

Credit Constraints under Interaction of Supply Rationing and Demand Depression: Evidence from Rural Households in China

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Abstract: This paper analyzes the credit demand depression phenomenon resulting from long-term institutional supply rationing. Under the interaction between imperfect formal credit system and rural households' risk aversion behavior, rural households will be discouraged to depress their credit demand or replace it with informal credit, which we call demand-side credit constraints. It find that about 33.72% of rural households are credit constrained in 1874 rural households, among which supply-side and demand-side credit constraints are respectively 17.13% and 18.14%. Estimation result shows that income, age, Rural Credit Cooperatives' membership and the relationship with financial agencies have different impact on supply-side and demand-side credit constraints. In conclusion, it is more important to promote rural finance innovation and reverse negative credit anticipation than to increase credit supply.

Key words: Credit Constraints, Credit Rationing, Demand Depression, Cognitive Bias, Risk Aversion

1. Introduction

Great attention is attached on credit constraints issue all over the world for its influence on the individual business behavior and economic growth. Stiglitz and Weiss(1981) indicated credit constraints is a long-term equilibrium because of the information asymmetry and adverse selection effect¹. Their publishing of "Credit Rationing in Markets with Imperfect Information" is a milestone of credit constraints theory. After that, a large number of papers investigate the credit constraints as credit rationing from the financial supply side. But, more and more researchers found that credit constraints result not only from formal financial sectors credit rationing but also from demand side of risk aversion, cognitive biases and demand depression. Baydas, Meyers and

¹ In S-W model, bank can only know the overall probability distribution of loan repay rate and can't distinguish that of each borrower. Increasing interest rates or increasing collateral requirements could increase the riskiness of the bank's loan portfolio, either by discouraging safer investors, or by inducing borrowers to invest in riskier projects, and therefore could decrease the bank's profit. Thus, credit rationing will be the optimal choice for bank for maximizing its profit.

Aguilera-Aldred(1992) and Petrick(2004) pointed out that some of credit demanders abandoned loan application. Theory of discouraged borrowers put forward by Kon & Storey (2003) indicated that imperfect credit screening mechanism will give biased signal to borrowers and lead them not to apply loan since wrongly feel they will be rejected. Boucher, Carter and Guirking(2008) divided credit constraints into supply-side and demand-side, and deemed high transaction cost and high risk cost of loan contract discouraged rural households' borrowing. Chinese researchers emphasized demande-side credit constraints as well. Gao(2002) brought forward financial demand depression theory of rural households and Wang(2004) further pointed out the main reason of financial demand depression was risk aversion and humiliation for borrowing. Wang and Zhao(2007) attributed the demand-side credit constraints to rural households' cognitive biases and behavior biases for loans and considered that credit constraints resulted from the interaction of external restriction and cognitive biases.

Long-term credit rationing from formal financial will not only directly restrict credit accession but also have a negative effect on people's expectation and behavior choice, which lead to the behavior reliance of demand depression under restricted institutional circumstance. That is demand-side credit constraints. The de-ruralization and non-agriculturization of rural financial institutions exacerbated the difficulty of rural households and small business to access to credit in China¹. Long time institutional restriction gradually changed people's behavior preference and behavior choice. Formal financial institutions are no longer the first choice of rural households financing². As a great deal of investigation showed, formal credit can't satisfy with rural households' production and consumption need in term of loan size, loan term, application procedure and guarantee forms, et al³. Rural financial institutions have never developed effective credit contract and risk management mechanism adapting to the small-scale, scattered, and lack of mortgage rural households. Meanwhile, the unsolved internal control problem of rural credit cooperatives easily induced rent-seeking behavior of loan officers, which formed credit rationing based on personal identity, official position, personal relationship, bribe, and so on. Therefore, most of rural households will feel the transaction cost of formal loan is too expensive and prefer higher interest rate but convenient informal loan. This actually reflects another form of formal credit constraints. Moreover, when this effect is solidified into future loan decision, it will results in consistent demand-side credit constraints.

