Study on the improvement of capital utilization efficiency of China's listed power companies based on the effectiveness of internal control

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Abstract

Along with the reformation of electric power system, power companies are losing their monopoly advantage and facing great challenges. The sample of this paper is the data of 58 listed electric power companies from 2014 to 2016.And the paper studies the correlation between the effectiveness of internal control and the efficiency of capital utilization. According to the research, there is a significant positive correlation between the efficiency of capital utilization and the effectiveness of internal control in listed electric power companies. The listed electric power companies should improve the effectiveness of internal control and then improve the efficiency of capital utilization.

Key words: *efficiency of capital utilization; effectiveness of internal control; listed electric power companies; control environment; risk assessment*

1 Introduction

The electric-power industry is Chinese basic industry providing protection for economic development. If the power companies don’t have effective internal control, resources will not be fully utilized. It will not only bring losses to the country, but also restrict economic development. Therefore, the electric power enterprises should strengthen internal control and improve the efficiency of capital utilization.

Jayanthi[1] proposed that the independence and professionalism of the audit committee and similar functional agencies will significantly promote the effectiveness of internal control. Moerland[2] established an index system according to the internal control information disclosed in the financial report. Based on the five objectives and requirements of internal control, Li Lianhua[3] established the evaluation index system. Zhu Chuanbao[4] established the index system from the point of five elements of internal control, and set reasonable weights for the indexes. Liu Dan[5] proposed to strengthen internal control from four aspects to improve the

efficiency of capital utilization. Cao Yingyu[6] elaborated on strengthening internal control and improving the efficiency of capital utilization to achieve the growth objectives of enterprises.

To sum up, there are some theoretical studies on the relationship between the internal control and the efficiency of capital utilization, but lack of empirical study of the correlation between the two. This problem should be further demonstrated and tested by the later researchers.

2 Theoretical analysis and research hypothesis

Internal control system is a contractual constraint in management. Enterprises can ensure the effective implementation of internal control, thereby avoiding the problem of agency. Effective internal control can reasonably ensure that enterprises operate in accordance with laws and regulations, and the assets are not infringed upon, so that enterprises can use resources effectively and economically. Then, enterprises can achieve their goals in an optimal way and improve the efficiency of capital utilization.

According to the above theoretical analysis, this paper puts forward the hypothesis of this research: the higher the effectiveness of internal control, the higher the efficiency of capital utilization.

3 Study design

3.1 Define variables

The explained variable of this article is the efficiency of capital utilization. Based on the previous research, this paper selects the DEA method to measure the indicator of listed electric power companies. This article selects three input indicators including retained earnings, debt financing and equity financing. Four output indicators including cash flow ratio, total asset turnover, return on equity and earnings per share are also selected. The original input and output indicators are shown in table 1.

Table 1 –Evaluating indicators of the efficiency of capital utilization

Input indicators	Internal capital		Earnings retained = surplus reserve + undistributed profit
	External capital	Liability capital	Debt financing = current liability + non-current liability
		Equity capital	Equity financing = capital stock + capital reserve
Output indicators	Sovency		Cash flow ratio = net cash flow from operating activities / current liabilities
	Operate		Turnover of total capital = sales income / average assets
	Profitability		Rate of return on net assets = net income / net assets
	Growth ability		Earnings per share growth rate = current earnings per share - previous earnings per share) / previous earnings per share

According to the "basic norms of internal control" issued by the Ministry of Finance and the framework of the international COSO report (Internal Control Integrated Framework), this article determined the quantitative evaluating indicators from the five elements of internal control. The effectiveness of internal control is analyzed through these five aspects: control environment, risk assessment, control activities, monitoring and information and communication. And we divide the indexes into three levels according to importance, with weights of 5, 3 and 2. Therefore, we can calculate the effectiveness of internal control and the effectiveness of the five elements of internal control.

We choose the company size, asset-liability ratio, sales of net profit margin and total assets turnover as the control variables.

