses	1.00	120	3.23	1.148	.105
	.00	291	3.66	1.267	.074
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - Terms of contract not clear	1.00	120	2.41	1.081	.099
	.00	291	1.92	1.161	.068

Table AI: Group Statistics for t-Test (Continued)

Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - Suffered crop loss, or cattle loss	1.00	120	3.47	1.061	.097
	.00	291	3.57	1.438	.084
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - Suffered death or major sickness of a family member	1.00	120	3.55	1.083	.099
	.00	289	3.48	1.214	.071
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - The borrower diverted the loan for other purpose	1.00	120	2.87	1.283	.117
	.00	289	2.24	1.232	.072
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - The borrower believes it could be profitable to default on a loan	1.00	120	2.46	1.256	.115
	.00	288	1.60	.623	.037
Will you lend a higher loan to a borrower who owns more assets (land user rights/home ownership, etc.) without using the assets for collateral?	1.00	120	2.64	1.002	.092
	.00	290	1.96	.940	.055
Will you lend a higher loan to a borrower who owns more assets (land user rights/home ownership, etc.) but only if he/she uses the assets as collateral?	1.00	120	3.25	1.169	.107
	.00	286	3.53	1.110	.066
Will you lend a higher loan to a borrower who owns more assets (land user rights/home ownership, etc.) at a lower interest rates, without using the assets as collateral?	1.00	120	2.24	.987	.090
	.00	290	2.08	.995	.058
Will you lend a higher loan to a borrower who owns more assets (land user rights/home ownership, etc.) at a lower interest rates, but only if he/she uses the assets as collateral?	1.00	120	3.07	1.186	.108
	.00	290	2.30	1.124	.066
Do you believe that honest borrowers are compelled to pay higher interest rate, because some borrowers do not repay their loan?	1.00	120	2.58	.993	.091
	.00	289	2.85	1.007	.059
Do you believe that honest borrowers are not able to obtain a needed amount of loan, because some of the villagers do not repay their loan or divert the loan for other purpose?	1.00	120	2.93	1.083	.099
	.00	289	2.90	.978	.058
Do you think that the borrower would be willing to pay a higher interest rate, to obtain the needed amount of loan?	1.00	120	2.53	.970	.089
	.00	290	2.37	1.102	.065
Do you believe that a borrower who accepts a loan that is very high relative to his/her assets is more likely to VOLUNTARILY default on that loan?	1.00	120	3.19	1.190	.109
	.00	290	3.21	1.129	.066
Do you believe that a borrower who accepts a loan at a higher interest rate is more likely to VOLUNTARILY default on that loan?	1.00	120	3.14	1.110	.101
	.00	289	3.23	1.251	.074
What are the criteria that you would prioritize when approving a loan: The borrower's ability to repay	1.00	120	4.63	.711	.065
	.00	290	4.35	.892	.052
What are the criteria that you would prioritize when approving a loan: The borrower's social connections	1.00	120	3.03	1.191	.109
	.00	288	3.56	1.164	.069
What are the criteria that you would prioritize when approving a loan: The borrower's Party membership	1.00	120	2.58	.904	.082
	.00	284	2.55	1.305	.077

Table AI: Group Statistics for t-Test (Continued)

What are the criteria that you would prioritize when approving a loan: The borrower's connection to the government	1.00	120	2.29	.793	.072
	.00	285	2.85	1.185	.070

