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Abstract. In this paper, from the perspective of the economic environment stability analysis of the risk investment to gen, small and medium enterprises financing constraints, the influence of the empirical results show that the participation of risk investment, stability of the economic environment can effectively relieve the small and medium-sized enterprise financing constraints, and the higher the risk investment holdings, companies face a lower degree of financing constraints. When the economic environment tends to be stable, the participation of venture capital can effectively alleviate corporate financing constraints.

Introduction

Financing constraints refer to the constraints faced by enterprises when they turn to external financing due to lack of their own funds due to asymmetric information and agency problems (Fazzari et al., 1988), which will inhibit or even hinder the investment behavior of enterprises and force them to give up those investment opportunities that will bring positive net present value and cause insufficient investment. China's small and medium-sized listed companies generally exist financing constraints, and the degree of serious. Financing constraints arise from the financing needs of enterprises themselves and will change dynamically with the change of external economic environment. Compared with large enterprises, small and medium-sized enterprise due to a single product and project, with high technical risk and market risk, coupled with not enough can mortgage assets, debt capital and equity capital in general are reluctant to invest in enterprises, led to much of its funding gap is difficult to get satisfaction, exogenous financing of the smes by the obvious limits (tan bo and Zhao Yue, 2012). Therefore, smes are eager to find fast and effective financing channels to alleviate their financing difficulties. The nature of venture capital is the pursuit of high risk and high return, which is considered by the public as an important way to broaden the financing constraints of high-risk smes.

Theoretical Basis and Research Hypothesis

Venture Capital (VC), originated in the United States, is translated as Venture Capital, mainly refers to a way of financing a start-up to provide financial support to obtain shares in a company. Venture capital is a new form of private equity investment. Venture capital has entered the public's attention because of the rapid development of China's economy after the reform and opening up. As early as 1998, Zhang xiaodi believed that the weakness of China's high-tech development lay in the low conversion rate of scientific and technological achievements, which could not be separated from the unsoundness of the financial market. Wang shuangzheng and Chen liwen (2003) pointed out that venture capital is the best way to solve the problem of "capital bottleneck", and demonstrated in detail the impact of venture capital on alleviating the financing constraints of enterprises, aiming at the major problems such as serious shortage of funds and unreasonable
financing structure in the process of high-tech innovation and industrialization in China. Li Cheng, CAI Dajian and Huang Shunxu (2009) studied the relationship between American venture capital and corporate financing constraints, and concluded that venture capital has an impact on economic development. Venture capital provides funding support for the industrialization of technological innovation, while the government establishes institutional guarantee for venture capital, further easing corporate financing constraints. Huang Fuguang et al. (2009) found through the data of listed companies on the small and medium-sized board in Shenzhen that financing constraints were common among small and medium-sized enterprises, and the introduction of venture capital eased the financing constraints of enterprises, but the effect was not significant. Hu Yongping (2016) found that there are significant financing constraints on r&d expenditure of gem listed companies, and venture capital can effectively alleviate the financing constraints on r&d expenditure. In addition, the higher the proportion of venture capital, the less the pressure of financing constraints faced by enterprises' r&d expenditure. Joint venture capital can also ease corporate financing constraints. Based on this, the following hypothesis is proposed:

Hypothesis 1: participation of venture capital can effectively alleviate financing constraints faced by enterprises.

Venture Capital, Economic Environment Stability and Financing Constraints

Economic environment improves the overall operating efficiency of economic environment by breaking the information asymmetry barrier continuously. The emerging economy carries on the process reorganization to the economic operation according to the new information flow, thus establishes the new economic operation mechanism. In this restructuring process produces a large number of new economic realities, phase separation, often with capital in view of the uncertainty of market opportunity, high-risk high-yield characteristics of risk investment just to satisfy the conditions, combined with small and medium-sized enterprise from financial institutions financing difficulties, risk investment to participate in the Nick of time, can significantly improve the level of corporate governance, reduce agency cost, and ease the financing constraints. Xu Rong (2015) used the financing constraint model proposed by Almeida (2004) to empirically analyze the widespread financing constraints of small and medium-sized enterprises in China, while financial development and venture capital can effectively reduce their financing constraints. Small and medium-sized enterprises with venture capital holdings face lower financing constraints than those without venture capital holdings. Wang Lei (2017) introduced the intermediary role of social capital, indicating that venture capital can indirectly relieve the financing constraints of invested enterprises through social capital. Hu Liufen (2018) studies show that there are significant differences between venture capital institutions with different characteristics in alleviating corporate financing constraints. However, the research results of Zhao Lijuan (2018) show that currently smes in China are still facing financing constraints, and the participation of venture capital has not significantly alleviated the financing constraints of smes. Based on this, the following hypothesis is proposed:

Hypothesis 2: when the economic environment tends to be stable, the participation of venture capital can effectively alleviate corporate financing constraints.

