

Research on China's High-speed Railway Development from the Perspective of Financial Analysis and Management

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Abstract. Over the years, the number of railway passengers sent, the turnover of railway passengers, freight volume, cargo turnover, and conversion turnover have steadily ranked first in the world. By the end of 2020, China had 146,000 kilometers of railways in operation, 38,000 kilometers of which were High-speed railways, ranking first in the world. However, behind these honours, there is a practical problem of low profits and high liabilities of High-speed rail projects. This paper will be based on the perspective of financial analysis, analyse financial system of the connotation of health management, from the profitability, asset quality, debt conditions, operating four aspects to build High-speed railway financial health management system, The corresponding indexes are obtained through quantitative analysis to evaluate the current operation status of High-speed railway.

Keywords: Profitability; Asset quality; Debt; Operating; Financial health management

1. Introduction

In recent years, the high-speed railway has developed rapidly and made remarkable achievements in the world. The social benefits of the high-speed railway are positive and it is considered a rational choice for the sustainable development of human transportation mode. However, its direct economic benefits are worrying, and it may face losses. China's high-speed railway was built at a high cost and huge investment at the beginning of construction, and the huge construction of the high-speed railway needs to pay a huge amount of debt, so its funding source and financially sustainable development have attracted great attention. As a means of transportation, a with large volume, the railway will face serious losses if it faces the situation of insufficient capacity for a long time.

In view of the above problems regarding the profitability of high-speed railways, this paper, from the perspective of financial sustainability, obtains corresponding indicators through quantitative analysis, focuses on the analysis of its profitability, asset quality, debt and operating conditions, and establishes the financial health management system of high-speed railway.

2. High-speed railroad financial management system

2.1 High-speed railroad health financial management system determination method construction

In this paper, based on the economic benefits of the high-speed railroad, four major aspects of profitability, asset quality, debt status and operation status will be used to determine the health of the financial status of high-speed railroads by analyzing and comparing quantitative indicators. According to the standard values of the railroad transportation industry set by SASAC and the formula of indicators, the actual financial data will be processed and the results will be compared with the standard values. The importance of each indicator in the healthy financial management system is judged, and the corresponding weight is assigned. The designed health financial management system of the railroad transportation industry, the calculation method and the corresponding weights are shown in Table 1.

Table 1. Evaluation criteria of the healthy financial management system of high-speed railroad

	Symbol	Formula	Weight
Profitability			37%
Operating Income Margin	A1	$\frac{\text{operating profit}}{\text{operating income}} \times 100\%$	8
Revenue on Net Assets	A2	$\frac{\text{Net profit}}{\text{Owner's equity}} \times 100\%$	17
Revenue on Net Assets	A3	$\frac{EBIT}{\text{Total assets}} \times 100\%$	12
Asset Quality			23%
Total Asset Turnover Ratio	B1	$\frac{\text{Revenue}}{\text{Total assets}} \times 100\%$	8
Accounts Receivable Turnover Ratio	B2	$\frac{\text{Average balance of accounts receivables}}{\text{Accounts receivables}} \times 100\%$	10
Asset Cash Recovery Rate	B3	$\frac{\text{Net cash flow from operations}}{\text{Total assets}} \times 100\%$	5
Debt			15%
Gearing Ratio	C1	$\frac{\text{Total liabilities}}{\text{Total asset}} \times 100\%$	10
Quick Ratio	C2	$\frac{(\text{Current assets} - \text{inventory})}{\text{Current liabilities}} \times 100\%$	5
Operating Conditions			25%
Operating Growth Rate	D1	$\frac{\text{Growth in operating income this year}}{\text{Last year operating income}} \times 100\%$	10
Operating Profit Growth Rate	D2	$\frac{\text{Growth in operating profit}}{\text{Last year operating profit}} \times 100\%$	9
Total Assets Growth Rate	D3	$\frac{\text{Growth in total assets this year}}{\text{Total assets at beginning of year}} \times 100\%$	6

Among them, the weightings of profitability, asset quality, debt status and operation status are 37%, 23%, 15% and 25% respectively. According to the standard value grades, the excellent value, good value, average value, lower value, worse value and worse value are assigned as 1, 0.8, 0.6, 0.4, 0.2 and 0. Multiplying the weights with the corresponding grade grades, the summary of the scores obtained is the evaluation score of the healthy financial management system of the railroad transportation industry.

