

Analysis on the Consequences of Baoshan Iron and Steel Group's Absorption and Merger with Wuhan Iron and Steel Group

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Abstract. Using Baoshan iron and steel group and Wuhan iron and steel group as the research objects, this paper will introduce the state-owned enterprises in China. Firstly, it introduces the basic information and merger motivation of the two companies. Secondly, through the event study method and comparative analysis method, further investigating the changes of stocks after business merger. Finally, using the data of financial statements and relevant numerical analysis, it is found that the merger has a certain positive impact on the fluctuation of the company's value and share price, and effectively improves its position and value in the market.

Keywords: Iron and steel enterprises; Absorption and merger; Price of stock; Event study method; financial statement.

1. Introduction

The economic prosperity of a country cannot be separated from the development of industrial industries, especially steel enterprises. Its application range is also very wide, covering a variety of fields such as military, civil appliances, automobile, aviation, etc. However, due to the phenomenon of China's current unsound economic system and the low industrial concentration of this industry, the development of steel enterprises has reached a bottleneck and is even on the verge of bankruptcy. In order to optimize the industrial structure and achieve self-help in the steel industry, state-owned enterprises in China have embarked on the road of M&A and restructuring. This paper will further explore and analyze the consequences from the absorption and merger of Baoshan iron and steel group with Wuhan iron and steel group through the information of enterprises disclosed by SSE and using the event study method and the comparison of financial data of enterprises after M&A to provide corresponding reference for the M&A and restructuring of state-owned enterprises in China's steel industry and even in other industries, and conclude that the merger has brought some positive financial effects in the short term, resulting in increased profits and improved market position.

2. Literature Review

2.1 Development Trend and Mainstream of Corporate M&A Restructuring

Wang and Yu argue that enterprises will conduct M&A and restructuring for more diversified industries, fields, products and services, and their forms will be more diversified, especially cross-border M&A will change from scale-driven to technology-driven [1]. At present, horizontal M&A within the same industry and vertical M&A in the same industry chain will still occupy the mainstream, so as to achieve resource integration, complementary advantages, extend the industrial chain and improve competitiveness in the international market through M&A. However, with the emergence of new technologies such as the Internet and artificial intelligence, as well as the competitive saturation of traditional industries, enterprises will increase cross-industry M&A for the purpose of industrial transformation and seizing new economic growth points.

2.2 A Study of Post-merger Performance of Firms

The market performance of mergers and acquisitions is based on the premise of the assumption of efficient capital markets by observing the cumulative excess returns of merging firms over a period of time before and after the disclosure date of the news of the merger and reorganization [2]. In the UK, Meeks analyzed hundreds of merger cases that occurred in the UK, and he found that the return on assets of enterprises decreases with the increase of years and shows a decreasing trend all the time, and finally reaches the lowest value in a certain year, and the business situation of enterprises is not optimistic [3]. In China, Yu found that vertical mergers and acquisitions have better long-term performance than horizontal mergers and acquisitions through a mediating effect model, which becomes more significant as the observation period grows longer [4].

2.3 Business Combination Classification

Business mergers have two forms: absorption mergers and new mergers. Merger by absorption refers to the merger of two or more enterprises by entering into a merger agreement, then one of the enterprises receives the assets and debts of the other enterprise. A new merger is a merger in which two or more enterprises enter into a merger agreement and establish a new enterprise on the basis of the dissolution of all enterprises.

2.4 The Impact of Corporate Mergers on Share Prices

Some scholars have found that the fluctuation of stock price of listed companies by the act of merger and acquisition is affected by the change of time. Feng and Wu (2001) showed that the stock price of listed companies tends to rise and then fall within a period of merger and acquisition [7].

3. Case Introduction

3.1 Merger party

Baoshan iron and steel group is an important central steel enterprise. The company was founded in Baoshan District, Shanghai in early 2000 and completed its listing in December of the same year. Baoshan iron and steel group's main business operations are: steel smelting, processing, coal, electricity, metal ores, etc.

