



Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

A Research into Risks and Measures of Rural Credit on the Basis of Game Theory

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ABSTRACT

Rural credit is a key issue that influences rural economic development. By analyzing the risks of rural credit, this paper, on the basis of game relationship between participants (credit agency, their staff and farmers) of risk factors, makes an in-depth research into measures that can reduce risks of rural credit. The analysis reveals that risk control of credit agency, their staff and farmers mainly depends on the operation of credit agency. Therefore, credit agency should establish strict supervision system and long-term welfare system; at the same time, it should improve the investigation of creditor's information which is currently empty and the investigation system.

Key words: Game Theory; Rural Credit; Credit Risks; Measures.

INTRODUCTION

Rural financial issues have become the bottleneck of rural economic development. Since the reform and opening-up, rural finance has been under reform, but it cannot change the rural residents who are inefficient in fiancé. Rural residents face serious credit restriction, so rural credit is caught in various difficulties. Rural finance mainly deals with scattered rural residents and middle and small-sized enterprises. Therefore, compared with urban credit, rural credit is high in transaction cost and in lack of guarantees which are exchangeable and cashable, and rural assets management market is unsound. What's more, compared with urban financial markets, rural markets are special. Its specificity mainly lies in the following aspects: first, its credit object is special, that's to say, the credit object—rural residents pay few attention to integrity, which, to a large degree, intensify the information asymmetry; in addition, compared with urban creditors, rural creditors are weak in economic strength and low in risk awareness, so rate of rural bad debts is high, which make the development of rural credit more difficult.

Many scholars have made in-depth analysis of rural credit issues. Zhang Longyao (2010) believes that the main reason for failures of rural credit market is information asymmetry, so we should make innovations in rural credit market. By analyzing rural credit guarantee system, ZengGuang (2012) thinks that credit guarantee institution, as a microcosmic body that plays a role in rural credit guarantee, has made the information asymmetry between farmers and financial institutions transparent, and reduces the credit risks of financial institutions, take banks for example, which makes farmers less difficult to financing. Hu Yanzheng (2004) conducts a survey into loans of 500 households in rural credit cooperatives of Z country, and analyzes the reasons why the proportion of non-performing loan in rural credit cooperatives is excessively high and the quality of assets is poor. GaoJianlai (2009) first points out that current supply of rural credit funds fail to meet the demands of rural households, and then analyses the fundamental reasons from the perspective of rural credit environment, agricultural investment efficiency, decisions of financial institutions. Wang Huanyin (2010) believes that the asymmetry of market information, limitations of objective knowledge, and lagging, imperfect and unreliable, and sometimes wrong decisions made by market subject lead to credit risks. The lagging rural economy and unsound laws and regulations result in the lack of mortgages and collateral securities in rural areas. What's more, rural credit system is incomplete; therefore, banks often decrease credit limits or increase the interest rates so as to reduce rural credit risks, which in turn hinders or even damages

rural economic development and causes credit rationing in rural areas. Zhou Yaling (2011) finds out that the alienation of interest rates caused by information asymmetry has exerted an obvious significance over the decisions of both game players. Based on the above study, this paper makes an in-depth analysis of rural credit risks and corresponding causes, and the game of lenders and borrowers based on risk elements and credit behaviors.

RISK ANALYSIS OF RURAL CREDIT

Banks. Generally speaking, the main reason of difficulties in rural credit lies in banks. Though banks cannot bring risks directly, as the controller of credit risks, they bring risks indirectly. The way banks play their role is mainly represented in the following aspects. First, rural credit institutions lack risk pre-warning mechanism. On the whole, China is short of professional and transformative talents of risk evaluation and research institutions of credit risks. Second, prevention system of credit institutions is not sound. For a lack of systems and schemes which prevent industry risks, rural credit institutions are doing bad work in risk prediction and prevention and execution of relative system, which enables disqualified prospective borrower to borrow, lifts the rate of bad assets and damages rural credit markets. Third, banks lack information management of credit risks. Most credit agencies only pay attention to security guarantees unilaterally and conduct few researches into other general information of prospective borrowers. In addition, loan approval is not carried out. Many banks only ask the prospective borrowers to fill in their information, conduct no audit or investigation into the authenticity, and allow their audit staff to handle the service quickly. What's more, banks have not conducted deliberate, multilateral and deep investigations into assets of the prospective borrowers, so many assets issues are false, which lower the authenticity of risk evaluations. Fourth, archives management in credit institutions is lack of standardization. Many credits are long-term. If the borrower is qualified when he applies for loan, but as with the time, his conditions may also change, increasing the credit risks. Therefore, archives management of borrowers must be updated regularly. Fifth, the management and mechanism of credit institutions. China is a relationship-type society and people are easy to be seduced by money, which often bring about behaviors against professional ethics and laws and rules inside the banks.

