Effect Analysis of De-overcapacity Policy in China's Coal Industry

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Abstract

Due to the predicament of coal industry's serious production overcapacity, sharp drop in coal price and general loss for coal enterprises, China fully implemented de-overcapacity policy in 2016, which is also the core task for government to promote "supply-side structural reform". This paper presents an overall analysis of closed coal mines' spatial distribution, nature and employees situation. Along with elimination of a large amount of backward production capacity, contradiction between supply and demand has been eased. In 2016, China's coal production was 3.364 billion tons with a decrease of 10.22% year on year. Coal price has risen and tend to stabilize, the Bohai Rim 5500 kcal thermal coal price index increased from 371 yuan/ton at the beginning of 2016 to around 600 yuan/ton at the end of the year and stabilized at 580 yuan/ton in 2017. Industry concentration was significantly improved with CR4 and CR8 increased from 17.38% and 25.04% in 2010 to 25.72% and 38.50% respectively in 2017. In 2017, the death rate per million tons of coal dropped from 0.293 in 2013 to 0.106 and China coal industry's international competitiveness has been obviously enhanced with occupying 21 seats among the top 30 global coal enterprises, far ahead of other countries. Finally, this paper puts forward specific proposals for advancing the reform of coal industry in China in terms of scientifically formulating capacity-reduction targets, optimizing production layout, and improving the de-overcapacity mechanism.

Keywords: Coal Industry, De-overcapacity Policy, Effect Analysis, Industry Concentration, Competitiveness

1. Introduction

Since 2013, China's coal demand has declined a lot under combined effects of slowing economic growth and tightening environmental constraints. Meanwhile, investment capacity during the "Golden Decade" period began to be released, leading to China's coal supply excessively surplus[1]. The overcapacity resulted in a sharp drop in coal price. Decline both in demand and price caused a serious loss of China's coal industry, which fell into an unprecedented crisis. In order to reverse this situation, since November 2015, the Central Economic Work Conference repeatedly stressed carrying out "supply-side structural reform" and deployed five major tasks: cutting overcapacity, destocking, de-leveraging, lowering costs and improving weak links, the core and most urgent task is cutting overcapacity. From February 1 to December 30, 2016, a series of policies aimed at speeding up coal's supply-side structural reform were issued, such as the Opinions on Resolving the Overcapacity Problem of the Coal Industry to Realize Development by Extricating the Coal Industry from Difficulties (the "Opinions"), the Thirteenth Five-Year Plan of Coal Industry Development, etc. So far, China supply-side structural reform of coal industry has been carried out for two years. How is the effect?

2. China's coal industry status before the supply-side reform

2.1 Serious overcapacity

The great investment enthusiasm on coal power during coal's "golden years" led to China's coal production capacity rapidly increased. According to data from the Coal Industry Association, China's coal production capacity in 2015 was about 5.7 billion tons. Among them, capacity through normal and transformation production accounted for 3.9 billion tons, new and expanded production capacity is 1.496 billion tons, the discontinued production capacity is 308 million tons[8]. Apart from 308 million tons that was discontinued and 700 million tons which had not yet been produced, China's effective coal production capacity in China was about 4.7 billion tons, much higher than the coal production of 3.7 billion tons and the production capacity was seriously excessive.
2.2 Low coal demand

Since China’s coal consumption reached the historical peak of 4.244 billion tons in 2013, demand of coal has been depressed due to the slowdown growth, environmental constraints and energy mix reform. In 2014, China’s coal consumption was 4.116 billion tons, 3.02% lower than last year. Since 2015, demand of coal in energy-intensive industries such as electricity, steel, building materials and chemical industry has significantly reduced. In 2015, electricity industry consumed 1.839 billion tons of coal, 6.2% lower than last year; steel industry consumed 627 million with 3.6% lower; building materials industry consumed 525 million with 8% lower; chemical industry consumed 253 million tons with 8.4% lower[3]. In 2015, the energy consumption of coal-fired power decreased from 378 g/Kwh in 2003 to 316 g/Kwh, the coal consumption declined to 3.97 billion tons, 3.55% lower than last year.

