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An Empirical Study on Factors Affecting the Credit Level of Small Micro-enterprises in China

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Abstract: This paper try to fully reveal the key factors affecting the credit level of small micro-enterprises form four features such as firm features, shareholder features, contract features and financial features by stepwise regression method. Innovation of this study is to construct credit evaluation model specially for small micro-enterprise which contained some important the financial indicators and non-financial indicators. The results show that the credit of small micro-enterprises has closely relationship with those four features. Those features of small micro-enterprises such as enterprises' size (net asset and sales), profitability (return on asset, return on net assets) and solvency (net cash flow to current liabilities) have significantly positive affect on its credit level. However, some features such as shareholders holding ratio, the proportions of major shareholders and mortgage-backed approach have significantly negative affect on its credit level.

Key words: Small micro-enterprise, credit level, factor

INTRODUCTION

Nowadays, the academic circle still has a quite vague idea of the definition of small micro-enterprises with various classifying criteria in different field practically. Based on the classifying criteria of the bank, this study defines enterprises with annual sales revenue and total assets below fifty million Yuan as the small micro-enterprise. From global perspective, the number of small micro-enterprises covers the main proportion of the total enterprise number in the world. But small micro-enterprises have been faced with the conflict between the macro-economic benefits and the micro-financing costs from the very beginning which can be seen from the following two aspects. Firstly, small micro-enterprises are irreplaceable in pushing economic development, increasing employment, advancing innovation, maintaining market competition activeness, protect the running of price mechanism, etc., Secondly, as the micro-subject, small micro-enterprises have continuous problem in surviving and development for the reason of financing difficulty. In China, the problem is more severe. One of the main cause is the fact that the credit level evaluation of the nation's major commercial banks aims mainly at large and medium-sized enterprises, thus there is lack of evaluation model and authorized strategy aiming at small micro-enterprises. Apart from this cause, what's more important is the inherent disadvantages of small micro-enterprises which can be shown in the following four aspects. Firstly, their founding age is short with small assets scale, lacking in mortgage resources and guarantee. Secondly, they usually attach themselves to large and medium-sized enterprises for business, thus are lacking in key competition and have developing risks. Thirdly, their inner management may have the disadvantages of imperfect internal governance, inadequate disclosure of information and the evocable information mismatch which results in the difficulty in getting bank's confidence. Fourthly, being the key and spirit figure of the enterprise, venture shareholders are generally enthusiastic and influential on enterprise' various links like production, management, decision-making, etc. But their attention to shareholder features is not enough when being evaluated by banks. The above reasons lead to the comparatively low level of small micro-enterprises' credit level and the lack of funds available. Meanwhile, the academic circle does not have enough attention to their disadvantages and short-comings in credit evaluation. The related scholars usually focus on credit loan risk research while ignoring general credit level evaluation research, focus on financial indicators while ignore non-financial indicators, focus on tangible assets while ignore intangible business, focus on their own information in the table while ignore the information outside the table (such as shareholder features and contract features), focus on

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normative disclosure of corporate information while ignore the role of cooperative enterprise in easing information mismatch, etc. These theoretical research limitation limit the ability of financial organizations to establish the credit level evaluation model aiming at small micro-enterprises, practically leading to the lack of objective and scientific judgment to small micro-enterprises, lower overall line of credit and the lack of solution to financing problem. Therefore it is necessary, against the limits of previous theoretical studies, to recognize the effects of small micro-enterprises' financial and non-financial features on their credit level, to establish a more objective and scientific credit evaluation model for small micro-enterprises, thus instructing and improving banks' credit policy and credit ideas. All these are both practically and theoretically meaningful in solving the financing problems of small micro-enterprises.

Taking small micro-enterprises as the study subject, this study try to establish evaluation model through fully exploring factors affecting the Credit Level of small micro-enterprises. After summarization and classification of related researches home and abroad, on the basis of attaching importance to the financial features of the enterprises, this paper pays special efforts to introduce factors of shareholder features, enterprise features and contract features into the range of factors affecting the credit level and adopts various Logistic methods to establish credit-level evaluation model of small micro-enterprises for this empirical research. The suggestions are given after the research conclusion. The following structure of his study is arranged as: Literature review, empirical research and analysis and conclusion.