Table AII: Independent Samples Test for t-Test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
How well do you think the available amount of bank/RCC loans can serve the credit demand of farm households	Equal variances assumed	19.307	.000	3.017	286	.003	.198	.066	.069	.327
	Equal variances not assumed			3.129	282.267	.002	.198	.063	.073	.322
If you reject a loan application, where do you think the farm household borrowers will likely obtain the loan?	Equal variances assumed	45.307	.000	-4.721	321	.000	-4.258	.902	-6.033	-2.484
	Equal variances not assumed			-6.089	213.362	.000	-4.258	.699	-5.637	-2.880
Reason to reject a loan application - Insufficient collateral	Equal variances assumed	5.244	.024	1.526	129	.130	.189	.124	-.056	.433
	Equal variances not assumed			1.209	11.074	.252	.189	.156	-.155	.532
Reason to reject a loan application - Crops/Livestock subject to too much price risk	Equal variances assumed	70.531	.000	4.522	128	.000	.675	.149	.380	.970
	Equal variances not assumed			15.721	119.000	.000	.675	.043	.590	.760
Reason to reject a loan application - Subject to too much yield risk	Equal variances assumed	.081	.777	1.400	128	.164	.225	.161	-.093	.543
	Equal variances not assumed			1.330	10.374	.212	.225	.169	-.150	.600
Reason to reject a loan application - The crops grown are vulnerable to the extreme weather	Equal variances assumed	427.761	.000	2.698	128	.008	.425	.158	.113	.737
	Equal variances not assumed			9.379	119.000	.000	.425	.045	.335	.515
Reason to reject a loan application - Personally do not believe that the farm household borrower is trustworthy	Equal variances assumed	15.091	.000	2.554	128	.012	.408	.160	.092	.725
	Equal variances not assumed			2.903	11.131	.014	.408	.141	.099	.717
Reason to reject a loan application - Do not believe that the farm household borrower could earn enough income	Equal variances assumed	544.000	.000	3.588	128	.000	.567	.158	.254	.879
	Equal variances not assumed			12.475	119.000	.000	.567	.045	.477	.657
Reason to reject a loan application - Mismatch between the repayment schedule required by RCC or bank and the timing of sales from the farm household borrower's farm	Equal variances assumed	3928.615	.000	3.299	128	.001	.525	.159	.210	.840
	Equal variances not assumed			11.468	119.000	.000	.525	.046	.434	.616
Reason to reject a loan application - Could not find someone to guarantee loan	Equal variances assumed	.544	.462	3.210	128	.002	.458	.143	.176	.741
	Equal variances not assumed			2.906	10.224	.015	.458	.158	.108	.809
Do you think your farm household borrower perceive his/her personal credit as important?	Equal variances assumed	34.514	.000	-7.793	400	.000	-.700	.090	-.877	-.523
	Equal variances not assumed			-6.757	169.698	.000	-.700	.104	-.904	-.496

Table AII: Independent Samples Test for t-Test (Continued)

Does your RCC only lend loans when borrowers provide "Group Guarantee"?	Equal variances assumed	1829.815	.000	14.259	241	.000	.625	.044	.539	.711
	Equal variances not assumed			14.083	119.000	.000	.625	.044	.537	.713
Do you think it is hard for a borrower to get a loan?	Equal variances assumed	9.570	.002	3.191	317	.002	.407	.128	.156	.658
	Equal variances not assumed			3.438	304.864	.001	.407	.118	.174	.640
Do you think the procedure is complicated for a farm household borrower to apply for a loan?	Equal variances assumed	.034	.855	-3.539	318	.000	-.402	.114	-.625	-.178
	Equal variances not assumed			-3.624	269.606	.000	-.402	.111	-.620	-.183
Do you think a loan application takes very long?	Equal variances assumed	.007	.932	1.965	316	.050	.149	.076	.000	.298
	Equal variances not assumed			1.991	261.732	.048	.149	.075	.002	.296
If your farm household borrower is a member of a Group Guarantee, You will lend him/her a larger loan than other borrowers could get, because of his/her Group Guarantee membership?	Equal variances assumed	30.877	.000	-11.181	191	.000	-1.383	.124	-1.627	-1.139
	Equal variances not assumed			-10.261	114.440	.000	-1.383	.135	-1.650	-1.116
If your farm household borrower is a member of a Group Guarantee, You will make it easier for him/her to get a loan, because of his/her Group Guarantee membership?	Equal variances assumed	.109	.742	-9.425	191	.000	-1.278	.136	-1.546	-1.011
	Equal variances not assumed			-9.443	153.061	.000	-1.278	.135	-1.546	-1.011
If your farm household borrower is a member of a Group Guarantee, You think the borrower will still prefer to join a Group Guarantee to get larger loans, even if he/she could get a loan individually?	Equal variances assumed	12.898	.000	-6.224	191	.000	-1.049	.168	-1.381	-.716
	Equal variances not assumed			-5.782	119.112	.000	-1.049	.181	-1.408	-.689
If your farm household borrower is a member of a Group Guarantee, You will give a lower interest rate to him/her than what you give to other borrowers, because of his/her Group Guarantee membership?	Equal variances assumed	.111	.739	-6.574	191	.000	-.920	.140	-1.196	-.644
	Equal variances not assumed			-6.443	142.456	.000	-.920	.143	-1.202	-.638
If a borrower does not join a Group Guarantee, you think it's because: He/She has sufficient collateral to obtain a loan	Equal variances assumed	7.485	.007	11.888	333	.000	1.300	.109	1.085	1.516
	Equal variances not assumed			11.378	216.174	.000	1.300	.114	1.075	1.526
If a borrower does not join a Group Guarantee, you think it's because: He/She does not want to guarantee someone else's debt	Equal variances assumed	87.246	.000	-1.177	333	.240	-.167	.142	-.447	.112
	Equal variances not assumed			-1.305	319.452	.193	-.167	.128	-.420	.085
If a borrower does not join a Group Guarantee, you think it's because: The procedures of joining a Group Guarantee are too bothersome	Equal variances assumed	.000	.999	3.931	312	.000	.456	.116	.228	.684
	Equal variances not assumed			4.026	271.600	.000	.456	.113	.233	.678
If your borrower could borrow more debt from money lenders, you think they will:	Equal variances assumed	51.404	.000	5.602	389	.000	.301	.054	.195	.406
	Equal variances not assumed			5.063	183.398	.000	.301	.059	.184	.418

