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# Research on Financial Performance Evaluation of Pharmaceutical Listed Companies: Based on Factor Analysis and Cluster Analysis

Qianqian Lu *

SEM, Nanjing University of Science and Technology, Nanjing, China

* Corresponding Author Email: Luqianqian2000@163.com

**Abstract.** With the improvement of people's living standards in China, people pay more and more attention to their own health. As one of the basic industries for people's livelihood, the pharmaceutical industry is often concerned. The article takes 85 pharmaceutical listed companies in China as the research object, selects 12 indicators from four aspects: profitability, debt paying ability, growth ability, and operational ability, and evaluates the financial performance of pharmaceutical listed companies based on factor analysis. By applying cluster analysis, 85 pharmaceutical listed companies were divided into 5 categories, providing more targeted and specific suggestions, creating conditions for the continuous optimization and development of pharmaceutical enterprises.

**Keywords:** pharmaceutical industry; financial performance evaluation; factor analysis; cluster analysis.

## 1. Introduction

The pharmaceutical industry is an important component of China's national economy, playing a crucial role in protecting and promoting people's health and improving their quality of life. It also has a significant impact on economic development and social progress. The pharmaceutical industry has very close technological and economic connections with industries such as chemical, machinery, electronics, and agriculture, and has good development prospects. It is a sunrise industry that will never decline.

The market of the pharmaceutical industry is complex, and the pharmaceutical manufacturing industry has close connections with upstream pharmaceutical raw material suppliers and downstream medical service institutions. The pharmaceutical industry can generally be divided into two major sectors: medicine and pharmaceuticals. The pharmaceutical related sub sectors are mainly located in the upstream and midstream of the industry chain, while the medical related sub sectors are mainly located in the downstream of the industry chain.

## 2. Literature References

As one of the fundamental industries for people's livelihood issues in China, the pharmaceutical industry has always been highly concerned, and domestic scholars have adopted various methods to study pharmaceutical listed companies. Chen Ruixue used principal component analysis to select factors that affect the stock returns of listed companies in the pharmaceutical industry [1]. The study found that the profitability factor had the strongest positive correlation with the stock returns of 100 listed companies in the pharmaceutical industry, providing a reference for investment decisions in the pharmaceutical industry. Cao Xin and Ruan Xianjing selected pharmaceutical companies in China that have been listed on the A-share market for no less than 5 years and invested no less than 100 million yuan in research and development in 2018 as research objects [2]. They used factor analysis to extract principal components and establish a model. They found that China's innovation and development capabilities are polarized, and the development of enterprises has entered a period of fluctuation, with opportunities and challenges coexisting. Chen Lu, Pu Qiuyue, and others conducted a study on the financial performance evaluation of 60 pharmaceutical listed companies in different fields based on principal component analysis [3]. By calculating the scores of the four major principal

components and the comprehensive score, they identified dominant and disadvantaged companies and analyzed their commonalities and individualities. Huang Rui took Harbin Sanlian Pharmaceutical Co., Ltd. as the research object, and used the principles and methods of improved efficacy coefficient method and entropy weight method to conduct in-depth analysis and comprehensive evaluation of the company's financial performance, providing a basis for the management decision-making of HSL Pharmaceutical Company [4].

Based on previous research, this article uses factor analysis to study the financial performance evaluation of 85 pharmaceutical listed companies in China. A total of 12 financial indicators were selected from four aspects: profitability, debt paying ability, growth ability, and operational ability to construct a corporate financial performance evaluation system. Based on the score results, cluster analysis is used to classify each pharmaceutical listed company into different categories, providing more targeted and specific suggestions, creating conditions for the continuous optimization and development of pharmaceutical enterprises.

## 3. Research Contents

### 3.1. Research Design

#### 3.1.1. Sampling

This article first selected 100 sample stocks from the CSI Medicine 100 Index, with a sample period from 2011 to 2022. After excluding ST companies and companies with incomplete information, the 2021 annual report data of 85 pharmaceutical listed companies on the Shenzhen and Shanghai main innovation boards were ultimately selected as the research sample.