LITERATURE REVIEW

The foreign researches on enterprises' credit evaluation can be traced back to 1930s with Fitzpatrick, as the first person, made research on and analyze enterprises' bankruptcy in 1932. Afterwards, many scholars continuously do researches from different perspectives and with different methods and models, the results of which are both theoretically and practically rich. The research attention from scholars home and abroad is paid to enterprises' credit risk evaluation. However, because the obvious relationship between credit risk and credit level is that the higher the credit risk is, the lower the credit level, the factors affecting credit risk must have influence on the credit level.

After summarization and classification of the present research literature, generally speaking, the factors affecting enterprises' credit level can be classified into four groups: Financial features, enterprise features, shareholder features and loan contract features. Further explanation is provided in the following part.

Financial features and credit level of enterprises: Among various factors affecting enterprises' credit level, factors of financial features have always got the attention of scholars home and abroad, the related researches is quite mature and rich. The main reason is that financial index is the easiest to be quantified, has identified and specific standard and has the most direct influence; while other non-financial index is hard to be quantified without identified and specific standard and only have the indirect influence.

Since 1966, there are nearly 30 scholars had made researches on enterprise credit level in different ways and almost all of their research results think that there exists some relationship between enterprise financial features and credit level (Beaver, 1966; Altman, 1968; 1977; Ohlson, 1980; Shumway, 2001; Westgaard and Wijst, 2001).

In terms of running ability, some scholars demonstrate that enterprise default probability is obviously related to factors of the total asset turnover, current asset turnover, receivables turnover, inventory turnover, productivity and net income (Chan, 1999; Chan and Chan, 2001; Yu and Zhan, 2004; Zhang and Zhu, 2001; Wu and Lu, 2001).

In terms of profits-making ability, quite a few scholars(Beaver, 1966; Altman, 1968, 1977; Chan, 1999; Wu and Lu, 2001; Liu and Qin, 2006) had made researches to demonstrates that there exists obvious relationship among total return on assets, return on equity, return on sales, the main business profit margins, the standard deviation of stock returns, excess returns and enterprises' default condition.

In terms of debt-paying ability, the researches (Beaver, 1966; Altman, 1968, 1977; Ohlson, 1980; Chan, 1999) hold the following idea: on the one hand, the asset-liability ratio and debt ratio of tax income before depreciation are positively related to corporate credit risk; on the other hand, current ratio, quick ratio, EBIT/interest costs, cash flow debt ratio, the ratio of receivables net assets, equity market capitalization to total debt ratio, cash flow, debt ratio and equity ratio are negatively related to corporate credit risk.

In terms of developing ability, the research of Ohlson, 1980 show that revenue growth has positive effect on enterprise credit level. Some scholars think that the index, including growth rate of total assets, rate of capital accumulation, profit growth, asset growth, equity growth and the main business revenue, is related to the financial problems of enterprises (Zhang *et al*., 2008; Wu and Lu, 2001).

Enterprise features and enterprise credit level: Enterprise features are usually presented in features like enterprise scale, enterprise life, registered capital and category, etc. In 1977, scholars like Altman first include enterprise scale variable into credit evaluation model. After that, scholars home and abroad follow the steps to do researches with the results commonly showing that enterprise features (enterprise scale, enterprise life, register assets and industry classification, etc.,) have significant effect on enterprise credit. The most representative literature is contributed by the following scholars (1977; Merton, 1974; Wu and Lu, 2001; Westgaard and Wijst, 2001; Lv and Zhao, 2004; Ren and Yang, 2006).

In terms of sub-fields, related researches are limited, mainly because standard deviation and data of various nations' classification are difficult to get. Some scholars think that it is necessary to take both industry difference and the degree of policy supporting different industry into consideration when evaluating enterprise credit (Ren and Yang, 2006).

