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Research on the Influence of Internal Control Quality of State-owned Listed Companies on Investment Efficiency

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***Abstract*—As one of the important financial activities, investment efficiency directly affects the value promotion of state-owned assets. The internal control of enterprises can restrain investment behavior in function. In theory, the quality of internal control will affect the investment efficiency of enterprises. In this paper, 824 state-owned listed companies are selected to study the impact of internal control quality on investment efficiency. This study found that inefficient investment is a common problem in state-owned enterprises, and insufficient investment is more extensive than over-investment. The quality of internal control has a certain inhibitory effect on the inefficient investment of state-owned listed companies, and has a significant inhibitory effect on the under-investment.**

Keywords—investment efficiency; internal control quality; state-owned listed companies; inefficient investment

I. INTRODUCTION

Maintaining and increasing the value of state-owned assets is the main business objective of state-owned enterprises in China. The investment efficiency of state-owned enterprises has a direct impact on the maintenance and appreciation of state-owned enterprises' assets. The existing literature shows that the inefficient investment of state-owned listed companies is widespread, which endangers the healthy growth of state-owned enterprises. Scholars hope to control inefficient investment by improving internal control.

Lambert, Leuz and venecchia (2007) found that the level of internal control has a significant impact on the decision-making mechanism of listed companies. With the gradual improvement of relevant systems, the more attention is paid to resource allocation in enterprises, the closer the allocation and utilization of resources are to the optimal investment decision-making. Cheng, Dan and Zhang (2013) also found that internal control can significantly inhibit inefficient investment.

Due to the existence of agency problems and information asymmetry problems, information friction leads to inefficient investment, namely over-investment (Stein, 2003) and under-investment (Myers, Majluf, 1984). Parrino and Weisbach (1999) used the simulation method to test the agency conflict between shareholders and creditors in the main stakeholders of enterprises, which will increase the frequency of irrational investment behavior. At the same time, they studied other factors that affect the investment efficiency, such as debt period, asset structure, project scale, industry, etc.

Luo Binyuan (2017) introduced and quantified investor sentiment, and found that investor sentiment would be restrained by internal control, thus reducing the interference to investment efficiency; Zhang Chuancai and Chen Hanwen (2017) found that high-quality internal control can improve the market competitiveness of enterprise products, providing empirical evidence for the position of internal control in the realization of enterprise strategic objectives. Wang Zhi et al. (2015) used panel data of listed companies and empirical analysis to explore the impact of internal control quality on the performance of inefficient investment with different property rights, and found that inefficient investment caused by high-quality internal control cash flow can play a restraining role, with better restraining effect in private enterprises.

In view of the management mode and particularity of the state-owned enterprises, this paper analyzes the influence of the internal control quality of the state-owned enterprises on the investment efficiency, so as to provide the basis for improving the investment efficiency of the state-owned enterprises.

II. RESEARCH DESIGN

A. Research Hypothesis

The state-owned enterprises in our country have the phenomenon of soft budget constraints. The investment efficiency has little influence on the senior managers, so the senior managers usually do not pay attention to the investment efficiency. According to the theory of free cash flow, excessive cash flow will stimulate enterprises to over-invest. However, the executives of state-owned enterprises are generally directly appointed by the government and lack of sufficient professional knowledge and experience in operation and management, and the regulatory authorities and state-owned enterprises are the same institutions. The reduction of regulatory strictness leads to the high position and weight of some executives of state-owned enterprises. Through their own rights, their interests are maximized, and the cash flow of

enterprises is reduced, resulting in the lack of sufficient cash for investment in projects with positive net cash flow. Or invest in the project with negative NPV due to interest transmission and other behaviors. Therefore, this paper makes the following assumptions:

H1: investment efficiency of state-owned listed companies in China is poor, and inefficient investment is common.

In theory, inefficient investment comes from agency cost and information asymmetry. A large number of studies show that the quality of internal control can improve the management level and risk prevention ability of enterprises, and an effective internal control can also enhance the integrity and accuracy of financial reports, so as to reduce information asymmetry. Senior managers take a more cautious approach to investment behavior, restrict their own self-interest behavior, and inhibit inefficient investment behavior. Because state-owned enterprises undertake certain social responsibilities such as macro-control and employment promotion, there are many investment projects without requiring economic profits, and over-investment may not be fully controlled. Therefore, this paper assumes the following:

H2: the quality of internal control can restrain the inefficient investment, which has a significant impact on the underinvestment.

B. Sample Selection and Data Sources

1) Sample Selection

Based on the opportunity of full implementation of internal control in 2014 and the transformation of all enterprises from voluntary disclosure to compulsory disclosure, this paper selects all state-owned listed companies on the A-share main board of Shanghai and Shenzhen stock markets in 2015-2017 as the initial research object. As part of the content of this paper needs the data of the previous year, the data is based on 2014, and the following criteria are used to screen the selected samples:

1. Eliminating the companies with missing data;

2. Removing the ST company;

3. Excluding financial insurance companies and leasing companies.

After the above-mentioned treatment, 824 state-owned listed companies were finally obtained as the research samples, including 239 state-owned and holding enterprises of the central government and 585 local state-owned holding enterprises.