However, this hidden credit constraints haven't received enough attention by policy makers. In such a long time, China's rural financial reform transformed and improved financial supply institution in a top-down way without sufficient consideration of demand factors. That is the main reason of its unsubstantial improvement for the difficulty of accessing loan. In 2004, the No.1 document of central government definitely required that the reform and innovation of rural financial system should be aiming at increasing rural households and enterprises loan and improve the rural financial service from the perspective of the actual demand of rural areas and rural

¹ After the commercialization reform of bank in China, large number of division of Agricultural Bank of China evacuated from rural areas and commercial bank greatly cut off rural business. Post Saving Bank pumps capital out of rural areas because of its restriction for lending.

² Zhang(2004 and 2005) found that current commercial bank became an unreachable institutional arrangement. The financing sequence of most rural households is first increasing non-agricultural income, second friend and relative loans and policy loans, and last dear money.

³ Formal credit is mainly small-scale and short-term and requires for mortgage, while informal credit is more flexible and based on the repayment capability usually without collateral and guarantee(Lin, et al., 1989; Cao, 2000, Zhou and Li, 2005 and Zhu and Li, 2006).

households. This paper will make a theoretical analysis on the formation of demand-side credit constraints and investigate credit constraints considering the interaction of credit rationing and demand depression. Based on the survey data of Development Research Centre of the State Council (DRC) in 2005, it empirically re-evaluated the extent and structure of credit constraints suffered by China's rural households using new criteria.

This paper is organized as follows. Section II presents the model and discusses the formation and reasons of demand-side credit constraints. Section III illuminates how we identify credit-constrained rural households. Section IV specifies the model to be estimated and empirically investigates the main factors affect credit constraints. Section V summarizes the main results and discusses policy implications.

2. Model for Demand-side Credit Constraints

Demand-side credit constraints, indirect credit constraints, are embodied in forms of credit depression and credit replacement. According to the study of Boucher, Carter and Guirkinger(2008) and Kon & Storey (2003), demand-side credit constraints resulting from two reasons: one is high transaction cost and risk cost; the other is the screening mistakes for effective borrowers and cognitive biases for the screening mechanism. Demand-side credit constraints could be ultimately attribute to the imperfect institutional arrangement of formal finance, but its formation is deeply related to rural households' cognitive biases and risk aversion preference.

As we know, high risk of agricultural business and scattered rural households and their fragility determine the high cost and high risk of rural credit, but strict regulation restrict risk dispersion and financial innovation. So the rational choice for rural financial institution is to reduce loan supply and implement credit ration based on asset limited liability. To solving this problem, the main measure of China is to increase credit supply, including microcredit and agricultural credit. But without the establishment of effective risk screening and internal supervision mechanism, the active credit policy creates more rent-seeking space and forms credit rationing based on personal identity, relationship, political background, and so on. Repeated practice will reinforce this credit rationing and exclude those lacking of mortgage, relationship and political power, which will make rural households take the observed credit rationing as formal credit screening criteria. Therefore, before the loan application, they will first consider whether they have relationship with rural credit cooperatives, need to bribe credit officers, and take the risk of losing mortgage assets. When they find these cost is far beyond they can endure or their probability to receive loan is too small, they will abandon loan application, resulting in demand-side credit constraints. Risk aversion preference of rural households determines their preference to keep fix revenue and evasion from the application risk, which will strengthen the demand-side credit constraints effect. Thus, the combined institutional credit constraints and rural households' risk aversion preference constricts credit demand and solidifies demanders' depression choice.

Assuming the total wealth of rural household is W , $W = K + W^*$, where K is production capital and W^* is financial wealth which can be used for mortgage. The accessible

formal loan for rural household is B , $B = f(W^*)$, which is determined by W^* . Except for the interest cost of $r \cdot B$ (r is interest rate), borrower has to afford application cost F , including preparation for application material, travelling time and cost, gifts or treating, and psychological uncomfortableness, so the total cost for loan will rise to $r \cdot B + F$. Assuming the output function without loan is $q = Q(K, H; \theta)$ (H and θ respectively represent labor input and rural households characteristics vector including entrepreneurial ability). The output function with loan is increased to $Q^G = Q(A, H; \theta)$ (A is minimum requirement for capital input) due to expand production input and improvement of technology. But its successful probability is π and once it fails rural household can only get Q^B , where $Q^G > q > Q^B$. And the failure of expanded project will make him difficult to cover the loan cost, so he will lose his mortgage asset W^* .