3. Financial management system analysis and evaluation

3.1 Overview of key projects of High-speed railroad

As the main organ of China's high-speed railroad, China Railway Corporation (Hereinafter referred to as China Railway) has been responsible for the construction, operation and safety of railroad transportation as stipulated by the state. In 2019, the prospectus submitted by Beijing-Shanghai High-speed Railway announced for the first time the operating status of each railroad

bureau. The data show that only six of the 18 railway bureau group companies are in profit, which has given rise to many thoughts on the operating status of each railroad bureau. As the early construction and opening of China's high-speed railway project, and the "star" railroad project of the China Railway, the Beijing-Shanghai High-speed Railway connects the "Beijing-Tianjin-Hebei" and "Yangtze River Delta" economic zones, and has become the economic lifeline between the north and south of China. In contrast to other High-speed railway projects, why the Beijing-Shanghai High-speed railway project can stand out and become the leader in the history of China's high-speed railway with high profitability, the excellent financial system management behind it is worth exploring.

3.2 Analysis of various financial indicators

Based on the financial statement data of the China Railway from 2016 to 2021 and Beijing-Shanghai High-speed Railway from 2016 to 2020, four aspects of status of profitability, asset quality, debt, and operation are analyzed using the corresponding indicators.

Table 2. Profitability Condition, 2016-2021

	2016	2017	2018	2019	2020	2021
CR						
Operating income margin	3.39%	5.11%	5.03%	2.55%	-2.84%	-7.80%
Revenue on net assets	0.04%	0.07%	0.07%	0.09%	-2.94%	-2.72%
Return on total assets	0.55%	0.79%	0.88%	0.28%	-0.41%	-0.48%
BSHR						
Operating income margin	34.37%	40.80%	43.90%	41.80%	16.00%	
Revenue on net assets	5.82%	6.36%	7.01%	7.88%	1.74%	
Return on total assets	5.01%	9.20%	16.00%	35.20%	8.80%	

It can be seen that China Railway and Beijing-Shanghai High-speed Railway are affected by the epidemic in 2020 and 2021, and the evaluation indicators of profitability decline seriously.

Table 3. Assets Quality Condition, 2016-2021

	2016	2017	2018	2019	2020	2021
CR						
Total assets turnover ratio	12.51%	13.28%	13.69%	13.65%	12.25%	5.85%
Accounts receivable turnover ratio	3.12	3.47	3.67	8.20	7.12	2.79
Asset cash recovery rate	0.13%	-0.78%	-0.40%	4.80%	2.68%	1.50%
BSHR						
Total assets turnover ratio	15%	17%	18%	14%	8%	
Accounts receivable turnover ratio	8.24	24.40	25.70	27.80	22.30	
Asset rash recovery rate	0.08%	0.08%	0.08%	0.09%	0.04%	

Also, the asset quality is affected by the epidemic. The indicators of decline seriously too.

Table 4. Debt Condition, 2016-2021

	2016	2017	2018	2019	2020	2021
CR						
Gearing ratio	65.03%	65.21%	65.15%	65.98%	65.63%	66.19%
Quick ratio	37.46%	30.54%	49.15%	64.39%	59.00%	68.00%
BSHR						
Gearing ratio	22.53%	18.76%	15.67%	27.09%	30.70%	
Quick ratio	76.00%	125.00%	225.00%	196.00%	72.00%	

China Railway is more indebted overall than Beijing-Shanghai High-speed Railway. As a result of the pandemic, the debt level has increased a bit.

Table 5. Operating Condition, 2017-2021

	2017	2018	2019	2020	2021
CR					
Operating growth rate	11.90%	7.89%	3.59%	-6.02%	-51.92%
Operating profit growth rate	53.35%	16.71%	-67.25%	-254.24%	17.68%
Total assets growth rate	5.48%	4.63%	3.91%	4.72%	0.62%
BSHR					
Operating growth rate	12.56%	5.42%	5.72%	-27.59%	
Operating profit growth rate	33.80%	13.20%	6.70%	-72.40%	
Total assets growth rate	-1.34%	-1.14%	5.37%	62.50%	

The operation of the High-speed rail project is in very poor condition due to the huge decrease in passenger traffic during the pandemic.