Data Sources

In this paper, the 2013-2017 data of small and medium-sized board and gem listed companies are taken as samples and screened based on the following criteria: (1) remove *ST and ST listed companies, (2) remove financial listed companies, (3) delete listed companies with negative net profit, and (4) remove listed companies with incomplete data. A total of 1335 companies and 6436 observed values were obtained. All financial data of the sample companies are obtained from Ruisi database.

Smes and gem enterprises have more significant constraints from debt financing. In this paper, the interest guarantee multiple is selected as the sample grouping index. In order to avoid the limitation brought by single pre-grouping index, the total assets are selected as the classification
standard of financing constraint degree. Particular way is: the sample each sample respectively by
the multiple of interest safeguard and the total assets as a group index, from big to small, in turn,
sorting, located in the top 33% of the sample value is defined as a low financing constraint group,
located in 33% of the sample is defined as a high financing constraint set, into two groups at the
same time, as the research object. With this method, 889 observed high financing constraints
(group= 1) and 1612 observed low financing constraints (group=0) are obtained.

This paper measures the degree of financing constraint from the four aspects of cash capacity,
profitability, solvency and growth capacity, and establishes the financing constraint index by
selecting the indicators of net cash flow and financial slack of operating activities, net interest rate
of sales, liquidity ratio and operating income growth rate.

Variable Definition

Explained variable: The dependent variable financing constraint FCI is shown in equation (1).

Explanatory variables: Whether the independent variable venture capital VC1 has venture capital,
if so, VC=1, if not, VC=0; VC2 venture capital shareholding ratio; Economic stability STAB USES
the least square method to calculate the sales revenue of the enterprise in the first five years; STAB*
VC2 venture capital shareholding ratio with stable economic environment.

Controllable variables include: Take logarithm of total assets of enterprise Size; Capital
expenditure ratio "cash paid for the purchase and construction of fixed assets, intangible assets and
other long-term assets" in the cash flow statement of Invest/total assets at the beginning. Dummy
variable Year, if the sample belongs to i Year, set 1; otherwise, set 0; Age of establishment of an
enterprise; Total asset turnover AT = sales revenue/total assets. Dummy variable of Industry. If the
sample belongs to Industry t, it takes 1; otherwise, it takes 0

Model Design

Reference to Hai-Qing Hu (2016) for the construction of financing constraints, such as to
discriminate the financing constraints into low financing constraints and high financing constraint
group as the research sample, selects the indexes, with significant difference in binary discrete
variable Y = \{0, low financing constraint set
1, high financing constraint set\} as dependent variable, the binary Logistic
regression, build the financing constraint index as shown in (1):

\[
FCI = \ln \frac{p(Y=1)}{p(Y=0)} = \alpha_0 + \alpha_1 CF + \alpha_2 SLACK + \alpha_3 ROS + \alpha_4 LB + \alpha_5 GROW
\] (1)

Where, FCI represents financing constraint index; CF is the net cash flow from operating
activities, expressed as the ratio of net cash flow from operating activities to total assets; SLACK is
the financial SLACK, ROS is the net profit rate of sales; LB is the flow ratio; GROW is the growth
rate of business income.

(1) Test the financing constraints of smes. This paper USES venture capital - financing constraint
index model to test whether the financing constraint of enterprises can be alleviated. See model (2) :

\[
FCI_{i,t} = \beta_0 + \beta_1 VC1_{i,t} + \beta_2 Size_{i,t} + \beta_3 Age_{i,t} + \beta_4 Invest_{i,t} + \beta_5 AT_{i,t} + \sum Year_{i,t} + \sum Industry_{i,t} + \epsilon_{i,t} \] (2)

In model (2), i represents the ith company and t represents the t fiscal year. The FCI index reflects
the degree of financing constraints faced by enterprises. When venture capital firms invest in
enterprises, the level of corporate financing constraints will be reduced. In the model, the front
coefficient of VC1t is significantly negative, that is, the participation of venture capital can
effectively alleviate the financing constraints of enterprises.

(2) Test the stability of economic environment, risk investment and financing constraints. In
model (3), add VC2t and STABt at the same time to test the influence of economic environment
stability and venture capital on corporate financing constraints, and introduce the cross product term
of the two to further test the influence of financing constraints.
\[ F_{Ci,t} = \beta_0 + \beta_1 VC_{2i,t} + \beta_2 STAB_{i,t} + \beta_3 VC_{2i,t} \times STAB_{i,t} + Size_{i,t} + \beta_4 Age_{i,t} + \beta_5 Invest_{i,t} + \beta_6 AT_{i,t} + \sum Year_{i,t} + \sum Industry_{i,t} + \varepsilon_{i,t} \]  

(3)

In model (3), if the coefficient in front of VC2_{i,t}*STAB_{i,t} is negative, it indicates that the participation of economic environment stability effectively reduces the financing constraints of enterprises.

