Internal control quality, equity pledge financing and investment efficiency

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Abstract. In the present situation of difficult enterprise-financing, the equity pledge of corporate controlling shareholders is an effective channel for enterprises to relieve financing constraints. Whether an enterprise can formulate a reasonable investment policy to obtain investment income effectively and achieve financial goals, determines whether an enterprise can develop in the long-term future. The target of this paper is to approach how the investment efficiency of an enterprise will change with the increase in the portion of controlling shareholder equity pledge (CSEQ), and how the internal control system of the enterprise regulates the contact between controlling shareholder equity pledge and investment efficiency. The article found that the controlling shareholder's equity pledge (CSEQ) affects the enterprise's inefficient investment behavior, and the controlling shareholder's equity pledge ratio has a positive interrelationship with the inefficient investment. According to the previous studies, this paper carries out further research, innovatively introduces the internal control quality index, discusses the influence of internal control quality on equity pledge and investment efficiency sensitivity. The result show that the higher internal control quality can restrain the excessive investment behavior of enterprises.

1. Introduction

In recent years, in the context of deepening supply-side structural reforms and deleveraging across the country, corporate financing channels have been subject to greater restrictions and stricter controls. In China, due to the concentrated concentration of public firms, the minority shareholders of the company have greater control of the company. Equity pledge financing, as a simple and highly liquid financing method, can quickly obtain a large amount of funds, and can guarantee the controlling shareholder's controlling power, so it is increasingly favored by the controlling shareholder. Scholars' exploration on the CSEQ is mainly carried out from the perspective of motivation and economic consequences. The motive research of equity pledge shows that the CSEQ is mainly for financing and guaranteeing control, and some controlling shareholders tunnel listed companies through equity pledge. Researchers have shown that the CSEQ may trigger the risk of a stock price crash. So as to prevent the transfer of shareholder control, corporations may also improve performance through earnings management and tax avoidance. In companies with pledges of controlling shareholder equity, in order to prevent the share price from falling below the closing line and face the danger of the transfer of control, when the dominant stockholder makes and implements investment decisions in the company may lead to two types of inefficient investment, overinvestment or underinvestment.
The internal control system is a set of systems within the enterprise that use the mutual constraints and connections generated by the division of labor to form control function norms to coordinate economic behaviors and control economic activities. Inefficient investment such as over-investment or under-investment in enterprise investment behavior is mainly involved by agency problems and asymmetric information. Internal control can regulate agency issues through a series of political institution managements, improve the efficiency and effectiveness of business operations, and promote the realization of development strategies. The prime goal of this paper is to explore how companies implementing high-quality internal control systems will affect the efficiency of investment in the context of CSEQ.

2. Literature review

Equity pledge is the act of the pledgor to use its equity as the subject matter to apply for a loan to a financial institution or provide a guarantee for a third party. Because the shareholdings in developed countries are more dispersed, foreign scholars' research on shareholding pledges mainly focuses on the agency issues they generate, while domestic scholars have more extensive investigation on the economic aftermath of controlling shareholding pledges.

Sleifer & Vishny (1997) believe that the separation of control rights and actual cash flow rights caused by equity pledges will intensify the controlling shareholders' motivation to use their own advantages to transfer resources, further harm the interests of small and medium shareholders, and lead to conflicts between principal shareholders and small shareholders. Li (2007) analyzed the CSEQ of China's listed companies and found that equity pledge would scale down the cost of major shareholders' embezzlement of company resources, making the phenomenon of “tunneling” of major shareholders more serious, and aggravating the conflict between dominant stockholders and minority stockholders. Hao and Liang (2009) proposed that the separation of control rights and cash flow rights caused by equity pledges will impair the encouragement effects and enhance the entrenchment effects, which will make it easier for large shareholders to "tunnel" the company and have an disadvantageous economic shock on the firm's value. This effect is more obvious in enterprises [1].

Different from the previous scholars' research structure that equity pledges have adverse economic consequences for companies, Tan and Wu (2013) proposed that equity pledges would have a governance effect on the enterprise, and the quality of the company’s equity pledged by the controlling shareholder’s equity pledge is higher than that without equity pledge. The quality of the company’s shareholdings, the quality of continuous pledged shares is higher than that of discontinuous pledged shares [2]. Research by Li and Zheng (2015) found that many controlling shareholders will consider the long-term interests of the corporations when pledged equity, and protect the interests of most investors through market capitalization management. And the higher the shareholder's equity pledge ratio, the more it will suppress the embezzlement behavior through the governance effect of market value management [3].