Therefore, the loan selection condition for rural household is as follow:

$$\begin{cases} \pi \cdot Q^G + (1 - \pi) \cdot (Q^B - W^*) > q + r \cdot B(W^*) + F & (1) \\ B(W^*) \geq A - K & (2) \end{cases}$$

Assuming γ_0 is reserved cost of rural household, $\gamma_0 = q + r \cdot B(W^*) + F$, which is the revenue without loan. As it show in equation (1), if the application cost F is very high, rural household will be constrained by the loan transaction cost. That is to say, although he could repay the loan interest, he will abandon application for unbearable application cost, which we called it Type I demand-side credit constraints or transaction cost constraints.

Financial institutions can't effective screen borrowers' credit and risk based on the identity and relationship rationing and the mistake will happen on credit decision. Assuming only $(1 - \delta)$ of effective applicant can receive loan, where δ is rejection probability of good applicant by financial institution's wrongly decision, $0 < \delta < 1$. Let $E(y_0) = \pi \cdot Q^G + (1 - \pi) \cdot (Q^B - W^*)$, where $E(y_0)$ is expected revenue with loan. So the equation (1) can be changed into

$$(1 - \delta) \cdot [E(y_0) - r \cdot B(W^*) - F] + \delta \cdot (q - F) > q \quad (3)$$

After transformation, we can get

$$E(y_0) > q + r \cdot B(W^*) + \frac{F}{1 - \delta} \quad (4)$$

Since $0 < \delta < 1$, credit rationing enforced by financial institution equals to increase the application cost of rural household, and raise the total credit cost up to $\gamma_1 = q + r \cdot B(W^*) + \frac{F}{1 - \delta}$.

When he can't afford the extra cost increased by credit rationing, he will abandon loan application. We called it Type II demand-side credit constraint, which depressed by the inequity credit rationing.

Meanwhile, rural household is risk aversion and will ask for the equivalent compensation facing with uncertainty, which uses a certain number of fixed wealth to compensate the uncertain risk. Assuming the equivalent compensation is v ($v > 0$), equation (3) will be became

$$(1-\delta) \cdot [E(y_0) - r \cdot B(W^*) - F] + \delta \cdot (q - F) - v > q \quad (5)$$

Then we can get

$$E(y_0) > q + r \cdot B(W^*) + \frac{F+v}{1-\delta} \quad (6)$$

After considering the risk compensation, the application cost for risk aversion rural household is further increased. When he can't afford the loan risk compensation, he will abandon application. We called Type III demand-side credit constraints, which depressed by the risk aversion for loan application.

