Discussion on the Construction of Financial Risk Control System of Electric Power Research Institutes under the Background of Informational

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Abstract. The level of enterprise management informatization determines its ability and effect to avoid financial risks. Only by properly evaluating this degree of informational can enterprises be correctly guided to establish a scientific risk management system. This paper analyzes the current situation of the financial risk management of power companies and the specific industry characteristics of power companies, and analyzes the current situation of financial risk management of power companies, and through the questionnaires and other methods to deepen the problems and problems. The reason was analyzed. Then, according to the characteristics of the financial company's financial risk, the financial risk control system of the power company including risk identification, risk measurement, risk control and risk feedback subsystems is constructed. Finally, based on the financial risk control system, the corresponding policies and systems are put forward to create a good environment for the operation of the financial risk control system of the power company.

1. Introduction
With the advent of the information age, the processing efficiency of modern financial data has been improved, and the space for enterprise risk management and internal control has been expanded. The establishment of financial risk control system can not only provide timely data support for business decision-making, but also optimize Enterprise management mechanism to improve the operational efficiency of enterprises. With the development of social economy and the in-depth implementation of a series of power system reform measures such as “separation of plant and network”, the power market structure has been gradually established, formed, developed and improved. As a power company with power grid management as the main body, it faces a series of financial risk: First, the lag in electricity price reforms exposes power companies to the risk of buying and selling electricity prices. At present, due to the government's decision on the on-grid price and the terminal sales price, the company lacks autonomy in reducing the cost of purchasing electricity and increasing the income from electricity sales. There is uncertainty. Second, capital-intensive and asset-intensive features have led to power companies requiring huge amounts of financing and are prone to serious financial risks. Finally, the particularity of electrical energy products has led to the existence of relatively large settlement risks for power companies. As a very special product, electric energy has the characteristics of simultaneous production, supply and sales, intangibility and unutterability. It is mainly based on credit sales. If customers use electricity to avoid payment and inability to pay fees, the power company
will suffer huge losses. To this end, earnestly study the financial risk control of power companies, which plays an important role in maintaining normal production and operation and sustainable development of power companies.

2. Power company financial risk early warning indicators

The design and selection of early warning indicators for the financial risk control system of the power company is an important part of the company's financial risk control system. When selecting the type of indicators, it is necessary to start from the specific characteristics and actual conditions of the company, and then proceed according to the actual situation. Corresponding adjustments and optimizations [1-2]. Through the analysis and evaluation of the financial risk of the power company, the following indicators can be selected as the early warning indicators of the financial company's financial risk.

| Risk warning indicator | Index calculation formula |
|------------------------|---------------------------|
| Cash sales rate        | Operating net cash flow / sales revenue |
| Prepayment account ageing distribution | Interval prepayment / total prepayment |
| Average price of electricity purchase | Current purchase price / electricity purchase price during the same period |
| Accounts receivable ageing distribution | Inter-bank receivables/total accounts receivable |
| Proportion of construction in progress | (Construction in progress + prepayments + engineering materials) / net fixed assets |
| Construction project budget ratio | Year-end balance/budget |
| Maintenance rate | Maintenance fee / non-current assets |
| Idle fixed asset occupancy rate | Lease of fixed assets original value / total value of fixed assets that can be leased |
| Debt equity ratio | Average total negative 1R / (market value of average shareholders’ equity - intangible assets - assets to be disposed of) |
| Cash inflows and outflows from operating activities | Cash inflow from operating activities / cash outflow from operating activities |
| Guaranteed asset ratio | Guarantee/net assets |
| VAT tax rate | The cumulative amount of “taxable amount” and the current “taxable sales” in each period of the current period |

According to the established financial risk early warning indicator system, the risk management office regularly obtains the information needed to calculate the indicators from the management information system every month, and calculates according to the formula, and compares it with the set warning value. For risk indicators that exceed the warning value, analyze the reasons for exceeding the standard and estimate the future impact. Work with the financial departments at all levels to design relevant countermeasures according to the steps of the risk control process, and report the analysis results to the risk management committee in time. The company's early warning indicator value needs to be determined according to the company's risk preference [3]. The risk warning and supervision process is shown below.
3. Evaluation of financial risk control indicators of power companies

