IS INTERNAL CAPITAL MARKET OF CHINA LISTED COMPANIES EFFICIENT?

Empirical Evidences from Listed Companies which Have Multiple Divisions in H-stock

Fengjuan Wang and Zhihua Xie
Business School, Beijing Technological and Business University, Fucheng Road, Beijing, P.R. China

Keywords: Internal capital market efficiency, Cash flow-sensitivity based on ROA, Evaluation method.

Abstract: In theory, when external capital market is not efficiency, groups can allocate resource efficiently through internal capital market. In this paper, we studied of listed companies which have multiple divisions in H-stock, used Cash Flow-Sensitivity Based on ROA to validate internal capital market efficiency of large samples. Results display that, on the whole, internal capital market of listed companies is efficiency, and the greater part of listed companies can continually allocate resource efficiently through internal capital market, part of listed companies have excellent capacity to "pick winner". This paper is the first literature which employs listed companies as large samples to evaluate internal capital market efficiency directly, which would make research results more reliable and more representative. It would provide evidences for developing groups in our country and lay the foundation of further research in theory and method.

1 INTRODUCTION

Due to the serious friction in the external capital market, the rapid development of enterprise groups and the wide presence of internal capital market practice, in recent years the concern on the theory of internal capital market in emerging market countries gradually exceeds the origin of this theory——the United States and other developed countries. Theoretically speaking, when the external capital market is inefficient or ineffective, the resources can be effectively allocated through internal capital market. Enterprises can build the internal capital market through diversified or group-based operation. Enterprise groups in China are rather common with a relatively high degree of diversification, internal capital market practice is prevalent and developing enterprise groups has always been seen as an important economic policy by the Government. However, the existing cases or empirical research literature about internal capital market efficiency (Lu Jianxin, 2008; Xu Qiting, 2008; Shao Jun and Liu Zhiyuan, 2007) all choose "the Family Enterprise" as the research object, which draws a conclusion that the internal capital market is inefficient. Wang Fengjuan and Zou Cunliang(2009) raised questions about their samples and concludes.

In summary, the internal capital market theory, practice and empirical evidence suffer contradiction. Does this mean that the economic policy of developing enterprise groups is wrong? Does it mean that the market behavior of the enterprise groups is irrational? To answer the questions is the aim of this article.

2 LITERATURE REVIEW AND THEORETICAL ANALYSIS

2.1 The Theoretical Basis for the Effective Internal Capital Market

The effectiveness of internal capital markets is due to the headquarters remaining control and information superiority, which can reduce the information asymmetry, increase motivation and effective supervision, producing "more-money effect" and "smarter -money effect".

The internal capital market results from the imperfection of the external capital market: asymmetric information. Due to the internal

Wang F. and Xie Z..
IS INTERNAL CAPITAL MARKET OF CHINA LISTED COMPANIES EFFICIENT? - Empirical Evidences from Listed Companies which Have Multiple Divisions in H-stock .
DOI: 10.5220/0003597206000605
In *Proceedings of the 13th International Conference on Enterprise Information Systems* (PMSS-2011), pages 600-605
ISBN: 978-989-8425-56-0

information barriers or high costs existing in obtaining the internal information of an enterprise, the external capital market can not conduct continuous fine-tuning to the company based on the market conditions, while the internal capital market is superior in the authenticity, timeliness and accuracy of the information, and has an advantage on the adaptability to the market environment (Williamson, 1975). Myers and Majluf (1984), Stein (1997) also provides the same evidences.

Gertner, Scharfstein and Stein (1994) built a model on the basis of Grossman and Hart ownership theory. They said that in the internal capital market, corporate headquarters (the investor) is the direct owner of the assets of divisions that utilize funds, and has residual control rights, while the investors of the external capital markets are not the direct owner of those assets. Due to this essential difference, the enterprise messaging, monitoring and incentives produce different results between internal capital markets and external capital markets. In the internal capital markets, the corporate headquarters with the residual control rights can better supervise and motivate departmental managers.

When there is information asymmetry between external investors and company management about the company assets value and expected return on investment projects, the securities issued by high-quality companies to finance investment projects may be undervalued, because companies may not obtain sufficient funds at a reasonable cost, they have to give up some projects with a positive net present value (Myers and Majluf, 1984) . Stulz (1990) pointed out that since the creation of a strong internal capital markets in diversified companies, it will effectively solve the problem of insufficient investment, so diversified business operations than single enterprises can make greater use of the investment opportunities that present value is positive, which will enhance corporate value.