2) Data Source

The data of listed companies needed in this paper are from CSMAR database, Dibo internal control index database and xuchao information network. Excel and spss19.0 were used to sort out the data, so as to exclude the influence of abnormal value and incomplete value on the empirical results.

C. Variable Definitions

1) Explained Variables.

According to Richardson's expectation model, the difference between the estimated investment amount and the actual investment amount in the current year estimated according to the financial indicators of the enterprise in the previous year is measured. If the error is greater than 0, it is over inv; otherwise, it is under inv; the greater the absolute value of the error is, the higher the inefficient investment level is.

2) Explanatory Variables.

DIB internal control index is used to quantify the quality of internal control in this paper. The higher the score, the higher the quality of internal control.

3) Control Variables.

There are many factors that affect the efficiency of investment. In this paper, we choose size, LEV, FCF and growth as control variables.

D. Model Building

In this paper, Richardson model is used to measure investment efficiency. The method is to get the residual value at the company level by regression. The positive residual value represents over-investment, while the negative one is under-investment. The greater the absolute value performance, the greater the degree of inefficient investment.

The specific model is as follows:

$$Inv_{i,t}=\alpha_0+\alpha_1 Inv_{i,t-1}+\alpha_2 Growth_{i,t-1}+\alpha_3 Lev_{i,t-1}+\alpha_4 Ret_{i,t-1}+\alpha_5 Cash_{i,t-1}+\alpha_6 Age_{i,t-1}+\alpha_7 Size_{i,t-1}+\sum Year+\varepsilon_{i,t} \quad (1)$$

inv_t- actural investment in year t;

Inv_{t-1}-New investment in year t-1;

$Growth_{t-1}$- development capacity in year t-1;

Lev_{t-1}-Asset liability ratio in year t-1;

$Cash_{t-1}$- Cash holdings in year t-1;

Ret_{t-1}-Stock yield in year t-1;

Age_{t-1}- Listing date till year t-1;

$Size_{t-1}$-company size;

Year- dummy variable for year.

Referring to the research of Li Wanfu (2011), Xin Qingquan, etc. (2007), this paper constructs a linear regression model (2) to test the impact of internal control quality on investment efficiency.

The model is as follows:

$$Ov\text{-}inv(Un\text{-}inv)_{i,t}=\beta_0+\beta_1 ICI_{i,t-1}+\beta_2 Growth_{i,t-1}+\beta_3 Lev_{i,t-1}+\beta_4 Fcf_{i,t-1}+\beta_5 Roa_{i,t-1}+\beta_6 Rot_{i,t-1}+\beta_7 Top1_{i,t-1}+\beta_8 Age_{i,t-1}+\beta_9 Size_{i,t-1}+\sum YEAR+\varepsilon_{i,t} \quad (2)$$

Ov-inv- Over-investment;

ICI- Underinvestment;

Un-inv- Internal control quality;

Growth- development capacity;

Lev-Asset liability ratio ;

Fcf- free cash flow;

Roa- Profitability;

Rot- Proportion of physical assets.

III. Empirical Results Analysis

A. *The empirical analysis of investment efficiency estimation model*

The results of multiple regression of investment efficiency model in table 1show that the overall investment efficiency model in this paper is significant, and the Vif is greater than 1, and there is no collinearity problem. Among the independent variables, invt-1 and cash are significant at the level of 1%, indicating that the independent variables have a significant impact on the dependent variables, which is consistent with the previous results. The regression model can reasonably explain the dependent variables. RET passed the significance test at the level of 10%, which also had some influence on the independent variables. The ratio of assets and liabilities, the scale of the company and the period of listing have not passed the significance test.

TABLE I. MULTIPLE REGRESSION ANALYSIS OF INVESTMENT EFFICIENCY MODEL

Model	B	t	Sig.	VIF
(Constant)	.025	1.237	.216	
Inv_{t-1}	.426	23.327	.000	1.075
Growth	-.002	-1.057	.290	1.013
Lev	-.001	-.080	.936	1.301
Ret	.004	1.945	.052	1.034
Cash	.076	5.573	.000	1.130
Age	-.002	-.890	.373	1.042
Size	-.0001	-.111	.912	1.262

B. *An empirical analysis of the impact of internal control quality on investment efficiency*

1) Multiple regression analysis of the whole sample

From the data results in table 2, we can see that the development level, shareholder income, enterprise scale, fixed asset ratio and the largest shareholder's shareholding ratio are all significant at the level of 1%, 5% and 10%. From the Vif > 1, we can see that there is no multicollinearity in the model, and the independent variables in the model can explain the dependent variables. According to the regression results, it is significantly positive at the level of 5%. However, due to two situations of inefficient investment, this paper does not treat the data of insufficient investment as positive. Therefore, further research and analysis are needed for the two groups of data types. The level of development and the rate of return of shareholders respectively reflect the development ability and profitability of the enterprise, which is positively related to the inefficient investment, indicating that the improvement of development ability and profitability provides space and conditions for investment.

