Analysis of Equity Financing Efficiency of China's Listed Real Estate Companies Based on DEA

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Abstract: The real estate industry is the basic industry and the leading industry of the national economy, and occupies an important position in China's economic and social structure. As a typical capital-intensive industry, sufficient free cash flow is the prerequisite for ensuring the normal operation of real estate companies. In recent years, under the stimulation of the continuously overheated real estate market, there are obvious investment impulses and equity financing impulses in listed real estate companies in China. In order to evaluate the rationality of this behavior of listed real estate companies, based on data envelopment analysis (DEA), an empirical test of the equity financing efficiency of 14 listed real estate companies was conducted, and it was concluded that the efficiency of equity financing of listed real estate companies in China was generally inefficient Conclusion. Finally, some countermeasures and suggestions are proposed on how to improve the equity financing efficiency of China's listed real estate companies.

1. Introduction

In recent years, the role of the real estate industry as a pillar of China's economic development has increased significantly. According to statistics, China's investment in real estate development in 2009 was 3,323.2 billion yuan, an increase of 16.1% year-on-year, accounting for 25% of the country's GDP and investment of 6.6%, and 60 directly related industries. One of the important "lifelines" of the economy. However, the rapid expansion of the real estate industry has also brought many problems, such as the alienation of housing functions, the long-term price deviation from value, and the impulse to invest and finance in the real estate industry. Since 2006, the real estate industry has always been at the cusp of macroeconomic regulation and contro [1]. The continuous upgrading of regulatory policies has caused the real estate industry to encounter unprecedented financial, financial, supply and demand, and other “care”. In this grim situation, the investment capital chain of the real estate industry will inevitably withstand multiple tests, and the impulse for investment and financing will always exist.

In order to meet the needs of investment and financing, many listed real estate companies in China still show strong preference for equity financing after completing initial public offering (IPO) financing, and are keen to integrate their funds through higher price issuance and allotment to further promote the company's development. Facing the national macro-control of the real estate industry, scientific evaluation of the investment and financing efficiency of the real estate industry can provide important theoretical and empirical basis for guiding the real estate industry of our country to conduct rational investment and financing. Based on this, this paper uses data envelopment analysis (DEA) to comprehensively evaluate the equity financing efficiency of 14 listed real estate companies in China, that is, the effective utilization of equity integration funds, to explore the use of funds obtained by equity financing of real estate companies, and to target How to improve the equity financing efficiency of China's real estate listed companies, put forward relevant countermeasures and suggestions.

2. An Analysis of the Impulse of Equity Financing in China's Real Estate Industry in Recent Years

In recent years, with the continuous deepening of the reform of the housing system and the continuous improvement of residents' income levels, housing has become a new consumption hot spot. After 1998, the market-oriented reform of housing commodities was implemented. The central bank also issued various preferential policies for home purchase loans. The long-term backlog of demand in the hearts of residents burst out in a short time, and real estate investment entered a period of stable and rapid development. Since 2003, house prices have continued to rise, and the sales prices of houses in most cities have risen significantly. First- and second-tier cities have frequently appeared, creating a market environment with high real estate growth, high sales, and strong supply and demand. Since 2006, the state has implemented a series of macro-control policies in planning, planning, land, construction and other links. Increasingly strict land and financial credit policies have caused the real estate industry to fall into financial difficulties, and the entire real estate industry has begun to diversify [2]. The way to explore investment and financing channels. Affected by the financial crisis in 2008, the domestic real estate market experienced a temporary downturn. However, the overall situation of the real estate market after 2009 was very good and became one of the main forces driving economic recovery. "Supply in short supply", "price increases", and "overheated investment" became Keywords for the real estate market in 2009. This shows that the demand for investment and financing in China's real estate industry has always been hot.

Looking at the current financing environment of China's real estate companies, under the circumstances that bank credit policies are subject to national macro-control and guidance, it is increasingly difficult for real estate companies to obtain loans, real estate funds and real estate trusts are still in their infancy, and overseas financing resistance is heavy. Choosing to leverage the capital market for equity financing is both a strategic arrangement and a breakthrough in the diversification of financing channels. The main performance in the securities market is that many real estate companies have sought domestic or overseas listings. In 2007-2008, the bull market in the domestic A-share market set off a wave of high price issuance and share allotment. As of May 2010, a total of 115 real estate companies were listed in Shanghai and Shenzhen, and 40 were listed in Hong Kong, with a total market value of nearly one trillion, and the scale of equity financing has increased significantly. However, the ability to operate funds is the core competitive element of real estate companies, and whether the funds obtained through equity financing can be used reasonably remains the key issue. Therefore, using scientific and reasonable methods to empirically test the equity financing efficiency of China's listed real estate companies will help to provide empirical evidence and relevant countermeasures for its investment and financing behavior to return to rationality and reduce blindness.

