Research on the SME's Collateral Credit Rationing under Loan Risk Compensation Mechanism

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Abstract

This paper discusses the function of loan risk compensation in the collateral credit rationing model. According to the derivation of my model, we find when the bank have some requirements on interest and collateral, at the same time, we add the loan risk subsidy variable into the above model, loan risk subsidy can lower the bank's collateral requirements for the enterprise, therefore, we can conclude that loan risk compensation can effectively alleviate the credit rationing faced by enterprises.

Keywords: loan risk compensation, collateral credit rationing model, SME, government

1. Introduction

Small and medium sized enterprises of science and technology refer to the small and medium-sized enterprises which rely on a certain number of scientific and technological personnel to engage in scientific and technological research and development activities, obtain their own intellectual property rights and transform them into high and new technology products or services to achieve sustainable development. Technology-based SMEs are an important part of the national economic growth process, and play an extremely important role in the process of promoting economic efficiency and rapid growth. Scientific and technological small and medium-sized enterprises are the main force of the national technology renewal and replacement. As Premier Li Keqiang advocated in the report of the government authorities in 2015, "mass entrepreneurship and innovation", the continuous growth of scientific and technological small and medium-sized

enterprises can not only promote the higher level of the country's overall technological innovation, but also bring to our country endless employment opportunities and relieve the pressure of employment. However, because the small and medium sized enterprises themselves have a small size and limited investors' registered capital, that is, their own money funds are relatively limited, but in order to maintain technical advantages and provide better customer experience in their own fields, enterprises often have a large amount of investment in the field of research and development. Therefore, the enterprises often need to carry out foreign financing. However, because of the small size, the authenticity of the financial data, the low transparency of the financial data, the low downstream customers and the low bargaining power of the upstream suppliers, the SMEs are difficult to finance in the creditor's rights market and often suffer from the credit rationing of the related financial institutions such as the banks. The market

environment is difficult. The small and medium sized enterprises of science and technology are an important part of the national economic growth process, and play an important role in the process of promoting economic efficiency and rapid growth. However, there is no uniform standard for the definition of technology-based SMEs at home and abroad. Because of the different national conditions and economic development stages, different countries have different definitions of the happy technology field, even if they are the same, there are also some differences in the definition of happy technology in different stages of economic development in a country. For example, in the early days of our country, under the living standard of the people, local governments are just pursuing the continuous growth of GDP, but there is not enough attention to the protection of the environment and resources. The state has not regarded this field as a happy technology field supported by the state. However, as the living standards of people are gradually increasing, people have put forward more and more demands on the environment of life. Countries also regard environment and resources as a happy technology field supported by the state. The division method of scientific and technological small and medium-sized enterprises is different from the division method of the general scientific and technological enterprises, because the main business can be used as a scientific and technological enterprise as long as it can be used as a scientific and technological enterprise as long as it meets the state's newly issued "happy field of national key support". However, the scientific and technological SMEs are a subdivision of the scientific and technological enterprises. But it still cannot be divorced from the field of technological enterprises.

In view of the above facts, in order to clarify the main body of this paper, the author will divide the scientific and technological enterprises and non scientific and technological enterprises from the macro level, which is divided according to the division method of "the technology field of state key support" published by the state. Then, from the micro level, the author divides the small and medium-sized enterprises in science and technology in detail according to the newly published evaluation method of small and medium enterprises (2017)

115 of the State Science and technology type. On the macro level, according to the new division of national key support technology, the small and medium sized enterprises of science and technology can be divided into eight areas: electronic information, biology and new medicine, aerospace, new materials, high-tech services, new energy sources and energy conservation, resources and environment, advanced manufacturing and automation. In the dry area, because of the space problem, we cannot further explain the above sub fields, and interested readers can search on the Internet by themselves. From the micro level, this paper mainly adopted the definition of small and medium sized enterprises in science and technology based on the latest state science and technology based small and medium enterprise evaluation method (2017) 115. That is, the small and medium sized enterprises of science and technology refer to the scientific and technological research and development activities based on a certain number of scientific and technological personnel, and to obtain independent intellectual property rights and convert them into high and new technology products or products services, so as to achieve sustainable development of SMEs. Specifically, only when companies meet the following requirements can they be regarded as a technological SME.