In terms of enterprise running life, scholars (Shumway, 2001) have done empirical researches to find that enterprise running life has negative effect on enterprise credit risk.

Shareholder features and enterprise credit level: Shareholder features usually include shareholders' working experience, personal credit, professional quality, etc. This paper, on this basis, adds features of shareholders' holding of the enterprise and risk-sharing to its debt (ie, guarantee or not, guarantee degree, joint and several liability or general liability). There are two main reasons for this. On the one hand, shareholders of small micro-enterprises are usually both the enterprise-owner and the runner and spirit of the enterprise, whose personal features influence greatly on enterprise' all links like producing, running and decision-making, etc. Therefore, we cannot evaluate the credit of small micro-enterprises without considering or measuring their shareholders' features. On the other hand, small micro-enterprises have their own disadvantages, such as comparatively small scale of assets, short time length of foundation, incomplete internal management system, unsystematically financial information and incomplete reveal of information, etc. These disadvantages lead to the failure of providing qualified guarantee for banks at finance-collecting, thus the Third Party Guarantee, with the major shareholder included, is needed. Therefore, compared with other types of enterprises, shareholder features of small micro-enterprises attaches greater importance to the production, management and even credit level of the enterprise. Xiao and Zhaodi (2008) think that small enterprise credit risk is, to some extend, related to the features of shareholders, especially pioneer major shareholders, thus factors like Third Party Guarantee should be taken into consideration in terms of their credit evaluation.

Drawn from the conclusion of the scholars mentioned above, shareholder features of small micro-enterprises are of greater importance to its credit level evaluation. When small micro-enterprises have mismatch in information for their own defects it is helpful to ease the degree of mismatch by introducing the Third Party Guarantee, so as to reach the aim of increasing the enterprise's credit. So when evaluating small micro-enterprises' credit level, the greatly positive effect of shareholder features on easing the degree of information mismatch and on increasing their credit has to taken into consideration. Therefore, on the basis of the present literature review of research conclusion, this paper further studies holding degree of shareholders of small micro-enterprises and debt-sharing risk features of shareholders (ie. guarantee or not, guarantee degree, joint responsibility and general responsibility).

Contract features and enterprise credit level: Enterprise credit contract usually contains finance structure, expiration date, set price, guarantee type and guarantee degree, etc. In recent years, there are continuous scholars studying the influence of loan contract features of enterprise on its credit level. Hamilton and Viscusi (1999) thinks that the adoption of contract guarantee is helpful in decreasing enterprise credit risk. Similarly, the researches of some scholars conclude that enterprise credit risk is closely related to the loan time limit and specific guarantee methods in the contract (Ren and Yang, 2006). The detailed arrangement in the contract not only can release the information mismatch degree in small micro-enterprises but also can decrease credit risk through increasing the penalty cost, thus the credit level is improved. Therefore, when evaluating the credit level of small micro-enterprises, the influence of credit contract information on their credit level should be considered and measured.

EMPIRICAL RESEARCH AND ANALYSIS

Sample and variables: With small micro-enterprises as the research subject, this study selects 450 small micro-enterprises as the research sample (Table 1) which, belonging to industry field and service industry field, are located in various areas of Guangdong Province, including the economically developed areas of the Pearl

Table 1: Distribution of the general sample

	2007		2008		2009		Total	
Credit level	No. of samples	Proportion (%)	No. of samples	Proportion (%)	No. of samples	Proportion (%)	No. of samples	Proportion (%)
AAA and AA+	40	8.89	28	6.22	25	5.56	93	6.89
AA	91	20.22	69	15.33	81	18.00	241	17.85
AA-	102	22.67	125	27.78	141	31.33	368	27.26
A+	101	22.44	139	30.89	106	23.56	346	25.63
A	70	15.56	59	13.11	71	15.78	200	14.81
Below A	46	10.22	30	6.67	26	5.78	102	7.56
Total	450	100.00	450	100.00	450	100.00	1350	100.00

