Evaluation of operation performance of coal enterprises——Based on the perspective of supply side structure reform

Jingye Lyu [a], Jia Kang [b] and Penglin Li [c]

School of Management, Xi'an University of Science and Technology, Xi'an 710054, Shanxi, China

Abstract

Coal is an important lifeline of China's economic development and social progress, the coal industry occupies a leading position in China's energy consumption structure, after the rapid development of the "golden ten years" in the future, since 2012, the development situation of China's coal enterprises began to turn, to promote the reform of the coal market. To promote the smooth operation of the coal industry, to resolve the overcapacity, turnaround development, improve the performance of the coal business, based on the financial data of China's 30 coal listed companies, the use of SPSS software and factor analysis method, empirical research the operating performance of the 2016 Chinese coal listed companies, and scores In order to provide suggestions and decisions for the investment decision and enterprise management of coal enterprises under the background of supply side reform structure.

Keywords

Supply side reform, operating performance, listed companies.

1. Introduction

Coal resources play an important role in the development of our country's economic law and social progress. However, the successive problems of coal industry concentration, low technology, low efficiency, serious waste of resources and huge environmental impact restrict the healthy development of the coal economy, The over-capacity in the coal industry and the deteriorating new normal in the coal supply and demand situation have become one of the most seriously problems to be solved by the current coal enterprises. In January 2016, General Secretary Xi Jinpin proposed a supply-side structural reform. which pointed out that the key work content is to increase production capacity, reduce inventories, deleverage, reduce costs and make up for shortcomings, and strengthen quality in production under the premise of moderately increasing aggregate demand Supply, increase total factor productivity, and better adapt supply side to demand side. In 2016, the "vigorous" go-to-production operation of the coal industry has ended in "early surpluses". As one of the main areas of supply-side structural reform, the coal industry achieved fruitful results in the first year of 2016. According to the data released by the National Bureau of Statistics of China, the output of raw coal in the country in 2016 was 310.98 million tons, down 3.0% from a year earlier. In 2016, the country produced a total of 336.3990 million tons of raw coal, down 9.4% from a year earlier. In October 2017, Comrade Xi Jinpin pointed out in the report of the 19 CPC National Congress that deepening the supply-side structural reforms and continuing to push the coal industry to resolve excess production capacity will keep coal output stable in 2017 and maintain the domestic coal price after stock output replacement High operation, industry profits improved significantly, the output also showed a mild rise. 2016 is the year when the country started to implement supply-side structural reform. It has achieved initial success in the coal industry. Under the background of deepening the reform of the state in 2017, it is of great practical significance to analyze the financial performance of China's coal enterprises.

2. Research state in China

Domestic scholars have conducted in-depth research on the performance of the coal industry. Some scholars are as follows: Wang Jingbo, Xie Shuanglei. By using the balanced scorecard and the EVA

method, through analyzing the performance problems of the coal enterprises, it provides the coal enterprises with brand-new Performance management evaluation system ideas. Wang Qian, Peng Yingke. Using DEA method to analyze the operating performance of coal enterprises in China, find out the reasons for the low efficiency and put forward relevant decision-making suggestions. LIU Jing, ZHANG Wei, GAO Ya-Cui. Using the factor analysis model, a comprehensive analysis is made on the operating performance of your company in Coal Mountain, and some suggestions on some existing performance problems are put forward.

3. The Status Quo of the Performance of Coal Listed Companies in China under the Background of Supply - Side Structural Reform

3.1 Domestic coal market prices rising

Affected by multiple factors, such as the national supply-side reform policy, domestic coal prices started to pick up and continue to rise in the second half of 2016. The coal price has risen sharply from the lowest level to a sharp rise. The profitability of coal enterprises has risen from almost the whole Industry losses transition to most turnaround. November 11, 2016 China's coal price index was 159.6, up 34.9 points.

3.2 Domestic coal production capacity dropped rapidly

The supply-side structural reforms in the energy field started to bear fruit in 2016, and the quality of energy supply further improved. The annual task of overcapacity in excess of coal was overdone, the output of raw coal dropped significantly, and the output of raw coal continued to drop. The output of raw coal for the year was 3.41 billion tons, down 9.0% from the previous year, which dropped for the third consecutive year after the coal output hit 3.97 billion tons in 2013.

