

**What Factors Affect Small and Medium-sized  
Enterprise's Ability to Borrow  
from Bank:  
Evidence from Chengdu City, Capital of  
South-Western China's Sichuan Province<sup>1</sup>**

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Paper No. 23, February 2006

Working Papers of the  
Business Institute Berlin at the  
Berlin School of Economics (FHW-Berlin)  
Badensche Str. 50-51, D-10825

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ISSN 1436 3151.

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<sup>1</sup> This paper is supported by the Scientific Research Fund of Southwestern University of Finance and Economics (SWUFE). And thanks for support of Chengdu SME Administration Bureau (CDSMEAB) and help from two directors of its financing & guarantee department, Zhenwei Zhong and Tianjun Ding

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## **Abstract**

There are many factors that affect SMEs' ability to borrow from bank. Based on facts and data about SMEs' financing in Chengdu city, capital of Southwestern China's Sichuan province, this paper is intended to investigate the factors affecting SMEs to borrow from bank by methods of empirical study. We find that whether SMEs can provide collateral or guarantee is a decisive factor, factors such as firm size, willingness to accept bank's clauses, close relationship with bank play an important role. But in contrast to intuition, correlation analysis and regression result shows that SMEs' financial variables such as income, net profit, asset-debt ratio and credit score is not obvious to affect their ability to get bank loan. Consistent with theory prediction and qualitative analysis, firm size is the most important factor to affect SMEs' ability to borrow from bank. The regression results reflect information asymmetry between SMEs and banks, and that banks had taken a simple way to protect themselves.

Key words: small and medium-sized enterprise (SME), ability to borrow, firm size, logit model, China's Sichuan Province

## 1. Introduction

Though SMEs play an important role in economic growth and employment creation, they are commonly constrained by finance. How to solve their financial constraint is a worldwide problem. Early in the 1930's, Senator Macmillan in his report to congress concerning SMEs' development pointed out that SMEs were distressed with finance gap. Much empirical study showed that SME were faced with not only equity gap but also debt gap. In China, SMEs are also suffering from finance gap, because SMEs' financing mainly rely on bank source, this paper will focus on the issues about SMEs' borrowing ability from bank.

The most important obstacle to get bank financing is information asymmetry between borrower and lender, e.g., the borrower has private information about the firm that lender doesn't have. For SMEs, because of their small size, short history, obscure accounting, etc, the extent of information asymmetry becomes more serious.

Is SMEs' information advantage sure to benefit them? The answer is no. Akerlof's lemons model (1970) concluded that ex ante information asymmetry would lead to adverse selection and failure in Pareto improvement. In lending market, there had existed the phenomena of credit rationing. De Meza and Webb (1992) defined credit rationing as "at certain level of interest rate, demand of loan exceeds supply." Bebczuk (2003) in his book displayed it in a comparatively simple way. Although credit rationing is far from being an efficient way to solve informational problems, it is handy to limit the risk by the lender. Credit rationing involves two kinds of situations: 1) among all the applicants of loan of bank, only a part of them get the loan, the other can't get loan even if they are willing to pay higher interest rate; 2) a person's borrowing demand can only partly be satisfied. According to neoclassical price theory, market price can automatically adjust to make demand of loan equal supply of loan, so credit rationing exists just as temporally, in the long run, credit rationing does not exist. In contrary to neoclassical price theory, Stiglitz and Weiss (1981) presented a formal model and proved that even without the government's interference, for adverse selection and moral hazard of borrower, credit rationing can exist as long-term equilibrium.

Now that credit rationing stems from asymmetric information, is there means to mitigate this problem? The answer is yes. On the standpoint of borrower, the key measure is to reduce degree of information asymmetry, specifically, conveying the intrinsic soundness of his

project and distinguishing him from riskier borrower. Those elements signaling SMEs' quality and alleviating informational problem undoubtedly become important factors affecting borrower's ability to borrowing from bank.

