9-2019

Analysis of credit enhancement of financing guarantee company

Tiewei ZHANG
Singapore Management University, tieweizhang.2016@ckdba.smu.edu.sg

Analysis of Credit Enhancement of Financing Guarantee Company

ZHANG Tiewei

SINGAPORE MANAGEMENT UNIVERSITY

June 2019

Analysis of Credit Enhancement Model of Financing Guarantee Company

ZHANG　Tiewei

Submitted to Lee Kong Chian School of Businessin partial fulfillment of the requirements for the Degree of Doctor of Business Administration

Dissertation Committee:

FU Fangjian（Chair）

Professor of Finance

Singapore Management University

ZHOU Chunsheng (Co-supervisor)

Professor of Finance

CK Graduate School of Business

YU Yang（member)

Assistant Professor of Finance

Singapore Management University

SINGAPORE MANAGEMENT UNIVERSITY

2019

Declaration

I hereby declare that this doctorate dissertation is my original work and it has been written by me in its entirety.
I have duly acknowledged all the sources of information which have been used in this dissertation.

This dissertation has also not been submitted for any degree in any university previously.

ZHANG Tiewei

June 20, 2019

Analysis of Credit Enhancement of Financing Guarantee Company (FGC)

ZHANG Tiewei

Abstract

In China, the financing problem of SMEs has been concerned for a long time, but it has not been solved effectively. At present, the development of financing guarantee companies (FGCs) providing credit enhancement services for SMEs is facing severe challenges. Essentially, financing guarantee is a special kind of creditor's right (debt investor's rights). The essence of creditor's right is the seller position of put options. Because the return-risk structure of creditor's right is seriously asymmetric, debt investors should follow the prudent and conservative operating principle. The "5Ws" principle or "5Cs" principle of bank loan business is the embodiment of this prudent and conservative principle. When selecting investee, debt security (bond) investors should follow the strict "exclusion-rejection" procedure, which is the direct requirement of the prudent and conservative principle in debt investment. Financing guarantee can be regarded as a non-standard debt security. Because of the higher risk of its clients of SMEs, the strictest principle of prudence and conservatism must be abided by in the operation of financing guarantee business, namely the zero-loss-principle. As a credit risk management instrument, financing guarantee has both links and differences with credit default swaps (CDS) and credit insurance. The essential difference is that financing guarantee must follow the zero-loss-principle, while CDS and credit insurance follow the principle of "expected loss less than expected return".

There is a match between the zero-loss-principle of credit enhancement business and the spirit of doer. The zero-loss-principle requires the FGC to strictly examine and screen the clients (entrepreneurs) and select the right clients at the very beginning. The spirit of doer usually refers to a dedicated character that takes the enterprising philosophy of " If others succeed by exerting one ounce of effort, I will exert a hundred times as much effort" as the core and seeks the right thing as practical, deep, long-term, capable and excellent as possible. The spirit of doer can increase enterprise value and reduce credit risk of financing guarantee business through learning curve effect, human capital effect and social capital effect. Through case study, it finds that FGC must refuse the actual controllers who do not focus on the business directly. Because opportunists are highly likely to fail in business, and once their business fails, the possibility of the FGC fully exercising its right of recourse after compensation is very low. Even before default, these opportunists have various countermeasures against recourse or claims.

There is a match between the zero-loss-principle of credit enhancement business and market competitiveness. Market competitiveness can improve the profitability, solvency and sustainability of enterprises. Enterprises with market competitiveness can improve EBITDA by raising prices or expanding sales, which can improve the short-term solvency of enterprises and reduce the risk of financing guarantee business. The case study finds that the enterprise market competitiveness can be measured objectively and quickly by using two indicators of customer

concentration and net profit margin.

There is a match between the zero-loss-principle of credit enhancement business and technical suitability. Technology is a means of transforming input into output in the process of production, and technological suitability is the organic unity of technological advancement and efficiency. The principles and methods of technology suitability evaluation are completely consistent with those of enterprise value evaluation, that is, to maximize the net present value or the internal rate of return. The case study finds that two indicators of return on assets (ROA) and average wage can grasp the degree of technical suitability quickly.

With the zero-loss-principle of financing guarantee business as the core, there is an organic unity among doer spirit, market competitiveness and technical suitability. Among them, the spirit of doer is the commander-in-chief, technical suitability is the means, and market competitiveness is the driving force and guidance. The three-factor credit enhancement model can explain the vicissitudes of China's financing guarantee industry, and can guide the FGCs to manage each financing guarantee business.

Keywords: Financing Guarantee Company (FGC), Zero-loss-principle, Doer Spirit, Market Competitiveness, Technical Suitability

Contents

Acknowledgement

I want to thank my tutors, Mr. FU Fangjian, Mr ZHOU Chunsheng and Ms. YU Yang. From the beginning of the topic selection to the final draft of my dissertation, my tutors have been continuously guiding and am encouraging me. Dissertation writing is also a process of continuous learning, summarizing, refining, revision and improvement. Cheung Kong Graduate School of Business and Singapore University of Management have created excellent conditions for my further study. I sincerely thank all the teachers of the DBA Project Team for their hard work and outstanding service. My heartfelt thanks to those who have given me great supports and helps in the process of my further study.

In the process of collecting data, I have many supports from Ms. DAI Jing, Ms. YU Jianqun, and other colleagues of the Success Financing Guarantee Company. During my Ph.D. study, I got great helps from all my colleagues. Thank you very much.

ZHANG Tiewei

June 20, 2019

Chapter I Introduction

Financing guarantee companies (FGCs) mainly serve small and medium-sized private enterprises (SMEs). Firstly, the current financial system in China, which mainly focuses on direct financing and debt financing, is taken as the logical starting point of the theoretical analysis. Then, the external and internal causes of financing difficulties of private SMEs are analyzed. Finally, from the point of view of credit risk management, financing guarantee is regarded as a special kind of credit risk management instruments, which provides a clear perspective and focus for the subsequent chapters.

1.1 Main Topics of the Background

China's indirect financing system and debt financing system aggravate the financing difficulties of SMEs. The financing guarantee of SMEs can be analyzed from the perspective of credit risk transferring instruments. At present, China's SMEs financing guarantee system needs to be improved urgently. These pre-existing conditions constitute the financial background and logical starting point of this study.

I. China's Financial System and Financing Difficulties of SMEs

The financing difficulty of SMEs is a worldwide problem. In China's traditional financial system, which is characterized by indirect financing and creditor's rights financing, imperfect credit system and lack of credit risk transfer tools, the financing problem of SMEs is more severe.

i Characteristics of China's Financial System

At present, China's financial system is characterized by indirect financing is dominant while direct financing is weak, debt financing as the main component while equity financing lags behind, lack of market-oriented credit risk management instruments, lagging credit information system and high credit risks.

1. Dominant Indirect Financing and Weak Direct Financing

At present, China's finance is still a separate mode, mainly including banking, trust, insurance and securities. As shown in Figure 1-1, the total assets of banking financial institutions reached 261.4 trillion yuan at the end of 2018, trust financial institutions reached 23.14 trillion yuan, and insurance financial institutions reached 18.33 trillion yuan, the market value of stocks, which represents the securities industry, with a scale of 43.03 trillion yuan at the end of 2018. The above four sectors accounted for 75.6%, 6.7%, 5.3% and 12.4% respectively. Banking financial institutions were in the leading position. The market value of the stock market, which represents direct financing, only accounted for 12.4% of the stock of major financial assets.

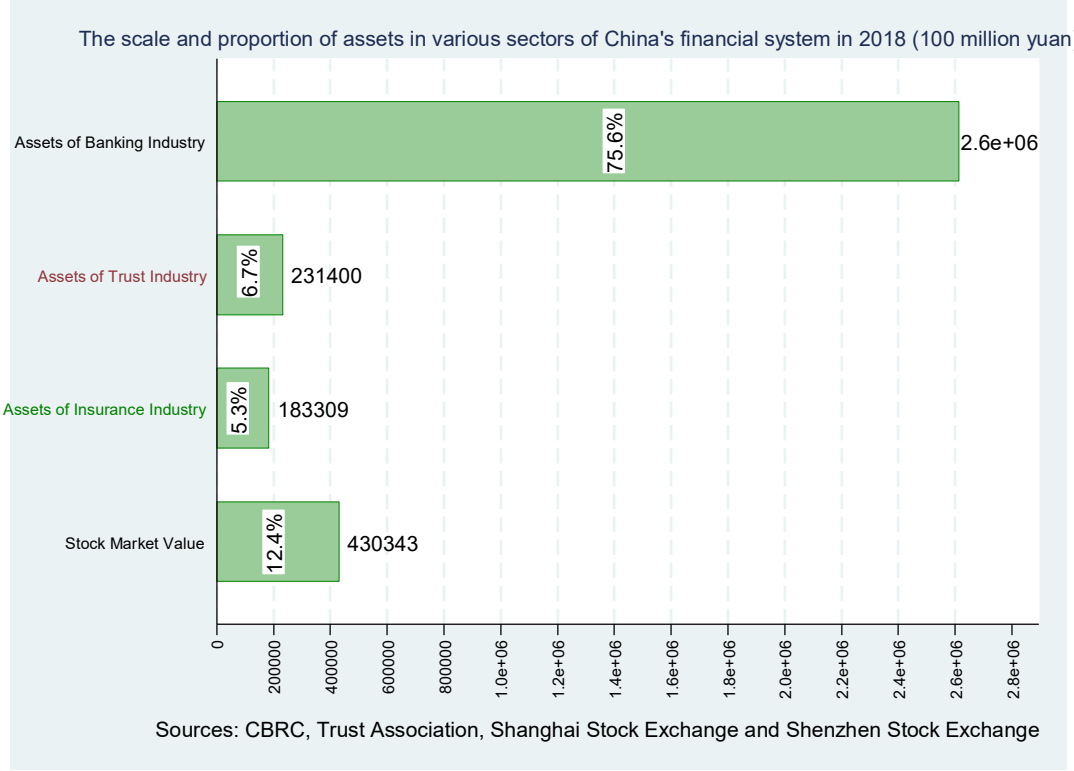

Figure 1-1 Scale and proportion of assets in various sectors of China's financial system in 2018

Commercial banks, insurance institutions and trust companies are typical financial intermediaries with indirect financing as the main business, and their financial liabilities and assets are mainly debt instruments rather than equity. The financial system dominated by indirect financing, on the one hand, creates the dominant position of financial intermediaries; on the other hand, it makes it difficult for financial risks to be spread in the whole society by means of market-oriented methods. These concentrated risks bring heavy pressure on financial intermediaries and further strengthen financial intermediaries' conservative character in business operation. In short, the dominant position of indirect financing and the imperfect risk spreading mechanism result in the inadequate service of financial intermediaries to private enterprises, especially SMEs, which lack implicit guarantee from the

government.

2. Dominant Debt Financing and Backward Equity Financing

As shown in Table 1-1, according to the National Bureau of Statistics, the increase of social financing in 2018 was 19259.8 billion yuan, of which: RMB loan was 15,671 billion yuan, accounting for 81.37%; corporate bond financing was 2,485.3 billion yuan, accounting for 12.90%; stock financing of non-financial enterprises was only 36.6 billion yuan, accounting for only 1.87%. From the nature of financing instruments, debt financing is dominant, and the proportion of equity financing is too low.

Table 1-1 Structure of China's Social Financing in 2008 -2018 (RMB 100 million)

year	amount	Renminbi loan		Enterprise bonds		Domestic Stocks of Non-financial Enterprises	
		amount	share（%）	amount	share（%）	amount	share（%）
2018	192598	156710	81.37	24853	12.90	3606	1.87
2017	194445	138432	71.19	4421	2.27	8759	4.50
2016	178159	124372	69.81	30025	16.85	12416	6.97
2015	154063	112693	73.15	29388	19.08	7590	4.93
2014	158761	97452	61.38	24329	15.32	4350	2.74
2013	173169	88916	51.35	18111	10.46	2219	1.28
2012	157631	82038	52.04	22551	14.31	2508	1.59
2011	128286	74715	58.24	13658	10.65	4377	3.41
2010	140191	79451	56.67	11063	7.89	5786	4.13
2009	139104	95942	68.97	12367	8.89	3350	2.41
2008	69802	49041	70.26	5523	7.91	3324	4.76
Average	153292	99978	65.22	17844	11.64	5299	3.46

Source: National Bureau of Statistics

From the legal and financial point of view, the creditor's right is a put option, and the lender (creditor) is the seller of the put option. Interest income constitutes the creditor's limited return, while potential principal loss constitutes the risk it may

encounter. The interest rate is only a small fraction of principal, so creditors are facing a severe return-risk asymmetry. Considering the asymmetric characteristics of creditor's rights with limited return and risk of nearly limitless potential loss, the lender should first consider downside risks of the prospective project and strictly follow the principles of soundness, safety and prudence. In general, the priority clients for the lenders are enterprises with long operating history, large scale, stable performance, good corporate governance, sufficient solvency and adequate collateral, especially state-owned enterprises with implicit government guarantee. Private SMEs are at a disadvantage in the above aspects, and naturally, they are not the favorite clients for the lenders.

From the fact of China's financial development in recent years, credit institutions represented by commercial banks naturally have the characteristics of preferring to large enterprises, mature industries and state-owned enterprises with implicit government guarantee. These organizations control China's financial resources mainly, which aggravates the financing difficulties of private SMEs in China. Especially in the period when the economy encounters external shocks or disturbances, such as the decline of economic growth, uncertain economic prospects or the background of de-leveraging, this feature is particularly pronounced.

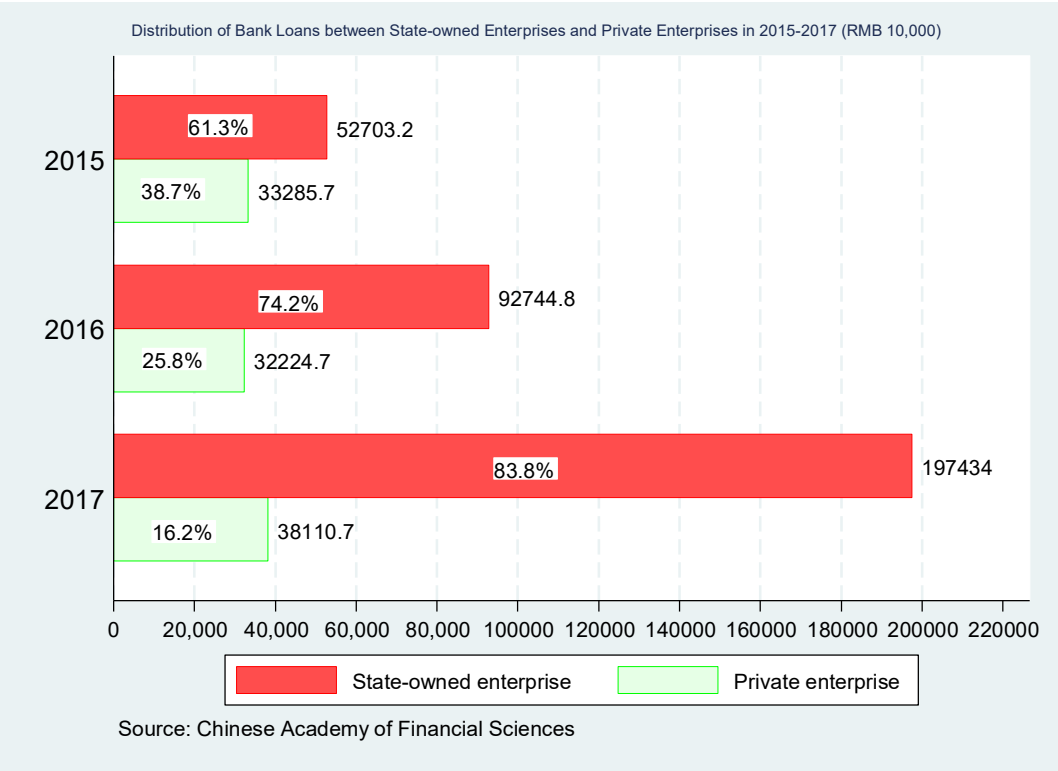

Figure 1-2 Distribution of Bank Loans in State-owned Enterprises and Private Enterprises in 2015 - 2017

As shown in Figure 1-2, since the implementation of the supply-side structural reform policy in 2016, the share of bank loans to state-owned enterprises has increased sharply from 61.3% in 2015 to 83.8% in 2017. While the share of bank loans to private enterprises has dropped rapidly from 38.7% in 2015 to 16.2% in 2017 which has dropped by more than half (-58.2%). This trend makes the private enterprises facing financing difficulties undoubtedly worse. It also makes the financing guarantee business of the FGC decline sharply and the quality of the financing guarantee business decrease tremendously.

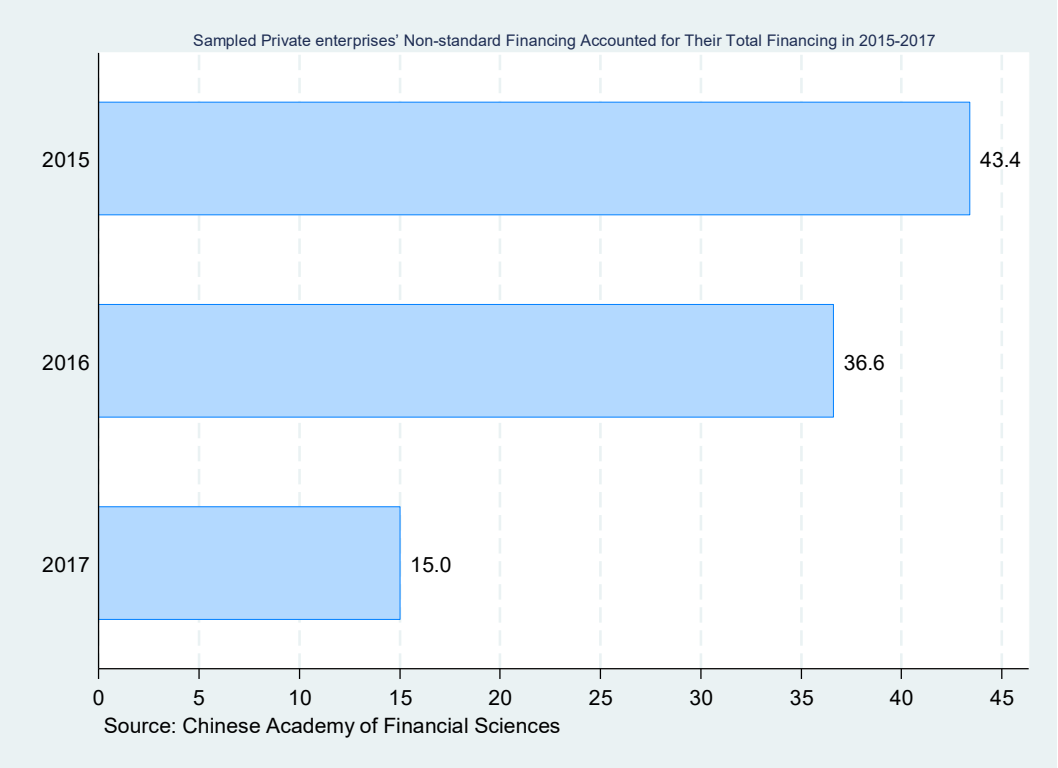

Figure 1-3 Sampled Private enterprises' Non-standard Financing Accounted for Their Total Financing in 2015-2017

As shown in Figure 1-3, under the background of strict financial supervision, non-standard financing relied on by private enterprises has also contracted sharply. The proportion of non-standard financing to the total financing of sampled private enterprises has decreased from 43.4% to 15.0%, while the increase in bank credit cannot cancel out the decrease in non-standard financing, resulting in the decline of the total financing scale of private enterprises. Inadequate traditional loans and tightened non-standard financing make the financing problem of private enterprises very noticeable.

3. Deficient Market-oriented Credit Risk Management Instruments

China's low proportion of direct financing seriously distresses the full development of the financial market, and it cannot provide effective risk transferring

instruments for financial institutions operating indirect financing, thus seriously restrict the development of indirect financing.

Asset securitization started late and CDS developed slowly.

Asset securitization refers to the process of dividing and reorganizing the assets expected to produce stable cash flow but with poor liquidity through a series of structural arrangements, and transforming the expected cash flow of assets into more competitive financial products with the help of credit enhancement. For banks and other credit institutions, the main functions of asset securitization include: revitalizing assets, alleviating mismatches between assets and liabilities; dispersing risks and reducing credit risk concentration; increasing intermediary business income, improving the return on assets of banks; enlarging business, strengthening and consolidating customer relations. China's credit asset securitization sprouted in the 1990s. It was not until 2005 that the Central Bank and the Banking Regulatory Commission officially promulgated the "*Measures for the Pilot Management of Credit Asset Securitization*". The pilot work of credit asset securitization officially opened, and a system of issuing and circulating of credit asset-backed securities (ABS) in the interbank market was set up, with the central bank and the Banking Regulatory Commission as the leading force. In 2017, 62 sponsors in the credit ABS market successfully issued 133 single products with a total amount of 597.229 billion yuan. Banking financial institutions, as the main initiator, account for 75.91% of the total amount issued. At present, the main problems of asset securitization in China are simple structure, limited profit margin, difficult pricing and valuation,

single investor structure, weak liquidity, etc.

In fact, as early as 2010, the China Traders Association issued the "*Interbank Market Credit Risk Mitigation Instruments Pilot Business Guidelines*", outlining the relevant framework of credit risk mitigation instruments, but the development of the mitigation instruments in the exchange market is relatively slow. On September 23, 2016, in order to enrich the means of risk management for market participants and improve the mechanism of credit risk transferring and sharing, the China Traders Association issued the revised "*Pilot Business Rules for Credit Risk Mitigation Instruments in Interbank Markets*". On October 22, 2018, the People's Bank of China issued the "*Establishment of Bond Financing Support Instruments for Private Enterprises to Support the Development of Private Economy Unwavering*". It requires that the credit risk mitigating instruments and credit enhancement should support private enterprises with market, prospect and competitive technology. However, up to now, the trading volume and application scope are very limited.

Credit Insurance Develops Slowly and Needs to Be Improved Urgently.

On July 11, 2017, the CIRC promulgated the *Interim Measures for the Supervision of Credit Guarantee Insurance Business*. In April of 2018, the credit insurance market changed dramatically. Suddenly, insurance companies issuing credit insurance policies informed clients that they could no longer issue insurance policies for financing businesses. Foreign banks notified customers one after another that the financing would be stopped because insurance could not be renewed. The utilization of credit insurance by Chinese banks has been popular for several years,

but in recent years, due to the internal management problems of banks and banks liking to use simple means of risk controlling such as mortgage and guarantee, the application scale of credit insurance has gradually declined. At the same time, due to the narrow variety of credit insurance in China, product introduction and innovation are practically absent, which cannot meet the diversified financing needs.

4. Behindhand Credit System and the High Credit Risk

The Development of Credit Reporting System Lags Behind.

Social credit system is a kind of social governance mechanism. It takes credit laws and regulations as the basis of system, credit professional service institutions as the main body, legal and effective credit information as the basis. It aims at reducing the information asymmetry among market participants, encouraging the trustworthy, making the dishonest pay the price, and ensuring the fairness and efficiency of market economy. The purpose of social credit system is to establish a market soft environment and efficient market rules suitable for the development of credit transactions, and to ensure the smooth transition from market economy to credit economy, that is, to replace the primary means of payment by credit transactions as the main mode of market transactions. A perfect social credit system is the premise for credit to play its role, the institutional assurance for the development of market economy to an advanced stage, and the infrastructure for the development of credit economy. The perfection of social credit system has become a remarkable symbol of the maturity of market economy.

In 1999, China put forward the concept of social credit system as a fundamental

measure to rectify and standardize the market economic order. However, it was not until 15 years later, that is, June 2014, that the first national top-level design document, *the Outline of Social Credit System Planning (2014-2020)*, was issued. In recent years, great progress has taken place in the construction of China's social credit system, which has attracted wide attention of the international communities. However, the lack of social credit has not been fundamentally reversed, mainly including: the lack of social integrity and credit transaction risks are still prominent, the development of public credit mechanism and market credit mechanism is very unbalanced, and the institutional mechanism of social credit system building is facing challenges. Compared with developed countries, the main problems in the construction of China's social credit system are: laws and regulations on credit management need to be established urgently, the construction of social credit system lacks overall planning, and the supply and demand of credit service market is seriously insufficient.

Credit Risk Remains High.

Since the reform and opening up, under the impetus of industrialization and urbanization, Chinese society has changed dramatically from a traditional acquaintance society to a modern anonymous society. With the imperfection of social credit system and legal system, there inevitably exist opportunists who betray their faith in market transactions: as long as the cost of default is much lower than the benefits, the existence of such opportunists is the result of rational game. This kind of opportunistic transaction acts on the financing market, which significantly

increases the burden and cost of the creditors' screening, and aggravates the financing difficulties of private SMEs. State-owned enterprises usually have implicit guarantees from the government, and there are no serious financing constraints. However, private SMEs have to pay for the high credit risk, so there are always difficulties in SMEs financing.

ii Financing Difficulties of SMEs

1. Embodiment of Financing Difficulties

Private economy plays an important role in the whole economic system. It contributes more than 50% of tax revenue, 60% of GDP, 70% of technological innovation, 80% of urban employment, 90% of new employment and the number of enterprises. Private enterprises are mainly SMEs. It is very difficult for private SMEs to finance indirectly or directly.

Indirect financing of private SMEs is difficult. At present, indirect financing is the main financing approach of Chinese enterprises. However, depositary financial institutions are inherently reluctant to lend, which is difficult to meet the financing needs of the whole society and seriously underserves private SMEs. Depositary financial institutions are very special investors, whose funds mainly come from deposit liabilities. Depositary financial institutions essentially absorb short-term liabilities and then use them to grant loans with relatively long maturities through the term mismatch. According to Article 7 of the Bankruptcy Law, if the debtor is unable to pay the debts that are due, the creditor may propose to the court the bankruptcy liquidation of the debtor. As deposit liabilities of depositary financial institutions are

essentially matured debts, it can be said that they are born on the start line of bankruptcy liquidation. This means that compared with other financial institutions or investors, depositary financial institutions tend to be vigilant and conservative in their investment behavior.

