



## EMPIRICAL ANALYSIS OF FINANCIAL ABILITY OF LISTED COMPANIES IN REAL ESTATE INDUSTRY

Cao Ruiyi

School of Management, Wuhan University of Technology, Wuhan, P. R. China, 430070

\*Corresponding Author Email: [970347494@qq.com](mailto:970347494@qq.com)

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### ABSTRACT

As the pillar industry of the national economy, the real estate industry plays a decisive role in the development of the national economy. At the same time, as an indispensable part of the basic necessities of life, the development of the real estate industry is also the focus of continuous concern of the entire society. This article selects 113 real estate listed companies listed on the main board of Shenzhen and Shanghai from 2014 to 2016 as a sample, and conducts an empirical study on the comprehensive financial capability of real estate enterprises in China from 2014 to 2016 through principal component analysis, the study finds that there are regional differences in the financial capabilities of China's real estate development and management companies. The main differences are as follows: The real estate enterprises in the major first-tier cities in China are still strong overall, but have declined slightly in recent years. The financial capabilities of the real estate industry in major second-tier cities such as Sichuan, Chongqing, Shandong and Hainan have been rising year by year, showing a trend of rapid development. The rest of the region such as Hubei, Hunan, Anhui, Fujian and other provinces real estate development is slow, there is more room for development.

### 1. INTRODUCTION

Through the domestic scholars on the real estate industry, we can see that the level of development of the real estate industry and the level of national economic development are highly relevant. A study shows that real estate investment and GDP growth has a higher correlation [1]. The research findings show that the reasonable growth of the real estate economy is of great significance to the healthy development of the national economy, but at the same time the growth rate of the real estate industry is too high or too low, will affect the steady growth of the national economy [2]. And because of the high correlation and high driving force of the real estate industry, the development of the real estate market directly affects the development of many other industries. At present, the development of China's real estate industry is unevenly distributed. According to a study, real estate is immobile and is greatly affected by the fundamentals of the regional economy. Both real estate development investment and real estate loans show significant regional characteristics [3]. However, the method of Theil index in the research to confirm that there is a clear regional difference in real estate prices in our country, and there is an increasing trend of inter-regional differences [4]. Therefore, based on the important role of real estate in national economic growth and the regional differences in the development of real estate industry in China, it is necessary to make a comprehensive analysis of the financial capabilities of real estate listed companies.

Some of researcher argue that the dual identities of national landownership agents and land administrators determine the necessary government involvement and intervention in the land

market [5]. In recent years, China has launched a number of real estate

related policies. Since early 2014, the real estate investment growth rate continued to decline, the sales growth weakened, and real estate investment became the pain point of economic growth. In response to this form, the government has introduced a series of stimulus policies. Since November 2014, the central bank cut interest rates six times in a row to maintain a relaxed pattern of funds. In 2015, the central bank joined multiple ministries and commissions to introduce "330 policies" to reduce the down-payment ratio of loans. In 2016, the central government will resolve the inventory of real estate and promote the sustainable development of the real estate industry and regard it as one of its main tasks. The implementation of the above multiple policies has an important impact on the development of the real estate industry. Therefore, given the many changes in the real estate industry in recent three years, it is of great significance to analyze the financial capabilities of real estate enterprises from 2014 to 2016.

The main contribution of this paper is to, by choosing to measure enterprise profit ability, debt paying ability, operation ability, development ability, a total of four aspects of 13 related financial indicators, using factor analysis method to evaluate comprehensive financial capacity of real estate enterprises from 2014 to 2016, which can effectively reflect the overall development of real estate industry in our country and the future development trend. At the same time, the results of this paper can also reflect the differences in the industry due to geographical location and city level and other factors. Secondly, this article enriches the research on the field of comprehensive financial capability analysis in the real estate

industry. Although domestic scholars have done some research on the comprehensive development of China's real estate industry, there are few studies on the financial capability. In addition, this article analyzes the comprehensive financial ability of the real estate industry in recent years, with a view to providing some references for other scholars in the field of real estate related research.

**2. RESEARCH DESIGN**

**2.1 Data sources and sample selection**

This article selects all the A-share real estate development and management companies listed in Shenzhen and Shanghai Stock Exchange, screened out the ST stocks that have been specially treated and the real estate development and operation enterprises with incomplete data information. Taking the remaining 113 listed companies as the research sample to explore the comprehensive development of real estate industry and its differences in geographical location and city level. All the data used in the text comes from Cathay CASMAR database.