TABLE II. MULTIPLE REGRESSION ANALYSIS OF WHOLE SAMPLE

Model	B	t	Sig.	VIF
(Constant)	-.067	-3.263	.001	
ICI	.002	2.472	.013	1.087
Growth	.010	7.623	.000	1.037
Lev	.004	.638	.524	1.385
Fcf	.000	-.178	.859	1.050
Roa	.053	3.659	.000	1.134
Age	.000	-.058	.953	1.036
Size	.002	2.532	.011	1.479
Rot	.020	3.675	.000	1.606
Top1	-.021	-2.772	.006	1.147
Adjusted R^2		.039		
R^2		.043		
F		12.222		

2) Multiple regression analysis of under-investment

The results of multiple regression analysis are shown in table 3 below. It can be seen that the quality of internal control is significantly positively correlated at the level of 10%, which indicates that internal control has a restraining effect on investment shortage. The higher the quality of internal control is, the less the degree of investment shortage is, which is consistent with assumption 2 of this paper. Among the control variables, enterprise scale, development ability and fixed asset ratio are significant at the level of 1%, 5% and 10%, respectively. The asset liability ratio, development ability and fixed asset ratio are negatively related to the lack of investment. With the sustainable development of the enterprise, when the investment mode of the company cannot be synchronized with it, the judgment of the project is delayed or misjudged, leading to the loss of good investment projects. The asset liability ratio is too high, the return required by the shareholders is increased, leading to the lack of enough cash for the enterprise to invest, which also leads to the abortion of good projects. And the investment is insufficient.

TABLE III. MULTIPLE REGRESSION ANALYSIS OF UNDER-INVESTMENT SAMPLES

Model	B	t	Sig.	VIF
(Constant)	-0.091	-7.243	0.000	
ICI	0.001	1.332	.083	1.106
Growth	-0.003	-2.514	.012	1.023
Lev	-0.05	-1.303	.193	1.427
Fcf	0.002	1.562	.119	1.043
Roa	.002	.190	.849	1.128
Age	0.000	-.215	.830	1.049
Size	0.003	5.850	.000	1.481
Rot	-.007	-1.945	.052	1.070
Top1	-.006	-1.175	.240	1.147
Adjusted R^2		.028		
R^2		.033		
F		6.022		

3) Multiple regression analysis of over-investment

Finally, the multiple regression analysis of the over-investment samples (table 4) shows that the quality of internal control of independent variables has no significant impact on over-investment. Among the control variables, the development capacity and the return of shareholders are significant at the level of 1%, the asset-liability ratio is significant at the level of 5%, and other variables have no significant impact. The quality of internal control has no significant impact on over-investment. The main reason is that the implementation of internal control in state-owned enterprises is not deep enough, and there are soft budget constraints in state-owned enterprises, internal control failure, and investment behavior out of control.

TABLE IV. MULTIPLE REGRESSION ANALYSIS OF OVER-INVESTMENT SAMPLES

Model	B	t	Sig.	VIF
(Constant)	.083	1.827	.068	
ICI	-.001	.027	.978	1.075
Growth	.009	4.419	.000	1.115
Lev	.030	2.156	.031	1.337
Fcf	-.008	-1.351	.177	1.101
Roa	.006	3.728	.000	1.170
Age	.002	.072	.943	1.050
Size	.013	-1.516	.130	1.510
Rot	.015	1.183	.237	1.114
Top1	-.010	-.646	.519	1.178
Adjusted R^2		.044		
R^2		.054		
F		5.504		

IV. CONCLUSION

This paper takes the state-owned listed companies as the research object to study the impact of internal control quality on investment efficiency. The residual of Richardson's expected investment model is used to measure the low investment efficiency, and the Dibo internal control index is used to measure the quality of internal control.

A. Inefficient investment is common in state-owned listed companies

The phenomenon of inefficient investment is common in State-owned Listed Companies in China, and the proportion of samples with insufficient investment accounts for about 2/3 of all samples, which indicates that the current situation of insufficient investment is more common. When comparing the mean value of two kinds of inefficient investment phenomena, we find that the degree of over-investment is obviously high. The current situation of inefficient investment "blooms everywhere" in state-owned enterprises, which seriously hinders the rational allocation of funds, thus affecting the maintenance and appreciation of state-owned assets. Therefore, it is urgent to improve the efficiency of investment.

B. Internal control quality can improve investment efficiency

The quality of internal control and inefficient investment have a negative correlation on the whole. The regression results before the level of undifferentiated government show that the higher the quality of internal control is, the lower the degree of underinvestment is, but there is no significant but negative correlation in over-investment. According to the data of internal control quality, the difference of internal control quality of state-owned enterprises in China is obvious, which means that the quality of internal control needs to be improved. Internal control plays an undeniable role in ensuring the long-term development of enterprises. Improving the quality of internal control is an inevitable requirement for state-owned enterprises.

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