Research on the Impact of Equity Concentration Degree on Investment Efficiency

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Abstract. This paper selects panel data of Shenzhen and Shanghai A-share listed companies from 2013 to 2018, and discusses the impact of company equity concentration on investment efficiency through multiple regression analysis. The results show that the more concentrated the equity, the lower investment efficiency; because when the interests of the largest shareholder are consistent with the company’s interests, the controlling shareholder has an incentive to strengthen the supervision of the investment behavior to inhibit the company’s over-investment, but overly cautious supervision leads to under investment.

Introduction

With the rapid economic development, enterprise either maintains or expands reproduction are inseparable from the investment, investment occupy a very important position in the enterprise economic activities. For an enterprise, investment efficiency directly affects the future development. High-efficiency investment can not only enhance the profitability, but also enhance the overall competitiveness of the enterprise. For society, efficient investment optimizes resource allocation and promotes the national economy. However, in practice, the study found that the phenomenon of domestic and foreign enterprises are inefficient investment, usually presents over-investment and under investment. Some companies ignore their ability to blindly invest in market hot spots, which leads to over-investment; some companies have good investment opportunities but give up due to their own funds and other reasons, resulting in insufficient investment. Inefficient investment will cause waste of social resources and damage the interests of shareholders and other stakeholders, Therefore, how to improve investment efficiency is an urgent problem to be solved in the theoretical and practical circles. Ownership concentration is one of the factors that affects the investment efficiency. A higher shareholding concentration may weaken the supervision behavior of small shareholders, causing large shareholders or managers to have too much power to make deviations from company goals for their own benefit short-term behavior, which affects the investment efficiency of the enterprise. So, what impact does equity concentration have on investment efficiency? This article analyzes the data of Shanghai and Shenzhen A-share listed companies from 2013 to 2018 to verify the relationship between equity concentration and listed companies' investment efficiency.

The more equity the controlling shareholder has, the stronger the control over the enterprise and the greater the impact on the company's investment decisions. Sepasi S[1](2016) summarized the changes in equity and governance structure during the development of the United Kingdom. the author believed that the reduction of equity concentration and the optimization of governance
structure will improve corporate accounting performance through studying the correlation between equity structure and corporate accounting performance. Tsui-Jung Lin\(^2\) (2017) believed that single-ownership companies tend to adopt a diversified ownership-holding model in the course of development and operation, which is a direct means of improving investment efficiency. Yao Fei\(^3\) (2016) studied the relationship between the equity structure of listed companies, the quality of accounting information and investment efficiency. The results show that the equity structure of listed companies in China has obvious Chinese characteristics, which has a huge impact on corporate governance and effective investment. The largest shareholder and the shareholding of the top ten shareholders has weakened the investment efficiency of listed companies. Yang Jiwei\(^4\) (2017) found that financial development, the shareholding ratio of the largest shareholder, the shareholding ratio of institutional investors and the shareholding ratio of the top five shareholders affect investment efficiency. Tian Guoshuang and Li Tong\(^5\) (2019) took China's A-share listed companies as samples and used regression analysis to compare the impact of different ownership structure on investment efficiency. The results of the study show that optimizing the shareholding structure can help improve the investment efficiency of enterprises, and reducing the proportion of state-owned shares can help improve the effectiveness of investment.

Combined with China's national conditions, the higher concentration of equity makes the company restricted to large shareholders in business decisions. The higher the shareholding ratio of shareholders, the greater the power they have, the more likely they are to "pull out" the enterprise through inappropriate investment behaviors such as over-investment or under-investment, reducing the company's investment efficiency. When the majority of the company's equity is concentrated in the hands of a few shareholders, the majority shareholder has the control of the company, and it has a strong influence on the company's investment decisions and management. The company's operations are based on the needs of shareholders. Large shareholders often formulate company development goals based on their own interests. When the concentration of equity is high, if the personal interests of the large shareholders are similar to the company's development interests, the large shareholders can effectively monitor the company's investment behavior to avoid excessive investment and other irrational investment. At the same time, due to the excessively strict supervision of the company by the major shareholders, the company has shrunk when making investment decisions and under-invested when additional project investment should be made. Based on the above analysis, this article proposes the following basic assumptions:

Hypothesis 1: The higher the concentration of equity, the lower the efficiency of corporate investment;

Hypothesis 2: When the major shareholders and the company's interests to reach agreement, ownership concentration negatively correlated with over-investment, positively correlated with lack of investment.

