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COMPARISON RESEARCH ON FINANCING EFFICIENCY OF BRICS STOCK MARKETS

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ARTICLE DETAILS

ABSTRACT

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As emerging markets, BRICS stock markets are of great importance for their own listed companies to financing. We find out that the result of financing can be greatly decided by financing efficiency. How to build a scientific index system is the key factor to evaluate stock market financing efficiency. Therefore, to improve the result of financing in BRICS stock markets, we need to study on the financing efficiency of BRICS stock markets. This paper firstly gathers the longitudinal section data of direct financing scale from BRICS stock markets. Then we regard three factors as input indexes, and other two factors as output indexes. Furthermore, we use the Data Envelopment Analysis to evaluate the financing efficiency of BRICS stock markets and find out the main factors that influence it. Finally, by comparing the result of DEA test, we find out the reason for the defects and differences on the financing efficiency of BRICS stock markets, and come up with some suggestions, such as perfecting the market access mechanism and adding the market tools, to deal with it.

KEYWORDS

BRICS Stock Market, DEA Model, Financing Efficiency.

1. INTRODUCTION

BRICS is an acronym of Brazil, Russia, India, China and South Africa, which are all treated as emerging economics by the world. Since the word BRICS was firstly discussed by Jim O'Neill in 2001, the stock markets in these five countries have developed rapidly. But there are also developmental gaps between them. For instance, as South China Morning Post said in 2-1-2015, in 2014, Brazil and Russia held an average decline of 4.2% in standard stock index, but China and India had an average increase of 40%. Generally, a mature market should be highly market-oriented, which could guide the resources to be optimally allocated. A booming stock market can reflect a well-developed national economy, which is good for local listed companies to financing. However, in undeveloped markets, the result of financing is not ideal. As we can see, compared with mature markets like Europe and America, many defects on financing are still existed in BRICS stock markets.

2. REVIEW OF LITERATURE

The financing efficiency is a hot topic in the academic field of stock market, and a considerable amount of scholars have given their own findings based on the in-depth and continuous research. A domestic scholar named Bai Qin-xian has firstly thought that the population effect should be considered as a crucial factor in comparing the financial systems between different countries [1]. Meanwhile, he also has provided the concepts of population effect and individual effect. Then, Wang Yong-qi has defined the financing efficiency in financial market as the difficulty and scale to raise capital from financial market [2]. Zhang Jin-qing has considered that in the process of financing, the more net earnings and lower cost, the higher the financing efficiency is [3]. After that, based on the microscopic point, Yang Xiao-bo has claimed that, on the basis of various management structures, an enterprise's financing efficiency is the capability of bringing the highest profit with the lowest cost and risk [4]. Hu Chao has thought that in Brazil, Russia, India, China and South Africa, the stock market financing efficiency is the level that capital gathered from market can make influence on the whole economy and the profit earned from stock market [5]. Moreover, researchers from overseas have given their results either. They has defined the financing efficiency in the perspective of the capital allocation, and pointed out that the process of financing should

conform to the Pareto Optimality. Pual. A. Sumueolson has given his point that the financing efficiency represents the capital allocation efficiency, which can be able to provide the greatest possibility for enterprises to financing under the condition of established resources and technology in the economy [6]. The researches mentioned above laid a theoretical foundation for the further study of the stock market financing efficiency.

For emerging markets, how to evaluate financing efficiency is continuously becoming the central focus of academic researches. Due to the point of Xu Ke-da, we should evaluate the stock market financing efficiency by comparing the trading efficiency and the allocation efficiency [7]. Zhang Jin-qing has used three capabilities of financing, including the ability to meet the demand of huge capital scale with relatively low cost, the ability to bolster the business investment, and the ability to guide the fund to the companies with high economic benefit, to evaluate the market financing efficiency [3]. In the perspective of listed companies, Chen Xian-jin and Yang Xiao-bo have used different indicators, such as the Tobin Q which represents the ratio between firms' stock value and replacement cost, the return on equity, the increase rate of business revenue and the earnings per share, to measure the financing efficiency [4,8]. In addition to this, Yang Xiao-bo has used DEA model to evaluate the listed company equity financing efficiency in China and India [4]. Moreover, Hu Chao has used the total amount of raised capital and the market return to reflect the whole BRICS stock markets financing result [5]. Thomas has divided financing efficiency into two parts, the capital allocation efficiency and the dynamic capital usage efficiency [9]. The relationship between them should be followed by companies in the process of financing and capital usage. Guoping Lin has estimated the effectiveness of the China's stock market by introducing the ratio between the share price and the dividend discounted, the Tobin Q and the ratio between the market capitalization and the GDP growth as indexes [10]. It can be seen that the measuring standard of financing efficiency in share market should be concentrated on the result of financing and the profit brought by financing.