Regarding the research on the investment efficiency of enterprises, Richardson (2006) found that the phenomenon of over-investment will appear in enterprises with high free cash flow, and the company's governance structure can assuage the over-investment behavior of enterprises [13]. Biddle et al. (2011) discovered that high-quality financial report quality can enhance capital investment efficiency. Under (overinvestment) underinvestment operating environment, there is a (negative) positive adjustment between financial report quality and investment efficiency [16]. Regarding the research on equity pledge and corporate investment behavior, Kao and Chen (2007) found that after equity pledge, the enterprise's risk appetite will be strengthened, and it will be more inclined to venture capital for earnings manipulation, and this investment behavior will damage the company's performance, will also reduce the quality of company accounting information disclosure. Xie and Wang (2017) found that the CSEQ would cause enterprises to overinvest, and product market competition would strengthen the relationship between them. In the company with multiple large shareholders, the positive contact between the CSEQ financing and overinvestment will weaken. Hou and Zhu (2018) proposed that the separation of control rights and cash flow rights caused by the pledge of controlling shareholder
equity will significantly increase the sensitivity of investment cash flow caused by excessive investment by companies [8]. Ke et al. (2019) studied the types of corporate investment behaviors affected by corporate equity pledges, and found that the relationship between the CSEQ ratio and the firm’s financial investment level was U-shaped, while the relationship with the firm’s industrial investment level was inverted U-shaped. This shows that the dominant stockholders with different equity pledge ratios adjust the company's investment strategy for different motives. Companies with low equity pledge ratios pay close attention to the long-term advancement of the enterprise, and will invest in the company's business activities to improve company performance, while high equity pledge, for preventing the transfer of control, a proportion of the company's controlling shareholders may adopt short-term investment strategies such as financial investment with high and quick returns [9].

3. Theoretical analysis and assumptions

3.1. Equity pledge financing and investment efficiency
The controlling shareholder applies its equity as a pledge to apply for a loan, resulting in the separation of control and cash flow rights. When the CSEQ makes the difference between the right of control and the cash flow right greater, and the disengagement of the two rights is more serious, the dominant stockholder may overinvest in their own interests due to concerns about the stock price falling to the liquidation line, and infringe the rights of small and medium shareholders, or take an overly conservative investment strategy and result in underinvestment. Also when the interests of dominant stockholder and minority shareholders are coordinated, equity pledge financing may also ease the company's inefficient investment and ensure the company's normal investment level. Therefore, this article proposes hypothesis:

H1a The CSEQ will reduce the investment efficiency of the enterprise and trigger inefficient investment behavior.

H1b The CSEQ will promote the enterprise's investment efficiency

3.2. Internal control quality, equity pledge and investment efficiency
When H1a was established, it showed that due to the agency conflict between dominant stockholder and minority shareholders, the motivation of dominant stockholders to infringe on the rights and interests of minority shareholders made the CSEQ and the inhibitory effect of investment efficiency. In order to protect the rights of small and medium shareholders, the company's internal control system can effectively supervise the inefficient investment policies and actions of the controlling shareholder's advice to the management. When the company's internal control quality is high, it is conducive to weakening the sensitivity of the CSEQ and corporate inefficient investment. Therefore, this article proposes hypothesis:

H2 When the quality of internal control of the company is higher, the negative correlation between the CSEQ and investment efficiency will be weakened.

4. Model design

4.1. Data source
This article selects China-Shanghai and Shenzhen A-share listed companies from 2013 to 2018 as the research sample, and screens the sample according to the following criteria, (1) A firm should not be a financial firm, and firms with ST also should be excluded.(2) In order to control the influence of extreme values on the regression results, Winsorize was carried out on the 1% quantile of the continuous variables in the explanatory variables. Because the calculation of investment efficiency index needs to lag one period, the actual research window of this paper is 2014-2018, and the number of research samples is 7870. All sample data are derived from CSMAR database and Resset database.