Then what are the factors? And what's the empirical inference? This paper is intended to answer these questions. Our conclusion is that all the collateral, internal funds, firm size, contractual clauses, relationship are factors to affect SMEs' ability to borrow from bank. But as far as SMEs in Chengdu city are concerned, collateral or guarantee is the decisive factor, firm size is the most important determinant to get bank loan, which is consistent with Petersen and Rajan's findings (1994). SMEs' financial variables such as income, net profit, asset-debt ratio is not obvious to affect their ability to get bank loan.

There are much literature dealing with financing of SMEs at home and abroad. But many of them including recent entrepreneurial finance conference papers (Bathala, Bowlin, Dukes, 2003; Ou, Haynes, 2003; Frydenberg, 2003; Comeau, Rhine, 2003; Neeley, 2003\*) mainly focused on source of capital, capital structure and similar topics, few of them investigate SMEs' ability to borrow from bank.

Different from them, this paper contributes to entrepreneurial finance literature in several dimensions. First, this paper summarize factors that affecting SMEs' ability to borrow from bank. Second, using unique data, by qualitative analysis and quantitative analysis, employing multiple regression and Logit model methods, explores specific parameter that affects SME's ability to acquire bank loan and finds that SMEs' asset size is the most important determinant to get bank loan. Third, SMEs in other cities or regions of Western China bears similarities of SMEs in Chengdu, so this paper provides a mirror of SMEs' financing situation in other neighbouring regions.

The remainder of this paper is organized as follows. Section 2 presents related theory and empirical hypothesis. Section 3 introduces data source and methodology, Section 4 presents analysis, Section 5 draws a conclusion and point out our future research direction.

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\* see entrepreneurial finance conference papers in year 2003 and 2004 on website <http://www.aofef.org>

## 2. Related theory and empirical hypotheses

In this section, we will overview related theory and explore factors that affect SMEs' ability to borrow from bank and propose a series of hypotheses prepared for next empirical study.

Obviously, the factors are those that can signal SMEs' quality to bank and reduce extent of information asymmetry, which in return benefit SMEs to acquire bank loan. In order to be effective a signal should be costly to all borrowers, but more importantly it should be prohibitively costly to the riskier borrowers. Based on information economics and capital structure theory, we put forward a simple model and five hypotheses.

### 2.1 The model

$$L = f(C, S, IF, CL, R) \quad (1)$$

$$\frac{\partial L}{\partial C} > 0, \frac{\partial L}{\partial S} > 0, \frac{\partial L}{\partial IF} > 0, \frac{\partial L}{\partial CL} > 0, \frac{\partial L}{\partial R} > 0$$

$$p = f(C, S, IF, CL, R) \quad (2)$$

$$\frac{\partial p}{\partial C} > 0, \frac{\partial p}{\partial S} > 0, \frac{\partial p}{\partial IF} > 0, \frac{\partial p}{\partial CL} > 0, \frac{\partial p}{\partial R} > 0$$

where L represents loan amount disbursed by bank, p represents the probability to get loan from bank. C represents collateral provided by SMEs, S represents firm size of SMEs, generally speaking, the larger the firm, the more collateral SMEs can provide, IF represents internal funds of SMEs, CL represents acceptance of contractual clauses between SMEs and bank, R represents SMEs' years of relationship with bank. That is, the bank loan that SMEs can get is an increasing function of its own collateral, size, internal funds, acceptance of contractual clauses, relationship. Also, the probability of SMEs' getting bank loan is an increasing function of its own collateral, size, internal funds, acceptance of contractual clauses, relationship.

### 2.2 Empirical hypotheses

Hypothesis 1 The more collateral SMEs can provide, the more bank loan SMEs can get

and by the higher probability SMEs get bank loan, that is,  $\frac{\partial L}{\partial C} > 0, \frac{\partial p}{\partial C} > 0$ .

Collateral is an asset of the borrower that is automatically transferred to the lender should the project revenues not be sufficient to repay the loan in full. As the collateral reduces the limited responsibility of the borrower in presence of unfavorable result, the borrower who provides collateral will be transmitting a signal concerning the quality of his project, declaring the probability of his project's success to be high. Specifically, collateral stands as a financing cost, which reduces the expected profit for bad quality borrowers and increases it for good quality borrowers.