2.2 The Theoretical Basis for the Ineffective Internal Capital Market

Due to the agency problem, influence costs and abuse of free cash flow, the internal capital market is inefficient or even ineffective in capital allocation.

Scharfstein and Stein (2000)believed a good investment project suffers relative under-investment and a poor investment project enjoys over-investment. With regard to the causes of "Company socialism", Scharfstein and Stein (2000) continued to analyze and found that this was due to the department manager's rent-seeking behavior. Rajan, etc. (2000) study have also reached the similar conclusion.

Managers have the tendency of over-investment with the remaining cash flows (Jensen, 1986, 1993), and the organizational structure of large enterprise provides more cash flow for managers, which thus easily leads to over-investment. Free cash flow theory suggests that due to the temptation of a number of factors, entrepreneurs prefer to invest in the project that would not increase shareholder wealth as opposed to paying the dividend, such as the money for its own on-the-job consumption (purchase of commercial aircraft), or the consumption for honor(for social contributions, etc.).

2.3 China's External Capital Market Efficiency and the Empirical Evidences

In China, the external capital market is inefficient, which has been proved by a large number of research literature. The first is the low efficiency of the banking system. Lu Jianxin(2008) argued that the bank-led financing model prevails in China, but for quite a long time, China's banking resource allocation is based upon the administrative relations. As the backbone of the banking system, state-owned commercial banks inject their credit facilities into the state economy whose economic contribution rate is not high. As a result, input and output are significantly mismatched, funding does not flow into sectors of high efficiency, and the allocation of resources is markedly ineffective. Second, the efficiency of China's stock market is rather low. Yu Qiao (1994) , Wu Shinong(1996), Chen Xiaoyue, et al (1997), Han Liyan and Cai Hongyan (2002), Zhang Bing and Li Xiaoming (2003), and Zeng Yamin (2004) have used different methods to study the stock market efficiency and reached the conclusions that China's stock market is ineffective or inefficient.

3 EVALUATION MODEL SELECTION OF INTERNAL CAPITAL MARKET EFFICIENCY AND EVALUATION METHODS

3.1 Internal Capital Market Efficiency Evaluation Model Selection

Measurement methods of internal capital market

efficiency can be divided into indirect and direct research methods. In the early empirical studies, researchers largely used the indirect research method. The indirect research method is a rough measurement; its use stems from researchers' inability to obtain needed business segment data (Lu Jianxin, 2008). With the improvement of segment reporting standards, segment information gradually meets the need of directly measuring the efficiency of the internal capital market. Particularly, after the advent of databases directly providing detailed financial data of the enterprise segment such as COMPUSTAT database and the LRD database, the direct research method has been increasingly used(Wang Fengjuan,2009). In abroad, the direct research model mainly has the following four kinds: investment cash flow sensitivity method (Shin and Stulz, 1998), the value added method (Rajan and Zingales, 2000), Q-sensitivity (Peyer and Shivdasani, 2001), and cash flow sensitivity method (Maksimovic and Phillips, 2002; Shcoar, 2002). Chinese scholars mostly use Q-sensitivity and cash flow sensitivity methods, including Wang Fengjuan and Zou Cunliang (2009), Lu Jianxin (2008), Xu Qiting (2008), Shao Jun and Liu Zhiyuan (2007). Conducted an in-depth analysis of the four models above, Wang Fengjuan and Xie Zhihua(2010) designed a new model named “cash flow sensitivity methods based on asset return”.

The formula of cash flow sensitivity coefficients based on the return on assets is as follows:

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

In the formula BAj is the book assets of segment j, BA is the book assets of all segments; cf is the cash flow of all segments. Capex is capital expenditure. The model is an improvement on cash flow sensitive method, replacing $\left(\frac{cf_j}{sale_j} - \frac{\overline{cf}}{\overline{sale}}\right)$ with $\left(\frac{cf_j}{BA_j} - \frac{cf}{BA}\right)$.

Just as the external investors invest to obtain investment return, the ultimate goal of internal capital allocation is to maximize return on capital. Thus, in theory, regardless of the external or internal capital markets, the return on investment is the resource allocation criterion which is the principle to design cash-flow sensitivity method based on assets return. Therefore, this article selects cash-flow sensitivity method based on return assets to evaluate the internal capital market efficiency.