(1) registered enterprises in China (excluding HK, Macao and Taiwan).

(2) the total number of employees is no more than 500, the annual sales revenue is no more than 200 million yuan, and the total assets are no more than 200 million yuan.

(3) products and services provided by enterprises are not prohibited, restricted or eliminated by the state.

(4) the enterprises did not have major safety, major quality accidents, serious environmental violations and serious dishonesty in scientific research for the last year and in the year, and the enterprises were not listed in the list of abnormal business names and serious illegal and trustworthy enterprises.

According to the evaluation index of high-tech SMEs, the score of enterprise income is no less than 60 points, and the score of scientific and technological personnel is not 0 points.

Of course, in the specific implementation of the loan risk compensation fund for small and medium-sized enterprises, the division of science and Technology Based SMEs may be slightly different from the above methods, such as the detailed rules for the management of the fund pool management of the loan risk compensation for small and medium-sized enterprises in Jiangsu Province, Jiangsu Province (2012) 72) first according to "the printing and issuing of the small and medium-sized enterprises" The notification on the quasi regulation (2011) (No. 300) of the Ministry of industry and Credit Union (No. 300) on the classification standards of small and medium enterprises, divided the enterprises into small and medium enterprises and non medium and small enterprises, and then give priority to the priority support for the small and medium-sized enterprises, high-tech enterprises and private scientific and technological enterprises identified by the relevant departments of the province, and the priority support for the invention patent and the provincial related departments identified by the state. The small and medium-sized enterprises of high and new technology products should be given priority to the enterprises that have been set up or served by the personnel related to the high level talent introduction and training plan of the provinces and provinces, and the small and micro enterprises with independent intellectual property rights are given priority.

The loan risk compensation mechanism is an important financial means to encourage and guide banks to increase credit support for technological SMEs. In comparison with this article, in particular, the loan risk compensation mainly refers to the establishment of a special fund pool by the government, if the bank loans give the government designated small and medium sized enterprises a loss, then the commercial banks can obtain a certain proportion of the interest compensation from the capital pool, thus promoting and encouraging the commercial banks to further relax the loans to small and medium-sized enterprises of science and technology. Limit.

By observing and studying the loan risk compensation model in different regions, the author finds that the loan risk compensation modes in each region can be attributed to the following categories:

The direct compensation model of loan risk: this means that if the bank and other financial institutions lend a loss to the small and medium sized enterprises designated by the government, the commercial banks can obtain a certain proportion of capital compensation from the pool of funds. In general, if the loan is lost, the bank can apply to the government to apply the maximum loss to the government to manage the loan risk compensation funds. The compensation rate is 70% of the principal. This way of loan risk compensation is the most commonly used compensation mode by the government, and it is also the main loan risk compensation mode in this paper. The area that adopts this mode mainly includes Jiangsu, Zhejiang, Shanghai, Fujian and so on. The following I will take the detailed rules for the management of the management of the loan risk compensation pool for the loan risk compensation of small and medium-sized enterprises of Jiangsu financial institutions (2012) 72) as an example, briefly introducing the method of Jiangsu Province in the implementation of this policy. First, the capital pool is set up by the financial capital of the city and county, and the provincial finance is matched on a certain scale, among which the provincial finance has the capital pool set up at the provincial level. The maximum amount of supporting funds is not more than 10 million yuan; the capital pool set up for the county (city) is not more than 5 million yuan. Secondly, at the beginning of each year, the local financial departments jointly recommend the scientific and technological loan projects with the departments of science and technology and other departments, and the cooperative banks will separate the loans; then, the loans are issued according to the benchmark interest rate published by the people's Bank, and the highest proportion of the floating rate shall not exceed 30%; Finally, after the confirmation of the loan loss, the conditions for the fund pool to be compensated and the proportion of the pool and bank responsibility share, the maximum proportion of the pool of funds is not more than 70%. In addition, the single household loan does not exceed 20% of the capital pool and is not more than 5 million yuan.