**Table 1:** Study samples

Sample name	Sample code	Sample name	Sample code	Sample name	Sample code	Sample name	Sample code
Vanke A	000002	Rongfeng Holdings	000668	Guancheng Datong	600067	Garbo Group	600622
Shen Zhenye A	000006	Sunshine City	000671	Songdu Shares	600077	New Huangpu	600638
New Good	000007	Suning Universal	000718	Daming City	600094	Pudong Jinqiao	600639
Shen Property A	000011	Taihe Group	000732	Zhongti industry	600158	Wanye Enterprises	600641
...	...	...	...	...	...	...	...
Shunfa Hengye	000631	Zhejiang Guangsha	600052	Qixia Construction	600533	Total sample	113
Jinke Shares	000656	Jiuding Investment	600053	Dima Shares	600565		
Beautiful Home	000667	Nanjing Hi-Tech	600064	Greenland Holdings	600606		

**2.2 Variable selection and measurement standards**

In this paper, the enterprise financial ability is measured by four aspects, which is divided into profit ability, debt paying ability, operation ability, development ability, each selected for three or

four indicators, including 13 financial indicators, such as return on equity, the net interest rate of the business, assets return rate, asset-liability ratio, financial rates.

**Table 2:** Variables and their measurement standards

Variable category	Variable name	symbol	Metrics
<b>Profitability</b>	Return on equity	X01	After-tax profit / owner's equity
	Sales margin	X02	Net profit / sales revenue * 100%
	Return on assets	X03	(Total profit + financial expenses) / total assets
<b>Solvency</b>	Assets and liabilities	X04	Total liabilities / Total assets * 100%
	Current ratio	X05	Total current assets / total current liabilities * 100%
	Property ratio	X06	Total Liabilities / Equity * 100%
<b>Operating capacity</b>	Total asset turnover	X07	Sales revenue / total assets
	Working Capital Turnover	X08	Operating income / working capital
	Fixed assets and income ratio	X09	Fixed assets / operating income
<b>Development capacity</b>	Total assets growth rate	X10	Total assets growth this year / Total assets at the beginning of the year * 100%
	The growth rate of owner's equity	X11	(Owner's Equity Current Ending Balance - Owner's Equity Original Opening) / Owner's Equity Beginning Value
	Sustainable growth rate	X12	Return on net assets * Retained earnings / (1 - ROE * Retained earnings)
	Operating profit growth rate	X13	Increase of operating profit for the year / Total operating profit of the previous year * 100%

**2.3 Model building**

This article selects a total of 10 financial indicators as a variable to measure the overall financial performance of real estate listed companies, each financial index to some extent reflect the financial capacity of enterprises, and the selected variables may have some relevance, that is the variables have some overlap with the measurement of the company's financial capability. Therefore, this paper uses the method of principal component analysis to remove repeated variables, and uses the linear combination of the original variables as a new comprehensive index, namely, the principal component F. And according to the analysis result of spss22 software, taking the eigenvalue greater than 1 as the main component extraction standard, several main components are selected to achieve the purpose of effectively reflecting most of the original data with a few principal components. According to the mathematical principle of principal component analysis, the model is as follows:

$$\begin{cases}
 F_1 = \partial_{11}X_1 + \partial_{12}X_2 + \partial_{13}X_3 + \dots + \partial_{1m}X_m + \epsilon_1 \\
 F_2 = \partial_{21}X_1 + \partial_{22}X_2 + \partial_{23}X_3 + \dots + \partial_{2m}X_m + \epsilon_2 \\
 F_3 = \partial_{31}X_1 + \partial_{32}X_2 + \partial_{33}X_3 + \dots + \partial_{3m}X_m + \epsilon_3 \\
 \dots \\
 F_n = \partial_{n1}X_1 + \partial_{n2}X_2 + \partial_{n3}X_3 + \dots + \partial_{nm}X_m + \epsilon_n
 \end{cases}$$

**3. EMPIRICAL TEST AND RESULT ANALYSIS**

This paper uses SPSS to analyze the financial capability of real estate development and management companies. Next, the data of 2014 will be used as an example to explain the analysis process.

**3.1 Principal component analysis**

**3.1.1 KMO and Bartlett test**

KMO and Bartlett test results as shown in the following table, Bartlett's spherical test approximate chi-square 993.044, P-value tends to 0. And KMO is 0.609, in line with the applicable conditions of principal component analysis.

**Table 3: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.609
Bartlett's Test of Sphericity	Approx. Chi-Square	993.044
	df	78
	Sig.	.000

**3.1.2 Factor to explain the original variables**

Factor to explain variables and the total variances of the original variables are shown in Table 4. According to the Kaiser criterion, take the eigenvalue greater than 1 as the extraction criterion, the first four components were extracted as the main components.