3. An Empirical Analysis of Equity Financing Efficiency of Real Estate Listed Companies Based on DEA

3.1 Foundation of DEA method

The most basic DEA model was proposed by Charnes, Cooper and Rhodes in 1978 and is called the CCR model. The model assumes constant returns to scale. However, because decision-making units are usually difficult to run on the optimal scale due to various factors, the use of the CCR model will lead to a situation where technical efficiency and scale efficiency are mixed together. To solve this problem, Banker, Charnes and Cooper (1984) proposed an improved method of the CCR model to analyze the efficiency problem of variable returns to scale, that is, the BCC model. The assumption of variable returns to scale makes it possible to remove the influence of scale efficiency when calculating technical efficiency, from which pure technical efficiency and scale efficiency can be obtained, and it can be used to judge whether the decision-making unit is optimal in scale [3]. Based on this improved DEA model, this paper conducts the following empirical tests.

3.2 Variable definitions

This article aims to evaluate the equity financing efficiency of listed real estate companies, so the input and output variables related to equity financing efficiency are established [4]:

3.2.1 Input indicators

Total assets (x_1). Refers to all assets owned or controlled by a listed company that can bring economic benefits. The indicator reflects the size of the real estate company and the financing scale related to it from an overall perspective, which is the basis for its capital operation.

Asset-liability ratio (x_2). Also known as the financial leverage factor, it is equal to the ratio of total liabilities to total assets. This indicator reflects the relative ratio of equity financing and debt financing of real estate companies. According to the theory of capital structure, whether an enterprise makes reasonable use of the leverage effect has an important impact on whether an enterprise can maximize its value.

Total operating cost (x_3). Total operating cost = operating cost + operating tax and surcharges + sales expenses + management expenses + financial expenses +Asset impairment losses, this indicator mainly reflects the company's operating costs, the level of costs determines the size of profits and the level of output. This indicator reflects the company's operating capabilities from a cost perspective.

3.2.2Output index

Return on net assets (y_1). The rate of return on net assets indicates how much net income the owner can earn per dollar of investment. It is equal to the company's net profit divided by the total net assets. This indicator is usually higher, the better, because it reflects the level of the company's raising funds to obtain remuneration, and also reflects the size of the interest of the business owner.

Earnings per share (y_2). Also known as after-tax profit per share and earnings per share, it is equal to the company's after-tax profit divided by the company's total share capital. It can measure the value of real estate company's stock investment and is an important indicator that comprehensively reflects the company's profitability.

Net profit (y_3). Refers to the retained profits of the company after the income tax has been paid in the total profits, and is also generally called after-tax profit or net income. Net profit reflects the final results of the real estate company's operation. If there is more net profit, the enterprise's operating efficiency is good; if there is less net profit, the enterprise's operating efficiency is poor.

3.3 Samples and data sources

Selecting a sample (ie, a decision unit) is actually determining a reference set for comparison. In order to make the evaluation results fully reflect the equity refinancing efficiency of China's listed real estate companies, this paper selects listed real estate companies with equity refinancing behavior in Shenzhen and Shanghai as reference sets. Since 2007 was a year of concentrated equity refinancing of listed real estate companies, 14 companies with additional stock issuances in 2007 were used as the sample for this study. In view of the lagging effect of equity financing, the performance of listed companies in the year of financing cannot fully reflect the efficiency of equity financing. This paper uses the financial data of the annual reports of these 14 sample companies from 2007 to 2009 as the basis for calculating input and output indicators. 2007) and two years after financing (2008, 2009) to evaluate the efficiency of capital use. The data in this article comes from Guotaian CSMAR series research database.

3.4 Empirical test results and analysis

This article mainly uses the data envelopment analysis software DEAP 2.1 version for calculation analysis, and obtains the equity financing efficiency and scale returns of 14 sample companies from 2007 to 2009, as shown in Table 1 and Table 2.

Table 1 Empirical test results

	2007			2008			2009		
	Technical efficiency (TE)	Pure technical efficiency (PTE)	Scale efficiency (SE)	Technical efficiency (TE)	Pure technical efficiency (PTE)	Scale efficiency (SE)	Technical efficiency (TE)	Pure technical efficiency (PTE)	Scale efficiency (SE)
Vanke A	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
COFCO Properties	1.000	1.000	1.000	0.250	0.303	0.826	0.610	0.719	0.850
AVIC Real Estate	0.814	1.000	0.815	0.222	0.400	0.555	0.262	0.480	0.55
Chongqing Development	1.000	1.000	1.000	0.947	0.945	1.000	0.945	0.700	0.727
Yicheng Co., Ltd	0.947	1.000	0.483	0.042	0.600	0.700	1.000	1.000	1.000
Dalong Real Estate	0.483	1.000	0.483	0.042	0.600	0.700	0.727	0.964	0.723
Xinhu Zhongbao	0.563	0.562	0.999	1.000	1.000	1.000	1.000	1.000	1.000
Huaye Real Estate	1.000	1.000	1.000	0.496	0.558	0.890	0.267	0.430	0.620
Wantong Real Estate	0.424	0.433	0.979	1.000	1.000	1.000	0.536	0.577	0.929
Beijing Urban Construction	0.424	0.459	0.861	0.531	0.547	0.970	1.000	1.000	1.000
Kaaba Development	0.093	0.286	0.325	0.228	0.331	0.688	0.358	0.492	0.727
Garbo Group	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Zhenghe shares	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Jingneng Real Estate	1.000	1.000	1.000	0.915	1.000	0.915	0.342	1.000	0.342