Because the amount of collateral is difficult to meet the bank's credit requirements, and the lack of government "implicit guarantee", financing problems of private SMEs are prominent. According to the sample survey data of the Chinese Academy of Financial Sciences, from 2015 to 2017, the ratio of bank loans of private enterprises to those of state-owned enterprises in the sampled enterprises declined rapidly from 63% to only 15%. Credit resources incline obviously to state-owned enterprises. At the same time, under the background of strict financial supervision, non-standard financing relied on by private enterprises has contracted sharply. The proportion of non-standard financing in the total financing of sampled private enterprises has decreased from 43% to 15%, while the increase of bank credit cannot offset the contraction of non-standard financing, which leads to the decline of the total financing scale of private enterprises. Traditional loans are inadequate and non-standard financing is tightened, which makes it difficult for private enterprises to raise funds.

It is difficult for private SMEs to obtain direct financing. Financing by issuing stocks and bonds is very demanding in China. According to the current *Company Law of China*, Joint Stock Company can be listed to raise funds from the whole society. However, the minimum registered capital for the establishment of a

joint stock company shall not be less than 10 million RMB. With such a high threshold, most SMEs can only stand back. At present, China's capital market is mainly inclined to large enterprises. The SME board, Growth Enterprise Market (GEM) board and the new three boards are still in the early stage of development, with small scale and narrow industry coverage, which are far from meeting the direct financing needs of SMEs. Although the newly established joint venture board in China provides a platform for direct financing for SMEs, the listed enterprises are a small number of large-scale SMEs, and most SMEs are difficult to access to the fund stock market. If SMEs have higher credit, they can obtain financing through commercial paper. However, due to the late start and imperfection of China's credit rating system, this financing channel is obviously not feasible.

According to the data of the 2012 World Bank questionnaire on Chinese enterprises, compared with the surrounding countries, Chinese enterprises are facing higher levels of credit constraints. Specifically, among the sources of funds needed by Chinese enterprises, endogenous financing provides most of the funds for enterprise investment, up to 90%, and bank loans provide only 5% of the total funds needed for investment, compared with 70% and 15% in the Asia-Pacific region, respectively. In addition, from the point of view of the availability of corporate loans, only 25% of Chinese enterprises can obtain bank loans, which is far below the average level in the Asia-Pacific region (40%). Among them, the ratio of the value of collateral to the amount of bank loans provided by enterprises receiving bank mortgages reaches 200%, which is much higher than the average collateral coverage

of 170% in the Asia-Pacific region. It can be said that over-reliance on endogenous financing and lack of bank loan support have become serious obstacles to the development of SMEs in the context of China's slowdown in economic growth and supply-side structural reform.

2. Reasons for Financing Difficulties of SMEs

The financing problem of SMEs has always been the focus of policy makers and researchers. The economic importance of the SMEs sector has been widely recognized in academic and policy literature. They acknowledge that SMEs are under-served, especially in the financial sector. The difficulty and high cost of financing for SMEs is a worldwide problem. As early as early as 1931, the McMillan Commission Report insisted that relatively small capital investment is riskier and more expensive for the lenders, which makes the conditions for SMEs to seek loans extremely unfavorable. Banks are unwilling to grant loans on the terms proposed by SMEs, so that in the process of SMEs development, the total amount of money invested is riskier and more expensive. There is a financing gap, i.e. the Macmillan gap.

In addition to the deficiencies that the enterprises themselves cannot eradicate, the factors that cause the financing difficulties of Chinese private SMEs are also related to the imperfection of the external environment and financing policy of the enterprises.

(a) Changes in the external environment are not conducive to the development of SMEs. In recent years, the basic wages of on-the-job workers have been

increasing year by year. Prices have risen, consumption expenditure has increased, and labor costs of SMEs have risen sharply. On the contrary, the profit margin of SMEs is decreasing year by year, and the survival risk of SMEs is increasing. At the same time, banks are facing such huge financial pressure, SMEs financing is worse. These difficulties include a substantial increase in overall costs and a huge shortfall in operating capital. At the same time, some industries are experiencing a decline in profits and even losses.

(b) The credit information system is not yet all encompassing. China's credit information system started late, and the People's Bank of China and commercial banks have not jointly established credit files for SMEs. It is difficult for the credit information system to provide sufficient credit information support for commercial banks to grant loans to SMEs. Commercial banks rely too much on mortgage guarantees for loans to SMEs.

(c) The return-risk of SMEs loans is asymmetric. With small business scale, small assets, weak brand effect, lack of market stability, weak competitiveness and ability to withstand external shocks, SMEs are easy to bring greater risks to investors. With the establishment of strict credit risk management accountability system in banks, it will obviously increase the difficulty of SME loans.

(d) The assets that SMEs can use for mortgage loans are inadequate. For the sake of risk factors, bank loans to SMEs are mainly guaranteed or mortgage loans. However, the size of SMEs is not large. They have neither fixed assets to be mortgaged nor negotiable securities. Some of them even rely on leasing equipment

and factory buildings. It is difficult to meet the preconditions that the borrower must have certain capital strength.

(e) The financial system of SMEs is not perfect, and the authenticity of financial information is difficult to verify. A considerable number of SMEs have not standardized financial systems and sound accounting departments. There are many doubts about the authenticity of financial statements provided by SMEs. Financial institutions can get little valuable operational and financial information of SMEs.

Consequently, in order to control risks, banks are unwilling to grant loans to SMEs.

II. Financing Guarantee as Credit Risk Transfer Instrument

1. Regulatory Requirements on Credit Risk of Basel Accord

Various versions of the Basel Accord require banks to bear credit risk with a corresponding proportion of capital, which constitutes a regulatory constraint on the amount of credit risk that banks bear under certain capital conditions. *The Basel Accord I* of July 1988 regards the capital adequacy ratio as the core of the regulatory framework to assess the bank's coverage and resistance to credit risk. The main contents include: concretizing the calculation of capital adequacy ratio, dividing the capital into core capital and subsidiary capital, and unifying the standard of capital composition; dividing the risky assets into the risky assets in the statement and the risky assets outside the statement, and stipulating different credit conversion coefficients for the off-balance sheet business, and classifying the inside and outside of the statement according to the asset classification. The risk weight is divided into

five categories, and the minimum capital adequacy ratio is proposed, in which the core capital adequacy ratio is not less than 4%, and the capital adequacy ratio is not less than 8%.

In June 2004, the Basel II Accord for the first time established three pillars of the international banking regulatory framework. On the basis of strengthening the minimum capital regulatory requirements, the second and third pillars based on supervision, inspection and market discipline were proposed. To expand the coverage of risk measurement, a banking risk system covering credit risk, operational risk and market risk was established for the first time. At the same time, counterparty credit risk, asset securitization credit risk and risk mitigation were included in bank risk measurement. Introducing internal model measurement for the first time allows banks with high risk management level to construct internal model to calculate capital through historical data.

In December 2010, Basel III focused on improving the "minimum capital requirements" of the first pillar. On the one hand, the requirements for capital quality and quantity have been further improved, including restoring the leading role of core capital, improving the criteria for identifying capital instruments, and stringent capital deduction projects; on the other hand, the scope of risk coverage has been expanded, and the minimum capital requirements for asset securitization and counterparty credit risk have been raised. At the same time, a broader level of macro-prudential capital has been achieved, including increasing the reserve capital requirement of no less than 2.5% consisting of common equity interests; establishing

counter-cyclical capital of 0-2.5% associated with excessive credit growth; and putting forward additional capital requirement of 1% for systemically important banks.

2. Financing Guarantee as a Credit Risk Transfer Instrument

Credit risk transfer (CRT) refers to financial institutions, generally commercial banks using various financial instruments to transfer credit risk to other banks or other financial institutions. At present, the participants in the credit risk transfer market are mainly various financial institutions, including: commercial banks, institutional investors and securities companies. Those who transfer credit risk are called credit risk transferors, and those who accept credit risk are called the recipient of credit risk.

CRT can be divided into financing CRT and non-financing CRT. Financing CRT refers to the transfer of credit risk to financial markets or financial institutions, while achieving the financing of funds, including loan sales, asset securitization and so on. The means of CRT separated from financing are credit guarantee, credit insurance and credit derivatives (CD). Credit guarantee is a flexible tool for credit risk transfer. Through bilateral contracts, the guarantor, as the undertaker of credit risk, assumes the corresponding obligation of compensation or payment on behalf of the third party (debtor) when it fails to fulfill its obligations. The amount is limited to the loss exposed to potential risks. Credit insurance refers to the insurance contract signed by an enterprise and an insurance institution to pay a certain premium so as to obtain compensation for losses incurred within the specified credit risk range. Credit

derivatives refer to a bilateral financial contractual arrangement in which both parties agree to swap the pre-agreed or formula-based cash flow, which depends on the pre-determined occurrence of credit events in the future. Credit events are usually associated with default, bankruptcy registration, credit rating decline or price decline considerably.

III. Financing Guarantee System in Urgent Need of Perfection

1. The Position of SMEs in the Economic System

SMEs are often seen as the backbone of the economy. Their significant contributions to economic growth, employment creation, social cohesion, poverty alleviation and local and regional development have won wide consensus. In China, according to official statistics in 2015, SMEs contributed more than 65% of GDP, more than 50% of tax revenue, more than 68% of exports and more than 75% of employment in 2014. According to Yi Gang, governor of the Central Bank, by the end of 2017, there were 28 million small and micro enterprises as legal persons, more than 65 million individual businesses, accounting for more than 90% of the total market participants; small and micro enterprises contributed more than 60% of GDP, more than 50% of tax revenue and 80% of employment posts; small and micro enterprises completed 65% of invention patents and 80% of employment posts. The above new product development is an important carrier of mass entrepreneurship and innovation.

2. Quasi-public Nature of Financing Guarantee for SMEs

The important role of SMEs in economic development and their financial

weakness characteristics determine that the development of SMEs must rely on government policy support. To this end, countries around the world generally adopt active fiscal and taxation support policies to promote the growth and development of SMEs. Practice in various countries has proved that because SMEs have the characteristics of large quantity, small scale, wide distribution and many kinds, only using financial support cannot avoid the problems of low efficiency, small coverage and poor fairness. The introduction of SMEs financing guarantee can effectively improve the efficiency and fairness of government support. At the same time, through the establishment of a guarantee group, the government can increase the support to the guaranteed, and use the leverage effect of guarantee to guide more SMEs and funds into the areas encouraged by the national industrial policy. From the practical effect, the government's intention to establish and develop SMEs financing guarantee is mainly to alleviate the financing difficulties of SMEs, at the same time to help achieve other macro-policy objectives, such as industrial policy guidance, supporting SMEs technological upgrading, and promoting the rapid development of high-tech enterprises. This reflects the quasi-public nature of SMEs financing guarantee. If it is fully commercialized, it will inevitably lead to insufficient supply.

Over the past 100 years, the development history of foreign guarantee industry and the actual operation mode of guarantee business in various countries have clearly shown that the financing guarantee business of SMEs has the characteristics of high risk and low return. It must rely on government financial funds. It belongs to the government's behavior to achieve specific policy objectives, and it is difficult to

universally implement profit-making business model.

3. Development status of SMEs financing guarantee system

The development of China's financing guarantee industry began in 1993. With the rapid development of the national economy, the financing guarantee industry has developed rapidly. By the end of 2014, when the momentum of the development of financing guarantee companies was at its peak, there were 7898 financing guarantee companies in China, with a guarantee balance of 2.74 trillion yuan, including 2.34 trillion yuan in the guarantee balance, 1.28 trillion yuan in the guarantee loan balance of SMEs financing, and 2514,000 small and medium-sized customers. The industry's paid-in capital is 925.5 billion yuan, of which 75 institutions have registered capital of more than 1 billion yuan, with an average registered capital of 117 million yuan. Since 2015, the growth rate of the number of financing guarantee companies has decreased by an average of 5% annually, and the growth rate of the scale of financing guarantee business has also slowed down.

The relevant policies on SMEs financing guarantee have been issued in succession throughout the country, which makes the financing guarantee industry standardized and provides practical guarantee for its stable development. At present, the CBRC and relevant departments have continuously strengthened the reform of the financing guarantee industry. The State Council has also issued a series of guidance on the development of financing guarantee companies. The financing guarantee industry is developing towards a scientific and effective model. However, there are still many problems in financing guarantee for SMEs, and it is necessary to

constantly improve the financing guarantee system.

1.2 Significance and Potential Innovation of Selection of Topics

I. Significance of Selecting Topics

At present, financing difficulty is still one of the basic problems that perplex the development of SMEs in China. The government and industry are also trying to alleviate or solve this problem through various institutional mechanism innovations. For example, to solve the difficulties of SMEs by increasing the credit of financing guarantee companies, but its institutional mechanism is still in the exploratory stage and needs to be further improved. The company I lead (China Success Finance Group Holding Co., Ltd.) has also been engaged in financing guarantee services for SMEs for a long time, and has accumulated rich first-hand materials and business experience. Based on the business cases of FGC, focusing on the zero-loss-principle of financing guarantee business operation under the mode of profit-making business in China, this paper tries to summarize the credit enhancement of financing guarantee company from three aspects: entrepreneur factor, market factor and technology factor inherent in the borrowing enterprise. It is expected that the conclusions of this study will be helpful to guide FCGs to carry out financing guarantee services more effectively, and to add new research perspectives and empirical conclusions to the theory of SMEs credit enhancement.

II. Potential Innovation Points

At present, China's financing guarantee system has not yet been unified as

quasi-public nature and the national support system has not yet been established. Under the condition that the FCG operates the financing guarantee business according to the principle of commercial operation, it should not only conform to the changes of the economic and social development situation, but also properly deal with the asymmetry of return-risk in financing guarantee business. FCGs must implement the zero-loss-principle in their business operations, and they must select their clients very harshly and carefully. This selection rule for financing guarantee customers is the basis of FCG's business operation, which is worthy of in-depth study. Following the logical thinking of enterprise fundamentals analysis, starting from the essential source of credit risk and taking the guaranteed enterprise as the analysis object, this paper incorporates the characteristics of entrepreneurs, the market competitiveness and the technological suitability of enterprises into the framework of credit enhancement model, and tries to simplify the traditional credit analysis methods as far as possible on the basis of refining the essential elements of credit enhancement of FGCs.

Summary

Financing difficulties of SMEs are a worldwide problem, which is more serious in China. This chapter first analyses the characteristics of China's financial system: indirect financing is dominant, direct financing is weak; debt financing is dominant, equity financing lags behind; market-oriented credit risk management instruments are scarce; credit reporting system lags behind, and credit risk is high. This is the basic financial environment for China’s FGCs to carry out credit enhancement

business. Then it introduces the main manifestations of SMEs financing difficulties, and preliminarily analyses the internal and external causes of SMEs' financing difficulties. Then, from the perspective of credit risk transfer instruments, the paper examines the financing guarantee system of SMEs in China, which needs to be improved urgently. Finally, the significance and potential innovations of the topic are introduced. According to the first-hand documents of the company's long-term financing guarantee business, this paper tries to summarize the credit enhancement model of FGC from three aspects: entrepreneurs, market and technology factors inherent in the borrowing enterprise.

Chapter II Literature Review

The credit enhancement business of FGC mainly serves for the financing of SMEs. In nature, it is a credit enhancement instrument, which belongs to credit risk management in theory and technology. The following is a review of the main literature on SMEs financing, credit enhancement and credit risk management.

1.1 Literature Review of SMEs Financing

I. Foreign Literature on Financing of SMEs

i. Credit Rationing and Relational Financing

1. Bank Credit Rationing

Credit rationing theory of Stiglitz and Weiss (1981) explains that SMEs are more difficult to obtain credit support. Information asymmetry in credit market will inevitably lead to adverse selection and moral hazard, which will make banks face higher credit risk. In order to reduce credit risk, banks will lower the interest rate below the equilibrium interest rate level to encourage enterprises with high creditworthiness to borrow, and limit those enterprises with low creditworthiness to borrow. For various reasons, SMEs often have low creditworthiness and are difficult to obtain loans from banks. This theory provides a good idea for the analysis of financing obstacles of SMEs from another angle, that is, from the perspective of information economics. It is generally believed that the characteristics of small enterprises determine that bank credit is one of the important sources of financing in its development process. Therefore, the discussion on credit rationing of small

enterprises is also an important branch of financing theory of SMEs.

Equilibrium credit rationing refers to the phenomenon that the credit market cannot be cleared under general interest rate conditions, not because of the monetary authority's control over the interest rate ceiling, but because of the bank's profit maximization motive. There are many theoretical explanations about the generation mechanism of credit rationing, among which Stiglitz et al. (1981) have the most influence on the theoretical model based on information asymmetry in credit market. Stiglitz and Weiss (1981, 1986, 1992) point out in the classical literature on credit rationing that adverse selection and moral hazard caused by information asymmetry are the basic reasons for balanced credit rationing. When facing the excess demand for loans, in order to avoid adverse selection, banks will not raise interest rates to clear the market, but allocate loan applicants at a level lower than the competitive equilibrium interest rate.

Whette (1983) extends Stiglitz's theory, pointing out that the collateral requirement of banks may also become an endogenous mechanism of credit rationing under the condition of borrower's risk neutrality. Bester (1987) further discusses the role of collateral in credit rationing. He believes that collateral and interest rate can be used as the screening mechanism for banks to separate the risk types of loan projects, that is, banks can separate high-risk and low-risk loan projects through the sensitivity of enterprises to the changes in the number of collateral. Williamson (1986) discusses the supervisory cost in the process of credit rationing. He also attributed the non-monotonic change between bank expected returns and

interest rates to information asymmetry.

2. Relationship Lending

Credit rationing is an endogenous mechanism of credit market. However, theoretical research and empirical evidence show that the rejected in credit rationing are mainly SMEs. The main problem of SMEs credit is that the information of SMEs is seriously opaque. Unlike standard contracts provided by banks, SMEs credit is more carried out through relationship loans. As an important means to solve the financing problem of SMEs, relational loan has attracted extensive attention of foreign sectors and scholars. The decision-making of such bank loans is mainly based on the accumulated information about borrowing enterprises and entrepreneurs through long-term and multi-channel contacts. Under the relational loan, the bank's information accumulation can be acquired not only incidentally through the deposit, settlement and consulting business of the enterprise, but also from the stakeholders of the enterprise and the community where the enterprise is located. The "soft information" which is difficult to quantify and transmit on the basis of relational loan partly makes up for the credit gap caused by SMEs inability to provide qualified financial information and collateral, and helps to increase their unfavorable credit conditions. Empirical research shows that the strengthening of long-term cooperation between banks and enterprises is conducive to reducing the loan interest rate of SMEs, reducing the loan guarantee and mortgage requirements, reducing the dependence on commercial credit, and mitigating the impact of interest rate fluctuations on the loan interest rate of SMEs.

Boot and Greenbaum (1993) argue that when small businesses cannot obtain formal loan commitments from banks or unconditional loan contracts, they will seek alternatives. One way is to resort to market mechanisms, by purchasing long-term implicit contracts with commissions, firms and banks can build closer relationships. With the expansion of the length and scope of the relationship, banks can better supervise enterprises. Nakamura (1993) emphasizes that the comparative advantage of banks in information production is particularly strong for small, relatively unknown enterprises that rely on a bank to provide services, so banks are willing to maintain credit relations with the original enterprises. The relationship theory generally agrees that the benefits of relationship-based credit are multifaceted, including increasing the supply of credit, but there are differences on whether it will reduce the cost of credit. Boot and Thakor (1994) show that for the best credit contract, borrowers initially pay a higher interest rate than the market and provide collateral. When a project succeeds, the interest rate for unsecured loans is lower than the market rate. Many scholars believe that a stronger "relationship" can enable small businesses to obtain lower lending rates (Berger and Udell, 1995).

As for the comparative advantage of banks in information production, Petersen and Rajan (1994, 1995) believe that banks can solve the problems of adverse selection and moral hazard, thus reducing interest rates. However, in a centralized credit market, the bank capture effect has little possibility of reducing interest rates. Others believe that firms may get worse credit conditions from their lending banks in the future. Sharpe (1990) and Rajan (1992) argue that the problem of information

possession allows banks to monopolize the market. Lenders gain information monopoly after the event. If successful enterprises want to find new banks, they may have to pay conversion costs.

In fact, high-quality borrowers are not necessarily mobile, and they are captured by information. Santomero (1982) argues that banks are allowed to extract additional rents from businesses because they have a cost burden in finding loans. However, Greenbaum (1989) emphasizes that when firms can afford such search costs, competitive banks will capture firms at low initial interest rates, so borrowing rates will not increase over time. Grace O. Kim (2001) argues that small businesses are willing to pay higher interest rates as credit commissions in the initial stage to ensure better credit conditions in the future. According to the relational investment model, unless small businesses default in the first phase, they will not get worse loan conditions in the second phase regardless of the number of lending institutions. In addition, in the aspect of cost-benefit analysis, the return on investment of small enterprises in relation is negative in the initial stage. After a certain period of time, small businesses may also gain the monopoly position of buyers in the credit market, because they can choose to suspend or not suspend the credit relationship, invest or not invest in the credit relationship of other banks. This may be because small businesses evolve in the financing life cycle and build creditworthiness without being captured by banks. However, since small businesses are already investing in their relationships with banks, there is no need for them to give up financing from them. This model not only explains the value of "relationship" to small enterprises,

but also explains the development of "relationship" itself when small enterprises develop.

ii. Structural Response Theory

1. Credit Policy Shocks.

There are two channels of credit shock: bank loan channel and balance sheet channel. The bank loan channel refers to the reduction of bank reserve accompanied by monetary tightening, which leads to the decrease of loan supply. In this case, enterprises tend to reduce their real expenditure level due to the lack of alternative sources of funds. This means that monetary policy may have a greater impact on firms that rely on bank loans while lacking alternative sources of capital, and small businesses tend to have these characteristics. The balance sheet channel means that monetary tightening impairs the value of corporate collateral by raising interest rates, reduces the credit rating of enterprises, and thus weakens the ability of enterprises to obtain loans. From this point of view, it can be concluded that small businesses are more impacted by the adjustment of monetary policy, because mortgage loan plays a more important role in financing of small enterprises than large enterprises. Gertler and Gilchrist (1994) show that small manufacturing enterprises are not only directly sensitive to interest rates, but also indirectly affected by the economic cycle. Therefore, the impact of monetary tightening on small enterprises is greater than that on large enterprises.

2. Scale Matching Theory

According to the theory of scale matching, there is a strong negative correlation

between bank loans to SMEs and bank size. Through the empirical analysis of banks with different scales, Strahan and Weston (1998) find that there is an inverted U-shaped non-monotonic function relationship between bank M& A scale and SMEs loan ratio. The ratio of loan to SMEs increases first and then decreases with the asset scale of bank M& A. Peek and Rosongren (1997) argue that mergers between big banks and small banks or between big banks tend to reduce lending to SMEs.

Banerjee et al.(2014) discuss the information advantages of small and medium-sized financial institutions in providing financial services for SMEs. They put forward two hypotheses: one is the long-term interaction hypothesis. The hypothesis holds that small and medium-sized financial institutions are generally local, specially serving local SMEs. Through long-term cooperation, the understanding of local SMEs is gradually increasing. Another hypothesis is the co-supervision hypothesis. This hypothesis is especially suitable for cooperative small and medium-sized financial institutions. Even if small and medium-sized financial institutions cannot really understand the operation of SMEs, for the common interests, SMEs in cooperative organizations will implement self-supervision, which is even more than the supervision of financial institutions. The enlightenment of this theory is that it is a feasible choice to develop small and medium-sized financial institutions to meet the financing needs of SMEs.

3. Growth Cycle Theory

Berger et al. (2003) put forward the theory of enterprise financial growth cycle by combining enterprise life cycle with financing. They believe that there is a

financial growth cycle in the course of enterprise development. With the development of enterprises, the accumulation of business records and performance, and the improvement of information transparency, the financing needs and financing options of enterprises will also change. Michaelas et al. (1998) believe that enterprises used debt financing more in the period of establishment and growth, and their dependence on debt financing would gradually decrease when enterprises gradually matured. Berger and Udell (1998) point out that small, young and opaque enterprise depend on initial internal financing, trade credit or angel financing; indirect financing can be obtained when enterprises develop gradually; and finally, if enterprises continue to grow, they have the opportunity to finance through the public equity and debt markets. Berger and Udell (1998) point out that the growth cycle theory mentioned above is only a general description of the financing path of enterprises. It does not apply to all small enterprises, because the size, age and information opacity of enterprises are not completely related.

The empirical test results also show the difference with this theoretical expectation. Fluck et al. (1997) find that the external financing (mainly debt financing) of Wisconsin enterprises in the initial stage exceeded the internal financing. From 7 to 8 years before the development of enterprises, the proportion of external financing in the total financing gradually declined, after the proportion of external financing gradually declined the proportion tends to rise again. This reflects that with the passage of time, the use of external capital by enterprises is not simply from a minimum to a maximum, but presents a "U" shaped development trend. The

combination of the two theories reflects that in the early stage of enterprise development, internal funds are always used first, while external funds are used only when internal funds are insufficient and conditions permit. Even in the initial stage, there are external financing channels to choose. Enterprises often choose debt financing firstly, and equity financing secondly. In equity financing, angel financing or venture capital is the first step. It is possible and reasonable to raise funds through the open equity market only when the enterprise develops to a considerable extent.

II. Domestic Literature on Financing of SMEs

i.Reasons for the Financing Difficulties of SMEs

1. Defects of Financial System Theory

Lin Yifu (2000) focuses on solving the financing problems of SMEs at the institutional levels. He believes that we should vigorously develop SMEs, reform state-owned enterprises, reform state-owned banks, open the market of non-state-owned SMEs, and establish financing institutions especially for SMEs; strengthen the function of market supervision, and strive to solve the financing difficulties of SMEs in essence. Lin Yifu (2014) believes that the current financial system cannot fully meet the financing needs of SMEs. Farmers, SMEs, although the proportion of the employed population is as high as 70%, and the proportion of gross domestic product is more than 60%, the financial services provided to them are still scarce.