Generally, we define the stock market financing efficiency as the influence made by financing on the profit of the whole stock market, and the improvement of stock market and national economy.

Furthermore, if the result is remarkable, we will say that the financing efficiency is significant. Otherwise, the financing efficiency is non-significant. In this paper, we use the financing efficiency index to measure the result of financing.

3. DEA EMPIRICAL MODEL AND DATA DESCRIPTION

The data envelopment analysis (DEA) is a linear programming method, which is based on the productivity frontier theory made by Farrell in 1957. Then, the theory was developed by Charnes et al., and he used it to evaluate the efficiency of the public sector and non-profit sectors. In 1985, the DEA model was firstly used by Sheman and Gold to evaluate the security company efficiency.

The DEA model is a method that measures the relative efficiency of decision making units (DMU) with the same input, output and nature. In the point of the production effectiveness, the DEA model is a very ideal and valid method to estimate the very DUM which contents multi-input and multi-output indexes and is simultaneously effective in technique and scale. Owing to the hypothesis of returns to scale, DEA model can be separated into two parts: CCR model and BBC model. CCR model, firstly discussed by Charnes, Cooper and Rhode in 1978, is used under the condition of constant returns to scale (CRS). Whereas, BBC model is used under the condition of variable returns to scale (VRS). These two models are all used by us to evaluate the financing efficiency of BRICS stock markets.

In this paper, we use 3 indexes as inputs, including the amount of listed companies, which points out the total number of listed firms in BRICS stock markets respectively, the scale of stock issuance, which represents the absolute value of the total equity of listed companies in different countries, the annual turnover ratio of stocks, which reflects the prosperity of secondary market and the investors' expectation. Moreover, we use other 2 indexes as outputs, including the ratio between the capital incremental on stock market and GDP growth, which directly reflects the contribution made by financing on GDP, and the total amount of raised capital, which represents the result of financing in BRICS stock markets.

Generally, If the empirical test based on the DEA model is effect, it will be proved that financing has a positive effect on the economy. Besides, if the result of the DEA test is close to 1, it will be proved that the stock market financing efficiency is valid.

This article researches the financing efficiency of BRICS stock markets by selecting the related data from the stock markets, during from 1991 to 2011. In order to ensure the continuity and reliability, all the data are chosen from the World Bank Website (www.worldbank.org.cn).

4. EMPIRICAL ANALYSIS ON THE FINANCING EFFICIENCY IN BRICS STOCK MARKETS

In this article, we use DEAP 2.1 to analyse the selected data, and the result are as follows:

Table 1: Statement of the financing efficiency in BRICS stock markets

projects countries	TE		SE		PTE	
	Effective	non-effective	Effective	non-effective	effective	non-effective
China	9Y.	12Y.	9Y.	12Y.	12Y.	9Y.
India	5Y.	17Y.	5Y.	17Y.	10Y.	11Y.
Brazil	6Y.	16Y.	6Y.	16Y.	11Y.	10Y.
South Africa	3Y.	18Y.	3Y.	18Y.	14Y.	7Y.
Russia	6Y.	13Y.	7Y.	12Y.	6Y.	13Y.

Tips: TE represents Technical Efficiency. SE represents Scale Efficiency, PTE represents Pure Technical Efficiency

Table 2: Percentage of Effective Years

	China	India	Brazil	South Africa	Russia
Percent of TE	42.86%	23.81%	28.57%	14.29%	31.58%
Percent of PTE	57.14%	47.62%	52.38%	66.67%	31.58%

Table 3: Mean Value of the Result Made by DEA Test

	TE	SE	PTE
China	0.739	0.902	0.824
India	0.578	0.662	0.882
Brazil	0.647	0.683	0.937
South Africa	0.589	0.598	0.98
Russia	0.565	0.826	0.641

In DEA test, TE means the technical efficiency under the condition of constant returns to scale, PTE means the technical efficiency under the condition of variable returns to scale. Additionally, SE is the ratio between TE and PTE.

The result reveals that, in this reference set, the financing efficiency of BRICS stock markets are all relatively weak-form efficient. Meanwhile, it also shows that the chosen factors (the amount of listed companies, the scale of stock issuance, the annual turnover ratio of stocks) cannot furthest affect the financing scale in market and the promoting function by stock market on GDP, which explains that the stock markets of these countries are not efficient in the selected period. As we can see in table 2, among the five countries, China's stock market has the largest number of the technical efficient years between 1991 and 2011. Whereas, the performance of South Africa is the worst, and other three countries show relatively weak-form efficiency. On the other hand, the stock market of South Africa is illustrated to be pure technical efficient in 14 years, accounting for the largest proportion.

