Performance Evaluation and Dynamic Evolution Analysis of Listed Companies in Fujian Province

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Abstract. With the continuous development and improvement of China Stock market, the performance of listed companies has increasingly become the focus of business operators, government management departments and investors. This paper uses entropy weight method, TOPSIS method and entropy weight TOPSIS method to establish the performance evaluation model of listed companies in Fujian Province, compare the overall strength and industry status of listed companies in Fujian Province, so as to study the situation of the industry and accordingly put forward countermeasures and suggestions for the production and management of listed companies.

Introduction

The measurement of enterprises performance is an important issue in the field of market economy. With the steady growth of the China economy and the continuous improvement of the market economy, the status of listed companies in the China has been improved and the performance of listed companies is also attracting more attention. Correct and fair evaluation of the operating ability of listed companies is the focus of performance evaluation.

Literature Review

The research of enterprise performance evaluation started in the United States. With the development of the economy and the transformation of enterprises, scholars from Western countries have carried out a series of explorations in the field of enterprise performance management and performance evaluation and have achieved remarkable results. From the early performance evaluation based on cost indicators to the evaluation of financial performance to the comprehensive performance evaluation that has been widely used today scholars put forward new ideas for performance evaluation from different angles. In addition, there are many innovative performance evaluation methods, including VBM theory [1], new 3D performance model [2]. China comprehensive evaluation of corporate performance started relatively late compared with foreign countries. With the change of economic system and the reform and development of enterprises, China’s Ministry of Finance, State Statistics Bureau and experts, civil institutions have carried out a lot of research and exploration on the construction of the evaluation index system and the improvement of performance evaluation methods.

To sum up, experts at home and abroad have done a lot of research on performance evaluation. There are still some shortcomings in the comprehensive evaluation of performance. First of all, although the evaluation methods abroad are relatively perfect, the national conditions and policies of different countries are different and with the development of the times, new elements are constantly considered; second, in the selection of evaluation indicators, most of the research uses the previous research results. There is a great subjective randomness; third, in the choice of index weight, most of the research adopts a certain subjective or objective weighting method. The evaluation results are one-sided.

Therefore, this paper attempts to construct a financial performance index system model of Fujian
listed companies by combining subjective analysis with objective factor analysis method and constructs the financial performance evaluation index system of listed companies by combining subjective factors and objective factors. Three different performance models, entropy weight method, TOPSIS method and entropy weight TOPSIS method, are adopted to evaluate the profitability of listed companies in Fujian Province. According to different evaluation results, this paper analyzes the different focuses of different weighting methods in the evaluation and then analyzes the advantages and disadvantages of listed companies.

Sample Selection and Variable Design

Sample Selection

A total of 41 listed companies in Fujian Province were selected from the Shanghai A shares and Shenzhen A shares from 2011 to 2015. In order to ensure the correctness of the sample data, the data of financial insurance and GEM companies, ST stocks, and enterprises with some important indicators missing are excluded. Finally, 21 samples are obtained.

Variable Design

This paper establishes an alternative indicator system including 27 indicators such as working capital, depreciation and amortization based on five aspects of profit, debt repayment, growth, operation and equity expansion. Due to the importance principle, this paper use the factor analysis method to exclude the less important indicators and construct the indicator model suitable. Finally, eight indicators are selected: Debt Asset ratio, Net Cash Flow from Creditors of Financing Activities, Owner's Equity Ratio, Working Capital Ratio, Net Profit Margin of Current Assets, Earnings before Interest and Tax, Capital Maintenance and Appreciation Rate, Earnings per Share Growth Rate (EPS).

Empirical Analysis on Financial Performance Evaluation of Listed Companies in Fujian Province

Financial Performance Evaluation of Listed Companies in Fujian Province Based on TOPSIS Method

Analysis of Listed Companies in Fujian Province Based on TOPSIS Method. TOPSIS Method Analysis Process is not described here. Import sample data into EXCEL. The selected data can be used to calculate the performance rankings of 21 listed companies from 2011 to 2015. From the impact of the selected eight indicators on TOPSIS, it can be concluded that the impact of eight indicators such as Debt Asset ratio on TOPSIS is shown in Table 1.