Peasant households. Peasant household is the direct source of risks. Risks of peasant household mainly lie in the following aspects. First, peasant households' conditions for loans are important information for credit institutions to evaluate risks. Peasant households' conditions for loans refer to their economic conditions which meet the demands of banks. Conditions for loans touch upon the economic conditions, income, personnel structure and health of a borrower and his/her family. Meanwhile, such information is not static but dynamic, that is to say, to keep a record of their economic conditions for many years. Dynamic state guarantees the stability of risks. According to the current rural conditions, most peasant households' conditions for loans are not favorable, which is not only manifested by the general conditions but also dynamic states, for example, peasant household's income risks are high, their income are not stable. Second, usage risks of peasant household loans. Rural loans in China are mainly for peasant households of small-scale operations and rural small and medium-sized enterprises. They are limited in operation power and capital, low in risk resistance capacity and high in operation risks. In addition, agricultural production faces greater natural risks which are higher than non-agricultural programs. Third, credit risks of peasant households. Compared with cities and towns, countries face higher credit risks. As peasant households have little knowledge of credit, and are relatively low in knowledge reserves and cultural literacy, their integrity degree of prompt repayment is low. Therefore, various measures are taken in rural areas to urge peasant households to repay, but the results are poor as rate of rural bad assets are still high. Rural credit risks may lead to many problems since they may provide false information when they fill a form and offer their data. Besides, even though they're good in other aspects, including economic conditions, they still fail to repay on time due to their low integrity.

GAME THEORY ANALYSIS OF RURAL CREDIT RISKS

According to the above analysis, rural credit risks mainly involve three factors: lending institutions, staff of lending institutions and peasant households. The three factors have game relationship: lending institutions and their staff, staff of lending institutions and peasant households, peasant households and lending institutions.

3.1 Game theory analysis of staff of lending institutions and peasant households

The sources of credit risks may be intentional substandard loans which refer to the situation that staff of lending institutions issue loans even though they are aware that the borrower's data is not true or that the data is true but the borrower is not qualified. Intentional substandard loans are very common. It shows that staffs of lending institutions and peasant households have game relationship since both sides have different choices (See Figure 1). If the farmers are good in terms of credit, they will successfully apply for loans if staffs of banks issue loans according to rules and regulations of banks. However, if farmers fail to meet the requirements of applying for loans, they have two choices: one is to successfully apply for loans by colluding with staffs of banks on their own; the other is to stop applying for loans. When farmers try to collude with staffs of lending institutions, the staffs have two choices: one is to gain some interests and issue loans to disqualified farmers; the other is to turn down the farmers and refuse to issue loans. There's also another possibility that the staffs hint at collusion to disqualified farmers so as to obtain benefits. If so,

the farmers face two choices: one is to successfully applying for loans by offering the staffs certain benefits; the other is to turn down the staff and get no loans.

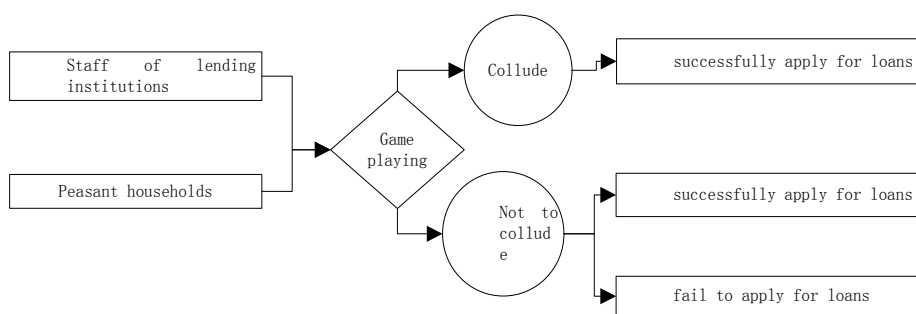


Figure 1 Game playing between Staff of lending institutions and peasant households