3.2 Merged party

Wuhan iron and steel group was founded in 1955 and has a longer history than Baoshan iron and steel group, it is a central enterprise with a high position in China's steel industry. After 40 years of development, it was successfully listed in Shanghai Stock Exchange in 1999.

3.3 Optimization of resource allocation

By integrating the personnel and assets of both companies, it will help optimize the structure of the steel industry, improve production efficiency and service quality, and lay the foundation for greater financial benefits from a post-merger listing.

3.4 Wuhan iron and steel group suffered serious losses

The operating profits from 2014 to 2016 were RMB 764.75 million, RMB 185.45 million and RMB 119.1902 million respectively, of which the losses were more serious due to poor operations in 2014 to 2015. This indicates that Wuhan iron and steel group was unable to effectively overcome the adverse factors and did not achieve sound operations.

4. Case Study

4.1 Research methodology: event study method

Event research refers to the use of data and information to analyze the impact of an event on a company's stock price movement.

4.2 Time and interval selection

February 27, 2017 was selected as the event date, and the merger of the two companies completed the listing of new shares on that date, i.e., $T=0$ days. The window period selection is special, because the listed company is in the period of suspension of trading one month before the event date, i.e., from January 23, 2017 to February 26, 2017, so 4 trading days after the start of the event date are selected as the window period, i.e., $[0, 3]$; the estimation period is 105 trading days before the window period, i.e., $[-140, -35]$.

4.3 Model selection

The capital asset pricing model (CAPM) establishes a regression model of stock payoffs using the market payoffs as follows: $R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$, where R_{it} : denotes the payoff of company i in period t and is calculated as (the closing price of the stock on day X - the closing price of the stock on $[X - 1]$ day) / $[X - 1]$ day of the stock. R_{mt} : indicates the market-weighted index stock's return for period t , calculated as (market X -day closing index - market $[X - 1]$ day closing index) / market $[X - 1]$ day closing index. α_i : denotes the intercept. ϵ_{it} : denotes the residual. β_i : denotes the regression slope.

4.4 Calculation of abnormal return and cumulative excess return

The abnormal return is the difference between the actual return $R_{i,t}$ and the normal return $R_{m,t}$ for each stock, which can be expressed as AR_{it} . ($R_{m,t}$ is the composite market return on day of the A-share market.) The formula is: $AR_{it} = R_{it} - R_{mt}$. The cumulative abnormal return is the sum of the abnormal returns of each stock during the event window, and is expressed as $CAR [0, 3]$.

4.5 Data collection

The data in this paper are sourced from Sohu Finance, and the share prices of Baoshan iron and steel group from October 10, 2016 to January 23, 2017 are selected, and the increase and decrease of Baoshan iron and steel group's share price on that day are calculated according to the closing price and opening price respectively; at the same time, the SSE composite A-share index is selected in the same time period, and the market return on that day is calculated according to this index.

4.6 Data analysis

The data within the estimation period $[-140, -35]$ were analyzed using EXCEL software. Based on the analysis of the results, which yielded α of 0.0039 and β of 1.4398, the yield curve for Baoshan iron and steel group was derived as $y = 1.4398x + 0.0039$