The model of loan discount compensation: this model is mainly to apply the interest subsidy to the government when the enterprise is lending money from the bank, that is, the part that the

enterprise would have paid the interest to the bank is now paid by the government. In addition, the government will also set up a special risk compensation fund. When the enterprise is unable to repay the bank's loan, the bank will obtain the fund from the risk compensation pool. A certain proportion of the loan loss compensation, therefore, this kind of loan risk compensation method is a financial means formed by the two kinds of financial special funds, which are the discount funds and the loan risk compensation funds. This way is directly subsidizing enterprises, and enterprises can get the most real preferential from the government. According to the author's reference to the relevant literature and through the local government portal, the application of this model is relatively wide, but it is mainly in some developed provinces and cities in the east to implement relevant policies, while the underdeveloped areas and other underdeveloped regions in the central and western regions are relatively deficient in the related policy fields. For example, according to the author's internship in the Pudong state capital committee of Shanghai, the total amount of interest rates of the government in each district of Shanghai is not more than 500 thousand yuan, and the time is not more than two years. The main purpose is to reduce the financing cost of the related enterprises and enhance the vitality of the enterprise. In addition, in 2015, Dongguan also introduced the "Trial Measures for the management of credit risk compensation funds and financial discount funds for Dongguan" (No. 25) (No. 2015). The details of some details of loan risk compensation funds and discount funds were specified. (1) in the term of loan, the longest term for the enterprise to obtain loans is three years, the shortest period is two years; (2) on the loan amount, the maximum loan amount that the enterprise can obtain from the bank is 15 million yuan; (3) in the compensation for the bank's loan risk, the risk compensation is limited to 10% of the total amount of the total amount of credit funds that the pilot bank actually issued. The total amount of the risk loss is lower than the limit, and the total amount of the risk compensation funds is compensated; the total amount of the risk loss exceeds the limit. It is undertaken by the pilot bank on its own. (4) in terms of discount rate, enterprises can get 1 million yuan discount subsidy, and the interest

discount will be completed within two years. Of course, the above is only an example of the implementation of the relevant provinces and municipalities on the policy. Most provinces and cities will fully consider their own development in the formulation and implementation of policies, and will not completely copy the policies of other families. However, I browse the provinces and cities through the Internet.

Related websites found that although the details of policy formulation, such as the amount and time limit, are different, the total number of them is different.

The risk compensation model of Loan Guarantee Agency: this model mainly refers to the risks faced by the government and the guarantee agency when the enterprise is unable to repay the loan. The guarantee agency here not only refers to the professional Guarantee Corporation, but also includes some financial institutions, such as insurance companies, Financial Services Company, bank and other banks. The main role of the guarantee agency in the loan process is to provide a guarantee for the borrower's loan, that is, once the enterprise guarantees the risk that the enterprise can not repay the loan, the guarantee agency will have the joint liability, the guarantee agency has the risk of repayment of some loans for the enterprise, so that the bank credit risk and the government's compensation pressure can be alleviated at the same time, in addition to this. The insurance company will also earn a certain amount of guarantee. According to the author's understanding, the government used this loan risk compensation model relatively few, only part of Guangdong and Shanghai adopted this model, because the author only consulted a small number of relevant literature, so may omit the relevant government, so it does not exclude the related areas in addition to parts of Shanghai and Guangdong also adopted the related models. In 2010, the "notice on the pilot project to carry out the performance assurance insurance of the short term loan performance of technology-based SMEs" (Shanghai Co [2010] No. 34), as an example, Shanghai has a special scientific and technological performance loan, which mainly includes the four parties, namely, the enterprise itself, the bank, the insurance company and the government, and the enterprises put forward the credit loan application to the relevant government departments and the government