3.2 Evaluation Methods of Internal Capital Market Efficiency

This paper uses two approaches to evaluate the internal capital market effectiveness of the samples as a whole. The first is based on the mean and median of the sample company's cash flow sensitivity coefficient: if both are positive, then the internal capital market is effective; if they are opposite, then make a judgment after further analysis. The second is based on the positive and negative signs of cash flow sensitivity coefficients, and calculates the percentage of samples with positive efficiency to the total sample (referred to "percentage of effective class"), when the percentage is greater than or equal to 50%, the internal capital market is effective on the whole.

In addition to the overall evaluation of all samples, in order to determine continuity of internal capital market efficiency in the sample companies, this paper has also drawn the samples that have disclosed segment data for 8 consecutive years, or throughout the period covered by our research, calculated the percentage of the years in which resources are effectively allocated to the 8 years. If the percentage is greater than or equal to 50%, then the sample's internal capital market as a whole is effective.

4 EVALUATION OF INTERNAL CAPITAL MARKET EFFICIENCY IN H SHARES LISTED COMPANIES WITH MULTI-SEGMENT

4.1 Sample Selection and Data Sources

In China listed company's shares include A shares, B shares, H shares, N shares and S shares. This distinction is primarily based on the location and investors the stock may target. In the quantitative terms, A-share listed company is largest and most representative, but due to incomplete division information, there is a lack of the critical data necessary to measure the internal capital market efficiency: "segment capital expenditure" and "division cash flow". Therefore, this paper selects H-share listed companies as object and makes an overall assessment of the internal capital market efficiency of listed companies in China. H-share and A-share listed companies are registered in the Mainland, there are therefore identical in terms of

Table 1: Total samples and distribution in each year.

Year	2007	2006	2005	2004	2003	2002	2001	2000	Total
Sample	72	64	46	37	29	20	17	12	297
Main board	56	49	33	26	20	15	15	11	225
GEM	16	15	13	11	9	5	2	1	72

Table 2: The descriptive statistics.

Item	2007	2006	2005	2004	2003	2002	2001	2000	total
Observation	72	64	46	37	29	20	17	12	297
Mean	0.0005885	0.0034292	0.000528	-0.001498	0.0030955	0.0081759	0.0002153	0.0006378	0.0016677
Median	1.956E-05	0.0004584	5.631E-05	0.000006	0.0000981	0.0006605	0.0001805	-4.6E-05	0.0001499
Change scope	0.0522768	0.4083792	0.0406579	0.1560778	0.075269	0.0912034	0.0157066	0.0165996	0.4083792
Min	-0.020521	-0.172303	-0.025152	-0.107211	-0.016456	-0.002803	-0.009739	-0.007817	-0.172303
Max	0.0317557	0.2360765	0.015506	0.0488668	0.058813	0.0884001	0.005968	0.008783	0.2360765
Skewness	1.8238095	1.9762107	-1.004468	-3.720129	3.1522601	3.2461998	-1.02608	0.2011373	-3.720129
Kurtosis	10.528633	25.898063	7.2486914	22.297462	11.018523	10.814744	3.661448	0.2791072	22.297462

Table 3: The statistics by class for each year.

Year	2007	2006	2005	2004	2003	2002	2001	2000	Total
Number of samples	72	64	46	37	29	20	17	12	297
Inefficient Class	35	25	21	18	13	6	7	6	131
Efficient Class	37	39	25	19	16	14	10	6	166
Percentage of efficient	51.39	60.94	53.35	51.35	55.17	70	58.82	50	55.89

ownership structure, corporate governance and business environment. Some of the samples belong to both A-share and H-share, so the samples have a strong representative value. The paper ultimately obtains 297 samples, with the total number of samples and the distribution in each year are set out in Table 1.

4.2 The Evaluation based on All Samples

All samples and the descriptive statistics of cash flow sensitivity coefficients of sample groups for each year are set out in Table 2.