**Empirical Results and Analysis**

**Descriptive Statistics**

The mean FCI of financing constraint index is -0.7868 and the standard deviation is 3.0313, indicating that enterprises are generally facing financing constraints. The maximum value of STAB for economic environment stability is 3.0847 and the minimum value is -7.0790, indicating a large gap in economic environment stability between enterprises. The average value of venture capital VC2 is 0.6370, indicating the low participation of venture capital. The maximum value of enterprise size is 25.979, and the minimum value is 17.9753, showing a small gap between them, but a large standard deviation, indicating a large gap between smes. The difference among enterprise age, capital expenditure and total assets turnover rate is large.

**Regression Analysis**

**Test the Financing Constraints of Smes.** In this paper, SPSS software is used for regression analysis, and model (2) is used to test the financing constraints of smes. The regression analysis results are shown in table 3. In the whole sample, the front coefficient of venture capital (VC1) is significantly negative, indicating that smes are faced with financing constraints, which proves that hypothesis 1 is valid. At the same time, it is also found that the size and age of enterprises are negatively correlated with the financing constraint (FCI), indicating that the larger the enterprise size and the longer the establishment age are, the smaller the financing constraint enterprises face, and the capital expenditure coefficient is significantly positive, indicating that the larger the capital expenditure is, the greater the financing constraint enterprises face.

<table>
<thead>
<tr>
<th>Model</th>
<th>Nonstandard coefficient</th>
<th>standard coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>(constant)</td>
<td>B</td>
<td>standard error</td>
</tr>
<tr>
<td>VC1</td>
<td>-1.170</td>
<td>.204</td>
</tr>
<tr>
<td>Size</td>
<td>-1.307</td>
<td>.039</td>
</tr>
<tr>
<td>Age</td>
<td>-.064</td>
<td>.009</td>
</tr>
<tr>
<td>Invest</td>
<td>1.457</td>
<td>.325</td>
</tr>
<tr>
<td>AT</td>
<td>.016</td>
<td>.001</td>
</tr>
</tbody>
</table>

**Test the Stability of Economic Environment, Risk Investment and Financing Constraints.** Model (3) is used to test whether the participation of venture capital can effectively alleviate corporate financing constraints when the economic environment tends to be stable. The regression results are shown in table 4. The results show that the stability of economic environment (STAB) coefficient is negative, the VC2 coefficient is negative, and the multiplicative coefficient between the shareholding ratio of venture capital and the stability of economic environment is negative, which proves the validity of hypothesis 4. When the economic environment is stable, the participation of venture capital can effectively relieve the financing constraints of enterprises.
Table 2. Economic Environment Stability, Risk Investment and Financing Constraints Test.

<table>
<thead>
<tr>
<th>Model</th>
<th>Nonstandard coefficient</th>
<th>standard coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard error</td>
</tr>
<tr>
<td>(constant)</td>
<td>19.183</td>
<td>.835</td>
</tr>
<tr>
<td>STAB</td>
<td>-.016</td>
<td>.034</td>
</tr>
<tr>
<td>VC2</td>
<td>-.539</td>
<td>.188</td>
</tr>
<tr>
<td>VC2*STAB</td>
<td>-.084</td>
<td>.052</td>
</tr>
<tr>
<td>Size</td>
<td>-.884</td>
<td>.037</td>
</tr>
<tr>
<td>Age</td>
<td>-.038</td>
<td>.008</td>
</tr>
<tr>
<td>Invest</td>
<td>1.168</td>
<td>.277</td>
</tr>
<tr>
<td>AT</td>
<td>1.460</td>
<td>.113</td>
</tr>
</tbody>
</table>

Conclusions

This paper empirically tested the financing constraints faced by smes in China by using 6,436 sample observation values of smes board and gem listed companies from 2013 to 2017. The results show that although the establishment of medium and small-sized enterprises and the entrepreneurship sector has greatly broadened the external financing channels for smes, the financing constraints faced by smes still exist. This paper further tests whether the participation of venture capital can effectively alleviate the financing constraints of enterprises. The results show that the participation of venture capital can help alleviate the financing constraints of smes, and the higher the shareholding ratio of venture capital, the lower the degree of financing constraints faced by enterprises. When the external economic environment tends to be stable and favorable, the financing constraints of enterprises will be reduced. Further test shows that, based on the stability of economic environment, the participation of venture capital can effectively reduce the financing constraints of enterprises.

In the future, the government should further guide and promote the stable development of the economic environment, establish a more fair and orderly financial market, create a fair and easy institutional environment for venture capital institutions, and guide the development and expansion of venture capital. The venture capital institutions themselves should also strengthen internal control and management, and improve their credibility. Only through the joint efforts of the national government and venture capital institutions can the healthy development of venture capital institutions be realized and the financing constraints of smes be effectively alleviated.

References