Table AII: Independent Samples Test for t-Test (Continued)

Do you think that agriculture/farming is crucial	Equal variances assumed	51.421	.000	5.176	409	.000	.616	.119	.382	.849
	Equal variances not assumed			5.764	285.865	.000	.616	.107	.405	.826
Your RCC cares about the well-being of farmers	Equal variances assumed	69.825	.000	10.919	409	.000	1.349	.124	1.107	1.592
	Equal variances not assumed			13.414	361.443	.000	1.349	.101	1.152	1.547
Your RCC cares about the borrower and his/her household	Equal variances assumed	104.989	.000	12.972	407	.000	1.491	.115	1.265	1.717
	Equal variances not assumed			16.616	390.500	.000	1.491	.090	1.315	1.667
Do you think your RCC provides loan products that are flexible enough to meet farmers' ability to repay when they sell their products/at harvest etc.?	Equal variances assumed	4.277	.039	5.858	407	.000	.722	.123	.479	.964
	Equal variances not assumed			5.677	208.162	.000	.722	.127	.471	.972
Your RCC will provide loans to agriculture even when there is a downturn in the agricultural economy	Equal variances assumed	13.863	.000	4.921	408	.000	.620	.126	.372	.867
	Equal variances not assumed			5.258	258.866	.000	.620	.118	.388	.852
Do you think your RCC is doing well in the lending practices	Equal variances assumed	25.070	.000	2.925	404	.004	.325	.111	.107	.543
	Equal variances not assumed			3.143	264.509	.002	.325	.103	.121	.528
Do you think your RCC is doing well in the services it provides	Equal variances assumed	39.627	.000	4.409	404	.000	.493	.112	.273	.713
	Equal variances not assumed			5.059	311.095	.000	.493	.098	.302	.685
Do you think borrowers can find suitable channels to get help or to file complaints if he/she is not satisfied with the financial services provided by your RCC?	Equal variances assumed	43.624	.000	12.394	403	.000	1.357	.110	1.142	1.573
	Equal variances not assumed			13.775	287.983	.000	1.357	.099	1.163	1.551
Do you think that there should be at least one Government regulated source of agricultural credit dedicated to providing loans to farming, whether the agricultural economy is good or bad?	Equal variances assumed	6.889	.009	-1.523	404	.129	-.184	.121	-.421	.053
	Equal variances not assumed			-1.467	206.237	.144	-.184	.125	-.431	.063
Do you think that it is a good idea to allow urban or city banks to set up bank branches in rural areas?	Equal variances assumed	24.825	.000	-5.667	408	.000	-.723	.128	-.974	-.472
	Equal variances not assumed			-5.165	184.631	.000	-.723	.140	-.999	-.447
Do you think that it is a good idea to encourage banks and RCCs to set up more ATMs, POS, as well as mobile banking, in rural areas	Equal variances assumed	25.853	.000	4.289	403	.000	.473	.110	.256	.690
	Equal variances not assumed			4.984	321.514	.000	.473	.095	.286	.660
Do you think farm household borrowers would be willing to pay more than the current interest rate to obtain a larger loan?	Equal variances assumed	30.420	.000	-1.589	408	.113	-.211	.133	-.471	.050
	Equal variances not assumed			-1.753	279.857	.081	-.211	.120	-.447	.026