**Table 4: Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.362	33.557	33.557	4.362	33.557	33.557	4.226	32.510	32.510
2	1.911	14.697	48.254	1.911	14.697	48.254	1.882	14.479	46.990
3	1.542	11.864	60.118	1.542	11.864	60.118	1.622	12.478	59.468
4	1.117	8.596	68.714	1.117	8.596	68.714	1.202	9.247	68.714
5	.972	7.474	76.188						
6	.812	6.249	82.437						
7	.636	4.896	87.333						
8	.578	4.445	91.778						
9	.477	3.670	95.448						
10	.293	2.253	97.701						
11	.214	1.647	99.348						
12	.075	.576	99.924						
13	.010	.076	100.000						

Extraction Method: Principal Component Analysis.

**3.2 The rotated load factor matrix and factor score matrix**

It can be seen from the matrix of load factors after rotation that the principal component 1 has a relatively high load factor on the profitability index of an enterprise and more comprehensively reflects the profitability information of the enterprise. Therefore, the principal component 1 can be used as a comprehensive index of

profitability. The principal component 2 has a larger load coefficient on the solvency ratio of the enterprise, which can more fully reflect the solvency of the enterprise. The main component 3 can better reflect the profitability and growth capacity of two aspects, the main component 4 focuses on reflecting the ability of business operations.

**Table 5:** Component Score Coefficient Matrix

	Component			
	1	2	3	4
Return on equity	.228	-.077	-.026	-.135
Operating margin	.017	.162	.286	.279
Return on assets	.086	.097	.243	.230
Assets and liabilities	.045	.467	-.117	-.212
Current ratio	.018	-.419	-.168	-.019
Property ratio	-.198	.188	.003	.100
Total asset turnover	-.034	.058	.477	-.054
Working Capital Turnover	.097	.111	.049	-.686
Fixed assets and income ratio	-.198	-.127	.090	.209
Total assets growth rate	.049	.182	-.418	.207
Sustainable growth rate	.214	.064	.048	.011
The growth rate of owner's equity	.105	.013	-.185	.325
Operating profit growth rate	.206	-.003	-.043	.028

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.

The principal component score matrix shown in Table 5 shows that the principal components are expressed as follows:

$$F1=0.228X01 + 0.017X02 + 0.086X03 + \dots + 0.206X13$$

$$F2=-0.077X01 + 0.162X02 + 0.097X03 + \dots - 0.003X13$$

$$F3=-0.026X01 + 0.286X02 + 0.243X03 + \dots - 0.043X13$$

$$F4=-0.135X01 + 0.279X02 + 0.230X03 + \dots + 0.028X13$$

According to the factor explaining the variance contribution rate of the original variables, the comprehensive score expression of enterprise financial ability in 2014 is:

$$F_{2014} = \frac{33.557F1 + 14.697F2 + 11.864F3 + 8.596F4}{68.714}$$

Similarly, available in other annual real estate management and development of financial capacity of enterprises comprehensive score. Scores in each year are shown in Table 6.

**4. RESEARCH FINDINGS AND RECOMMENDATIONS**

Corporate financial capacity is a measure of an important indicator of an enterprise's comprehensive ability. The strength of an enterprise's financial ability largely determines the persistence of the enterprise's competitive advantage. The size and boundaries of an enterprise, as well as the breadth and depth of its diversification and transnational business strategies. In order to analyze the status quo and trend of the development of real estate industry in our country, this paper chooses a total of four aspects of 13 financial indexes including profitability, solvency, operation ability and development ability based on the principal component analysis

method to establish the comprehensive financial capability of the real estate industry analysis model to evaluate the comprehensive financial capability of listed A-share real estate companies in Shenzhen and Shanghai and draw the ranking of the comprehensive financial capability of real estate management and development enterprises in China from 2014 to 2016. The main conclusions of this paper are as follows:

(1) Real estate companies in Beijing, Shanghai, Guangzhou, Shenzhen, Jiangsu, Zhejiang and Shanghai performed strongly but declined slightly in recent years. The comprehensive ranking of real estate enterprises' financial ability from 2014 to 2016 shows that among the top ten enterprises in three years, more than half of real estate enterprises in Jiangsu, Zhejiang and Shanghai have always accounted for more than half, of which Youngor (600177), Jingtou Development (600683), Guangming Real Estate (600708), Nanjing Gaoke (600064), China Enterprise (600675) and several other companies ranked the top ten consecutive years, However, rankings of companies such as Lujiazui (600663), Hualian (000620) and New Good (000007) have been declining year after year. This shows that the gap between the development of the real estate industry in the second and third tier cities in China and the first-tier cities is still relatively large, the gap is shrinking every year.