Bebzuck (2003) in his book provided a simple proof that collateral can work as signal and convey information of firm's project quality. Booth and Chua (1995) studied a sample of 1,347 high-amount loans in the United States with an average value of US\$ 184 million, finding that 45% of them were guaranteed. Another paper by Berger and Udell (1990) shows that 70% of a large sample of loans, smaller than US\$ 50,000 was covered with collateral.

So we propose hypothesis 1 that the more collateral SMEs can provide, the more bank loan SMEs can get and by the higher probability SMEs get bank loan.

Hypothesis 2 The larger the sizes of SMEs, the more bank loan SMEs can get and by the higher probability SMEs get bank loan, that is,

$$\frac{\partial L}{\partial S} > 0, \frac{\partial p}{\partial S} > 0$$

Larger-sized enterprise, especially those with big proportion of tangible assets can provide more collateral as bank requires. Besides, large-sized firm involves large bankrupt cost and reputation cost when he fails to repay the loan.

Based on 3404 small companies in the United States, according to their book asset value, Petersen and Rajan (1994) classified them into six categories and found that only part of the sample firm get bank loan, but the percentage rises from 34% for the smallest size to 91% for the largest size.

So we propose hypothesis 2 that the larger the size of SMEs, the more bank loan SMEs can get and by the higher probability SMEs get bank loan.

Hypothesis 3 The more internal funds of SMEs, the more bank loan SMEs can get and

by the higher probability SMEs get bank loan, that is,  $\frac{\partial L}{\partial IF} > 0, \frac{\partial p}{\partial IF} > 0$

Internal funds carry an opportunity cost to the entrepreneur, as with collateral, by tying his fortune to that of the project, the borrower is expressing his confidence in the project and voluntarily giving up his limited responsibility in the case of a negative result. So internal funds is a signal that trustworthy borrowers can resort to distinguish themselves. Leland and Pyle (1977) developed a simple model, which showed that entrepreneur's equilibrium ownership share increases with firm quality and predicted a positive correlation between value and equity ownership of insiders.

Japelli and Pagano (1994) found that among sixteen OECD countries in no country do banks lend 100% of the property value, with loan/property ratio fluctuating between a minimum of 50% (Turkey and Greece) and a maximum of 95% (Denmark).

So we propose hypothesis 2 that the more internal funds of SMEs, the more bank loan SMEs can get and by the higher probability SMEs get bank loan.

Hypothesis 4 The more willing to accept the clauses bank put forward SMEs are, the more bank loan SMEs can get and by the higher probability SMEs get bank loan, that is,

$$\frac{\partial L}{\partial CL} > 0, \frac{\partial p}{\partial CL} > 0$$

Banks generally put forward a series of clauses that protect his right. The acceptance of these clauses is a positive signal to bank and result in more bank loan and smaller interest rate for the borrower. Ross, Westfield and Jaffe (1996) cite evidence revealing that 91% of public debt issues in the United States include the prohibition of using additional debt, 39% of realizing mergers and 36% of selling shares.

So we propose hypothesis 4 that the more willing to accept the clauses bank put forward SMEs are, the more bank loan SMEs can get and by the higher probability SMEs get bank loan.

Hypothesis 5 The closer the SMEs' relationship with bank is, the more bank loan SMEs

can get and by the higher probability SMEs get bank loan, that is,  $\frac{\partial L}{\partial R} > 0, \frac{\partial p}{\partial R} > 0$

An increasingly large body of research looks into advantage of relationship between firms and providers of capital in facilitating access to funds (Diamond, 1989; Boot and Thakor, 1994; Uzzi, 1999; Scholtens, 1999; Cole, 1998; Berger and Udell, 1995; Petersen and Rajan, 1994; Fama, 1995). In general, a long-term relationship with a formal financial intermediary is expected to lower the costs of financing because that it decreases the cost of monitoring, opens the possibility for greater contact compliance and gives the financier more control over potential moral hazard problems.

So we propose hypothesis 5 that the closer the SMEs' relationship with bank is, the more bank loan SMEs can get and by the higher probability SMEs get bank loan.