departments. A dedicated team is dedicated to conducting a due diligence survey on the application enterprise, and then submitted to the decision committee by the completed team to form a written survey report. If the decision committee passes the application of the enterprise, the cooperative bank will make credit lending to the enterprise, that is, it does not require any collateral from the enterprise, but in this process the enterprise must pay a certain guarantee cost to the enterprise. Insurance companies, but in order to reduce the financing costs of enterprises and encourage enterprises to repay, the government will have a special financial subsidy fund for the successful repayment of the enterprise, subsidize its 50% guarantee costs. Of course, the mode of Shanghai also has certain characteristics of second modes, but there are still great differences in essence.

In general, the government will not use a single model, because the different loan risk compensation model has its own limitations and the scope of enterprise application. Therefore, in general, two or three different pool of funds will be set up by local governments, and two to three different loan risk compensation modes are used in a mixed way. According to the author's internship experience in Shanghai Pudong SASAC, the government of Pudong New Area has adopted at least two kinds of loan risk compensation models mentioned above, which are the direct loan risk compensation mode and the loan discount compensation model. The former is a technology type small and medium-sized enterprise which can not provide the sufficient collateral to provide the credit loan for obtaining banks. Lower bank risks; the latter, in addition to providing credit loans for obtaining bank credit for small and medium sized enterprises that can not provide sufficient value collateral, provides interest subsidy for those capable of obtaining bank loans, thus reducing the operating costs of the enterprises and helping the enterprises to grow better.

The above three loan risk compensation models have different characteristics. The first loan risk model is the most commonly used model of loan risk compensation by local governments. The most important feature of the loan risk compensation model is that it can provide mortgage for the small and medium sized enterprises which can not provide the foot value mortgage, and can effectively share the risk of the bank in the loan process. This model mainly deals with those small and medium sized enterprises which can not provide the guarantee of foot value, and can not obtain loans from the banks. It is mainly used in those primary and technological SMEs, which can be applied to those small and medium sized enterprises with a certain scale, but the effect may not be better. The second model of loan risk compensation, that is, the risk compensation model of the interest discount loan, is mainly applicable to those enterprises with certain scale, which can obtain certain loans from the banks with their own strength, but because the business income and profit rate are not so high, there is a great pressure on the repayment of interest on the interest rate. The risk compensation mode can effectively alleviate the embarrassing situation. The third mode is a bit similar to the first mode, but there are still some differences. The third mode has introduced the third party market organization except the borrower and the borrower - the Guarantee Corporation. This model can effectively help the small and medium sized enterprises to borrow the difficulty of borrowing, and can reduce the pressure of the government's compensation, but it will increase the business operation process and delay the time for the enterprise to get the loan. It is convenient.

There is not a surprising difference in the body, and the core is to promote more and more small and medium sized enterprises in the region to gain more capital, so as to gain a better space for growth.

Under the condition of information asymmetry, if the bank can only adjust the interest rate, that is, the two parties only discuss the level of the interest rate in the credit contract, and there is no demand for the size of the assets, the debt ratio, the collateral and so on. Then the credit market will produce a balanced credit rationing even if the external variable is added to the loan risk compensation variable. In the above models, the credit rationing phenomenon will not disappear, but under certain conditions, it can reduce the number of firms that are subject to credit rationing. The main content of the discussion in this paper is that When banks require the interest rate and collateral in the credit contract at the same time, whether the credit rationing phenomenon in the credit market

will disappear or whether the number of enterprises that have credit rationing will decrease and the exogenous variables of loan risk compensation variables will have an impact on the lending of SMEs. In real life, in addition to regulating interest rate, banks can also have many other requirements for enterprises in the credit contract, such as assets scale, debt ratio, collateral and so on. As is known to all, mortgage loans are very popular in the modern credit market. In the course of the loan to the enterprise, collateral has also played a vital role. On the one hand, when an enterprise breaks a contract, banks can make up for their losses by selling collateral from enterprises, on the other hand, collateral can have constraints and incentives on the enterprises themselves, and constrain enterprises to dare to default, because once a breach of contract will lose the ownership of the collateral, it will also seriously damage the reputation of the enterprise itself, the damage of credit will undoubtedly increase the cost of foreign financing, especially the cost of credit. In order to complete the contract, the enterprise will work hard for the above two points.