Data and Variable Definition

This article selects Shanghai and Shenzhen A-share listed companies from the CSMAR database as the initial research sample. Because the model has lagging items, the investment efficiency model uses 2013-2018 data, the equity concentration degree selects 2013-2017 data., and used Excel to process the sample as follows: (1) Excluded ST, *ST, PT companies; (2) Excluded financial industry listed companies; (3) Excluded company sample points with missing required data for each year. After screening, 12752 unbalanced panel data were obtained.
This paper draws on the Richardson (2006) model to construct a regression model of expected investment, and uses the difference between the actual investment expenditure value and the expected value obtained by the regression equation to measure the inefficient investment level. A positive residual indicates that the company is over-invested (OVERINV), a negative residual indicates that the company is under-invested (UNDERINV), and the larger the absolute value of the residual, the lower the investment efficiency. The specific model is as follows.

\[ Inv_t = \beta_0 + \beta_1 Grow_{t-1} + \beta_2 Cash_{t-1} + \beta_3 Lev_{t-1} + \beta_4 Age_{t-1} + \beta_5 Ret_{t-1} + \beta_6 Inv_{t-1} + \sum Year + \epsilon_t \]  

(1)

Referring to the existing literature, the variables designed in this paper are shown in Table 1.

| Variable type   | Variable          | Symbol | Calculation method                                                                 |
|-----------------|-------------------|--------|------------------------------------------------------------------------------------|
| Explained       | Investment        | INV    | Absolute residual value from Richardson model regression                           |
| variable        | efficiency        |        |                                                                                   |
| Over investment | OVERINV           |        | Positive residuals from Richardson model regression                                |
| Under           | UNDERINV          |        | Negative residuals from Richardson model regression                                |
| investment      | CR                | CR     | Shareholding ratio of the largest shareholder                                       |
| Control         | Turnover of total assets | TURNOVER | Operating income / average total assets                                           |
| variable        | rate of return    | RET    | Annual dividend return                                                            |
|                 | Company size      | SIZE   | Ln(Final assets)                                                                 |
|                 | Business growth   | GROWTH | (Current operating income - previous operating income) / Previous operating income |
|                 | Free cash flow    | CASH   | Activities Net operating cash flow / total assets of the company in early          |
|                 | Large shareholder | OCCUPY | Other receivables / total assets at the end of the period                           |

**Methodology**

Based on the previous analysis, this paper constructs a model of the impact of equity concentration on investment efficiency to test the proposed hypothesis. Model (2) tests hypothesis 1, and model (3) (4) tests hypothesis 2.

\[ Inv_t = \alpha_0 + \alpha_1 CR_{t-1} + \alpha_2 Grow_{t-1} + \alpha_3 SIZE_{t-1} + \alpha_4 Ret_{t-1} + \alpha_5 TURNOVER_{t-1} + \alpha_6 OCCUPY_{t-1} + \alpha_7 Cash_{t-1} + \epsilon_t \]  

(2)
\[
OVERINV_u = \alpha_0 + \alpha_1 CR_{u-1} + \alpha_2 GROW_{u-1} + \alpha_3 SIZE_{u-1} + \alpha_4 RET_{u-1} \\
+ \alpha_5 TURNOVER_{u-1} + \alpha_6 OCCUPY_{u-1} + CASH_{u-1} + e_u
\]  

\[
UNDERINV_u = \alpha_0 + \alpha_1 CR_{u-1} + \alpha_2 GROW_{u-1} + \alpha_3 SIZE_{u-1} + \alpha_4 RET_{u-1} \\
+ \alpha_5 TURNOVER_{u-1} + \alpha_6 OCCUPY_{u-1} + CASH_{u-1} + e_u
\]

