Financial Analysis of Renhe Pharmaceuticals Based on Factor Analysis

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Abstract: Under the influence of the new coronavirus epidemic and the national medical reform, China's pharmaceutical industry faces more opportunities and challenges. This paper selects 24 pharmaceutical enterprises which can be compared with renhe pharmaceutical industry, selects 15 indexes, uses factor analysis to make financial analysis, evaluates their profitability, operation, debt service and development ability, calculates the comprehensive score, judges the scale position of renhe pharmaceutical industry in the industry.

1. Introduction

The pharmaceutical industry has long been in the spotlight. In 2018, with the development of the internet, the state introduced policies urging pharmaceutical companies to develop e-commerce. In 2019, the scope of regulatory responsibilities was expanded and improved. The impact of the novel coronavirus pandemic in 2020 has created more opportunities and challenges for the pharmaceutical industry. Through the financial analysis of Renhe Pharmaceuticals, we can help the management to grasp the financial situation of the company and actively meet the opportunities and challenges.

2. Application of factor analysis

2.1. Sample Selection

This paper selects 24 companies that can be compared with Renhe Pharmaceuticals: Hongzhi Pharmaceuticals, Widely-known, Zhongxin Pharmaceuticals, Chisholm Collection, Kang Enbei, Essence Pharmaceuticals, Treasure Island, Sinohang Group, Taiji Group, Tibetan Pharmaceuticals, Ma Yinglong, Kenman Group, Sinopharm Pharmaceuticals, Sunflower Pharmaceuticals, Kunbang Pharmaceuticals, Shouxian Valley, Jiangzhong Pharmaceuticals, Takin Pharma, Guilin Sanjin, Yoshikawa Pharmaceuticals, Tesco, Step Pharma, Jiuzhitang, Guizhou Province. Fifteen financial indicators, such as operating margin, net profit margin, gross profit margin, asset return rate, operating income growth rate, total asset growth rate, net asset growth rate, current rate, speed ratio, asset liability rate, receivable turnover rate, inventory turnover rate, current asset turnover rate, fixed asset turnover rate, were selected.

2.2. Factor analysis feasibility test

In this paper, the raw data are pretreated by Z-score standardization. They were tested for KMO and Bartley spheroids, as shown in the Table 1:

Number of	.574		
Bartley spheroids	artley spheroids Approximate Chip		
	reedom of movement	105	
	Significance	.000	

Table 1 KMO and Bartlett Tests

The above table shows that KMO = 0.574, above 0.5, P = 0, below 0.05, indicates that these indicators are relevant and independent of each other and apply to factor analysis.

2.3. Extraction of public factors

This paper uses principal component analysis to extract the common factor for the 15 selected indicators. Table 2 shows the explanation of the general variance of the common factor:

	Initial Eigenvalues			Extraction of load square sum			Rotating load square sum		
	Total	Percentage	Sum%	Total	Percentage	Sum%	Total	Percentage	Sum%
		variance			variance			variance	
1	5.889	39.263	39.26	5.88	39.263	39.263	5.080	33.866	33.866
2	3.056	20.376	59.63	3.05	20.376	59.639	2.908	19.387	53.253
3	1.812	12.081	71.72	1.81	12.081	71.721	2.051	13.675	66.928
4	1.195	7.964	79.68	1.19	7.964	79.685	1.914	12.757	79.685
5	.971	6.472	86.15						
6	.694	4.630	90.78						
7	.394	2.625	93.41						
8	.286	1.903	95.31						
9	.275	1.832	97.14						
10	.161	1.072	98.21						
11	.133	.889	99.10						
12	.094	.626	99.73						
13	.023	.155	99.88						
14	.016	.107	99.99						
15	.001	.004	100.0						

Table 2 Explanation of total variance

A principal component analysis of the data revealed four indicators with signature values greater than 1. These four principal component variance contribution rates were 39.26%, 20.38%, 12.08%, 7.96%, and a cumulative contribution rate of 79.69%, which is close to 80%.

