CHINA'S STEEL INDUSTRY: AN UPDATE

YU Hong & YANG Mu

EAI Background Brief No. 501

Date of Publication: 14 January 2010

Executive Summary

1. China has taken the lead in steel production in the world since 1996, with production reaching 500 million metric tons (mmt) in 2008. The share of Chinese produced steel in the world increased to 37.6% in 2008 from 5.1% in 1980.

2. The growth of the steel sector has benefited from the rapid economic development and strong domestic demand. With the fundamentals of the Chinese economy remaining sound, and state investment in the high steel-consumption sectors maintaining at a high level, there is cause for optimism over the future development of China's steel industry.

3. The year 2008 was a difficult year for China's steel industry. The sharp fall in external consumption has severely affected the export of steel products from China.

4. Compared to the 11.4 mmt in the first quarter of 2008, the export of finished steel products was down by 51.8% to reach only 5.5 mmt in the first quarter of 2009.

5. In January 2009, the State Council of China released a new development outline for the steel industry 2009-2011. This Outline maps out comprehensive development schemes, such as structural readjustment and technological upgrading, and at the same time addresses other issues such as overcapacity and production fragmentation.

6. Overcapacity in production is the most prominent problem. For long-term sustainable development, domestic steel enterprises will have to put a cap on their production output.

7. Production fragmentation is another problem. The lack of production consolidation results in duplicated development and 'cut-throat' style

competition among domestic steel enterprises. China's steel industry is perhaps the most fragmented in the world.

8. Most of these steel firms suffer from weak competitiveness and low production output. The steel industry is big, but not strong. Productivity in the Chinese steel firms is low and technical progress is still slow.

9. Mergers and acquisitions (M&As) are the key strategy for the development of China's steel industry. M&As are important to not only helping the industry cope with the impact of the global economic crisis via production cost reduction, but also strengthening global competitiveness for the steel enterprises via market share expansion.

10. China's steel industry has been facing serious roadblocks in implementing its M&A strategy. In particular, domestic steelmakers have encountered resistance from local protectionism.

11. Although China produced around 36% of the world's steel output in 2007, it accounted for more than 50% of carbon dioxide emissions generated from world steel production. The steel sector still has a long way to go to achieve energy conservation.

12. The rapid growth of energy-intensive steel production paid the price of serious environmental degradation. The rapid expansion of high energy-consuming steel production is unaffordable, both economically and environmentally, in the long run.

13. To protect the environment in China, elimination of production methods, which use outdated technology, and technological upgrading are essential.

14. Resolving these problems is a major challenge for the government. Concrete results are yet to become apparent. There is a lack of policy details to achieve these objectives.

CHINA'S STEEL INDUSTRY: AN UPDATE

YU Hong & YANG Mu*

Serious Structural Problems amidst Rapid Growth

1.1 The steel sector has been the mainstay of the Chinese economy since the early 1950s. China has been one of the key producers in the world's steel industry over the last decade, with production reaching 500 million metric tons (mmt) in 2008. The share of Chinese steel in the world increased to 37.6% in 2008 from 5.1% in 1980.

1.2 The growth of the steel sector has benefited from the rapid economic development and strong domestic demand over the last decade. Likewise, the steel industry has also contributed to China's economic growth. As the fundamentals of the Chinese economy remain sound and state-oriented capital investment to the high steel-consumption sectors is high, there is cause for optimism over the future development of China's steel industry.

1.3 The year 2008 was a difficult year for China's steel industry mainly due to production overcapacity and fragmentation. Also, it has been suffering from high export dependency. The sharp fall in external consumption has severely affected the export of steel products from China. Compared to the 11.4 mmt in the first quarter of 2008, the export of finished steel products was down by 51.8% to only 5.5 mmt in the first quarter of 2009.

1.4 Against the backdrop of the global economic crisis, in January 2009, the State Council of China released a new development outline for the steel industry

* Dr. Yu Hong is Visiting Research Fellow at the East Asian Institute, National University of Singapore. Dr. Yang Mu is Senior Research Fellow at the same institute. They would like to thank Prof. John Wong for going through the drafts and giving valuable comments. They also benefited from the constructive suggestions given by Dr. Sarah Tong.

2009-2011 (referred to as the Outline). This Outline maps out comprehensive development schemes, such as structural readjustment and technological upgrading, and at the same time addresses other issues such as overcapacity and production fragmentation.

1.5 The priority task for the steel sector is to curb over-production. For 2009, the apparent domestic consumption (including production, net imports and inventory adjustment) of crude steel is estimated at merely 470 mmt; however, the steel production capacity is expected to be more than 600 mmt, with a production overcapacity of around 25%.[1] The steel enterprises are simply making too much steel.

1.6 China's steel sector is dominated by a few large state-owned enterprises (SOEs) with numerous small- and medium-sized enterprises (SMEs) accounting for only a small portion of steel output. Overcapacity has been mainly due to the rapid expansion of production by the SMEs. This in turn might add additional pressure to the downward trend of steel prices in the light of the plunge in external consumption. For long-term sustainable development, all domestic steel enterprises need to restrict their production output.