4.2. Measurement of investment efficiency
This paper uses the expected investment model proposed by Richardson (2006) to calculate the expected investment level of the company, and then uses the residual $\epsilon_{t,t}$ of the regression model to represent the company's inefficient investment expenditure. When $\epsilon_{t,t}$ is greater than 0, the actual investment level is higher than the expected level, indicating that the company is overinvesting, and $\epsilon_{t,t}$ is less than 0, indicating that the actual investment level is lower than the expected level, indicating that the company is underinvesting. In order to facilitate the measurement of inefficient investment, in the regression analysis, the residual $\epsilon_{t,t}$ is taken as the absolute value to measure the inefficient investment of the enterprise. The model for calculating investment efficiency is:

$$Inv_{t,t} = \beta_0 + \beta_1 TobinQ_{t,t-1} + \beta_2 Lev_{t,t-1} + \beta_3 Cash_{t,t-1} + \beta_4 ROA_{t,t-1} + \beta_5 Age_{t,t-1} + \beta_6 Size_{t,t-1} + \beta_7 Ret_{t,t-1} + \beta_8 Inv_{t,t-1} + \sum Year + \sum Industry + \epsilon_{t,t}$$ (1)

Among the model, $Inv_{t,t}$ represents the investment level of the company in the t year, the ratio of the cash paid for the construction of fixed assets, intangible assets and other long-term assets for the company to total assets at the beginning of the year, $TobinQ_{t,t-1}$, $Lev_{t,t-1}$, $Cash_{t,t-1}$, $ROA_{t,t-1}$, $Age_{t,t-1}$, $Size_{t,t-1}$, $Ret_{t,t-1}$, $Inv_{t,t-1}$ respectively measure the company's growth ability, Asset-liability ratio, cash holding ratio, profitability, time to market, company size, stock yield and investment level in t-1 year.

4.3 Main regression model and variable description

The model for testing H1 is:

$$Over/UnderInv_{t,t} = \alpha_0 + \alpha_1 Pledge\_per_{t,t} + \alpha_2 Top_{t,t} + \alpha_3 Instown_{t,t} + \alpha_4 Size_{t,t} + \alpha_5 ROA_{t,t} + \alpha_6 GROWTH_{t,t} + \alpha_7 LEV_{t,t} + \alpha_8 TobinQ_{t,t} + \alpha_9 Age_{t,t} + \sum Year + \sum Industry + \epsilon$$ (2)

Among the model, $Over/UnderInv$ indicates that the investment efficiency is the regression residual of the model (1), $Pledge\_per$ is the explanatory variable of the model, which represents the proportion of shares pledged by the company’s largest shareholder in t year, and the control variables include $Top$ (the largest shareholder holds shares Proportion), $Instown$ (institutional investor holding ratio), $Size$ (natural log of total assets), $ROA$ (return on assets), $GROWTH$ (sales income growth rate), $LEV$ (asset-liability ratio), $TobinQ$ value, $Age$ (The age of the company's listing), while controlling the industry and the possible impact of the year.

This article uses model (3) to test H2:

$$Over/UnderInv_{t,t} = \alpha_0 + \alpha_1 Pledge\_per_{t,t} + \alpha_2 DIB_{t,t} + \alpha_3 Pledge\_per_{t,t} * DIB_{t,t} + \alpha_4 Control_{t,t} + \sum Year + \sum Industry + \epsilon$$ (3)

Among model (3), $DIB$ is the natural logarithm of Dibo internal control index, which represents the company's internal control level, and other control variables are consistent with model (2).

5. Descriptive statistics and empirical results

5.1 Descriptive statistics

| Table 1 | Descriptive statistics of various variables in the sample of overinvested enterprises. |
|---------|--------------------------------------------------------------------------------------|
| **Variable** | **Obs** | **Mean** | **Std.dev** | **Min** | **Max** |
| OverInv  | 3.016 | 0.061484 | 0.1051946 | 0.0000159 | 0.9588928 |
| Pledge-per | 3.016 | 0.3190588 | 0.3728241 | 0 | 1 |
| DIB | 3.016 | 6.361445 | 0.848476 | 0 | 6.795963 |
| Top | 3.016 | 0.3321722 | 0.1448916 | 0.0389 | 0.8999 |
| Instown | 3.016 | 0.3779907 | 0.2454505 | 0 | 1.988503 |
| Size | 3.016 | 22.63157 | 1.16502 | 18.76574 | 27.66691 |
| Roa | 3.016 | 0.0344404 | 0.0637176 | -9268486 | 0.481941 |
| Growth | 3.016 | 0.6117679 | 5.989138 | -9483611 | 251.2112 |
| LEV | 3.016 | 0.4817 | 0.1931421 | 0.0090628 | 1.548278 |
| TobinQ | 3.016 | 1.942162 | 1.26789 | 0.7166737 | 16.6071 |
| Age | 3.016 | 14.79567 | 6.383978 | 3 | 28 |
Table 1 shows that in the 7870 research sample, there are 3016 companies with over-investment behaviors, the average investment efficiency is 0.61484, the average share ratio of equity pledge of large shareholders is 0.3190588, and the average value of the company's internal control quality index is 6.341445.