Compared with other companies, power companies have their own unique features: such as high concentration of funds, technology, and public service security. It is precisely because of these characteristics that the reform of the power system brings opportunities and brings a series of risks. The indicator system is divided into three levels: the target layer is the comprehensive score of the enterprise financial risk assessment [4]. The standard layer measures the financial risk level of the enterprise from four levels: profitability $C_1$, solvency $C_2$, operational capability $C_3$, and development potential $C_4$. Profitability measures the ability of a company to obtain profits in a certain period of time; solvency measures the ability of a company to pay cash and repay debts; operational capacity refers to the management ability of a company’s operations; development capability refers to the expansion of a company’s scale, Ability to enhance strength. At the indicator level, a total of 12 indicators were selected. Among them, the operating profit rate $C_{11}$, the return on net assets $C_{12}$, the total return on assets $C_{13}$, measure the profitability of the enterprise; the asset-liability ratio $C_{21}$, the interest multiplier $C_{22}$, and the quick ratio $C_{23}$, measure the solvency of the enterprise; The indicators are accounts receivable turnover rate $C_{31}$, current assets turnover rate $C_{32}$, total asset turnover rate $C_{33}$, enterprise development capacity includes three indicators: operating income growth rate $C_{41}$, total asset growth rate $C_{42}$, and operating profit growth rate $C_{43}$.

In the measurement of the financial risk level of enterprises, how to determine the weight is a key issue. At present, the methods for determining index weights mainly include subjective weighting method and objective weighting method. The subjective weighting method includes expert scoring method and analytic hierarchy process. Its subjectivity is too strong, and the result lacks stability. The objective weighting method includes factor analysis method, principal component analysis method and entropy weight method. The author uses the entropy weight method to determine the weight of the enterprise financial risk assessment indicators, which can avoid the deviation caused by human factors.
The specific calculation steps of the entropy weight method are as follows: First, the original data is standardized. Let the original data matrix \( A = (X_{ij})_{m \times n} \), \( m \) evaluation objects, \( n \) evaluation indicators, normalize the matrix to obtain \( R = (X_{ij})_{m \times n} \); secondly, calculate the entropy expression of the \( j \)-th index as follows [5]:

\[
h_j = -k \sum_{i=1}^{m} f_{ij} \ln f_{ij}
\]

Including

\[
f_{ij} = \frac{r_{ij}}{\sum_{i=1}^{m} r_{ij}} \quad k = \frac{1}{\ln n}
\]

Then, calculate the entropy weight of the \( j \)-th indicator as:

\[
w_j = \frac{1-h_j}{n - \sum_{j=1}^{n} h_j}
\]

Finally, calculate the comprehensive score of the company's financial risk assessment:

\[
q_{ij} = w_{ij} \times r_{ij} \quad Q_{ij} = \sum_{j=1}^{n} q_{ij}
\]

Among them, \( q_{ij} \) is the evaluation score of the \( j \)-th indicator in the \( i \)-th year, and \( Q_{ij} \) is the financial risk evaluation score of the enterprise in the \( i \)-th year.

4. Financial risk assessment results of a power company

The basic data in the analysis is mainly derived from the annual financial statements of M power companies (2015-2017). According to the above calculation steps, the weights of the indicators and the total weight of each system are obtained.

From Table 2, we can see that the most influential factor on the financial risk of the company is the asset-liability ratio with a weight of 0.279572673. The remaining indicators are in order of growth from high to low: operating profit growth rate (0.096287785), total asset turnover rate (0.093464598), operating profit margin (0.080376704), return on net assets (0.060261227), interest multiplier (0.059936511), operating income growth rate (0.05726509), current assets turnover rate (0.055281853), total return on assets (0.05508593), total asset growth rate (0.054684684), quick ratio (0.054151758), accounts receivable turnover rate (0.053658524).
Table 2. The total weight of each system of the financial enterprise's financial risk assessment and the weight of each evaluation index.

| System weight | Index | Weight  |
|---------------|-------|---------|
| Profitability C1 | 0.195696524 | C_{11} = 0.080376704 |
|               |       | C_{12} = 0.060261227 |
|               |       | C_{13} = 0.055058593 |
| Solvency C2    | 0.393660942 | C_{21} = 0.054151758 |
|               |       | C_{22} = 0.279572673 |
|               |       | C_{23} = 0.059936511 |
| Operational capability C3 | 0.202404975 | C_{31} = 0.053658524 |
|               |       | C_{32} = 0.055281853 |
|               |       | C_{33} = 0.093464598 |
| Development capability C4 | 0.208237559 | C_{41} = 0.096287785 |
|               |       | C_{42} = 0.05726509 |
|               |       | C_{43} = 0.054684684 |