3.2 Sample selection

This paper focuses on the listed electric power companies listed on the Shanghai and Shenzhen stock markets. And then filter in accordance with the following principles: First, exclude ST, PT and delisting listed companies. Second, exclude the listed companies whose data is incomplete and abnormal. Finally, the data of 58 listed electric power companies from 2014 to 2016 are used as the research sample. The data are collected from eastmoney.com, cninfo.com and the Tonghuashun software. And the information about internal control is collected and sorted manually by reading annual reports.

3.3 Model building

Since the results calculated by the DEA model are within the range of 0 to 1, the explanatory variables of the regression model are all greater than 0 and less than 1. If we use the traditional ordinary least squares to do the regression, there will be deviations. Therefore, this paper selected Tobit model for regression analysis.

According to the above hypothesis, the multiple linear regression model is as follows:

$$EFF= \beta_1+\beta_2 ICI+\beta_3 SIZE+\beta_4 LEV+\beta_5 NPM+\beta_6 ATR+ \varepsilon \quad (1)$$

Because the impact of the five elements on the efficiency of capital utilization may vary, this paper uses the following model to analyze the relationship between the five elements of internal control and the efficiency of capital utilization further.

$$EFF=\beta_1+\beta_2 CE+\beta_3 RA+\beta_4 CA+\beta_5 IC+\beta_6 SOC+\beta_7 SIZE+\beta_8 LEV+\beta_9 NPM+\beta_{10} ATR+ \varepsilon \quad (2)$$

4 Empirical test and result analysis

We use Eviews9 to do Tobit regression analysis. The multiple regression analysis results of model 1 are shown in table 2, and the results of model 2 are shown in table 3.

Table 2– Model 1. Empirical test results

Variable	2016			2015			2014		
	coefficient	z-Stat	Prob	coefficient	z-Stat	Prob	coefficient	z-Stat	Prob
Cons	0.9034	3.8094	0.0001	0.2866	3.5247	0.0004	0.3931	1.5372	0.1242
ICI	0.0070	1.6809	0.0928	0.0015	2.0356	0.0418	0.0022	1.4754	0.1537
SIZE	0.0026	0.7186	0.4724	0.0458	4.5469	0.0000	0.0361	3.2133	0.0013
LEV	-0.0611	-0.5356	0.5922	-0.2588	-2.9727	0.0030	-0.1681	-1.8659	0.0621
NPM	0.1162	2.9391	0.0033	0.0213	0.6689	0.5036	0.0206	1.3682	0.1713
ATR	0.6577	5.6476	0.0000	0.2900	3.9312	0.0001	0.2155	3.1417	0.0017
R^2	0.6251			0.6021			0.5716		
Adj-R^2	0.5575			0.5317			0.4748		

Table 3–Model 2. Empirical test results

Variable	2016			2015			2014		
	coefficient	z-Stat	Prob	coefficient	z-Stat	Prob	coefficient	z-Stat	Prob
Cons	2.3194	3.3514	0.0008	0.2465	2.1561	0.0311	0.3779	1.5195	0.1286
CE	-0.0121	-2.2072	0.0273	-0.0030	-1.7003	0.0891	-0.0054	-1.0382	0.2992
RA	0.0065	1.0382	0.2992	0.0049	2.1245	0.0336	0.0094	1.4569	0.1452
CA	0.0136	1.6570	0.0975	0.0057	1.3515	0.1765	0.0071	1.0969	0.2727
IC	-0.0386	-3.1981	0.0014	-0.0234	-2.3304	0.0198	-0.0177	-1.4894	0.1364
SOC	-0.0993	-2.4387	0.0147	-0.0907	-2.2053	0.0274	-0.0886	-2.3428	0.0191
SIZE	0.0127	1.1051	0.2691	0.0504	5.1306	0.0000	0.0348	3.1614	0.0016
LEV	-0.0569	-0.4944	0.6210	-0.2607	-3.1447	0.0017	-0.1335	-2.1561	0.0311
NPM	0.1636	4.5418	0.0000	0.0337	0.7186	0.4724	0.0170	1.9574	0.0503
ATR	0.8123	7.4721	0.0000	0.3405	4.7431	0.0000	0.2178	3.2765	0.0011
R^2	0.6733			0.6784			0.6178		
Adj-R^2	0.5825			0.5806			0.5299		

According to the data in table 2 and table 3, we can know that the R^2 of model 1 are greater than 0.55 and the adjusted R^2 are greater than 0.45. The R^2 of model 2 are greater than 0.6 and the adjusted R^2 are greater than 0.5. This indicates that the models have a good fitting degree. And there is a high degree of explanation for the efficiency of capital utilization in existing variables.