Table 2. Descriptive statistics of various variables in a sample of underinvested companies.

| Variable | Obs | Mean  | Std.dev. | Min  | Max  |
|----------|-----|-------|----------|------|------|
| OverInv  | 4,854 | 0.0350713 | 0.036766 | 0.0000358 | 0.4413587 |
| Pleadge-per | 4,854 | 0.2849166 | 0.3682281 | 0.0000358 | 0.4413587 |
| DIB      | 4,854 | 6.278776 | 1.081896 | 0.0000358 | 6.802006 |
| Top      | 4,854 | 0.3455097 | 0.1472151 | 0.0000358 | 0.8909 |
| Instrow  | 4,854 | 0.3413777 | 0.2540426 | 0.0000358 | 1.038836 |
| Size     | 4,854 | 22.32687 | 1.226702 | 0.0000358 | 27.46437 |
| Roa      | 4,854 | 0.0323601 | 0.1419322 | -1.647913 | 8.441391 |
| Growth   | 4,854 | 0.3413777 | 0.2540426 | 0.0000358 | 1.038836 |
| LEV      | 4,854 | 0.3413777 | 0.2540426 | 0.0000358 | 1.038836 |
| TobinQ   | 4,854 | 2.630606 | 10.57405 | 0.1527682 | 715.9448 |
| Age      | 4,854 | 13.87348 | 6.264989 | 3 | 27 |

Table 2 shows that in the 7870 research sample, there were 4854 under-invested companies, indicating that under-investment is more likely to occur in inefficient investment behaviors of companies than over-investment behaviors. The average investment efficiency is 0.0350713. The average pledge ratio is 0.2849166, and the average value of the company's internal control quality index is 6.278776.

5.2. Empirical analysis

This paper divides the research sample into two small samples with underinvestment and overinvestment behavior based on the regression residuals of the model (1). Respectively using overinvestment and underinvestment as the dependent variable, the controlling shareholder’s equity pledge as the explanatory variable, the internal control quality as the adjustment variable to perform the regression analysis. The regression results are shown in Table 3.

Table 3. Internal control quality, controlling shareholder equity pledge and investment efficiency regression results.

| Dependent variable | Overinvestment | Underinvestment |
|-------------------|----------------|-----------------|
| Regression model   | Model1         | Model2          | Model1          | Model2          |
| Pleadge-per        | 0.0308364***   | -0.0142232      | 0.0109587***    | 0.0069344       |
|                   | (7.88)         | (-0.59)         | (8.85)          | (1.07)          |
|                   |                | -0.0017552      | -0.0016003***   | -2.85           |
|                   |                | (-0.77)         |                |                |
|                   |                | 0.0071998*      | 0.0006412       |                |
|                   |                | (1.92)          |                |                |
| Top               | 0.0063136      | 0.0062773       | 0.0021839       | 0.0022062       |
|                   | (0.58)         | (0.58)          | (0.64)          | (0.65)          |
|                   |                | (0.58)          |                |                |
|                   |                | (0.64)          |                |                |
| Instrow           | 0.0250184***   | 0.0249234***    | -0.0005272      | -0.000764       |
|                   | (3.23)         | (3.21)          | (-2.3)          | (-0.33)         |
|                   |                |                | (-23)           | (-33)           |
| Size              | 0.032441*      | 0.032368        | 0.001318        | 0.0001916       |
|                   | (1.8)          | (1.8)           | (0.97)          | (0.37)          |
| Roa               | -0.0312672     | -0.038359       | 0.0056345       | 0.0113021       |
|                   | (-0.9)         | (-1.06)         | (0.63)          | (1.24)          |
| Growth            | 0.0372752***   | 0.0373097***    | 0.0064386***    | 0.0065058***    |
|                   | (23.15)        | (23.18)         | (4.84)          | (4.89)          |
| LEV               | -0.041792      | -0.0046054      | -0.0154126***   | -0.146301***    |
|                   | (-0.41)        | (-0.45)         | (-4.79)         | (-5.07)         |
| TobinQ            | 0.020601       | 0.0020988       | 0.0044357***    | 0.0040243***    |
Age & (1.23) & (1.24) & (8.85) & (12.40) \\
\hline
& -0.0013349*** & -0.0013114*** & -0.0004179*** & -0.0004214*** \\
\hline
Constant & (-5.20) & (-5.05) & (-5.13) & (-5.18) \\
\hline
IND/YEAR & YES & YES & 0.0315388** & 0.0344378*** \\
\hline
Observations & 3016 & 3016 & 4,854 & 4,854 \\
\hline
Adj R-squared & 0.1371 & 0.2391 & 0.1415 & 0.1371 \\
\hline