Wu Jinglian (2012) believes that the financing difficulties of SMEs are directly or indirectly related to the discriminatory economic policies to a certain extent. In

the planned economy era, there is little possibility for SMEs to survive. Since the 1980s, individual households business, private enterprises have emerged. The initial stage of private enterprises is SMEs. These enterprises have been facing a disadvantageous market environment for a long time. Only by eliminating discriminatory standards, improving the financing environment, lowering the access threshold of the financial industry, allowing and supporting the establishment and development of various types of private small financial institutions, and matching SMEs with small and medium-sized financial institutions, can the problem of financing be alleviated.。

Xu Honghong (2001) believes that the financial gap is fundamentally caused by the financial depression in China. Real interest rates do not reflect the real supply and demand of funds, resulting in the coexistence of excessive demand for funds and insufficient effective supply, resulting in a financial gap. At the same time, because of the asymmetric information between banks and enterprises, the effective supply of funds is reduced and the financial gap is aggravated. Yu Xuehua and Luan Jingzong (2005) argue that China's credit rationing is not a single credit rationing subject to market constraints, but also one subject to the inertia of the traditional planned economic system, namely the so-called "double credit rationing". Under this condition, the financing difficulties of SMEs mainly lie in three aspects: information asymmetry, excessive government involvement and endogenous financing constraints of SMEs.

Zhang Jie (1998, 2000) believes that the financing difficulties of SMEs stem

from the financial support of the state-owned financial system for large state-owned enterprises, the rigid dependence of state-owned enterprises on such support and the resulting credit capitalization. Therefore, the financing problem of SMEs is fundamentally a credit dilemma caused by the financing system. Liu Xiuli et al. (2006) believe that state-owned commercial banks occupy an absolute position in the national financial system. If private enterprises cannot get its support, it will be difficult to solve the problem of financing, the credit policy of state-owned commercial banks and should be adjusted and a certain proportion of funds should be allocated to SMEs

2. Theory of Enterprise Defects

Li Yang and Yang Siqun (2001) believe that the financing difficulties of SMEs are due to their high failure rate and closure rate, low credit rating, poor asset condition, lack of effective guarantee or collateral for loans, and insufficient creditworthiness for their own assets. Yang Qianyuan et al. (2000) and Li Changyou (2004) think that the basic reason for financing difficulties is the quality of Chinese SMEs themselves - the financial system is not perfect, which leads to their low credit. When the operation is difficult, most SMEs try to prolong the interest on loans, which poses a great threat to the security of credit funds of financial institutions and aggravates the difficulty of SMEs loan. Yang Junlong and Yang Jun (2003) believe that the main causes of financing difficulties are unclear property rights structure, credit barriers and risk variables of SMEs. SMEs should start from improving their own creditworthiness to solve the financing difficulties. Hu Naiwu et al. (2006) point

out that SMEs have a lower reputation than large enterprises, their management style and behavioral characteristics are highly uncertain, and the moral hazard of lending to SMEs is relatively more serious.

3. Theory of Market Matching Failure

Hu Naiwu et al. (2006) emphasize that in the face of the financing demand of SMEs characterized by of privatization, diversification and serious information blockage, financial intermediaries with scale advantage in lending have failed, so it may be contrary to economic theory and not sustainable forcing large commercial banks to grant loans to SMEs. Zhang Qinggeng et al. (2006) point out that the lack of experience in credit analysis of SMEs and the poor ability of risk management of banks are also one of the reasons for financing difficulties of SMEs. Chen Jian (2006) summarizes the practical experience of Korean Bank in developing SMEs credit business, points out that the biggest problem faced by Chinese commercial banks is the lack of basic data. The data model of commercial banks is mainly based on account center, not customer center. This makes it possible for Chinese commercial banks to establish their own data model based on account center rather than customer center. Commercial banks cannot fully understand the overall situation of enterprises, and the weak risk management foundation of SMEs makes it difficult to control risks.

Liu Juntao (2004) argues that the structure of China's financial market is unbalanced, the long-term lending and property rights markets of banks are underdeveloped, while the debt security and stock markets are much more developed;

there are also imbalances in the capital market, where debt security issuance is relatively large while stock issuance is relatively small, while the opposite is true in the trading market; and it is the imbalance in the debt security market itself, that is, the bond market is relatively developed, while the corporate bond market are relatively lagging behind. Yang Fenglai et al. (2006) point out that the lack of financial innovation makes the financial system lack of new financial products to support SMEs. Chen Hanwen (2006) points out that the lack of capital market hierarchy, second board market and over-the-counter market, as well as strict market access rules and lack of a variety of trading instruments in capital market make SMEs unable to use capital market to raise funds in their own way.

ii.Solutions to the Financing Problem of SMEs

1. Improving the Loanability of SMEs

Ye Qian et al. (2003) examine the specific content of the expansion of Hodgmann model of default risk through model analysis, including four types of credit rationing and eliminating ideas, and believe that credit rationing existed objectively for a long time and credit risk classification for enterprises was an effective incentive mechanism. The guarantee effect should be exerted by establishing a borrower alliance and a supervision alliance. Tang Luyuan (2003) analyzes the significance of introducing external institutional constraints to change the game equilibrium from the perspective of bank-enterprise game, and put forward some countermeasures, such as establishing a credit legal system, punishing enterprise's dishonesty and establishing enterprise's credit information system. Tang

Ping (2006) believes that credit intermediaries should give full play to the role of credit supervision of SMEs. Credit intermediaries providing credit guarantee for SMEs should regularly or irregularly inspect and supervise the credit and finance of SMEs in order to prevent the irregularities in the operation of SMEs. Li Dan (2006) believes that SMEs should not only establish a standardized property rights system and credit system, but also establish a standardized financial system, improve the level of financial management, and enhance the authenticity and transparency of financial information. At the same time, the enterprise financial agency system has been proved to be an effective measure in market economy countries, and China should gradually implement it.

2. Perfecting the Financing Guarantee System

Lin Yifu et al. (2001) based on the function and effective allocation of the financial system, believe that the premise of SMEs financing is to establish national credit system, credit investigation institutions, guarantee system, government and market mechanism. Duan Weiping et al.(2003) through game analysis, propose that the solution to non-cooperation between banks and enterprises is to develop credit guarantee and small and medium-sized financial institutions. Ou Xinqian (2004) believes that, with the necessary policy support, it is unavoidable to focus on supporting a number of guaranty institutions with outstanding business performance and sound management system to speed up the establishment of SMEs credit re-guarantee institutions. Zhang Qinggeng et al. (2006) believe that state-owned commercial banks should gradually formulate and improve their internal "Credit

Grade Evaluation Measures of Credit Guarantee Institutions", promote the development of guarantee business of FGCs, and promote the smooth financing channels of SMEs. To solve the problem of information asymmetry, the development of credit guarantee institutions can effectively reduce the problem of information asymmetry. Jin Lihong et al. (2006) believe that the re-guarantee system should be established. While undertaking the responsibility of guarantee, the guarantee institutions should reinsurance the risks already assumed in accordance with a certain proportion, and then the insurance institutions should take part of the risks. In this way, insurance companies can update products, and guarantee agencies can relieve worries and avoid risks.

2.1 Literature Review of Credit Enhancement

According to *the Business Standards for Credit Enhancing Institutions* and *Risk Management Standards for Credit Enhancing Institutions* issued by the People's Bank of China in 2001, credit enhancement refers to the effective forms that are clearly defined in the documents of guarantee, credit derivatives, structured financial products or other effective forms defined in laws, regulations, policies and industry self-regulatory documents that can improve the credit rating of debts and enhance the level of debt performance guarantee, thereby dispersing and transferring credit risks to professional financial services. The way to achieve credit enhancement is to design the product structure and specific agreement arrangements, or use various effective means and financial instruments to ensure that debtors pay the principal and interest of corporate bonds on time, so as to make corporate bonds have higher

credit rating, increase the probability of successful bond issuance, and reduce the cost of bond issuance.

According to the principle of credit enhancement, the ways of credit enhancement can be divided into basic credit enhancement, derivatives credit enhancement and structured credit enhancement. Among them: basic credit enhancement, including guarantee and pledge, has been widely used in various types of corporate bonds, mainly for improving the credit rating of bonds before issuance; credit derivatives credit enhancement includes credit default swaps, credit risk mitigation instruments, mainly for short-term financing bills, medium-term bills and other bonds. By purchasing credit derivatives, securities investors can transfer their credit risks and slow down their capital regulatory constraints. Structured credit enhancement includes senior-junior structure, which is mainly used for investors with different risk preferences to share bond risks through bond stratification and increase structured credit. Structured credit enhancement is generally used in conjunction with other credit enhancement methods.

I. Foreign Credit Enhancement Literature

Steven (2002) believes that credit enhancement is a unique technological approach. When credit rating is insufficient, the initiator sacrifices part of the capital cost to purchase additional credit support from the other party. John, Lynch and Puri (2003) believe that there is a strong negative correlation between bond spreads and credit rating, and that higher-level bonds have smaller spreads, so credit enhancement can effectively reduce financing costs. Ambuose (2001) believes that

there are many aspects of risk in the process of asset securitization issuance, and credit enhancement can effectively increase the confidence of investors, which is a practical strategy. This slight concession to income can promote the project to produce cash flow redistribution and achieve a small and broad effect. Van Son Lai and Issouf Soumare (2010) establish contingent claim analysis models for continuous time to analyze the impact of credit insurance on investment, and find that under the premise of maximizing the interests of investors, the existence of credit insurance has greatly increased the attractiveness of investment, and there is a relationship between investment duration and investment scale. Acharya (2002) analyzes all aspects of the credit enhancement mode and finds that there is the most suitable design in each specific situation, but each design has its advantages and disadvantages, and the combination of internal and external upgrading is a reasonable solution.

II. Domestic Credit Enhancement Literature

Xue Shirong (2009) points out that credit enhancement technology can effectively reduce the financing costs of securities issuers and improve the credit rating of assets, thereby increasing the liquidity of assets in the economy, improving the flow of funds and turnover speed. Peng Jiangbo and Geng Xin (2011) believe that credit enhancement improves the allocation efficiency of funds and the financing efficiency of financial markets by reducing the credit risk and financing cost of SMEs. Liao Xiaoyun (2007) compares the effects of various credit derivatives, believing that credit derivatives have the characteristics of

off-balance-sheet management instruments, and the effectiveness of their correction results has been recognized by the banking industry. The application of credit derivatives can simplify legal procedures, save transaction costs, and effectively and reasonably adjust the capital adequacy ratio and risk weight of banks and expand the scope of credit risk protection. Zhang Xuetao and Hu Wei (2012) use the method of combining theory with demonstration to explore and study the effect of credit derivative instrument-credit risk mitigation instrument in the credit risk mitigation of commercial banks. They believe that the use of credit risk mitigation instrument could increase the target loan amount by about 63% while maintaining the risk-weighted assets unchanged. At the same time, the use of credit risk mitigation instruments will generate excessive investment demand, and ultimately increase the target loan amount by about 74%.

2.3 Review of Credit Risk Management Literature

Credit risk refers to the risk that the borrower defaults and fails to fulfill his obligation to pay debts. This may happen when the other party fails to pay or fails to pay on time. As far as the essence of banking activities is concerned, credit risk is the most obvious risk of banks. As far as potential losses are concerned, this is usually the biggest category of risk for banks. The default of a few customers may cause great losses to banks. McKinsey, a well-known consulting firm, has studied the actual allocation of risk capital in international banking industry and finds that credit risk accounts for 60% of the total risk exposure of banks, while market risk and operational risk only account for 20%. According to the definition of Basel II, credit

risk is a function of the probability distribution of expected results of bank loans and risk exposure and it can be decomposed into three elements: default probability, default exposure and specific default loss rate. According to *the Criteria for Credit Rating in Credit Market and Interbank Bond Market* (People's Bank of China, 2006), credit risk refers to the possibility of loss caused by default of borrowers or market counterparties; in a broad sense, credit risk also includes the possibility of loss caused by the change of borrower's credit rating and fulfilling capability, which leads to the change of market value of borrower's debt.

The main purpose of risk management is to reduce income volatility and avoid major losses. In the proper risk management process, it is necessary to identify risks, measure and quantify risks, and formulate risk management strategies. Risk can be dealt with by one of the following four methods: risk aversion, risk mitigation, risk retention and risk transfer. Credit risk is managed in various ways. The most important credit risk management technologies include selection, limit, diversification and credit enhancement. Selection - A good credit risk management begins with a good choice of counterparties and products. Limit - Limit the bank's exposure to specific counterparts, avoiding a loss or a limited number of losses that endanger the bank's solvency. Diversification - The allocation process of banks will provide good risk diversification for different borrowers of different types, sectors and regions. Credit enhancement - When a bank finds that it is exposed to a certain type of counterparty, it can purchase financing guarantees or credit derivatives to obtain credit protection. Through protection, the credit quality of the secured assets

can be improved, which is also called credit risk mitigation.

I. Foreign Credit Risk Management Literature

i. Credit Risk Management Thought

Western commercial banks have a history of more than 300 years, which has laid a solid theoretical foundation and effective institutional arrangements for bank credit risk management. From Adam Smith's theory of asset management, the theory of liability management in the 1960s, the theory of integrated asset-liability management in the 1970s to the theory of off-balance sheet management and risky asset management in the 1980s, as well as the emergence and rapid development of financial engineering, the formation and continuous improvement of the Basel system. After more than two centuries of development, the theory of bank credit risk management has become a more systematic scientific system.

1. Asset Management Theory

Since the emergence of banking industry until the 1960s, the focus of asset-liability management of commercial banks has been on asset management. The representative theories mainly include reserve theory, commercial loan theory, anticipated income theory, super money supply theory and asset shiftability theory.

Firstly, the Reserve Theory. That is to say, in order to cope with liquidity risk, banks must maintain a certain level of cash assets or some short-term securities, which is the traditional way for commercial banks to maintain liquidity.

Secondly, the Commercial Loan Theory, also known as the Real Bill Theory, originated from the 18th century British economist Adam Smith's *the Wealth of*

Nations. The theory holds that in order to cope with the unforeseen cash withdrawal risk of depositors, banks must maintain the high liquidity of assets in the use of funds, and loans must be short-term and self-repayment. For quite a long time, the real bill theory has dominated the asset management theory of commercial banks.

Thirdly, the Shiftability Theory. After World War I, Moulton, an American scholar, first proposed it in 1919 and it developed rapidly in the 1930s and 1940s. The theory of asset convertibility is the product of the development of financial market to certain extent, that is, the products of the more developed security exchange market. Convertibility theory provides a theoretical basis for the diversification of bank financial assets.

Fourthly, the Anticipated Theory. Anticipated theory is an important turning point in the evolution of bank risk management theory. In 1949, Prochow, an American scholar, published the theory of anticipated income on loan liquidity, which marked the birth of the anticipated theory.

Fifthly, the Theory of Super-money Supply. With the diversification of money forms and the increasing pressure of competition in bank credit market, the theory of excess money supply appeared in the 1960s and 1970s. The theory holds that the provision of money by bank credit is only one of the means by which banks achieve the business objectives. In addition, banks have not only a variety of alternative means, but also a wide range of objectives that can be achieved simultaneously.

2. Liability Management Theory

This theory is based on the vague definition of liabilities. Banks can give a

variety of explanations on the issue of liabilities. Liability management can be divided into two categories: one is to compensate for withdrawal deposits by short-term borrowings, the other is to borrow money to meet increased borrowing requirements, and to expand liabilities by borrowing from the Eurodollar market, federal funds and so on. The purpose of liability management is to increase the possibility of profit by expanding liabilities.

3. Integrated Asset-Liability Management Theory

Backe (1977), an American economist, put forward the theory of integrated asset-liability management. This theory is a comprehensive one, which aims to managing the risk of assets and liabilities of banks as a whole, and in a flexible and changeable way. It can make corresponding policy adjustments with the change of operating environment, collocates reasonably in the aspects of interest rate, term, risk and liquidity, and organically combines various assets and liabilities to ensure the profitability and assets of banks safety and liquidity. The goal of this kind of management is to maximize the profit and to develop steadily in the long run under the condition of the established risk tolerance. Interest rate risk management is only a means to achieve the goal. The main contents of the management include interest spread management, non-interest expenditure management, capital flow supervision, loan quality control and so on.

4. Intermediary Business Management Theory

In the context of deregulation in the 1980s, the competition in banking industry intensified unprecedentedly, and industrial and commercial enterprises began to

participate in the competition of financial industry on a large scale, forcing commercial banks to find new management ideas to get out of the predicament. It is under this condition that the theory of intermediate business management, also known as off-balance sheet business theory, has sprung up. The theory advocates looking for new business areas beyond traditional bank liabilities and assets business, and opening up new sources of profit. This theory holds that banks are institutions that produce financial products and provide financial services, and also engage in business activities that provide information services. Banks should join in all areas related to information services.

5. Risk Asset Management Theory

The theory originated from the promulgation and implementation of *Basel Accord* in July 1988. The *accord* unifies the understanding of capital composition, introduces the ratio of risky assets, classifies assets and off-balance-sheet business items with risk weights, familiarizes the concept of minimum capital adequacy ratio to control the credit expansion of banks, and alerts banks to strictly control the quality of credit assets.

ii.Credit Risk Management Method

In recent years, there have been a large number of empirical studies on corporate credit risk abroad. Fitzpatrick (1932) compares the financial ratios of bankrupt and non-bankrupt enterprises, and finds that the financial ratios of bankrupt enterprises are poor. Fisher (1936), who originally proposes the discriminant analysis method, has a simple idea: select a certain number of groupings from the data you

want to separate, such as default and non-default, and then find out the explanatory variables from the two categorizations and find the combination of these explanatory variables. Durand (1941) first applies Fisher's method to economic and financial fields. The Z-score model of Altman (1968) is the earliest and most famous application of discriminant analysis in credit scoring. A multivariate analysis method is used to discriminate the operating conditions of 66 manufacturing enterprises in the United States. The explanatory variables include: working capital to assets, retained earnings to assets, EBIT to assets, net value to liability and sales income to assets. The model has strong discriminant ability and soon becomes a mainstream technique to measure enterprise risk. Eisenbeis (1977) criticizes this method, believing that it is only suitable for small sample distribution data, and it is difficult to define the boundaries of data classification, such as good or bad. Nevertheless, because of its simplicity and ease of estimation, this method is favored by banks. Mester (1997) believes that 70% of the world's banks use the scoring model to analyze small commercial loans.

On the basis of Altman (1968), many scholars, such as Fernandez of Spain (1988), Altman, Marco and Varetto of Italy (1994), Izan of Australia (1984), Gloubos and Grammatikos of Greece (1988), Ta and Seah of Singapore (1981), Altman and Lavallee of Canada (1981), Ko of Japan (1982), Baetge, Huss and Niehaus of Germany (1988) have studied the credit risk of enterprises by using different financial ratios in different quantities and forms in the frameworks of linear discriminant analysis, quadratic discriminant analysis and linear regression analysis.

Since the 1980s, logistic regression analysis has gradually replaced the traditional discriminant analysis method. Martin (1977) uses logistic method and discriminant analysis to predict 23 bankruptcy banks from 1975 to 1976, and finds that the results of the two methods are similar. Lawrence and Ashadi (1995) use logit model to analyze the management of problematic loans, and use a series of borrowers and bank variables to analyze the choice of solutions. Campbell and Dietrich (1983) use logit model to study mortgage loan and show that the age of mortgage, the ratio of mortgage to loan value, interest rate and unemployment rate have strong explanatory power in explaining the repayment, default and negligence of mortgage loan. Laitinen (2000) applies Taylor series to logistic regression analysis to predict corporate default and bankruptcy and finds that cash ratio, shareholder equity ratio and cash flow ratio are important indicators to determine the level of default risk. Gardner and Mills (1989) use logit model to estimate the default probability of the current negligent loan, find that the default of the negligent borrower is not necessarily the end of default, and suggest that the bank use this method to determine the seriousness of the loan problem and establish the corresponding response mechanism. Empirical study by Charitou, Neophytou and Charalambous (2004) shows that logit model has stronger predictive ability than other methods for predicting default risk.

The development of credit risk measurement technology as a symbol of modern credit risk management has its characteristics and general development trend: from qualitative analysis to quantitative analysis; from indicator form to modeled form or

combination of the two; from the analysis of individual assets (or loans) to combining-angle analysis; from the method of book value to the method of market value; the transformation of variables describing risk from discrete form to continuous form; considering not only the micro-characteristics of single borrower and single lender, but also the impact of the macroeconomic environment; from a single risk measurement model to a diversified and customized one. The change in risk measurement mode also draws on the latest research results in related fields such as econometrics, insurance actuarial science, optimization theory, simulation technology, and so on, so as to continuously improve the precision and accuracy of credit risk measurement.

The common practice adopted by western commercial banks is to comprehensively control the assets and liabilities of banks. In addition, it is worth mentioning that in the selection of specific strategies, attention is not only paid to the management of various risks, but also to the management of portfolio risk, and the diversification of risk portfolio is fully considered. In the choice of management methods, the main characteristics are: to unify management of various risks, to use more quantitative analysis with appropriate qualitative analysis, to transform the previous indicator evaluation into model quantitative analysis gradually, and to achieve a systematic and comprehensive assessment of the risk of credit portfolio, and to apply advanced concepts in the financial field to practice timely.

II. Domestic Credit Risk Management Literature

The research on bank credit risk management in China started in the late 1980s.

Since the 1990s, the government, practitioners and theorists have shown great interest in financial risk, such as the translation of foreign credit risk theory, the writing of books or the trial implementation of Western risk management methods, which have achieved great results. From the theoretical point of view, a large number of academic papers and works on financial risks, including credit risks of commercial banks, are emerging at an unprecedented rate. Scholars have conducted in-depth discussions from different perspectives, and the research contents, scope and methods are becoming increasingly rich and mature.

i. Credit Risk Management of Commercial Banks

Xue Feng (1995) makes a systematic analysis of the credit risk from the macro-environment, economic subject and economic system, and makes an empirical description of the credit risk in China's actual economic and financial operation, and puts forward some ideas and countermeasures to solve the problem of bank credit risk. Zhong Wei and Li Xindan (1998) explain the formation mechanism of credit risk from the internal risk of financial system. Zheng Yaodong et al. (1998) discuss the role of the five-level classification of credit assets in preventing credit risks. Han Ping and Xi Youmin (1999) analyze the characteristics, concrete appearances and generating mechanism of credit risk of commercial banks in China during the period of economic transition.

Gao Ling (2000) believes that the key to the management of bank credit risk lies in the control of default risk of borrowing enterprises. By using the analytic hierarchy process (AHP), an early warning model of bank credit risk in China is

established, which playes a guiding role in the management of bank credit risk. Liang Qi and Huang Gonghao (2002) make a tentative discussion on the construction of credit risk management system of commercial banks in China. Shi Hanxiang (2003) believes that the main reasons for the formation of credit risk in state-owned commercial banks were the external factors such as administrative intervention, enterprises escaping the financial obligations, the lagging development of financial market, and the internal factors such as the low level of bank risk management, the imperfect mechanism and the low quality of employees.

To manage the credit risk, banks must introduce the concept of integrated risk management, and implement integrated risk management in all aspects from the external environment governance and internal management. Jiang Fangming (2003) analyzes the inherent mechanism of credit risk caused by the backward risk management of commercial banks, and puts forward countermeasures and suggestions from five aspects: risk culture, risk monitoring mode, risk monitoring process, risk measurement and risk transfer. Ouyang Weimin (2003) considers the basic principles and evolution of commercial bank risk management, analyzes the current situation and characteristics of commercial bank risk in China and the problems in risk management, and proposes means and suggestions to speed up the modernization of commercial bank risk management in China.

Based on the impact of economic and financial globalization on credit risk management of state-owned commercial banks, the Research Team of Shanghai Branch of ICBC (2004) proposes that state-owned commercial banks should

establish right risk management concepts, and designs several principles, overall framework and strategic steps of credit risk management. The Project Team of Hangzhou Institute of Finance Studies (2005) believes that in order to improve the risk management system of credit assets of modern commercial banks in China, three key elements must be focused on: system, culture and people. At the same time, many principles should be grasped, namely the advanced principle, hierarchical principle, dynamic principle, gradual principle, contingency principle and humanity principle.

Zhao Zongjun et al. (2005) use the theory of asymmetric information as an analytical tool, discourse the formation mechanism of credit risk management of commercial banks, and put forward suggestions to improve the credit risk management of commercial banks aiming at the credit risk caused by asymmetric information. Sun Lingyun and Wu Baohong (2006) point out that due to the rapid development of market economy and the serious inadaptability of financial property right system reform, authorized operation of management and internal control and self-discipline system, many banks still have serious deficiencies in the concept of credit risk control and behavioral deviation, so that the rate of non-performing credit assets is still at a high level. They also put forward specific suggestions on credit risk management and optimization of credit risk control.

ii. Quantification of Credit Risk

Since the latest credit risk quantitative management model was developed by international financial institutions and major western banks in recent years, the

current domestic research and analysis on credit risk quantitative management mainly focuses on the introduction, evaluation and reference of foreign models. Some scholars have done some research on these models, and revised and perfected the credit risk measurement models suitable for China.

Lu Yaoming et al. (1998) introduce some technical methods of credit risk management of western commercial banks, including credit derivative transactions, asset securitization and so on. Pong Sulin et al. (2001) aim at the credit market with asymmetric information, analyze several common cases of loss of credit funds or loss of opportunity and their mathematical principles, establish a decision-making model of bank credit risk, and draw the following conclusions by giving Kuhn-Tucker conditions: when collateral fails as a means of identifying the type of enterprise risk, banks will have special requirements for the value of collateral provided by enterprises in order to avoid credit risk.