<table>
<thead>
<tr>
<th>F1</th>
<th>F2</th>
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<th>F5</th>
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<th>F7</th>
<th>F8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative correlation</td>
<td>Positive correlation</td>
<td>Positive correlation</td>
<td>Positive correlation</td>
<td>The impact isn’t obvious</td>
<td>Positive correlation</td>
<td>Positive correlation</td>
<td>The impact isn’t obvious</td>
</tr>
</tbody>
</table>

Evaluation Result Analysis. Based on the above empirical analysis results, we can see the performance fluctuation of a listed company for 5 years from the vertical. Because the number of samples is too large, this paper mainly selects two representative enterprises for specific analysis. Yongan Forestry company (000663) and Zhonghe company(002070) are the well-known listed companies in Fujian Province. And there are events in the selected time range that cause the company's ranking to fluctuate. So this article takes the two companies as examples.
Table 2. Ranking of Yongan Forestry (000663) from 2011 to 2015.

<table>
<thead>
<tr>
<th>Time</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
<th>F6</th>
<th>F7</th>
<th>F8</th>
<th>ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12-31</td>
<td>0.249</td>
<td>35180211</td>
<td>0.895</td>
<td>0.249</td>
<td>-0.062</td>
<td>3870</td>
<td>0.879</td>
<td>-6.750</td>
<td>16</td>
</tr>
<tr>
<td>2012-12-31</td>
<td>0.260</td>
<td>-75431772</td>
<td>0.850</td>
<td>0.260</td>
<td>0.019</td>
<td>76105602</td>
<td>1.009</td>
<td>-1.217</td>
<td>2</td>
</tr>
<tr>
<td>2013-12-31</td>
<td>0.266</td>
<td>-84689360</td>
<td>0.864</td>
<td>0.266</td>
<td>0.019</td>
<td>61269774</td>
<td>0.950</td>
<td>0.000</td>
<td>1</td>
</tr>
<tr>
<td>2014-12-31</td>
<td>0.258</td>
<td>-14347260</td>
<td>0.898</td>
<td>0.258</td>
<td>-0.024</td>
<td>35743789</td>
<td>0.982</td>
<td>-3.000</td>
<td>3</td>
</tr>
<tr>
<td>2015-12-31</td>
<td>0.513</td>
<td>-138105673</td>
<td>0.877</td>
<td>0.513</td>
<td>0.033</td>
<td>120457789</td>
<td>5.773</td>
<td>-3.000</td>
<td>92</td>
</tr>
</tbody>
</table>

Yongan Forestry Company (000663) was formed by the merger of all enterprises under the former Yongan Forestry Commission. It is a listed company with multi-level and strict organizational structure that conducts protective mining and unified acquisition of forestry resources in Yongan city. It is also a relatively well-known enterprise in Fujian Province. As can be seen from Table 2, from 2011 to 2014, Yongan Forestry Company ranked higher. However, in 2015, the ranking of Yongan Forestry Company fell sharply. From the original data, it was found that in 2015, Yongan Forestry Company carried out major asset restructuring. The Debt Asset ratio rose significantly and the EBIT dropped sharply, which led to the decline of the company's ranking.

Zhonghe Company (002070) is a comprehensive listed company engaged in the production, sale and foreign trade of clothing fabrics and other textiles, and gradually transitioning to the sale of wood products, building materials, hardware and chemical raw materials. As can be seen from Table 3, the performance ranking of Zhonghe Company fluctuated significantly. In 2014, its Debt Asset ratio decreased and EBIT increased significantly, so the performance ranking increased significantly. In 2015, its EBIT decreased and Net profit rate of current assets decreased to negative value, so the performance ranking decline.

Table 3. Ranking of Zhonghe Shares (002070) from 2011 to 2015.