In view of the above reality, many scholars at home and abroad have a wide and in-depth study of this field, but because of the difference between the model design and the premise hypothesis, the final conclusions are quite different. Through the reading and thinking of the related literature, the author finds that the above theory can be summed up in the following two viewpoints. One is represented by Stiglitz and Weiss, they think even if the collateral is added to the credit treaty, equilibrium credit rationing will still exist; the other is represented by Bester they think if the banks are allowed to adjust interest rates and collateral requirements in the credit contracts at the same time, the credit rationing will not exist and will form a separation equilibrium.

Stiglitz and Weiss (1981)[1] think there are two reasons that lead to a balanced credit rationing in the credit market even if collateral is used as a credit contract clause. For some later researchers, the claim that collateral can be used to distinguish the risk category of the borrower, Stiglitz and Weiss (1987, 1987, 1992)[2][3][4] have established some theoretical models in the later period and discussed the related problems. He thinks that there are differences between borrowers in many dimensions. It is difficult to distinguish effectively different risk types based on the only feature of collateral. Wette (1983)[5] further examines the role of collateral in the balance of credit rationing on the basis of the S-W model.

Many scholars have given different views on the above views. Bester (19851987)[6][7] believes that if the banks are allowed to adjust interest rates and collateral requirements in the competitive credit market, there will be no credit rationing in equilibrium. Chan and Kanatas (1985)[8] think that mortgage can play a signaling role, that is, it can indirectly alleviate the information asymmetry between borrowers and borrowers. Besanko and Thakor (1987)[9] assume that only adverse selection exists in the model. The role of moral hazard is zero. Banks will consider various factors including interest rate, mainly collateral, in the credit contract. Riley (1987)[10] believes that high quality borrowers have a way of signaling the difference between them and low quality borrowers. Hung-jen Wang (2000)[11] believes that security is positively related to credit risk.

To sum up, the author finds that the research of credit rationing by domestic and foreign scholars is mainly focused on debating parties, without considering government intervention. The biggest difference between the author and the previous literature is that when considering both sides of the loan, the third party government loan risk compensation factor is introduced at the same time, and the influence of loan risk compensation factors on the enterprise credit rationing is investigated. The theoretical significance of this paper is to introduce the loan risk compensation variable into the credit rationing model under the condition of information asymmetry. On the one hand, it expands the equilibrium credit rationing theory of asymmetric information conditions; on the other hand, the loan risk compensation funds are mainly funded by the finance, so this paper also has certain significance for the expansion of the theory of fiscal expenditure. Therefore, the theoretical significance of this paper is mainly reflected in the above two aspects. The expansion of the theory is mainly based on the above two aspects.

2. Model hypothesis

Each enterprise has its own assets A and is evenly distributed between $[0, \overline{A}]$.

(1) According to the number of enterprises' own assets, the enterprises can be divided into two kinds of enterprises of different sizes. The first class enterprises J own assets A_j^l, A_k^s are owned by second types of enterprises k, that is, the size of the first class enterprises is larger than that of the second kinds of enterprises.

(2) The credit market is a competitive market, that is, in a balanced state; the bank's profit is zero.

(3) Both banks and borrowers are risk neutral.

(4) The enterprise does not have any liquid assets. If an enterprise only makes loans to the bank, it can invest in technology development projects, and the fixed capital B of each project is fixed.

(5) When an enterprise breaks a contract, a bank will bear the corresponding liquidation expenses when handling the assets it collaterals.

