Study on the Relationship of Ownership Structure and Over-Investment of China's Listed Companies

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Abstract: Investment in the company's financial activities has been one of the most important subjects. With the complexity and multiplicity of factors which influence investment decision-making, investment decision-making behavior not always serve the goal of listed companies, which results in the inefficient investment especially over-investment. This paper selects the companies which listed in Shanghai and Shenzhen stock market as research sample from 2013 to 2017 year, by using the Richardson's (2006) residual model to measure the over-investment. Then three groups of multi regression analytical models have been built in three aspects which consist of the ownership concentration, the ultimate controller and the equity restriction to analyze the relationship between ownership structure and over-investment behavior. With empirical research, this paper has the following conclusions. The first majority shareholder's holding is significantly "U-shape" correlated with over-investment. Equity restriction has negative correlation with over-investment. Over-investment of state-holding listed company is more than the over-investment of non-state-holding, but is not significant.

1. Introduction

Investment, consumption and import-export are "three carriages" of economic growth. Investment is the main motivation of the company growth, which play an important position in the company's financial activities. Investment efficiency has a far-reaching impact on the company's value and future development prospects. However, as the amount of low efficient investments in Chinese listed companies increase dramatically, and their managers or controlling shareholder expropriate more private benefit through investment, some enterprises push money into non-main projects even low profit in order to make enterprise scale bigger. These investments are not likely to get the expected returns, and may even make the company more passive, affecting the original operation and causing over-investment upgrade.

Corporate governance has always been the focus of financial theoretical system in modern enterprises, which has an important impact on the efficiency of corporate investment. As the basic position of corporate governance structure, ownership structure determines governance structure and is bound to affect investment efficiency. Therefore, the meaning and value is self-evident of the research on relation between the company ownership structure and over-investment.

2. Hypotheses Development

The separation of ownership and operation right of modern enterprise causes the relation of trust and agency. It is easy to cause the conflict between management and shareholders due to the conflicts of interests. Managers will obtain more private benefit through investment, resulting in over-investment. In addition, the high supervision cost and low benefit reduce the enthusiasm of controlling shareholder. This also provides convenient conditions for managers. However, with the increasing of proportion of controlling shareholder shares, the controlling shareholders benefit from increased performance through supervision of the management. When the supervision benefits are

greater than the cost of supervision, the controlling shareholders will actively supervise the management and reduce the over-investment. But there is a new conflict of interest between major shareholders and minority shareholders when the shareholding ratio of controlling shareholders grows to certain scale, the major shareholders will extract the interests of small shareholders by diverting the public resources into their own pockets through over-investment and other concealed means. Therefore, over-investment will be intensified as the shareholding ratio of controlling shareholders increases. Accordingly, the following hypothesis is proposed:

H1: The first majority shareholder's holding is significant "U-shape" correlated with over-investment.

"Ultimate controller" was first proposed by La Porta et al. (1999) [1]. It can be divided into state holding and non-state holding in China's listed companies. The owners in state holding companies are often lack of supervision motivation to managers. And when the ultimate controller is the government, local governments will require their enterprises to achieve not only economic goals but also political and social goals such as improving employment rate [2]. It makes business investment more subject to the government's administrative intervention, which could exacerbate the over-investment. On the contrary, the majority of the controlling shareholders in non-state holding companies have stronger supervision with less administrative intervention. Based on the above analysis, hypothesis is proposed:

H2: Over-investment of state-holding listed company is more than the over-investment of non-state-holding.

Pagano and Roell(1988)[3]state that the tunneling behavior of major shareholders can be effectively restrained by the alliance and competition among shareholders. The exits of multiple large shareholders are effective in mitigating the expropriation problem. Bloch and Hege (2001) [4]show major shareholder will reduce the grabbing of private benefits of control in order to gain the support of other shareholders when ownership is unevenly distributed. Wanbo Ding (2014) [5] find the higher equity restriction ratio is the more it can restrain the excessive investment for the period of 2008-2012 with 1280 samples. This leads to hypothesis 3:

H3: Equity restriction has negative correlation with over-investment.

3. Methodology for Estimating of Over-investment

3.1. Sample & Date

Our sample covers the Chinese companies which are in Shanghai and Shenzhen stock market for the period of 2013 to 2017 year. The sample has 10644 observations after excluding date outliers and the finance firms. The data are extracted from CSMAR database.