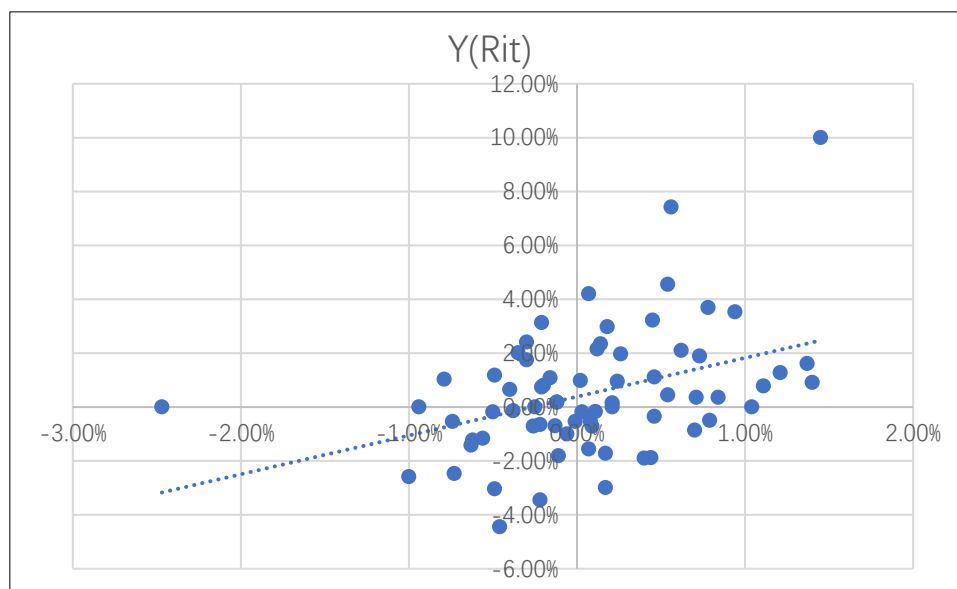


Fig. 1 Baoshan iron and steel group yield curve

Then a total of four days from February 27 to March 2, 2017 was selected as the event window period, and the excess return and cumulative excess return during the event period can be derived through EXCEL calculations, and the relevant data and graphs are shown below.

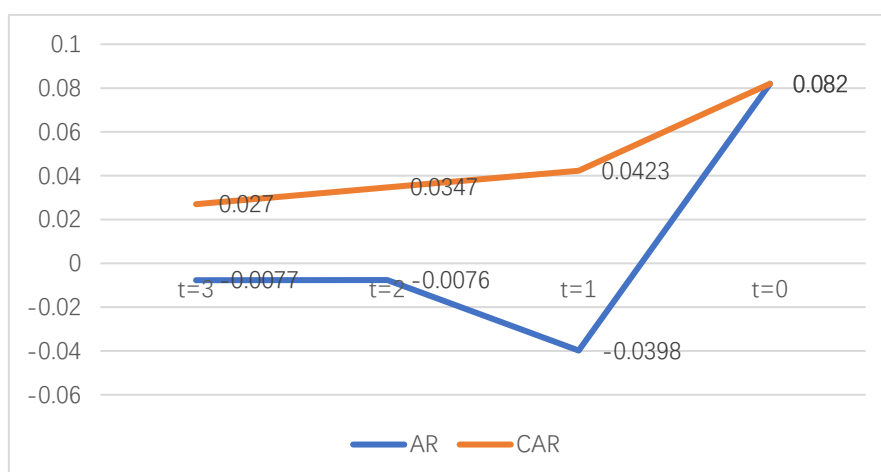


Fig. 2 Baoshan iron and steel group excess return and cumulative excess return

Table 1. Baoshan iron and steel group event window period yield and market yield

Date	X (rmt)	Y (Rit)
2017/2/27	-0.76%	7.50%
2017/2/28	0.40%	-3.01%
2017/3/1	0.16%	-0.14%
2017/3/2	-0.52%	-1.13%

Table 2. Baoshan iron and steel group abnormal returns and cumulative abnormal returns

Time Difference	AR	CAR
t=0	8.20%	8.20%
t=1	-3.98%	4.23%
t=2	-0.76%	3.47%
t=3	-0.77%	2.70%

Then two other steel companies were selected for the same time period by the same method, Shandong Steel (600022) and Bayi Steel (600581), resulting in the following data.

Table 3. Abnormal returns and cumulative abnormal returns for Shandong steel (600022)

Time Difference	AR	CAR
t=0	-0.24%	-0.24%
t=1	0.21%	-0.03%
t=2	0.13%	0.10%
t=3	-0.09%	0.01%