#### 3.1.2. Selection of indicators

This article adheres to the principles of systematicity, typicality, and concise scientificity in the selection of financial indicators. A preliminary analysis of financial indicators is conducted, and low representative indicators are eliminated. Finally, 12 financial evaluation indicators are selected from four aspects: profitability, debt paying ability, growth ability, and operational ability. Measure the company's profitability using the return on equity (X1), return on assets (X2), and net profit margin on sales (X3); Measure the company's debt paying ability using the current ratio (X4), quick ratio (X5), and net asset liability ratio (X6); Measure the company's growth ability using net profit growth rate (X7), total asset growth rate (X8), and per share net asset growth rate (X9); Measure the company's operational capability using inventory turnover rate (X10), accounts receivable turnover rate (X11), and total asset turnover rate (X12). All data used were sourced from the Ruisi database, and a model was constructed using SPSS 27.0. The data was then processed and analyzed.

#### 3.1.3. Research method

The KMO test is used to examine the correlation and partial correlation between variables, with KMO statistic values ranging from 0 to 1. The closer the value of KMO statistic is to 1, the stronger the correlation between variables, the weaker the partial correlation, and the better the effect of factor analysis. In practical analysis, when the KMO statistic is above 0.7, it is considered that factor analysis performs better; When the KMO statistic is below 0.5, factor analysis is not suitable and variable selection or other analysis methods should be considered. If variables are independent of each other, common factors cannot be extracted from them, and factor analysis cannot be applied.

The Bartlett sphericity test takes the correlation coefficient matrix of variables as the starting point, and the null hypothesis is that the correlation matrix is the unit matrix. If the null hypothesis is rejected, it indicates that there is correlation between variables, and factor analysis is effective; If the null hypothesis is not rejected, it indicates that the variables are independent of each other and not suitable for factor analysis.

Factor analysis is a multivariate statistical analysis method that utilizes the idea of dimensionality reduction, starting from the study of the dependency relationships within the original variable correlation matrix, to reduce some variables with complex relationships into a few comprehensive factors. The basic idea is to group the original variables based on their correlation size, so that variables within the same group have higher correlation, while variables in different groups have lower correlation. Each set of variables represents a basic structure and is represented by an unobservable composite variable, which is called the common factor. Factor analysis often has the following four basic steps: confirming whether the original variables to be analyzed are suitable for factor analysis; Construct factor variables; Using rotation methods to make factor variables more interpretable; Calculate factor variable scores for analysis.

Cluster analysis classifies individuals or objects so that the similarity between objects in the same class is stronger than that with objects in other classes, with the aim of maximizing the homogeneity of objects between classes and the heterogeneity of objects between classes. Cluster analysis usually uses systematic clustering method and K-means clustering method. When the sample size is large, the computational workload of using systematic clustering method is large, and the resulting tree diagram is also complex, which is not easy to analyze. K-means clustering method is better. K-means clustering is a fast-clustering method that originates from iterative algorithms in mathematics. When clustering samples, a rough initial classification is given first, and then some principles are designed to modify the categories, continuously adjusting and correcting the sample composition of these categories until they are more reasonable. In order to quickly find an initial classification, it is generally recommended to first select some condensation points and have the sample condense towards them according to a certain rule.

### 3.2. Financial Performance Analysis

#### 3.2.1. Applicability testing

Before conducting factor analysis, it is often necessary to understand the correlation between variables to determine whether factor analysis is suitable for the data. Generally, KMO and Bartlett's sphericity test are used to determine, and the data is imported into SPSS 27.0 for testing.

The test results are shown in Table 1. The KMO statistic value is 0.572>0.5, indicating that it is barely suitable for factor analysis. However, the Bartlett significance level is<0.001, rejecting the null hypothesis that the correlation matrix is a unit matrix at a significance level of 0.01, indicating that there is correlation between the sample data and it is suitable for factor analysis.

**Table 1**. KMO and Bartlett's Test

| KMO sampling suitability quantity | Bartlett sphericity test | | |
|---|---|---|---|
| | Approximate chi square | Freedom | Significance |
| 0.572 | 1185.570 | 66 | <0.001 |

#### 3.2.2. Extraction

Using SPSS 27.0, a dimensionality reduction analysis was conducted on 12 indicators of 85 selected pharmaceutical listed companies to obtain the variance contribution rate and cumulative contribution rate of each factor in the sample data. In the total variance interpretation table, eigenvalues are extracted according to the principle of greater than 1.

