

Analysis of Financial Risk Warning Based on Improved Efficiency Coefficient Method

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Abstract: With the launch of the “2025 Plan” and the “13th Five-Year Plan”, new energy vehicles have become an important link in the transformation and upgrading of automotive industry in China, and its core power battery industry plays a decisive role. However, under the impact of policy subsidy contraction and economic downturn, power battery companies may face many financial risks. This paper takes the Contemporary Amperex Technology Co., Limited (CATL) as an example, selects the data from 2017 to 2021, uses the improved efficiency coefficient method to assess the financial risks that may occur in enterprises, and provides preventive measures.

1. Introduction

Driven by national policies and industrial capital, the power battery industry has broad development prospects. However, in recent years, the economic situation at home and abroad has been deteriorating, and coupled with the adjustment of subsidy policies, power battery companies are facing internal and external difficulties. Therefore, enterprises urgently need to identify potential financial risks, effectively enhance their crisis prevention capabilities, and achieve sustainable development.

2. Theoretical Basis

Financial risk warning refers to the analysis, evaluation, and prediction of a company’s operating and financial activities through various methods such as the efficiency coefficient method, through the analysis of the company’s financial statements and business plans, in order to identify potential operational and financial risks and avoid losses.^[1]

When researching financial risk warning issues, the selection of evaluation methods is crucial. The entropy method can objectively determine the weights of multiple indicators, eliminating the influence of subjective analysis.^[2]The efficacy coefficient method can determine different financial indicators based on different industries, and classify risk warning levels based on the calculated warning values, which has strong applicability. Therefore, this article combines the characteristics of power battery enterprises and adopts entropy method and efficiency coefficient method to construct a financial risk warning indicator system.^[3]

3. Financial Risk Identification in CATL

3.1. Debt Repayment Risk Identification

Table 1 CATL’ Debt Repayment Capacity Indicators from 2017 to 2021

Index	2017	2018	2019	2020	2021
Quick ratio	1.66	1.51	1.32	1.81	0.92
Asset liability ratio (%)	46.7	52.36	58.37	55.82	69.9
Times interest earned	49.97	21.61	20.93	11.9	18.1

It can be seen from Table 1 that the quick ratio of the CATL fluctuates greatly and the overall value is low. The overall asset liability ratio of the enterprise shows an upward trend. Although it declined slightly in 2020, it rose rapidly in 2021, which means that the long-term solvency of the future financing CATL is poor, and there may be greater risks in future financing. The enterprise's times interest earned fluctuates greatly, which means that there are risks in its long-term financing in the future. To sum up, the solvency of the CATL is problematic.

3.2. Profit Risk Identification

Table 2 Profitability indicators of CATL from 2017 to 2021

Index	2017	2018	2019	2020	2021
Profit margin of sales (%)	20.97	12.62	10.95	12.13	13.7
Return on equity (%)	18.99	11.75	12.78	11.27	21.52
Total Return on assets (%)	12.71	7.26	6.91	5.91	9.07

From Table 2, it can be seen that the three indicators of enterprises continued to decline from 2017 to 2020, and rebounded in 2021, which may be related to structural overcapacity and cost runaway in the industry. Moreover, in 2021, a global crisis of car battery shortage broke out, resulting in delayed delivery and other situations. The price of cars fluctuated sharply, and the installed capacity of power batteries decreased, thereby affecting the profits of power battery companies.

3.3. Operational Risk Identification

Table 3 Operating Capacity Indicators of CATL from 2017 to 2021

Index	2017	2018	2019	2020	2021
Total Asset turnover	0.51	0.48	0.52	0.39	0.56
Accounts receivable turnover rate	2.81	4.51	6.29	5.13	7.44
Inventory turnover	5.33	3.79	3.5	2.94	3.6

As shown in Table 3, the total asset turnover rate of the enterprise remained fluctuating around 0.5 from 2017 to 2021, indicating a generally stable sales capacity of the enterprise. Accounts receivable fluctuate significantly and fund recovery is unstable, which may be related to factors such as the pandemic and overall poor industry conditions. The inventory turnover rate continued to decline from 2018 to 2020, followed by a small increase, which means that the inventory liquidity of enterprises is low, which corresponds to the structural overcapacity of the entire industry. To sum up, the future operating capacity of CATL is likely to remain depressed.

3.4. Development Risk Identification

Table 4 Development Capacity Indicators of CATL from 2017 to 2021

Index	2017	2018	2019	2020	2021
Total asset growth rate (%)	73.72	48.77	37.18	54.53	96.44
Operating revenue growth rate (%)	34.4	48.08	54.63	9.9	159
Capital preservation and appreciation rate (%)	167.63	132.98	119.85	164.02	133.86

It can be seen from Table 4 that the fluctuation trend of the growth rate of total assets of enterprises is basically consistent with that of capital maintenance and appreciation, both falling first and then rising, which indicates that the expansion of asset scale in the CATL is accelerating, and the growth rate of equity is increasing. The fluctuation trend of the growth rate of operating revenue is opposite to that of total asset growth rate and capital preservation and appreciation rate, indicating that the expansion of enterprise asset equity scale has not been effectively transformed into a driving force to increase market share, and there may be problems with the enterprise's development strategy.

4. Construction of Financial Risk Early Warning Indicator System in CATL

4.1. Selection of Indicators

Combined with the above analysis of financial risks in CATL, this paper selects quick ratio, asset liability ratio, times interest earned, sales profit margin rate, return on net assets, total return on assets, total asset turnover rate, accounts receivable turnover rate, inventory turnover rate, total asset growth rate, operating income growth rate, capital maintenance growth rate to determine the weight.