Table 2: Model independent variables and their descriptive statistics

Final variables	Code	N	Minimum	Maximum	Average	Standard deviation
LN (Sales Revenue)	X_1	1350	0.000	16.780	9.372	1.909
LN (Net assets)	X_2	1350	0.000	7.524	5.994	1.586
Return rate on total assets	X_3	1350	-0.410	3.750	0.102	0.148
Ratio between net cash flow and flowing debt	X_4	1350	-45.320	314.440	0.509	11.484
Rate of capital accumulation	X_5	1350	-210.000	106.030	0.259	6.708
Return rate on net assets	X_6	1350	-8.900	38.180	0.164	1.135
Holding proportion of major shareholders	X_7	1350	0.030	3.000	0.760	0.253
LN (General assets)	X_8	1350	0.000	8.955	7.750	1.536
Guarantee ratio of shareholders	X_9	1350	0.000	1.000	0.163	0.352
Mortgage-based way of security	X_{10}	1350	0.000	3.000	0.073	0.269

River Delta, the economically secondary developed areas in eastern and western Guangdong and the economically developing areas in northern Guangdong. In terms of ownership of the enterprises, the sample contains both the small non-state-owned enterprises and the small state-owned enterprises; in terms of organization forms of enterprises, the sample contains both the joint-stock enterprises and non-joint-stock enterprises. Considering that fact that generally banks evaluate enterprise year credit level according to the related information in the previous year, the model in this paper takes the dependent variable data from the independent variable data of the previous year. That is, the independent variable data comes from the years from 2006 to 2008 while the dependent variable data comes from the years from 2007 to 2009. The credit level here is the recently popular twelve categories: AAA, AA+, AA, AA-, A+, A, A-, BBB+, BBB, BBB- and BB. Because sample enterprises rarely have the credit level of AAA or below A, the sample credit levels are classified, according to their distribution, into six levels: AA+ and above, AA, AA-, A+, A and below A. All the sample data in this paper come from some state-owned bank provincial branch with the sample distribution shown in the following Table 1. The soft used in this paper is chiefly SPSS17.0.

In terms of the independent variable X_i, in order to ensure that the research conclusion is representative and reliable, this paper adopts 35 alternative independent variable, covering the four aspects of enterprise features (industry field, located area, enterprise scale, enterprise life, enterprise ownership and enterprise form, etc), shareholder features (guarantee ratio of shareholders, shareholders holding ratio and shareholders experience), loan contract features (finance structure of the contract, guarantee features and the maximum financing period) and enterprise financial features (debt-paying ability, ability of making profits, running ability and developing ability, etc.,). In this way, the possible affecting factors, both financial and non-financial factors, on small enterprise credit level are measured quite comprehensively.

Since the variables of the model are quite many, Stepwise Regression is used to select the variables in the final model. The results are shown in the following Table 2 with 10 variables in the final model.

Empirical model: According to the above selection and analysis of model variables, the empirical model is as the following:

$$Yi = C + \sum_{j=1}^{10} b_j X_{i,j} + \varepsilon_i \quad (1)$$

In the equation, C refers the Constant, $b_{i,j}$ refers to various variables' Coefficients to be estimated and ε_i refers to the Error Term.

Empirical research result: The results after the regression analysis are shown as the following Table 3. From Table 3 above, all independent variables is significant in the reliable level of 1%; meanwhile, the Tolerance Value of all variables are obviously more than 0.1 and all the VIF values are less than 5. This shows that the co-linearity degree between the model variables is quite small.