2.4. naming of public factors

Four common factors were selected instead of 15 raw variables to explain the majority of the raw data, which were expressed in terms of F1, F2, F3, and F4, as shown in the component matrix in Table 3:

	Component			
	1	2	3	4
Zscore(operating margin)	.878	.014	.234	.239
Zscore(net profit margin)	.841	092	.325	.327
Zscore(gross profit margin)	.411	306	.224	.739
Zscore(asset return rate)	.850	.333	.217	.192
Zscore(operating income growth rate)	055	.166	.379	.561

Table 3 Rotated composition matrix

Zscore(total asset growth rate)	.113	071	.898	.168
Zscore(net asset growth rate)	.509	.054	.453	443
Zscore(current rate)	.871	206	.186	229
Zscore(speed ratio)	.878	226	.227	219
Zscore(asset liability rate)		.043	.109	.035
Zscore(receivable turnover rate)		.044	.688	.042
Zscore(inventory turnover rate)		.593	.194	656
Zscore(current asset turnover rate)		.864	128	.179
Zscore(fixed asset turnover rate)	.192	.814	.108	082
Zscore(total asset turnover rate)	198	.895	040	237

Component One has a large payload on the profitability indicator variable, so F1 is named the profitability factor. Indicators with a higher payload in the F2 column are often used to measure the financial performance of an enterprise, hence the designation of F2 as an operating capability factor. The solvency index has a high load in F3, which is named as the solvency factor. The load of the growth ability index is higher in the F4 column, which is defined as the growth ability factor.

2.5. Factor score

Based on the coefficient of variance contribution in table 2, the weight is calculated as a factor of four common factors, which add up to a combined score of F for 25 companies, as shown in Table 4:

	F1	F2	F3	F4	F
Renhe pharmaceutical	1.39	.57	.82	-2.25	.51
Hongzhi Pharmaceuticals	53	.31	.33	.80	.03
Widely-known	91	-1.94	49	17	97
Zhongxin Pharmaceuticals	.01	.66	61	38	.001
Chisholm Collection	.48	90	3.11	.41	.58
Kang Enbei	55	12	80	.27	359
Essence Pharmaceuticals	40	82	07	33	43
Treasure Island	45	-1.19	.06	.06	46
Sinohang Group	69	-1.07	1.24	.62	24
Taiji Group	-2.08	.14	.25	32	85
Tibetan Pharmaceuticals	2.09	.76	90	1.55	1.17
Ma Yinglong	.66	1.17	1.15	-1.13	.58
Kenman Group	98	2.46	1.09	81	.23
Sinopharm Pharmaceuticals	-1.15	34	61	-1.55	92
Sunflower Pharmaceuticals	.53	.09	-1.08	.30	.11
Kunbang Pharmaceuticals	75	1.15	21	19	10

 Table 4 Comprehensive score

Shouxian Valley	1.30	79	.48	.80	.57
Jiangzhong Pharmaceuticals	1.49	65	44	45	.32
Takin Pharma	06	.35	16	1.28	.23
Guilin Sanjin	.69	-1.01	.05	.04	.06
Yoshikawa Pharmaceuticals	1.08	02	.24	25	.45
Tesco	.54	07	-2.09	-1.57	39
Step Pharma	45	1.70	24	2.13	.52
Jiuzhitang	25	.29	62	.70	02
Guizhou Province	-1.02	72	50	.45	62

F1 stands for corporate profitability. Benevolent Pharmaceuticals ranked third in profitability factor scores. F2 stands for operational capability factor, Benevolence Pharmaceuticals F2 = 0.57, ranking seventh out of 25 companies. F3 stands for solvency factor, and Benevolence Pharmaceuticals ranks fifth with a solvency factor of 0.82. F4 stands for Growth Capability Factor, while Benevolence Pharmaceuticals lags behind.

F represents the combined financial position of an enterprise, and Renhe Pharma F = 0.5 is ranked sixth, indicating that its consolidated financial position is relatively sound. Benevolent Pharmaceuticals has a strong profitability, a strong operating capability, and a debt service capacity at the forefront of the industry, but it has a weak development capacity and needs to strengthen management control over development.

3. conclusion

By using factor analysis to analyze the financial situation of renhe pharmaceutical industry, the four main factors are obtained and the total score is calculated. It can be found that renhe pharmaceutical industry's profitability, operating ability, debt repayment ability is at the leading position in the industry and its development ability is slightly weak. Benevolent Pharmaceuticals ranked sixth out of 25 sampled enterprises, indicating good development, high management level and good management efficiency.

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