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Equity Balance, Internal Control and Investment Efficiency

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Abstract. Based on the data of GEM companies in Shanghai and Shenzhen from 2011 to 2014, this paper explores and verifies the relationship between equity balance, internal control and investment efficiency. The results reflect that the balance between equity and investment efficiency shows a "U-shaped" curve. There is no significant relationship between internal control and investment efficiency.

Introduction

Investment is crucial for enterprises. Investment efficiency refers to the contrast between the achievements by investment activities and the investment that is occupied or consumed. Inefficient investment consists of under-investment and over-investment in enterprises. Inefficient investment is a form of improper decision-making. It has a great harm to the company and will inhibit the steady development of enterprises. Optimizing investment efficiency and selecting the highest investment efficiency projects will maximize the interests of shareholders and the company's wealth. So to explore the factors that affect the efficiency of investment in enterprises, finding ways in theory to improve investment efficiency has become particularly important .In the process of corporate governance, internal control is essential. Internal control refers to the organization, plan, procedure and method of various restriction and adjustment implemented by the unit within a unit in order to improve operational efficiency, fully and effectively acquire and use various resources and achieve the established management objectives under a certain environment.

In recent years, research on the interrelationship between internal control and investment efficiency has deepened. The academic community has not yet reached a consensus for the relationship between equity balance and investment efficiency. Some scholars think that the ownership concentration and the controlling shareholder's shareholding ratio are positively stimulating the investment efficiency of enterprises. Ran Mao Sheng (2010) reached the same conclusion [1]. However, some other scholars hold different opinions. Such as Zhong Yibin etc. (2010) that the equity balances can improve investment efficiency. Some studies also show that with the enhancement of the equity balance, the investment efficiency can only be improved to a certain extent [2]. The research by Jiang Ling etc. (2015) shows that the shareholding ratio of the largest shareholder has an inverted "U" curve with the investment efficiency of the enterprise. Proper equity balances can increase the investment efficiency, and the excess of the quota will have an inhibitory effect [3].In recent years, the research on internal control and investment efficiency has been gradually deepened, and the conclusions that are reached are basically the same. Li etc. (2011) conducted empirical tests on the relationship between internal control and investment efficiency. The conclusion shows that there is a positive correlation between the quality of internal control and the efficiency of corporate investment [4]. The relationship among the three in the GEM is scarcely mentioned. This article will be based on the GEM market, seeking the interrelationship of the equity balances, internal control and investment efficiency.

Research Hypothesis

The impact of equity balances on investment efficiency has not yet reached a conclusion in academia. The author believes that on the one hand, equity checks and balances can break down the centralized decision-making power of the largest shareholder, so as to avoid inefficient investment

due to shareholders' personal interests; On the other hand, excessive equity checks will greatly slow down the decision-making process. Therefore, this paper argues that the balance between equity balance and investment efficiency is not a simple linear relationship. Accordingly, the following hypothesis are proposed:

Hypothesis 1: The equity balance and investment efficiency shows a "U-shaped" relationship, that is, equity checks and balances can, to a certain extent, promote the improvement of investment efficiency.

Whether under-investment or over-investment, internal control can better compensate for the deficiencies. High-quality internal control can offset the investment preference caused by manager's personal preference or personality factors. The establishment of the corresponding system can also guarantee the maximization of shareholders 'rights to a certain extent and prevent managers from deviating from the decision-making of shareholders' interests. A higher level of internal control can also improve the quality of financial reporting, thereby reducing the asymmetric information among internal managers and external investors. And a higher level of internal control can guarantee that the public can learn more about invested companies and reduce inefficient investment. In addition, efficient internal investment can also regulate the behavior of major shareholders to protect the wealth of small and medium shareholders. In conclusion, we believe that effective internal control can improve the efficiency of the investment in an enterprise. Accordingly, the following hypothesis are proposed:

Hypothesis 2: Internal control is positively correlated with investment efficiency. The higher the level of internal control, the higher the investment efficiency is .

Research Design

Sources of Data

All of the data used in this paper is mainly from the CSMAR database of Cathay Pacific .And the internal control index is from the internal control data of Dubbo Company.Taking the GEM companies of Shanghai and Shenzhen stock markets as samples, the selected data are from 2011 to 2014. In data statistics, incomplete data samples were deleted, leaving only the data of a complete GEM company, the final sample totaling 822. Data uses Excel2010 and STATA13 for processing and analyzing.