As shown in Table 2, there are four eigenvalues greater than 1, with variance percentages of 31.830%, 19.090%, 13.058%, 8.432%, and a cumulative variance contribution rate of 72.411%. Therefore, these four factors basically extract the information contained in the original financial data and can be used to evaluate the financial performance of pharmaceutical listed companies.

**Table 2**. Explanation Table of Total Variance

| Component | Initial eigenvalue | | | Extract the sum of squared loads | | | Reprinting dutch square sum | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Variance percentage | Accumulated% | Total | Variance percentage | Accumulated% | Total | Variance percentage | Accumulated% |
| 1 | 3.820 | 31.830 | 31.830 | 3.820 | 31.830 | 31.830 | 3.057 | 25.474 | 25.474 |
| 2 | 2.291 | 19.090 | 50.921 | 2.291 | 19.090 | 50.921 | 2.588 | 21.566 | 47.040 |
| 3 | 1.567 | 13.058 | 63.978 | 1.567 | 13.058 | 63.978 | 2.010 | 16.753 | 63.793 |
| 4 | 1.012 | 8.432 | 72.411 | 1.012 | 8.432 | 72.411 | 1.034 | 8.618 | 72.411 |
| 5 | 0.984 | 8.200 | 80.611 | | | | | | |
| 6 | 0.956 | 7.965 | 88.575 | | | | | | |
| 7 | 0.824 | 6.864 | 95.439 | | | | | | |
| 8 | 0.352 | 2.937 | 98.376 | | | | | | |
| 9 | 0.142 | 1.184 | 99.559 | | | | | | |
| 10 | 0.040 | 0.333 | 99.892 | | | | | | |
| 11 | 0.012 | 0.097 | 99.990 | | | | | | |
| 12 | 0.001 | 0.010 | 100.000 | | | | | | |

Extraction method: Principal Component Analysis.

### 3.2.3. Factor naming

After obtaining the initial load matrix and common factors, for ease of explanation, it is often necessary to rotate the factors. In this paper, the maximum variance method is used to orthogonally rotate the factors. According to Table 2, the variance percentages of the four factors after rotation have changed to 25.474%, 21.566%, 16.753%, and 8.618%, respectively, while the cumulative contribution rate of variance remains at 72.411%. The ability of the common factor to interpret the original data has not improved after rotation, but the factor loading matrix and factor score coefficient matrix has changed, with elements in the factor loading matrix tending towards 0 or ± 1.

Table 3 shows the rotated component matrix, and it can be seen that the first common factor F1 has a higher load on total asset growth rate and net asset growth rate per share than other variables,

indicating that the common factor F1 mainly explains the company's growth ability, which is named the growth ability factor; The second common factor F2 has significantly higher loadings on return on equity and return on assets than other variables. They mainly represent a company's profitability, indicating that profitability plays an important role in measuring a company's financial performance. It is named the profitability factor; The third common factor F3 has a high net asset liability ratio load, indicating that it mainly measures a company's debt paying ability and is named the debt paying ability factor; The fourth common factor F4 has a higher load on accounts receivable turnover than other variables, indicating that it can reflect the company's operational capability. Therefore, it is named the operational capability factor.

**Table 3**. Rotated Component Matrix

| Index | Component | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| X1 | 0.057 | 0.957 | 0.173 | -0.058 |
| X2 | 0.106 | 0.961 | 0.006 | -0.073 |
| X3 | 0.328 | 0.630 | -0.564 | -0.180 |
| X4 | 0.828 | 0.017 | -0.321 | -0.115 |
| X5 | 0.830 | 0.018 | -0.303 | -0.147 |
| X6 | -0.171 | -0.243 | 0.771 | -0.087 |
| X7 | -0.018 | 0.417 | -0.160 | 0.251 |
| X8 | 0.891 | 0.166 | 0.012 | 0.136 |
| X9 | 0.843 | 0.057 | 0.074 | 0.208 |
| X10 | -0.096 | 0.065 | -0.295 | -0.507 |
| X11 | -0.009 | 0.031 | -0.219 | 0.754 |
| X12 | -0.125 | 0.287 | 0.841 | -0.006 |

Extraction method: Principal Component Analysis.

Rotation method: Caesar normalization maximum variance method.