It can be seen from Table 2 that the maximum of cash flow sensitivity coefficient of all samples is 0.236076526, the minimum is -0.172302688 and change amplitude is 0.408379214, which indicate the level of differences in the efficiency of the internal capital market is relatively large; the mean is 0.001667662, the median is 0.000149884, both are positive. Therefore, the internal capital market of the samples as a whole is effective. From the descriptive statistics for each year, except in 2000 and 2004, the mean and median are positive, indicating in the six years the samples are able to effectively allocate resources. A further analysis found that in 2004 the sample statistical bias degree was -3.72012936, indicating the efficiency indicators of sample companies presented serious left side. When excluding the minimum, the mean is 0.001438145, and the median is 0.00004489, both being positive; when excluding the minimum and maximum, the mean is 8.30393E-05, and the median is 0.000006, both being positive.

4.3 The Evaluation based on All Samples Comparison of Main Board and Growth Enterprise Market

The comparison of internal capital market efficiency of Main Board and Growth Enterprise is set out in table 4.

In Table 4 by comparing the mean and median of cash flow sensitivity coefficient in Main Board and GEM, the internal capital market efficiency of Main Board is higher than the GEM. This is mainly because the size of listed companies in the Main Board is large, cash flows are highly complementary and the internal capital operating mechanism are relatively advanced and standardized.

4.3 Evaluation of the Continuity of Internal Capital Market Efficiency

The above statistical analysis in general evaluates the internal capital market efficiency of Chinese listed companies, but because the return on capital may occur at a later time. The cash flow sensitivity coefficient for a period is negative, this does not

Table 4: Cash flow sensitivity coefficient of Main Board and Grow Enterprise Market.

Item	Number of samples	Max	Min	Change scope	Mean	Median
Total samples	297	0.236076526	-0.172302688	0.408379214	0.001667662	0.000149884
Main Board	225	0.2360765	-0.107211	0.3432875	0.001923538	0.000191511
GEM	72	-0.107211	-0.1723027	0.2607028	0.00086805	-0.00003439

Table 5: Cash flow sensitivity coefficient of sub-sample.

Item	2007	2006	2005	2004	2003	2002	2001	2000	total
Number of samples	12	12	12	12	12	12	12	12	96
Max	0.021319	0.236077	0.005891	0.008910	0.058813	0.011401	0.005968	0.008783	0.236077
Min	-0.002943	-0.001282	-0.001448	-0.107211	-0.001240	-0.002803	-0.009739	-0.007817	-0.107211
Change scope	0.024262	0.237359	0.007339	0.116121	0.060053	0.014204	0.015707	0.016600	0.343288
Mean	0.002467	0.022108	0.001183	-0.007753	0.005943	0.001776	0.000395	0.000638	0.003345
Median	0.000912	0.000651	0.000098	0.000171	0.000234	0.000985	0.000376	-0.000046	0.000349

necessarily point to the inefficient resources allocation in the current period. Therefore, it is needed to conduct a continuity research on the allocation efficiency for each year. Of the 72 sample companies with 2007 as the base, 12 companies disclosed segment information throughout 8 years from 2000 to 2007, and met the requirements for the calculation of cash flow sensitivity coefficients based on the return on assets. Therefore, this paper selects the 12 listed companies as the research object and got 96 sub-samples.

The descriptive statistics of cash flow sensitivity coefficients of the 96 sub-samples are set out in Table 5. As seen from Table 5, except that the median in 2000 is negative (consistent with the analysis of total sample), the mean and median of the other years as well as the total sample are positive. Therefore, either from the sub-sample for each year or from the sub-sample for the total sample, the internal capital market is effective.

5 CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

5.1 Conclusions

By analyzing 297 samples from 2000 to 2007 by year and by the Main Board and the GEM, and evaluating the sample in accordance with the mean and median of the cash flow sensitivity coefficient and the percentage of efficient class, this paper arrives at the conclusion that the internal capital market of the sample companies was effective, and the internal capital market of the Main Board samples was more efficient than that of the GEM. As the samples have strong representativeness, this paper concludes that internal capital markets of Chinese listed companies and even non-listed companies are efficient, and the internal capital market efficiency of large enterprises was higher than that of small businesses.

5.2 The Limitations of this Article and Future Research Directions

Although H-share listed companies and A-share listed companies are registered and operate in the Mainland, and are identical in terms of ownership structure, corporate governance and business environment, the conclusions of the study has certain limitations due to the difference in the regulatory level between the A-share and H-share market. Therefore, the research directly on the A shares will be more meaningful. But this requires improvements on segment information disclosure in the A-stock market or a new empirical model designed based on existing available information, which is exactly the direction of future research. Moreover, the paper finds that 44.11% of the sample companies were still unable to effectively allocate resources. So why can some companies allocate resources efficiently, while others can not? What factors have led to differences in the efficiency of resource

allocation? How to build an effective internal capital market? These are valuable research topics.