Hao Liping et al. (2001) discuss the feasibility of artificial neural network and its application in credit risk analysis, emphasis the construction of artificial neural network model for credit risk analysis of commercial banks. A feasible neural network model for credit risk assessment is obtained, which provides a scientific basis for credit decision-making. Liang Shidong and Guo Zhong (2002) analyze the reasons for the development of new credit risk models, and make a comparative analysis of the representative modern credit risk models in the West. Pan Weilin (2002) introduces in detail how to use VaR method to calculate the credit risk of commercial banks. Wang Qiong and Chen Jinxian (2002) introduce credit risk

pricing and KMV credit risk pricing model. Xiao Dongmei and Li Tao (2002) make a systematic analysis of credit risk based on $H\infty$ control theory in view of the uncertainty of bank credit risk system model. Liu Wei and Chen Xiangzhi (2002) establish a more scientific and feasible credit asset management model which can meet the market requirements by using the methods of principal component analysis, cluster analysis, discriminant analysis, multiple regression, random sampling and statistical test of modern multivariate statistical theory.。

Wang Yuanyue et al. (2003) introduce the most popular credit risk model construction method in the West - factor method, and briefly analyze its application in the popular risk management models such as Basel Accord internal rating method, Creditmetrics, CreditRisk Plus. Fan Nan (2003) believes that Creditmetrics is a typical quantitative method which can be compared among different industries, and it is a good supplement to the traditional methods of credit risk management of commercial banks in China. Yuan Guiqiu (2003) analyzes the credit risk measurement based on RAROC principle and believes that it is a feasible method for China's financial institutions to study and apply credit risk at the present stage by adjusting the credit grade transferring matrix which has been used publicly and establishing credit risk pricing model. Zhou Chunxi (2003) introduces the method of multi-level fuzzy mathematics into bank performance rating to make a comprehensive evaluation, combining qualitative and quantitative analysis. Liu Fang (2003) proposes to use the principal component analysis method to evaluate the bank's operating performance, trying to avoid the problem that the comprehensive

evaluation method is difficult to achieve fairness and objectivity in the setting of weights, and strive to objectively and impartially evaluate the results. Ge Chaohao and Ge Xuejian (2005) use cluster analysis and Fisher discriminant analysis to measure and evaluate the credit risk of banks. The mathematical principle of the model, indicators and data pre-processing are introduced in detail, and the discriminant function of credit rating is established.

Liang Qi (2005) studies the measurement of credit loss of commercial banks' portfolio on the basis of defining the relationship between bank loan loss and default loss, elaborates the asset-related method of measuring default loss, and gives the specific process of the additional method of enterprise asset return rate. Fu Qiang and Li Yongtao (2005) establish a logistic model of the credit situation of listed companies based on the annual report data and find that the multiple of interest guarantee and the turnover of inventory are the key determinants of the credit of listed companies, and use the model to evaluate the credit risk of listed companies one year later. Zou Xinyue (2005) makes an empirical analysis of the credit risk of 184 listed companies in China, and clearly finds that the typical linear discriminant model is effective in Chinese market and can provide investors with scientific decision-making.

Guo Zhanqin and Zhou Zongfang (2006) set up a parametric programming model based on interval number to deal with the uncertainty of credit risk and return. By choosing the risk loss parameter alpha, banks can determine the optimal portfolio weights of different risky credit projects under the equilibrium state of risk-return, so

as to obtain the maximum return under the given risk. Long Haiming and Deng Taixing (2006) set up a solvency model to discuss the quantitative relationship between consumer debt ratio and expected default rate of consumer credit, and compare the return and risk loss of non-performing loan rate with the actual default rate, and provides a new idea for the management of consumer credit in commercial banks. Wang Naijing and Youyonghua (2006) use the comprehensive financial data of 100 listed companies as samples, and use principal component analysis and Fisher discriminant analysis to evaluate the risk of enterprises. Zhai Dongsheng and Cao Yunfa (2006) use Fisher discriminant analysis model to analyze the credit status of listed companies in China and show that the overall discriminant accuracy of the model is 90.38%.

After the promulgation of the new Basel Accord, many scholars have carried out research. Xu Zhendong (2002) analyzes the capital requirements for bank credit risk under the new standard method and internal evaluation method. Zhang Shi (2002) introduces the main contents of the internal rating method proposed by the new Basel Accord and the specific requirements for its implementation, and then analyzes the ways to construct the internal rating of credit risk of commercial banks management in China. Zhang Zhang (2002) describes the credit risk management system and related technologies from the perspective of the internal rating method of the new Basel Capital Accord, and organically combined the advanced risk concepts with the actual operation of commercial banks in China. Chen Jianhua and Tang Libo (2003) start with the analysis of the characteristics of IRB and the minimum standard

of use, and proceed from the angle of risk management of commercial banks, analyze the difference between the risk management system based on asset classification and the risk management system based on IRB, and put forward the business under the current conditions ,and point out that in order to establish risk management system based on IRB law, commercial banks should reform and improve the loan risk classification system. Yu Liyong and Cao Fengqi (2004) analyze the impact of the new Basel Accord on the capital adequacy of Chinese banks. Tan Ying (2005) introduces the internal allocation method of economic capital commonly used in foreign commercial banks, and uses three methods of economic capital allocation to compare the hypothetical data, thus found some problems in China.

To sum up, the domestic theoretical research on bank credit risk management mainly stays on introducing and drawing lessons from foreign advanced models. Domestic research on bank credit risk management and model-building lacks initiative and innovation. The main signs are as follows:

(1) The framework of integrated management of credit risk in commercial banks is not complete enough. Many scholars only study and analyze some local problems. Although some scholars try to use some mathematical methods to measure bank credit risk, their ideas are not in line with international standards and are difficult to be recognized.

(2) There is no reasonable and complete construction of bank credit risk management system from the perspective of modern commercial bank system. In the

analysis of existing credit risk problems of state-owned commercial banks, most papers generally confine their research direction in external factors such as macroeconomic system, and seldom pay attention to the bank's own imperfect risk management system, weak implementation, backward means and other internal factors.

(3) Quantitative analysis is less. Several copy the western models, neglect the different accounting systems and national conditions and non-financial statement factors, and lack of analysis from the technical level.

(4) The research on bank credit risk is mainly about credit risk, but the research on credit market risk and internal control is insufficient.

(5) The analysis and construction of credit risk management system lay particular emphasis on qualitative analysis, lacking of theoretical research combining qualitative and quantitative analysis, and empirical research is even scarcer.

Summary

Credit enhancement of FGCs serves the financing of SMEs, which is a credit enhancement instrument in nature and belongs to the scope of credit risk management in terms of theoretical origin and technology. This chapter reviews the main literature in three areas. On the financing difficulties of SMEs, foreign literatures mainly include bank credit rationing, relationship lending, asymmetric response to credit policy shocks, scale matching theory and growth cycle theory under the condition of asymmetric information; domestic literatures mainly include

system defect theory, enterprise self-defect theory, matching failure theory. The main countermeasures and suggestions are to improve the loanability of SMEs funds and improve the financing guarantee system. As for the literature on credit enhancement, domestic and foreign literature focuses on discussing its function from the perspective of financial instruments and financial markets.

Credit risk management is the core of bank operation, which has accumulated abundant literature in its 300-year development process. The credit risk management thoughts of foreign banks have gone through the stages of asset management theory, liability management theory, integrated asset-liability management theory, intermediary business management theory and risk asset management theory. Credit risk management method is mainly quantitative analysis, supplemented by qualitative analysis. From the previous indictors evaluation, it gradually transforms into model measurement analysis, and realizes a systematic and comprehensive assessment of the risk of credit portfolio. Domestic research on bank credit risk management started in the late 1980s, or translated and introduced western credit risk theory, or wrote books, or tried out western risk management methods, which have achieved great results. From the theoretical point of view, a large number of academic papers and works on financial risks, including credit risks of commercial banks, are emerging at an unprecedented rate. Scholars have conducted in-depth discussions from different perspectives, and the research contents, scope and methods are becoming increasingly rich and mature.

Chapter III Essence of Credit Enhancement of FGC

Financing guarantee is a special kind of creditor's rights. First, the economic characteristics of creditor's rights are analyzed. It is deduced that creditor's rights investors (lenders and bond investors) should abide by the conservative principle. Then, from the perspective of credit risk management instruments, the connection and difference among financing guarantee and CDS, credit insurance are analyzed.

3.1 Economic Analysis of Creditor's Rights

This section analyses the nature of creditor's rights and the conservative criteria that creditor's rights investors should follow. As a special creditor's right, financing guarantee should strictly abide by the conservative criterion, namely zero-loss-principle.

I. Creditor's Rights Are Essentially Put Options

Black and Scholes (1973) not only give option BS pricing formula, but also extend it to the valuation of corporate equity and creditor's rights. They think that the value of equity is such a call option, the execution price is the par value of unliquidated debt, the maturity price of basic assets is the value of the company assets, and the creditor is the seller of put options, allowing shareholders to buy company assets at the par value of creditor's rights at maturity.

Merton (1974) uses the option pricing principle to give the pricing method of corporate debt, which is used to price credit risk. Merton (1974) gives the parabolic

partial differential equation of stock market value: $0 = \frac{1}{2}\sigma^2 V^2 F_{VV} + (rV - C)F_V - rF + F_t + C_y$, among them, V refers to the enterprise value, σ^2 refers to instantaneous variance for enterprise returns，C is the amount paid by the enterprise per unit time and F is the market value of the securities, C_y is the amount of payment per unit time, r is the risk-free rate of return and ***t*** is the time.。

For creditor's rights, if B is the face value of creditor's rights, F is the market value of creditor's rights and τ is the term of creditor's rights, then there are: $F_V \geq 0$，$F_B \geq 0$，$F_\tau < 0$，$F_{\sigma^2} < 0$，$F_r < 0$。Then it demonstrates that the risk premium of creditor's rights increases with the increase in the ratio of the present value of debt to the value of enterprise, increases with the fluctuation rate of enterprise value; and the volatility of the value of creditor's rights increases with the increase of the ratio of the present value of debt to the value of enterprise, and with the increase of the volatility of enterprise's value.

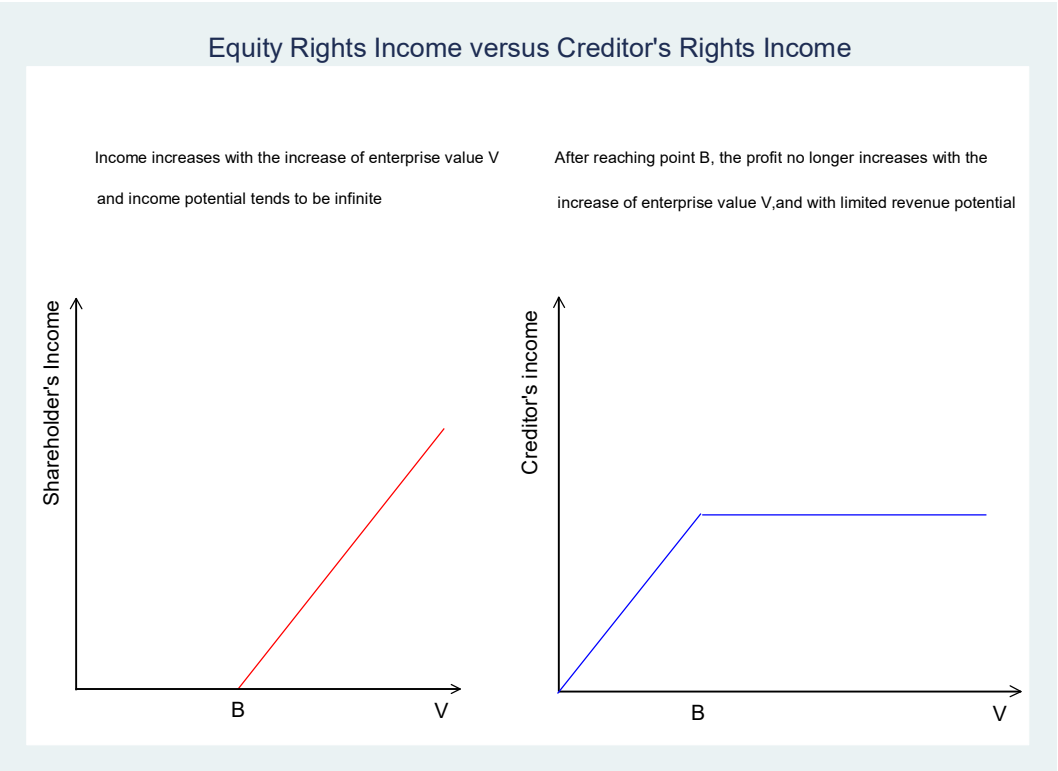

Figure 3-1 Equity Rights Income versus Creditor's Rights Income

The profit models of creditor's rights and equity vary with the behavior of creditors and shareholders. Figure 3-1 shows the income function of the creditor and the shareholder in relation to the enterprise value V when the debt matures. B is the principal of the debt. The creditor's income is capped by the principal returned at maturity. But if the value of the enterprise is below the principal amount of the debt (V<B), the creditor takes priority over the shareholder to get the whole value of the company V, while the shareholder gets zero payment. However, if the value of the company exceeds the repayable debt (V > B), the excess value (V-B) will be shared by the shareholders. As a result, the shareholder's income increases with the increase of enterprise value, and the earning potential is infinite; after the creditor's income reaches a certain point (B), it is restricted and will not increase with the increase of enterprise value. In short, the shareholder is in the position of buyer of call options,

while the creditor is in the position of seller of put options. In reality, because the ratio of creditor's interest income to principal (interest rate) is far less than 1, under the limited liability institutional arrangements, creditors always face the situation of limited income (pre-agreed interest income) and huge potential loss (total principal). Therefore, creditors should pay special attention to the downside risks of the investee enterprises. Creditors should pay special attention to enterprise value because the downside risks have a reverse relationship with enterprise value.

II. Conservative Principle of Creditor's Rights Investment

i. Conservative Principles of Bank Loans

The practice of long-term business operation shows that the general principles of ensuring the safety of principal, maintaining the liquidity and striving for maximum profits should be adhered to in the operation of banks. Banks must try their best to make the loans repaid in a timely and complete manner. If the loan cannot be recovered in time, it will inevitably affect the liquidity of the bank. If bad loans occur, the bank will suffer losses of funds and even shake the bank's credit. Therefore, ensuring the safety of bank loan funds is the first principle that banks must follow when loaning. In order to maintain the liquidity, commercial banks must also rationally arrange the types and term structure of loans according to the types and term structure of the sources of funds. On the premise of ensuring the safety of funds, banks strive for maximum profits, seizing opportunities in loan business, paying attention to the art and skills of loan pricing, aiming at obtain higher interest income. Safety, liquidity and profitability are often contradictory in the specific

implementation of loans. In general, banks always consider the safety and liquidity of funds first. But in order to make full use of bank funds and increase profit opportunities, they usually take into account by strengthening pre-loan review.

In the pre-loan review, banks act according to some specific loan principles. For example, the "5Ws" principle was a set of specific lending principles once very popular in the western banking industry. Banks must examine every loan application from five aspects: who, why, what, when and how. Because these five words all contain "W", they are also called "5Ws" principle. For example, the "5Cs" principle is another set of specific rules commonly used in the loan review of western commercial banks, which refers to the character, capital, capacity, collateral and condition of borrowers.

1. The 5Ws Principle

Who is the borrower? This requires that focus should be placed on the situation of the borrowers (including enterprises and individuals), including the credit status of the borrowers, the ability to repay the loans, and the operation status of the enterprises (or personal wealth). This is the most basic one of the "5Ws" principles. If this one does not meet the standard, then there is no need to review other factors.

Why does the potential debtor borrow money? This requires a clear understanding of the purpose of borrowing. Generally speaking, banks are more willing to meet the demand for capital revolving loan or productive loans, especially for working capital loans, which are mostly short-term, with commodity guarantees and relatively safe. For consumption or speculative borrowing, banks have strict

control, especially those with high risk of speculative borrowing. Banks are particularly cautious when examining applications for such loans.

What is the borrower's guarantee? This requires determining how or in what way the borrower mortgages or guarantees the loan. Although banks also carry out credit loans, more often than not they ask borrowers for collateral, so that when borrowers cannot repay the loan on time, they can sell the collateral to compensate for the loss. In implementing this principle, banks strive to accurately grasp the quality and quantity of the collaterals.

When can the borrower repay the loan? This requires determining the term or duration of the loan. Banks generally consider the borrower's requirements in terms of the duration and structure of the source of funds. The main purpose is to maintain the solvency and liquidity of the bank.

How does the borrower repay the loan? This requires knowing whether the borrower repays the loan at one time or in installments, and what kind of income the borrower uses to repay the loan, whether the debt is repaid with normal income or with liabilities. For those who pay off the loan at one time with normal income, the bank can give a reasonable discount in the pricing of the loan, because the repayment of such borrowers is more reliable. For loan installment borrowers, the interest rate can be increased appropriately when the loan is priced, because the borrower's economic situation is often not very good and the loan risk is habitually high.

2. The 5Cs Principle

Character, mainly refers to the willingness of borrower to pay their debts, is the

most important factor in 5Cs. It is reflected in the borrower's past record of repayment of debts, and banks generally have files on customers for inquiry. In addition, western countries generally have institutions specializing in investigating the credit position of individuals and enterprises. Banks basically know the credit status of their new customers through such institutions. Therefore, in western countries, whether individuals, enterprises or governments, they must maintain a good record of debt servicing. If there is a forcible recourse by the court because of the debt relationship, whoever will lose the opportunity to obtain loans.

Capital refers to the value, nature and quantity of borrower's capital. The bank pays special attention to the stability and liquidity of the borrower's capital value in the loan review. At the same time, great attention is paid to the borrower's net capital value and its structure, as well as the amount and structure of borrower's liabilities. All these are related to the safety of bank loans. Banks will agree to provide loans only if they are sure that the credit is risk-free.

Capacity refers to the ability of the borrower to make extensive use of their abilities and to make good use of their borrowed funds and make profits. The bank judges the borrower's ability mainly by his/her age, business experience, business ability, education level, adaptability, forecasting ability and ideology. No matter how good a company's debt-servicing record and capital is, if there are no smart entrepreneurs and managers, it is also likely to fail in the fierce competition, which will lead to the loss of bank loans. As a result, banks are particularly careful in examining borrower’s capacity.

Collateral refers to the collateral that the borrower provides as a guarantee of repayment. Banks usually require that such collateral be stable in value, insured by insurance companies, and used as a widely marketable asset. In case the borrower fails to repay the loan, the bank can quickly dispose of the collateral and sell it for cash to mitigate the risk and loss of the loan.

The condition of an enterprise refers to its operation and external operating environment. The bank mainly judges whether the enterprise's own operation is good or not according to the enterprise's operation characteristics, operation methods, technology conditions and labor relations. The assessment of the external business environment of enterprises is based on factors such as political changes, social environment, business cycle, seasonal changes, national income level, etc., as well as the development trend of the industry and the level of competition in the same industry, almost all the factors that the enterprises themselves cannot control. The banks think it is necessary to know the conditions in advance and take measures to ensure the safety of bank loans.

3. Three Core Factors

Whether "5Ws" principle or "5Cs" principle, we can sum up three elements: human factors (such as "who" in the 5Ws principle, character and capacity in the 5Cs principle, etc.), financial factors (such as "what" in the 5Ws principle, capital and collateral in the 5Cs principle, etc.), economic factors (such as "why", "when", "how" in the "5Ws" principle, and "conditions" in the "5Cs" principle, etc.). So when banks implement the loan principles, the key points of its implementation are

formulated around these three elements.

Human factors. Banks always know as much as possible about the number of shareholders of borrowing enterprises, the proportion structure of common shareholders and preferred shareholders, and the status of private property of shareholders. If necessary, they can conduct enquiries through credit investigation agencies. The top managers of enterprise generally participate in decision-making. Some of the leading managers themselves are shareholders of enterprises. Their experience, educational background, ability and social relations have a significant impact on the operation of enterprises. In addition, business operators with good social relations tend to have a lot of convenience in purchasing, marketing and utilizing new technologies and raising funds, while those with bad social relations are not only difficult to get outside help when they encounter difficulties, but also tend to fall into the situation of being pushed down by others.

Financial factors. Banks mainly use financial statements to analyze a series of financial ratios, such as liquidity ratio, quick ratio, cash ratio, profitability, debt ratio and so on. Banks usually require collateral from borrowers, such as goods purchased with loans, or houses, land, and securities. Banks review of these collateral focuses on legitimacy, safety and convenience。

Economic factors. The core of economic factor analysis is to evaluate the nature of the enterprise, the market of the enterprise, the characteristics and development trend of the industry in which the borrowing enterprise is located, to understand the borrowing purpose of the enterprise and the time and mode of repayment, and to

make a proper choice when pricing the loan according to the international and domestic political and economic situation.

ii. Conservative Principle of Debt Security Investment

Debt security is an investment instrument with restricted returns. The correct way to select debt security is to find specific and convincing safety factors that can support the sacrifices made in terms of earnings. Debt security investment is an art of negation. The focus of debt security investment is to avoid losses, so choosing debt securities is a negating process. What need to do is to exclude and reject the prospect bad investee, not to seek and accept them. In the field of debt security investment, there is no such a thing as being overly critical or calculating. The correct process of debt security investment should be to select a strong company, and then select the highest yield of the debt security issued by the company. Debt securities that worth buying should be able to withstand the test of recession. The more stable the nature of the enterprise, the better the safety of its debt security. The debt securities of very small enterprises do not qualify as fixed-value investment instruments. Of course, large-scale per se is not enough to ensure safety, which must be built on the basis of sufficient value of enterprises. The pursuit of yield at the cost of safety often results in a loss. A prudent debt security investor should not allow himself to play the role of an insurance company and risk losing money in order to earn extra profits.

3.2 Economic Analysis of Financing Guarantee

I. Relations among Participants in Financing Guarantee

Because of the high degree of information asymmetry, high risk of adverse

selection and low credit rating of SMEs, banks are generally reluctant to grant loans to SMEs. In order to improve their credit rating and obtain bank loans, SMEs need the guarantee from third parties with higher credit rating. The existence of guarantor reduces the degree of information asymmetry between credit parties. Guarantor provides financing guarantee for SMEs with its own credit, promises banks that when SMEs cannot repay loans on time as stipulated in the contract, and in case of breach of contract, the guarantor will repay the loans for SMEs. In this way, the risk of credit default of banks is greatly reduced, and it is easier for banks to choose to lend to SMEs with guarantors. The guarantor who provides the financing guarantee service charges the guarantee fee from the SMEs. Therefore, in financing guarantee transactions, the main function of the guarantor is to enhance credit of the guaranteed, and for the beneficiary (lending bank), the risk of the guaranteed has been spread out to a large extent.

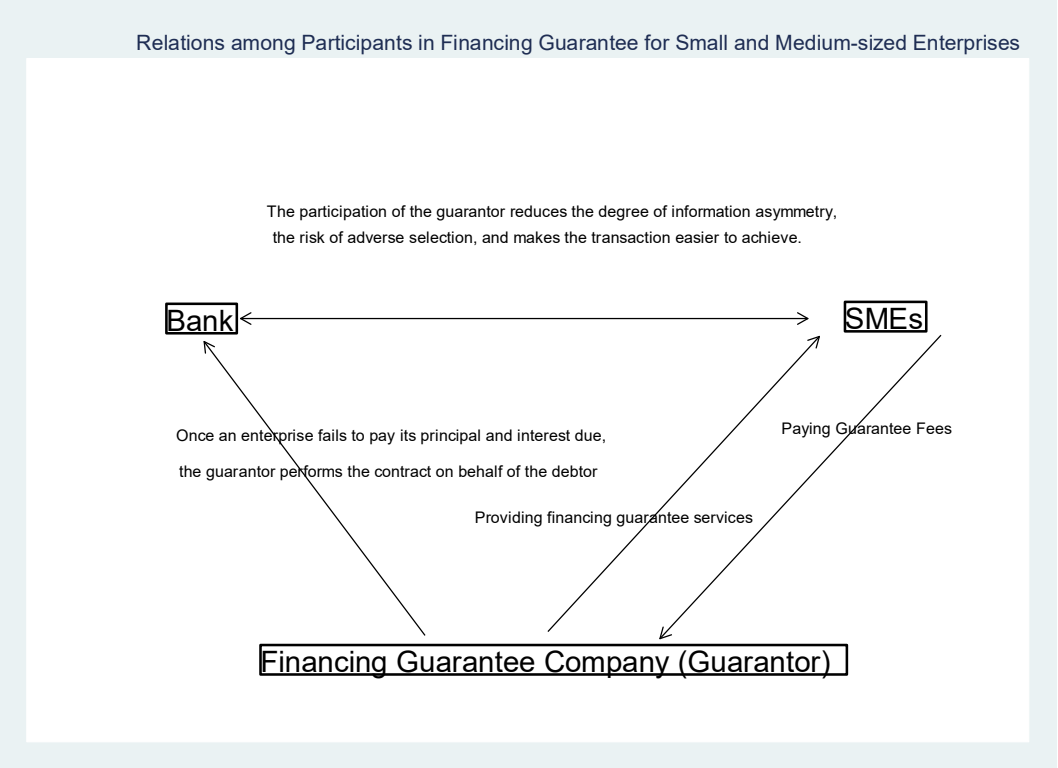

Figure 3-2 Relations among SMEs Financing Guarantee Participants

According to the *Guarantee Law of the People's Republic of China* (1995), financing guarantee is a kind of guarantee. The guarantee refers to the act that the guarantor and the creditor agree that when the debtor fails to perform the debt, the guarantor performs the debt or assumes responsibility according to the agreement. Guarantee has the characteristics of equality, voluntariness, subordination, security and complementarity. According to *the Regulations on the Supervision and Administration of Financing Guarantee Companies* (2017), financing guarantee refers to the guarantor's act of providing guarantee for the guaranteed borrowing, issuing bonds and other debt financing; the so-called financing guarantee company (FGC) refers to a limited liability company or an incorporated company which has established and operated financing guarantee business according to law. The main functions of financing guarantee include safeguarding the realization of creditor's

rights, reducing information asymmetry, decreasing market transaction costs, enhancing credit, risk management and economic leverage.