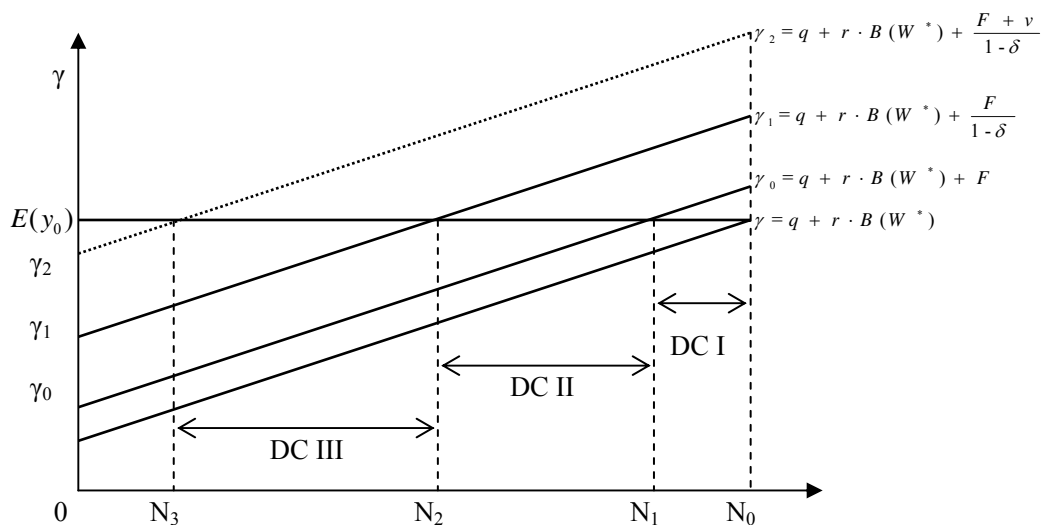


Figure 1 Demand-side Credit Constraints

In Fig.1, horizontal axis represent the number of financial demanders under a certain output level and vertical axis represent the loan application cost γ . Assuming the number of financial demanders is N_0 under expected revenue level of $E(y_0)$. Transaction cost including preparation for material, traffic, and gifts will constrained $DCI = N_0 - N_1$ of rural household

suffering Type I demand-side credit constraints; the incorrect credit decision further increase rural households' loan cost and make $DCII = N_1 - N_2$ of them constrained by the Type II demand-side credit constraints; rural households' risk aversion for loan application will lead $DCIII = N_2 - N_3$ of them facing Type III demand-side credit constraints. In sum, there are $DC = DCI + DCII + DCIII = N_3 - N_0$ of rural households suffering demand-side credit constraints.

Generally speaking, demand-side credit constraints have two distinct characteristics: 1) it has financial demand and can afford the loan interest; 2) it won't make loan application or abandon voluntarily because of high transaction cost, inequality credit rationing and risk aversion which increase the loan cost cognized by rural households and decrease their expectation for loan access. Demand-side credit constraints are rural households' rational reaction to current credit rationing and credit institutional arrangement. It takes the form of financial demand shrinking but actually reveals the contradiction between credit demand and supply. Little attention was attached to it and most of researchers never count it into credit constraints. But it has even greater restrictive effect on economy development than credit rationing. As it indicated in the above analysis, demand-side credit constraints restrict those around marginal rural households to improve their production. The heaviest striking is not the capital restriction but the destruction of their courage for improving business and life. It intensifies the risk aversion preference of financial demanders, which will conduct into production and business activities and restrict their entrepreneurial development, leading them relapse into low level development trap.

3. Credit Constraints Identification

It is important but difficult to measure credit constraints. Researchers all over the world make great strength to develop better methods from indirect measures by sensitivity (including consumption and liquidity) to direct survey to identify credit constraints. Survey is considered as a better method since sensitivity of critical variables may not come from credit constraints, but its validity depends on the questionnaire designation and screening mechanism. In the past, most of studies used the probability of access to formal loan to measure credit constraints and latter they

expanded to take effective financial demand, the replacement of informal loan and the limit of formal loans scale into consideration. Since Baydas, Meyers and Aguilera-Aldred(1992) firstly put forward that borrowers may refuse to apply because they pessimistically believe that they would be rejected, some researchers began to include them into credit constraints and redefined the criteria credit constraints identification(Petrick, 2004; Boucher, Guirkingner & Trivelli, 2005). We will adopt their method to include demand-side credit constraints and investigate the extent of credit constraints for Chinese rural households by the survey data from DRC in 2005¹.

The data provides us with very detailed information about rural households' credit willingness and activities from 2001 2004, and designed a series of questions following the route of loan decision, including willingness for loan, reasons for non-application of credit, reasons for abandoning application, reasons for being rejected, loan acquirement from formal and informal finance, and so on. It enables us to make a deep analysis about credit decisive procedure of rural households and establishes a framework to identify different kinds of credit constraints. As figure 2 shows, the beginning point of loan decision is "whether you need loan or not". If there is no credit demand, credit constraints problem won't exist. Among total sample of 1962 rural households, 1326 of them (accounting for 67.58%) indicated that they had loan demand from 2001 to 2004, 579 rural households who didn't need loan are categorized into non-constraints group, and 57 of them (account for 2.91%) are missing data. Among 1326 rural households with loan demand, 642 of them (accounting for 48.42%) have gotten formal loans, 645 of them (accounting for 48.64%) haven't gotten formal loans, and 39 of them (accounting for 2.94%) are missing data. Among 645 rural households inaccessible to formal loans, 485 of them (accounting for 75.19%) never applied loans, 20 abandoned after application, 94 were rejected, and 46 are missing data.