### 3. Data and Methodology

In this section, we will introduce the data resource and methods of analyses.

#### 3.1 Data source

The dataset is kept by CDSMEAB (Chengdu SME Administration Bureau), dealing with financing status about key SMEs in Chengdu city and surrounding counties, covering 10 administration districts and neighbouring 10 counties. Date range from 2003 to 2004.

Because the dataset doesn't include all the SMEs in Chengdu city, we treat it as sample. Besides, the interval of time is short, things did not change a lot, so we think of it as cross-sectional data, not panel data.

The database provides the following contents of each SME: 1) enterprise name, 2) enterprise address, 3) legal person and its telephone, 4) operating scope and main products, 5) total assets, 6) asset-debt ration, 7) major operating income, 8) increased amount of major operating income compared to last year, 9) tax amount, 10) net profit, 11) circulating days of working capital, 12) bank with whom SME open an account, 13) credit score, 14) balance of long-term loan, 15) balance of short-term loan, 16) plan of development and investment, 17)



loan gap, 18) the main obstacles to get bank loan you think, 19) what honor SMEs once winned, 20) CDSMEAB's recommending opinion.

To better understanding financing of SMEs, we interviewed 15 owners of SME, two directors of CDAMEAB's financing & guarantee department, five bank loan managers in charge of loan.

### **3.2 Sample bias issues**

Key SMEs refer to those SMEs who have grown to a certain size, earned considerable social fame and attracted attention of CDSMEAB, when they are asking for bank loan, CDSMEAB is ready to recommend them. So there exists potential sample selection issues, e.g, the sample is biased towards more successful SMEs.

Even if the bias exists, we don't think they are of much concern to our results because the sample reflects the main stream of SMEs in Chengdu city, in some results such as industry distribution and logit model there are may be bias, but as a whole, it can be largely representative of the overall SMEs in this region.

### **3.3 Methodology**

We plan to employ methods of qualitative analysis and quantitative analysis.

In qualitative analysis, we will describe SMEs' characteristics of business, financial gap and analyze how factors such as collateral, relationship affect SMEs' ability to borrow from bank.

In quantitative analysis, we will use SMEs' financial data and Eviews software, by multiple linear regression and logit model, to analyze how financial variables affect SMEs' amount availability and probability of bank loan.

In multiple regressions, we take loan that SMEs have gotten as dependent variable, SMEs' total asset, operating income, net profit, credit grade, asset-debt ratio as explanatory variables. The regression formula is as followings.

$$Loan_i = \alpha + \beta_1 \cdot Tasset_i + \beta_2 \cdot ADratio_i + \beta_3 \cdot Nprofit_i + \beta_4 \cdot Cgrade_i + \mu_i, i = 1, 2, \dots, n \quad (3)$$

here,

$loan_i$  represents specific total bank loan to SMEs, including long-term loan and short-term loan

$Tasset_i$  represents total asset of sample SMEs,

$ADratio_i$  represents asset-debt ration of sample SMEs,  $Adratio = \text{debt} / \text{total asset}$

$Nprofit_i$  represents net profit of sample SMEs

$Cgrade_i$  represent credit score of sample SMEs, which is assigned value from 0 to 27, see Table 9.

$\mu_i$ , random error term

The regression result must satisfy econometric test such as F-test, t-test and DW-test and economic test, otherwise adjust the equation or explanatory variable till it satisfies all the test.

In logit model, we take  $y$  as dependent variable,  $y$  implies whether the SME have gotten loan, if the SME got loan,  $y=1$ , otherwise  $y=0$ , other variables such as SMEs' total asset, operating income, net profit, credit grade, asset-debt ratio work as explanatory variables. The regression formula is as followings.

$$y_i = \alpha + \beta_1 \cdot Tasset_i + \beta_2 \cdot ADratio_i + \beta_3 \cdot Nprofit_i + \beta_4 \cdot Cgrade_i + \mu_i, i = 1, 2, \dots, n \quad (4)$$

here,

$y_i = 1, 0$  when SOE is loaned,  $y_i = 1$ , otherwise  $y_i = 0$

$Tasset_i$  represents total asset of sample SMEs,

$ADratio_i$  represents asset-debt ration of sample SMEs,  $Adratio = \text{debt} / \text{total asset}$

$Nprofit_i$  represents net profit of sample SMEs

$Cgrade_i$  represent credit score of sample SMEs, which is assigned value from 0 to 27, see Table 9.