2.3 Coal enterprises suffered serious losses

Since 2011, losses have become increasingly serious in most coal enterprises due to the deterioration of market environment. As is clearly shown in Tab. 1, in 2015, the total profit of China’s coal industry was 44.1 billion yuan, a decrease of 390.1 billion yuan compared with the 434.2 billion yuan in 2011; a drop of 89.84%. By the end of 2015, the number of loss making coal enterprises was 2,027, an increase of 1,182 than 2011; the proportion of loss making enterprises was 31.52%, an increase of 20.42% than 2011. According to statistics, 20 of the 38 listed coal companies suffered losses in 2015 with a loss rate of 52.63%[4].

<table>
<thead>
<tr>
<th>Year</th>
<th>The number of coal enterprises</th>
<th>The number of loss making enterprises</th>
<th>Loss rate (%)</th>
<th>Total loss ($100 million yuan)</th>
<th>Total profit ($100 million yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>7611</td>
<td>845</td>
<td>11.10</td>
<td>73</td>
<td>4342</td>
</tr>
<tr>
<td>2012</td>
<td>7790</td>
<td>1290</td>
<td>16.56</td>
<td>240</td>
<td>3555</td>
</tr>
<tr>
<td>2013</td>
<td>7975</td>
<td>1788</td>
<td>22.12</td>
<td>457</td>
<td>2370</td>
</tr>
<tr>
<td>2014</td>
<td>7098</td>
<td>1929</td>
<td>27.18</td>
<td>782</td>
<td>1268</td>
</tr>
<tr>
<td>2015</td>
<td>6430</td>
<td>2027</td>
<td>31.52</td>
<td>973</td>
<td>441</td>
</tr>
</tbody>
</table>

Source: National Bureau of Statistics official website

3. De-overcapacity in China’s coal industry

3.1 The process of de-overcapacity

In 2016, a total of 25 provinces in China announced the list of 2044 closed coal mines, involved production capacity of approximately 310 million tons, surpassed the planned amount of 250 million tons. In 2017, China cut coal capacity of 183 million tons, exceeded the plan[5]. As of February 26, 2018, 9 provinces had released the de-capacity target in 2018, involved production capacity of 66.48 million tons[6]. Those shows that China’s supply-side structural reform in coal industry has a good start. China’s coal mines decreased from over 12,000 at the beginning of 2016 to around 7,000 by the end of 2017. During 2016-2017, 493 million tons of capacity was cut. China hopes to achieve the target of cutting capacity about 500 million tons in 2018 in advance.

3.2 Closed coal mines distribution

Fig.1 presents the distribution of China’s closed mines, which are mainly with small production capacity, complex geological conditions, backward production conditions, longer mining years and poor coal quality, concentrated in the southwest and central China, including Sichuan, Guizhou, Chongqing, Yunnan, Shanxi, Henan and Hunan. In 2016, the number of closed coal mines in above 7 provinces is up to 1,205, accounted for 58.95% of whole China. The total amount of capacity elimination was about 151 million tons, accounting for 48.03% of whole China.

3.3 Classification of closed mines

Most of China’s state-owned coal mines, especially the large and medium depleted mines, have a long mining history, overstaffing, too many social functions, which resulted in insolvency and heavy burdens. As is shown in Tab. 2, the state-owned coal mines accounted for 81% of capacity elimination in 2016, the rest are private or collective mines[7]. Among the state-owned, production capacity of large and medium mines accounts for 36%, small mines below 300,000 tons accounts for 45%.

<table>
<thead>
<tr>
<th>Property classification</th>
<th>Size classification</th>
<th>Mines proportion</th>
<th>Capacity proportion</th>
</tr>
</thead>
</table>

Fig. 1. Distribution of China’s closed mines during 2016-2017
Coal consumption in China during 2008-2017 involved staff more than 1 million. Human resources problem was very prominent, which are mainly staff redundancy, the overall low culture level and the irrational work and age structure. Take the state-owned mines as an example in Tab. 3, in terms of education level, staff with academic qualification below high school is as high as 64%, university and higher education accounts for only 9%. In terms of work structure, the proportion of first-line workers is only 36%, while the logistics staff accounts for as high as 49%; in terms of age structure, staff over the age of 50 accounted for 15%, the proportion of retired and near-retirees is significant.