ACKNOWLEDGEMENTS

This article is subsidized by Beijing Education Commission (SM201010011008 and PHR20100512) and Beijing Natural Science Foundation (9112005).

REFERENCES

Chen Xiaoyue, Chen Xiao, and Gu Bin, 1997. Empirical research on weak efficiency in the Chinese stock market. *Economic Research Journal* , vol.9, pp.13-17.

Gertner, R. H., D. S. Scharfstein and J. C., Stein, 1994. Internal Versus External Capital Markets. *The Quarterly Journal of Economics,* No.109, pp.1211-1230.

Han Liyan, Cai Hongyan, 2002. Research on the capital allocation efficiency in China and its relationship with the financial market. *Management World*, no.1, pp.65-70.

Jensen, M., 1986. Agency Costs of Free Cash Flow， Corporate Finance， and Takeovers. *the American Economics*, vol.76, no.2, pp.323-329.

Jensen, M., 1993. The Model Industrial Revolution, Exit, and the Failure of Internal Control Systems. J*ournal of Financial,* vol.46, no.2, pp.831-880.

Lu Jiangxin, 2008. *Research on allocation efficiency of internal capital market*. Peking University Press.

Maksimovic, V., G. Phillips, 2002. Do Conglomerate Firms Allocate Resources Inefficiently across Industries? Theory and Evidence. *Journal of Finance,* Vol.56, No.2, pp.721-768.

Myers, S. C., and N. C. Majlufm, 1984. Corporate Financing and Investment Decision when Firms Have Information that Investors Do Not Have. *Journal of Financial Economics*,no.13, pp.187-222.

Peyer, U. C. and A. Shivdasani, 2001. Leverage and internal capital markets: Evidence from leveraged recapitalizations. *Journal of Financial Economics,* Vol.59, No. 2: pp.477-515.

Schoar, A., 2002. Effects of Corporate Diversification on Productivity. *Journal of Finance*, Vol.57, No.6, pp.2379-2403.

Rajan, R., S. Henri, and L. Zingales, 2000. The Cost of Diversity: The Diversification Discount and Inefficient Investment. *Journal of Finance*, Vol.52, No.1, pp.35-80.

Shao Jun, Liu Zhiyuan, 2007. Is the internal capital market within an enterprise family efficient? – case study based on the Hongyi Family. *Management World* , No.6,pp.114-121.

Shin and Stulz, 1998. Are Internal Capital Market Efficient?. *Quarterly Journal of Economics*, Vol. 113, No.2 (May), pp.531-552.

Stein, J. C., 1997. Internal Capital Markets and the Competition for Corporate Resources. *The Journal of Finance*, vol.52, pp.111-133.

Stulz, R., 1990. Managerial Discretion and Optimal Financing Policies. *Journal of Financial Economics*, Vol.26, No.1, pp.3-27.

Wang Fengjuan, 2009. *Research on Internal Capital Market efficiency: A Study Based on H-stock*. Economic sciences press

Wang Fengjuan, Xie Zhihua, 2010. The Modification and Verification of Empirical Model to Measure Internal Capital Market Efficiency. *Accounting Research*, no.8, 108-124.

Wang Fengjuan, and Zou Cunliang, 2009. Degree of diversification and efficiency of internal capital market – study of cases based on division data. *Management World* , no.4,pp.153-161.

Williamson, O liver E., 1975. *Markets and Hierarchies：Analysis and Antitrust Implication*. New York：Free Press.

Wu Shinong, 1996. Analysis of the efficiency in the Chinese securities market. *Economic Research Journal*, no.4, pp.13-19.

Xu Qiting, 2008. *Research on efficiency of internal capital market – empirical study based on privately-owned listed companies in China*. Economic Science Press.

Yu Qiao 1994. Efficient Market, Abnormal Circle and Volatile Stock Price. *Economic Research Journal*, no.9, pp.43-50.

Zeng Yamin, and Zhang Junsheng, 2004. Ownership structure and output efficiency: empirical study on Chinese enterprise. *Finance and Economics Reseach*, no.7, pp.89-96.

Zhang Bing, and Li Xiaoming, 2003. Study on gradual efficiency in the Chinese stock market. *Economic Research Journ*al , no.1, pp.54-61.