(6) In order to facilitate the latter model deduction, it is assumed that the liquidation cost is a fixed proportion h of the collateral value, hC is to express the cost of liquidation, $0 \le h \le 1$, C is to represent the value of the collateral, $C > 0$, therefore, the value compensation that the bank can obtain after the liquidation of the collateral is $(1-h)C$, let $t = 1 - h$, so the value that the bank can obtain after clearing the collateral is tC, $0 \le t \le 1$.

(7) E indicates that business operators are in a state of effort to pay more than the operator is in a lazy state; p_h indicates that the probability of success of technology development projects is in the state of enterprise managers' efforts; p_l indicates the probability of success of technology development projects when managers are lazy, $p_h > p_l$, $\Delta p = p_h - p_l$. When the technology development project is successful, the enterprise gains revenue R, and the profit is zero when it fails. There are only two possibilities for technological development projects: success and failure; if the enterprise invests in technology development projects, and managers strive to operate, the following inequality relations are established: $p_h R - E > B > p_l R$.

(8) The cost of obtaining loanable funds of banks is b, that is, the interest rate of depositors in the bank deposit is b, and the profit per unit loan of banks is r, that is, the interest rate of banks is r, let $H = B(1+r)$, $M = B(1+r)$, H indicates that the loan firm returns the bank's principal and interest without breach of contract, and M indicates that the bank will pay the principal and interest of the depositor to obtain the loan.

(9) The probability that a bank gives a loan to each applicant is equal.

3. Establishment and Analysis of Credit Rationing Model

A bank provides a loan contract $\{r_i, C_i\}$ to the enterprise, $\{r_i, C_i\}$ indicate a combination of loan interest rates r and collateral requirements C faced by the borrower. For enterprises, loan contracts must satisfy incentive compatibility constraints and participation constraints. For banks, loan contracts must make bank profits non negative. Therefore, a feasible mortgage credit constraint can be expressed in the following formula.

For the enterprise:

Enterprise incentive compatibility constraints:

$$p_h(A + R - H) + (1 - p_h)(A - C) - E \ge p_l(A + R - H) + (1 - p_l)(A - C) \quad (1)$$

The following equation can be derived from the above inequalities:

$$H \le R - E/\Delta p + C \quad (2)$$

When the equal sign is established, the maximum loan interest rate that the enterprise is willing to accept under the incentive compatibility condition of the enterprise can be obtained.

The constraints of enterprise participation:

$$p_h(A + R - H) + (1 - p_h)(A - C) - E \ge A \quad (3)$$

The following equation can be derived from the above inequalities:

$$p_h(R - H) - (1 - p_h)C - E \ge 0 \quad (4)$$

For banks, banks only have the constraints of participation and do not have incentive compatibility constraints, that is, the relationship between bank constraints is as follows:

$$p_h H + (tC + \lambda\theta B)(1 - p_h) - M \ge 0 \quad (5)$$

θ shows the loan loss readiness rate (constant), and λ shows the government's compensation rate for bank loans, $\lambda \in [0,1]$.

A feasible constraint on a mortgage, that is, the minimum standard for the borrower to obtain a loan from a bank, which must be met by its own assets:

$$A \ge C \quad (6)$$

Since the credit market has been assumed to be a competitive market, the banks are bound to constantly adjust r and C until their expected profit is zero. In equilibrium, they are all satisfied, any bank participation constraint. However, in order to determine the R and C values, we must analyze the constraint conditions of the enterprise, the liquidation of enterprises collateral bank must pay a certain cost, so the relative enterprises direct repayment, the collateral for the banks is certainly better than direct repayment enterprises and banks to maximize their profit, will minimize collateral requirements, increase loan repayment requirements, until it reaches the critical condition of enterprise incentive compatibility, namely when the loan interest rate of 2 type corresponding to an equality on the banks is the optimal interest rate.