3.2 Peasant households and lending institutions

The game relationship between peasant households and lending institutions mainly depends on the authenticity of peasant household’s data and examination of lending institutions. If farmer provide true data, then there’re two possibilities: one is that they get loans if they’re qualified; the other is that they fail if they’re not. What the lending institutions should do is to make a comparison between the farmers’ data and terms of conditions. However, when farmers provide false information, the lending institutions have two choices: first, they verify the information during which they will have to pay the costs of information verification, find the problem, and then farmers fail to apply for loans; second, they do not verify the information, believe the farmers and issue loans to them, which will increase the risks. Therefore, the game playing of both sides depends on the balancing of interest of lending institutions. If the cost of examination is too high, the lending institutions are very likely to give up the examination; if the cost is not high, the lending institutions are very likely to verify the information. At this juncture, the rate of rural bad assets will influence banks’ choices. If default of peasant households is common, which signifies high risks, the lending institutions have greater odds of examinations; if default is not common, which signifies high integrity, the lending institutions tend to trust the farmers.

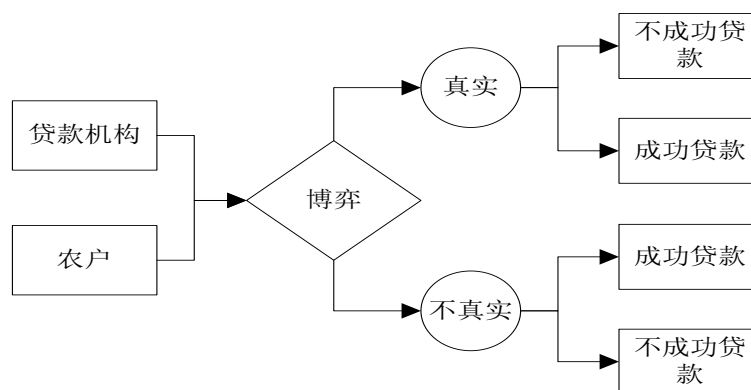


图 2 贷款机构与农户的博弈分析

3.3 Lending institutions and their staff

The relationship between lending institutions and their staff is not simply benefit game, but supervision game. Lending institutions will make use of various rules, regulations and measures to prevent violation. Therefore, from the perspective of behaviors, the two sides have game relationship, namely, lending institutions will come up with various measures to prevent breach of loans while their staffs will adopt different methods to avoid the supervision so as to obtain more benefits. The result of their game is whether breach of loans could happen. If lending institutions win the game, credit risks will be reduced and their staffs will not gain more interests. On the contrary, if their staffs have exploited an advantage and issue loans against the rules, the credit risks of lending institutions will be increased, and their staffs will inevitably obtain more benefits but also face risks of being found out.

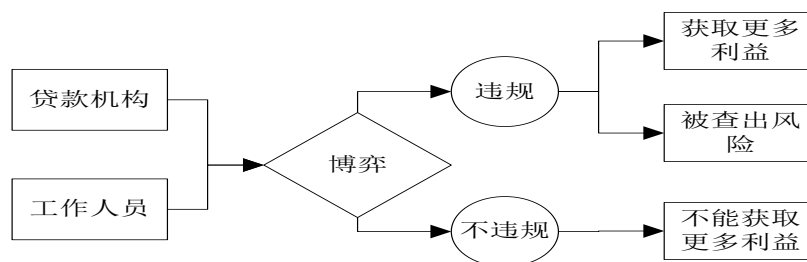


图 3 贷款机构与工作人员的博弈分析

CONCLUSION

It can be seen from the above analysis that the risk of China's rural credit is mainly due to two aspects. The direct factor is the farmer while the indirectly is the moral hazard of the management of the lending institutions and their staff. The main relationship is focused on the interest of staff and the management of banks. Therefore, in order to reduce risk bank should take the following measures.

First of all, bank should strengthen supervision and review, and improve the violation uncover rate. Everyone is vulnerable to the temptation. The credit industry is very sensitive, so close supervision must be strengthened. The crime cost will be improved through supervision and compliance review. The staff of the credit institution will weigh the pros and cons then. Therefore the risk of illegal operation will be increased and the probability is reduced.

Secondly, the welfare mechanism of the credit institute staff should be improved. In addition to high salary for nourishing honesty, a long term welfare mechanism should be established in order to increase the cost of illegal operation. If the illegal operation of staff was found, he will lost his jobs and the good benefit of now and future.

Thirdly, the supervision and audit survey system should be established. This is the most shortage aspect of China's rural credit. The investigation and audit do not play their role, which greatly improved the farmers' chances of practice fraud. Therefore the rural credit risk is increased. As for the cost factor, the lending institution could establish indirect and stable channels to tighten the survey and investigation channel, so as to reduce the cost of investigation and review.

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