II. Economic Characteristics of Financing Guarantee

From the point of view of risk-return structure, financing guarantee is a kind of non-standard debt securities. As an investor of this kind of debt securities, the FGC can obtain a certain amount of premium income in advance, and its potential risk (the possibility of loss) is the guaranteed amount which is tens of times the premium. To be exact, every guarantee business can be regarded as a put option. FGC is in the position of seller of put options, with restricted profits and unrestricted potential losses. Generally, the risk of financing guarantee is the residual risk transferred by banks and other credit institutions. Although it usually represents the risk of breach of contract by the guaranteed, it is essentially a combination of various risks from the guaranteed. Under the imperfect conditions of China's social credit system, financing guarantee system, laws and regulations, financial supervision and financial market, any unfavorable change of any variable will evolve into the residual risk to FGCs. According to risk sources, the residual risk can be divided into: risks from guaranteed enterprises, from government departments, from FGCs themselves, from banks, from the guarantee system, and so on.

From the perspective of return-risk structure, financing guarantee business has all the economic characteristics of debt security investment. Therefore, the FGC should strictly follow the conservative principle of debt security investment in its process of operation, and strictly regulate the process and rules of "negating and

excluding". Moreover, almost all the clients of FGCs, namely the guaranteed enterprises, are SMEs, who are usually not qualified to issue debt securities in the capital market, because their credit rating is far lower than that of issuing debt securities. This means that compared with debt security investments, financing guarantees generally have greater risks. Therefore, for each financing guarantee business, the FGC must take risk control as the core. The operating criteria are more conservative than the "safe margin" principle of debt security investment, and should be defined as the zero-loss-principle. The zero-loss-principle refers to that the whole process of financing guarantee business follows the most stringent excluding and screening rules, and in case of any suspicious situation, timely to take remedial measures or terminate the business to control losses. If the zero-loss-principle is violated, the financing guarantee business is not worth doing at all. Especially in the case that China regards financing guarantee as a profit-making business at present, FGC must strictly screen clients and strictly implement counter-guarantee measures in accordance with the principle of zero loss; in the case of adverse macroeconomic situation, even to suspend the guarantee business rather than to easily relaxes the rules of conservative operation to result in huge compensation losses.

III. Case Study of Asymmetric Risk-Return Structure

On August 31, 2016, J Guarantee Company provided HY Company with a loan guarantee contract with a period of one year and amount of 2.7 million yuan to P Bank. The guarantee rate was 2%, and the guarantee fee was 54,000 yuan. On September 9, 2016, P Bank granted loans totaling 2.7 million yuan to HY Company,

agreeing to repay 1.7 million yuan in one time and 1 million yuan in monthly equal amount. On September 20, 2017, P Bank served J Guarantee Company with the *Notice of Performance of Compensation*. Because HY Company failed to repay the principal and interest of the loan due on September 9, 2017. On the expiration date of the loan contract, P Bank required J Guarantee Company to fulfill its guarantee responsibility and repay the principal of the loan on behalf of the Guaranteed HY Company of 2210186.43 yuan and the overdue interest of 860.74 yuan, totalling RMB 2296187.17 yuan. On the day of receipt of the P Bank's notification, J Guarantee Company fulfills its guarantee responsibility in accordance with the contract and repays the loan principal and overdue interest to P Bank on behalf of the guaranteed, totaling RMB 2,296,187.17 yuan.

Although there are various counter-guarantee clauses and penalties for breach of contract in the guarantee contract, the negotiation failed. The guaranteed HY company and three individuals did not recoup J Guarantee Company. After resorting to the court, the counter-guarantor did not appear in court. Court default judgment was: HY company repays the amount of compensation 2,296,187.17 yuan, and interest (229 6187.17 yuan as capital, according to the loan interest rate of the People's Bank of China during the same period, from September 20, 2017 to September 23, 2017) and fine for breach of contract (the principal is 229687.17 yuan, with an annual interest rate of 24%, which is calculated from September 24, 2017 to the date of actual liquidation).

After the judgment came into effect, the guaranteed HY Company refused to

comply with the court judgment. On April 27, 2018, J Guarantee Company applied to the court for enforcement. As a result, the bank deposit account of the executed person was 25.72 yuan, and the property allocated by the court was 423,170.34 yuan. The total amount of the executed money was 423,196.06 yuan. After withholding the execution fee of 26,941 yuan, the balance was 396,255.06 yuan. On April 27 and 28, 2018, the court announced the *Restriction of High Consumption Order*, against legal person and natural persons of the guaranteed company. This is the end of the guarantee business.

Even if we do not consider the troubles and costs of auditing, signing, litigation and other activities, only calculate the income of guarantee fees, compensation losses and recovery gains, then according to this business case, the results are as follows: In the absence of breach of contract by the guaranteed, the income of the guarantee fee is 54,000 yuan. In fact, the guaranteed breached the contract and J Guarantee Company compensated 2296,187.17 yuan, then recovered 396,255.06 yuan through court judgment and enforcement, and finally lost 1899,932.11 yuan. This case calculates the real return-risk ratio of 1:35.2. That is to say, once the financing guarantee business fails, the actual loss is 35.2 times the income of the guarantee fee. Therefore, financing guarantee is a special debt security with strong asymmetry of return-risk. FGC must strictly follow the principle of zero loss in its operation.

3.3 Comparisons between Financing Guarantee and CDS

I. Brief Introduction to Credit Default Swaps

Credit default swaps (CDS) is also called loan default insurance. The

International Swap and Derivatives Association (ISDA) established standardized credit default swap contracts in 1998. Since then, CDS transactions have developed rapidly. In CDS transactions, one party wishing to avoid credit risk is called the purchaser of credit protection, while the other party who is willing to bear credit risk and provides credit protection to the risk transferring party is called the seller of credit protection. The purchaser of CDS pays a certain fee to the seller on a regular basis. Once a credit event occurs (mainly refers to the insolvency of the debt security issuer), the CDS purchaser has the right to deliver the debt security to the CDS seller at face value, thus effectively avoiding credit risk. The emergence of CDS solves the liquidity problem of credit risk, makes credit risk trade and transfer like price risk, and reduces the difficulty and cost of issuing debt securities.

In CDS contracts, the buyer of CDS pays the seller a certain fee on a regular basis, which is generally expressed by a fixed basis point based on face value. If there is no default event, the CDS seller will not have any cash outflow. Once the default event occurs, the CDS seller is obliged to compensate the difference between the face value of the debt security and the market value after the default event, or to purchase the debt security held by the CDS buyer at the face value. Characteristically, CDS belongs to options. Because the characteristics of options are that the buyer has only rights but no obligations, while the seller has only obligations but no rights, so once the debtor defaults, the buyer can ask for implementing CDS contract to pass on credit risk. And the CDS point difference reflects the option premium.

CDS is transaction in which the credit risk of reference assets is transferred

from the buyer of credit protection to the seller. The CDS buyer pays a fixed fee to the seller who is willing to take risk protection during the contract period; while the CDS seller accepts the fee, he undertakes to compensate the buyer for the loss of default within the contract period when the corresponding credit default occurs. The credit corresponding to the reference assets is either a certain credit or a basket of credit. If any default occurs in a basket of credit, the seller must compensate the other party for the loss.

II. Linkage between Financing Guarantee and CDS

Both are instruments for creditors to transfer the debtor's credit risk, and they belong to credit risk derivatives in a broad sense. For creditors, the effect of divesting and transferring credit risk is the same, which can protect the principal of creditor's rights. For product pricing, the pricing principle of credit risk is the same. Because of the large volume of CDS market transactions, financing guarantee can effectively refer to the pricing of CDS under the same system, and adjust the guarantee fee rate according to the degree of credit risk of the guaranteed enterprise.

III. Difference between Financing Guarantee and CDS

1. The legal status of the debtor is different.

Under CDS, the seller of credit protection can issue, create and trade CDS without any relationship with the debtor and without the request or consent of the debtor. CDS credit protection seller collects insurance premium from creditors (credit protection buyer), and has no right to collect insurance premium from debtors. Under CDS, the reference enterprise (debtor) does not need to sign a

counter-guarantee contract with the seller of credit protection. Even if the debtor defaults and causes the seller to compensate the buyer, the seller of credit protection has no right to recover from the debtor.

In the financing guarantee business, the FGC provides guarantee to the creditor at the request of the debtor. FGC collects guarantee fee from debtors, and usually has no right to collect guarantee fee from the creditor. Both FGC and the guaranteed enterprise must sign the counter-guarantee contract. Once the debtor defaults and causes the FGC to fulfill its obligation of compensation according to the financing guarantee contract, it can recover according to the counter-guarantee contract.

2. The degree of standardization of contracts varies.

CDS contracts have a higher degree of standardization, which is conducive to reducing transaction costs; financing guarantee contracts have a lower degree of standardization and higher transaction costs. Under CDS, the number of buyers is usually uncertain, and the actual creditor-debtor relationship is not required. In financing guarantee business, creditors and debtors are usually specific and have real lending relationship in reality. Under CDS, the amount of CDS issued or created by financial institutions is not limited by the size of the reference debt; in financing guarantee business, the maximum amount of guarantee is the amount of the primary creditor's rights. Under CDS, the amount of CDS issued or created by financial institutions may be higher or lower than the amount of reference debt; in the guarantee business, the amount usually guaranteed by FGC is the same as or less than the amount of the principal claim. The buyer of CDS is not necessarily the

creditor of the reference debt; the beneficiary of the financing guarantee must be the creditor of the debt under the primary contract.

Under CDS, the precondition for credit protection seller to pay the buyer is the credit events stipulated in CDS agreement. In the guarantee business, the factors leading to the payment by the guarantee company include all default events stipulated in the guarantee contract, and the scope of default events is often much larger than that of credit events. The validity of CDS agreement is not affected by the reference debt relationship. Even though the reference debt relationship is invalid, the CDS agreement is still valid. Generally, the validity of the guarantee contract is affected by the validity of the primary contract, the primary contract is invalid, and the guarantee contract is invalid. CDS can be transferred separately from the reference debt relationship, thus promoting the prosperity and development of the financial derivatives market. It is conducive for banks to obtain profits linked to the reference debt without capital investment when no credit event occurs. It is also conducive to dispersing the risk concentration of banks. Guarantee contracts cannot be transferred separately from the primary contract.

3. The final effect of risk management is different.

CDS, as the most widely used credit derivatives in the international financial market, plays an important role in innovative financial business such as asset securitization. It can optimize asset allocation actively, hedge risks and carry out active risk management. CDS is an important part of innovative financial business. In the financing guarantee business, the FGC is in a passive position in dealing with

the risk, and financing guarantee does not have the function of dispersing credit risk in a large scale. Therefore, FGC must operate the financing guarantee business in line with the prudent principle of zero loss.

3.4 Comparisons between Financing Guarantee and Credit Insurance

I. Links between Financing Guarantee and Credit Insurance

1. The Same Basis for Production

Reducing credit risk is the common foundation of financing guarantee and credit insurance. Credit risk exists in economic and social exchanges. In order to protect the rights and interests and reduce losses caused by risks, it is badly need to avoid risks and make up for losses. Both financing guarantee and credit insurance arise because of the existence of risks.

2. The Same as Risk Management Instruments

In a mature market economy, both financing guarantee and credit insurance are effective means for market transaction participants to manage and disperse risks. They play an important role in protecting the rights and interests of market transaction participants and reducing risks. In order to maximize their own interests, market participants usually combine financing guarantee with credit insurance.

II. Differences between Financing Guarantee and Credit Insurance

1. Different Functions

The primary function of financing guarantee is to guarantee the realization of creditor's rights and promote the financing. The function of insurance is to compensate the insured when the loss agreed upon in the insurance contract occurs.

The function of financing guarantee is firstly to promote financing, secondly to compensate the creditor when the debtor defaults.

2. Different Operating Mechanism

For financing guarantee, the carrier of financial guarantee liability is generally the property of the guarantor itself; for insurance, the carrier of compensation responsibility is mainly the insurance fund formed by policyholders paying premiums. Guarantee fund has the characteristics of closeness, while the composition of insurance fund has the characteristics of openness.

The operation concept of financing guarantee is the principle of zero loss which means that the premise of providing financing guarantee is to avoid compensation as far as possible. Financing guarantee carries out risk measurement and business operation according to the principle of zero loss and the guarantee-all-the way means. It must track and monitor the change of risks, and takes corresponding measures to deal the existing and potential risk factors, so as to reduce the risk of customer default and ensure the interests of FGC. Insurance calculates and collects premiums according to the probability of loss and does not need to track and monitor the risk of customers. Insurance only needs to measure the risk according to the probability and provide compensation when the risk occurs. The premise of insurance is that there must be compensation behavior, as long as the compensation does not exceed the estimated rate, it can make profits.

Generally, financing guarantee cannot operate in accordance with "law of large numbers" as insurance does. The number of guarantees provided by FGC is limited

by its financial resources and ability to disperse risks, and the amount of compensation often exceeds the guarantee fee income. Therefore, the law of large numbers is generally not applicable to guarantee business, and the principle of zero loss must be implemented in guarantee business.

The insurance compensation is due to the proximate causes, and the financing guarantee compensation is due to the default results. Insurance follows the principle of proximate cause, and only the loss proximately caused by insured perils can be compensated. Generally, the guarantee liability should be fulfilled as long as the consequences of the loss occur, no matter what causes the loss.

3. Different Legal Relations

The legal relationship of financing guarantee is subordinate. Guarantee contract is the subordinate contract of the main contract according to the Guarantee Law, while insurance contract is an independent legal relationship. The legal relationship of guarantee is restrictive, and the guarantor has the right to restrict the property rights of the guaranteed, which derives that the guarantor has the right to supervise the production and business activities of the guaranteed. While the insurer generally has no right to restrict the property of the insured and has no right to supervise its business activities. Guarantee is based on the principle of general good faith, and the risk of dishonesty is borne by the guarantor, that is, the guarantor can't cancel the guarantee contract because of fault and general dishonesty of the guaranteed unless the guaranteed and the creditor collude to defraud the guarantor to provide the guarantee. Insurance is based on the principle of utmost good faith. The risk of

dishonesty is generally borne by the insured.

4. Different Characteristics of Economic Relations

Guarantee has significant personalization characteristics, while insurance does not. Financing guarantee is not only the proof of ability of the guaranteed to perform the contract, but also the recognition and guarantee of credit quality of the guaranteed. It is a significant personalized social relationship. The guarantor should conduct a comprehensive examination and evaluation of the quality and ability of the guaranteed. Insurance is a relatively simple economic relationship. Only when there is a possibility of claims settlement in the event of an insurance accident, can the insurer conduct in-depth examination and evaluation of the insured and the insurance accident. This occasion accounts for a very small proportion of the overall insurance business.

Summary

Financing guarantee is a special kind of creditor's rights, so this chapter first analyses the economic characteristics of creditor's rights. According to the analysis of Black and Scholes (1973), Merton (1974), the essence of creditor's rights is put options. Creditor is in the position of seller. Its return-risk portfolio is characterized by: restricted income and the almost unlimited potential loss (whole principal is subject to loss). Creditor (lender and debt security investor) should abide by the principle of conservatism. In order to ensure the safety of funds, banks usually strictly abide by conservative principles of loan review, such as the "5Ws" principle (who, why, what, when, how), the "5Cs" principle (Character, Capital, Capacity,

Collateral, Condition), aiming at making a detailed assessment of the human, financial and economic factors of borrowing enterprises. The key point of debt security investment is to avoid loss, and the pursuit of yield at the cost of safety is often not worth the loss. Therefore, debt security selection is a negating process. In the field of debt security investment, there is no behavior that can be called excessive criticism or haggling.

Financing guarantee means that the guarantor provides guarantee for the guaranteed borrowing, issuing bonds and other debt financing. From the point of view of return- risk structure, financing guarantee product is a kind of non-standard debt security. As an investor of this kind of debt security, FGC can obtain a certain amount of premium in advance, and its potential risk (the possibility of loss) is tens of times that of premium. Every guarantee business can be regarded as a put option, and FGC is in the position of seller of put options, with limited return and unlimited potential losses. The financing guarantee business has all the economic characteristics of debt security investment, and FGC should follow the conservative principle of debt security investment in its operation. FGC must take risk control as the core in handling every financing guarantee business. The operating criteria are more conservative than the "safe margin" principle of debt security investment, and they should follow the zero-loss- principle. If the principle of zero loss is violated, the financing guarantee business is not worth operating.

As a credit risk management tool, financing guarantee has both commons and difference with CDS. For creditors, the effect of divesting and transferring credit risk

is the same, both of which can protect the principal of creditor's rights; for product pricing, the pricing principle of credit risk is the same. The difference between the two is that the legal status of the debtor, the degree of standardization of the contract, and the final effect of risk treatment.

Financing guarantee and credit insurance are both based on the existence of credit risk. They are effective means for market transaction participants to manage and disperse risks, and play an important role in protecting the rights and interests of market transaction participants and reducing risks. The main differences between them are: different functions, different operating mechanisms, different legal relations and different characteristics of economic relations.

Chapter IV Spirit of Doer and Enterprise Credit Enhancement

Firstly, this chapter defines the spirit of doer, analyses the matching between the spirit of doer and the principle of zero loss of financing guarantee. Then, through the case analysis of Mr. A, it is found that FGC must resolutely reject the financing guarantee applications of those opportunist owners who lack professional and dedicated spirit.

4.1 Zero-Loss-Principle and Doer Spirit

I. Doer and Doer Spirit

Financing guarantee is a special kind of creditor's rights, and its asymmetry of return-risk is very pronounced. Generally, the guaranteed enterprises are usually SMEs, and their credit risk is usually much greater than that of the large enterprises qualified to issue normal debt securities. Therefore, for each financing guarantee business, the FGC must take strict control of downside risk as the core and fully implement the principle of zero loss. Especially under the condition that China regards the financing guarantee business as a profit-making business which means FGC bears profits and losses with its own account. That is to say, if any financing guarantee business does not conform to the principle of zero loss, it is not worth trying at all.

In addition, financing guarantee is the proof of the ability of the guaranteed to perform the contract, the recognition and guarantee of the reputation quality of the guaranteed and it is a remarkable personalized social relationship. The guarantor

should conduct an all-round examination and evaluation of the quality, ability and social relations of the guaranteed. The principle of zero loss not only requires the FGC to implement strict counter-guarantee measures for every guarantee business, surmount the relevant restrictions of the current company law on limited liability, and let the owner or actual controller of the guaranteed enterprise bear joint liabilities through the counter-guarantee agreement. That is, once the guaranteed enterprise breaches the contract, it must be liable for joint liabilities and FGC can recover the compensation from the owners or actual controllers according to the counter-guarantee agreement. And more importantly, FGC must choose the right person from the beginning, because the key to the success or failure of SMEs lies in the owners and actual controllers. Financing guarantee business will be far more critical on the selection criteria for business owners than bank loan business, because the credit risk of SMEs depends largely on their business owners or actual controllers. Only through the factor of owner or actual controller, can FGC effectively identify, measure and control the financing guarantee risk.

Taking Foshan financing guarantee as an example, Foshan is mainly a private economy. In 2016, the private economy accounted for 63.5% of the whole economy. There are more than 200,000 private enterprises and private SMEs constitute the main service clients of Foshan FGCs. In theory, the zero-loss-principle implemented by the FGC should match the actual controllers of the guaranteed enterprise with stable and conservative personality traits, such as prudence and low-keyed, keen and flexible, practical and tenacious, honesty and trustworthiness, and good social

reputation. Through text analysis of sampled business documents, it is found that the main characteristics of the actual controllers of the guaranteed enterprises are: (1) rich industry experience, 10-30 years of industry experience, most have 15-20 years of industry experience; (2) low-keyed and pragmatic, stable operation; (3) insight, quick thinking; (4) stable source of customers, the abundant human relations, good reputation. The above characteristics are different from the entrepreneurship defined by the current academic community. The core of entrepreneurship is innovation. The above characteristics mainly emphasize focus, experience and sound operation. Essentially, equity investment emphasizes entrepreneurship, because the return-risk of equity investment instruments is symmetric, and entrepreneurship with innovation and risk as its core features can bring huge upside profit space for equity investors. However, for the financing guarantee business, because of the asymmetry of return-risk, FGC emphasizes the principle of zero loss and the overall control of the downside risk, so it prefers the steady and continuous operation of enterprises and prudent and pragmatic entrepreneurs. Therefore, the above characteristics of financing guarantee clients are summarized as the spirit of doer.

A doer is a concept contrary to a visionary or a theorist. The core characteristic of doer is to seek the sustained survival and development of enterprises and undertakings with a go-getter attitude. In reality, the concept of doer is broader than that of entrepreneur. In fact, entrepreneur is also a special kind of doers. Doers pay more attention to cherishing the present, doing practical work well, focusing on areas of expertise, striving for ambition, and beginning well and ending well.

When referring to the spirit of doer, it is necessary to mention the background of the slogan "empty talk misleads the nation, practical work rejuvenates the country". In 1992, during the mid-term of China's reform and opening-up, Deng Xiaoping's speech on the Southern Tour mentioned that "empty talk misleads the country and practical work to rejuvenate the country". Shenzhen Shekou Industrial Zone resolutely erected it as a sign on Shekou Industrial Avenue, which not only inspired Shenzhen people to build special economic zones and strive for reform, but also quickly became the catchwords and mottos that inspired people of the whole nation to be enterprising and ambitious. After the Eighteenth National Congress of the Communist Party of China, "empty talk misleads the nation, practical work rejuvenates the country " once again appeared in the prominent position of newspapers, television and the Internet. From the perspective of societal culture and historical background, the essence of doer is a person who pursues wealth and career through vigorous efforts and step-by-step stability. The typical groups of doers are usually well-managed SMEs owners.

Some people generalize that the characteristics of a doer are bearing accountability, enduring loneliness, tolerating solitude, withstanding pressure, surviving the pain, resisting temptation, standing up to ups and downs, weathering humiliation, holding out the blow and preserving vitality. The core of the doer spirit is to practice the law of value in the market by focusing, specializing and sticking to what is determined to do. In short, the spirit of doer is the dedicated character of being practical, deep-going, persistent, capable and excellent.

II. Roles of Doer Spirit

The spirit of doer accords with the inherent requirements of law of value and law of competition. According to the principle of Marxist economics, SMEs run by doers are commodity producers, while commodities are labor products for exchange, which have two attributes of use value and value. The value of a commodity is determined by the socially necessary labor time consumed in the production of the commodity. Commodity exchange is based on the amount of value. The spirit of doer can promote enterprises to improve production, management, labor productivity, and to reduce individual working time in unit commodities, thereby improving the market competition status and profit opportunities of enterprises.

The spirit of doer usually pursues the enterprising philosophy of "*if others succeed by exerting one ounce of effort, I will exert a hundred times as much effort"*. The Doctrine of the Mean records: *"If another man succeeds by one effort, he will use a hundred efforts. If another man succeeds by ten efforts, he will use a thousand. Let a man proceed in this way, and, though dull, he will surely become intelligent; though weak, he will surely become strong.* "Mr. Inamori once summarized the results of life and career as a formula: the results of life or career = thinking mode * enthusiasm * ability, in which the values of enthusiasm and ability range from 0 to 100 points, and the values of thinking mode range from negative 100 to positive 100 points (-100,100). Mr. Inamori believes that even people with ordinary abilities can be very successful as long as s/he has a good way of thinking and devotes enough enthusiasm. Actually, from the dynamic point of view, the spirit of doer will directly

affect the two elements of enthusiasm and thinking mode in the equation, and in the long run, it will also increase the ability in the equation, thus promoting the doer to achieve sustainable success in his career.

In terms of entrepreneurs' human capital, the doer spirit can make up for the shortcomings of low educational background to a certain extent. After all, the practice produces true knowledge and achievements. According to the analysis of the sampled business documents, only 9 of the actual controllers of the guaranteed enterprises have college or higher education, accounting for 30%, while the other 70% have education of high school or below. In view of the especially historical and social background of China at that time, Foshan entrepreneurs in their 50s generally have low educational background, but entire period of actual operation since their start-up is 6-31 years, averaging 16.5 years. Their long-term work in the industry has enabled them to accumulate considerable experience and a certain scale of market and wealth.

In addition, doer spirit helps to accumulate social capital. The entrepreneur's social capital is characterized by his/her personal attachment, and is the sum of the network system, social reputation and trust centered on the entrepreneur's individual. On the one hand, the spirit of doer can maintain, consolidate and expand the reputation of entrepreneurs in the industry and in the region, and accumulate market social capital; on the other hand, the spirit of doer can help entrepreneur establish and maintain various (direct or indirect) links with government functional departments, and accumulate institutional social capital. Social capital can provide

enterprise with key knowledge and resources, thus helping enterprise to integrate internal and external resources, and to obtain development opportunities from the external environment. In so doing, the doer spirit favors SMEs to gain competitive advantage and improve enterprise performance and enterprise value.

4.2 Doer Spirit and Enterprise Value

I. Enterprise Value and Its Determinants

According to financial economics theory, enterprise value (EV) is the discounted value of all future cash flows generated by the enterprise, which is expressed by formula as follows: $\boldsymbol{V = \sum_{t=0}^{N} \frac{CF_t}{(1+k)^t}}$, among them, t is the future time point, CF_t is the profit of t time, k is the discount rate, and Σ is the summation sign. This formula reveals four factors that affect the value of an enterprise: (a) the number of times of earnings persistence (N), (b) the size of each return (CF_t), (c) the discounted interest rate (k) and, (d) the time-point distribution of earnings (t). Keeping other conditions unchanged, the number of times (N) and the size of each return (CF_t) are positively associated with EV, and the discounted interest rate (k) and the time distribution (t) positively associated with EV.