The author believes that if the financial risk assessment comprehensive score is 1, it indicates that the financial risk status of the enterprise is at a “completely risk-free” level; if the financial risk assessment comprehensive score is 0, it indicates that the financial risk status of the enterprise is at the “complete risk” level; If the financial risk assessment comprehensive score is between 0 and 0.5 [6], it indicates that the financial risk status of the enterprise is at a “higher risk” level; if the financial risk assessment comprehensive score is between 0.5 and 1, the financial statement of the enterprise The risk profile is at a “lower risk” level.

Table 3. 2015-2017 the comprehensive score of the financial risk assessment of the power company and the scores of each criterion layer.

| Years | Financial risk assessment comprehensive score | Profitability | Solvency | Operating capacity | Development ability |
|-------|---------------------------------------------|--------------|----------|-------------------|---------------------|
| 2015  | 0.6891                                      | 0.1284       | 0.3788   | 0.0646            | 0.1171              |
| 2016  | 0.3678                                      | 0.0195       | 0.0949   | 0.1464            | 0.1068              |
| 2017  | 0.6807                                      | 0.2152       | 0.1294   | 0.1689            | 0.1670              |

It can be seen from Table 3 that in 2015, the power enterprise's financial comprehensive evaluation score was the lowest, 0.3678, lower than 0.5, indicating that the financial risk status of the power company was at a “higher risk” level in 2015, mainly due to the power of the year. Corporate profitability and solvency are weak. In 2015 and 2017, the comprehensive financial evaluation scores of the power companies were 0.6891 and 0.6807, which were similar, both exceeding 0.5, indicating that the financial risk status of a power company in 2015 and 2016 was at a “lower risk” level. Through the average score of the three-year financial risk assessment, the average score can be 0.57922, which is higher than 0.5, which indicates that the financial risk status of a power company in the past three years is at a “lower risk” level, that is, the financial situation faced by the enterprise. The degree of risk is low.
5. Measures to improve the financial risk control ability of power companies

5.1. Accelerated Capital Management Transformation
Generally speaking, the enterprise's fund control management should involve multiple aspects such as account setting, account payment settlement principle, cash collection, internal financing and capital risk control. In the era of big data, the fund management of power companies should have a financial sharing service center. The fund management department and the fund control group jointly undertake and gradually promote the transformation of fund management to management accounting services. Relevant financial management personnel should further enhance their comprehensive capabilities and actively participate in deep fund management such as cash report evaluation, budget analysis, and capital cost control.

5.2. Strengthening the construction of internal control
In order to effectively control and avoid financial risks. Electric power enterprises should establish and improve the internal control system of the enterprise, such as the system of authorizing the approval of positions and performing business duties, and separating the property custody positions from accounting records. It is necessary to strengthen the cultivation of the quality of financial personnel, and to improve the risk awareness and related post responsibility of financial personnel through training, and reduce the risk of internal control [7].

5.3. Sound risk assessment mechanism
The financial risks of enterprises are closely related to internal control. Using financial statement analysis method, standard deviation method, market risk analysis method, model method and other financial data analysis methods, it can effectively assess the current situation of financial risks of power companies and future development trends. Electric power enterprises should establish a financial index evaluation system suitable for power companies based on financial pre-budget budget and test results, improve the collection, analysis and prediction of historical data, thus establishing a long-term financial early warning system and appropriate stop-loss mechanism to improve financial risk management and control capabilities, early measures to avoid potential financial risks, and timely and accurate processing and response after the risk event broke out.

6. Conclusion
In the information age, to improve the financial internal risk control of power companies, it is necessary to establish a sound control environment, optimize the risk assessment mechanism, strengthen the intensity of control activities, and promote the communication and exchange of information inside and outside the enterprise, so as to effectively avoid financial risks. This paper uses the fuzzy comprehensive evaluation method to analyze the financial risk of power companies, and provides a new idea for the research of financial risks of power companies. Combining qualitative and quantitative analysis provides a scientific basis for power companies to better measure and predict financial risks, so as to better control and prevent financial risks of power companies.

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