3.3 Domestic coal market pick up

First of all, the general trend of coal consumption in our country is declining. On the one hand, the adjustment of economic structure weakens the demand for coal energy. On the other hand, the replacement of new energy is accelerating. The green development of modern industrialization has a great impact on the coal industry. Secondly, the investment in coal declined at an accelerating pace. Since 2012, the prosperity of the coal market continued to decline. The profitability of coal enterprises deteriorated year by year. The investment enthusiasm of the coal industry dropped sharply.

4. Empirical Research

4.1 Index system construction and sample selection

Based on the data of the website of Shenzhen Stock Exchange and Shanghai Stock Exchange, this paper selects 29 representative listed coal companies as a sample study. Based on the enterprise performance evaluation system, from the enterprise profitability index, operation capability index, solvency index and growth capacity index Reflect the comprehensive performance of coal enterprises, and select 11 indicators resume comprehensive evaluation system, the specific indicators are as follows:

Table 1 - comprehensive performance evaluation system

Variable	Index	Formula
Financial efficiency indicator	X1	Return on net assets
	X2	Main business profit margin
	X3	Sales gross margin
Asset Operating Index	X4	Inventory Turnover
	X5	Accounts Receivable Turnover Rate
	X6	Total asset turnover
Solvency indicator	X7	Current ratio
	X8	Asset-liability ratio
Growth Index	X9	Net profit growth rate
	X10	Net asset growth rate

4.2 Descriptive statistics

Using SPSS22 software for statistical analysis of the data obtained as follows:

Table 2 - Descriptive Statistical Analysis

	N	Minimum	Maximum	Average	Standard deviation
X1	29	-138.83	18.72	-2.5875	29.15791
X2	29	-0.5342	75.3852	21.822059	14.6210783
X3	29	2.367	76.4725	22.78169	15.6638316
X6	29	1.5685	38.2246	10.955876	8.3679621
X7	29	1.7944	48.0255	9.741186	12.1497543
X8	29	0.125	12.0569	0.769797	2.1789396
X9	29	0.14	2.9053	0.947893	0.5098089
X10	29	12.6156	85.2143	55.8408	20.9259821

From the corporate profitability indicators, the average return on net assets -2.5875%, the main business profit margin averaged 22%, the average gross margin was 22% sales, the three indicators of the larger standard deviation, This shows that the profitability of these 30 coal-listed companies is modest, and there is a gap between various companies. Judging from the indicators of business capability, the average inventory turnover rate of 11%, accounts receivable turnover average of 10%, indicating that companies in the sales, inventory management capacity is weak, the standard deviation of total asset turnover Smaller, indicating a smaller gap between the companies. Solvency indicators from the point of view, the current ratio of 0.9% on average, the smaller the standard deviation, indicating a stronger corporate short-term solvency, the smaller the gap between companies, however, the corporate gearing ratio generally high, the average 56%, corporate risk is larger. From the development capacity indicators, the average of the three indicators are low, indicating that in 2016 the growth of listed coal enterprises is not high, the development capacity needs to be further improved.

4.3 Factor Analysis Results

After the correlation test of the enterprise's financial index data, it can be found that there is a correlation between the more data. In order to judge whether the factor analysis can be carried out, the KMO test and the Bartlett test can be obtained by KMO and Bartlett test: KMO value is 0.509, greater than 0.5, indicating that the selected indicators can be analyzed by factor, Bartlett sphericity test value is 537. 444, and the corresponding significant probability of less than 0.05, rejecting the correlation matrix is the original hypothesis of the unit matrix, The selected sample data has a certain correlation ,which suitable for factor analysis, the eigenvalues obtained from the correlation coefficient matrix, the contribution rate of variance and the cumulative contribution rate shown in Table 3, we can see the variance of the first factor accounted for all Factor variance of 25.424% %, while the first four factors cumulative variance contribution rate reached 82.52%, with strong representation, therefore, the first four factors have been selected to describe and evaluate the performance of China's coal-listed companies operating performance situation. Using the maximum variance method of rotation, the selection of the principal component extraction method to explore the specific meaning of different factors represented by the factorial loading matrix after rotation as shown in Table 3.