3.2. Measuring Over-investment

We follow Richardson (2006) [6] to measure over-investment. The total investment I_{TOTAL} can be split into two components: one is investment expenditure to maintenance, $I_{MAINTENANCE}$, the other is investment expenditure to new projects, I_{NEW_t}. I_{NEW_t} consists of two parts: the expected investment expenditure in new positive NPV projects, $I^{*}_{NEW_t}$, and unexpected investments, $I^{\varepsilon}_{NEW_t}$, which can be negative (underinvestment) or positive (overinvestment).

$$I_{TOTAL} = I_{MAINTENANCE} + I_{NEW_t} \qquad (1)$$

$$I_{NEW_t} = I^{*}_{NEW_t} + I^{\varepsilon}_{NEW_t} \qquad (2)$$

I_{NEW_t} is determined by company's growth opportunities, cash ,size and other factors, so we establish the following model:

$$I_{NEW_t} = \alpha + \beta_1 Growth_{t-1} + \beta_2 Cash_{t-1} + \beta_3 Lev_{t-1} + \beta_4 \operatorname{Re} t_{t-1} + \beta_5 Size_{t-1}$$
$$+ \beta_6 I_{NEW_{t-1}} + \beta_7 Age + \sum Year + \sum Industry + \varepsilon \qquad (3)$$

In equation 3, $I^{\varepsilon}_{NEW_t}$ is the residual, when the residual greater than 0, investment expenditure is

positive (over-investment).

Variables are defined below:

I_{NEWt} is I_{TOTAL} subtract $I_{MAINTENANCE}$. The I_{TOTAL} is measured by cash paid for the purchase and construction of fixed assets, intangible assets and other long-term assets then subtract net cash recovered from disposal of fixed assets, intangible assets and other long-term assets. $I_{MAINTENANCE}$ is defined as depreciation and amortization expenses.

$Growth_{t-1}$ is Tobin's Q, defined as the ratio of the market value of assets to the current replacement cost of those assets for year t-1.

$Cash_{t-1}$ is the cash divided by total assets for year t-1.

Lev_{t-1} is defined as the total liabilities over total assets for year t-1.

Ret_{t-1} is the stock returns for the year prior to the firm's investment year in market value for year t-1.

$Size_{t-1}$ is measured by the logarithm of total assets.

Age is the years of firm listed on the stock exchange for year t-1.

Year, Industry are vector of indicator variables to capture annual and industry fixed effects respectively.

3.3. Empirical Test of Over-investment

The table 1 shows the model of inefficient investment is reasonable. When the residual error is greater than zero, it means the enterprise has over-investment, and when the residual error is less than zero, it means the investment is insufficient. As the paper studies over-investment, only the case of positive residual is considered. At last, 4392 samples of over-investment were obtained from 10644 total samples. About two-fifths of the China's listed companies existed excessive investment.

Table 1 The Results of Regression for Inefficient Investment.

Variables	Coefficient	t	Sig.	Tolerance	VIF
α	7.128***	11.540	0.000		
$Growth_{t-1}$	0.001***	5.432	0.000	0.588	1.699
$Cash_{t-1}$	0.028***	9.084	0.000	0.798	1.254
Lev_{t-1}	-0.009***	-4.000	0.000	0.580	1.724
Ret_{t-1}	0.002***	3.094	0.002	0.650	1.538
$Size_{t-1}$	0.002***	4.870	0.000	0.545	1.835
I_{NEWt-1}	0.383***	51.117	0.000	0.916	1.092
Age	-0.004***	-11.572	0.000	0.669	1.494
Year					
Industry					
Adj-R^2	0.276				
F	155.446***				
Durbin-Watson	1.983				
Observations	10644				

***,**,* significant at 1%, 5%, and 10% respectively.

4. Empirical Analysis of Shareholding Structure and Over-investment

4.1. Model Identification

The three groups of multi regression analytical models have been built in three aspects like the ownership concentration, the ultimate controller and the equity restriction to analyze the relationship between ownership structure and over-investment behavior.

$$OI = \alpha + \beta_1 TOP1 + \beta_2 TOP1^2 + \beta_3 Lev + \beta_4 FCF + \beta_5 Inder + \beta_6 Monisize$$
$$+ \beta_7 Age + \varepsilon \qquad (4)$$

$$OI = \alpha + \beta_1 State + \beta_2 Lev + \beta_3 FCF + \beta_4 Inder + \beta_5 Monisize$$
$$+ \beta_6 Age + \varepsilon \tag{5}$$

$$OI = \alpha + \beta_1 CN_{2-5} + \beta_2 Lev + \beta_3 FCF + \beta_4 Inder + \beta_5 Monisize$$
$$+ \beta_6 Age + \varepsilon \tag{6}$$

Where,

OI is over-investment; TOP1 is shareholding ratio of the largest shareholder; $TOP1^2$ is the square of shareholding ratio of the largest shareholder; State is coded "1" if a firm is state holding and "0" if non-state holding; CN_{2-5} is the sum of shareholding ratios of the second to fifth shareholder divided by the largest shareholder; Lev_t is defined as the total liabilities divided by total assets; FCF is free cash flow of firm; Inder is measured as the percentage of independent outside directors; Monisize is measured as the total number of supervisors; Age is the years of firm listed on the stock exchange.