### Empirical Results

Descriptive analysis is the static description analysis of the data. This paper used the software Stata13.1 to descriptively analyze all the variables in Table 1 from the four indicators: minimum value, maximum value, mean value and standard deviation. The results are shown in Table 2:

| Variables | Observations | Minimum value | Maximum value | Mean value | Standard deviation |
|-----------|--------------|---------------|---------------|------------|-------------------|
| inv       | 12752        | .0001         | .9753         | .044789    | .0664858          |
| overinv   | 4722         | .0000         | .9753         | .061044    | .0973362          |
| underinv  | 8030         | .0000         | .4414         | .035230    | .0346760          |
| cr        | 12752        | .0081         | .9923         | .5225      | .1537149          |
| turnover  | 12752        | .0055         | 12.3729       | .64488     | .5479639          |
| occupy    | 12752        | .0000         | .5878         | .016803    | .0299654          |
| cash      | 12752        | -.2247        | 0.3035        | 0.0476     | 0.0832            |
| grow      | 12752        | .0826         | 121.4833      | 2.239284   | 2.7525301         |
| size      | 12752        | 17.6413       | 28.5087       | 22.118937  | 1.3002447         |
| ret       | 12752        | -.9929        | 14.9767       | .121954    | .5632075          |

A total of 12,752 sample data are selected in this paper, of which the number of samples in the over-investment group (residual > 0) was 4722, accounting for 37.03%, and the number of samples in the under-investment group (residual <0) was 8030, accounting for 62.97%. Most inefficient investments of listed companies in China are under-investment. However, the average number of over-invested samples is greater than the under-invested sample group, indicating that over-investment is more serious than under-investment. The main reason is that with the development of China's economy, the market provides a large number of investment opportunities for enterprises. A series of factors such as unsound capital markets and asymmetric information have led to outstanding financing constraints for enterprises, resulting in insufficient investment by enterprises. The highest investment efficiency of listed companies is 97.53%, the lowest is 0.1%, the degree of dispersion is large, and the average shareholding ratio of the largest shareholder reaches 0.5225, indicating that the overall share concentration of companies is relatively concentrated, and there is a phenomenon of control of large shareholders. The minimum value of the total asset turnover rate is 0.0055, some enterprises have weak operating capabilities, the maximum value of 12.3729, the individual differences between enterprises are large, the average value is 0.64488, it suggests that the overall turnover of listed companies is good. The average
average capital occupancy of major shareholders is 0.0168, it can be seen that the capital occupancy of major shareholders is generally moderate.

Table 3. Pearson correlation coefficient table of variables.

|       | inv   | overinv | underinv | cr   | turnover | occupy | grow | ret   | size   |
|-------|-------|---------|----------|------|----------|--------|------|-------|--------|
| inv   | 1     |         |          |      |          |        |      |       |        |
| overinv | 1.000** | 1       |          |      |          |        |      |       |        |
| underinv | 1.000** | .003*   | 1        |      |          |        |      |       |        |
| cr    | -.009 | -.009   | .031**   | 1    |          |        |      |       |        |
| turnover | -.038** | -.017   | -.093**  | .046** | 1        |        |      |       |        |
| occupy | .029** | .020    | .060**   | -.098** | .005    | 1      |      |       |        |
| grow  | .152** | .178**  | .234**   | -.050** | -.025** | -.007  | 1    |       |        |
| ret   | .077** | .070**  | .109**   | .000  | -.011   | .023** | .324** | 1      |        |
| size  | -.183** | -.210** | -.236**  | .222** | .042**  | .040** | -.419** | -.099** | 1      |