As a special creditor's right, the risk of financing guarantee is inversely proportional to the value of the guaranteed enterprise. In other words, other conditions remain unchanged, the greater the value of the guaranteed enterprise, the smaller the possibility of default and the lower the risk of financing guarantee business; on the contrary, the smaller the value of the guaranteed enterprise, the greater the possibility of default and the higher the risk of financing guarantee

business. Therefore, the aforementioned four factors that determine EV will affect the risk of financing guarantee business through the EV. According to this logic, the following chapters will directly analyze the impact of the factors discussed on EV when discussing the credit enhancement model of FGC. In theory, as long as the minimum boundary of the guaranteed enterprise EV is far greater than 0, the guaranteed client has no motive for breach of contract, and the financing guarantee business can achieve zero-loss.

II. Doer Spirit and Enterprise Value

i. Learning Curve Effect and Enterprise Value

1. Learning Curve Effect

Learning curve is a dynamic production function, which is first summarized in the aircraft manufacturing industry. Dr. Wright of Cornell University (1936) summarizes the experience of aircraft manufacturing and find that when the cumulative output of aircraft doubled, the average working hours decreased by about 20%, that is to say, to 80% before the output doubled. For the first time, the relationship between average working hours and cumulative output is called learning curve. The learning curve function can be described by the following models: $y = kx^{-\alpha}$, Among them, y is the man-hour needed to produce unit x, k is the man-hour needed to produce unit 1, and α is the learning rate index, $0 < \alpha < 1$. The above formula can be visualized in Figure 4-1 below.

Learning curve effect is helpful to intuitively understand the economic meaning of doer spirit from the aspect of cost. If there is an obvious learning effect in the

production process, the product cost will decrease with the increase of accumulated output, and then enterprise can use the learning curve to establish cost advantage and competitive advantage by focusing and sticking to what is determined to do.

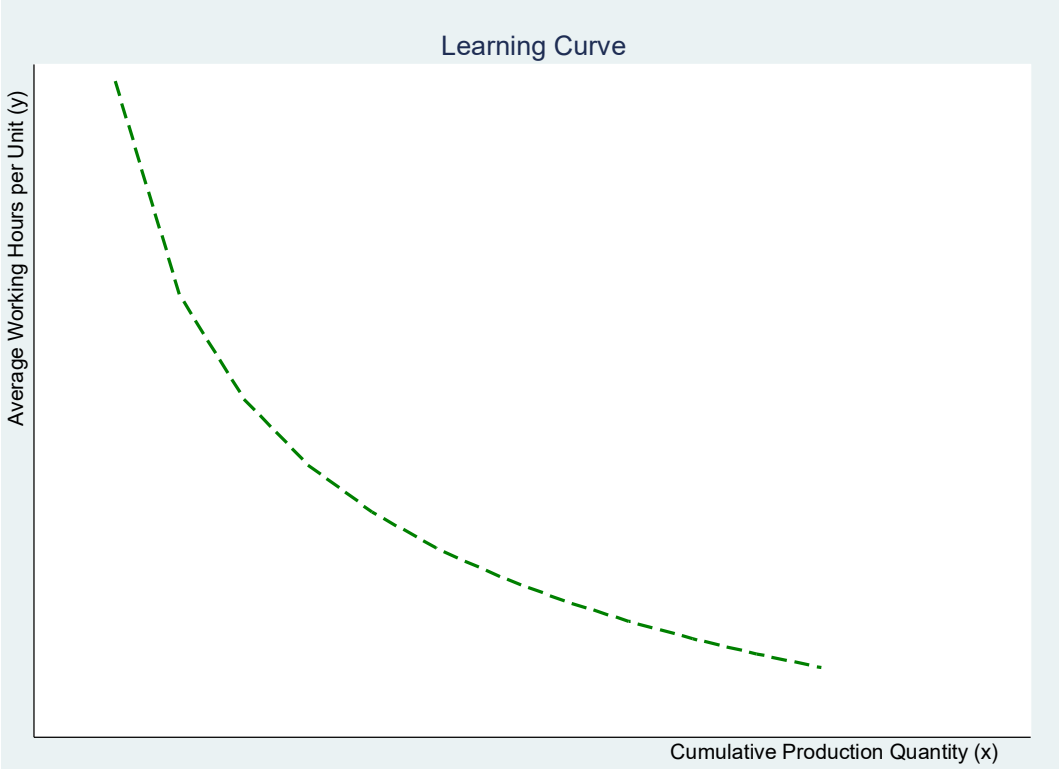

Figure 4-1 Learning Curve

Although the learning curve effect is summarized from the manufacturing process, it can be easily extended to other activities involving skill accumulation and knowledge accumulation. The learning curve effect brought about by concentration and experience accumulation is not only reflected in reducing operating costs, but also in expanding sales opportunities, optimizing sales markets and increasing sales revenue, which ultimately results in the improvement of net profit of enterprise.

2. Learning Curve Effect and Enterprise Value

As before, the spirit of doer can ensure that enterprise and entrepreneur get sufficient learning curve effect. The learning curve effect can enhance EV by

increasing the size of the return (CF_t) and the number of times the return lasts (N) in the enterprise valuation formula. The main mechanisms are as follows: (1) the spirit of doer helps to expand revenues by learning curve effect; (2) the spirit of doer helps to reduce average operating costs by learning curve effect; (3) the spirit of doer itself can improve the number of net income perseverance.

If d is used to express the spirit of doer, substituting d into the formula of enterprise valuation, we can get following formula:

$$V_{(d)} = \sum_{t=0}^{N_{(d)}} \frac{CF_{t(d)}}{(1+k)^t} \ ,$$

$$\text{where}, \ \frac{\partial CF_{t(d)}}{\partial d} > 0, \ \frac{\partial N_{(d)}}{\partial d} > 0,$$

Thus, $\frac{\partial V_{(d)}}{\partial d} > 0$, that is, the spirit of doer is conducive to improving EV.

ii. Social Capital and Enterprise Value

Social capital refers to the collection of social relations network of entrepreneur, which plays the roles of resource grabbing and ability endowing. According to the nature of social network, it can be divided into two categories: market-oriented social capital and institutional-oriented social capital. Market-oriented social capital refers to the social network established by entrepreneur and their main business partners (such as middlemen-suppliers and strategic partners). Institutional-oriented social capital refers to the societal networking among entrepreneur, government agencies and industry authorities (such as industry, commerce, taxation and other government administrative agencies, and trade associations, etc.).

The entrepreneur with the spirit of doer can accumulate not only abundant human capital, but also extensive and profound social capital in the process of doing

businesses that they recognize as practical, deep-going, long-term, capable and excellent. In the process of mutual promotion of human capital, social capital and physical capital, the capability of doers to identify and capture market opportunities is gradually improved, and the ability of enterprises to create and realize value is constantly enriched, which ultimately leads to the enlarging EV.

According to the relationship between the risk of financing guarantee business and EV, it can be inferred that: ***the spirit of doer is conducive to reducing the risk of financing guarantee business***.

4.2 Case Study of Doer Spirit and Enterprise Credit Enhancement

II. Background note

The asymmetric nature of return-risk of financing guarantee business determines that the distribution of the successful cases versus the failure ones is also extremely asymmetric. From the perspective of compensation rate indicator, the compensation rate of Foshan financing guarantee during 2015 to 2017 were 3.16%, 1.77% and 2.00% respectively, which belonged to the typical small probability. Compensation means that there is a problem in the financing guarantee business. If the compensatory business is deducted from the entire business, it will be successful business. From 2015 to 2017, the success rates of Foshan financing guarantee business were 96.84%, 98.23% and 98.00%, respectively. Because successful cases play an absolute dominant role in financing guarantee business, the failure ones are small probability events. Because the distribution of successful samples versus failure ones in financing guarantee business is severely asymmetrical, the commonly

used quantitative methods cannot be used to carry out regression analysis, in this instance only case study method can be used.

In addition, considering the return-risk asymmetry of financing guarantee and the principle of zero loss in business operation, it is more meaningful and feasible to select typical cases from a limited number of failure business to focused research. Therefore, the case studies in this chapter and subsequent chapters are all compensatory business, i.e. failure cases. As far as the average situation of Foshan FGCs is concerned, the number of guaranteed clients of each FGC is less than 200 per year, and the number of failure business per year is less than 5. Whether from the perspective of each FGC or the whole financing guarantee industry, the failure cases are more scarce and precious. In view of the inherent requirement of the principle of zero loss in business operation, failure cases are worth studying in order to fully and comprehensively draw lessons from them.

II. Basic Situation of Guarantee Business Case

Mr. A, born in 1965, is the actual controller of YH Company. YH Company was founded on July 30, 1996. Its registered capital was 1 million yuan, and Mr. A paid 700,000 yuan, accounting for 70% of the shares. The weaving business of YH Company was under the responsibility of Mr. A, while hardware products business was in the charge of the other shareholder. In 1997, the hardware business ceased production and withdrew. The other shareholder did not participate in the management of YH Company. Since then, the company only operated the weaving business, and its actual controller was Mr. A. After the amendment of the *Company*

Law in October 2005, in order to improve the organizational structure of YH Company, on September 3, 2006, the shareholders meeting passed a resolution, and the other shareholder transferred all his shares to Mr. A, and the nature of the enterprise was changed to limited liability company wholly owned by natural person. Mr. A continued to be the executive director and his wife was the supervisor.

YH Company set up a new shoe factory at the end of 2010 and put into production after the Spring Festival of 2011. Because shoe manufacturing involved environmental protection approval and export licenses of new company, it was decided not to set up new company, and continue to operate in the name of YH Company and expand its business scope. In February 2012, HY Company was approved by the Bureau of Industry and Commerce to change its business scope. Shoe factory was closed in the second half of 2014. Because shoe market was depressed, the order of shoe factory declined, and the cost of manpower increased, which caused the profit of shoe factory to decline, Mr. A decided to stop the production and operation of the shoe factory.

On September 5, 2011, Mr. A established HS restaurant, which operates in the form of individual business. His wife was the individual operator and ran the catering business, which was mainly featuring fish. Up to the time of applying for financing guarantee, the average monthly revenue reached more than 2.8 million yuan, and HS restaurant had about 150 employees. The monthly cost was composed of 450,000 yuan of labor cost, 100,000 yuan of water and electricity cost, 60,000 yuan of tax and fee, 130,000 yuan of rent; and 45% of the revenue went to raw

materials, totaling about 1.8 million yuan.

At the end of 2011, another limited liability company, HS Restaurant Co., Ltd. (HS Company for short) was set up in another town's commercial complex, which rented 1-3 storeys of the office buildings. HS Company invested 26 million yuan in renovation, started trial operation at the end of 2012, and formally obtained a business license on March 29, 2013, and had 50 waiters and 30 cooks. Mr. A. was the legal representative and actual controller of HS Company. With the gradual expansion of business, the original HS restaurant could no longer meet the daily business needs, therefore the company and its Hong Kong partners re-upgraded the canteen and planned to invest 12 million yuan. The initial investment of 5.5 million yuan was funded by Hong Kong partner. Later, the partner applied for share withdrawal. Therefore, the initial investment of 5.5 million yuan, together with half of the profit of 5 million yuan of the old HS restaurant, i.e. 2.5 million yuan, totaling 8 million yuan, was returned to the Hong Kong partner.

In August 2016, YH Company applied to J Guarantee Company for loan guarantee. The nature of the loan was working capital loan, the application amount was 2.7 million yuan, and the period was 12 months, agreeing to repay the loan in the following manner: one-time repay 1 .7 million yuan, and equally repay the other 1 million yuan on monthly basis. At that time, the family assets and liabilities of 51-year-old Mr. A were: real estate with appraisal value of 2.8448 million yuan; loans with a total amount of 900,000 yuan and outstanding balance of 644,000 yuan. And monthly repayment of 74,143 yuan went to micro-credit company. Loans from

micro-credit company were used to repay due loans from Z Bank at the beginning of the year.

YH Company, the guaranteed enterprise, mainly dealt in the hosiery industry, and most of its products were exported. After more than 10 years of development, it had become a hosiery company with a certain scale and distinct product characteristics. By 2016, the company had more than 100 modern hosiery looms, and could independently complete all hosiery weaving processes including knitting, stitching, setting, hot stamping, finishing and packaging.

In credit assessment, J Guarantee Company considered that besides the real estate of the actual controller (28,448,000 yuan) as counter-guarantee collateral, a batch of machinery and equipment under YH Company's name had an appraised value of about 3 million yuan as counter-collateral; in addition, it provided land and ground buildings to be subleased to the guarantee company with an appraised value of 5.07 million yuan. The original lease contract was kept by J Guarantee Company and a batch of inventory was used as collateral. The final credit rating was rated B, with a qualitative score of 64.49.

On August 31, 2016, J Guarantee Company signed a guarantee contract with YH Company, which agreed to provide guarantee for YH Company to P Bank for a sum of 2.7 million yuan. On September 20, 2017, P Bank served "*Notice of Performance of Compensation*" to J Guarantee Company. Because YH Company failed to repay the principal and interest on the date of maturity of the loan, J Guarantee Company was required to fulfill the guarantor liability in accordance with

the contract. J Guarantee Company repaid the principal and overdue interest of 2,210,186.43 yuan and 86,000.74 yuan on behalf of YH Company, totaling 2,296,187.17 yuan.

III. Controller's Doer Spirit Analysis

1. Every Cooperation Ends with the Withdrawal of Minority Shareholders.

The organizational form of a limited liability company provides a legal basis for long-term cooperation between shareholders. In theory, as long as the relationship among shareholders is harmonious and the business of the company is blameless, the cooperative shareholders usually stick to the growth and development of the company. However, due to numerous reasons, there are flaws in the relationship among shareholders, and the minor shareholders eventually choose to withdraw from the operation and shares. From the perspective of corporate information transmission, even minor shareholders know more about inside information than external creditors. There are two causes for minor shareholders to withdraw: voluntarily or forcibly.

If the minor shareholders withdraw voluntarily, it usually means that the business prospects of the company or/and the major shareholders are not optimistic, and they want to stop losses by the foot vote in time. If the minor shareholders are forced to withdraw from the company, it means that the major shareholders have moral problems. Therefore, whether minor shareholders voluntarily or forcibly withdraw from the company, it is the very alert signal when evaluating the company and its actual controllers. Especially when evaluating the creditworthiness of the actual controlling shareholder, if each cooperation relationship ends with the

ultimate departure of the minor shareholders, it can be undoubtedly suspected that the personality of the controlling shareholders is questionable. It's hard to imagine that an entrepreneur with doer spirit will end up barren wherever s/he goes. Logically, if the minor shareholders who cooperate with the actual controller end up with withdrawal or failure, it is difficult to prevent the controller from taking opportunistic actions against the interests of lenders and guarantors.

In the above case, Mr. A was the actual controller of YH Company. The guaranteed enterprise was established in 1996 and the minor shareholder withdrew from management in the following year (1997). Ten years later (2006), the minor shareholder transferred all the shares of YH Company and the controller Mr. A wholly owned YH Company.

At the end of 2011, Mr. A and his Hong Kong partner re-upgraded the restaurant, and the initial investment of 5.5 million yuan was funded by Hong Kong partners. In 2013, the partner applied for withdrawal. Mr. A returned 5.5 million yuan of pre-investment funds and half of the original HS restaurant's profits of 5 million yuan (2.5 million yuan) to the minor shareholder and ended the cooperative relationship.

2. Lack of Focus and Cross-border Operation

In 2016, when applying for guarantee, YH Company, the guaranteed enterprise, was mainly engaged in hosiery industry. Before or at that time, the actual controller Mr. A tried many times to operate across borders. Mr. A had a severely opportunistic mentality and lacked the necessary dedication and professionalism. YH Company set

up a new shoe factory at the end of 2010, which was engaged in production after the Spring Festival of 2011 and closed in the second half of 2014. In September 2011, Mr. A set up HS restaurant. In late 2011, he rented 1-3 floors of the office buildings in another town to set up HS Restaurant company. He invested 26 million yuan in decoration and began trial operation in late 2012. As of September 20, 2017, when Mr. A defaulted, HS Restaurant and HS Restaurant Co., Ltd. all ended in failures.

According to the first section of this chapter, the spirit of doer is a kind of dedicated character with the philosophy of " If others succeed by exerting one ounce of effort, I will exert a hundred times as much effort". A doer will do things that are recognized as practical, deep-going, long-term, capable and excellent as possible. In this case, Mr. A had a completely speculative mindset. It is difficult to imagine that such a person can begin well and end well. Whether dealing with interpersonal relationships or business economy, he just tasted it and ended up fruitless.

Summary

The zero-loss-principle of financing guarantee requires that FGC should first strictly screen clients in credit enhancement business, and systematically evaluate the owners and actual controllers of guaranteed enterprise. According to the business files of the China Success Guarantee Company, this chapter summarizes the assessment factors in the credit enhancement model for the owner or actual controller as the spirit of doer. Doers refer to those who pursue wealth and career through vigorous efforts and stepwise stability. Typical groups of doers are usually well-managed small and medium-sized business owners. The spirit of doer refers to

the enterprising concept of " If others succeed by exerting one ounce of effort, I will exert a hundred times as much effort", which makes sure that the right things are done in a practical, deep, long-term, capable and excellent way.

The spirit of doer can promote enterprise to do anything possible to improve production, management, labor productivity, and to reduce individual labor time in unit commodities, thereby to improve the position of the enterprise in the market competition and profit opportunities. To a certain extent, the spirit of doer can make up for the shortcomings of low educational background and realize the accumulation of entrepreneur’s human capital. The spirit of doer helps to accumulate social capital. Therefore, the doer spirit can directly improve the enterprise value through the learning curve effect and the social capital accumulation effect. The increase in enterprise value can reduce the credit risk of financing guarantee business. From the essential and long-term point of view, the spirit of doer matches systematically with the zero-loss-principle of credit enhancement business. Through the case study of Mr. A, the major shareholder and controller of YH Company, this chapter verifies the principle and mechanism of the spirit of doers reducing the credit risk of financing guarantee business.

ChapterV Market Competitiveness and Enterprise Credit Enhancement

Firstly, this chapter analyses the implication of market competitiveness, and the relation between market competitiveness and enterprise value. Secondly, the case study of B Company shows that the enterprise market competitiveness can be measured objectively and accurately by two indicators: customer concentration and net profit margin.

5.1 Market Competitiveness and Enterprise Value

I. Meaning of Market Competitiveness

Market competitiveness means that enterprise provides the right goods or services with the right quality at the right price on the right time. This means that the competitive enterprise satisfies customer needs more efficiently and effectively than others do. Usually in the competitory environment, only by relying on their own resources or strategic advantages to provide products or services for the market, and on the basis of optimizing and integrating the market and their own resources, can enterprise form a market competitiveness characterized by market impact and market power to achieve profits and sustainable development.

From the financial point of view, enterprise can reduce product cost and improve product quality by refining production process and technological level, which not only helps to increase market shares, but also benefits to improve sales profit margin. The financial performance of enterprise market competitiveness is good sales trend and high profit margin. In the same market, faced with similar

customer groups, when enterprise can win higher profit margins than others in the same industry, it means that it has competitive advantages in the market. Generally speaking, the larger the market share and the stronger the profitability, the stronger the market competitiveness. Hence, market competitiveness can improve the profitability, solvency and sustainability of the enterprise.

According to the 30 selected business archives, 8 of them have a clear evaluation of the competitiveness of enterprises in the market: 6 of them have strong competitiveness in the market, one has competitiveness in the market, and another has been evaluated as having ordinary competitiveness in the market. The other 22 files do not make a clear evaluation of market competitiveness. It can be seen that in practice, market competitiveness evaluation is a relatively complex process. Only when the relevant conditions are clear and sufficient, can the enterprise market competitiveness be evaluated.

In the actual market competition, the development trend of the subdividing industry has a direct impact on the enterprise market competitiveness. The enterprise market competitiveness is closely related to market potential and market structure. For FGC as outsider, market potential and market structure are easier to evaluate to some extent. Among the 30 files selected, 15 have definite evaluation conclusions on the market potential, 12 of them have positive evaluation on the market potential of enterprises. They are commented with "fast growth", "good prospect", "rising trend", "great potential", "great" and so on. In conclusion, only 2 files give the evaluation conclusion of "overcapacity" and "transformation" respectively, while the other 15

materials do not give the conclusion of market potential. As for the evaluation of market structure, 8 files have evaluation conclusion: 3 of them are competitive, differentiated or uncertain, 5 of them are centralized and marketed; the other 22 files don't have evaluation conclusions.

II. Market Competitiveness and Enterprise Value

Because financing guarantee business is usually short-term business, the focus of business evaluation is mainly on the impact of enterprise market competitiveness on business income and profit in the short term, at the same time taking into account its impact on enterprise value. Financial short-term analysis model is mainly cost-volume-profit analysis model. According to this model, the enterprise market competitiveness directly affects the unit price and sales volume in the short term, thus affecting EBITDA and the net profit, and ultimately influencing EV. The model is constructed as follows:

Supposing that in the relevant range, enterprise cost can be divided into two parts: variable versus fixed. And fixed cost is expressed as ***a***, and unit variable cost expressed as ***b***; assuming unit price is expressed as ***p***, sales volume expressed as ***x***, and sales revenue expressed as ***y***, then ***y = px***; presuming that total cost function is c, then c = a + bx. Assuming that enterprise has market competitiveness, its products always have market for sale and a balance between production and marketing can be achieved, that is to say, its inventory level remains unchanged for a period of time. The profit is π, and the model can be expressed as：

$$\pi=y-c=px-(a+bx)=(p-b)x-a \qquad (5\text{-}1)$$

According to Formula 5-1, the enterprise market competitiveness can act on profit π through two variables of ***p*** and ***x***, and derive the profit function to ***p*** and ***x***, respectively：

$$\frac{\partial \pi}{\partial p} = x \qquad (5\text{-}2)$$

Form 5-2 reveals that if an enterprise with sufficient market competitiveness increases its profits by raising its price, it can increase the EBITDA of x units per unit of price increase, and the leverage effect of price increase on EBITDA is x. As shown in Fig. 5-1, a price increase not only reduces the position of break-even point, but also increases EBITDA in an equal proportion based on sales volume. See the shadow area of the figure.

$$\frac{\partial \pi}{\partial x} = p - b \qquad (5\text{-}3)$$

Form 5-3 reveals that if a competitive enterprise increases its profits by expanding its sales, the EBITDA of (p-b) units can be increased with each additional unit of sales volume, and the leverage effect of expanding sales volume on EBITDA is p-b. In the cost-volume-profit analysis model, p-b is called unit contribution margin (*CM* for short), i.e. EBITDA increases with each additional sales volume. As shown in Figure 5-2, when sales volume increase from x_0 to x_1, EBITDA increases from $EBITDA_0$ to $EBITDA_1$ with a leverage factor of p-b.

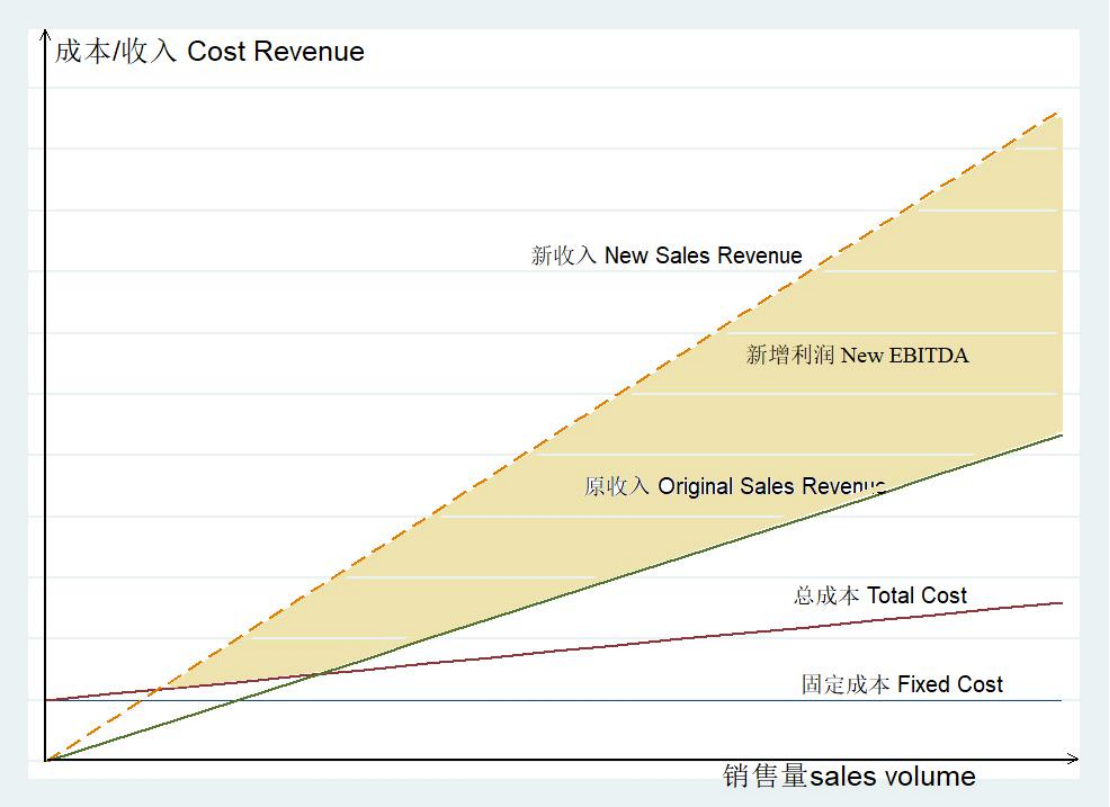

Figure 5-1 Impact of Price Rise on EBITDA

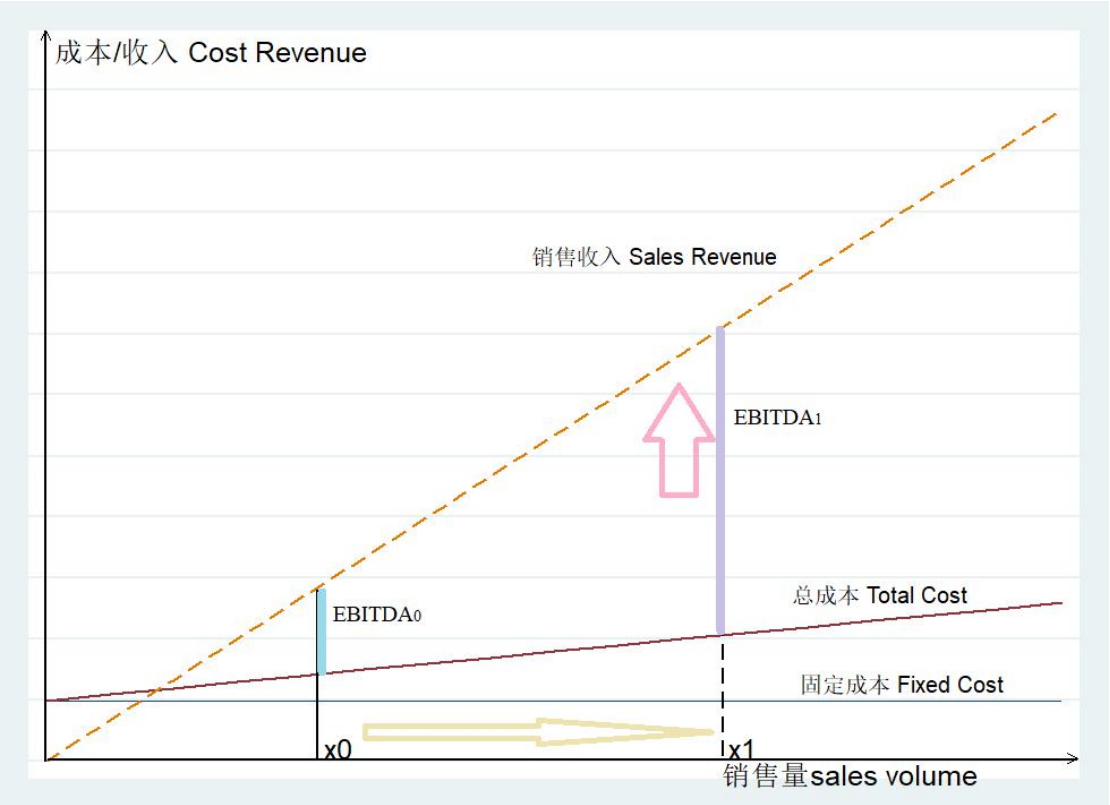

Figure 5-2 Impact of Expanding Sales on EBITDA

If the other conditions remain unchanged, the increase of EBITDA will increase the net profit, that is to say, the numerator in the enterprise valuation formula will rise, and thus EV will be increased. According to the relationship between the risk of financing guarantee business and EV, it can be inferred that: ***the enterprise market competitiveness is conducive to reducing the risk of financing guarantee business***.