Table AII: Independent Samples Test for t-Test (Continued)

What proportion of household income do you think the farmers are able to save in a year (in RMB)?	Equal variances assumed	1.889	.170	13.608	307	.000	1.139	.084	.974	1.304
	Equal variances not assumed			13.609	253.451	.000	1.139	.084	.974	1.304
Do you think farmers could obtain needed amount of money from Banks or RCCs for consumption, education and healthcare purposes?	Equal variances assumed	13.287	.000	3.248	405	.001	.434	.134	.171	.697
	Equal variances not assumed			3.521	269.612	.001	.434	.123	.191	.677
Do you think farmers could obtain needed amount of money from Banks or RCCs for farming and business purposes?	Equal variances assumed	48.104	.000	11.149	405	.000	1.404	.126	1.156	1.651
	Equal variances not assumed			13.271	339.194	.000	1.404	.106	1.196	1.612
Biggest concerns when you make lending decisions - The farm household borrower has unpaid debts on previous loans from your RCC or banks	Equal variances assumed	.049	.825	16.013	393	.000	1.906	.119	1.672	2.140
	Equal variances not assumed			16.150	231.289	.000	1.906	.118	1.673	2.138
Biggest concerns when you make lending decisions - The farm household borrower's family culture is to borrow as little as possible	Equal variances assumed	11.565	.001	-4.389	393	.000	-.579	.132	-.839	-.320
	Equal variances not assumed			-4.701	267.730	.000	-.579	.123	-.822	-.337
Biggest concerns when you make lending decisions - You do not consider this household "credit-worthy"	Equal variances assumed	2.492	.115	7.481	395	.000	.836	.112	.616	1.055
	Equal variances not assumed			7.154	204.889	.000	.836	.117	.605	1.066
Biggest concerns when you make lending decisions - The farm household borrower does not want to ask another villager to sign a group guarantee	Equal variances assumed	8.330	.004	2.851	391	.005	.360	.126	.112	.608
	Equal variances not assumed			2.962	249.150	.003	.360	.121	.121	.599
Biggest concerns when you make lending decisions - The farm household borrower could not find someone to provide a third-party individual guarantee	Equal variances assumed	17.720	.000	-2.662	387	.008	-.377	.142	-.656	-.099
	Equal variances not assumed			-2.849	270.459	.005	-.377	.132	-.638	-.117
Biggest concerns when you make lending decisions - The farm household borrower does not want to have to guarantee another villager's debts	Equal variances assumed	10.117	.002	7.428	392	.000	.864	.116	.635	1.093
	Equal variances not assumed			8.188	288.324	.000	.864	.106	.656	1.072
Biggest concerns when you make lending decisions - The farm household borrower thinks that the process of getting a group guarantee is too cumbersome/difficult	Equal variances assumed	12.209	.001	3.621	391	.000	.468	.129	.214	.722
	Equal variances not assumed			4.024	294.962	.000	.468	.116	.239	.697
Biggest concerns when you make lending decisions - Interest rates on RCC or bank loans are higher than interest rates that a farm household borrower could obtain from friends or relatives	Equal variances assumed	.058	.810	-9.069	395	.000	-1.032	.114	-1.255	-.808
	Equal variances not assumed			-9.032	224.079	.000	-1.032	.114	-1.257	-.807
Biggest concerns when you make lending decisions - Interest rates on RCC or bank loans are higher than a farm household borrower is able to pay	Equal variances assumed	.378	.539	2.332	395	.020	.259	.111	.041	.478
	Equal variances not assumed			2.443	252.479	.015	.259	.106	.050	.468

Table AII: Independent Samples Test for t-Test (Continued)