In order to investigate 、 analysis and evaluate the comprehensive performance of coal listed companies, we use the factor regression method to find the factor score function, given by spss22 factor score matrix, as shown in Table 5, you can get the various common factor The expression is as follows:

Table 3 Rotation factor load matrix

Elem ent	Start special micro-value			Capture square and load			Loop sum of squares to load		
	Total %	Mutate d %	Accumula ted%	Total %	Mutate d %	Accumula ted%	Total %	Mutate d %	Accumula ted%
1	2.375	29.687	29.687	2.375	29.687	29.687	2.034	2.375	29.687
2	1.892	23.645	53.333	1.892	23.645	53.333	1.954	1.892	23.645
3	1.179	14.743	68.075	1.179	14.743	68.075	1.428	1.179	14.743
4	1.156	14.445	82.52	1.156	14.445	82.52	1.186	1.156	14.445
5	0.606	7.576	90.096					0.606	7.576
6	0.522	6.523	96.619					0.522	6.523
7	0.184	2.3	98.919					0.184	2.3
8	0.086	1.081	100					0.086	1.081

Table 4 - Factor Scoring Sparse Matrix

Factor	Composition			
	F1	F2	F3	F4
X1	-0.075	0.075	0.543	0.309
X2	-0.141	0.424	0.012	0.044
X3	-0.148	0.415	0.011	0.024
X4	0.183	0.074	0.268	-0.251
X5	0.106	0.015	0.081	0.625
X6	0.103	0.146	0.28	-0.521
X7	-0.258	-0.209	0.037	-0.14
X8	0.299	0.068	-0.191	0.057
X9	0.261	-0.018	0.258	0.048
X10	-0.117	-0.234	0.37	-0.007

$$F1 = -0.075\,X_1 - 0.141\,X_2 - 0.148\,X_3 + 0.183\,X_4 + 0.106\,X_5 + 0.103\,X_6 - 0.258\,X_7 + 0.299\,X_8 + 0.261\,X_9 - 0.117\,X_{10}$$

$$F2 = 0.075\,X_1 + 0.424\,X_2 + 0.415\,X_3 + 0.074\,X_4 + 0.015\,X_5 + 0.146\,X_6 - 0.209\,X_7 + 0.068\,X_8 - 0.018\,X_9 - 0.234\,X_{10}$$

$$F3 = 0.543\,X_1 + 0.012\,X_2 + 0.011\,X_3 + 0.268\,X_4 + 0.081\,X_5 + 0.28\,X_6 + 0.037\,X_7 - 0.191\,X_8 + 0.258\,X_9 + 0.37\,X_{10}$$

$$F4 = 0.309\,X_1 + 0.044\,X_2 + 0.024\,X_3 - 0.251\,X_4 + 0.625\,X_5 - 0.521\,X_6 - 0.14\,X_7 + 0.057\,X_8 + 0.048\,X_9 - 0.007\,X_{10}$$

According to the factor score function, the scores and rankings of four common factors of each listed coal company can be calculated. The four common factors F1, F2, F3 and F4 respectively reflect the operating performance of China's listed coal companies, but it is ifficult to achieve the effect of comprehensive evaluationonly through a common factor. Therefore, it is also necessary to calculate the comprehensive factor F with the variance contribution rate corresponding to each common factor as follows:

$$F = 0.386\,F_1 + 0.269\,F_2 + 0.189\,F_3 + 0.155\,F_4$$

Bringing the four common factor scores A1, A2, A3, and A4 of the listed coal companies into the above equation, the comprehensive factor A can be obtained to obtain the score and rank of each company's performance .

