The Influence Mechanism of Over Investment on Corporate Credit Risk

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Abstract. This paper studies the influence mechanism of over investment on corporate credit risk, using the Chinese listed companies over the period from 2009 to 2014. The study found that over investment is positively related to the new added with-interest property debt rate, at the same time, over investment and the corporate credit risk is significantly positively correlated, the new added with-interest property debt rate have mediating effect between over investment and corporate credit risk.

Introduction

At present, the government has been aware of duplication, excessive investment (Yang, 2006) [1], and put forward a new strategy which relies on innovation as a new business growth point, but the managers did not wake up, in order to maximize their own interests as the starting point. The economic consequences of over investment, not only lead to decline in performance (Liu and Su, 2011; Zhan and Wang, 2013) [2-3], but also may increase the corporate credit risk. Credit risk occurs with the business activities, but managers pay more attention to performance or value of the firm, while ignoring the risk management and control (Jang etc., 2009) [4]. Many companies failed in business, not because of their poor operating performance, but lacking of risk prevention. The accumulation of credit risk will eventually lead to bankruptcy. Although some scholars have studied the impact of over investment on the corporate credit risk (Xu and Zhou, 2016) [5], the mechanism of action has not been deeply analyzed. This paper discusses the impact mechanism of over investment on the corporate credit risk, it can be a wake-up call for the managers, so that it attaches importance to the company's risk management and control.

Theoretical Analysis and Research Hypothesis

Serious economic consequences from over investment, which may affect performance and corporate risk. At present, over investment do great harm to firm value, which has been recognized by academic community (Zhan and Wang, 2013) [3]. The corporate credit risk has the characteristics of comprehensive, every business event is closely related to credit risk, the causes and enlargement of all risks of that listed companies will increasing corporate credit risk.

When over investment behavior occurs, the company mainly focus on the expansion of the company size, the progress of investment projects, and underestimate the potential risk of the project, which leads to ignore the risk. Over investment not only failed to create profit, cash flow, but erosion of the existing cash flow, it is likely to cause the enterprise capital chain rupture. Over investment behavior is often accompanied by the consumption of free cash flow (Taghavi etc., 2014) [6]. With the expansion of the scale of investment, the company's own cash is often unable to meet the needs of expansion. According to the pecking order theory, in the process of investing, managers will give priority to the use of own cash, and then carry out debt financing. Therefore, when over investment occurs, which usually accompanied by less own capital and more debt. Obviously, the enterprise's own cash flow is an important means to avoid credit risk, once the own cash dries up and interest-bearing liabilities increases, it means that the corporate credit risk has
gone up. The results of over investment projects have a negative cash flow, which will only exacerbate the expansion of credit risk. Based on the previous theoretical analysis, we put forward the following hypothesis 1:

Hypothesis 1: Over investment behavior will significantly increase the corporate credit risk.

The current academic research on over investment and debt financing, mainly focused on the governance effect of debt financing, generally, the liability is regarded as the dependent variable. Liabilities and over investment shape each other, in the higher degree of liability, the shareholders tend to invest projects with high-risk, resulting in over investment (Jensen and Meckling, 1976)[7]. Over investment cannot have boosted revenue, which are likely to show a loss and reduce the value of company. Over investment behavior not only cannot bring cash flow, but will consume the own cash. Especially, over investment behavior needs to rely on a large number of capital flows to maintain, the company's own funds often cannot meet the needs, in order to maintain and continue to expand the scale of investment, which need to external financing. According to pecking order theory, the company will give priority to the use of its own cash, followed by debt financing, and finally equity financing (Myers and Majluf, 1984)[8]. Because of its own funds cannot meet the need, it will further debt financing, the more serious the over investment, the more the debt financing scale, especially interest-bearing liabilities.

There is no doubt that, the company raise interest-bearing liabilities, if those companies are highly profitable and liquid, it can able to generate sufficient cash flow to repay the debt service, therefore, the corporate credit risk is relatively small. However, if the over investment behavior have not bright development prospect and relatively strong profitability, it cannot able to generate sufficient cash flow to repay the debt service, it will lead to the finances are in a critical state, the corporate credit risk would be pretty high. Because of over investment being that it has a situation with too high debt in the process of investing. This has reduced the profit ability of enterprises virtually, has weakened the competitiveness of enterprises. Because there is not enough cash flow to maintain the scale of invest, the corporation have to increase the debt. The corporation imposed enormous pressure on debt service, facing greater credit risk.

Hypothesis 2: Over investment behavior will increase the new added with-interest property debt rate.

Hypothesis 3: The new added with-interest property debt rate have mediating effect between over investment and corporate credit risk.

Research and Design

Data source

This paper uses 2009-2014 China's Shanghai and Shenzhen A-share listed companies as the initial sample data, and removes the following sample:(1)The financial listed companies, because the financial data of this kind of listing Corporation have larger differences with generally listed companies;(2)Taking into account the impact of IPO, In previous December 31, 2008 as the reference listed companies, excluding 2009 and its subsequent listing of the sample;(3)Key indicators for missing values of the sample;(4)The sample of index data exists extreme value, because the presence of extreme values may affect the robustness of the conclusions;(5)ST and *ST samples have been specially treated, due to these companies have a great risk of bankruptcy. In this paper, data from the CSMAR and RESSET database, statistical analysis was performed using Stata10.0 software.

