Research on Financial Performance of New Energy Vehicle Listed Companies

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Abstract: In recent years, the world's major automobile producing countries and major automobile manufacturing enterprises are speeding up the development and manufacturing of new energy vehicles. Scholars from all walks of life have also studied the new energy vehicle enterprises from different perspectives. This article, through factor analysis to financial performance evaluation of listed 55 new energy automobile companies in China, has found factors affecting financial performance, and come to conclusions of each factor score and comprehensive score. Objective analysises of the impact of factors on financial performance of new energy vehicles listed company in China are made, and corresponding suggestions are advanced.

Keywords: new energy vehicle; financial performance; factor analysis

1 INTRODUCTION

In recent ten years, China adheres to the strategic orientation of basically promoting pure electric vehicles, and supports the development of new energy vehicle industry through subsidies. However, the high cost in the early period of research and development and the difficulties of popularizing the charging pile supporting facilities are likely to cause shortage of cost spent on the stage of research and development of new energy automobile enterprise, difficulties of opening the market after product launch and many other problems, which will cause that car business failing to develop well for the new energy automotive enterprises. Therefore, it is of great theoretical and practical significance to study the financial performance of new energy vehicle listed companies [1].

2 RESEARCH DESIGN

2.1 Selection of samples

In order to study the financial performance of new energy vehicle listed companies, this paper searches for the annual report data in 2020 through the Wind and *Yahoo Finance*, eliminates ST companies and companies with incomplete information, and selects samples of 55 new energy vehicle listed companies, mainly including vehicles, batteries and charging piles.

2.2 Determination of methods

Due to the excessive number of indicators used to evaluate financial performance, in order to analyze the profitability, development, operation and debt repayment of enterprises more intuitively and clearly, this paper evaluates the financial performance of new energy vehicle listed companies based on the factor analysis method. Factor analysis method has the characteristics of objectivity and strong operability, and it can reflect the main information of many variables with only a few indicators, which can reduce the errors caused by subjective analysis to a certain extent and facilitate data analysis.

2.3 The selection of indicators

The selection of indicators in this paper follows the principles of comprehensiveness, scientificity and representativeness. 12 indicators in combination with the high growth nature of new energy vehicle listed companies are selected from the four aspects of profitability, debt paying ability, operation abilityand development ability: earnings per share X_1, net profit rate of sales X_2, return on equity X_3, current ratio X_4, quick ratio X_5, asset-liability ratio X_6, total assets turnover X_7, inventory turnover ratio X_8, accounts receivable turnover X_9, total assets growth rate X_{10}, net profit growth rate X_{11} and total operating income growth rate X_{12}[2].

3 EMPIRICAL ANALYSIS

3.1 Data processing and applicability test

The solvency indexes selected in this paper are all moderate indexes, which need to be assimilated before analysis. In addition, the indicators should be standardized because the dimensions of each indicator are different. In this paper, KMO test and Bartlett test are used to determine whether the selected samples are suitable for factor analysis. The KMO value is generally required to be greater than 0.5 and the Bartlett spherical test generally requires Significance less than 0.01, indicating suitability for factor analysis. According to SPSS25.0, the KMO value was 0.601>0.5 and Significance was close to 0, which met the conditions for use in factor analysis. Therefore, it indicates that the selected samples and data are appropriate and suitable for further analysis.

3.2 Extract common factors

In this paper, SPSS25.0 was used to extract common factors and the results of total variance interpretation analysis were obtained, as shown in Table 1.

TABLE 1. TOTAL VARIANCE INTERPRETATION

Com pone nt	Initial eigenvalue			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Percentag e of variance	Cumul ation %	Total	Percentage of variance	Cumul ation %	Total	Percentag e of variance	Cumul ation %
1	3.969	33.075	33.075	3.969	33.075	33.075	3.969	33.075	33.075
2	2.412	20.100	53.175	2.412	20.100	53.175	2.412	20.100	53.175
3	1.379	11.491	64.666	1.379	11.491	64.666	1.379	11.491	64.666
4	1.276	10.631	75.297	1.276	10.631	75.297	1.276	10.631	75.297

It can be seen from the table that 4 factors with eigenvalues greater than 1 can be extracted from the 12 indicators, and their cumulative contribution rate is 75.297, which indicates that the extracted factors can fully reflect the information of the indicators selected in this paper, and the loss of information is less. Therefore, these four factors can be used to reflect the financial performance of the 55 listed companies.