4. Financial management system analysis and evaluation

4.1 Judgment of the overall financial status of China State Railway Group Company. Ltd. and Beijing-Shanghai High-speed Railway

Based on the aforementioned index values and the designed weights of each index value, the scores of each index value and the scores of each of the four analysis angles of economic efficiency were calculated. The scores of all indicators for the year were summed up to obtain the scores of the financial management system for the year.

Table 6. Scores of China Railway's financial condition, 2017 to 2021

		Score				
		2017	2018	2019	2020	2021
CR	Weight					
Profitability	37%	19.80	18.80	16.40	9.00	7.40
A1	8	4.80	4.80	4.80	3.20	1.60
A2	17	10.20	6.80	6.80	3.40	3.40
A3	12	4.80	7.20	4.80	2.40	2.40
Asset Quality	23%	2.00	5.60	11.60	10.60	12.00
B1	8	0.00	1.60	1.60	1.60	8.00
B2	10	0.00	2.00	6.00	6.00	2.00
B3	5	2.00	2.00	4.00	3.00	2.00
Debt	15%	7.00	8.00	8.00	8.00	8.00
C1	10	6.00	6.00	6.00	6.00	6.00
C2	5	1.00	2.00	2.00	2.00	2.00
Operating	25%	22.60	17.40	4.40	3.60	11.40
D1	10	10.00	6.00	2.00	0.00	0.00
D2	9	9.00	9.00	0.00	0.00	9.00
D3	6	3.60	2.40	2.40	3.60	2.40
Overall Condition	100%	51.40	49.80	40.40	31.20	38.80

The overall annual average score of China Railway is around 50 points, which is at the average level. From the point of view of profitability, the profitability of the company in 2021 is relatively

good, reaching 23.2; the quality of assets is increasing year by year; the debt situation has remained stable, and the operating conditions have fluctuated.

Table 7. Scores of Beijing-Shanghai High-speed Railway's financial condition, 2017 to 2020

BSHR	Weight	Score			
		2017	2018	2019	2020
Profitability	37%	33.60	33.60	33.60	30.20
A1	8	8.00	8.00	8.00	8.00
A2	17	13.60	13.60	13.60	10.20
A3	12	12.00	12.00	12.00	12.00
Asset Quality	23%	12.00	13.60	13.60	12.00
B1	8	0.00	1.60	1.60	0.00
B2	10	10.00	10.00	10.00	10.00
B3	5	2.00	2.00	2.00	2.00
Debt	15%	15.00	15.00	15.00	13.00
C1	10	10.00	10.00	10.00	10.00
C2	5	5.00	5.00	5.00	3.00
Operating	25%	21.40	12.40	10.84	2.40
D1	10	10.00	4.00	4.00	0.00
D2	9	9.00	7.20	5.40	0.00
D3	6	2.40	1.20	1.44	2.40
Overall Condition	100%	82.00	74.60	73.04	57.60

The overall score of the Beijing-Shanghai High-speed Railway is at a high level, but it has been on a downward trend, from excellent to average. Profitability and operating conditions declined from 33.6 and 21.4 in 2017 to 30.2 and 2.4 in 2020, especially between 2019 and 2020, where scores dropped the most.

4.2 Analysis on the financial status of China Railway and Beijing-Shanghai High-speed Railway

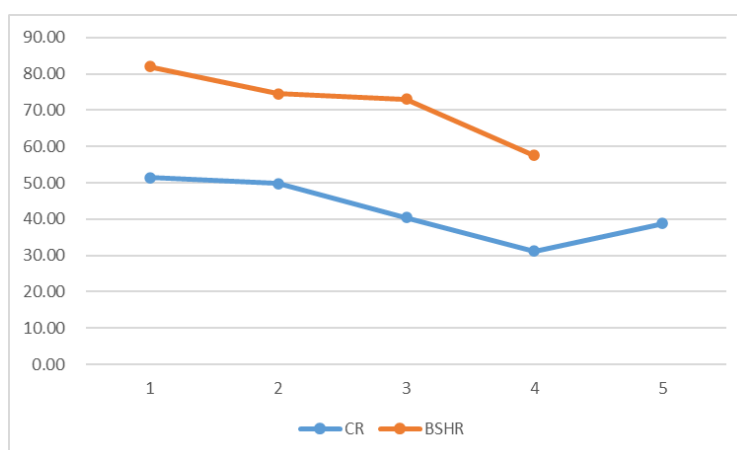


Figure 1. Comparison of Scores between China Railway and Beijing-Shanghai High-speed Railway