4.2. Descriptive Statistics

Table 2 reports summary statistics for the sample. The minimum value of the over-investment is 0.0000, the maximum value is 0.3723 and the standard deviation is 0.0369.It indicates that there is a difference of over-investment between companies. In the explanatory variable, the mean value of TOP1 is 0.3450, and the maximum value is 0.8909, which indicates that "one shareholder overwhelms the others" still exists after the share-trading reform, The mean value of CN_{2-5} is 0.6861, which indicates that there are still other shareholders in China's listed companies besides the largest shareholder. In addition, approximately 39.66% of samples are state holding listed companies. It is obviously different from the past with high proportion of state-owned companies. To some extent, it is related to the reform of state-owned enterprises. Most of companies have been gradually opened to private capital except for important industries.

Table 2 The Description Analysis of Variables

	N	Minimum	Maximum	Mean	Std. dev.
OI	4392	0.0000	0.3723	0.0276	0.0369
TOP1	4392	0.0431	0.8909	0.3450	0.1473
CN_{2-5}	4392	0.0058	3.9226	0.6861	0.5906
State	4392	0.0000	1.0000	0.3966	0.4893
Lev_t	4392	0.0103	0.9865	0.4450	0.2042
FCF	4392	-0.8556	1.0259	-0.0077	0.1200
Inder	4392	0.2500	0.7500	0.3738	0.0553
Monisize	4392	1.0000	15.0000	3.5929	1.1161
Age	4392	3.0000	28.0000	11.8254	6.6540

4.3. Empirical Results

Regression 4 of table 3 present results regarding the impact of the largest shareholder on company's over-investment. Consistent with hypotheses 1, the result shows that the proportion of the first largest shareholder (TOP1) is negatively (at the 5% level in Eq. (4)) related to the over-investment, while the square of TOP1 has significantly positive impact on it. This finding supports H1 that the first majority shareholder's holding is significant "U-shape" correlated with over-investment. The result of regression 5 shows the relation between State and over-investment. Over-investment of state-holding listed company is more than the non-over-investment of state-holding, but it's not significant. Hypotheses 2 is not verified. To test H3, we add the variable of CN_{2-5} to study the study the relationship between equity restriction and over-investment in Eq. (6). The result shows that the variable is negative and significant (at the 10% level). Therefore, we obtain evidence that the balances of major shareholders can restrain over-investment. On the other hand, control variables such as free cash flow (FCF), the years of firm listed on the stock exchange (Age) are significant negatively related to the over-investment.

Table 3 The Results of Regression of Shareholding Structure and Over-Investment

Variables	Eq.(4)	Eq.(5)	Eq.(6)
α	0.030*** (5.755)	0.034*** (7.447)	0.035*** (7.550)
TOP1	-0.005** (-2.234)		
TOP1^2	0.012** (2.717)		
State		0.001 (1.052)	
CN$_{2-5}$			-0.002* (-1.924)
Lev	0.003 (0.955)	0.003 (0.983)	0.003 (1.013)
FCF	-0.038*** (-8.131)	-0.037*** (-8.000)	-0.034*** (-8.080)
Inder	0.001 (0.112)	0.002 (0.213)	0.002 (0.176)
Monisize	-0.001 (-1.048)	-0.001 (-1.122)	-0.001 (-0.910)
Age	-0.001*** (-5.829)	-0.001*** (-5.960)	-0.001*** (-6.138)
Adj-R^2	0.022	0.022	0.022
F	17.420***	17.431***	17.692***
Durbin-Watson	1.881	1.878	1.879
Observations	4392	4392	4392

***,**,* significant at 1%, 5%, and 10% respectively, t-values are in brackets.

5. Conclusions

The study of inefficient investment is always one of the active research studied by many scholars. The level of investment efficiency has a profound impact on the company's value and future development. We take the listed companies from 2013 to 2017 as the sample and study the relationship between ownership structure and over-investment. The results show that there is a u-shaped relationship between ownership concentration and over-investment. It can alleviate the agency conflict between the manager and the stockholders and restrain the over-investment with the increasing of proportion of the largest shareholder shares. However, when the shareholding ratio reaches to a certain level, there is a new conflict of interest between major shareholders and minority shareholders, which intensifies the over-investment. In addition, over-investment of state holding listed company is more than the non-state holding, but is not significant. Equity restriction ration has negative correlation with over-investment. According to the research results, this paper proposes to maintain an appropriate ownership concentration degree, reduce state-owned shares, develop institutional investors, to improve the ownership structure and reduce over-investment behavior which is in favor of sustainable development of listed companies.

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