Through further investigation the reasons of inaccessibility to formal loans, we could identify those really constrained and categorize them into supply-side or demand-side credit constraints. The precondition of effective credit demand is that they can afford the interest cost of loan, so we

¹ The data consist of 1962 rural households covering 180 villages of 29 provinces in China, among which 773 households (accounting for 39.4%), 483 households (accounting for 24.6%) and 706 households (accounting for 36.0%) are respectively from east, middle and west China.

considered those selected “afraid of incapability to repay” and “interest rate is too high” as “unconstrained” group. “Complex procedure and extra requirement”, “inconvenience comparing to informal loan”, “bad service of bank”, “too far away”, “too expensive to find mortgage or guarantee”, and “too small loan amount” can be attributed to the problem of imperfect financial service and high transaction cost. “No relationship and no loan”, “never know farmers can apply loan”, and “ignorant of loan conditions and procedures” can be attributed to cognitive biases for credit market. Therefore, when rural household selected any of the above choice in the questions, we will consider them as demand-side credit constrained. As we find in the result, it is consistent with the above theory that the understanding and cognition of rural households for credit rationing mechanism has substantial influence on their credit decision. In the question of the reasons for no application, 179 rural households answered that they would not receive loans because of no relationship with financial officers. In addition, 500 rural households (accounting for 35.97%) considered “reliable relationship” as most important factor for getting loans; 153 and 83 rural households respectively selected “guarantee by political leaders” and “to be political leaders or officers” as important factor for getting loans. But most of them didn’t receive loans and even never applied for loans.

We identified supply-side credit constraints through three ways: firstly, loan application rejected for non-ability reasons, including “no mortgage or guarantee”, “no relationship”, and “shortage of capital of bank”; secondly, loan received can satisfy rural households’ capital demand; thirdly, the largest amount of loan received by rural household is less than his expected loan amount. Any of the above three conditions satisfied, he will be attributed to supply-side credit constraints.

Based on the above mechanism, we summarized the result of credit constraints. According to the questions answered, 1874 samples could be effectively categorized. As it shows in table 1, there are 632 rural households (accounting for 33.72%) being credit constrained, among which 321 (accounting for 17.13%) are belonged to demand-side constrained and 340 (accounting for 18.14%) to supply-side constrained.