3.3 Establishment of factor load matrix

There are many methods of factor rotation. In this paper, the maximum variance method is used to perform orthogonal rotation of factor loading matrix, and the results of rotation component matrix are obtained. After observing the rotating component matrix results, it can be found that the net profit rate on sales, earnings per share and return on equity have a large load on the common factor F_1. These indicators are all indicators reflecting the profitability of the company. The common factor F_1 can be named as the profit factor, and F_1 has the largest contribution with a rate of 33.075%. The growth rate of total assets and total operating income have a great correlation with the public factor F_2. These indicators are all indicators reflecting the development ability of the company, so the public factor F_2 can be named as the development factor. Accounts receivable turnover, total assets turnover, inventory turnover have a large load on the common factor F_3, these indicators are indicators reflecting the company's operating capacity, so the common factor F_3 can be named as the operating factor. Asset-liability ratio, quick ratio and current ratio have a great load on the common factor F_4. These indicators are all indicators reflecting the company's solvency, so the public factor F_4 can be named as the debt paying factor.

3.4 Construct comprehensive evaluation function

Using SPSS regression analysis, four common factor scoring coefficient matrices can be obtained, as shown in Table 2.

TABLE 2. COMPONENT SCORE COEFFICIENT MATRIX

Compo nent	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}
1	0.103	0.399	0.025	-0.157	-0.031	-0.053	-0.048	0.110	-0.105	0.014	0.433	0.201
2	0.199	-0.106	0.097	0.341	-0.315	-0.002	0.068	-0.245	0.056	0.297	-0.217	0.065
3	0.143	-0.069	0.097	0.017	-0.062	-0.060	0.460	0.183	0.463	0.010	-0.077	-0.056
4	-0.034	-0.058	0.290	0.097	0.488	0.619	-0.070	-0.005	0.011	0.001	-0.071	0.039

We have set the initial evaluation index as X_1, X_2...to X_{12}. According to the component score coefficient matrix, the comprehensive expressions of the principal component F_1, F_2, F_3 and F_4 can be obtained through calculation.

$F_1=0.103X_1+0.399X_2+0.025X_3-0.157X_4-0.031X_5-0.053X_6-0.048X_7+0.110X_8-0.105X_9+0.014X_{10}+0.433X_{11}+0.201X_{12}$.

$F_2=0.199X_1-0.106X_2+0.097X_3+0.341X_4-0.315X_5-0.002X_6+0.068X_7-0.245X_8+0.056X_9+0.297X_{10}-0.217X_{11}+0.065X_{12}$.

$F_3=0.143X_1-0.069X_2+0.097X_3+0.017X_4-0.062X_5-0.060X_6+0.460X_7+0.183X_8+0.463X_9+0.010X_{10}-0.077X_{11}-0.056X_{12}$.

$F_4=-0.034X_1-0.058X_2+0.290X_3+0.097X_4+0.488X_5+0.619X_6-0.070X_7-0.005X_8+0.011X_9+0.001X_{10}-0.071X_{11}+0.039X_{12}$.

Then according to the weight of variance contribution rate of the four common factors, the comprehensive scoring formula of financial performance evaluation can be obtained: $F=(33.075\% F_1+20.100\% F_2+11.491\%F_3+10.631\% F_4)/75.297\%$.

Substitute the standardized data of each index of the selected company into the formula to obtain the score of each factor, comprehensive score and ranking, as shown in Table 3.

TABLE 3. FACTOR SCORE, OVERALL SCORE AND RANKING

Stock abbreviations (stock code)	F_1	F_2	F_3	F_4	F	Ranking				
						F_1	F_2	F_3	F_4	F
GDW (688390)	0.7734	3.5229	0.7808	0.2431	1.4336	2	1	7	26	1
HCJS (300124)	0.5134	1.4208	-0.1219	0.0852	0.5982	8	5	20	30	2
NDSD (300750)	0.1419	2.0349	-0.1786	0.0897	0.5909	28	2	23	29	3
TNGF (688819)	-0.0553	0.2434	2.7667	0.3381	0.5106	38	20	2	20	4
PTL (603659)	0.0442	1.9851	-0.3520	-0.0503	0.4885	34	3	34	34	5
...	...	...	...	...	...	...	...	...	...	...
ZTKC (000957)	-0.2300	-0.7382	-0.4201	-0.7712	-0.4711	46	46	39	47	51
AKKJ (002610)	-0.1209	-1.8794	-0.3847	0.9653	-0.4772	41	54	35	9	52
XKGF (601127)	-0.5784	-1.1434	-0.2382	-1.8197	-0.8526	53	52	25	52	53
YXKC (600213)	-0.4466	-1.9144	-0.9236	-3.5787	-1.3534	50	55	53	55	54
BQLG (600733)	-6.7671	0.9073	-0.4541	-0.1384	-2.8192	55	10	42	37	55

*Only the top five and bottom five are listed due to space constraints.