(2) The financial capability of real estate enterprises in Shandong, Sichuan and Chongqing has risen rapidly. According to the top ten comprehensive ranking, real estate enterprises in second-tier cities have entered a phase of rapid development except for the first-tier cities such as Beijing Shanghai and Guangzhou. Such as Shandong Lu Shang Home (600223), Sichuan Blue Development (600466), and Chongqing Dima (600565) ranked the top three companies in overall financial position. It is noteworthy that in 2016, two real estate enterprises in Hainan, Hainan Airlines (600515) and Hyde shares (000567) are among the top ten, indicating that the real estate market in the second-tier cities began to gradually become active and entered a phase of rapid development.

(3) The rest of the region such as Hubei, Hunan, Anhui, Fujian and other real estate business financial ability has increased in recent years, but the increase is small, some companies have declined, such as Anhui Hefei Urban Construction (002208), Hunan Jiakai City (000918 ), Hubei Jinghan shares (000615), Fujian China Wuyi (000797), Sunshine City (000671) and other companies in the three-year rankings have risen, but the increase is limited. This shows that the development of real estate in these provinces is slow, there is more room for development.

**Table 6:** The comprehensive ranking of financial ability of real estate management and development enterprises from 2014 to 2016

Ranking	2014 Overall	2015 Overall	2016 Overall
1	Dima shares	Blu-ray development	Xinguang Yuancheng
2	Dalong real estate	Greenland Holdings	Zhujiang Holdings
3	Nanjing Hi-Tech	Younger	Guangyu Group
4	Wolong real estate	Jinghan shares	Lushang real estate
5	Guangming real estate	Chinese enterprises	HNA basic
6	Younger	Lushang real estate	Jiakai City

7	Tianye shares	Guangming real estate	Hyde shares
8	Jiuding investment	Jingtou development	Greenland Holdings
9	China International Trade	Shirong Zhaoye	Chinese enterprises
10	Lujiazui	Nanjing Hi-Tech	Jingtou development
11	Laiyin sports	Fanhai Holdings	Tianfang development
12	Shimao shares	Chinese happy	Chinese happy
13	Zhonghong shares	Gree real estate	Greenview Holdings
14	China Tech	Jinke shares	Zhongfang real estate
15	City Investment Holdings	China Wuyi	Sunshine City
16	Guangyu development	Yunnan Chengtou	Ningbo Fuda
17	Hyde shares	Jiuding investment	Fanhai Holdings
18	Shen Property A	Shoukai shares	Cinda real estate
19	Shen Shenfang A	Yuetai shares	Phoenix shares
20	Pudong Jinqiao	Sunshine City	Tianye shares
21	Wanye enterprises	Cinda real estate	Jinbin development
22	Sunshine City	AVIC real estate	Vanke A
23	Tianfang development	Taihe Group	Suzhou high-tech
24	Zhejiang Guangsha	Vanke A	AVIC real estate
25	Shenfa Hengye	Tiandiyuan	Hefei urban construction
26	Nanguo home	Zhongtian Finance	Blu-ray development
27	Shangshi development	Rongsheng development	Tiandiyuan
28	Jinghan shares	COFCO Real Estate	Rongsheng development
29	Zhongtian finance	Xinhua Union	Guangyu development
30	Hefei urban construction	Tianye shares	Beichen Industrial
31	Chinese happy	Zhongzhou Holdings	Zhongzhou Holdings
32	Suning Universal	Binjiang Group	COFCO Real Estate
33	Rongsheng development	Huayuan real estate	Laiyin sports
34	Vanke A	Shangshil development	Shoukai shares
35	Beijing urban construction	Nanguo home	Rongfeng Holdings
36	Daming City	Poly Real Estate	Taihe Group
37	Golden Group	Qixia construction	Jinghan shares
38	Shen Zhenye A	Yinyi shares	Zhejiang Guangsha
39	Xinhu Zhongbao	Caixin development	Jinke shares
40	Garbo Group	Huafa shares	Guangming real estate
41	Electronic City	Xiangjiang Holdings	Guangdong Hongyuan A
42	Guancheng Datong	Dima shares	Dagang shares
43	AVIC real estate	Beautiful home	Shirong Zhaoye
44	Poly Real Estate	Daming city	Daming city
45	New Huangpu	Lujiazui	Poly Real Estate
46	Shahe shares	Jiakai City	Xinhua Union
47	Shoukai shares	Hefei urban construction	Huayuan real estate
48	COFCO Real Estate	Sanxiang impression	Zhongtian Finance
49	Fuxing shares	Shimao shares	Xinchao Zhongbao
50	Xinguang Yuancheng	Beichen Industrial	Lujiazui
51	Tibet Chengtou	Xinhu Zhongbao	Songdu shares
52	Financial Street	Tibet Chengtou	Younger
53	Huayuan real estate	Suning Universal	Dima shares
54	Phoenix shares	Shunfa Hengye	Gree real estate
55	Ningbo Fuda	Fuxing shares	Shangshi development
56	Zhongti industry	Songdu shares	Nanguo home