Comparing the overall scores of the China Railway and the Beijing-Shanghai High-speed Railway, it is found that the quality of the financial management system of the Beijing-Shanghai High-speed Railway is higher than that of the China Railway. Since the epidemic, the passenger traffic of the China Railway has dropped 40% year-on-year, and the passenger traffic of the Beijing-Shanghai High-speed Railway has dropped 48% year-on-year. With the loss of a large amount of passenger

traffic, the profitability and operation of the two corporations are not optimistic. Due to the policy in various places during the epidemic, people travel less, which results in a cut in passenger volume. A year-on-year decline of 3 to 4 percent in key indicators such as operating income, and net cash flow from operating activities and equity per share appears. However, because the China Railway owns some freight lines and increased freight traffic to transport supplies during the epidemic, freight traffic increased by 6% in 2020, driving some of the economic benefits and making the overall decline rate of the China Railway slower than that of the Beijing-Shanghai High-speed Railway in 2020.

5. Suggestions for the financial health management of China's high-speed railways

Through the financing mode, project positioning, planning and design, construction, operation and maintenance, and other aspects of refinement management to create a new profit model, to make high-speed railroad realize the efficiency transformation from speed to quality.

Multi-channel and multi-modality to raise construction funds and promote the reform of railroad investment and financing system is the key development direction to improve the high-speed railway project (State Council, 2013)^[1]. High-speed railway projects should actively explore the part of local capital funding, the introduction of social capital cooperation funding, the implementation of the general engineering contracting model, and encourage the active attraction of social capital to participate in the investment (Xiuzhong Li, 2021)^[2].

Standardize the enterprise construction and operation management of high-speed railway projects and improve the level of asset returns. For changes in social forms such as the COVID-19 epidemic, operation should be actively improved, personnel and daily operating expenses should be reasonably planned. Shift from relying on the successive opening of the main railroad lines to relying on main transport business to carry out value-added services can better expand market share. For the feasibility study stage of new projects, land planning should be carried out in a timely manner for areas along the line and in a certain area around the station, and areas that do not have development conditions should be located in other areas (Yaochuang Yue, 2020)^[3].

The completion of the financial health management system for High-speed railway needs a good cost accounting system, performance assessment system, effective control of construction and operation costs to operate together to improve the overall operating efficiency. On the basis of strict management of project assets, we should carry out a comprehensive asset assessment, identify the quality of assets at the present stage of the enterprise, explore new development directions using existing assets and enhance the enterprise's self-development capability (Xiaowen Cui, 2016)^[4].

Further, improve the tariff mechanism and strengthen the market-oriented reform of High-speed rail fares. For a long time, China's railroad enterprises basically implement unified pricing under the guidance of the government, and the decision on basic tariff belongs to the State Council, the railroad corporation draws up the basic railroad tariff, which is audited by the price department of the State Council and submitted to the State Council for approval before implementation, the tariff mechanism cannot fully reflect the market supply and demand, and investors cannot determine the price based on market supply and demand (Huilin Huang & Kai Huang, 2017)^[5].

6. Conclusion

The railroad is an important national infrastructure and livelihood project and high-speed railway is also a resource-saving and environment-friendly mode of transportation. To maintain the sustainability of high-speed railroad projects, its healthy financial management system is of paramount importance, which is related to the lifeline of high-speed railroad funds. Investment and financing in the early stage, construction and cost management in the middle stage, as well as daily operation and maintenance in the later stage all need to maintain a healthy financial level in order to

make the whole High-speed railway project develop continuously in a healthy posture and make important contributions to China's railroad transportation business.

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