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Comprehensive Evaluation of the Performance of Real Estate Listed Companies in My Country

-- Based on Factor Analysis

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Abstract

Select the relevant financial and market data of 10 listed real estate companies such as Heung Kong Holdings, Yunnan City Investment, and Vantone Real Estate, and use factor analysis to evaluate the performance of their financial indicators and non-financial indicators, and elaborate from quantitative and qualitative analysis. The data The results show that financial indicators have a significant impact on corporate performance, and non-financial indicators also have a certain impact on related companies. Therefore, the principle of balanced evaluation should be adopted in the process of corporate performance evaluation.

Keywords

Factor Analysis; Real Estate Listed Companies; Performance Evaluation; Qualitative Indicators; Quantitative Indicators.

1. Relevant Theoretical Content

In the process of real estate governance, it is required to strengthen the company's performance management, establish a systematic and comprehensive evaluation mechanism within the listed company, so as to reflect the company's recent operating conditions, and actively formulate an effective management mechanism within the company. The factor analysis method first started at the beginning of the last century, and was used by arleSSPearman, Karl Pearon, etc. in the statistics of human intelligence. It can analyze some variables in the problem, and make a more in-depth and specific elaboration on a certain problem [1].

2. Principles of Research Methods

2.1. The Basic Idea of Factor Analysis

During the research process, the observed variables are classified by factor analysis method, and the observed variables with high correlation and close connection are classified into the same category, while the correlation between different groups is low, and each group of variables is a common factor . In the research process, through factor analysis of several index variables, common factors are extracted, and then the variance contribution rate of each factor is used to construct a score function. Mathematical matrix form of factor analysis method:

$$X = AF + B$$

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$$\begin{cases} x_1 = a_{11} f_1 + a_{12} f_2 + a_{13} f_3 + ... a_{1k} f_k + \beta_1 \\ x_2 = a_{21} f_1 + a_{22} f_2 + a_{23} f_3 + ... a_{2k} f_k + \beta_2 \\ x_3 = a_{31} f_1 + a_{32} f_2 + a_{33} f_3 + ... a_{3k} f_k + \beta_3 \\ ..... \\ x_p = a_{p1} f_1 + a_{p2} f_2 + a_{p3} f_3 + ... a_{pk} f_k + \beta_p \end{cases} \quad (k \leqslant p)$$

Figure 1. Mathematical form of factor analysis

2.2. Research Steps

2.2.1. Data Standardization

In the collected data, there are usually differences in magnitude and dimension between variables. Therefore, in order to eliminate the differences between the two, the original data are standardized.

$$X_i = \frac{X_i - E(X_i)}{\sqrt{Var(X_i)}}$$

Figure 2. Data standardization

2.2.2. Data Inspection

In the factor analysis method, only when the correlation between the variables is high, can the accurate factor analysis be carried out. For this reason, the Bartlett test and the KMO test are used for the variables. In the Bartlett test, when the correlation coefficient matrix is not an identity matrix, or when the Bartlett test value is less than or equal to 0.05, it indicates that the relationship between variables is correlated and suitable for factor analysis. In the KMO test, when the KMO value is greater than 0.7, the factor analysis effect is better, and when the KMO value is less than 0.5, the data is not suitable for factor analysis.

2.2.3. Determination Factor

Let F1, F2,...,Fp be p factors, among which the total amount of data information contained in the first m factors (that is, its cumulative contribution rate) is not less than 80% or the eigenvalue is greater than 1, the first m factors can be used to reflect original evaluation index.

2.2.4. Calculation of Factor Scores

According to the weight of the calculated variance contribution rate of each factor, the comprehensive evaluation index function is obtained from the linear combination of each factor:

$$F = \frac{\gamma_1 F_1 + \gamma_2 F_2 + ... + \gamma_m F_m}{\gamma_1 + \gamma_2 + .. + \gamma_m} = \sum_{i=1}^{m} \omega_i F_i$$

Figure 3. Comprehensive evaluation index function

3. Research Design

3.1. Selection of Indicators

The selection of performance evaluation indicators for real estate listed companies should be able to reflect the company's financial performance. Real estate enterprises have a long development and business cycle, and the long-term principle should be taken into account in the selection of performance evaluation indicators, and the profitability, solvency, growth ability and operating ability in the process of enterprise development should be fully considered.

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Profitability indicators mainly include earnings per share, return on equity, and return on total assets. Indicators of solvency mainly include quick ratio, current ratio, and asset-liability ratio. Operating capability indicators mainly include fixed asset turnover, total asset turnover, inventory turnover, and accounts receivable turnover; growth capability indicators mainly include net profit growth rate, main business income growth rate, and total asset growth rate. The knowledge level of employees is mainly reflected in the proportion of undergraduates in the employee system, and the social contribution is mainly reflected in the amount of taxes paid by enterprises for the society [3].