$\mu_i$ , random error

According to the result, we conduct z-test and Hosmer-Lemeshow goodness of fit test, only when all the tests are satisfied can a conclusion be drawn.

## 4. Statistical results and analysis

In this section, we will present statistical results and testify the above hypotheses, analyzing the factors that affect SMEs' ability to borrow from banks.

### 4.1 Descriptive statistics

Industry distribution. Table 1 shows that SMEs cover a wide range of business, respectively distributed in industry of construction/manufacturing/industrial, agriculture, service and others, accounting for 68.7%, 9.9%, 20.2%, 1.12% of the sample, among which construction/manufacturing/industrial sector dominates other sectors.

Table 1  
Characteristics of business

| Industry                              | Observation | Percentage (%) |
|---------------------------------------|-------------|----------------|
| Construction/manufacture/industrial   | 235         | 68.7           |
| Chemical                              | 20          | 5.8            |
| Electronic device /optical instrument | 36          | 10.5           |
| Pharmacy                              | 14          | 4.1            |
| Metal material processing             | 16          | 4.7            |
| Non-metal special material processing | 7           | 2.0            |
| Special instrument/equipment          | 32          | 9.4            |
| Machinery products/equipment          | 31          | 9.1            |
| Automobile/machinery parts            | 30          | 8.7            |
| IT products                           | 23          | 6.7            |
| Clothe/shoes                          | 16          | 4.7            |
| Food processing                       | 10          | 2.9            |
| Agriculture                           | 34          | 9.9            |
| Agriculture production materials      | 33          | 9.6            |
| breeding                              | 1           | 0.3            |
| Services                              | 69          | 20.2           |
| Package/printing                      | 21          | 6.1            |
| Utilities                             | 33          | 9.6            |
| Real estate                           | 10          | 2.9            |
| Mortgage/investment                   | 2           | 0.6            |
| Hospital                              | 1           | 0.3            |
| Retail                                | 2           | 0.6            |
| Others                                | 4           | 1.12           |
| Total                                 | 342         | 99.92          |

Note: the result was weighted to reflect sample stratification

Source: author's calculation based on the sample data.

Financial gap of SMEs. From Table 2, we can see that 129 of total sample 342 SMEs, 37.7% of total sample once got loan from bank, 213 of the sample, 62.2% of which have not yet gotten bank loan. Table 3 shows that in period of 2003-2004, those SMEs in Chengdu city who once got bank loan have gotten long-term bank loan of 582.70 million RMB yuan, short-term bank loan of 2107.22 million RMB yuan, total 2689.92 million RMB yuan, even so there's still bank loan shortage of 719.44 million for them. The bank loan demand of SMEs who did not get loan is 3672.97 million yuan. The overall financial gap of the sample SMEs is 4482.41 million yuan, 13.1 million yuan for each SME on average.

Table 2  
Percentage of SMEs who once got or did not get loan from bank

|   | observation | Percentage (%) |
|---|-------------|----------------|
| SMEs who have gotten loan from bank         | 129         | 37.7           |
| SMEs who have not yet gotten loan from bank | 213         | 62.2           |
| Total                                       | 342         | 99.9           |

Note: the result was weighted to reflect sample financial gap  
Source: author's calculation based on the sample data.

Table 3  
Loan in demand

|                              | Balance of long – term loan (million RMB yuan) | Balance of short –term loan (million RMB yuan) | Loan in demand(million RMB yuan)(percentage of total demand) |
|------------------------------|--|--|--|
| SMEs who once got bank loan  | 582.70   | 2107.22  | 719.44 (21%)   |
| SMEs who did't get bank loan | 0  | 0  | 3672.97 (100%)   |
| Total                        | 582.70   | 2107.22  | 4482.41 (62%)  |

Note: the result was weighted to reflect sample financial gap  
Source: data comes from dataset author's summarization based on the sample data.