### 3.2.4. Calculate factor score

Table 4 shows the factor score coefficient matrix, which presents the linear relationship between four common factors and the standardized original variables, allowing for the calculation of scores for each common factor. The expressions for the four common factors are:

$F_1 = -0.021X_1^* - 0.027X_2^* + 0.002X_3^* + 0.272X_4^* + 0.276X_5^* + 0.071X_6^* - 0.071X_7^* + 0.325X_8^* + 0.321X_9^* - 0.066X_{10}^* - 0.067X_{11}^* + 0.057X_{12}^*$

$F_2 = 0.384X_1^* + 0.379X_2^* + 0.216X_3^* - 0.064X_4^* - 0.065X_5^* - 0.078X_6^* + 0.178X_7^* + 0.007X_8^* - 0.030X_9^* + 0.008X_{10}^* + 0.041X_{11}^* + 0.138X_{12}^*$

$F_3 = 0.122X_1^* + 0.036X_2^* - 0.251X_3^* - 0.052X_4^* - 0.040X_5^* + 0.407X_6^* - 0.097X_7^* + 0.137X_8^* + 0.160X_9^* - 0.158X_{10}^* - 0.155X_{11}^* + 0.458X_{12}^*$

$F_4 = -0.026X_1^* - 0.036X_2^* - 0.140X_3^* - 0.131X_4^* - 0.162X_5^* - 0.120X_6^* + 0.269X_7^* + 0.104X_8^* + 0.170X_9^* - 0.476X_{10}^* + 0.746X_{11}^* - 0.024X_{12}^*$

**Table 4**. Factor Score Coefficient Matrix

| Index | Component | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| X1 | -0.021 | 0.384 | 0.122 | -0.026 |
| X2 | -0.027 | 0.379 | 0.036 | -0.036 |
| X3 | 0.002 | 0.216 | -0.251 | -0.140 |
| X4 | 0.272 | -0.064 | -0.052 | -0.131 |
| X5 | 0.276 | -0.065 | -0.040 | -0.162 |
| X6 | 0.071 | -0.078 | 0.407 | -0.120 |
| X7 | -0.071 | 0.178 | -0.097 | 0.269 |
| X8 | 0.325 | 0.007 | 0.137 | 0.104 |
| X9 | 0.321 | -0.030 | 0.160 | 0.170 |
| X10 | -0.066 | 0.008 | -0.158 | -0.476 |
| X11 | -0.067 | 0.041 | -0.155 | 0.746 |
| X12 | 0.057 | 0.138 | 0.458 | -0.024 |

Extraction method: Principal Component Analysis.

Rotation method: Caesar normalization maximum variance method.

SPSS software will input standardized raw data into a four-factor scoring function, which can obtain the scores of each pharmaceutical listed company in four aspects: growth ability, profitability, debt paying ability, and operational ability. By weighting and summarizing the variance contribution rate of each factor to the total variance contribution rate of the four factors, a comprehensive evaluation of the financial performance of pharmaceutical listed companies can be further made. The comprehensive score is calculated as follows:

$F = (25.474F1 + 21.566F_2 + 16.753F_3 + 8.618F_4)/72.411$

### 3.2.5. Evaluate results

Using a comprehensive evaluation model, the financial performance scores and rankings of 85 pharmaceutical listed companies were obtained. Table 5 shows the scores of the top 10 pharmaceutical listed companies in the comprehensive ranking. From the scores and ranking results, among the 85 sample companies, 32 companies have a comprehensive score greater than 0, indicating that 37.65% of pharmaceutical listed companies have good financial performance. Among them, Yiqiao Shenzhou, Zhifei Biotechnology, Pailin Biotechnology, Wantai Biotechnology, and Zhaoyan New Drug have the best financial performance, ranking in the top five in terms of comprehensive score. Yifan Xinfu, Shanghai Laishi, Jilin Aodong, Guangyuyuan, and Taige Pharmaceutical have poor financial performance, ranking last in terms of comprehensive score.