5.2 Case Study on Market Competitiveness and Credit Enhancement

I. Basic Situation of Guarantee Business Case

1. Status of the Guaranteed Enterprise

B Ceramics Company was founded in November 2006. In June 2007, natural person Mr. H and natural person Mr. T invested 300,000 yuan respectively to acquire all shares of the company, and each accounted for 50% shares. In November 2008, Mr. H's cousin invested 300,000 yuan to acquire Mr. T's equity. Mr. T was a registered shareholder and the real controller was Mr. H.

In 1990, Mr. H began to work in a ceramics factory in Nanzhuang Town of Foshan, and engaged in the sales of ceramics and chemical raw materials from 1995 to 2003. In 2003, Mr. H went to Heshan to set up F Ceramics Company to engage in brick production and marketing. F Ceramics Company closed its business in October 2009 due to other reasons. At the end of 2006, Mr. H acquired B Ceramics Company to engage in brick polishing, processing and marketing.

In July 2008, it established Xinxing County Y Ceramics Company to engage in brick production and marketing. Y Ceramic Company employed about 1000 people, and the legal representative and actual controller was natural person Mr. H.

Another affiliated enterprise, Xinxing J Building Material Company was registered and established on April 11, 2013. Its business scope was sales of building materials, processing and sales of building ceramics, and its legal representative and actual controller was Mr. H.

After nearly seven years of development, B Ceramics Company had three polishing production lines, 40, 42, 48, respectively, with more than 300 employees. Products were mainly high-grade dark Bratti polishing bricks. Because dark brick was mainly used in decoration engineering and building materials, its market and sales channels were stable, and were not affected by the real estate regulation policy. Moreover, there were few competitors in the market of high-grade dark brick subdivision in the industry, and its sales channel was more stable than others in the same industry.

Compared with 2012, the ceramic industry showed signs of recovery in 2013, and market orders increased. In order to adapt to the changing market demand, enterprises produced white polycrystalline stone in 2013. The product structure was half of dark brick and half of light brick. About 40% of B company's ceramics products were sold abroad to the Middle East, Southeast Asia and other regions, mainly 600 dark Bratti. For domestic sales, at that time, four brands had been registered.

B Ceramics Company is essentially an industrial extension project added by the actual controller, Mr. H, on the basis of managing Y Company ceramics brick production. On the one hand, this "private polishing factory" could achieve new

economic benefits; on the other hand, it could solve the problem of quality degradation through deep processing and polishing of brick billets with quality problems to maximize current benefits. At that time, more than 90% of the bricks purchased by B Company came from Y Ceramics Company.

For ceramic industry, the upgrading of production line and technical improvement were the key to development. Starting in 2012, the company had completed two polishing line equipment upgrading; and the remaining one had also been upgraded by half. Through the renewal of equipment technology, the production efficiency and product quality were improved, and the competitiveness of was further enhanced. In 2013, the actual controller Mr. H set up the second affiliated company in Xinxing County. At that time, the first polishing production line was being ordered. It was planned to relocate the production line of B Ceramics Company to factories in Xinxing County one after another, and B Ceramics Company had no investment plan.

2. The Process of Guarantee Business

B Ceramic Company was the old customer of J Guarantee Company, and the two parties had been cooperating for 4 years. This business is a continuation. B Ceramic Company applied for 10 million yuan guarantee to J Guarantee Company. After credit rating, J Guarantee Company gave the applicant a good credit rating of BB ratings and qualitative rating of 70.73.

On February 14, 2014, J Guarantee Company signed a guarantee contract with B Ceramics Company, which stipulated that 7 million yuan of loans and other

expenses under the *Working Capital Loan Contract* signed by B Ceramics Company and Z Bank would be guaranteed by J Guarantee Company. At the same time, it was agreed that if the breach of contract of B Ceramic Company results in the compensation of J Guarantee Company, it should repay the full amount of money to the J Guarantee Company within three days from the date of compensation, as well as the interest and penalty on the bank loan of the same period. In case of overdue liquidation, J Guarantee Company had the right to collect liquidated damages from B Ceramics Company at 0.2% of the compensation amount per day from the date of overdue liquidation.

At the same time, J Guarantee Company and B Ceramics Company, the two affiliated enterprises, the actual controller, the affiliated enterprise shareholders signed the "*Maximum Counter-Guarantee Contract*", which agreed that B Ceramics Company provided machinery and equipment and existing and future inventory, and the affiliated enterprise provided machinery and equipment as collaterals. A number of real estates under the name of the actual controller and the shareholders of the affiliated enterprises and the buildings of the guaranteed enterprise were mortgaged to J Guarantee Company. On the same day, J Guarantee Company signed a *Guarantee Contract* with Z Bank to undertake joint guarantee liability for the loan of B Ceramics Company from Z Bank.

On February 19, 2014, Z Bank granted the loan of 7 million yuan to B Ceramics Company. The borrowing period was 24 months, and the repayment method was to repay according to the plan. It was agreed that the principal and

interest should be repaid on a quarterly basis starting from the sixth month.

On December 18 of 2015, December 21 and January 26 of 2016, Z Bank issued a *Notice of Claim for Compensation* to J Guarantee Company. Because B Ceramic Company could not repay the principal and interest of the matured loan, J Guarantee Company was required to repay the principal and interest of the loan on behalf of B Ceramic Company, totaling 2,022,001.23 yuan. J Guarantee Company repaid 202,2001.23 yuan to Z Bank on the same day.

After compensation, B Ceramics Company did not return the full amount to J Guarantee Company as contracted. J Guarantee Company sued the guaranteed enterprise, the affiliated enterprises and the actual controller and associated individuals under counter-guarantee contract to the court. On May 18 of 2016, the court made a default judgment:

Demanding that B Ceramics Company pay J Guarantee Company the principal amount of compensation of 2,022,001.23 yuan, as well as interest, penalty and liquidated damages; the actual controller, affiliated enterprises and affiliated shareholders bear joint liability for the above debts; J Guarantee Company has priority of claim in the collaterals under the counter-guarantee contract.

From February 22 to 23 of 2018, the court auctioned a house and three parking spaces of collaterals. The total revenue from the auction is 5,738,080 yuan. So far, after four years, the guarantee business was closed.

II. Market Competitiveness Analysis

1. Market Situation of Construction Ceramics Industry

Since the second half of 2010, great changes have taken place in the pattern of China's ceramics industry. From the industrial base to the sales market, from brand management to channel access, a new market pattern has taken shape. Since the state promulgated energy saving and emission reduction policies in 2010, the governments of Foshan, Shandong and other ceramics producing areas have implemented shutdown and transfer of enterprises with high energy consumption and heavy pollution. The large-scale migration of Foshan building ceramics had shocked the whole ceramic industry.

As building ceramics industry has always been a labor-intensive industry, it has always been unable to get rid of the ultimate destiny of relocating to poor areas. With the rising costs of raw materials, energy, human resources, logistics, environment and so on, the development of building ceramics industry in Guangdong coastal areas had reached a limit. According to incomplete statistics, from March 2007 to the first half of 2013, Foshan ceramics enterprises had migrated to the following areas: Qingyuan, Deqing, Gaoyao, Gaoan, Fengcheng, Pingxiang, Jingdezhen and Jiujiang. The total investment was over 25 billion yuan, the total area of the new plan was close to 40,000 mu (about 26,666,640 square meters) and there were more than 350 designed production lines. In the process of northward migration, Qingyuan and Xinxing were the earliest regions to undertake the transfer, and also the regions to take shape firstly in emerging industrial bases.

Judging from the situation at that time (2013), the industry had gradually formed a number of strong ceramic brands. Among them, Xinzhongyuan was unique

scenery in the field of polished tiles, Jinyitao was invincible in the field of antique tiles, Dongpeng had successfully spanned the two fields of architectural ceramics and bathroom, Wrigley led the trend in the field of bathroom, Huida was exceptional in the field of bathroom export. And Xinmingzhu, Smick and Marco Polo, Oxonor, Irvine, Nobel, etc., all were excellent brands.

2. Market Competitiveness Analysis

B Ceramic Company was commonly known as "Private Polishing Factory" in the industry. It produced dark Bratti bricks and white polycrystalline bricks. Its mode was similar to other polishing bricks factories. Brick billets are polished into polished bricks through a series of polishing and grinding processes. After compressive strength test and damage test, the finished products are packed out of the factory. After nearly seven years of development, B Ceramic Company had three polishing production lines, 40, 42, 48 respectively, and had more than 300 employees. The products were mainly high-grade dark polished Bratti bricks. Because dark bricks were mainly used in decoration engineering and building materials, their market and sales channels were stable, and they were not affected by real estate regulation policies.

There were few competitors in the market of high-grade dark brick sector in the industry, and its sales channel was more stable. In 2013, the ceramic industry showed signs of recovery and market orders increased. In order to adapt to the changing market demand, the company produced white polycrystalline stone. The product structure was half of dark brick and half of light brick. In 2012, the company

realized sales revenue of 252.12 million yuan and net profit of 12.92 million yuan. By August 2013, it had realized sales revenue of 158.48 million yuan and net profit of 7.7 million yuan.

About 40% of the products of B Ceramics Company, mainly 600 dark Bratti, were sold to the Middle East, Southeast Asia and other regions. For domestic sales, four brands had been registered. The company had carried out general contracting sales on these brands, and introduced powerful distributors as their general agents for external sales. More than 90% of the bricks purchased by B Ceramics Company came from the affiliated enterprise of Y Ceramics Company. The settlement method was prepaid, and the bills of promissory notes were paid for 2 months after the bricks were shipped. Both sides had fair purchasing price and independent accounting. They were closely related to each other to ensure timely supply of bricks and billets.

In 2012, the company's top four sales customers were all natural persons. Their total sales volume and sales revenue were 387,000 square meters and 232,870,000 yuan, respectively. The top four sales accounted for 92.4% of the sales volume of B Ceramics Company. The top four customers' sales accounted for 33.11%, 27.68%, 17.42% and 13.84% of sales respectively. The high customer concentration reflected that the sales channel was too single and the market competitiveness was weak. After all, for the enterprise in building ceramics industry with low industry concentration, the profit division between suppliers and distributors was inconsistent. In order to maximize their profits, the distributors with market power would inevitably depress

the prices and profits of the suppliers.

Referring to the financial statements provided by B Ceramic Company from 2011 to 2013, the net profit margins of sales, as the final result of the market competitiveness, were 5.23%, 5.12% and 4.76% respectively. The minute and deteriorating net profit margin reflected the weak market competitiveness of B Ceramic Company.

Summery

Market competitiveness means that enterprise provides the right goods or services with the right quality at the right price on the right time. Market competitiveness means that enterprise meets the customer needs more efficiently and more effectively. Market competitiveness can improve the profitability, solvency and sustainability. Competitive enterprise, whether by raising prices or expanding sales, can improve EBITDA, thereby improve the short-term solvency and reduce the risk of financing guarantee business. Most financing guarantee businesses are short-term, and market competitiveness can significantly improve the short-term performance indicators, therefore market competitiveness and the zero-loss-principle of credit enhancement business form a key match. Through the case analysis of B Ceramics Company, it is found that the enterprise market competitiveness can be measured objectively and accurately by two indicators of customer concentration and net profit margin.

Chapter VI Technology Suitability and Enterprise Credit Enhancement

6.1 Technology Suitability and Enterprise Value

I. Meaning of Technical Suitability

From an economics point of view, technology refers to the means of converting input into output in the production process, including hard technology (means of labor) and soft technology (design, manufacturing methods, technical information). Technical suitability is the organic unity of technological advancement and economic efficiency. Technology is a means to improve economic benefits, and the purpose of developing technology is to improve economic benefits. To achieve the unity of technological advancement and economic efficiency, that is, to improve technological suitability is the fundamental direction when enterprises choose or develop technology.

Technological suitability is the physical basis for linking doer spirit and market competitiveness. In order to give full play to the role of doer spirit, it must be put into practice on technology suitability and technology most suitable for enterprise environmental conditions. Market competitiveness will not arise out of thin air. Its realistically solid basis is the enterprise technology suitability.

According to the files of guarantee business, the items of evaluating technical suitability mainly include technical equipment, quality management, technical certification and management level. As for technical equipment, 18 out of 30 files have definite evaluation conclusions, including "advanced" (15), "breakthrough" (1),

"complete" (1), "high-tech" (1); the remaining 12 do not have any conclusion. As for quality management and technical argumentation, 15 out of 30 files have definite conclusions, which are "conformity" (11), "medium" (1), "specification" (1), "more than 30 patents" (1), "brand value" (1). The remaining 15 files don't have any evaluation conclusion. As for the management level, 21 of the 30 files have clear conclusions, which are "normative" (6), "normal" (3), "medium" (1), "robust" (2), "efficient" (2), "advanced" (5), "skilled" (1), "main research, development and sales, manufacturing outsourcing" (1).

II. Technical Suitability and Enterprise Value

According to the basic principles of technological economics or engineering economics, enterprises should evaluate the economic effect of each technology project they choose. The technological project will be adopted when its net present value (NPV) is greater than zero or when the highest internal rate of return (IRR) is achieved. Selecting the technology project of which the financial net present value is positive and maximized means that the technology project can contribute the maximized value to enterprise value (EV). Because the method of evaluating the technology suitability is completely consistent with the method of evaluating the enterprise value, the technological suitability is directly unified with EV maximization. In theory, enterprise value is the sum of the net present value of all technological projects. For FGC, each client-enterprise can be regarded as a technology project, and the potential enterprises can be screened according to the principles and methods of engineering economics for screening technology projects,

so as to provide impartial basis for credit risk assessment and financing guarantee business decision-making.

Enterprise operation activities are inseparable from capital investment and labor investment. Under the new normal conditions of China's economy, the suitable technology can improve the return on assets (ROA) and the wage level of employees from the perspective of business performance. Return on assets measures how much net profit is generated from one unit of assets. The formula is: ***return on assets = net profit after tax / total assets.*** The higher the return on assets, the better the effect of asset utilization, indicating that the enterprise has achieved decent results in increasing income and saving the use of funds, and vice versa.

In competitive labor market, the wage level directly reflects the quality of employees. Generally, with the updating of technological equipment and the improvement of technological level in enterprises, low-quality workers tend to be replaced by machines. When the number of high-quality workers who operate advanced machinery and equipment increases and that of high-quality workers decreases, the proportion of high-quality workers will increase. In addition to the long-term trend of rising wage level in China, technologically suitable enterprise can provide higher salary for their employees. Therefore, the return on asset and wage level are the two basic indicators to measure enterprise technology suitability.

6.2 Case Study on Technology Suitability and Credit Enhancement

I. Basic Situation of Guarantee Business Case

1. Basic Situation of C Clothing Company

C Clothing Company (C Company for short) was established in January 2004. It mainly produced and managed various kinds of knitted clothing products. Actual Controller Mr. L, diligent and willing to specialize, in 1996, when he had one-year apprenticeship experience in garment craft factories after graduation from middle school, tried to run garment factory. In the early days of its establishment, due to the lack of in-depth understanding of the garment industry, C Company once fell into a slow stage of development. To make up for its shortcomings, Mr. L stationed in garment factory day and night, from a layman to C company's chief designer and testing officer. Since its establishment, C company had been growing steadily in the fierce market competition with its indomitable pioneering spirit. Especially after 2011, advanced JIT single-piece production line and hanging equipment had been introduced to ensure better product quality and delivery time.

Company C enjoyed a high reputation among its peers. After a good pace of adjustment, the company had obtained IS09001 quality system certification with strong technical force and standardized operation process. At the same time, it had won the favor of domestic and foreign brands. Yishion, Zhenweisi, Birchmei, Beibei Bear, 361, Delphi and so on are its main partners, among which Yishion and Baiqimei account for more than 50% of all orders of C Company. Having a fixed sales channel did not stop the pace of its progress, C company continued to introduce a number of semi-automatic equipment, in order to ensure the quality of the premises of further shortening the delivery period, and further expand the production scale.

C Company had developed from a small workshop with only a dozen people to

a private enterprise with more than 300 people. In addition to having good production technology and sales channels, it was also closely related to the innovative and forward-looking thinking of managers. Firstly, the company paid attention to effective communication between management and grass-roots level, realizing that the grass-roots feedback could help enterprise correct errors in time; secondly, the company attached great importance to the training of staff skills, and carried out a series of training courses from time to time, so that employees could better adapt to their own work. C Company's performance was relatively stable, in the medium position in the same industry. Especially in 2011, the introduction of new computer equipment, effective decomposition process, and control production speed, offset the regret of slowing the process due to lack of skilled craftsmen.

After China's economy entered a new normal, young people willing to work in factories were becoming more and more difficult to recruit. Enterprises once fell into a situation of shortage of manpower. They clearly had endless orders, but had to cancel them. In view of this situation, Mr. L, the actual controller, believed that only by constantly replacing manpower with machines could the enterprise have long-term development. So C Company planned to continue to introduce semi-automated equipment, in addition to the original four automated production lines, it was estimated that 50-100 employees could be saved.

Furthermore, due to the buyer's settlement period of 30-60 days, and garment manufacturing industry needed a large amount of capital to be prepare, once the capital chain was broken, the company would fall into the awkward situation of

prolonging the supply period. As a result, in July 2012, the company borrowed a working capital loan amounted 3 million yuan from local financial institutions for a period of two years, mainly to supplement the liquidity.

From the domestic demand of the industry, by the end of 2012, with the stabilization of China's economy, the growth rate of domestic garment sales had rebounded gradually. According to China Garment Association's understanding of some garment enterprises order meeting in spring and summer of 2013, due to the slowdown in demand, the willingness of agents to order declined, and the total order volume was generally lower than expected. In the second half of 2013, with the recovery of the economy and the gradual improvement of consumption stimulus policy, domestic garment consumption would also show a gradual upward trend.

Three-year enterprise data show that sales revenue increased by 15.7741 million yuan in the same period of 2012 compared with 2011, an increase of 21.5%, and net profit increased by 35.3 million yuan, an increase of 0.8%. The large increase in sales revenue had not caused a significant increase in net profit. Firstly, the main reason was that the price of raw materials and the cost of labor increased, which led to the increase in sales cost. Secondly, because the profit margin of the apparel industry was generally not high, small profits and more sales were the usual methods used by many enterprises. The comprehensive financial indicators were still within the normal range.

Clothing industry belongs to labor-intensive industry. In 2013, the number of employees in C Company was 292-301, with the average wage ranging from 2716.7

to 3239.6 yuan per capita per month. In 2013, the minimum wage in Foshan was 1310 yuan, and the average wage of on-the-job employees was of 4196 yuan. It could be seen that C company was facing a difficult choice: there was no room to depress the wages, because it had already faced the situation of difficult recruitment; the machine replacement scheme would consume a lot of investment, fixed cost would be raised after a substantial increase in operating leverage, and the sales volume and sales revenue at the break-even-point would increase rapidly.

Mr. L, the actual controller, also had an associated enterprise, JC Glass Machinery Company. JC Glass Machinery Company, founded on June 6, 2008, was a sole proprietorship company. The company mainly produced glass edge grinders, and the models produced were all general purpose machines. Therefore, the company could prepare materials before they received orders, and the process of preparing materials required sufficient liquidity.

According to the information provided, the main business revenue in 2010 was 15.89 million yuan, and the net profit was 2.48 million yuan; in 2011, the main business revenue was 19.83 million yuan, and the net profit was 2.93 million yuan; in 2012, the main business income was 31.27 million yuan, and the net profit was 4.42 million yuan.

2. The Process of Guarantee Business

In June 2013, C Company filed a loan guarantee application to J Guarantee Company. The application amounted 10 million yuan and the period was 36 months. The repayment method was to repay the principal as planned (paying interest

monthly, repaying the principal in the first year was 2 million yuan, repaying 500,000 yuan quarterly; repaying the remaining 4 million yuan in the second and third year respectively, namely repaying 1 million yuan quarterly for the last two years). After credit evaluation, on July 25, 2013, J Guarantee Company gave C Company a BBB rating with good credit and a qualitative score of 78.86. It agreed to provide guarantee for C Company to apply for liquidity loan of 10 million yuan from Z Bank. The guarantee fee was calculated at 6% of the guaranteed amount, as was 600,000 yuan.

On September 25, 2013, J Guarantee Company and C Company signed the *Guarantee Contract*, which stipulated that J Guarantee Company would provide joint guarantees for loans of 10 million yuan and other expenses under the *Working Capital Loan Contract* signed by C Company and Z Bank on September 25, 2013. If the default of C Company resulted in the compensation of J Guarantee Company, C Company should repay the full amount of money to J Guarantee Company within three days from the date of compensation, as well as the interest and penalty on the bank loan of the same period from the date of compensation. In case of overdue liquidation, J Guarantee Company had the right to collect liquidated damages from C Company at 0.2% of the compensation amount per day from the date of overdue liquidation. On the same day, J Guarantee Company signed a *Guarantee Contract* with Z Bank to provide joint guarantee liability for the loan of C Company. On October 8 of the same year, Z Bank granted a loan of 10 million yuan to C Company.

In order to protect rights and interests, J Guarantee Company signed the

following counter-guarantee contracts with the actual controllers and other stakeholders of C Company:

(1) On September 25, 2013, J Guarantee Company signed the "Counter-guarantee Contract" with C Company and five shareholders, which agreed to provide joint liability guarantees for the debts of C Company to J Guarantee Company;

(2) On September 25, 2013, signed the "*Maximum Counter-Guarantee Contract*" with the actual controller and his spouse, and agreed to mortgage four shops and five parking spaces under their name to J Guarantee Company, which had been registered for mortgage;

(3) on September 17, 2013, signed the "*Maximum Counter-Guarantee Contract*" with C Company, which stipulated that C Company should mortgage its existing and future inventories to J Guarantee Company;

(4) on October 30, 2014, signed the *Contract of Maximum Counter-Guarantee* with C Company, which stipulated that C Company would provide J Guarantee Company with the Maximum Counter-Guarantee Mortgage for the batch of machinery and equipment under its name, and had already registered the mortgage;

(5) On October 30, 2014, signed the *Contract of Maximum Counter-guarantee* with the actual controller and his spouse, which stipulated that two of them would mortgage their real estate to J Guarantee Company;

(6) On September 25, 2013, signed a "Maximum Counter-Guarantee Contract" with Company C, stipulating that the existing and future accounts receivable and

other accounts receivable generated by the production and operation of C Company within the next five years from the date of issuance of the loans referred to in the contract would provide counter-guarantee to J Guarantee Company, and the registration had been completed.

On June 5, 2015, Z Bank issued a *Notice of Claim for Compensation* to J Guarantee Company, requesting J Guarantee Company to compensate the borrowing principal of C Company amounted 890,430.69 yuan and the fine interest of 3,623.56 yuan, totaling 894,054.25 yuan. J Guarantee Company compensated Z Bank the amount on the same day.

According to the counter-guarantee contract, if the recovery is failed, J Guarantee Company would sue the parties of the counter-guarantee contracts to the court. On July 9, 2015, the court rendered a default judgment:

(1) C Company should repay the principal of compensation and interest, penalty and liquidation damages to J Guarantee Company within three days from the effective date of this judgment; (2) Other guarantors under the counter-guarantee contract should bear joint liability for the above-mentioned debts; (3) J Guarantee Company, as the first creditor, had the priority right to be repaid for the price of the collateral (the current assets of shops, garages, houses, affiliated enterprises, machinery and equipment of C Company and accounts receivable) after discount, auction or sale.