4 RESULT ANALYSIS AND RELATED SUGGESTIONS

4.1 Result analysis

4.1.1 From the perspective of F_1

The two enterprises of GDW (688390) and HCJS (300124) have high F_1 scores, while the three enterprises of BQLG (600733), XKGF (601127) and YXKC (600213) have low F_1 scores. F_1 mainly represents the profitability of the enterprise. According to the comparative analysis, the profitability indicators of GDW (688390) and HCJS (300124) are very high, among which earnings per share of GDW (688390) is 3.64, ranking first, and its return on equity is 34.99% ranking second. The net profit rate on sales of HCJS (300124) is 18.95%, ranking the fourth. And the analysis shows that the profitability indicators of BQLG (600733), XKGF (601127) and YXKC (600213) are all negative. The net profit rate of sales of BQLG (600733) is -122.83%, its earnings per share is -1.86, and the return on equity of YXKC (600213) is -165.80%, all ranking the lowest.

4.1.2 From the perspective of F_2

The F_2 scores of GDW (688390), NDSD (300750) and PTL (603659) are relatively high, while the F_2 scores of YXKC (600213), AKKJ (002610) and XKGF (601127) are all very low. and F_2 mainly represents the development ability of the enterprise. It can be seen that the indicators of development ability of the first three enterprises are very high. Among them, the growth rate of total assets of GDW (688390) is 152.44%, and its growth rate of total operating income is 68.09%, both ranking first. The growth rate of total assets of NDSD (300750) is 54.53%, ranking the fifth. The growth rate of total assets of PTL (603659) is 78.16%, ranking the second. The indicators of these three enterprises rank at the forefront of the 55 enterprises in all aspects, especially GDW (688390) having strong profitability, outstanding advantages and great potential for future development. According to the comparative analysis of the data of the enterprises with the lowest scores, it can be seen that the indicators of development ability of YXKC (600213), AKKJ (002610) and XKGF (601127) are basically negative. The net profit growth rate of YXKC (600213) is -1207.63%, and that of XKGF (601127) is -2716.51%. Both companies ranked last in net profit growth.

4.1.3 From the perspective of F_3

TNGF(688819) has a high score in F_3, while YXKC(600213) has a low score in F_3. and F_3 mainly represents the operating capacity of the enterprise. Among them, the turnover rate of total assets and accounts receivable of TNGF(688819) are respectively 1.87 and 37.72, ranking second in total assets and third in accounts receivable. On the other hand, the total asset turnover rate of YXKC(600213) is 0.41, and the accounts receivable turnover rate is 0.53, both ranking behind.

4.1.4 From the perspective of F_4

The F_4 scores of GDW (688390), HCJS(300124), NDSD(300750), TNGF(688819) and PTL(603659) are all average, while the F_4 scores of YXKC(600213) and XKGF(601127) are all low. F_4 mainly represents the debt paying ability of enterprises, indicating that the debt paying ability of listed new energy vehicle companies is poor as a whole. According to the

comparative analysis of the data of various enterprises with low scores, the asset-liability ratios of YXKC(600213) and XKGF(601127) are respectively 97.47% and 78.61%, being at the bottom of the list in terms of debt to asset ratios.

4.2 Suggestions

4.2.1 Implement mergers and acquisitions to achieve synergies

Listed large and medium-sized new energy vehicle companies should make full use of their advantages to acquire some small and medium-sized enterprises, improve the industry concentration, achieve economies of scale, resource complementarity, reduce their own operational risks, so as to obtain operational synergies; At the same time, it can also make full use of the surplus management resources, save the management cost, so as to obtain the management synergy effect [3].

4.2.2 Pay attention to operational capacity and strengthen asset management.

Listed companies of new energy vehicles should especially strengthen the management of current assets. In operation management, they should pay special attention to the management of accounts receivable, including customer analysis and aging analysis. Enterprises can also take necessary factoring measures for accounts receivable. For inventory management, enterprises should adhere to the order mode, reduce unnecessary inventory costs.

4.2.3 Innovate subsidy methods to reduce the dependence of enterprises on subsidies.

The way of government subsidizing is to directly provide financial subsidies to enterprises and to subsidize consumers when buying new energy vehicles. We believe that the government can innovate subsidy methods, such as giving tax incentives to enterprises to indirectly subsidize the new energy vehicle industry, so as to avoid directly subsidizing specific models and making the production and sales of enterprises dependent on government support [4].

4.2.4 Increase investment in funds and support the construction of basic supporting facilities

At present, the number of public charging stations and charging piles in China is only more than 300,000 and more than 500,000 respectively, and this kind of charging facilities cannot meet the charging needs of consumers. At the same time, the lack of charging pile construction has become the main reason why consumers do not buy new energy vehicles. At present, the most urgent need is that the government should vigorously support the construction of basic supporting facilities [5].

5 THE CONCLUSION

Through factor analysis, this paper evaluates the financial performance of 55 new energy vehicle listed companies in China, finds out the factors that affect the financial performance. On the whole, the profitability and development ability of new energy vehicle listed companies are relatively optimistic, and the ability of debt paying is generally poor. Therefore, new energy vehicle listed companies should focus on maintaining a reasonable capital structure, reducing financial risks, and strengthening asset management so as to improve their competitiveness.

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