Overall, the development status of the sample companies is good, but there are still many pharmaceutical listed companies that have financial problems, with many deficiencies in growth ability, profitability, debt repayment ability, and operational ability. Among the growth ability factors, only 16 companies such as Yiqiao Shenzhou, Pailin Biotechnology, and Zhaoyan New Drug scored above 0, while others performed poorly. These companies should set their sights on the future, optimize their development strategies, and increase their research and innovation efforts. In terms of profitability factors, 33 companies including Zhifei Biotechnology, Daan Gene, and Yingke Medical

scored above 0, indicating that all companies attach great importance to profitability. Other companies should broaden their sales channels and improve operational efficiency. In terms of debt repayment ability factors, 37 companies including Jiuzhou Tong, Shanghai Pharmaceutical, and Renmin scored above 0, indicating that these companies have done well in debt management. Other companies should borrow reasonably based on their actual situation and production needs, and develop better debt repayment plans. In terms of operational capability factors, 34 companies including Tiantan Biotechnology, Pailin Biotechnology, and Xinlitai scored above 0, while the remaining companies did not score high. Efforts should be made to strengthen the improvement of their operational systems.

In addition, some companies should also pay attention to balanced development in all aspects. Taking Yiqiao Shenzhou, which ranks first in comprehensive score, as an example, its growth ability factor score is particularly high at 7.69865. However, the scores of the other three ability factors are all negative, indicating that there are still many shortcomings in profitability, debt paying ability, and operational ability. It is necessary to pay attention to the improvement of these three aspects of ability, make up for the shortcomings, and avoid potential risks.

**Table 5**. Top 10 Comprehensive Scores of Pharmaceutical Listed Companies in 2021

| Companies | F1 | F2 | F3 | F4 | Score | Rank |
|---|---|---|---|---|---|---|
| Yiqiao Shenzhou | 7.69865 | -0.52098 | -0.91014 | -1.49388 | 2.16 | 1 |
| Zhifei Biology | 0.60358 | 3.59401 | 2.01021 | 0.18726 | 1.77 | 2 |
| Pailin Biology | 3.17806 | -0.48198 | 0.88880 | 1.67477 | 1.38 | 3 |
| Wantai Biotechnology | 0.11144 | 2.67567 | 1.02550 | 0.04263 | 1.08 | 4 |
| Zhaoyan New Drug | 2.56614 | -0.24838 | 0.14366 | 1.31677 | 1.02 | 5 |
| Jinyu Medicine | 0.26484 | 1.60029 | 1.58782 | -0.14706 | 0.92 | 6 |
| Yingke Medical | -0.02187 | 2.86471 | 0.37998 | -0.12013 | 0.92 | 7 |
| Daan Gene | -0.22539 | 2.88279 | 0.42226 | -0.37956 | 0.83 | 8 |
| Jiuan Medical | -0.06810 | 1.64692 | 0.02711 | 0.26588 | 0.50 | 9 |
| Jianfan Biology | 0.22353 | 1.52952 | -0.14425 | -0.28883 | 0.47 | 10 |

### 3.3. Cluster Analysis of Pharmaceutical Listed Companies

#### 3.3.1. Research ideas

Based on factor analysis, the growth ability factor, profitability factor, debt paying ability factor, and operational ability factor have been extracted from 85 sample companies, and the scores of growths, profitability, debt paying ability, operational ability factor, and comprehensive factor have been calculated. Based on the scores of these five factors, this section uses SPSS for K-means clustering analysis to divide 85 pharmaceutical listed companies into five categories. The clustering results and their reasons are analyzed in depth to provide a more comprehensive evaluation of the financial performance of pharmaceutical listed companies.

#### 3.3.2. Result analysis

The final clustering centers are shown in Table 6, and combined with the analysis results of SPSS software, it can be concluded that:

The growth ability factor score of the first type of company is particularly high, while the scores of the other three ability factors are negative, and its comprehensive factor score is the highest. Therefore, such companies can be regarded as emerging pharmaceutical enterprises with infinite potential and

bright development prospects, but they still lack experience in profitability, debt repayment ability, and operational ability. It is necessary to pay attention to the improvement of these three aspects of ability and make up for the shortcomings, otherwise they are easily eliminated in the competition.

The growth ability factor score, debt paying ability factor score, and operational ability factor score of the second type of company are all less than 0, and their comprehensive factor score is the lowest. Therefore, these companies have poor comprehensive capabilities and shortcomings in various aspects, and may face the risk of merger and reorganization. They should re-examine their financial system, formulate plans to optimize their corporate structure, and strive to overcome the downturn.