Biggest concerns when you make lending decisions - The farm household borrower does not own the collateral to get a loan	Equal variances assumed	39.316	.000	-1.167	394	.244	-.164	.141	-.442	.113
	Equal variances not assumed			-1.278	282.913	.202	-.164	.129	-.418	.089
Biggest concerns when you make lending decisions - The banks/RCCs are located too far for the farm household borrowers to travel	Equal variances assumed	.252	.616	4.402	395	.000	.403	.091	.223	.583
	Equal variances not assumed			4.041	188.517	.000	.403	.100	.206	.599
Biggest concerns when you make lending decisions - The farm household borrower thinks your RCC or bank requires too much paper work	Equal variances assumed	2.443	.119	-3.212	392	.001	-.364	.113	-.587	-.141
	Equal variances not assumed			-3.428	265.791	.001	-.364	.106	-.573	-.155
Biggest concerns when you make lending decisions - The farm household borrower thinks your RCC or bank takes too long in approving a loan	Equal variances assumed	.383	.536	6.870	392	.000	.817	.119	.583	1.051
	Equal variances not assumed			7.079	243.747	.000	.817	.115	.590	1.044
Biggest concerns when you make lending decisions - Do you think that farm household borrowers believe your RCC colleagues or bank lenders require a bribe from them to approve their loan applications	Equal variances assumed	5.307	.022	4.057	389	.000	.450	.111	.232	.668
	Equal variances not assumed			4.058	228.069	.000	.450	.111	.231	.668
Biggest concerns when you make lending decisions - The farm household borrower prefers to borrow from a friends or relative	Equal variances assumed	51.065	.000	-18.092	396	.000	-2.014	.111	-2.233	-1.795
	Equal variances not assumed			-20.492	306.204	.000	-2.014	.098	-2.207	-1.821
Biggest concerns when you make lending decisions - It's easier for the farm household borrower to obtain loans from friends and relatives rather than from banks and RCCs	Equal variances assumed	7.520	.006	-8.502	396	.000	-1.009	.119	-1.243	-.776
	Equal variances not assumed			-8.881	250.335	.000	-1.009	.114	-1.233	-.786
Biggest concerns when you make lending decisions - The farm household borrower prefers to borrow from a money lender	Equal variances assumed	2.993	.084	13.681	395	.000	1.339	.098	1.146	1.531
	Equal variances not assumed			12.524	187.503	.000	1.339	.107	1.128	1.549
Biggest concerns when you make lending decisions - The farm household borrower prefers to get supplier credit or to transact on credit	Equal variances assumed	9.474	.002	.533	393	.594	.066	.123	-.176	.308
	Equal variances not assumed			.571	267.542	.569	.066	.115	-.161	.292
Biggest concerns when you make lending decisions - The farm household borrower does not like to be indebted to a bank or RCC	Equal variances assumed	64.969	.000	-4.670	394	.000	-.643	.138	-.914	-.372
	Equal variances not assumed			-5.273	305.100	.000	-.643	.122	-.883	-.403
Biggest concerns when you make lending decisions - The farm household borrower does not like to buy microcredit disability insurance required by banks or RCCs	Equal variances assumed	.394	.531	5.996	393	.000	.737	.123	.495	.978
	Equal variances not assumed			6.039	230.611	.000	.737	.122	.496	.977
Do you think the farm household borrower would be more likely to borrow from a bank or RCC, if interest rates on RCC or bank loans were lower than current interest rates	Equal variances assumed	16.152	.000	.833	406	.406	.109	.131	-.148	.366
	Equal variances not assumed			.904	270.018	.367	.109	.121	-.128	.346

Table AII: Independent Samples Test for t-Test (Continued)