<table>
<thead>
<tr>
<th>Time</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
<th>F6</th>
<th>F7</th>
<th>F8</th>
<th>ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12-31</td>
<td>0.569</td>
<td>-50394428</td>
<td>0.697</td>
<td>0.569</td>
<td>0.054</td>
<td>130366722</td>
<td>1.064</td>
<td>-0.442</td>
<td>17</td>
</tr>
<tr>
<td>2012-12-31</td>
<td>0.488</td>
<td>148965759</td>
<td>0.934</td>
<td>0.488</td>
<td>0.027</td>
<td>102829786</td>
<td>1.428</td>
<td>-0.536</td>
<td>31</td>
</tr>
<tr>
<td>2013-12-31</td>
<td>0.563</td>
<td>-302406542</td>
<td>0.843</td>
<td>0.563</td>
<td>0.024</td>
<td>111584120</td>
<td>1.025</td>
<td>-0.219</td>
<td>57</td>
</tr>
<tr>
<td>2014-12-31</td>
<td>0.310</td>
<td>112200938</td>
<td>1.017</td>
<td>0.310</td>
<td>0.005</td>
<td>82763212</td>
<td>0.546</td>
<td>-0.683</td>
<td>4</td>
</tr>
<tr>
<td>2015-12-31</td>
<td>0.281</td>
<td>255170359</td>
<td>1.102</td>
<td>0.281</td>
<td>-0.113</td>
<td>-55469716</td>
<td>0.835</td>
<td>-12.005</td>
<td>83</td>
</tr>
</tbody>
</table>

It can be seen from Performance Ranking of Listed Companies in Fujian Province from 2012 to 2015 that there is no obvious concentration trend. It can be concluded that the economic situation in Fujian Province has not experienced great fluctuations.

Financial Performance Evaluation of Listed Companies in Fujian Province Based on Entropy Weight Method

Analysis of Listed Companies in Fujian Province Based on Entropy Weight Method.

Entropy weight method Analysis Process is not described here. The sample data is imported into EXCEL. According to the above steps, the entropy weight of the eight indicators of listed company
can be calculated. The entropy weights are 0.129886496, 0.067515702, 0.126544875, 0.164560262, 0.095112363, 0.100773587, 0.216248762 and 0.099357953 respectively.

**Evaluation Result Analysis.** The indicators with greater weight are Debt Asset ratio, working capital ratio, Owner's equity ratio, Earnings Before Interest and Tax, Capital maintenance and appreciation rate. The weight of these indicators is above 10%, indicating that the above five indicators have a significant impact on the financial performance of listed companies in Fujian Province. Net profit rate of current assets, Earnings per share growth rate and Net cash flow from creditors of financing activities have little effect on the financial performance of enterprises.

From the comparison of entropy weight method and TOPSIS method, it can be seen that there are significant differences between the two rankings due to the different selection of index weights. In the entropy weight method, the weight of capital preservation growth rate is the highest, but in TOPSIS method, the impact of Capital maintenance and appreciation rate is not very obvious.

### Performance Evaluation of Listed Companies in Fujian Province Based on Entropy Weight TOPSIS Method

**Entropy Weight TOPSIS Method Analysis Process.** Entropy weight TOPSIS method adds an entropy weight to the indicator based on the TOPSIS method to highlight the influence of important indicators. Debt Asset ratio, Owner's equity ratio, working capital ratio, Net profit rate of current assets, Net cash flow from creditors of financing activities, Earnings Before Interest and Tax, Capital maintenance and appreciation rate, Earnings per share growth rate are multiplied by entropy value respectively. The entropy weight of listed companies in Fujian is calculated using entropy weight method. The entropy weights are 0.13, 0.06, 0.12, 0.16, 0.09, 0.10, 0.21 and 0.10 respectively. Perform the steps of the TOPSIS method again to get the results.