It can be seen from Table 1 that from 2007 to 2009, the three companies with higher equity financing efficiency were Vanke A, Jiabao Group, Zhenghe, and all efficiency values reached 1;AVIC Real Estate, Yicheng and Tianfang Development have not achieved equity financing DEA for three years, and the efficiency values of AVIC Real Estate and Tianfang Development are lower in individual years.For example, the technical efficiency of Tianfang Development in 2007 was only 0.093, and the technical efficiency of AVIC Real Estate in 2008 was only 0.222; the remaining 8 listed real estate companies had 1-2 years of equity financing in the three years of 2007-2009 DEA is effective, but there are also cases where the efficiency value is low in individual years. For example, the technical efficiency value of Huaye Real Estate in 2009 was only 0.267. Explain that during the survey period, 11 of the 14 sample companies need to dynamically adjust the input and output levels to improve the efficiency of their equity financing.

It can be seen from Table 2 that from 2007 to 2009, Vanke A, Jiabao Group, Zhenghe Co., Ltd. all achieved the same scale of return on equity financing (that is, the scale reached optimal); COFCO Real Estate, AVIC Real Estate, Yicheng, Huaye Real Estate, Wantong Real Estate, Tianfang Development, Jingneng Real Estate's equity financing scale returns of 7 companies showed an increasing trend; Dalong Real Estate and Xinhu Zhongbao's equity financing scale returns from increasing to unchanged; Yu Development's equity financing scale returns From unchanged to diminishing; Beijing Urban Construction's equity financing scale returns increase first and then diminish and eventually remain unchanged. It shows that in the three years after the financing of the 14 sample companies, 11 equity financing did not achieve economies of scale.

Table 2 DEA-Based Judgment Table of Scale Income of Equity Financing of 14 Real Estate Listed Companies

	Vanke A	COFCO Properties	AVIC Real Estate	Chongqing Development	Yicheng Co., Ltd	Dalong real estate	Xinhu Zhongbao
2007	constant	constant	Diminishing	constant	Diminishing	Increment	Increment
2008	constant	Increment	Increment	Diminishing	Diminishing	Increment	constant
2009	constant	Increment	Increment	Diminishing	Increment	constant	constant
	Huaye Real Estate	Wantong Real Estate	Beijing Urban Construction	Kaaba Development	Garbo Group	Zhenghe shares	Jingneng Real Estate
2007	constant	Increment	Increment	Increment	constant	constant	constant
2008	Increment	constant	Diminishing	Increment	constant	constant	Diminishing
2009	Increment	Increment	constant	Increment	constant	constant	Increment

In summary, from 2007 to 2009, among the 14 listed real estate companies, only three of them reached the equity financing DEA effect, accounting for 21. 43%. It shows that the equity financing efficiency of most of the listed real estate companies in China is not high and has not reached the economies of scale. Although some companies have better individual output indicators (such as a higher return on net assets), the input-output ratio is not high. The performance of listed real estate companies in China as a whole is still low due to efficiency. Very weak. In addition, it also shows that the core competitiveness of China's real estate industry has not played an important role in the development strategy of enterprises.

4. Suggestions on Improving the Efficiency of Equity Financing of Listed Real Estate Companies in China

Recognize the market situation clearly, strengthen argumentation and evaluation, and reduce the blindness of investment and financing of listed real estate companies. The overall economic environment determines the relationship between the supply and demand of capital and the level of inflation in the entire economic system. If the demand and supply of funds in the entire social economy change or the level of inflation changes, investors will change their required rate of return, and the capital cost of real estate companies will change accordingly.

Cultivate core competitiveness and enhance the growth of listed real estate companies. To solve the problem of low equity financing efficiency of China's listed real estate companies exposed in the previous empirical analysis, the key lies in improving the capital operation capacity of listed companies and promoting the formation of core competitiveness. The construction of the core competitiveness of real estate listed companies is mainly through stimulating innovation capabilities, forming economies of scale, developing their own comparative advantages, improving brand capabilities, and strengthening resource integration capabilities.

Optimize the corporate governance structure to ensure the operating quality of listed real estate companies. Judging from the empirical results, the equity financing efficiency of listed real estate companies in China needs to be improved urgently, and efforts must be made to improve the level of operation and management. A good corporate governance structure is essential. At present, the phenomenon of "one big share" is still relatively serious among listed companies. Large shareholders conduct blind diversified expansion for the purpose of maximizing their own interests, which affects the equity financing efficiency and the company's sustainable development [5].

Integrate the superior resources of the real estate industry and promote listed real estate companies to achieve economies of scale. In recent years, mergers and acquisitions in the real estate industry have continued to grow. As mentioned above, the ever-increasing macro-control policies and increasing market competition require that real estate companies' capital strength and development capabilities continue to increase, which has become a fundamental driving factor for the merger and acquisition integration of China's real estate industry. At this stage, state-owned capital is being adjusted and newly entered in the real estate industry. The emergence of the people has further promoted the merger and acquisition integration of the real estate industry.

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