The Choice of Variables and Construction of Models

Choice of Variables

Explained Variable

Investment efficiency is the explained variable in this paper, which is used to indicate the company's investment efficiency. This paper cites the model of Richardson (2006) to estimate the level of investment efficiency through the residual between the firm's ideal investment efficiency and the actual investment efficiency. The model is as follows:

$$Invest_t=\beta0+\beta1Growtht\text{-}1+\beta2Levt\text{-}1+\beta3Casht\text{-}1+\beta4Aget\text{-}1+\beta5Sizet\text{-}1+\beta6Returnst\text{-}1+\beta7Investt\text{-}1+\Sigma Industry+\Sigma Year+\varepsilon \quad (1)$$

In this model, $Invest_t$ represents the amount of new investment in year t, the income recovered from the disposal of fixed assets, intangible assets and long-term assets through the formula Invest = (expenditures paid to construct fixed assets, intangible assets and long-term assets) / end of period Total assets to measure and calculate. Similarly, the meaning of the variable Investt-1 is also visible.Growtht-1 represents the company's ability to grow during t-1, that is, investment growth opportunities, which can be calculated by calculating the growth rate of main business income during the period. Levt-1 refers to the scale of debt, that is, the total liabilities at the end of t-1 / Assets; Cash t-1 refers to cash holdings, that is, cash and cash equivalents during the t-1 / total assets at the end of the period; Aget-1 refers to the actual year of listing of the company; Sizet-1

refers to the size of the company, Returnst-1 is the rate of the return on stock, that is, the rate of annual return on stock considering the cash bonus reinvestment. Σ Industry, Σ Year represent the industry effect and the annual effect respectively. We use Model 1 and a linear regression analysis of Model 1 to derive the residual value (denoted as D), with positive values representing over-investment and negative values representing under-investment. In addition, the paper uses the absolute value of the residual value to measure the investment efficiency of the company, which is denoted as efficiency. The greater the value, the lower the investment efficiency. On the contrary, the higher the investment efficiency.

Explanatory Variables

This paper introduces two explanatory variables: equity balance and internal control, and studies the impact of the two on investment efficiency. Equity balances is that the control is by the majority of shareholders to share through internal mutual restraint to avoid any major shareholder exclusive decision-making system. This article uses CSMAR data to measure the level of the shareholder balance (denoted Ratio) by using shareholder checks and balances. And after referring to the literature on the equity balance, we choose the following formula to measure the balance of shareholders: Ratio = the total number of shares held by the three largest shareholders / the number of the largest shareholder, the larger the Ratio, the higher the balance; the smaller the Ratio, the lower the level of equity balances. Internal control (denoted as IC) measures the level of internal control in the company. This article uses the internal control data of DBEC from 2011 to 2014 to measure the internal control in order to reflect the level of internal control of the company. High values match high-level internal controls, low values match low-level internal controls.

Control Variables

In order to study the investment efficiency, this paper introduces a series of control variables - Age, asset-liability ratio (Lev) and return on assets (ROA) control.

Model Building

In order to confirm the above assumptions, this paper establishes the following multiple regression model:

$$Efficiency=\beta 0+\beta 1Ratio^2+\beta 2IC+\beta 3Lev+\beta 3Age+\beta 4ROA+\varepsilon \quad (2)$$

Empirical Results Analysis

Descriptive Analysis

Table 1 Data descriptive statistics

Variable	Obs.	Mean	Std.Dev	Min	Max
Ratio	822	1.66963	0.4667407	1.01381	3
IC	822	668.1381	66.96033	0	778.98
Efficiency	822	0.0404646	0.0367253	1.39E-17	0.3363698
Lev	822	0.2587693	0.1577396	0.0110537	0.886428
Age	822	3.843066	0.8765142	3	6
ROA	822	0.0486383	0.0528117	-0.43657	0.244582

From table1, we can see that the minimum value of the equity balance is 1.01381, indicating that the number of shares held by the largest shareholder and the second and third largest shareholders is basically the same, with a maximum value of 3, indicating that the number of shares held by the second and third largest shareholders is the largest shareholder Double the number of shares held. These two data reflect that the GEM companies have a basic equity balance, which means a higher level of equity checks and balances. The minimum value of internal control index (IC) is 0, that is, the level of internal control is low and the internal control system is invalid. The maximum value is