In Table 3, it can be seen that the correlation coefficient between equity concentration and corporate investment efficiency is -0.009, which can initially indicate that the higher the equity concentration of listed companies, the lower the corporate investment efficiency. The correlation coefficient between the concentration of equity and the level of over-investment is -0.009, the higher the concentration of equity in listed companies, the lower the level of over-investment. The degree of equity concentration can alleviate over-investment to a certain extent. The concentration of equity and investment efficiency are significant at the level of 0.01, it suggests that the equity concentration has a tendency to increase the level of under-investment. In summary, the concentration of equity has a certain effect on reducing the level of corporate investment and alleviating excessive investment, but the result is not significant, and needs further empirical testing.
|                | Model (2)         | Model (3)         | Model (4)         |
|----------------|------------------|------------------|------------------|
|                | inv              | overinv          | underinv         |
| cr             | -0.000364*** (0.000133) | -0.00147*** (0.000342) | 0.000267** (0.000108) |
| turnover       | -0.00418 (0.00374)  | -0.0102 (0.0154)  | -0.00388 (0.00251)  |
| occupy         | 0.134** (0.0568)   | 0.333* (0.172)    | 0.0627* (0.0332)   |
| ret            | 0.00343*** (0.00117) | 0.00633* (0.00344) | 0.00268*** (0.000888) |
| size           | -0.0266*** (0.00216) | -0.0445*** (0.00505) | -0.0145*** (0.00192) |
| cash           | 0.00894 (0.00591)   | 0.0227*** (0.00743) | 0.00140* (0.000765) |
| salary         | 0.00409 (0.00298)   | 0.00424 (0.00937)  | 0.00617*** (0.00228) |
| _cons          | 0.591*** (0.0547)   | 1.057*** (0.167)   | 0.253*** (0.0464)   |
| N              | 12752             | 4722             | 8030             |
| R2             | 0.033             | 0.067            | 0.034            |

Standard errors in parentheses* p < 0.10, ** p < 0.05, *** p < 0.01

From the above table (Table 4), the correlation coefficient of equity concentration (cr) and investment efficiency (inv) is -0.000364, which is significantly negative at the level of 1%, indicating that the more concentrated the equity, the lower the investment efficiency, which verifies hypothesis 1. The largest shareholder's shareholding ratio and over-investment (overinv) significantly correlated at a 1% significance and showed a regression coefficient of -0.00147, and under-investment (underinv) at a 1% significance showed 0.000267, which verified Hypothesis 2, which explains that with the increase in the shareholding ratio of the largest shareholder, the under-investment will increase, and the increase in the shareholding ratio of the largest shareholder will reduce the level of over-investment. Large shareholders may use their power to make investment decisions that maximize their own interests, thereby reducing the efficiency of corporate resource allocation and the efficiency of corporate investment. A study of control variables found that free cash flow (cash) significantly exacerbates over-investment, possibly because companies have sufficient free cash flow, which increases the tendency of managerial opportunism to exacerbate over-investment. The coefficient of shareholder capital occupancy (occupy) for over-investment is -0.333 and is significant at the level of 10%, and the coefficient of under-investment is 0.0627 and significant at the level of 10%, which may be due to the large shareholder’s Concerned about the situation of the enterprise, it plays a supervisory role in the management, reduces the degree of information asymmetry and alleviates agency problems, thereby improving the efficiency of enterprise investment. Executive compensation passed the significance test at the level of 1%, and the correlation coefficient for under-investment was 0.00617, indicating that it can alleviate under-investment, because executive compensation incentives can alleviate agency conflicts, to a certain extent, the interests of executives and shareholders The interests are consistent.
Conclusion

This paper selects the 2013-2018 Shanghai and Shenzhen A-share listed company data to study the impact of equity concentration on investment efficiency, and mainly draws the following research conclusions: This paper uses the Richardson residual model to measure the inefficiency of corporate investment. Under-investment is more common than over-investment. Over-investment is more serious than under-investment; the concentration of equity can lead to changes in the investment efficiency of the enterprise. The main manifestation is that the more concentrated the equity, the lower the investment efficiency. Further analysis of the main reason is that when the interests of the largest shareholder are consistent with the interests of the company, the controlling shareholder is motivated to strengthen the supervision of investment behavior to effectively suppress the company's over-investment, but excessively cautious supervision results in insufficient investment.

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