

Analysis on the Early Warning of Enterprise Financial Risk under the Method of Efficiency Coefficient——Take H Power Company as an Example

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Abstract: With the continuous attempts and innovations in financial risk early warning research methods, in addition to the existing financial risk early warning models, more and more disciplines are also used in the analysis of corporate financial risk early warning. This paper introduces cash flow indicators to screen out indicators that are suitable for H Power Company's financial risk early warning, and then uses the efficiency coefficient method to use the selected indicators to evaluate and analyse the H Company's financial risks, which is more than direct application of existing models targeted. Judging the company's financial health according to the evaluation results and making warning judgments to facilitate the enterprise as a reference for dealing with financial risks.

1. Introduction

Financial risk has always been an aspect that all companies want to control as much as possible. As an important means of prevention, financial risk early warning plays a role that cannot be underestimated. The power industry is an important component closely related to the national economy. The research on the financial risk prevention of power companies has never stopped. This article borrows the principle of the efficiency coefficient method to carry out financial risk early warning research on a power company, as to help companies better carry out risk assessment and timely measures to take precautions can also be used as a reference for similar companies. The article establishes a financial risk early warning system for H Power Company, which reflects the financial risk degree of H Power Company.

2. Establishment of Financial Risk Evaluation System

The first is the screening of financial risk early warning indicators. This article selects the entropy method to screen and confirm the corporate financial profit, debt repayment, operation, growth ability indicators and some cash flow indicators. The indicators based on the weight size calculated by the entropy weight method are more It is objective and not affected by subjective judgment.

The specific operation principle is: Assume that the enterprise has m evaluation objects, n evaluation indicators, and the j -th index value of the i -th evaluation object is $X_{ij}(i=1,2,3,\dots,m; j=1,2,3,\dots,n)$. First, set the original value to the corresponding matrix $A=(X_{ij})m \times n$; then standardize the indicators to obtain a new normalized matrix $R=(Y_{ij})m \times n$; then use formula (2-1) to calculate the i -th The proportion of the j -th index among the evaluation objects under the standardized index:

$$P_{ij} = \frac{y_{ij}}{\sum_{i=1}^m y_{ij}} (i = 1,2,3,\dots,m; j = 1,2,3,\dots,n) \quad (2-1)$$

Calculate the entropy value of the j -th index according to formula (2-2):

$$e_j = -\frac{1}{\ln m} \sum_{i=1}^m P_{ij} \ln P_{ij} (i = 1,2,3,\dots,m; j = 1,2,3,\dots,n) \quad (2-2)$$

Then use formula (2-3) to determine the weight of the j-th index:

$$w_j = \frac{1 - e_j}{n - \sum_{j=1}^n e_j} \quad (i = 1, 2, 3, \dots, m; j = 1, 2, 3, \dots, n) \quad (2-3)$$

Ranked according to the weights of the second-level specific indicators under the five first-level indicators divided by profit, debt service, operation, growth capability indicators and some cash flow indicators, and supplemented by the correlation test results for indicator screening, and then again Use the entropy method to calculate and confirm the weight of each indicator. At this time, the improved efficiency coefficient method is used, that is, the corresponding coefficient is assigned after the standard value gear is refined, and the corresponding formula of the improved efficiency coefficient value is applied to calculate the corresponding secondary indicator Score, and finally add them together, and compare the divided risk degree table to judge the financial risk degree of the enterprise. Specifically, first refer to the relevant formula of the efficacy coefficient method used in the process:

$$\text{Individual basic index score} = \text{basic score of this file} + \text{adjustment score} \quad (2-4)$$

$$\text{Basic score of this file} = \text{index weight} \times \text{standard coefficient of this file} \quad (2-5)$$

$$\text{Adjustment score} = \text{Efficacy coefficient} \times (\text{basic score for the upper file} - \text{basic score for this file}) \quad (2-6)$$

$$\text{Efficacy coefficient} = (\text{actual value} - \text{standard value of this file}) / (\text{standard value of the previous file} - \text{standard value of this file}) \quad (2-7)$$

$$\text{Upgrading basic score} = \text{index weight} \times \text{upgrading standard coefficient} \quad (2-8)$$

The corresponding coefficients of the refined five-level standard values are (1,0.8,0.6,0.4,0.2) in order from good to bad. If the actual value of an indicator reaches the excellent value, the standard coefficient is directly taken as 1, otherwise lower than in the case of a poor value, the number is taken as 0. The reference source of the standard value combines the "Industry Classification" issued by the China Securities Regulatory Commission and the "Enterprise Performance Evaluation Standards" issued by the SASAC. Finally, the calculated scores of each individual indicator are added up to obtain the current comprehensive score, and the score is compared with the divided financial risk degree table to finally judge the financial risk degree of the enterprise. The score division of the degree of financial risk refers to the division standard of most domestic scholars in the research process, and the five-level interval is (0,20], (20,40], (40,60], (60,80), and (80,100) The range represents giant police, heavy police, medium police, light police and no police in turn.