Variable definitions

Overinvestment. In this paper, with reference to Richardson (2006) model to measure over-investment[9], this model suggests that enterprises exist the optimal investment scale. When the actual investment scale larger than the optimal size of the company, namely over-investment, and when the actual investment scale is smaller than the optimal size, that is, under-investment.

Corporate credit risk. There are a variety of measurement model of credit risk of foreign company, however, due to the truth that Chinese companies’ credit statistics are not perfect, in this
paper, we will use EDF model which developed by KMV company to measure the credit risk of listed companies in China.

The new added with-interest property debt rate. According to the corporate accounting standards, the interest-bearing liabilities including short-term borrowings, noncurrent liabilities due within one year, long-term loans and bonds payable. The new added with-interest property debt rate, it is equal to new added interest-bearing liabilities divided by the total assets of the initial period.

Control variables

Since the company's credit risk is not only affected by the internal control, but also affected by other factors, such as Tobin's Q, profitability, cash, financial leverage, the scale of the company, industry attributes and annual effect etc.

Measurement methods and model selection

To test hypothesis 1, 2 and 3, set up the following model to test:

\[ EDF_{it} = \alpha + \beta_1Overinv_{i,t-1} + \beta_1Control_{i,t-1} + \sum Industry + \sum Year + \epsilon \]  

\[ Ylev_{it} = \alpha + \beta_1Overinv_{i,t-1} + \beta_1Control_{i,t-1} + \sum Industry + \sum Year + \epsilon \]  

\[ EDF_{it} = \alpha + \beta_1Overinv_{i,t-1} + \beta_2Ylev_{i,t-1} + \beta_1Control_{i,t-1} + \sum Industry + \sum Year + \epsilon \]

Empirical Results

Table 1 lists the test results of over investment, the new added with-interest property debt rate and corporate credit risk. In the test process of model (1), the regression coefficient of over investment is significantly positive, which shows that the more serious over investment, the higher the corporate credit risk, it proves the correctness of the previous hypothesis 1.

In the test process of model (2), over investment is proportional to the new added with-interest property debt rate, and significant at the 1% level. It shows that the more serious over investment, the higher the new added with-interest property debt rate, which proves the correctness of the previous hypothesis 1. Further proof of hypothesis 3, compared to the model (1), in the test process of model (3), model (3) added a new variable, the regression coefficient of the new added with-interest property debt rate is significantly positive, indicating that the new added with-interest property debt rate have mediating effect between over investment and corporate credit risk. It proves the correctness of the previous hypothesis 3.

<table>
<thead>
<tr>
<th>Variable</th>
<th>EDF</th>
<th>Ylev</th>
<th>EDF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.3988*** (17.31)</td>
<td>-0.7210*** (-3.67)</td>
<td>0.3373*** (14.27)</td>
</tr>
<tr>
<td>Overinv_{t-1}</td>
<td>0.0106*** (2.64)</td>
<td>0.4408*** (12.76)</td>
<td>0.0009** (2.18)</td>
</tr>
<tr>
<td>Ylev_{t-1}</td>
<td>-0.0052*** (-5.36)</td>
<td>0.0287*** (3.73)</td>
<td>-0.0007* (-1.81)</td>
</tr>
<tr>
<td>Size_{t-1}</td>
<td>-0.0495*** (-5.04)</td>
<td>-0.1217 (-1.49)</td>
<td>-0.0043 (-1.44)</td>
</tr>
<tr>
<td>Cash_{t-1}</td>
<td>0.1112*** (16.73)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lev_{t-1}</td>
<td>-0.1061*** (-4.91)</td>
<td>-0.2297*** (-10.85)</td>
<td>-0.0020*** (-2.06)</td>
</tr>
<tr>
<td>ROA_{t-1}</td>
<td>-0.0018* (-1.93)</td>
<td></td>
<td></td>
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<tr>
<td>Tobinq_{t-1}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry/Year</td>
<td>Control</td>
<td>Control</td>
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<td>--------------</td>
<td>---------</td>
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<tr>
<td>Sample size</td>
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<td>4875</td>
<td>4875</td>
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<tr>
<td>F</td>
<td>83.62</td>
<td>11.29</td>
<td>66.54</td>
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<tr>
<td>Adjust-R²</td>
<td>0.3710</td>
<td>0.0655</td>
<td>0.3187</td>
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</table>

**Research Conclusion**

Investment is an important part of the companies' financial decisions, inefficient investment behavior has aroused public concern at home and abroad. At present, there are many studies on the causes of over investment and its economic consequences, few studies have been conducted on the influence mechanism of overinvestment on corporate credit risk. The study found that over investment is positively related to the new added with-interest property debt rate, at the same time, over investment and the corporate credit risk is significantly positively correlated, the new added with-interest property debt rate have mediating effect between over investment and corporate credit risk. There may be other intermediary variables, such as the performance, because of over investment reduce performance, which will increase the development risk of the company, it can be the further research direction in the future.

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**References**