4.2. Entropy Weight Method for Determining Weights

According to the entropy method calculation formula, the results of using stata16 to process the data are shown in Table 5.

Table 5 CATL 2017-2021 Financial Index Weights

Index	Weight
Quick ratio	5.39%
Asset liability ratio	5.21%
Times interest earned	10.45%
Profit margin of sales	11.65%
Return on equity	11.00%
Total Return on assets	10.95%
Total asset turnover	5.09%
Accounts receivable turnover rate	5.98%
Inventory turnover	8.52%
Total Assets Growth Rate	8.04%
Operating revenue growth rate	9.91%

4.3. Calculation of Financial Risk Early Warning Indicators under the Improved Efficiency Coefficient Method

This paper calculates the financial index scores of the CATL from 2017 to 2021, and makes a financial early warning analysis on the operation of the CATL in combination with the risk level.

Table 7 CATL 2017-2021 Financial Early Warning Status

	2017	2018	2019	2020	2021
Total score	0.823	0.715	0.713	0.744	0.867
Warning status	Light alert	Light alert	Light alert	Light alert	No alert

It can be seen from Table 6 and Table 7 that from 2017 to 2021, the financial risk score of CATL fluctuated greatly. From 2017 to 2020, the enterprise has been in a state of light alert, and by 2021, it has transitioned to a state of no alert.

From the perspective of specific indicators, the sales profit margin, return on net assets and total return on assets of CATL in 2021 were many times higher than the excellent value, and the growth rate of total assets and operating revenue was several times higher than the excellent value. The goal of carbon neutrality and carbon peaking in 2020 has accelerated the adjustment of the domestic energy structure. With its excellent R&D capacity and perfect production capacity, the CATL industry has ushered in a wave of rapid growth in revenue in 2021.

However, with the rapid growth of income, the asset liability ratio and inventory turnover of enterprises are at a relatively poor level. The high asset liability ratio is related to the pursuit of further development of market share in the CATL in recent years to adapt to the growing market demand. The low inventory turnover rate may be related to the order-based production mode of the industrial chain. The enterprise is located in the middle of the entire automobile manufacturing industry chain. When the downstream vehicle manufacturers have demand, they start to produce batteries and deliver batteries according to the requirements of downstream enterprises. If the downstream automobile manufacturers place orders and complete battery production in advance,

while the downstream automobile manufacturers have not yet completed the integration of batteries, these products will become the inventory of CATL.

5. Analysis and Suggestions on Financial Risk Early Warning in CATL

Through the above research on the financial risk of CATL, this paper has the following suggestions for enterprises:

First, in the complex and volatile market environment, CATL is more inclined to equity financing, and there is a risk of excessive financing. When making financial decisions, enterprise should balance risks and benefits, and optimize the capital structure to ensure a reasonable reserve of funds. Second, enterprise should strengthen the management of accounts receivable realization, accelerate product technology updates, and activate idle production capacity. Enterprise should strengthen the management of accounts receivable realization, accelerate product technology updates, and activate idle production capacity. Third, to increase market share and sustainable development, enterprise must improve the capital operation efficiency, strengthen the fund security management, and implement reasonable development strategies.

6. Conclusion

The new energy vehicle industry is the trend of China's automobile manufacturing industry transformation and upgrading. As the core of new energy vehicles, the power battery market has broad development prospects. However, due to the complex changes in the internal and external environment, research on financial risk warning has strong foresight. At present, the development of the power battery industry is still very immature. This paper selects the CATL, the industry leader, to carry out financial risk early warning research, hoping to provide some reference for the development of various power battery enterprises and the entire industry

References

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Table 6 CATL 2021 Financial Risk Assessment

Index	Weight	Actual value	Standard coefficient of this file	Standard value of this file	Basic score of this file	Upper standard coefficient	Upper standard value	Upper level basic score	Efficacy coefficient	Adjusted score	Score
Quick ratio	5.39%	92	0.6	87.6	0.03	0.800	110.900	0.043	0.189	0.002	0.034
Asset liability ratio	5.21%	69.9	0.2	83.3	0.01	0.400	68.300	0.021	0.893	0.009	0.020
Times interest earned	10.45%	18.1	1	8.9	0.10	***	***	***	***	0.000	0.105
Profit margin of sales	11.65%	13.7	1	8.8	0.12	***	***	***	***	0.000	0.117
Return on equity	11.00%	21.52	1	14.4	0.11	***	***	***	***	0.000	0.110
Total Return on assets	10.95%	9.07	1	6.7	0.11	***	***	***	***	0.000	0.109
Total Asset turnover	5.09%	0.56	0.4	0.4	0.02	0.600	0.800	0.031	0.400	0.004	0.024
Accounts receivable turnover rate	5.98%	7.44	0.8	5.7	0.05	1.000	7.800	0.060	0.829	0.010	0.058
Inventory turnover	8.52%	3.6	0.2	2.8	0.02	0.400	3.700	0.034	0.889	0.015	0.032
Total Assets Growth Rate	8.04%	96.44	1	17.1	0.08	***	***	***	***	0.000	0.080
Operating revenue growth rate	9.91%	159	1	21	0.10	***	***	***	***	0.000	0.099
Rate of capital accumulation	7.82%	133.86	1	115	0.08	***	***	***	***	0.000	0.078
Total score											0.867