

Is the Internal Capital Market Efficient?—Empirical Evidence from Chinese A-Shares Listed Companies*

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Abstract: This paper measure the efficiency of internal capital market according to the new model on the basis of the existing internal market efficiency model modification, The study found that A-shares listed Corporation internal capital market efficiency is effective overall and has the effect on the allocation of resources. The result has a guiding significance for understanding the Chinese capital market efficiency.

Introduction

In mid twentieth Century, America appears the phenomenon of mergers and acquisitions in large-scale, the same situation also appeared in other countries, the enterprise group's internal capital market gradually formed. At the same time, the advantages of internal capital market in the allocation of resources has also accelerated the occurrence and development. In 1980s, However American appears the phenomenon of the disintegration of enterprise group in large scale, the results show that this kind of phenomenon and the low efficiency of internal capital market has a significant and direct relationship which makes the scholars study the enterprise group's internal capital market efficiency, and the research method has gradually shifted from the pure theory research to a multi angle research.

However, these research conclusion mainly about USA "conglomerate" (M organization) can not be directly used for "group" (H organization). In addition, Chinese group path is very different form other emerging market countries and the differences of Chinese political and economic background, so a series of problems about operation mechanism ,operation efficiency and the effects need further research.

In China, inefficient allocation of resources has been a serious problems . A shares listed Corporation as the main part of China's listed Corporation is very representative. But because the segment data is difficult to obtain, less research objects use A shares listed Corporation about the internal capital market efficiency. This paper chooses A shares listed Corporation as the object of study to come to the conclusion which reflect the efficiency of internal capital market of our country .

Domestic and foreign literature review and evaluation

The relevant foreign research literature

On the efficiency of internal capital market, the existing literature give two views: the effective

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theory and invalid theory.

The effective theory thinks that the efficiency of internal capital market is from the headquarters of the residual rights of control and information advantage, it can reduce the information asymmetry and increase the incentive and supervision to gain "multi currency effect" and "good money" effect, so as to improve the enterprise internal capital allocation efficiency. Stein (1997) [1] described the internal capital market "picking winners" activities: headquarters with the information and residual rights of control allocated resources for higher efficiency division accurately .

Invalid theory thinks that the internal capital market in the enterprise internal capital allocation is inefficient or ineffective because of the problem of agency, cost and the abuse of free cash flow . Scharfstein and Stein (2000) [2] and Rajan (2000) [3] have different and same research. The same point is that they all agree "socialist" in the process of internal capital allocation, and the greater difference of investment opportunities between segments, the problem is more serious . The difference point is Scharfstein and Stein (2000) [2] model is a double agent model, they think that when company head quarters have a weaker ordering incentive , "socialist" phenomenon is the most significant.

Domestic related literature

Yang Mianzhi (2006) [7] reviewed on the efficiency of internal capital market research and pointed out that at present external capital market of our country is under the condition of low efficiency, the development of internal capital market has a very positive effect on improving the efficiency of resource allocation.

On the theory research of the internal capital market efficiency influencing factor , Xu Qiting (2008) [9] pointed out that there are relations between internal capital market efficiency and CEO decision-making ability , capital allocation decision-making procedures and internal decision-making level, organization of information structure, agency problems, different factors will bring different results of internal resource allocation. Wang Fengjuan and Wang Yakun (2009) [11] analyses the group of financial institutions enhance on the efficiency of internal capital market and points out that the financial sector is the operation platform and intermediary of internal capital market, but also can help resource allocation be better through the internal borrowing rates.

Review of the literature

Many foreign scholars show that the advantage of internal capital market in the aspect of information, incentive and supervision is the efficiency factor of internal capital allocation, but the agency problem, rent-seeking and abuse of free cash flow is not efficiency factors of internal capital allocation. Diversification is the main factor affecting the efficiency of internal capital markets, but on the aspect of the effect, at present it has not been unanimous conclusion. The results of these studies provide the theoretical basis and good perspective for subsequent research, especially for emerging market countries. This paper set out from the inside, the external capital market relations and internal resource allocation system, the paper makes a systematic study on the internal capital market efficiency of our country enterprise using A shares listed companies as a sample, to provide a complete analysis framework for further theoretical analysis and empirical research.