### Table 3 Status of Closed mines’ staff.

<table>
<thead>
<tr>
<th>Academic qualification</th>
<th>Work structure</th>
<th>Age structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below high school</td>
<td>Univ. and above</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>Manage</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Eng. techn.</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>First line</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>Logistics</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above high school</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.4 Closed mines’ staff situation

According to statistics, China's coal de-capacity in 2016-2017 involved staff more than 1 million. Human resources problem was very prominent, which are mainly staff redundancy, the overall low culture level and the irrational work and age structure. The contradiction between supply and demand eased, and competitive capacity has continued to increase. The contradiction between supply and demand eased, and the coal market remained stable overall.

4. Effect analysis of de-overcapacity policy

4.1 The contradiction between supply and demand has been eased, and the competitive capacity has continuously increased

Fig. 2 shows the changes in coal production and consumption in China during 2008-2017. Compared with the normal cutting capacity during 2014-2015 when coal is in a low price, decline in coal production in 2016 was more serious. China's coal production decreased by 2.52%, 3.28%, and 10.22% in 2014, 2015, and 2016, respectively, and increased slightly in 2017. By carrying out measures of removing backward capacity, governing illegal mining and safety inspections, the production has been further standardized, industry structure has been optimized, and competitive capacity has continued to increase.

4.2 Coal prices rise and gradually stabilize, and profitability continues to increase

As a commodity, coal price is mainly determined by supply and demand in market. According to the de-capacity scheme, production time of coal mines was required to reduce from 330 days to 276 days, which is equivalent to a 16% reduction in production capacity. In addition, mines which have been suspended or reduced in capacity with poor resource condition and high cost need a long period to resume production, reduction in supply resulted in a rapid increase in coal price. In 2016, the Bohai Rim 5500 kcal thermal coal price rose from 401 yuan in June to 607 yuan in early November. Since September 2016, China has successively invested a batch of advanced production capacity, the middlemen have also gradually released coal inventory. With the increased supply, coal price has fallen slightly, but stabilized at around 580 yuan per ton in 2017. Benefitting from the rise in price, the coal market is picking up, and profitability of coal enterprises is significantly enhanced. From 2016 to 2017, the coal mining and washing industry achieved total profits of 109.09 billion yuan and 295.93 billion yuan, respectively, increase of 223.6% and 290.5% year-on-year, respectively. The coal industry attained substantial increase in profits for two years.  

4.3 The pace of corporate mergers and reorganizations has accelerated, significantly increasing industry concentration

The “Opinions” encouraged mergers and acquisitions between coal enterprises, coal and electricity enterprises, coal and coal chemical enterprises, coal and other related enterprises. On November 20, 2017, China Guodian Group and Shenhua Group reorganized as the National Energy Group, which becomes the world's largest coal production, thermal power generation, renewable energy power generation.
and coal-to-oil, coal chemical company. With the process of mergers and acquisitions, the number of coal mines decreased from 12,000 in early 2016 to around 7,000 in 2017, industry concentration further increased. In 2010, the CR8 in China's coal industry was only 25.04%, but raised to 36.41% in 2016 and 38.50% in 2017, as is shown in Tab. 4. According to Bain's classification of market types, China's coal market is still of competition type, but very close to the level of oligopoly V-type.

Table 4 China's coal production TOP8 and CR8 in 2010 and 2017 (unit: 10,000 tons)