Do you think the farm household borrower would be more likely to borrow from a bank or RCC, if the cost of obtaining a loan (fees, non-interest charges) on RCC or bank loans were lower than current costs	Equal variances assumed	9.872	.002	-3.549	406	.000	-.459	.129	-.713	-.205
	Equal variances not assumed			-3.747	252.346	.000	-.459	.123	-.700	-.218
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - Lack of financial recourses	Equal variances assumed	1.893	.170	-3.223	409	.001	-.431	.134	-.694	-.168
	Equal variances not assumed			-3.357	243.328	.001	-.431	.128	-.684	-.178
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - Terms of contract not clear	Equal variances assumed	.007	.935	3.946	409	.000	.487	.124	.245	.730
	Equal variances not assumed			4.066	237.254	.000	.487	.120	.251	.724
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - Suffered crop loss, or cattle loss	Equal variances assumed	35.853	.000	-.691	409	.490	-.100	.145	-.386	.185
	Equal variances not assumed			-.782	297.558	.435	-.100	.128	-.353	.152
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - Suffered death or major sickness of a family member	Equal variances assumed	2.532	.112	.567	407	.571	.072	.128	-.179	.324
	Equal variances not assumed			.594	247.502	.553	.072	.122	-.168	.313
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - The borrower diverted the loan for other purpose	Equal variances assumed	.152	.697	4.611	407	.000	.624	.135	.358	.891
	Equal variances not assumed			4.534	214.560	.000	.624	.138	.353	.896
Whether a farm household borrower has ever defaulted on a loan from your RCC, banks, friends or relatives, the cause of a default in the past or future - The borrower believes it could be profitable to default on a loan	Equal variances assumed	105.845	.000	9.234	406	.000	.861	.093	.678	1.044
	Equal variances not assumed			7.152	143.986	.000	.861	.120	.623	1.099
Will you lend a higher loan to a borrower who owns more assets (land user rights/home ownership, etc.) without using the assets for collateral?	Equal variances assumed	7.211	.008	6.563	408	.000	.683	.104	.478	.888
	Equal variances not assumed			6.391	209.951	.000	.683	.107	.472	.894
Will you lend a higher loan to a borrower who owns more assets (land user rights/home ownership, etc.) but only if he/she uses the assets as collateral?	Equal variances assumed	.026	.871	-2.266	404	.024	-.278	.123	-.519	-.037
	Equal variances not assumed			-2.219	213.421	.028	-.278	.125	-.525	-.031
Will you lend a higher loan to a borrower who owns more assets (land user rights/home ownership, etc.) at a lower interest rates, without using the assets as collateral?	Equal variances assumed	.563	.454	1.538	408	.125	.166	.108	-.046	.378
	Equal variances not assumed			1.544	223.850	.124	.166	.107	-.046	.377
Will you lend a higher loan to a borrower who owns more assets (land user rights/home ownership, etc.) at a lower interest rates, but only if he/she uses the assets as collateral?	Equal variances assumed	.280	.597	6.153	408	.000	.763	.124	.519	1.007
	Equal variances not assumed			6.018	211.844	.000	.763	.127	.513	1.013

Table AII: Independent Samples Test for t-Test (Continued)

Do you believe that honest borrowers are compelled to pay higher interest rate, because some borrowers do not repay their loan?	Equal variances assumed	.896	.344	-2.568	407	.011	-.280	.109	-.494	-.066
	Equal variances not assumed			-2.583	225.310	.010	-.280	.108	-.493	-.066
Do you believe that honest borrowers are not able to obtain a needed amount of loan, because some of the villagers do not repay their loan or divert the loan for other purpose?	Equal variances assumed	1.440	.231	.276	407	.783	.030	.110	-.185	.246
	Equal variances not assumed			.264	203.599	.792	.030	.114	-.195	.256
Do you think that the borrower would be willing to pay a higher interest rate, to obtain the needed amount of loan?	Equal variances assumed	5.771	.017	1.451	408	.148	.168	.116	-.060	.395
	Equal variances not assumed			1.530	250.829	.127	.168	.110	-.048	.384
Do you believe that a borrower who accepts a loan that is very high relative to his/her assets is more likely to VOLUNTARILY default on that loan?	Equal variances assumed	.138	.711	-.150	408	.881	-.019	.124	-.263	.226
	Equal variances not assumed			-.147	211.949	.883	-.019	.127	-.270	.232
Do you believe that a borrower who accepts a loan at a higher interest rate is more likely to VOLUNTARILY default on that loan?	Equal variances assumed	3.026	.083	-.659	407	.510	-.087	.132	-.345	.172
	Equal variances not assumed			-.692	249.085	.489	-.087	.125	-.333	.160
What are the criteria that you would prioritize when approving a loan: The borrower's ability to repay	Equal variances assumed	17.073	.000	2.985	408	.003	.273	.092	.093	.453
	Equal variances not assumed			3.277	276.413	.001	.273	.083	.109	.437
What are the criteria that you would prioritize when approving a loan: The borrower's social connections	Equal variances assumed	.038	.845	-4.165	406	.000	-.531	.127	-.781	-.280
	Equal variances not assumed			-4.126	218.229	.000	-.531	.129	-.784	-.277
What are the criteria that you would prioritize when approving a loan: The borrower's Party membership	Equal variances assumed	29.197	.000	.260	402	.795	.034	.131	-.223	.291
	Equal variances not assumed			.301	317.587	.764	.034	.113	-.189	.257
What are the criteria that you would prioritize when approving a loan: The borrower's connection to the government	Equal variances assumed	22.876	.000	-4.727	403	.000	-.557	.118	-.789	-.326
	Equal variances not assumed			-5.530	326.862	.000	-.557	.101	-.756	-.359

Note: If the significance for Levene's test is 0.05 or below, then the "Equal Variances Not Assumed" test (the one on the bottom) is used. Otherwise we use the "Equal Variances Assumed" test (the one on the top).