Table 5 - Coal listed companies rankings

Stock name	F1	F2	F3	F4	F	Ranking
Yangquan Coal Industry	20.0238102	23.4966175	0.8348581	727.4321836	126.9595575	1
Yanzhou Coal Industry	35.7904321	13.9638204	30.9039333	26.5686344	27.5303562	2
Shenhuo shares	24.664677	27.8661855	-12.774365	37.1001826	20.35274254	3
Wing Tai Energy	23.6437522	31.521305	10.9136085	-2.6090618	19.26398682	4
Lu'an ring can	19.32632	32.2694655	0.7180044	8.9636722	17.66551776	5
Mountain Coal International	31.7664675	11.0896718	4.1643873	8.4569802	17.3428793	6
New energy	24.1066924	23.5882531	-3.4755187	11.5114164	16.77781986	7
Pingdingshan shares	24.1066924	23.5882531	-3.4755187	11.5114164	16.77781986	8
Hengyuan Coal and Electricity	21.2566012	17.3409888	5.7539806	13.9457682	16.11887045	9
Orchid Technology	15.8181301	29.9184629	-0.51599	9.1193158	15.46983658	10
Orchid Technology	18.2629749	23.7609938	-13.8574338	28.5048919	15.2404189	11
Shanxi coking	7.6735414	15.1410453	-3.4520118	7.407392	14.78148563	12
Datong Coal Industry	7.1464668	42.6604283	-3.3275959	7.5884507	14.78148563	13
Xishan Coal and Electricity	12.6127387	29.1349566	-6.3522326	8.0962329	12.7601646	14
China Coal Energy	9.867583	30.7993117	-5.5404861	8.9819122	12.4389464	15
Po Tyrone	10.74119	24.5926564	-0.0882257	9.8725552	12.2753767	16
Meijin energy	13.4163076	13.9539685	10.0600654	8.9152398	12.21552679	17
Shaan xiblack cat	15.7232411	16.8870798	0.0785031	7.8033613	11.83615362	18
Jizhong Energy	14.0833492	21.2836646	-3.6815447	4.466171	11.15792313	19
China Shenhua	-1.4049163	28.5688348	12.4171106	9.9805496	11.03653796	20
Antai Group	45.8365822	13.7499468	-48.7612323	-12.8130607	10.18975911	21
Panjiang shares	9.8848177	20.9264321	3.5010242	0.2641482	10.14738641	22
New Continent	4.7529067	30.7993117	-6.2556993	5.7088428	9.8221803	23
Jingyuan coal	5.1571591	12.7310048	10.6308351	4.8642822	8.178495279	24

Cloud coal energy	12.8098049	11.2519477	-2.3446766	3.7279728	8.106050529	25
Tour long game	-38.3140604	65.5476038	-14.0798372	4.3526694	0.856652634	26
Jinrui mining	-12.4400366	0.8512436	-8.1218556	3.4916195	-5.566699285	27
Anyuan Coal Industry	31.8190812	18.9492621	-118.4306601	-40.2421531	-11.24141164	28
Baihua village	-45.0490554	-89.6099945	149.3901803	2.2679959	-12.90774046	29

4.4 Coal Listed Companies Performance Ranking Results Analysis

From the above table, we can find that listed companies in coal have the highest score of common factor F3 and F2, the lowest score of common factor F4 and the smoother score of common factor F1, indicating that as the reform of supply side deepens, With the gradual recovery of operational capacity and the overall solvency of enterprises, with the recovery of coal prices and the impact of weather conditions, the sales volume of coal has been on the rise and the profitability of enterprises has also gradually increased. However, due to the contradiction between supply and demand in the coal market in 2012 Influence, there is still room for growth of coal enterprises to increase their capacity, the intensity of supply testing needs to be strengthened.

By observing the ranking of comprehensive factor F, Yangquan Coal ranked first among other factors in overall ranking, mainly due to its highest score on the A4 common factor with the largest variance contribution rate, which is much higher than other factors Listed companies, indicating that in the context of to capacity, energy structure adjustment, the growth of coal companies in the business performance impact of the degree is very important.

5. Suggestions

According to the result of performance appraisal, it can be concluded that the enterprise's ability exerts its influence on the performance of the enterprise as profitability> operation ability> solvency ability> growth ability. Coal enterprises should change the enterprise development strategy and adjust the enterprise energy structure under the background of supply-side reform , Enhance profitability, independent research and development capabilities and development capabilities to improve the operating efficiency of enterprises to achieve diversified development of coal enterprises, and ultimately achieve the purpose of improving business performance.

References

[1] Lu Jingyao, Xia Mengyang, Zhang Jinsuo. Performance Evaluation of China's Coal Listed Companies under the Low Market[J]. Friends of Accounting, 2017(08):94-99.

[2]WANG Qian, YANG Tong. Evaluation of Operational Performance of Coal Enterprises Based on DEA Method [J]. Economics and Management, 2013, 27(02): 93-96.

[3] Peng Yingke, Zhang Wen. Analysis of the performance of listed companies in China's coal enterprises [J]. Economic Mathematics, 2010, 27(01): 73-80.

[4]Wang Jingbo. Research on performance evaluation of coal enterprises based on balanced scorecard [D]. Shandong University of Science and Technology, 2007

[5]Qiu Jingcui, Zhao Ning. Performance evaluation of listed coal companies based on factor analysis[J]. Coal Technology, 2011, 30(10): 277-278.