<table>
<thead>
<tr>
<th>Rank</th>
<th>TOP8 in 2010</th>
<th>Production (10⁴t)</th>
<th>TOP8 in 2016</th>
<th>Production (10⁴t)</th>
<th>TOP8 in 2017</th>
<th>Production (10⁴t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shenhua Group</td>
<td>32780</td>
<td>Shenhua Group</td>
<td>43149</td>
<td>Shenhua Group</td>
<td>44072</td>
</tr>
<tr>
<td>2</td>
<td>China Coal Group</td>
<td>12505</td>
<td>China Coal Group</td>
<td>13323</td>
<td>China Coal Group</td>
<td>16368</td>
</tr>
<tr>
<td>3</td>
<td>Shanxi Coking Coal Group</td>
<td>8078</td>
<td>Shandong Energy Group</td>
<td>13050</td>
<td>Shandong Energy Group</td>
<td>14139</td>
</tr>
<tr>
<td>4</td>
<td>Datong Coal Mine Group</td>
<td>7450</td>
<td>Shaanxi Coal Chemical Industry Group</td>
<td>12593</td>
<td>Shaanxi Coal Chemical Industry Group</td>
<td>14010</td>
</tr>
<tr>
<td>5</td>
<td>Shaanxi Coal Chemical Industry Group</td>
<td>7100</td>
<td>Datong Coal Mine Group</td>
<td>11786</td>
<td>Yancon Group</td>
<td>13511</td>
</tr>
<tr>
<td>6</td>
<td>Huainan Mining Group</td>
<td>6715</td>
<td>Yancon Group</td>
<td>11415</td>
<td>Datong Coal Mine Group</td>
<td>12700</td>
</tr>
<tr>
<td>7</td>
<td>Henan Coal Chemical Industry Group</td>
<td>5698</td>
<td>Shanxi Coking Coal Group</td>
<td>9151</td>
<td>Shanxi Coking Coal Group</td>
<td>9609</td>
</tr>
<tr>
<td>8</td>
<td>Luan Mining Group</td>
<td>5509</td>
<td>Jizhong Energy Group</td>
<td>8009</td>
<td>Yangquan Coal Industry Group</td>
<td>8200</td>
</tr>
<tr>
<td>China's coal production in 2010</td>
<td>342844</td>
<td>China's coal production in 2016</td>
<td>336398</td>
<td>China's coal production in 2017</td>
<td>344500</td>
<td></td>
</tr>
<tr>
<td>CR₈</td>
<td>25.04%</td>
<td>CR₈s</td>
<td>36.41%</td>
<td>CR₈s</td>
<td>38.50%</td>
<td></td>
</tr>
</tbody>
</table>

Source: National Bureau of Statistics official website, National Coal Industry Network

4.4 Coal mining is safer and international competitiveness is obviously enhanced

Fig. 3 presents the changes of death rate per million tons of coal in the past five years. Since the implementation of the supply-side reform, a large number of coal mines in small scale and poor safety production condition have been shut down. China's coal mining becomes more secure, efficient, and competitive. In 2016, the death rate per million tons of coal in China was 0.156, dropping 1.89% year on year. In 2017, the safety situation of most coal mines is steady for the better with death rate per million tons of coal declining to 0.106, a decrease of 32.05% year on year. Among the top 30 most competitive coal companies in the world in 2017, China owns 21.

4.5 Conclusions and suggestions

De-overcapacity is the core task of supply-side reform. China has a good start in cutting coal capacity, exceeded the planned targets of 2016 and 2017. The supply-side reform of China's coal industry has achieved remarkable results as follows: Contradiction between supply and demand has been alleviated. Profitability of coal enterprises increased a lot, industrial concentration improved remarkably, coal mining has become more secure and international competitiveness been significantly enhanced. In order to further press ahead with supply-side structural reform, resolve backward production capacity, improve the quality of coal and achieve healthy and orderly development of China's coal industry, following suggestions are proposed.

(1) Establish a big data platform of coal and scientifically set up de-overcapacity targets. The formulation of de-overcapacity targets by government is often based on the data such as coal production and consumption in recent years. However, due to the large number of coal enterprises involved and large amount of information, reporting data step by step reduces the accuracy and timeliness of data, weakens the effect of decision making. The big data platform can access to data of coal companies timely and give a quick analysis and forecast, ensure the scientific nature of de-capacity goal.
(2) Optimize the coal production layout. De-overcapacity is a long-term task which cannot be accomplished overnight. The Chinese government planned to complete this project within 3-5 years. The time is too tight and the schedule is not clear enough. We propose it should be at least ten years to guarantee the reduction plan be carried out in an orderly manner[12]. At the same time, follow the strategy of "reducing the east, limiting the central and northeast, optimizing the west" to optimize the layout of China's coal development.

(3) Improve the exit mechanism and form a market-leading exit criteria. In recent years, most of the closing work of coal mines depends on the government, there is no market-based exit mechanism yet. China should change the reduction mechanism to gradually form a market-leading exit criterion, develop capacity standards and force the backward production shut down. The government will return to its place of monitoring and providing services.

(4) Pay attention to the utilization of shutting down mines' resources, fostering the successor industry, and forming a new growth pole for the regional economy. Development and utilization of closed mine resources should be incorporated into regional economic and social development plans. Combine regional economic characteristics and resource advantages, develop alternative enterprises and form a sustainable industry chain with a rational layout, high industrial added value and high development potential to promote healthy development of regional economy and society.

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Reference