Table AIII: Hypothesis Test Summary for U-Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Insufficient collateral is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
2	The distribution of Crops/Livestock subject to too much price risk is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.645	Retain the null hypothesis.
3	The distribution of too much yield risk is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
4	The distribution of crop grown are vulnerable to the extreme weather is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.512	Retain the null hypothesis.
5	The distribution of failed to repay the loan in the past is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.319	Retain the null hypothesis.
6	The distribution of RCC or bank does not believe I am trustworthy is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.611	Retain the null hypothesis.
7	The distribution of RCC or bank doesn¡¯t believe that I earned enough income is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.070	Retain the null hypothesis.

Table AIII: Hypothesis Test Summary for U-Test (Continued)

8	The distribution of repayment schedule required by RCC or bank does not match the timing of sales from my farm is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.564	Retain the null hypothesis.
9	The distribution of Could not find someone to guarantee loan is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.036	Reject the null hypothesis.
10	The distribution of your current formal lender require a ¡®Group Guaranteej¯ in order for you to get a loan is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.006	Reject the null hypothesis.
11	The distribution of Because I am a member of a Group Guarantee I can get a larger loan than I could get otherwise is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.003	Reject the null hypothesis.
12	The distribution of Because I am a member of a Group Guarantee I can get a loan easier is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.019	Reject the null hypothesis.
13	The distribution of Although I can get a loan individually I have joined a group guarantee so I can get a larger loan is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.001	Reject the null hypothesis.
14	The distribution of Because I am a member of a Group Guarantee I can get a lower interest rate than I could get otherwise is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Table AIII: Hypothesis Test Summary for U-Test (Continued)

15	The distribution of I am not a member of a Group Guarantee because I have sufficient collateral to get a loan is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
16	The distribution of I am not a member of a Group Guarantee because I do not want to guarantee someone else¡¯s debt is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
17	The distribution of I am not a member of a Group Guarantee because the procedures are too bothersome is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
18	The distribution of local RCC or Bank views agriculture/farming as being important. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.293	Retain the null hypothesis.
19	The distribution of local RCC or Bank cares about the welfare of farmers. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.163	Retain the null hypothesis.
20	The distribution of local RCC or Bank cares about me and my household is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
21	The distribution of Loan products from my local RCC or Bank are flexible enough to meet my ability to repay when I sell my products/at harvest etc is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Table AIII: Hypothesis Test Summary for U-Test (Continued)

22	The distribution of local RCC or Bank will provide loans to agriculture even when there is a downturn in the agricultural economy is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.072	Retain the null hypothesis.
23	The distribution of satisfied with the lending practices of my RCC or Bank is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
24	The distribution of satisfied with the services provided by my RCC or Bank is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
25	The distribution of I can find suitable channels to get help or to file complaints if I am not satisfied with the financial services provide by my RCC or Bank is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
26	The distribution of there should be at least one Government regulated source of agricultural credit dedicated to providing loans to farming whether the agricultural economy is good or bad. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.540	Retain the null hypothesis.
27	The distribution of allowing urban or city banks to set up bank branches in rural areas is a good idea is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
28	The distribution of encouraging banks or RCCs to set up more ATMs, POS, cellphone banking in rural areas is a good idea is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.904	Retain the null hypothesis.