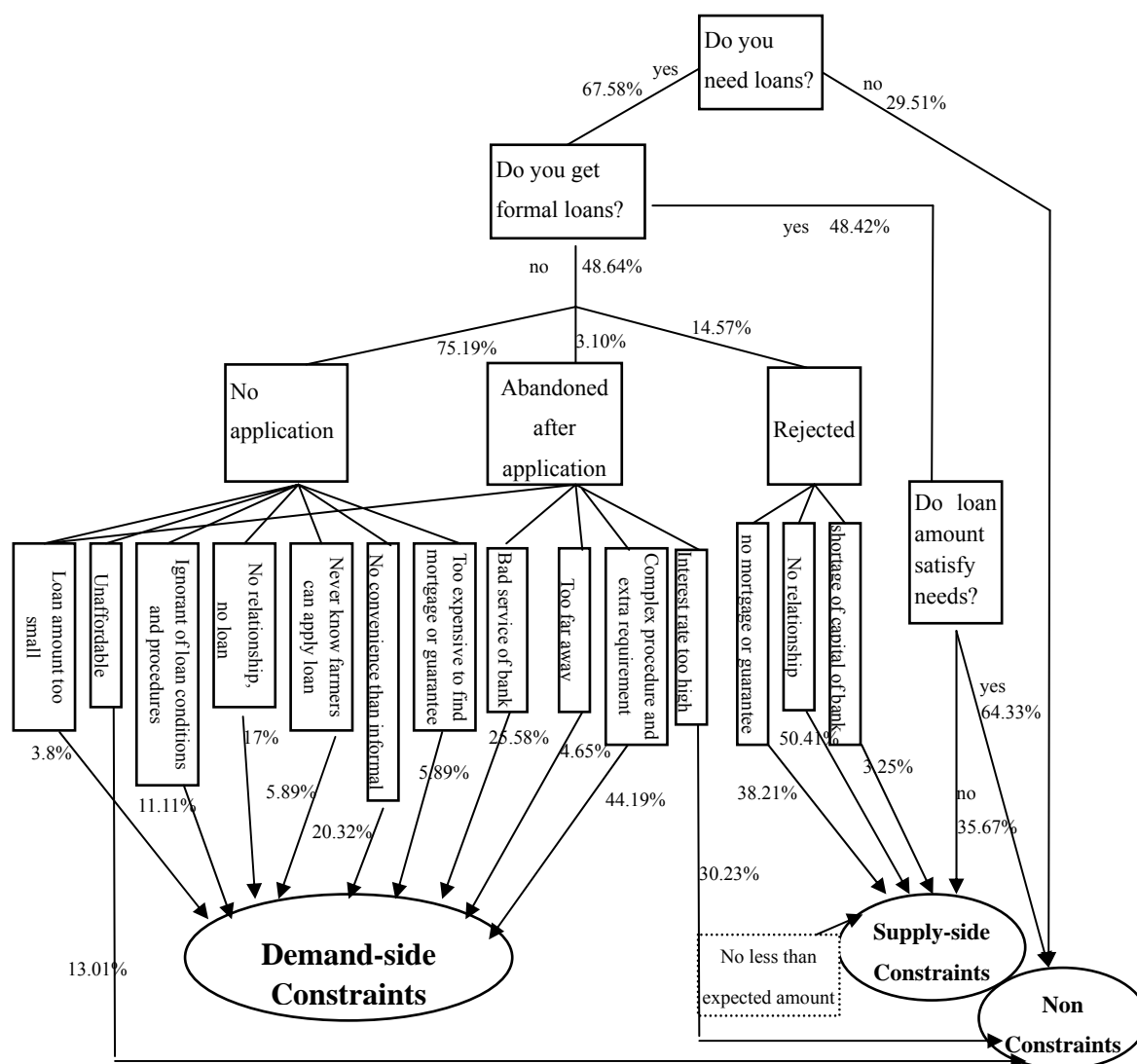


Figure 2 Credit Constraints Identification Mechanism

Table 1 The Frequency of Credit Constrained Households

	Demand-side Constraints	Supply-side Constraints	Overall Credit Constraints
Effective samples	1874	1874	1874
Frequency of constrained households	321	340	632
Proportion of the constrained (%)	17.13	18.14	33.72

4. Factors Affecting on Credit Constraints

We are more care about what kind of rural households are easier constrained, what the difference between demand-side and supply-side constraints, and difference influence of factors on these two credit constraints, so as to find methods to solve the contradiction of credit supply

and demand and smooth credit constraints. *Probit* and *Logit* model will be used to investigate how credit constraints are determined.

$$Probit : \Phi(Z) = \int_{-\infty}^Z \phi(v)dv ; Logit : G(Z) = \exp(Z)/[1 + \exp(Z)]$$

$$Z = \alpha + \beta_1 X + \beta_2 M + \beta_3 R + \beta_4 D$$

In the equation, Z represents whether rural household are credit constrained or not ($Z=1$ constrained, $Z=0$ unconstrained). X is a characteristic vector of rural household, including $LnAY$ (log value of average net income of rural household in 2003 and 2004), Age (age of household head), $land$ (planting land area), education of household head (dummy variables of *high school* and *college*), Dr (dependent ratio of family), type of rural household (dummy variables for *big planting or breeding household*, *business household*, and *poverty household*); M is financial market condition, including distance to nearest financial institution and numbers of financial institutions; R is relationship to financial institutions, including dummy variables for *membership* and *relationship* of Rural Credit Cooperatives); D is dummy variable for area, including *east* and *west* areas.