3.2. Construction of Evaluation System

Construct the performance evaluation index system of real estate listed companies, including quantitative index and qualitative index. Quantitative analysis indicators are mainly financial indicators, including profitability, solvency, operating ability, growth ability, internal operation, employee learning and growth, etc.

Qualitative analysis indicators mainly refer to non-financial indicators, mainly including customer and social responsibility. Customer indicators are mainly reflected in related values such as brand awareness and customer satisfaction obtained through questionnaires. Social responsibility is mainly reflected in environmental protection, land resource utilization and other aspects.

4. Empirical Analysis of Performance Evaluation of Listed Real Estate Companies

4.1. Samples and Data Sources

The research samples in this paper are 10 real estate companies, all of which are listed in Shenzhen or Shanghai and belong to the A-share market. Relevant financial indicators are queried on professional websites, and non-financial indicator data are analyzed using expert scoring methods and survey questionnaires.

The data used in the study of this paper consulted the relevant values announced by real estate listed companies, and selected professional websites published by enterprises, including Securities Star, enterprise annual reports, http://www.cninfo.com.cn and so on. For the collected relevant values, SPSS17.0, Excel2010 and other statistical software and numerical analysis software were used.

4.2. Data Standardization

In the process of analysis and application, it is required to establish a standardized analysis method for the application of molecules, conduct multiple analyzes on selected variables, judge whether the variable meets the conditions of factor analysis, and perform Bartlett test and KMO test on variables. The KMO value is =0.552 , which is lower than 0.6 and not suitable for factor analysis. The Bartlett sphericity test method was selected, and the concomitant probability = 0.000, which was less than 0.05, was suitable for factor analysis.

Table 1. Bartlett and KMO inspection

Kaiser-Meyer-Olkin	0.552
Bartlett sphericity test value	246.110
Sig.	0.000
df	120

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4.3. Evaluation of the Performance of Listed Real Estate Companies based on Factor Analysis

4.3.1. Quantitative Analysis Indicators

Using the factor analysis method to study the performance evaluation of real estate listed companies, study different factors and their proportions in the analysis indicators, and combine these proportions to analyze the overall performance evaluation of listed companies.

Comprehensive performance evaluation of listed companies in the research = (FAC2 * 0.14565+FAC4 * 0.12080+FAC6* 0.09904+FAC1 * 0.16310+FAC3 * 0.13322+FAC5* 0.10558) / 0.76738.

From this, the following analytical data are obtained.

Table 2. Quantitative analysis of performance evaluation index scores

Serial Number	Name	Code	Quantitative Factor Score
1	Heung Kong Holdings	600162.SH	-0.169518
2	Yunnan City Investment	600239.SH	-0.218649
3	Vantone Real Estate	600246.SH	0.061832
4	Huafa shares	600325.SH	0.208324
5	Gemdale Group	600383.SH	0.591631
6	Poly Real Estate	600048.SH	0.731421
7	Wolong Real Estate	600173.SH	-0.089496
8	Huaye Real Estate	600240.SH	-0.184385
9	Kaaba development	600322.SH	0.097851
10	The first shares	600376.SH	-0.008395

From the above analysis results, it can be seen that the top three companies in various performance evaluation indicators are Poly Real Estate, Gemdale Group, and Huafa. Due to the different selection of indicators, the evaluation results will be affected to a certain extent. Based on the above analysis results, it can be seen that the overall development momentum of listed real estate companies is relatively good, but there is still a lot of room for improvement in the improvement of comprehensive strength, which is mainly reflected in the improvement of the knowledge level of employees and the level of market share. It is required that real estate listed companies can fully pay attention to the improvement of their own comprehensive strength in the development process and promote the improvement of the internal comprehensive strength of the enterprise [4].

4.3.2. Qualitative Analysis Index Evaluation Results

The questionnaire method is used as the main way to analyze the qualitative performance evaluation indicators of enterprises. Distributed 150 questionnaires to relevant practitioners, relevant experts, and ordinary people, and divided customer satisfaction in non-financial indicators into five levels, namely A, B, C, D, and E, respectively representing very satisfied and satisfied , Fair, Dissatisfied, Very Dissatisfied. The knowledge level of employees, environmental protection indicators, brand awareness, and land resource utilization indicators are divided into five grades: A, B, C, D, and E, which represent very high, high, average, low, and very low, respectively. Experts collected and scored the results of various questionnaires, combined the analysis results, and obtained a total of 5 grades of A, B, C, D, and E, representing 1.0 points, 0.8 points, 0.6 points, 0.4 points, and 0.2 points respectively. graded. The sum of each index in qualitative analysis is the sum of the scores of each index numerical index [5].