The equation of the 2 equation is established. At the same time, the expression will be brought into the 5 form after the establishment. At the same time, the equation of the 4.5 form is also established, so we can get the following formula:

$$p_h[R - E/\Delta p + C_0] + (tC_0 + \lambda\theta B)(1 - p_h) - M = 0 \quad (7)$$

C_0 expresses the collateral value of the bank's expected profit at zero, and we can get the following formula according to the 7 form:

$$C_0 = \frac{M - p_h(R - E/\Delta p) - (1 - p_h)\lambda\theta B}{p_h + (1 - p_h)t} \quad (8)$$

Because $\quad C > 0 \quad$,
$M - p_h(R - E/\Delta p) - (1 - p_h)\lambda\theta B > 0$.

According to the 8 form, we can deduce the following two relationships:

$$\frac{dC_0}{dt} = -\frac{M - p_h R + p_h E/\Delta p - (1 - p_h)\lambda\theta B}{[p_h + (1 - p_h)t]^2}(1 - p_h) < 0$$

$$（9）$$

$$\frac{dC_0}{d\lambda} = -\frac{(1 - p_h)\theta B}{p_h + (1 - p_h)t} < 0 \quad (10)$$

By bringing 8 into the 2, the best repayments can be obtained by the bank:

$$H_0 = R - \frac{E}{\Delta p} + \frac{M - p_h(R - E/\Delta p) - (1 - p_h)\theta B}{p_h + (1 - p_h)t}$$

$$(11)$$

According to the discrepancy of the enterprise's own assets, there will be several following cases:

When $C_0 > A_j^i$, then, all enterprises will be allocated, that is, no business can get a loan from the bank.

When C_0 is between A_j^i, part of the first class enterprises will be rationed, and the other enterprises will get bank loans. The second enterprises will all be rationed.

When C_0 is between A_k^s, some second types of enterprises will be rationed, and others can get bank loans. All enterprises can get loans.

When $A_k^s > C_0$, no business will be subject to credit rationing.

In the above assumptions, the author only assumes that banks know the distribution of their own assets, but it is not clear which category each firm belongs to. Because this article is about the credit rationing situation of high-tech SMEs, the author divides second kinds of enterprises into technology SMEs and non technology SMEs, and assumes that banks know the specific classification of enterprises in the second categories. According to the characteristics of small and medium-sized enterprises own we know, SMEs must belong to second types of enterprises, on the one hand, it is the small and medium-sized enterprises, on the other hand it has most of the assets for patents and other intangible assets, cash intangible assets have serious difficulties, therefore, according to the above two reasons the scientific and technological small and medium-sized enterprises are classified into second categories. Suppose that t_t is the proportion of compensation that a commercial SME can get from its liquidation value when breaking a contract, and the corresponding value of its collateral is C_t; t_n indicates that the proportion of compensation that a bank can get from its liquidation value when a non technology SME breaks its contract, the corresponding value of its collateral is C_n.

Through the above analysis, it is known that if banks can provide different types of loan

contracts to different types of enterprises, loan contracts for non technology SMEs will be $\{r_n, C_n\}$, and loans for technology SMEs will be $\{r_t, C_t\}$, which is the best for banks. If the bank for all the two types of enterprises to provide credit contract with $\{r_n, C_n\}$, then the part of SMEs will be able to obtain loans, but this is not optimal for the banks, because this part of SME default probability is relatively large, and the value of the collateral is relatively small, it will cause the bank could not reach profits; if the bank for all the two types of enterprises to provide credit contract $\{r_t, C_t\}$, there must be a part of the non tech SMEs are difficult to meet the demands, which is part of the risk level and relative enterprises in small and medium sized enterprises is not high, the bank could have a profit in the enterprises, but as provided by the contract does not lead to its maximization. To sum up, the best case for banks is to provide classified contracts and to provide different types of contracts for different types of enterprises.

4. Conclusion

This paper discusses the function of loan risk compensation in the collateral credit rationing model. According to the derivation of my model, we find when the bank have some requirements on interest and collateral, at the same time, we add the loan risk subsidy variable into the above model, loan risk subsidy can lower the bank's collateral requirements for the enterprise, therefore, we can conclude that loan risk compensation can effectively alleviate the credit rationing faced by enterprises.

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