Generally speaking, Russia has the lowest stock market financing efficiency among the BRICS. India and Brazil are similar in overall

performance. Although, compared with mature markets in Europe and America, the financing efficiency of BRICS stock markets are lower, it can be seen from the findings that, with the rapid development of the BRICS stock markets during the chosen period, the result of the DEA test are becoming more and more close to 1, which means the financing result of BRICS stock markets are becoming more and more efficient.

According to the empirical findings, China is the best in the mean value of technical efficiency with the number of 0.739. Russia is the worst with 0.565 only. India and South Africa are weaker efficient as well, with 0.578 and 0.589 respectively. Further, South Africa is the best in pure technical efficiency with the number of 0.98, followed by Brazil with 0.937. Russia also has the worst performance in PTE, with merely 0.641. Moreover, in the mean value of scale efficiency, China holds a better result among five countries, with 0.902. By contrast, South Africa is illustrated to be the most inefficient, with 0.598. Objectively, the financing efficiency of China's stock market is not strongly efficient. However, compared with other countries in the BRICS, it is illustrated to be relatively effective. Even so, the financing efficiency in other years that tested to be less than 1 illustrates that stock markets of Brazil, Russia, India, China and South Africa do not play a fully role of stimulating economic growth in these years, which means the markets could be improved in the future. In general, China and Brazil hold a higher financing efficiency, for that these two countries hold larger proportions of TE, SE, and PTE than other countries. Moreover, the mean values of TE, SE, and PTE in China and Brazil are higher than that in India, Russia and South Africa as well.

Throughout the BRICS for nearly 20 years of development, it can be seen that differences in stock market development between various countries are still existed. Owing to the special listing system that the same company can be listed in two different markets, the amount of listed companies is redundant in India market. But the total equity of listed firms and the stock

trading are not high enough. Therefore, the result of the DEA test in India is relatively low, showing that problems are still existed in India's stock market and the market cannot fuel economic growth to an extreme. Comparatively speaking, the tested result of Russia is more precise than other countries, which illustrates that the Russia's stock market is constantly improved during from 1991 to 2011. In addition, the financing efficiency in Russia's stock market is rising during the same time. For another, the stock market of South Africa, as the financial center of the whole Africa, plays a vital role in this area. Nevertheless, due to the social environment of Africa, there are gaps existed in the amount of listed companies, the total scale of raised capital and the ratio between the capital incremental on stock market and the GDP growth between South Africa and other four countries. Brazil, located beside North America, is a better developed country in Latin America. The geographical advantage makes Brazil hold a similar number of listed companies, but three times of the total market capitalization of listed enterprises and six times of the absolute value of GDP with South Africa. As a result, the stock market of Brazil is more financing effective than other countries except for China. Even though the share market in China has only developed for over 20 years, it maintains a good condition of development. The good investing environment and policy lead to a better market among BRICS. It can be concluded no matter from the total amount of capitalization or the result of the DEA test.

5. REASONS FOR THE DIFFERENCES ON FINANCING EFFICIENCY OF BRICS STOCK MARKETS

Seeing from the result of the DEA test, the financing efficiency of BRICS stock markets is gradually increasing between 1991 and 2011. However, it is undeniable that there is still a huge gap existed between mature markets like Europe and America and BRICS markets. Thus, the BRICS stock markets still have obvious shortages.

5.1 Whole scale of BRICS stock market is relatively small

For example, in BRICS stock markets, the number of listed companies, the scales of total capitalization and the volume of trade lead to a short number of raised capital. By the end of 2005, there were more than 500 listed companies in Russia's market. But the scale of every firm's asset was very small, and the number of investors in stock market was less than 100,000. Therefore, most of listed companies were treated as the dormant company, because their trading volume was 0. But these companies did not be delisted yet.

5.2 The security issue system needs to be perfect

Up to now, the security issue system in China still remains the verification system. Compared with the registration system in developed markets, the issue of new shares needs a long time and complex procedure in the verification system, which makes China's market inefficient. In India, furthermore, the institution that one company could be listed in two different stock markets leads to a superfluous number of listed firms. By the end of 2010, the number of listed companies in the Bombay Stock Exchange (BSE) was 7430, and the number in the National Stock Exchange (NSE) was 1060. Because of that almost all the companies in NSE were simultaneously listed in BSE at that time, so that the total amount of listed firms in India was nearly to 7430. Although there were lots of listed companies, a considerable portion of them were existed in name only, with a very small trading volume. Therefore, the phenomenon discussed above makes India's stock weak-form financing efficient.