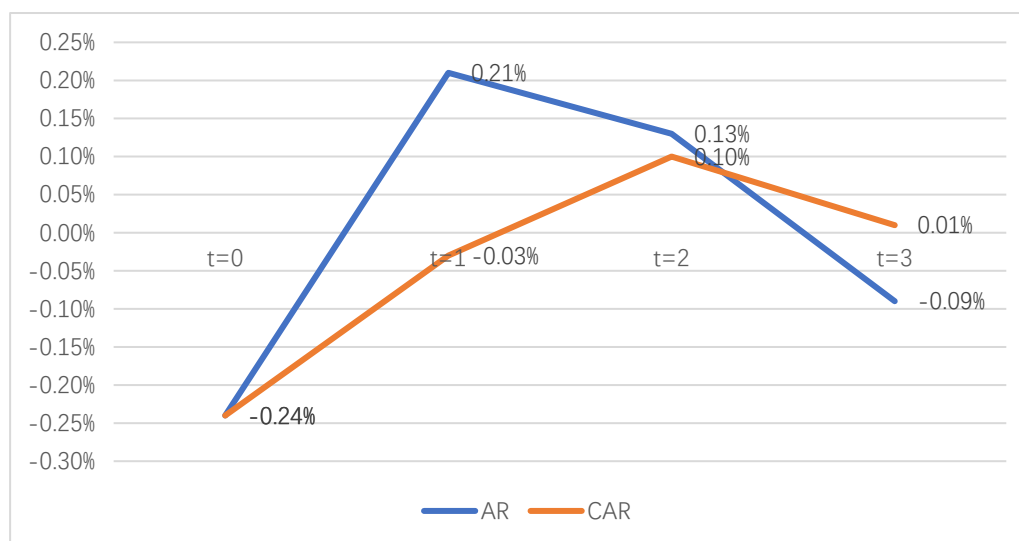


Fig. 3 Abnormal return and cumulative abnormal return for Shandong steel (600022)

Table 4. Abnormal returns and cumulative abnormal returns for Bayi steel (600581)

Time Difference	AR	CAR
t=0	-0.17%	-0.17%
t=1	0.27%	0.10%
t=2	0.22%	0.32%
t=3	0.58%	0.90%

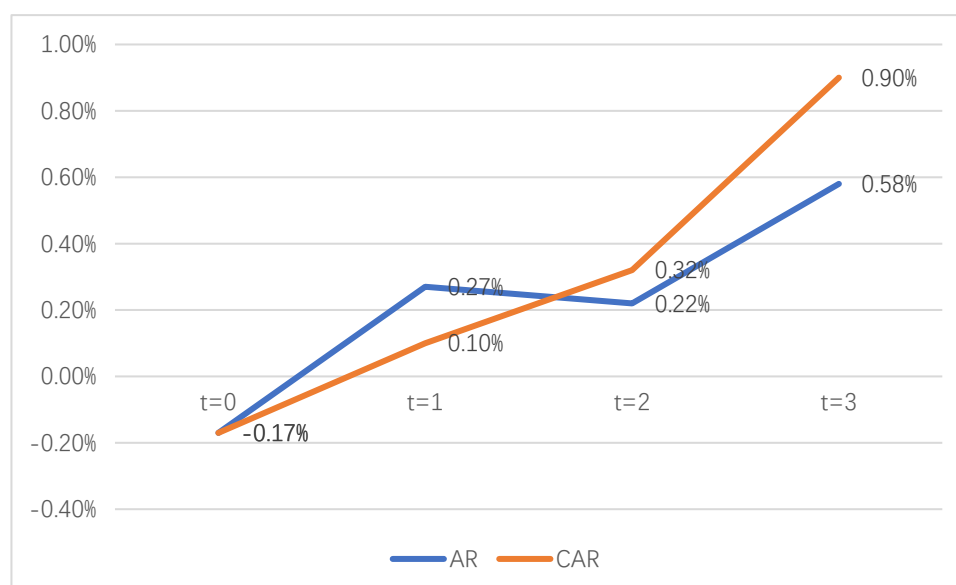


Fig. 4 Abnormal returns and cumulative abnormal returns for Bayi steel (600581)

4.7 Data conclusion of event research method

(1) From the data and graphs, it can be seen that during the event period in which the M&A occurs, the M&A company tends to make larger profits, especially on the day of the acquisition announcement, the company's share price and cumulative abnormal return increase significantly, thus creating greater economic value for the company in the short term. At $t=0$ days, Baoshan iron and steel group's abnormal return peaks at a positive 8.20%, and as time goes by, the AR during the event window begins to decrease rapidly, becoming negative from $t=1$ days to a minimum value of -3.98%. The abnormal returns on $t=2$ and $t=3$ days are also less than 0, at -0.76% and -0.77%, respectively, but the magnitude of change compared to that at $t=1$ days. However, the magnitude of the change is slower than that at $t=1$ day, and it keeps fluctuating around a certain yield value.