The growth, profitability, debt repayment, and operational capability factors of the third type of company all have scores greater than 0, and their comprehensive factor scores are also relatively high. Therefore, such companies have strong profitability, good operating conditions, reasonable borrowing and repayment of debts, and have a good future prospect in sustained and stable development. These types of companies can invest more in research and development, increase their efforts in scientific research and innovation, form a strong competitive advantage in the market, and produce good drugs that meet the needs of the public.

The operating capability factor score of the fourth type of company is particularly high, the debt paying ability score factor is low, and the comprehensive factor score is greater than 0. Therefore, these types of companies have good operational strategies but poor debt paying ability, making them high-risk enterprises for investors and not recommended for investment. These types of companies need to use their assets more reasonably, borrow reasonably based on their actual situation and production needs, and develop the optimal debt repayment plan to reduce debt risks. Otherwise, investors are unwilling to invest their funds, and the company may face the risk of bankruptcy due to a lack of funding sources.

The growth, profitability, debt repayment, and operational capability factor scores of the fifth type of company are all close to 0, and the comprehensive factor score is also close to 0 and less than 0. Therefore, such companies are ordinary enterprises in the market, in a lukewarm state. These types of companies need to comprehensively enhance their abilities in asset utilization, capital appreciation, debt repayment, and other aspects, and identify their own strengths to promote their advantages and stand out in the market.

Among the 85 listed pharmaceutical companies, the fifth category has the highest number of companies, with 64, followed by the third category with 16. This also shows the current situation and problems of China's pharmaceutical industry. Although a number of backward enterprises have been eliminated through the comprehensive implementation of GMP certification, the problem of many, small, scattered, and chaotic pharmaceutical production enterprises has not been fundamentally solved, and leading enterprises with international competitiveness are still very lacking. Domestic manufacturers still concentrate on producing some relatively mature and low technical requirements generic drugs, with a large number of companies producing the same variety, overcapacity, lack of variety innovation and technological innovation, low degree of specialization, poor collaboration, and intensified market homogenization competition.

The problems in the pharmaceutical industry urgently need to be solved, and the government has introduced a series of policies to promote the reform of the pharmaceutical industry and drive the development of pharmaceutical enterprises. For the sustainable and healthy development of the pharmaceutical industry, pharmaceutical listed companies should improve resource utilization efficiency, arrange debt repayment plans reasonably, optimize production structure, and strengthen technological innovation. This not only helps to improve the company's financial performance, but also promotes the vigorous development of the pharmaceutical industry.

**Table 6**. Final Clustering Center

| | Cluster | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| F1 | 7.69865 | -0.18496 | 0.33318 | -0.06220 | -0.19395 |
| F2 | -0.52098 | 0.31965 | 1.42764 | 0.03860 | -0.36436 |
| F3 | -0.91014 | -2.31177 | 0.23727 | -1.97547 | 0.09413 |
| F4 | -1.49388 | -1.88031 | 0.10629 | 6.86991 | -0.02243 |
| F | 2.16 | -0.73 | 0.61 | 0.35 | -0.16 |

## 4. Summary

Based on previous research, this article uses factor analysis to study the financial performance evaluation of 85 pharmaceutical listed companies in China. A total of 12 financial indicators were selected from four aspects: profitability, debt paying ability, growth ability, and operational ability to construct a corporate financial performance evaluation system. Finally, four common factors were extracted and named as growth ability factor, profitability factor, debt paying ability factor, and operational ability factor. The scores of each factor and the comprehensive factor were calculated, and a preliminary evaluation of the financial performance of pharmaceutical listed companies was conducted.

Based on the score results, the K-means clustering method was used to divide the 85 pharmaceutical listed companies into 5 categories. It can be seen that each type of enterprise has different characteristics, specific problems, and development directions. This article provides more targeted and specific suggestions for different types of enterprises, creating conditions for the continuous optimization and development of pharmaceutical enterprises. From the clustering results, it can be seen that the number of lukewarm pharmaceutical companies is the highest, and there are more well-developed pharmaceutical companies, which is consistent with the current situation of China's pharmaceutical industry. The reform of the pharmaceutical industry is urgent, and pharmaceutical listed companies can refer to financial performance evaluation results, combine market conditions and relevant national policies, and formulate development strategies that are suitable for themselves to improve their comprehensive capabilities.

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