From these statistics, we can see that only small fraction (37.7%) of SMEs were financed by bank, To some SMEs, even though they have gotten loan from bank, but they are not insufficiently financed, only 79% of their bank request is satisfied. As a whole, only 38% of bank loan request is satisfied. They demonstrate characteristics of credit rationing. Then what are the reasons that result in that SMEs cannot or cannot sufficiently be financed by bank? What are the factors that affect SMEs' ability to borrow from bank?

## 4.2 Factors that affect SMEs' ability to borrow from bank

Collateral. Whether collateral or guarantee is provided when SMEs apply for bank loan is the decisive factor that affects their ability to get bank loan. Dataset shows that for the sample SMEs, their first bank loans are all guaranteed.

When asked what are the reasons that lead to their difficulty in borrowing from bank, the owners of SMEs answer the question as they think right. The answers are included in the dataset, we collect 267 valid answers displayed in Table 4.

Table 4  
Reasons explaining SMEs' difficulty in getting bank loan

| Reasons   | Votes | Percentage (%) |
|---|-------|----------------|
| Limit of credit line quarto by higher bank                    | 14    | 5.2            |
| No collateral/no mortgage/insufficient collateral or mortgage | 183   | 68.5           |
| New venture   | 20    | 7.5            |
| Small firm size, low awareness                                | 22    | 8.2            |
| No loan quarto to SME by higher bank                          | 13    | 4.9            |
| Profit is not good enough                                     | 4     | 1.5            |
| Ownership of private firm                                     | 3     | 1.1            |
| Immigrate from other places                                   | 2     | 0.7            |
| others  | 6     | 2.2            |
| Total   | 267   | 99.9           |

Note: the result was weighted to reflect factors that affect availability of bank loan

Source: data comes from dataset author's summarization based on the sample data

Table 4 shows there are nine reasons that contribute to SMEs' obstacle to borrow from bank. Among various reasons we can see that no collateral/no guarantee/insufficient collateral or guarantee account for 68.5% of all the votes, which constitutes the most important reason, other reasons such as new venture, small firm size and low awareness, limit of credit line quarto by higher bank, no loan quarto to SME by higher bank, also lead to SMEs' difficulty in borrowing from bank.

Table 4 indicates that owners of SMEs attribute the main reason of unavailability of bank loan to no collateral and guarantee or insufficient collateral and guarantee.

In practice banks only accept stringent collateral such as certificate of land right of use and real estate, which makes SMEs' availability of bank loan more difficult.

Firm size. Firm size constitutes another important factor that affect SMEs' ability to get bank loan. Table 4 shows firm size account for 8.2% of the votes explaining reasons of difficulty in getting bank loan. Later we will proceed to analyze how firm size affect SMEs' ability to get bank loan and find that firm size has a positive relationship with its availability of bank loan.

Internal funds. Sample SMEs have an average asset-debt ratio of 45.5%, Table 6 shows that asset-debt ratio has correlation coefficient of 0.21 with bank loan, smaller than total asset with loan. Importance of internal funds is not reflected in Table 4. Surprisingly, In contrast to empirical hypothesis, along with the following regression analysis, Internal funds in this sample seems that it doesn't play a significant role in obtaining bank loan.

Relationship with bank. From the dataset, we find that all the sample SMEs who had got bank loan from the bank with whom they open an account, none of them cross open-account bank to get bank loan. Furthermore, Table 6 shows that reason of new venture account for 7.5% of the votes explaining reasons of difficulty to get bank loan and reason of immigrate from other places account for 0.7%. These facts imply that relationship with bank is important.

Other factors. Other factor such as whether SMEs are willing to accepted contractual clauses put forward by bank is also important factor that affects their ability to borrow from bank. We interviewed fifteen owners of SMEs, they think acceptance of bank's clauses is important element to get bank loan. Five of them had accepted the clauses, the other expressed their willingness to accepted it.