5.3 The behaviors of the main market body and investors are not standard

With enterprises raising capital from stock market, some of them make fake financial information for the purpose of entering stock market, attempting to deceive the supervision department and investors. For example, as National Finance News reported in 15-12-2010 that in 1996, a Chinese company named Hongguangshiye claimed in its materials for public listing that it owned the profits of 54 million in RMB. However, it is verified that the company actually lost its profits of 103 million in RMB in 1996, inflating profits to about 157 million. Even worse, some companies are listed as excuses to openly encircling money. For instance, in 2009, a famous India's company named Satyam (NYSE: SAY) was verified that the inflated assets was up to about 1 billion dollars. In detail, as China Securities Journal reported in 9-1-2009, the management inflated revenues to 136 million dollars in three-quarter earnings of 2008, 10 times larger than the actual profits. Moreover, the available cash was inflated to 1.1 billion dollars, but Satyam only had 66 million dollars in actual. For another, it is found that during from 2008 to 2010, there were 32 listed companies punished by China Securities Regulatory Commission

(CSRC) because of financial fraud. The phenomenon mentioned above not only leads to the low quality of listed companies, but also to the speculative behavior of investors. At the same time, the order of stock market is offended greatly. Moreover, the irrational investment behavior of investors could increase the speculation of the market and decrease the financing efficiency in the meantime.

5.4 The marketization is still insufficient

As emerging markets, BRICS stock markets developed dramatically in the past few decades. Nevertheless, compared with mature markets, they are still insufficiently marketization, especially the share markets of China and Russia. Too much governmental intervention is bad not only for marketization, but also for the financing efficiency.

6. CORRESPONDING SUGGESTIONS

By contrasting the financing efficiency of BRICS stock markets and making empirical analysis, we can see that the result is not ideal. There is a great gap between mature markets and BRICS markets in financing efficiency. For the purpose of enhancing the financing efficiency of the China's stock market, this paper provides some suggestions.

6.1 Perfecting the market access mechanism

For increasing the efficiency of the whole China's stock market and giving full play to the function of the capital market, the Chinese government should further reform the market access mechanism. Then, combined with the developmental situation of the China's stock market, the reform should be progressed in two ways simultaneously. On one hand, based on the principal of holding the overall objective of supervision, the capital market should be gradually converted from government-directed to market-directed. The government should reduce unnecessary investigation and change the direction of the substantive examination. Simultaneously, push the market access mechanism forward to the registered system. On the other hand, for protecting the benefits of investors, the government should provide a more fair, just and public market. Also, the authority should enhance the market restraint mechanism and the market transparency.

6.2 Adding the financial tools in stock market

Contrasted by the situation in India that the stock market cannot afford the demand of financing of various enterprises, the hierarchical structure of China's stock market is not perfect yet. At present, the stock exchange market is the only rapidly developed market in China. Other markets like unlisted companies and private equity securities are still in the embryonic stage. They are in urgent need of development. Only by constantly improving the structure of stock market tools, can the system of multi-level capital market be built. Besides, the stock market financing scale can be increased, and the financing efficiency can be enhanced as well. Thus, to achieve these goals, we should do as follows: Firstly, the environment for innovation should be improved, and the product system should be perfected. Meanwhile, the government should encourage the innovation of new products and accelerate building the market products system. Secondly, the new products should be created orderly and systematically. The scale of the whole market and the risk of products should be controlled strictly. Finally, the status of market participants in product innovation should be paid more attention to. The authorities should strengthen the investment institutions in the role of product innovation activities. Moreover, the demand of clients for product innovation and market competition should be encouraged.

6.3 Reducing government intervention and becoming more market-oriented

Because of too much government intervention, China's stock market has been treated as the market of policy and news for a long time. Too much government intervention and high frequency of policy being published make stock market have a low level of marketization and reduce the overall effectiveness of market. Meanwhile, it also make resources in market cannot be reasonably allocated. For instance, in the early time, China's stock market was a place to financing only for large state-owned enterprises. Owing to this limitation, all the small and medium-sized companies and other outstanding enterprises had no chance to enter the market. Generally, a mature market should be highly market-oriented, which could guide the resources to be optimally allocated. Hence, the Chinese government should reduce unnecessary intervention, and let the stock market work by itself, improving the level of marketization furtherly. All these measures are of great importance for lifting the overall stock market operation efficiency.

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