Measure the efficiency of internal capital markets

An empirical measure model of internal capital market efficiency

The existing empirical measure model of internal capital market efficiency

The model of researching on internal capital market efficiency measure is divided into indirect

model and direct model. the premise hypothesis of the indirect method is that only diversified enterprises exist internal capital market, with the excess value reflecting the efficiency of internal capital market. Direct research model mainly includes the investment cash flow sensitivity, value added method, the sensitivity of Q method and the cash flow sensitivity method. Although these methods increase the possibility of direct evaluation of internal capital market efficiency. But it still has some defects, it still needs further research and improvement.

Wang Fengjuan (2009) [18] studied on the efficiency of internal capital market using H share as sample, improved the efficiency of internal capital market measure model and form the cash flow sensitivity coefficient based on rates of return on assets (Cash Flow-Sensitivity Based on ROA, CFS_A).

$$CFS_A = \sum_{j=1}^n \left[\left(\frac{cf_j}{BA_j} - \frac{cf}{BA} \right) \left(\frac{capex_j}{BA_j} - \frac{capex}{BA} \right) \frac{BA_j}{BA} \right] \quad (1)$$

The model determines whether internal capital market is effective according to the sign of CFS_A , if $CFS_A > 0$, the internal capital flow to the division that enterprise cash flow rate of return is higher, internal capital market is effective. On the contrary, the internal capital market is ineffective.

The verification and constructing of a new model

A shares listed Corporation segment information has not been fully disclosed, the key data of some computational efficiency (such as cash flow, capital expenditure) is a serious loss that it is unable to study directly on the A shares listed Corporation of internal capital market efficiency. But with the development of A shares listed Corporation segment disclosure, more and more detailed division data listed Corporation is disclosed and it is possible to research the internal capital market efficiency using the A shares listed Corporation as a sample.

Through the observation of all A shares listed Corporation annual report, it is found that most listed Corporation depreciation data disclosure is still inadequate, Therefore this paper use profit index instead of cash flow index and use the rate of return to reflect the allocation of resources or investment opportunity index. The rationality for this alternative: first, when differences of each segment assets structure is not the case, the profits instead of cash flow calculation for each segment relative capacity will not change; second, the rate of return on total assets and net assets yield rate which is on the calculated basis of the net profit are the core indicators of performance evaluation and investment decision making. The profit sensitivity is based on return on assets (APS: Adjusted Profit Sensitivity), the calculation formula is as follows:

$$APS = \sum_{j=1}^n \left[\left(\frac{p_j}{BA_j} - \frac{p}{BA} \right) \left(\frac{capex_j}{BA_j} - \frac{capex}{BA} \right) \frac{BA_j}{BA} \right] \quad (2)$$

The model judge whether the enterprise internal capital flows to the division of higher rate of return based on the APS symbol, than it can determine whether internal capital market is effective. Profit sensitivity coefficient is positive and the internal capital market is effective; whereas the internal capital market is uneffective. this paper use the profit index instead of cash flow index test to calculate different parameters of sensitivity. The results showed that segment profit instead of partial cash flow did not cause changes in APS symbols. it is visible that we can measure the internal capital market efficiency using APS when China's A shares listed Corporation segment data disclosure is still not perfect situation,

Evaluation of A shares listed Corporation's internal capital market efficiency

This paper makes a general evaluation of the efficiency of China's A shares of internal capital market listed Corporation, has laid the foundation for the study of factors affecting the efficiency of internal capital.

Sample selection

The number of enterprise groups in China is large, especially enterprise group of the listed Corporation is too numerous to enumerate. Due to the data availability, because it is unable to obtain the information and data of the whole group, it is only relatively feasible study on listed Corporation. The number of A shares listed Corporation is the largest, thus it was selected as the sample of this study sources. In order to ensure the reliability and the representative of the conclusion of the study, this paper uses panel data. The database does not provide the segment reporting information, so the relevant information and data use manual collection. This paper select samples of A shares of the listed Corporation from 2007 to 2010. Remove sample enterprises not to disclose segment information, financial enterprises, only the disclosure of the division of regional data and disclosure is not perfect, this paper finally gets 516 sample, sample and distribution in different years as shown in table 1.