Factors such as profit is not good enough, ownership of private firm, limit of credit line quarto by higher bank, no loan quarto to SME by higher bank are also reflected in Table 4, but both of them are not dominant. "limit of credit line quarto by higher bank, no loan quarto to SME by higher bank" reflect problems of financial system, which is beyond our discussion scope.

## 4.2 Regression results

Table 6 implies that total loan have strong relationship with SMEs' total asset and weak relationship with asset-debt ratio, income, net profit, to our surprise, have weakest relationship with credit score. It indicates that loan is mostly determined by total asset.

Now we begin to determine the regression equation. Because correlation analysis shows the independent variable such as total asset, income, net profit might have positive correlation coefficient, we worry about multicollinearity. The multiple regression result shows that coefficient of income, net profit, asset-debt ratio can't satisfy t-test at significance level of 5%, so we drop explanatory variable of income, net profit, asset-debt ratio from the original regression equation. Equation (3) is adjusted as equation (5):

$$Loan_i = \beta_1 \cdot Tasset_i + \beta_4 \cdot Cgrade_i + \mu_i, i = 1, 2, \dots, n \quad (5)$$

And the main regression result is displayed in panel A of table 7,

$$That\ is, \quad Loan = 0.35 \cdot Tasset - 20.04 \cdot Cgrade \quad (6)$$

But credit score has negative coefficient, not being in line of economic meaning, so further drop term of credit score, the ultimate equation is

$$Loan_i = \alpha + \beta_1 \cdot Tasset_i + \mu_i, i = 1, 2, \dots, n \quad (7)$$

And its main regression parameter is displayed in panel B of table 7

$$That\ is \quad Loan = -455.32 + 0.35 \cdot Tasset \quad (8)$$

Equation (8) means that SMEs' total loan is mostly determined by their own total assets. The larger the size, the more loan they will be able to get from the bank.

In the Logit model, we find similar results as multiple regression, select a valid sample of 245, we get its regression result displayed in Table 8, and the equation is

$$y^* = -0.5143 + 0.000185 \cdot Tasset \quad (9)$$

Equation (9) indicates that an increase of SMEs' assets leads to an increase in their probability of getting a bank loan.

### 4.3 Interpretation of regression results

OLs regression and Logit model shows that SMEs' bank loan and their probability of getting bank loan only have a positive relationship with their total asset in the context of statistics at the significant level of 5%. It can be interpreted that larger-sized SMEs are more capable of providing collateral as bank required, which leads to their being easier to obtain bank loan. As to why banks produce information and explore other factors to provide bank loan, theory concerning relationship between bank organization and market structure may be involved (Berger, Miller, Petersen, Rajan, 2001; Berger and Udell, 2002), which is beyond discussion here.

In a word, the regression results reflect information asymmetry between SMEs and banks, and banks had taken a simple way to protect themselves.

## 5. Conclusion

There are many reasons that lead to SME's difficulty in borrowing from bank. Extant theories imply that collateral, firm size, internal funds, willingness to accept bank's clauses, close relationship with bank have positive effect on SMEs' ability to get bank loan. As far as SMEs in Chengdu city are concerned, our empirical study finds that whether SMEs can provide collateral or guarantee is a decisive factor, factors such as firm size, willingness to accept bank's clauses, close relationship with bank play an important role. But in contrast to intuition, correlation analysis and regression result shows that SMEs' financial variables such as income, net profit, asset-debt ratio, credit score is not obvious to affect their ability to get bank loan. Consistent with theory prediction and qualitative analysis, firm size is the most important factor to affect SMEs' ability to borrow from bank.

The result is disappointed and it proved the existence of information problems and banks had taken a simple way to protect themselves. Most of SMEs are in growth phrase, with small or medium size, by themselves can not provide sufficient and qualified collateral for bank loan, so it's natural that many SMEs' bank application will be refused.



In order to improve SMEs' ability to borrow from bank, building mechanism to reduce information must be considered, the mechanism concerns factors outside of SMEs including multi-level bank system, guarantee and venture capital industry, etc. There is considerable amount of literature dealing with relationship between SMEs' financing and development of multi-level bank system, guarantee agency, venture capital. The literature argue that multi-level bank system, developed guarantee and venture capital industry benefit SMEs to get loan bank.