Table 3: esults of Model Regression

	Non-standardized coefficient					Co-linearity statistic	
Independent variables	B	Standard error	Standardized coefficient	T statistic	Sig.	Tolerance	VIF
(Constant)	4.678***	0.286		16.376	0.000		
X_1	-0.190***	0.020	-0.272	-9.338	0.000	0.708	1.412
X_2	-0.191***	0.037	-0.228	-5.225	0.000	0.316	3.167
X_3	-1.471***	0.324	-0.164	-4.546	0.000	0.461	2.168
X_4	-0.010***	0.003	-0.083	-3.287	0.001	0.932	1.073
X_5	-0.019***	0.005	-0.094	3.665	0.000	0.911	1.098
X_6	-0.133***	0.041	-0.114	3.254	0.001	0.491	2.038
X_7	0.600***	0.130	0.114	4.615	0.000	0.978	1.022
X_8	0.152***	0.039	0.176	3.864	0.000	0.290	3.447
X_9	0.743***	0.109	0.196	6.831	0.000	0.726	1.377
X_{10}	0.552***	0.079	0.211	7.015	0.000	0.666	1.502
adj-R^2				0.045			
D-W				1.015			

Remarks: ***Represent the significance in the reliable level of 1%, Data source: collected and classified according to statistic result

In terms of enterprise features of small micro-enterprises, the sales revenue scale of enterprises and the net assets scale have obvious negative effect on their credit level which demonstrates that the larger the sales revenue scale and the net assets scale of small micro-enterprises are, the more beneficial it is in improving their general credit level. The general assets have significantly positive effect on the credit level of small micro-enterprises which demonstrates that the general assets don't have the function of improving the credit level but do decrease the credit level.

In terms of shareholder features, guarantee ratio of shareholders and the holding proportion of major shareholders have obvious positive effect on their credit level which demonstrates that the greater the guarantee ratio of shareholders and the higher the holding proportion of major shareholders are, the lower the credit level of the enterprise is.

In terms of contract guarantees feature, although the adoption of Mortgage or mortgage-based way of security may increase enterprises' contract-default costs and reduce the default risk to some extent it is unhelpful in increasing enterprises' general credit level but it may decrease the credit level.

According to the Standardized Coefficient of all independent variables, the improving effect on enterprise credit level can be ranked, in descending order, as the following: Sales Revenue, Net assets, Return rate on total assets, Return rate on net assets, Rate of capital accumulation, the ratio of cash flow and current liabilities; and the variables obviously decreasing the credit level are ranked as follows: Mortgage or mortgage-based way of security, guarantee ratio of shareholders, general assets and the major shareholders' holding.

CONCLUSION

Expanding the factors affecting the credit level of small micro-enterprises from the range of traditional financial features to non-financial ones, this study tries to fully explore factors affecting the general Credit Level of small micro-enterprises from four perspectives: Enterprise features, shareholder features, contract features and finance features. Results show that the credit level of small micro-enterprises is closely related with enterprise scale features, financial features and shareholder features. Therefore, when financial organizations evaluate the general credit level of small micro-enterprises, apart from the financial features, the non-financial ones should also be considered in the affecting factors. When making decision to authorize them, apart from the keen attention paid to assets scale, the effect of the specific guarantee way in the loan contract, the holding and guarantee proportion of shareholders and the contract features on credit evaluation cannot be ignored. Specifically, the greater the sales revenue scale and the net assets scale, the more helpful it is to improve its credit level; while the general assets scale is not beneficial at all. Their profits-making ability, debt-paying ability and developing ability can obviously improve their credit level and the key financial indicator is the growth rate of total assets, return rate of net assets and the rate of capital accumulation. Therefore, enterprises can increase their credit level by improving these indicators. In terms of non-financial factors, both the holding of the shareholders and shareholders' guarantee degree are non-beneficial in increasing the credit level of small micro-enterprises. As for solution to this, on the one hand, enterprises can improve, to some degree, their credit level by decreasing the share percentage of the major shareholder and introducing more external investors, fulfilling the diversification of shareholders. On the other hand, the general credit level can be increased by decreasing the union side warranty as well as increasing the guarantee proportion of the non-union side. In terms of contract features it is traditionally thought that mortgage guarantee can increase enterprises' default costs to decrease the

credit risk of enterprises which actually doesn't work as expected in increasing small micro-enterprises' credit level but significantly decrease their general credit level.

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