1.7 Production fragmentation is another challenge facing the steel industry. The lack of production consolidation results in duplicated development across regions and 'cut-throat' style competition among domestic steel enterprises. China's steel industry is perhaps the most fragmented in the world. China has more than 7,000 iron and steel companies, far more than any other countries.

1.8 However, most of these firms suffer from weak competitiveness and low production output. China's steel industry is big, but not strong. The share of the top five domestic steelmakers in total steel production of China was merely 27% in 2007. Baosteel Group, China's flagship steel enterprise, made only 35.4 mmt of steel products.

[1] Ministry of Industry and Information Technology, People's Republic of China, 2009

1.9 The problems of production overcapacity and fragmentation in the steel sector are nothing new, and have existed since 1990s. Resolving these problems is a major challenge for the government. Although the central departments of China are attempting to deal with these problems, concrete results have yet to become apparent. There is a lack of policy details to achieve these objectives.

1.10 Mergers and acquisitions (M&As) are the key strategy for the development of China's steel industry. M&As are important to not only helping China cope with the impact of the global economic crisis via production cost reduction, but also strengthening the global competitiveness of the steel enterprises via market share expansion.

1.11 Consolidation and integration are never going to be easy for the domestic steel sector. China's steel industry has been facing serious roadblocks in implementing its M&A strategy. In particular, domestic steelmakers have encountered resistance from local protectionism.

1.12 Due to the increased and inefficient use of energy and electricity, the rapid growth of energy-intensive steel production paid the price of serious environmental degradation and pollution in areas near to the steel firms. To protect the environment in China, elimination of outdated production methods and promotion of technological upgrading are essential.

1.13 The lax environmental standards and regulations for the steelmaking sector also need to be further strengthened and highly polluting and energy-guzzling small steel enterprises should be shut down. The rapid expansion of high energy-consuming steel production is unaffordable, both economically and environmentally, in the long run.

Rapid Development of China's Steel Industry

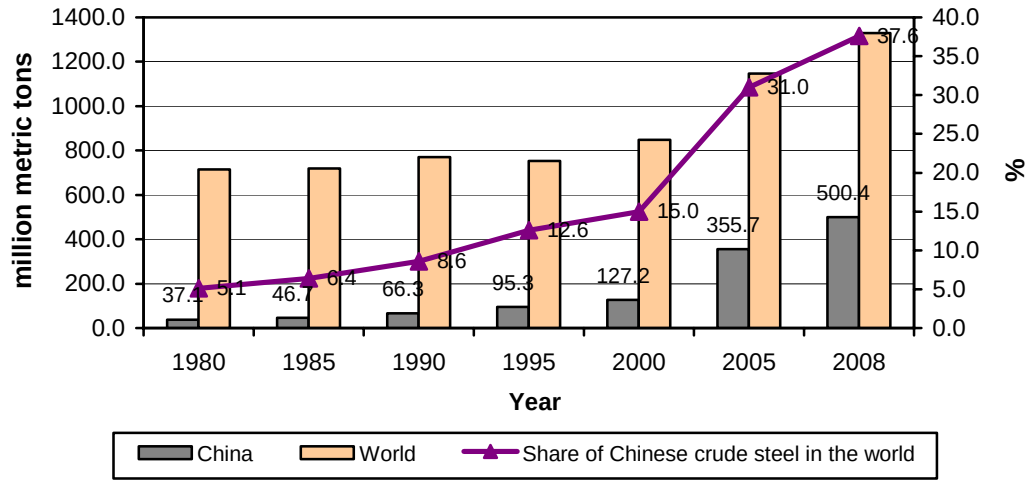
2.1 China has been one of the key steel producers in the world over the last decade, as evidenced by its leading world position, with production reaching 500 mmt

in 2008. Its total production capacity surpassed the combined output of the next seven largest steel-producing countries (see Table 1). The share of Chinese steel in the world increased to 37.6% in 2008 from 5.1% in 1980, with production of merely 37.1 mmt (see Figure 1).

TABLE 1 WORLD'S TOP TEN STEEL-PRODUCING COUNTRIES, 2008

Country	Rank	Production 2008 (million metric tons)	World Share (%)
China	**1**	**500**	**37.6**
Japan	2	118	8.9
The U.S.A.	3	91	7.2
Russia	4	68	5.2
India	5	55	4.1
South Korea	6	53	4.0
Germany	7	45	3.4
Ukraine	8	37	2.8
Brazil	9	33	2.5
Italy	10	30	2.3

FIGURE 1 CHINA'S GLOBAL SHARE OF CRUDE STEEL



Source: *The World Steel Association*. 2009

2.2 The rapid industrialization of China has led to an increase in demand for steel products. [2] Indeed, China's steel sector has benefited from the rapid development of the Chinese economy over the last decade especially after China became a member of the World Trade Organization (WTO) in 2001. The rapid growth of China's key industries such as its automobile and ship-building sectors has boosted the demand for high-end steel products. Also, owing to the huge state investment in high steel-consumption sectors such as infrastructure and housing construction, low-end steel production has been reporting decent growth.