57	Binjiang Group	Huaye Capital	Sunshine shares
58	Fanhai Holdings	Guangyu development	China Wuyi
59	Black peony	Beijing Chengjian	Binjiang Group
60	Chongqing development	Zhujiang Industrial	Shimao shares
61	Zhongzhou Holdings	Golden Group	Shunfa Hengye
62	Yinyi shares	Ningbo Fuda	Xiangjing shares
63	Yuetai shares	Tianfang development	Qixia construction
64	Yue Hongyuan A	Chengtou Holdings	Huafa shares
65	Cinda real estate	Phoenix shares	Beijing Chengjian
66	Huaye Capital	Jinbin development	Yinyi shares
67	Beautiful home	Black peony	Zhonghong shares
68	Caixin development	Shen Zhenye A	Guancheng Datong
69	China Wuyi	Financial Street	Garbo Group
70	Xiangjiang Holdings	Nanshan Holdings	Fuxing shares
71	HNA Investment	Dagang shares	Zhujiang Industrial
72	Tiandyuan	Garbo Group	China International Trade
73	Huafa shares	Zhejiang Guangsha	Suning Universal
74	HNA basic	Shanghai Lingang	Financial Street
75	Jingneg home	New Huangpu	Shahe shares
76	Gree real estate	Shen Shenfang A	Rongan real estate
77	Guangyu Group	Guancheng Datong	Tibet Chengtou
78	Jingtou development	Shahe shares	Golden Group
79	Dgang shares	Guangyu Group	New Huangpu
80	Qixia construction	Wolong real estate	Chongqing development
81	Beichen Industrial	Shen Property A	Nanjing Hi-Tech
82	Changchun Jingkai	Zhonghong shares	Wolong real estate
83	Wantong real estate	Sunshine shares	Wantong real estate
84	Songdu shares	Zhongti industry	Huaye Capital
85	Xinhua Union	Electronic City	Zhongti industry
86	Wanze shares	Jingneng home	Jingneng home
87	Jinke shares	Hualian Holdings	Pudong Jinqiao
88	Jiakai City	China International Trade	Chengtou Holdings
89	Tianbao Infrastructure	Zhongfang real estate	Shen Zhenye A
90	Jinbin development	Wanye enterprises	Beautiful home
91	Yunnan Chengtou	Wanze shares	Nanshan Holdings
92	Suzhou high-tech	Rongan real estate	Shanghai Lingang
93	Sanxiang impression	Changchun Jingkai	Black peony
94	Zhujiang Industrial	Gorgeous family	Zhongfang shares
95	Rongan real estate	Rongfeng Holdings	Jiuding investment
96	Shanghai Lingang	HNA Investment	Shen Shenfang A
97	Shirong Zhaoye	Laiyin sports	Electronic City
98	Taihe Group	Tianbao Infrastructure	Caixin development
99	Chinese enterprises	Dalong real estate	Wanze shares
100	New and good	Chongqing development	Hainan high-speed
101	Sunshine shares	Xinguang Yuancheng	Wanye enterprises
102	Hainan high-speed	China Tech	Yuetai shares
103	Blu-ray development	Pudong Jinqiao	Tianbao Infrastructure
104	Zhongfang real estate	New and good	Changchun Jingkai
105	Hualian Holdings	HNA basic	Gorgeous family
106	Lushang real estate	Yue Hongyuan A	Dalong real estate

107	Gorgeous family	Zhongfang shares	HNA Investment
108	Zhongfang shares	Hainan high-speed	Shen Property A
109	Greenview Holdings	Greenview Holdings	China Tech
110	Greenland Holdings	Suzhou high-tech	New and good
111	Rongfeng Holdings	Wantong real estate	Hualian Holdings
112	Nanshan Holdings	Hyde shares	Sanxiang impression
113	Zhujiang Holdings	Zhujiang Holdings	Yunnan Chengtuo

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