3. H company Example Epplication

As a long-established electric power company in the electric power industry, H Power Company was listed in 1993. It is the largest electricity and heat supplier in H Province. Its business mainly focuses on thermal power generation. It has 8 owned power generation subsidiaries. While the company suffered consecutive losses in 2017 and 2018, and was listed as "ST" in 2019. This article selects the relevant financial indicator data of H Power Company from 2016 to 2018. It performs corresponding operations on it in accordance with the established financial risk evaluation system.

For companies, to establish a financial risk early warning model that is in line with their own reality, the selection of indicators should integrate the external environment and internal actual conditions, and consider the characteristics of the industry, instead of making the results full of uncertainty based on experience or random selection. Therefore, it is best to follow the following principles when selecting financial risk warning indicators:

(1) Principle of representativeness

The selection of financial risk early warning to indicators should be representative, able to fully reflect and reveal the risks faced by the enterprise in the daily operation and management process and provide timely warnings to the enterprise.

(2) Principle of sensitivity

The selected indicators must be able to reflect the changes in the financial activities of the enterprise in a timely, accurate and scientific manner.

(3) Systematic principle

The selected indicators are not mutually independent, but should be interrelated and related, which can more comprehensively monitor and reflect the company's operating and financial status, and more objectively reflect the company's risk level.

(4) Principle of practicality

For the actual operation of the enterprise, the selection of financial risk early warning indicators should be practical, so that the financial risk early warning results are more intuitive for enterprise managers to understand and make timely decision-making judgments.

The more chaotic the data, the less information it carries, the lower the utility is, the larger the calculated entropy value, and the smaller the weight coefficient of the corresponding index. Based on this, the importance of each index is clear. But just staying here does not meet the four principles of indicator selection mentioned above. For this reason, we will use the correlation analysis method to further filter the financial early warning model indicators based on the data in Table 4-3. And observe the correlation between the two indicators. If the calculated value is larger, the correlation between the two indicators is stronger. It also means that the mutual influence of each other's changes is greater, and the similarity of the information reflected is higher, so that the two can be replaced. The stronger it is, and the two must choose the best to avoid duplication of information.

Therefore, the further screening of indicators is completed according to the following steps:

First, the specific indicators under the five systems are sorted according to the calculated weight coefficient w , and then the person correlation coefficient is used for analysis.

Then use SPSS to judge the degree of correlation between the specific indicators under the index system. It uses 0.9 as the criterion for judging the degree of correlation. On the one hand, if the calculated correlation result is higher than 0.9, the weight of these two financial indicators will be eliminated the relatively low index, on the other hand, if the calculated correlation degree is less than 0.9, the part of the index whose weight is higher than the average of the relative system weight is retained.

Finally, the screening results of each system are sorted and summarized for the next step of analysis and processing. Based on the selected new financial risk early warning indicators, after normalizing the indicator data, the entropy weight method is used again to calculate the weight coefficients of each indicator and use them as the indicator variables of the Huadian Energy Financial Risk Early Warning Model Corresponding to the weight, the specific operation can use the formula listed in the previous article, at this time, you can choose to borrow the Spssau software, and finally get the weight coefficient result as shown in Table 1.

Table 1. Evaluation index and index weights

Index-I	Index- II	Entropy	Utility value	Weight coefficient	Index-I weight	Weight equal value
Debt paying ability	Quick ratio	0.7251	0.2749	0.1055	0.2763	0.1382
	Asset-liability Ratio	0.5549	0.4451	0.1708		
Profitability	ROE	0.7155	0.2845	0.1091	0.1979	0.0990
	OPE	0.7686	0.2314	0.0888		
Operating capacity	Total assets turnover	0.7712	0.2288	0.0878	0.1632	0.0816
	Inventory turnover	0.8034	0.1966	0.0754		
Cash flow	Cash to Current liabilities	0.8468	0.1532	0.0588	0.0588	0.0588
Sustainable earning growth ability	Operating profit growth rate	0.7387	0.2613	0.1002	0.3038	0.1013
	Sale growth rate	0.729	0.271	0.1040		
	Value Increasing Rate	0.7404	0.2596	0.0996		

According to the results in Table 2, the score in 2016 was 61.24 points, in 2017 it was 33.01 points, and in 2018 it was 33.95 points. With the scores calculated based on the entropy weight method and the efficacy coefficient method, the scores corresponded to the previous risk levels. For light and heavy police. In 2016, the company experienced obvious financial risks. In 2017 and

2018, the financial risks intensified and fell to a serious alarm level. At the same time, because the company's continuous operating profit for the two years was negative, the ST was implemented in 2019, and the overall actual and financial risk warning. The results are roughly consistent.