Note: The data in the table are the regression coefficients of the respective variables in the regression model, and the t value is in parentheses. ***, **, and * indicate statistical significance in 1%, 5%, and 10%, respectively.

Columns 2 and 4 of Table 3 show that in the sample of companies with overinvestment, the Pleadge-per regression coefficient is significantly positive at a 1% confidence level, indicating that the CSEQ and the firm’s overinvestment and underinvestment Inefficient investment behavior is significantly positively correlated, and the empirical results support hypothesis H1a. It shows that on the one hand, companies with a higher shareholding pledge ratio of the company’s dominant stockholder, in order to prevent the corporation’s share price from declining and losing control, the shareholders will conduct more investment behaviors, causing companies to overinvest. On the other hand, in companies with underinvestment, the increase in the CSEQ ratio will also increase the company's underinvestment. Explain that with the increase in the proportion of CSEQ, the company's over-investment and underinvestment will be improved, so the increase in the proportion of CSEQ will trigger inefficient investment behavior.

Further study and discuss the moderating effect of the internal control of the company on the CSEQ and the inefficient investment behavior. The Columns 3 of Table 3 shows that the interaction term of Pleadge-per * DIB is significantly positive at the 10% confidence level in the regression of the overinvested company sample. The Columns 5 shows that the Pleadge-per * DIB interaction is not significant in the regression of the underinvested company sample, while the DIB regression coefficient is significantly negative at 1%. It proves that companies with excessive investment behavior, the higher the quality of internal control will offset the impact of the CSEQ to promote the company's excessive investment behavior. For enterprises with underinvestment, the quality of internal control can suppress underinvestment, but the effect of internal control on the underinvestment behavior of the company caused by the pledge of controlling shareholder equity is not significant, it may be due to the fact that the internal control system cannot effectively supervise passive investment policies such as underinvestment.

6. Conclusions
According to the sample data of China's A-share listed companies from 2013 to 2018, this thesis studies the affection of CSEQ on inefficient investment behavior of the company, and analyzes the moderating effect of internal control quality in CSEQ and inefficient investment behavior. Research shows that the pledge of controlling shareholders' equity affects the inefficient investment behavior of enterprises. The CSEQ ratio is positively related to the degree of inefficient investment. The higher the CSEQ ratio, the higher the degree of over-investment or under-investment of the enterprise. A further study on the introduction of adjustment variables for the quality of internal control found that the higher the quality of internal control, the weaker the positive relationship between the CSEQ and the company’s overinvestment. For underinvested enterprises, the higher the quality of internal control can suppress underinvestment, but it has no significant impact on the positive correlation between the CSEQ and the excessive investment behavior of the enterprise.

The research in this article gives us the following enlightenment. First, the behavior of CSEQ will exacerbate the company's inefficient investment behavior, which is adverse to the firm's long-term development and will harm the interests of small and medium investors. Relevant regulatory agencies should pay more attention to the flow of funds obtained by the pledge of the CSEQ to avoid the encroachment of interests caused by excessive investment. Second, the higher the quality of the internal control system can weaken the over-investment problem caused by the CSEQ to a certain extent, but the
supervision and control of the under-investment behavior caused by the equity pledge is not significant. Therefore, when the internal control department of the enterprise formulates the internal control system, it should improve the supervision to deal with the underinvestment of the enterprise.

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