(2) The cumulative abnormal return CAR value of Baoshan iron and steel group remains positive and large from $t=0$ days to $t=4$ days, which effectively indicates the significant market value appreciation effect of the company in the short term due to M&A. However, as time passes, it gradually shows a decreasing trend from 8.20% to 2.70% and remains stable above 0. It should be noted that the event study method in this case can only effectively reveal the short-term performance of the two companies and cannot confirm the change in medium- and long-term performance.

(3) By comparing the abnormal return AR and cumulative abnormal return CAR values of Baoshan iron and steel group, Shandong iron and steel and Bayi steel in the same event window, only the CAR value of Baoshan iron and steel group remains positive between $t=0$ and $t=4$ in the window period, while the CAR values of the other companies, Bayi steel and Shandong steel, are unstable and fluctuate above and below the threshold value of 0. Other companies in the same industry the data of other steel groups in the same industry proves from the side that Baoshan iron and steel group's mergers and acquisitions have a certain positive financial effect, which drives the share price growth to some extent.

4.8 Changes in major financial indicators (all data below are from Sina finance website)

Table 5. Baoshan iron and steel group's key financial indicators, 2016 - 2022

Financial indicators	2016 (1231)	2017 (1231)	2018 (1231)	2019 (1231)	2020 (1231)	2021 (1231)	2022 (0331)
Main revenue (RMB million)	13343533	28909290	30477946	29159398	5997277	8360714	8597979
Net profit (RMB million)	559752	1917034	2156516	1242323	1267678	2363200	373207
Current assets (RMB million)	13676312	13329261	12008857	13056449	14641188	14935502	16779320
Current liabilities (RMB million)	17030649	16320664	13330326	13258676	12908872	13740376	14621545
Total assets (RMB million)	35906775	35023463	33514061	33963300	35622505	38039756	39586584
Total liabilities (RMB million)	13885676	17576223	14589552	14841709	15648239	16967699	18053814

4.8.1 Changes in financial ratios and analysis

Table 6. Changes in financial ratios and analysis, 2016 - 2022

	2016	2017	2018	2019	2020	2021	2022
Asset-liability ratio	0.39	0.5	0.44	0.43	0.43	0.44	0.45
Current ratio	0.8	0.82	0.9	0.98	1.13	1.09	1.15
Asset turnover ratio	0.53	1.65	0.89	0.86	0.17	0.23	0.22