After the judgment comes into effect, the execution process of the judgment becomes tortuous. On May 26, 2017, the court received an execution objection from

the outsider LYZ, who believed that he had acquired 20% of the property rights of the mortgaged property. The court's auction of the property damaged his legitimate rights and interests. On May 23, 2018, the outsider filed suits in the Intermediate Court. Finally, on July 19, 2018 and February 25, 2019, the court issued notice of the auction of the mortgaged shops respectively. On December 31, 2018, some collateral (parking spaces, shops) began to be auctioned online, with a total amount of 3,998,890 yuan. The guarantee business started in June 2013 and ended in March 2019. It had spanned six years and gone through many setbacks. This profoundly shows that the occurrence of compensation and breaking the zero-loss-principle is undoubtedly a nightmare for FGCs.

II. Technology Suitability Analysis

1. Hardware Equipment

As shown in Table 6-1, in 2013 C Company had 816 machines and equipment of various types, with a total value of more than 71.0 million yuan. According to the relevant announcement of the Market Supervision and Administration, the 816 machines and equipment were registered as mortgages on October 30, 2014, and the mortgagee was J Guarantee Company. From the aspect of purchasing unit price, the highest price of a single piece of equipment was 35,000 yuan. Background information showed that all equipment did not have invoices, at least it could be explained that there were no invoices when purchasing equipment, or the invoice management was not prudent. Regardless of which case, it showed that the company did not attach enough importance to machinery and equipment management. The

low value of machinery and equipment and insufficient attention easily led to the lag of hardware and equipment technology and the development hindrances. After introducing the new computer equipment in 2011, the company continued to introduce semi-automation equipment in the second half of 2013. The fact proved that this kind of passive adjustment to the problem of rising labor costs and difficulty in recruiting workers on hardware equipment was too late.

Table 6-1 Hardware Equipment List of C Company (2013)

No.	Hardware Equipment	Quantity	Unit price (yuan)	Total value (yuan)
1	Hang System	150	19,600	2,940,000
2	Computerized flat car	356	4,300	1,530,800
3	Cart Style-1	84	13,500	1,134,000
4	Cart Style-2	115	5,500	632,500
5	Double needle car	10	5,000	50,000
6	Double Needle Chain Bottom	6	3,000	18,000
7	Knife cart	6	2,490	14,940
8	Zigzag Sewing Machine	15	2,500	37,500
9	Five-lane Car	5	6,500	32,500
10	Third-lane car	2	5,500	11,000
11	Double Needle and Trouser Head Car	10	13,800	138,000
12	Button Car	8	6,500	52,000
13	Knob Car	4	30,000	120,000
14	Injection truck	8	600	4,800
15	Jujube cart	5	28,000	140,000
16	Zhanggen Car	2	20,000	40,000
17	Paper press	1	29,990	29,990
18	Wire blower	3	5,000	15,000
19	Needle tester	1	35,000	35,000
20	Cloth inspecting machine	2	28,000	56,000
21	Loosening machine	3	11,000	33,000
22	Hot bed	20	2,000	40,000
summation				7,105,030

Source: J Guarantee Company Guarantee Business Survey Report.

2. Management Technology

Financial management lost efficacy. The idea of borrowing short-term debt to support equipment-update in the context of continued declines in return on asset (ROA) was wrong in itself. According to the data, the ROA of C Company in 2011 was 23.9%, which dropped to 11.0% in 2012. The downward trend of C Company in 2013 was not meaningfully improved. Given the high financing costs of SMEs, in the case of declining ROA, enterprises should have acted prudently and could not easily borrow and increase financial leverage. The graver mistake was that C Company intended to add automation equipment with part of short-term loans. This mismatch strategy of "short-term borrowing and long-term using" easily led to bankruptcy due to the breakdown of funds chains once the company ran into some unfavorable shocks.

Outsourcing management was backward. C Company took most of orders for their own production. Generally, about 30% of the orders needed to be outsourced in summer. According to the owner, Mr. L, it was difficult to control the quality of outgoing parts. Some manufacturers were unwilling to assume after-sales responsibility, resulting in the re-processing of returned parts, which wasted both resources and time. Therefore, the company planned to increase production capacity and reduce outsourcing.

Personnel management failed. C Company was charged with unprovoked arrears in the remuneration of eight employees in August 2015. C Company refused to attend the lawsuit without justifiable reasons, and the court made a default judgment: C Company should pay 86,380 yuan of wages owed to the eight plaintiffs;

C Company should pay 12,9880 yuan of economic compensation for the termination of labor relations with the two plaintiffs; and C Company should bear the litigation expenses.

3. Indicator Evaluation

The return on assets of C Company was 23.9% in 2011, 11.0% in 2012 and 9.9% in the first five months of 2013, showing a continuous declining trend. The average wage in March 2013 was 3239.6 yuan, which was basically the same as the average annual wage of urban private sector employees in China in 2013 (32706 yuan). This indicated that most employees were ordinary workers with low technical literacy.

Summary

Technology is a means of converting input into output in the production process. Achieving the unity of technological advancement and economic efficiency is the fundamental direction when enterprises choose and develop technology. Technical suitability is the physical basis of connecting doer spirit and market competitiveness.

According to the basic principles of technological economics or engineering economics, enterprise should evaluate the economic effect of each technology project they choose. In theory, enterprise value is the sum of the net present value of all technological projects of the enterprise. Therefore, technology suitability and the maximization of enterprise value are directly unified.

Under the new normal conditions of China's economy, the technology suitability can improve the return on assets and the wage level of employees from

the perspective of business performance. Return on assets and wage level are two straightforward indicators to measure the technological suitability. Through the case study of C Company, it is found that enterprise without technology suitability displays signs of imbalance in many aspects of machinery and equipment, financial management, personnel management, outsourcing management. The imbalance directly increases enterprise vulnerability and risk level. The ultimate consequences of technology imbalance are the reduced return on assets and low average wage

level.

Chapter VI Concluding Remarks and Research Prospects

7.1 Concluding Remarks

Under China's current financial system, which is dominated by indirect financing and creditor's rights financing, combining with underdeveloped social credit system and imperfect credit risk management instruments, SMEs financing is very difficult. Financing guarantee can alleviate the SMEs financing problem to a certain extent, and it has the nature of quasi-public service. At present, China defines financing guarantee as profit-making business and encourages private capital and private enterprises to develop financing guarantee business. Private financing guarantee company (FGC) must strictly follow the zero-loss-principle to carry out business, otherwise they will not survive.

The principle of zero loss essentially requires the financing guarantee company to give special attention to the key value driving factors of client-enterprises, such as human factors, market competition factors and technological factors. Combining with the business cases of China Success Guarantee Company, this paper summarizes the above three factors as doer spirit, market competitiveness and technology suitability.

As shown in Figure 7-1, the principle of zero loss is the core of financing guarantee business, while the spirit of doer, market competitiveness and technology suitability are the realistic assurance of implementing the principle. Among them, the spirit of doer is the commander-in-chief, technology suitability is the means, and

market competitiveness is the driving force and guidance.

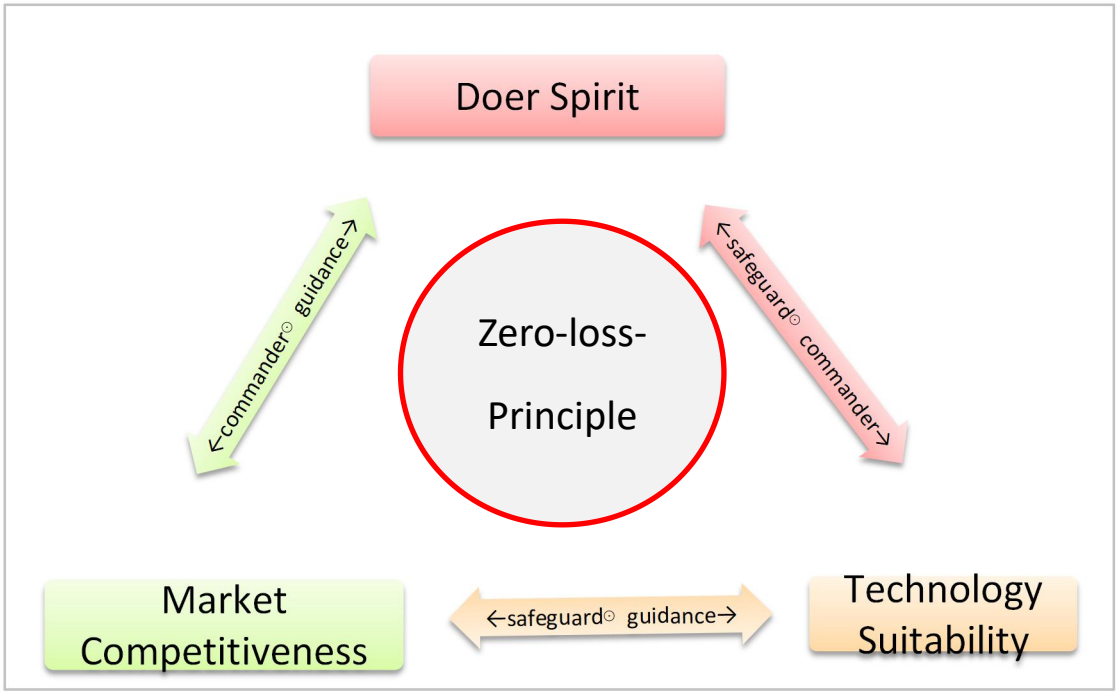

Figure 7-1 Three Factors of Financing Guarantee Credit Enhancement Model

The principle of zero loss does not deny the existence value of FGC; on the contrary, it highlights the service value of FGC. Financing guarantee companies are professional service organizations providing credit rating, credit enhancement and certification services, etc. Taking the principle of zero loss as the core, it is of great significance to establish and improve the service-oriented FGCs, financing guarantee system and financing guarantee business aiming at alleviating financing difficulties of SMEs and perfecting social credit system.

7.2 Research Prospects

Through thorough analysis, this paper argues that the credit enhancement business of FGC is a "pure service", and the principle of zero loss must be fully

implemented in its business operation process. Whether in the future the Chinese government still defines the financing guarantee as a profit-making business or redefines it as non-profit quasi-public service, the private FGCs that run the financing guarantee business should fully implement the zero-loss-principle. Understandably, the three-factor credit enhancement model summarized in this paper only proves some directions. The focus of future research is to build and improve the evaluation indicator system for each factor according to the actual needs of economic and social development, so as to make the indicator system compatible with big data technology and keep synchronous development.

Although the present study gives a preliminary evaluation framework, it can well explain the ups and downs of China's financing guarantee industry. Especially from the second half of 1995 to 2014, China's financing guarantee industry entered a stage of coexistence of growth and disorder. The main reason for the growth and disorder is that neither the government nor the FGC has clarified that the essence of financing guarantee is "pure service" rather than insurance business, and the principle of zero loss must be fully implemented in the course of business operation. As a result, after China's economy entered a new normal stage, the default rate and the compensation rate of FGCs increased sharply, and a large number of private FGCs went bankrupt or suspended business. So did the loan risk of commercial banks. Originally, the financing guarantee system aimed at dispersing risks, on the contrary it led to the accumulation of risks.

Since 2015, in the context of economic downturn and reduced export demand,

the survival pressure of SMEs has increased sharply, and the non-performing rate of bank loans has continued to rise. Under these conditions, FGCs are cautious about business development and take the initiative to reduce the loan guarantee scale for fear of sharp rise in compensation rates. According to the credit enhancement model, the equilibrium between supply of and demand for financing guarantee business is a circle, along which the principle of zero loss can be observed. Those enterprises that do not meet the requirements of credit enhancement model are excluded from the circle (financing guarantee supply screening mechanism), and those that fully meet the requirements of credit enhancement model but can also meet the loan conditions of credit institutions are inside the circle because they have no financing guarantee demand (financing guarantee demand screening mechanism). The equilibrium boundary between supply and demand of financing guarantee varies with the change in business cycle and has strong pro-cyclicality. Hence, the financing guarantee industry, like the credit industry, does not have counter-cyclical balancing mechanism.

Taking Guangdong Province as an example, according to the "*Development Report of Guangdong Credit Guarantee Industry 2015*", by the end of December 2014, 126 legal entities of FGCs (including 10 state-owned and state-owned holding guarantee institutions) had submitted data through the information reporting system of SMEs credit guarantee institutions. At the end of 2014, the total registered capital was 18.799 billion yuan. 116 FGCs, accounting for 92.06% of the provincial guarantee institutions, had registered capital of more than 100 million yuan. The

government finance or state-owned holding enterprises contributed 2.038 billion yuan, accounting for 10.84% of the total registered capital. The rest were invested by natural persons and private enterprises. In 2014, the operating income of FGCs was 1.198 billion yuan, down by 57.51% from the same period last year. In 2014, assets totaled 2.354 billion yuan, down by 50.94% from the same period last year; liabilities totaled 3.267 billion yuan, down by 64.56% from the same period last year; owner's equity 2.027 billion yuan, down by 47.71% from the same period last year.

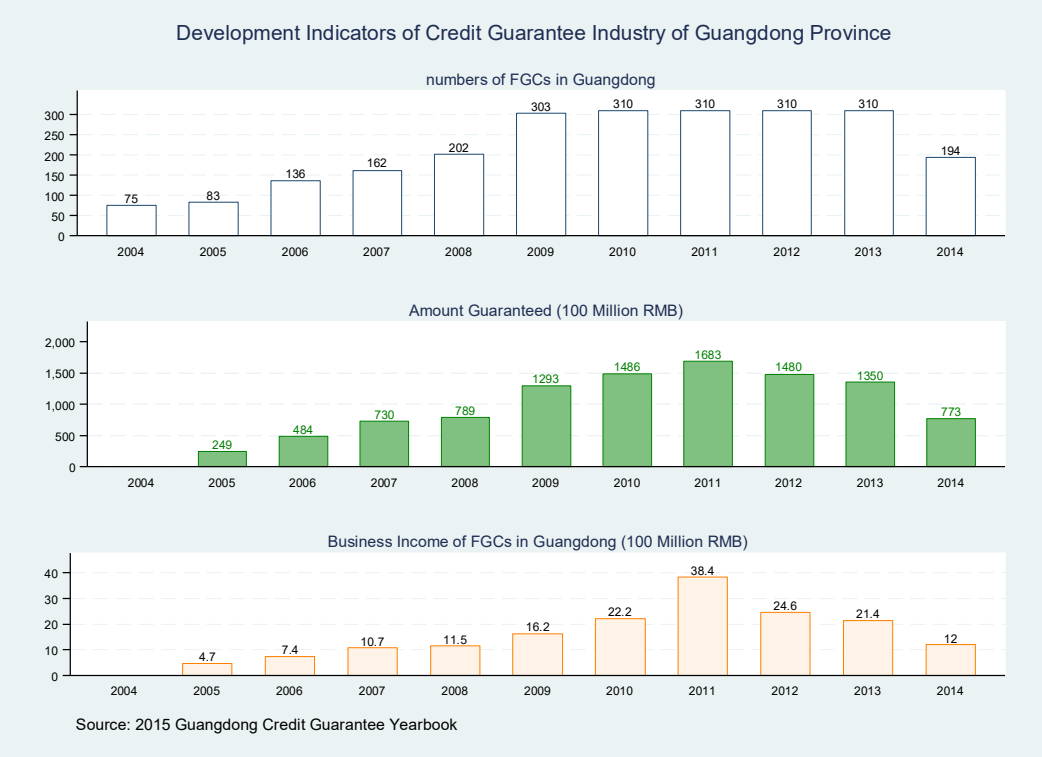

Figure 7-2 Main Economic Indicators of Financing Guarantee Industry in Guangdong Province, 2004-2014

As shown in Figure 7-2, from 2004 to 2014, Guangdong credit guarantee industry had experienced a rapid development stage and a sharp adjustment and modification stage. The number of FGCs increased from 75 in 2004 to 310 in 2010, increasing 3.1 times in six years, with an average annual growth rate of 26.7%.

However, by 2014, the number of FGCs decreased to 194, decreased by 37.4% from 2010. The amount guaranteed increased from 24.9 billion yuan in 2005 to 268.3 billion yuan in 2011, an increase of 98.8 times in six years, with an average annual growth rate of 48.6%, but it dropped to 77.3 billion yuan in 2014, a decrease of 71.2% compared with 2011. The revenue of guarantee business increased from 470 million yuan in 2005 to 3.84 billion yuan in 2011, which increased by 7.2 times in six years with an average annual growth rate of 41.9%, but it dropped to 1.2 billion yuan in 2014, 68.8% decrease compared with 2011.

Looking forward, with the zero-loss principle as the core, the three-factor credit enhancement model of FGC discussed in this paper needs to be further studied in the future. Besides the improvement of the three-factor indicators, more research space exists in the research, discussion and redefinition of the implications and content of credit enhancement service of FGC. Under the background of Internet plus, big data and service economy, it is of great significance and profound influence to further study and explore the industry boundary, business mode and empowerment technology of FGC credit enhancement service.

References

Ali, M. . (2013). Model of Lending Decisions on Small and Medium Enterprises: Case Study in the South of Sumatera. *Proceedings of the International Conference on Managing the Asian Century*. Springer Singapore.

Banerjee, A., Chandrasekhar, A. G., Duflo, E., & Jackson, M. O. (2013). The diffusion of microfinance. *Science, 341(6144)*, 363.

Barro, R. J. . (1976). The loan market, collateral, and rates of interest. *Journal of Money Credit & Banking*, *8(4)*, 439-456.

Beck, T., & Augusto, D. L. T. (2007). *The basic analytics of access to financial services. (Vol.16, pp.1-58(58))*. The World Bank.

Beck, T., Demirgüç-Kunt, A., Laeven, L., & Maksimovic, V. (2006). The determinants of financing obstacles. *Journal of International Money & Finance, 25(6)*, 932-952.

Berger, A. N. , & Udell, G. F. . (1990). Collateral, loan quality and bank risk. *Finance and Economics Discussion Series, 25(1)*, 21-42.

Berger, A. N., & Udell, G. F. (1998). Lines of credit and relationship lending in small firm finance. *Social Science Electronic Publishing, 63(2)*, 47-48.

Berger, A. N., & Udell, G. F. (2003). *Small Business and Debt Finance. Handbook of Entrepreneurship Research*.

Bester, H. (1985). Screening vs. rationing in credit markets with imperfect information. *American Economic Review, 75(4)*, 850-855.

Bester, H. (1987). The role of collateral in credit markets with imperfect information. *European Economic Review, 31(4)*, 887-899.

Black, F. , & Scholes, M. . (1973). The pricing of options and corporate liabilities. *Journal of Political Economy, 81(3)*, 637-654.

Boocock, G., & Shariff, M. N. M. (2005). Measuring the effectiveness of credit guarantee schemes evidence from malaysia. *International Small Business Journal, 23(4)*, 427-454.

Boot, A. W. A., & Greenbaum, S. I. (1993). Reputation and discretion in financial contracting. *American Economic Review, 83(5)*, 1165-1183.

Campello, M., & Chen, L. (2010). Are financial constraints priced? evidence from firm fundamentals and stock returns. *Journal of Money Credit & Banking, 42(6),* 1185–1198.

Cassar, G. (2004). The financing of business start-ups. *Journal of Business Venturing, 19(2)*, 261-283.

Chang, H. , Hall, C. M. , & Paz, M. . (2014). Customer concentration, cost structure, and performance. *Social Science Electronic Publishing.*

Chege, S. W. . (2010). The relationship between credit risk management practices and financial performance among microfinance institutions in Kenya. *University of Nairobi Kenya*.

Clementi, G. L., & Hopenhayn, H. A. (2006). A theory of financing constraints and firm dynamics. *Quarterly Journal of Economics, 121(1)*, 229-265.

Cowan, K., Drexler, A., & Álvaro Yañez. (2015). The effect of credit guarantees on credit availability and delinquency rates. *Journal of Banking & Finance, 59*, 98-110.

Diane, C. P. . (2013). Handbook of credit risk management. *Wiley & Sons*.

Duffee, G. R., & Zhou, C. (1999). Credit derivatives in banking: useful tools for managing risk? *Research Program in Finance Working Papers, 48(1)*, 25-54.

Gale, D. , & Hellwig, M. . (1985). Incentive-compatible debt contracts: the one-period problem. *Review of Economic Studies, 52(4)*, 647-663..

Gatuhu, R. N. (2013). The effect of credit management on the financial performance of microfinance institutions in kenya.

Gertler,M.,&Gilchrist, S. (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. *Quarterly Journal of Economics, 109(2)*, 309-340.

Green, A.,(2003), Credit guarantee schemes for small enterprises: aneffective instrument to promote private sector-led growth? *SME Technical Working Paper Series, No.10, UNIDO.*

Hellmann, T., Murdock, K., & Stiglitz, J. (1997). Financial restraint: towards a new paradigm. *Role of Government in East Asian Economic Development*, 163-208.

Hillier, B., & Ibrahimo, M. V. (1993). Asymmetric information and models of credit rationing. *Bulletin of Economic Research, 45(4)*, 271-304.

Howorth, C. A. (2001). Small firms' demand for finance. *International Small Business Journal.*

Hui, K. W. , Liang, C. , & Yeung, P. E. . (2018). The effect of major customer concentration on firm profitability: competitive or collaborative?. *Review of Accounting Studies*.

Kaun, R. B. D. E. . (1975). Marketing signaling: informational transfer in hiring and related screening processes.by a. michael spence. *Industrial and Labor Relations Review, 29(1)*, 143-144.

Kersten, R., Harms, J., Liket, K., & Maas, K. (2017). Small firms, large impact? a systematic review of the SME finance literature. *World Development.*

KPMG (1999) An evaluation of the small firms loan guarantee scheme. *London: DTI.*

Lacker, J. M. . (2001). Collateralized debt as the optimal contract. Review of *Economic Dynamics, 4(4)*, 842-859.

Leone, P., & Vento, G. A. (2012). Credit guarantee institutions and SME finance. *Palgrave Macmillan Studies in Banking & Financial Institutions*.

Levitsky, J. (2012). Credit guarantee schemes for SMEs- an international review. *Small Enterprise Development, 8(2)*, 4-17.

Merton, & Robert, C. . (1974). On the pricing of corporate debt: the risk structure of interest rates. *The Journal of Finance, 29(2)*, 449-470.

Michaelas, N., & Francis Chittenden and Panikkos Poutziouris. (1999). Financial policy and capital structure choice in U.K. SMEs: empirical evidence from company panel data. *Small Business Economics, 12(2)*, 113-130.

Michaelas, N., Chittenden, Francis, & Poutziouris, Panikkos. (1998). A model of capital structure decision making in small firms. *Journal of Small Business & Enterprise Development, 5(3)*, 246-260.

Nakamura, L. I. . (1993). Recent research in commercial banking, information and lending. *Working Papers, 2*.

OECD. (2006). The SME financing gap: theory and evidence. *Financial Market Trends, 2006(2)*, 89-97.

Oh, I., Lee, J. D., Heshmati, A., & Choi, G. G. (2009). Evaluation of credit guarantee policy using propensity score matching. *Small Business Economics, 33(3)*, 335-351.

Panayiota K.(2017) Modern credit risk management: theory and practice. *Macmillan Publishers Ltd.*

Peek, J., & Rosengren, E. S. (1997). Bank consolidation and small business lending: it's not just bank size that matters. *Working Papers, 22(6–8)*, 799-819.

Robert, C. . (1974). On the pricing of corporate debt: the risk structure of interest rates. *Journal of Finance, 29(2)*, 449-470.

Stiglitz, J. E. , & Weiss, A. . (1981). Credit rationing in markets with imperfect information. *American Economic Review, 71(3)*, 393-410.

Stiglitz, J. E., & Hoff, K. (1990). Introduction: imperfect information and rural credit markets-puzzles and policy perspectives. in “the symposium issue on imperfect information and rural credit markets.”. *World Bank Economic Review, 4(3)*, 235-250.

Stiglitz, J. E., & Weiss, A. (1986). Credit rationing and collateral. in: J. Edwards, J. Franks,C. Mayer and S. Schaefer, eds., "*Recent developments in corporate finance*" Cambridge:Cambridge University Press, (pp. 101-135).

Stiglitz, J. E., & Weiss, A. (1992). Asymmetric information in credit markets and its implications for macro-economics. *Oxford Economic Papers, 44(4)*, 694-724 .

Strahan, P. E., & Weston, J. P. (1998). Small business lending and the changing structure of the banking industry. *Journal of Banking & Finance, 22(6-8)*, 821-845.

Udell, G., Berger, A. N., Saunders, A., & Scalise, J. M. (1998). The effects of bank mergers and acquisitions on small business lending. *Journal of Financial Economics, 50(2)*, 187-229.

Uesugi, I., Sakai, K., & Yamashiro, G. M. (2010). The effectiveness of public credit guarantees in the Japanese loan market. *Journal of the Japanese & International Economies, 24(4)*, 457-480.

Wang Fei. (2014).Analysis of the relationship between product market competitiveness, ultimate controllers' nature and financing constraints. *Business Economic Research (15)*, 91-92.

Wette, & Hildegard, C. . (1983). Collateral in credit rationing in markets with imperfect information: note. *American Economic Review, 73(3)*, 442-445.

Williamson, S. D. (1986). Costly monitoring, financial intermediation, and equilibrium credit rationing. *Journal of Monetary Economics, 18(2)*, 159-179.

Winborg, J., & Landström, H. (1997). Financial bootstrapping in small businesses: examining small business managers' resource acquisition behaviors. *Journal of Business*

Venturing, 16(3), 235-254.

Zang Bo. (2012). Legal research on financing guarantee institutions in China. *(Doctoral dissertation, Wuhan University)*.

Yu, Z.Q.(2012). SMEs' financing guarantee mode under credit rationing: international comparison and choice of china. *Journal of Guizhou University of Finance & Economics*.

Zhou, C. (1998). Dynamic portfolio choice and asset pricing with differential information. *Journal of Economic Dynamics & Control, 22(7)*, 1027-1051.