Table 2. Score of financial risk early warning index of h power company in 2016-2018

Index	Basic Index	Basic Score			Adjustment Score			Single Indicator Score			Total Score		
	Year	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Debt-paying Ability	Quick Ratio	0	4.22	4.22	0	0	0.07	0	4.29	4	3.67	4.29	4.29
	Liability on Asset Ratio	3.42	0	0	0.25	0	0	3.67	0	0			
Profitability	ROE	4.36	0	0	2	0	0	6	0	0	10.25	2.36	2.26
	Main Business Profit Margin	3.55	1.78	1.78	0.76	0.58	0.48	4.31	2.36	2.26			
Operating Capacity	Turnover of Total Assets	5.27	5.27	5.27	0.88	1.05	1.58	6.15	6.32	6.85	13.69	13.86	14.39
	Inventory Turnover	7.54	7.54	7.54	0	0	0	7.54	7.54	7.54			
Cash Flow	Cash Coverage Ratio	3.53	1.18	3.53	0.15	0.92	0.09	3.68	2.09	3.62	3.68	2.09	3.62
Growth Ability	Sales Profit Growth Rate	10.02	0	0	0	0	0	10	0	0	29.96	10.40	10.4
	Sales Growth Rate	10.4	10.4	10.4	0	0	0	10.4	10.4	10.4			
	Capital Appreciation Rate	7.97	0	0	1.58	0	0	9.54	0	0			

The debt-to-asset ratio of Company H was as high as 92.64% in 2018. The company is facing a heavier debt burden, which is mainly reflected in project reconstruction and expansion, a significant increase in fuel costs due to market influences, and coal prices continue to operate at a high level. Banks' pledged loans and policy-led special funds payable have put companies under high debt repayment pressure. In 2017 and 2018, due to the significant decline in the profitability of the thermal power generation industry, the market-oriented competition in electricity has intensified, and the use of thermal power units Hourly operation continues at a low level, coal prices continue to operate at a high level, while coal, electricity, and heat price linkages are not in place, thermal power generation is greatly impacted by rising coal costs, and there has been a large-scale decline in profits and even losses, which makes interest guarantee multiple Shows a negative value. The short-term and long-term debt repayment indicators shown in the table all reflect that Huadian Energy has high financing risk. Although this is not unrelated to the characteristics of China's power industry, Huadian Energy itself has Issues that cannot be ignored. Otherwise, the serious consequences of the rupture of the capital chain are likely to occur, and it is difficult to maintain the sustainability of the guarantee of corporate capital needs. Due to the continuous deepening of the current supply-side structural reforms, the power market and coal market reform are fully limited, the profitability of the power industry has declined significantly, the utilization hours of thermal power continue to decline, and the price of thermal coal has risen sharply, and the increase in coal costs has a greater impact Although Huadian Energy has wholly-owned and participated in the two major coal mines and owns part of the carbon resources, due to the sufficiency of development and transportation security, it still faces the problem of tight supply of coal resources, high power supply costs, and profit margins. The obvious decline. The company faces certain investment risks, and the prospects for returns are not optimistic. These are clearly reflected in the results obtained by H company's financial risk early warning model.

4. Suggested Countermeasures

4.1. Pay Attention to Financial Risk Early Warning

First of all, companies should increase their attention to financial risks. As managers and decision-makers of corporate finance, financial personnel must establish a sense of risk control. As an important pillar industry related to people's livelihood, the power industry cannot be ignored. Once it produces relatively obvious financial risks. On the one hand, it will have an impact on the company's own production, operation and performance. On the other hand, it will also cause

immeasurable risk losses to the company. In severe cases, it may even affect the local livelihood infrastructure and related infrastructure construction. Daily energy supply.

4.2 Optimize Industrial Structure Upgrade

Stabilize coal supply channels, develop high-quality fuels, and vigorously research and develop new energy sources while complying with energy conservation, emission reduction, and green production policies. Faced with high coal prices, companies must actively seek alternative fuels on the one hand, and on the other production and operation process of the company, it is necessary to reduce costs and increase efficiency as much as possible, two-pronged approach to improve the efficiency of the enterprise. At the same time, in terms of business operations, production and supply policies are adjusted in a timely manner based on the operating efficiency of various products.

4.3 Increase Funding Channels

Although Company H mentioned in its financial statements that the company's current risks are mainly concentrated in credit risk, liquidity risk and market risk, considering that the core connotation of financial risk is the ability of fund-raising activities to guarantee the capital needs of operating activities. Therefore, for enterprises, financing channels cannot be too single. Company H is highly dependent on bank loans. Once interest rates change, it will inevitably put pressure on the debt repayment of enterprises. Broadening the financing channels of enterprises will also help enterprises diversify risks.

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