It can be seen from Entropy weight TOPSIS method that except for Yongan Forestry Company (000663), which has ranked among the best of the Performance ranking during 2011 to 2014, the performance rankings of other listed companies, fluctuated greatly.

### Analysis of Listed Companies in Fujian Province Based on Entropy Weight TOPSIS Method

In order to compare the similarities and differences between TOPSIS method and entropy weight TOPSIS method, this section is still taking Yongan forestry company(000663) and zhonghe company(002070) as examples. It can be seen from the calculation results (results are not listed here) that TOPSIS method and entropy weight TOPSIS method have the same trend for the performance evaluation of listed companies. However, because entropy weight TOPSIS method adds the importance level of financial indicators, the role of this method is more obvious. Under entropy weight TOPSIS method, Yongan Forestry company's (000663) performance ranking in 2015 dropped to ninety-nine, while the performance ranking calculated under TOPSIS method was 92. Zhonghe Company (002070) rose to the first in 2014 under entropy weight TOPSIS model. It can be concluded that entropy weight TOPSIS method is greatly influenced by the weight of the importance index. The accuracy of the entropy weight TOPSIS method has an important relationship with the objectivity of the index weight.

**Evaluation Results Analysis.** Since entropy weight TOPSIS method is based on the analysis result of entropy weight method in 3.1. Debt Asset ratio, Owner's equity ratio, working capital ratio, Net profit rate of current assets, Net cash flow from creditors of financing activities, Earnings Before Interest and Tax, Capital maintenance and appreciation rate, Earnings per share growth rate are multiplied by entropy weight respectively. Therefore, it highlights the importance of indicators such as Owner’s equity ratio that have a great impact on the performance of listed companies.

It can be considered that TOPSIS method and entropy weight TOPSIS method have the same trend for the performance evaluation of listed companies. Because the entropy weight TOPSIS method adds the weight of the index, the importance of the index is highlighted, so the influence of subjective factors on entropy weight TOPSIS method will be smaller than TOPSIS method.
Suggestion

Optimize Capital Structure and Increase Capital Preservation and Appreciation Ratio

Listed companies must actively seek new financing channels and carry out diversified financing activities. The banking system should also be appropriately reformed to provide some preferential policies for the growth of listed companies. At the same time, government departments should also strengthen their regulatory capabilities, establish social credit systems, improve the capital preservation and appreciation rate of listed companies, optimize the capital structure of listed companies and improve the operating effect of listed companies [3].

Optimize Ownership Structure and form Relative Holding Mode

If there are too many shares held by shareholders, the issue of repurchasing stocks should be properly considered. If shareholders hold too few stocks, the issue of increasing stocks should be properly considered. Moderate concentration of equity and equity balance are positively related to the financial performance of listed companies. On the contrary, "one stock is dominant" or “free rider” caused by excessive dispersion of shareholders has a negative impact on listed companies. [4].

Enhance the Innovation of Enterprises and Increase Awareness of Independent Innovation

Listed companies should continue to carry out innovative activities. Enterprises can increase R&D investment from two aspects: increasing independent investment by themselves and striving for government investment in corporate innovation. Through continuous innovation, the company stimulates innovation output with R&D investment, constitutes healthy operation of R&D activities, optimizes the configuration structure of R&D personnel, and establishes an effective technological innovation mechanism[3]. Governments should promote enterprises to actively implement incentive measures and introduce innovative resources into enterprises from society as the fundamental guarantee of independent innovation [5].

Appropriately Expand the Horizontal Scale of Listed Companies and Control the Vertical Scale of Listed Companies

In recent years, the average scale of the enterprises in Fujian province has gradually expanded and the industrial concentration has been improved. However, in general, the scale of enterprises is still small. The distribution of production factors is not reasonable and the management level is low. Therefore, listed companies in Fujian should pay attention to improve the quality of main products, study the core technology, appropriately expand the horizontal scale, make full use of the scale economy, reduce the cost and effectively enhance the core competitiveness of enterprises [6].

Acknowledgment

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References