778.98, that is, the quality of internal control is high. The difference between the two is 778.98 and the variance is 66.96. This shows that there is a large gap between the quality of internal control of GEM companies .And the average is 668.1. The internal control data of more companies are close to the maximum one, which shows that more companies have higher internal control quality. Investment efficiency of the minimum value is 1.39E-17, nearly closing to . And its maximum value is 0.3364.The gap between these two value is small, indicating that the gap of GEM company's investment efficiency is small. Closing to the average of the minimum value means that the overall investment efficiency of the GEM companies is high. The average of Lev is 0.2588, showing that the sample company has a small debt ratio and the sample is suitable for selection. The age of the listed company (Age) is very small, only 3, which may be caused by GEM short duration.

Correlation Analysis

This paper analyzes the relationship between equity control, internal control and investment efficiency. And it analyzes the impact of variables separately on investment efficiency .The results are shown in Table 2.

Table 2 Analysis table of equity balance and investment efficiency

	Efficiency	$Ratio^2$	Ratio	IC
Efficiency	1.000	4.231***	0.0000***	0.0000***
IC	0.0000***	0.1301	1.1209	1.0000
Ratio2	0.0000***	1.000	1.0000	4.231***
Ratio	0.7250	0.5235	1.0000	0.5585
Age	-0.0262**	-0.0329**	-0.0483**	-0.1107**
Lev	-0.6828	-0.5819	-0.0143**	0.0000***
ROA	-0.1901	0.6829	0.4295	

***P<0.01, **P<0.05, *P<0.1

From Table 2, we know that the ratio of equity and investment efficiency is the non-linear correlation . From the significant correlation between the square root of the investment ratio and the efficiency of the investment, the balance investment (Ratio)and the investment efficiency is significantly "U-shaped", and the coefficient is positive meaning that the two was "U-shaped" relationship. In summary, the relationship between equity balance, internal control (IC) and investment efficiency (Efficiency) has not been clearly drawn. Therefore, on the basis of the constructed model, with controlling the industry and annual , all the variables are further analyzed by multiple regression analysis to explore the deep relationship between equity balance, internal control and investment efficiency.

Multiple Regression Analysis

Regression Analysis of Equity Balance and Investment Efficiency

Based on the control of the industry and the annual, aimed at the relationship between equity balance and investment efficiency, the relationship between internal control and investment efficiency, We conduct a multiple regression analysis, which used quadratic regression to analyze, while the latter using linear Regression equation to analyze.

As shown in the table 3, in GEM, the square measure (Equity2) of equity balance is positively correlated with the investment efficiency (Efficiency). That is, the effect of the equity balance on the GEM on investment efficiency is a "U-shaped" curve. As the larger the efficiency value in this article, the lower the investment efficiency, therefore, the "U-shaped" curve shows that in the GEM, equity balances can promote the improvement of investment efficiency to some extent, that is, when the equity balance reaches a certain equilibrium value θ Previously, the rise of equity balance will lead to the improvement of investment efficiency. When the equity balance exceeds θ, the rise of equity balance will lead to the decline of investment efficiency. Assumption 1 holds. According to the P value, there is no significant relationship between internal control (IC) and investment

efficiency in GEM, and internal control does not significantly promote investment efficiency. That is, Hypothesis 2 is not valid.

Table 3 Regression analysis table of equity balance and investment efficiency

$Ratio^2$	4.410161***	
IC		0.0000257**
Age	-0.000409	-0.0031647
Lev	-0.002773	-0.0038931*
ROA	-0.0427315	-0.0466606
Constant	0.0316732	0.0387611
Obs.	822	822
R-squared	0.7811	0.0102

Robustness Test

In this paper, we test the above two regression models by using ROA instead of Return on Assets (ROA). The empirical results in this text have certain robustness.

Conclusion

This paper mainly studies the relationship between equity balance, internal control and investment efficiency respectively in GEM. Through the analysis and processing of the data of GEM companies in Shanghai and Shenzhen from 2011 to 2014,this paper draws the conclusion: (1) In GEM, equity balance and investment efficiency are the relationship of "U-shaped" (2) Unlike the main board market, there is no significant linear relationship between internal control and investment efficiency in GEM. That is, the level of internal control has no significant effect on investment efficiency.

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