In fact, large enterprise-oriented bank systems (see Table 5), undeveloped guarantee and venture capital industry in Chengdu city constitute important external factors that owe a lot to SMEs' inability to get bank loan. How the external factors affect SMEs' ability to get bank loan is our future research object.

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Table 5  
Bank's market share in Chengdu in October of 2004

|  | Deposit market share | loan market share |
|--|----------------------|-------------------|
| Chengdu Branch of State-own sole proprietorship bank | 63.6%                | 66.5%             |
| Nationwide share-holding bank Chengdu Branch         | 19.2%                | 19.5%             |
| Local commercial bank                                | 4.8%                 | 4.4%              |
| Rural credit union                                   | 7.3%                 | 6.7%              |
| Total  | 94.9%                | 96.8%             |

Note: the result was weighted to reflect large-oriented bank system in Chengdu city  
Source: data comes from bulletin board of Sichuan Branch of central bank of China, author's summarization based on the bulletin data.

Table 6  
Correlation statistics

|      | Total asset | ADratio | Income | Credit score | Net profit |
|------|-------------|---------|--------|--------------|------------|
| loan | 0.78        | 0.21    | 0.29   | 0.058        | 0.27       |

Note: the result was correlation between loan and some SMEs' financial indicator  
Source: original data comes from dataset and Correlation statistics come from Eviews software.

Table 7  
Determinants of availability of SMEs' bank loan

---

Panel A

|                             |        |             |             |         |
|-----------------------------|--------|-------------|-------------|---------|
| Number of observations      | 82     |             |             |         |
| Variable                    |        | Coefficient | t-Statistic | p-value |
| TASSET                      |        | 0.35        | 11.19526    | 0.0000  |
| CGRADE                      |        | -20.04      | -2.279703   | 0.0253  |
| R2                          | 0.6117 |             |             |         |
| Adjusted R2                 | 0.6068 |             |             |         |
| Significant at the 5% level |        |             |             |         |

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Panel B

|                             |        |             |             |         |
|-----------------------------|--------|-------------|-------------|---------|
| Number of observations      | 82     |             |             |         |
| Variable                    |        | Coefficient | t-Statistic | p-value |
| C                           |        | -455.32     | -2.22       | 0.0293  |
| TASSET                      |        | 0.35        | 11.20       | 0.0000  |
| R2                          | 0.6104 |             |             |         |
| Adjusted R2                 | 0.6056 |             |             |         |
| Significant at the 5% level |        |             |             |         |

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Notes: this table reports OLS regression results for determinants of SMEs' bank loan  
Source: data comes from dataset and author's calculation based on the data

Table 8  
Probability to get loan bank

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|               |                                     |             |         |
|---------------|-------------------------------------|-------------|---------|
| Obs.          | 245                                 |             |         |
| Variable      | Coefficient                         | z-Statistic | p-value |
| C             | -0.53143                            | -3.04       | 0.0023  |
| Tasset        | 0.000185                            | 3.49        | 0.0005  |
| H-L Statistic | 17.04 $\text{prob}(\chi^2(8))=0.03$ |             |         |

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Notes: this table reports Logit regression results for determinants of SMEs' bank loan  
Source: data comes from dataset and author's calculation based on the data

Table 9  
Assigned value of credit score

| sign | Assigned value | sign | Assigned value |
|------|----------------|------|----------------|
| AAA+ | 27             | B+   | 12             |
| AAA  | 26             | B    | 11             |
| AAA- | 25             | B-   | 10             |
| AA+  | 24             | CCC+ | 9              |
| AA   | 23             | CCC  | 8              |
| AA-  | 22             | CCC- | 7              |
| A+   | 21             | CC+  | 6              |
| A    | 20             | CC   | 5              |
| A-   | 19             | CC-  | 4              |
| BBB+ | 18             | C+   | 3              |
| BBB  | 17             | C    | 2              |
| BBB- | 16             | C-   | 1              |
| BB+  | 15             | D    | 0              |
| BB   | 14             |      |                |
| BB-  | 13             |      |                |

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