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Table 3. Qualitative analysis of performance evaluation index scores

Serial Number	Name	Brand Awareness	Customer Satisfaction	Land Resource Utilization	Qualitative Index Score
1	Heung Kong Holdings	0.67	0.65	0.58	2.53
2	Yunnan City Investment	0.61	0.73	0.68	2.65
3	Vantone Real Estate	0.65	0.7	0.68	2.54
4	Huafa shares	0.53	0.63	0.72	2.6
5	Gemdale Group	0.65	0.7	0.82	2.88
6	Poly Real Estate	0.7	0.78	0.85	3.1
7	Wolong Real Estate	0.62	0.77	0.62	2.54
8	Huaye Real Estate	0.69	0.65	0.72	2.54
9	Kaaba development	0.65	0.7	0.68	2.77
10	The first shares	0.59	0.68	0.76	2.66

Table 4. Score factors of listed real estate companies

Name	FAC1	FAC2	FAC3	FAC4	FAC5	FAC6
Heung Kong Holdings	1.22448	-0.4109	-1.2229	-0.3991	-0.4786	-0.0835
Yunnan City Investment	0.72337	-0.0881	-0.7126	0.82681	-0.1885	-2.6046
Vantone Real Estate	-0.5092	0.13813	0.90503	-0.0302	-1.3892	1.41517
Huafa shares	0.25877	0.69972	0.25002	-0.1024	0.47888	-0.5628
Gemdale Group	0.27254	0.71164	1.64743	0.17702	-0.1361	0.02706
Poly Real Estate	1.20535	-0.3117	1.87393	-0.4249	-0.2104	0.1290
Wolong Real Estate	0.90707	-0.5462	-0.6354	-0.2319	-0.1076	-0.1314
Huaye Real Estate	-1.7573	-0.1115	-0.2670	0.42628	0.29238	-0.2456
Kaaba development	0.19667	-0.1229	-0.4012	-0.1905	3.00121	1.40569
The first shares	0.27254	-0.3714	0.94707	-0.1593	0.05012	-0.9756

4.3.3. Comprehensive Analysis of Performance Evaluation

In this study, the weights of financial indicators and non-financial indicators are 75% and 25%, respectively. From this, the comprehensive score of performance analysis of listed real estate companies can be obtained, as shown in the table below.

Table 5. Performance evaluation scores of listed real estate companies

Serial Number	Name	Quantitative Factor Score	Qualitative Index Score	Overall Score
1	Heung Kong Holdings	-0.169518	2.53	0.505362
2	Yunnan City Investment	-0.218649	2.65	0.498513
3	Vantone Real Estate	0.061832	2.54	0.681374
4	Huafa shares	0.208324	2.6	0.806243
5	Gemdale Group	0.591631	2.88	1.163723
6	Poly Real Estate	0.731421	3.1	1.323566
7	Wolong Real Estate	-0.089496	2.54	0.567878
8	Huaye Real Estate	-0.184385	2.54	0.496711
9	Kaaba development	0.097851	2.77	0.765888
10	The first shares	-0.008395	2.66	0.658703

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From the performance management values of the above 10 real estate companies, it can be seen that corporate performance evaluation is mainly affected by financial indicators, but the influence of non-financial indicators cannot be ignored, such as Gemdale Group, Poly Real Estate, Tianfang Development and other enterprises Non-financial indicators account for a large proportion [6-7]. Gemdale Group and Poly Real Estate ranked first and second overall, which shows that both qualitative and quantitative analysis indicators play an important role in the performance evaluation process of listed real estate companies, and it is required that the principle of balance should be adhered to in the evaluation process.

References

[1] Zhang Jingjing. Analysis of Debt Carrying Capacity of Listed Real Estate Companies Based on Factor Analysis [J]. Business Accounting, 2019(12):43-46.

[2] Tan Chang. Research on Financial Performance Evaluation of Listed Companies in my country's Online Game Industry-Based on Factor Analysis [J]. Modern Commerce and Industry, 2019(27).

[3] Ge Qiaomei, Xu Biying. Research on Financial Performance Evaluation of my country's Internet Listed Companies Based on Factor Analysis [J]. Journal of Shenyang Aerospace University, 2019(3).

[4] Han Xu. Business Performance Analysis of Listed Companies in Inner Mongolia-Based on Factor Analysis and Cluster Analysis [J]. Journal of Dalian University for Nationalities, 2019, 21(2): 126-131. HAN Xu. Business Performance Analysis of Inner Mongolia Listed Companies --Based on factor analysis and cluster analysis. Journal of Dalian Nationalities University, 2019, 21(2):126-131.

[5] Zheng Zhiqiang. Research on Evaluation of Intellectual Property Competitiveness of High-tech Industry Based on Factor Analysis [J]. Journal of Xi'an Shiyou University (Social Science Edition), 2019(3).

[6] Wu Mei, Yan Ziwei, Zhu Jiaming. Financial Performance Evaluation of my country's Agricultural Listed Companies Based on Factor Analysis [J]. Journal of Jilin Institute of Agricultural Science and Technology, 2019, 28(2).

[7] Jiang Wulin, Zhang Kerong, Zhou Zijian. Research on the Financing Capability Evaluation of Anhui Science and Technology SMEs Based on Factor Analysis [J]. Journal of Jingchu Institute of Technology, 2019(2).