Through the results of multiple regression analysis in table 2, we can know that the regression coefficients of the effectiveness of internal control from 2014 to 2016 are all greater than 0. It shows that the efficiency of capital utilization of listed electric power companies is positively related to the effectiveness of internal control. The Prob is less than 0.1 in 2016 and less than 0.05 in 2015. It shows that the efficiency of capital utilization is significantly positively related to the effectiveness of internal control over 95%. So strengthening internal control can effectively improve the efficiency of capital utilization of listed electric power companies.

The results of model 2 show that: There was a significant negative correlation with more than 95% possibility in 2016 and more than 90% possibility in 2015. This may be due to the control environment is too strict and enterprises don't make full use of equity financing. The regression coefficients of risk assessment and control activities are positive. And the efficiency of capital utilization is significantly positively related to the risk assessment and control activities. This shows that strengthening risk assessment and control activities can effectively improve the efficiency of capital utilization. The regression coefficients of information communication and monitoring reflect that more than a certain degree of information communication and monitoring will reduce the efficiency of capital utilization of listed electric power companies. Because excessive communication will lead to higher costs and lower flexibility.

Comparing the regression coefficients of the five factors, we find the following views. The regression coefficient of monitoring is the largest, which indicates that the timely and effective monitoring can greatly affect the efficiency of capital utilization of the listed electric power companies. Strengthening the information communication can effectively affect the efficiency of capital utilization. Control environment, risk assessment and control activities have similar effects on the efficiency of capital utilization. Listed electric power companies can choose reasonable methods to strengthen internal control and improve the efficiency of capital utilization.

5 Research conclusions and suggestions

Based on the empirical research above, this paper draws the conclusions:

The efficiency of capital utilization of listed electric power companies is positively related to the effectiveness of internal control. The efficiency of capital utilization is positively related to risk assessment and control activities, and negatively related to control environment, information communication and monitoring. That is to say, improving the effectiveness of internal control can effectively improve the efficiency of capital utilization. And the comprehensive risk supervision and efficient control activities can improve the efficiency of capital utilization. Too strict control environment, excessive information communication and monitoring will inhibit the efficiency of capital utilization.

Therefore, listed electric power enterprises should control the implementation of the five elements in a reasonable level such as simplify the information and communication, strengthen the flexibility of supervision and adjust the control environment. They can strengthen the internal control construction with emphasis so that the enterprises make the use of capital more efficient.

References

1. *Jayanthi Krishnan,* The disclosure of material weakness in internal control after the Sarbanes-Oxley Act, The Accounting Review. Sci. **91** (2005) 137-158.
2. *L. Moerland,* Incentives for Reporting on Internal Control--A Study of Internal Control Reporting Practices in Finland, Norway, Sweden, The Netherlands and United Kingdom, Maastricht University. Sci. **95** (2007) 58–72.
3. *L. Lianhua, T. Guoping*, Internal control efficiency: theoretical framework and measurement evaluation, Accounting Research. Sci. **93** (2012) 16–21.
4. *Z. Chuanbao, K. Han*, Research on the correlation between the effectiveness of internal control and corporate performance, Economics and Management Review. Sci. **91** (2014) 126–131.
5. *L. Dan,* How to strengthen internal control and improve the efficiency of capital utilization, Chinese Commercial Circles. Sci. **97** (2009) 132–138.
6. *C. Yingyu,* Strengthen internal control and improve the efficiency of capital management, Financial Circles. Sci. **95** (2015) 76–236.