Table 1 Sample distribution

Years	2010	2009	2008	2007	total
The number of A shares listed companies	2132	1718	1625	1550	7025
The number of A shares listed companies that disclose segment information in Schedule form	254	235	231	219	939
The number of A shares listed non-financial companies that disclose segment information	224	209	208	199	840
The number of A shares listed non-financial companies that disclose business segments	194	189	175	167	735
Total number of samples	161	143	126	86	516

Measuring of the efficiency of internal capital market

Through comparative analysis and verification, The paper constructs the measurement model based on the profit sensitivity coefficient of asset returns. Although the Sample Firms in 2010 has 161, but some listed Corporation listed in a relatively shorter time, the total sample of 4 years from 2007 to 2010 is only 516, considering the time lag factor, sample amount is less, therefore this paper select the profit sensitivity coefficient based on the asset returns without considering the time lag factor as the evaluation index of the internal capital market efficiency.

Evaluation of the efficiency of internal capital market

This paper evaluate internal capital market efficiency of A shares listed Corporation according to the mean and median symbols of the Sample Firms profit sensitivity coefficient as well as the effective sample weight. If the median and mean of APS were positive, then the internal capital market is effective; if the median and mean of APS is not all positive, it illustrate the overall efficiency of internal capital market according to the effective sample.

Evaluation of internal capital market efficiency of A shares listed corporation

Profit sensitivity descriptive statistics, as shown in table 2.

Table2 Profit sensitivity coefficient sample descriptive statistics

Project	2010	2009	2008	2007	The total sample
observations	161	143	126	86	516
The mean	0.00741021	-0.00017684	0.00153960	0.00589224	0.00362108
The edian	0.00002051	0.00000376	0.00000722	0.00001324	0.00000447
Range	0.950580	0.458261	0.255051	0.483806	1.170366
The minimum value	-0.022216	-0.242002	-0.038792	-0.129513	-0.242002
The maximum value	0.928364	0.216259	0.216259	0.354293	0.928364

From the table, the maximum value of the whole sample profit flow sensitive coefficient is 0.928364, the minimum value is -0.242002, it changes in the rate of 1.170366, which shows that the difference of internal capital market efficiency is very big; The mean is 0.00362108 and the median is 0.00000447245, both are positive, the internal capital market of the visible Sample Firms as a whole is effective. From the descriptive statistics of each year, each year of 07, 08, 10, the mean and median of profit sensitivity are positive, we can explain that the Sample Firms can effectively allocate resources in this years. The mean and median of Sample Firms profit sensitivity in 2009 are positive and negative, it must combine the effective group accounted for this indicator to judge this year whether internal capital market Sample Firms are effective.

Each year of 2007 - 2010 group ratio index statistics are shown in table 3.

Table 3 Sample Packet Statistics

Year	2007	2008	2009	2010	total
The number of samples	86	126	143	161	516
Effective roup	44	63	74	93	274
Invalid group	42	63	69	68	242
Effective roup accounted for	51.16%	50.00%	51.75%	57.76%	53.10%

It can be seen from the table data that 53.1% of Sample Firms' internal capital market is effective in all Sample Firms. Annual statistics can be seen that the rest of the year has more than 50% Sample Firms can effectively allocate internal capital with the exception of 2008, just 50% of sample Firms' the internal capital market is effective, Therefore the internal capital market of Sample Firms in the whole is efficient.

The conclusion

This paper analyzed 516 samples per year during 4 years from 2007 to 2010, according to the two ways of evaluation: the mean and median symbol of the Sample firms profit sensitivity and the effective composition, they all showed the conclusion that internal capital market of Sample Firms is effective, the research results have great significance for understanding the efficiency of internal

capital market in China's listed Corporation.

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