Table AIII: Hypothesis Test Summary for U-Test (Continued)

29	The distribution of be willing to pay more than the current interest rate in order to obtain a larger loan is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
30	The distribution of proportion of Household income are you able to save in a year is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.030	Reject the null hypothesis.
31	The distribution of able to borrow needed amount of money from Banks or RCC for consumption, education and health purposes is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
32	The distribution of able to borrow needed amount of money from Banks or RCC for farming and business purposes is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
33	The distribution of have unpaid debts on previous RCC or bank loans is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
34	The distribution of family culture is borrow as little as possible is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
35	The distribution of he RCC or Bank does not consider me ¡®Credit Worthy is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
36	The distribution of do not want to ask another villager to sign a group guarantee is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Table AIII: Hypothesis Test Summary for U-Test (Continued)

37	The distribution of could not find someone to provide a third-party (individual not group) guarantee is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
38	The distribution of do not want to have to guarantee another villagerį s debts is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.346	Retain the null hypothesis.
39	The distribution of the process of getting a group guarantee is too cumbersome/difficult is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
40	The distribution of Interest rates on RCC or bank loans are higher than interest rates on loans from friends or relatives is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.401	Retain the null hypothesis.
41	The distribution of Interest rates on RCC or bank loans are higher than I am able to pay is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
42	The distribution of lack the collateral to get a loan is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
43	The distribution of The RCC or bank is too far for me to travel is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
44	The distribution of RCC or bank requires too much paper work is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Table AIII: Hypothesis Test Summary for U-Test (Continued)

45	The distribution of RCC or bank takes too long in approving loan is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
46	The distribution of RCC or bank lender requires a bribe is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
47	The distribution of prefer to borrow from a friend or relative. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
48	The distribution of Borrowing from a friend or relative is easier than borrowing from a RCC or Bank is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
49	The distribution of prefer to borrow from a money lender is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
50	The distribution of prefer to get supplier credit or to transact on credit is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
51	The distribution of do not like to be indebted to a bank or RCC is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
52	The distribution of do not like to buy microcredit disability insurance required by banks or RCCs is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.007	Reject the null hypothesis.

Table AIII: Hypothesis Test Summary for U-Test (Continued)

53	The distribution of if interest rates on RCC or bank loans were lower than current interest rates I would be more likely to borrow from a bank or RCC is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.335	Retain the null hypothesis.
54	The distribution of If the cost of obtaining a loan (fees, non-interest charges) on RCC or bank loans were lower than current costs I would be more likely to borrow from a bank or RCC is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.704	Retain the null hypothesis.
55	The distribution of Lack of financial resources is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.954	Retain the null hypothesis.
56	The distribution of Terms of contract not clear is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.124	Retain the null hypothesis.
57	The distribution of Suffered crop loss, cattle loss is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
58	The distribution of Suffered death or major sickness of a family member is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
59	The distribution of I diverted the loan for other purpose is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.018	Reject the null hypothesis.

Table AIII: Hypothesis Test Summary for U-Test (Continued)

60	The distribution of Profitable if default on a loan is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.004	Reject the null hypothesis.
61	The distribution of If I had more assets (user rights/ house etc), then I could get a higher loan from a bank or RCC without using the assets for collateral. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
62	The distribution of If I had more assets (user rights/ house etc), then I could get a higher loan from a RCC or bank but only if I use the assets as collateral. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
63	The distribution of If I had more assets (user rights/ house etc), then I could get a higher loan from RCC or bank, at a lower interest rate, without using the assets as collateral is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.009	Reject the null hypothesis.
64	The distribution of If I had more assets (user rights/ house etc), then I could get a higher loan from RCC or bank, at a lower interest rate, but only if I use the assets as collateral. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.013	Reject the null hypothesis.
65	The distribution of honest borrowers are compelled to pay higher interest rate, because some borrowers do not repay their loan is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.209	Retain the null hypothesis.
66	The distribution of honest borrowers are not able to obtain a required amount of loan, because some of the villagers do not repay their loan or divert the loan. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.756	Retain the null hypothesis.

Table AIII: Hypothesis Test Summary for U-Test (Continued)

67	The distribution of To obtain a required amount of loan, I would be willing to pay a higher interest rate. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
68	The distribution of a borrower who accepts a loan that is very high relative to his farm assets is more likely to VOLUNTARILY default on that loan. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
69	The distribution of a borrower who accepts a loan, at a higher interest rate is more likely to VOLUNTARILY default on that loan. is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
70	The distribution of Ability to repay is more important in qualifying for a loan approval for Village Committee or VCC is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
71	The distribution of Social connections is more important in qualifying for a loan approval for Village Committee or VCC is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
72	The distribution of Party membership is more important in qualifying for a loan approval for Village Committee or VCC is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.279	Retain the null hypothesis.
73	The distribution of links / communications to government is more important in qualifying for a loan approval for Village Committee or VCC is the same across categories of Borrower.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.