We could make the following conclusion from the result of model estimation (see Table 1).

Firstly, variables affect risk preference, such as income and age, have significant effect on demand-side credit constraints, which is consistent with the above theoretical analysis. Family income and credit constraints have \cap shaped relationship. As the income increases, the probability of demand-side credit constraints first rises up and then drops down, and the threshold is 5884 yuan. Age has positive effect on demand-side credit constraints. In general, risk aversion preference is decreasing with the raise of income and it is enhanced with age growing. But the accumulation of family asset and credit information is also related to age, so age has positive effect on supply-side constraints. We could find that the lowest income people never suffer the strictest credit constraints for two reasons: one is that the policy loan of combating poverty relieves their credit constraints; the other is that they can't smooth income fluctuation for their risk fragility and loan will be unavoidable when risk happens.

Table 2 Model for Determination of Credit Constraints

	Model I		Model II		Model III	
	Credit Constrained	Demand-side	Constrained	Supply-side	Constrained	
	Probit	Logit	Probit	Logit	Probit	Logit
<i>LnAY</i>	0.547** (0.238)	0.929** (0.419)	0.802** (0.343)	1.419** (0.637)	0.272 (0.276)	0.480 (0.516)
<i>LnAY</i> ²	-0.033** (0.014)	-0.056** (0.024)	-0.046** (0.019)	-0.082** (0.036)	-0.017 (0.016)	-0.029 (0.029)
<i>Age</i>	-0.005 (0.003)	-0.009 (0.006)	-0.040* (0.022)	-0.064* (0.038)	-0.011** (0.004)	-0.018** (0.008)
<i>Age</i> ²	—	—	0.048** (0.024)	0.076* (0.042)	—	—
<i>land</i>	0.007** (0.003)	0.012** (0.005)	0.001 (0.004)	0.002 (0.008)	0.007** (0.003)	0.012** (0.006)
<i>Dr</i>	0.384** (0.150)	0.641** (0.251)	0.192 (0.171)	0.309 (0.306)	0.459* (0.188)	0.745** (0.335)
<i>high</i>	-0.031 (0.085)	-2.052 (0.140)	-0.061 (0.100)	-0.089 (0.176)	-0.0145 (0.102)	-0.016 (0.181)
<i>college</i>	0.186 (0.143)	0.299 (0.237)	0.275* (0.157)	0.494* (0.270)	0.052 (0.182)	0.032 (0.340)
<i>business</i>	0.0452 (0.108)	0.077 (0.176)	-0.039 (0.126)	-0.052 (0.222)	0.141 (0.125)	0.241 (0.221)
<i>big</i>	-0.051 (0.168)	-0.074 (0.275)	-0.046 (0.192)	-0.064 (0.335)	-0.097 (0.211)	-0.122 (0.374)
<i>poverty</i>	-0.086 (0.127)	-0.140 (0.209)	-0.067 (0.149)	-0.083 (0.261)	-0.123 (0.152)	-0.252 (0.278)
<i>distance</i>	0.026** (0.007)	0.042** (0.013)	0.018** (0.008)	0.031** (0.013)	0.015* (0.009)	0.027* (0.015)
<i>numbers</i>	-0.066 (0.045)	-0.109 (0.076)	0.029 (0.051)	0.050 (0.088)	-0.109** (0.056)	-0.217** (0.107)
<i>member</i>	0.205** (0.087)	0.337** (0.142)	-0.547*** (0.114)	-1.004*** (0.218)	0.667*** (0.097)	1.162*** (0.170)
<i>relation</i>	0.081 (0.082)	0.130 (0.134)	0.177* (0.094)	0.323** (0.163)	-0.097 (0.100)	-0.205 (0.181)
<i>east</i>	-0.256*** (0.098)	-0.416*** (0.159)	-0.123 (0.106)	-0.228 (0.181)	-0.425*** (0.126)	-0.828*** (0.237)
<i>west</i>	-0.281*** (0.100)	-0.459*** (0.162)	-0.518*** (0.119)	-0.935*** (0.215)	0.100 (0.112)	0.146 (0.195)
<i>constant</i>	-2.516*** (1.072)	-4.256** (1.883)	-3.38** (1.612)	-6.037** (2.972)	-1.928 (1.239)	-3.238 (2.319)
Sample	1231	1231	1231	1231	1229	1229
LR	53.790	54.05	90.937	90.05	140.962	140.06
McFadden's R²	0.034	0.034	0.077	0.076	0.122	0.121
Correct Predict	66.77%	66.77%	81.48%	81.48%	81.61%	81.53%
AIC	1.280	1.280	0.919	0.919	0.853	0.853