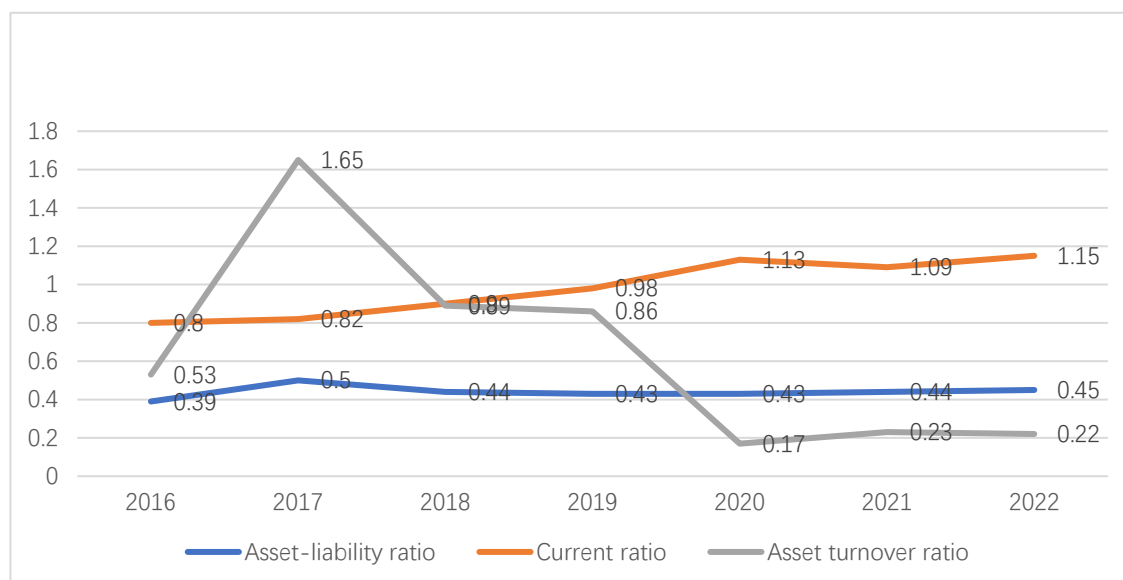


Fig. 5 Changes in financial ratios

(1) Asset turnover ratio = asset turnover / average asset balance. The operating capacity of a company can usually be assessed using the asset turnover ratio. The asset turnover ratio before the merger in 2016 was only 0.53, which rapidly increased to 1.65 from the merger in 2017, which indicates that the operational efficiency is greatly improved, showing the positive financial effect of mergers and acquisitions. However, in the long term, from 2018 to the end of the first quarter of 2022, the asset turnover ratio shows a fluctuating decline, reaching a minimum of 0.17 in 2020, indicating that its turnover speed then becomes slower, ultimately leading to lower operating efficiency.

(2) Current ratio is the ratio of current assets to current liabilities. The current ratio can measure the excellence of a company's short-term solvency. From the analysis of the above table, it can be seen that from 2016 to the first quarter of 2022, Baoshan iron and steel group's current ratio shows an increasing trend and the data rises rapidly, reaching the highest value of 1.13 in 2020, which is an increase of nearly 37.8% compared to the current ratio at the beginning of the merger in 2017, indicating that Baoshan iron and steel group's short-term debt-servicing ability has performed reasonably well for a period of time after the merger and can maintain a good financial positive effect all the time.

(3) Asset-liability ratio refers to the total liabilities divided by total assets. The greater the asset-liability ratio, the weaker the solvency of the enterprise and the heavier the burden, and vice versa, the smaller the debt burden of the enterprise. As can be seen from the above table, the enterprise was able to reasonably control the gearing indicator within the optimal range from 2016 to the beginning of 2022, and its operation is relatively good. Although Baoshan iron and steel group's asset-liability ratio after the merger and acquisition in early 2017 increased slightly compared with the drop at the end of 2016, with an increase of about 28.2%, the ratio fluctuated around 0.44 at the beginning of 2018, and whether the specific reason was affected by the epidemic at the end of 2019 or the impact of the enterprise merger, no clear conclusion has been drawn yet, and it is necessary to further combine the enterprise's operating conditions and detailed data at that time to exploration and analysis will be conducted.

4.9 Summary of changes in financial data

From the above tables and data, it can be seen that Baoshan iron and steel group has a better overall financial situation between 2016-2022, and after the merger event in 2017, the development capacity and operating capacity of the enterprise have improved, especially the asset turnover ratio has increased, which has greatly improved the operating efficiency of the enterprise.

5. Conclusion

According to the research results and data analysis, the M&A of them is driven by market interest in the short-term days, reflecting the necessity and feasibility of this M&A. However, as time passes, the development of the post-merger Baoshan iron and steel group tends to stabilize and its growth rate gradually slows down. The success of this merger of two enterprises has played a good demonstration role for the restructuring of state-owned enterprises in China. The inspiration of this merger is that the merger and reorganization between enterprises should not only follow the trend of the development of the times, but also always pay attention to not limiting the vision to short-term interests, and make a set of long-term and reasonable merger and acquisition plan with reference to the production and operation activities of the enterprise in recent years and its own financial situation. It should be noted that this merger is still short, and there is still a long time ahead to examine and explore both companies in all aspects. In addition, in the long run, we still need to continue to examine whether there are still difficulties in this merger, whether the performance always keeps rising steadily, whether the core competitiveness of the market is improved, whether the industrial structure is optimized, and so on.

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