Note: ***, ** and * present significant respectively at 1%, 5% and 10%. Standard deviations is in parentheses.

Secondly, capability variables don't have significant effect on credit constraint, such as education, production characteristics. In theory, educated rural household should be easier understood loan procedure and relevant information and education is an indication for personal ability. But we can't find evidence that education relive credit constraints. Business household and scaled-specialized planting or breeding household couldn't be less constrained as well. To some extent, it implies that financial institutions haven't established credit supply mechanism based on

borrowers' production and business capability. At the same time, it should be noticed that large planting land areas would exacerbate credit constraints, which signal the improper distribution of financial resources. Planting land can't be used as collateral, so its expanding would increase the probability of loan access.

Thirdly, Rural Credit Cooperative membership could relieve demand-side constraints but enhance supply-side constraints and overall credit constraints. Usually, there are preferential conditions for members and it is required to be a shareholder before getting loans from Rural Credit Cooperatives. Therefore, membership helps solve the problem of information asymmetry and encourages rural household's loan application. However, to scattered risk, loans of Rural Credit Cooperative are small-scaled and even members can't receive sufficient loan amount. Meanwhile, relationship with Rural Credit Cooperatives has no effect on credit constraints, which means relation won't be the critical factor for credit constraints. It also could be found that relationship intensifies demand-side constraint on the contrary. However, most of rural households attributed their loan rejection to no relationship, which discourage the loan application of rural household without relationship.

Fourthly, local financial market will affect the probability of credit constraints. Distance will increase the travelling cost and communication cost for rural households and make it more difficult to monitor and management for financial institutions. So the increasing distance to financial institutions raises the probability of credit constraints. Numbers of financial institutions have negative effect on supply-side constraints, which indicate that plenitude financial resources and sufficient competition reduce supply-side constraints. In financial market more developed east area, the probability of credit constraints is relatively low. Credit constraints are relieved in west areas due to more policy finance supporting.

5. Concluding Remarks

For a long time, it is difficult to precisely observe and estimate credit constrains. This paper re-evaluates credit constraints of Chinese rural households from the perspective of interaction of supply rationing and demand depression. And it further divided credit constraints into supply-side and demand-side constraints, which redound to understand the structural characteristics. In recent years, along with the acceleration of rural financial reform, rural household's loan accessibility has

been greatly improved. Nevertheless, the empirical result shows that the credit constraints are still very serious in rural China. 34% of rural households are credit constrained and the proportion will rise to 45% when only considering those with loan demand. Compared to the past, the extent of credit constraints won't be significantly relieved but the structure changed greatly. Pure supply rationing is transformed into mixed credit constraints under the interaction of supply and demand side, and demand-side constraints are even more serious than supply-side constraints.

It demonstrates that simply increasing credit supply can't effectively solve the credit constraints problem. It is more important to promote institutional innovation for reducing transaction cost and overcoming information asymmetry, so as to eradicate the "glass barrier" of credit demand depression. It should be noticed that Rural Credit Cooperatives members could relieve demand-side constraints. The implication for us is that rural financial innovation should make efforts on encouraging and enhancing credit participation and cooperation. Moreover, the estimation result shows that increase income will decrease risk aversion preference. Therefore, rural financial system should aim at increasing farmers' income. It is necessary to complement relevant industrial development, market support, technology assistance policies along with actively promoting rural financial reform.

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