2.3 As the fundamentals of the Chinese economy remain sound and state-oriented capital investment, such as low-cost housing, infrastructure construction and Sichuan earthquake reconstruction, in key high steel-consumption areas is high, there is cause for optimism for the future development of China's steel industry. For example, for the first time since October 2008, 72 major domestic steelmakers made profit of 1.3 billion *yuan* in May 2009.[3]

2.4 The domestic steel enterprises have benefited substantially from the 4-trillion *yuan* stimulus package announced by the central government in November 2008 to offset the negative impact of the global crisis by stimulating domestic consumption. Thanks to these proactive fiscal and domestic consumption stimulus policies, the performance of China's steel industry might be further improved in the third and fourth quarters of 2009.

Impact of the Global Economic Crisis

3.1 The world's steel industry has been hit hard by the global economic crisis since 2008. Global recession has depressed the world's demand for steel. The world's crude steel production was 1,329.7 mmt in 2008. If China's figures

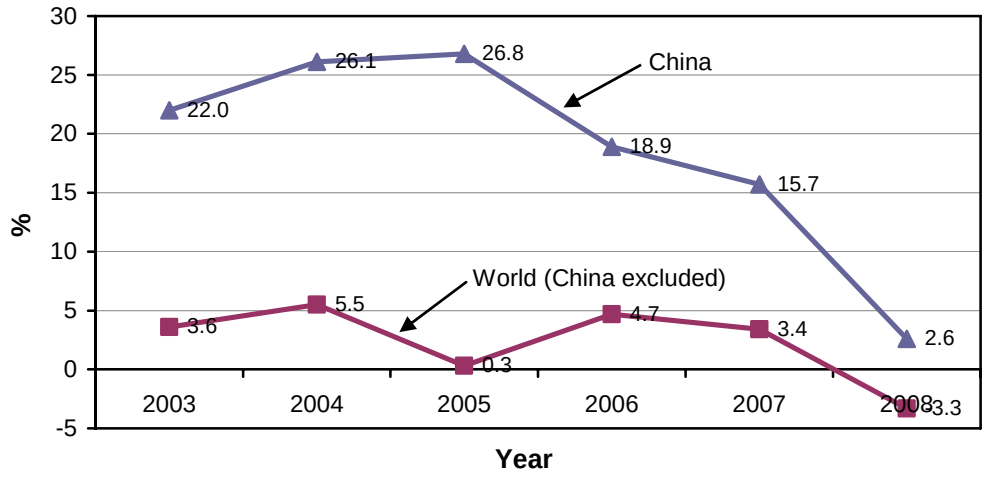
[2] Feng, Lintong, (1994) "China's Steel Industry: Its Rapid Expansion and Influence on the International Steel Industry", *Resources Policy*, 20(4), pp. 219-34.

[3] "Major steel mills back in black", *China Daily*, 30 Jun, 2009

were excluded, annual growth of crude steel production would show a contraction of 3.3% in 2008 compared to an expansion of 3.4% in 2007 (see Figure 2).

3.2 Many major steel-producing countries, such as the U.S.A., Japan, and Russia, recorded a sharp fall in steel production in 2008.[4] For example, the total steel production in the U.S.A. was down to 91.5 mmt in 2008 from 98.2 mmt in 2007, a decrease of 7%. More than 50% of its steel production capacity has become idle since January 2009, marking the lowest levels of production for several decades.

FIGURE 2 GROWTH OF CRUDE STEEL PRODUCTION IN THE WORLD



Source: *The World Steel Association*, 2009[5]

3.3 The year 2008 was a difficult year for China's steel industry. It has been suffering from high export dependency, with semi-manufactured and finished

[4] *The World Steel Association* 2009

[5] The World Steel Association (WSA) is one of the most powerful and largest industry associations in the world. It represents 18 of the world's 20 biggest steel enterprises and around 170 steelmakers, steel industry associations and steel research institutes across the world. In total, its members produce around 85% of the world's annual steel output.

steel products exports accounting for 23% of total steel production in 2008.[6] The sharp fall in external consumption has severely affected the export of steel products from China.

3.4 The export of finished steel products decreased to 1.4 mmt in April 2009 from 7.5 mmt in August 2008. Compared to the 11.4 mmt in the first quarter of 2008, the export of finished steel products was down by 51.8% to reach only 5.5 mmt in the first quarter of 2009.[7] Total export value of finished steel products hit only US$7.5 billion during the first four months of 2009, a decrease of 47.8%.

3.5 The global economic recession has also exacerbated the existing problems of excessive capacity and production fragmentation in the steel sector. Due to the impact of this recession and decreasing steel prices, up to 62% of 72 large and medium-sized steelmakers in China recorded losses of 29.1 billion *yuan* in 2008.[8] During the first quarter of 2009, these key domestic steel enterprises recorded further losses, totaling 3.3 billion *yuan*, according to the China Iron and Steel Association.

3.6 Rising iron ore prices also significantly increase production costs for many of China's large- and medium-sized steel companies which are now in financial difficulties.[9] The proposed joint venture between leading global mining companies, Rio Tinto and BHP Billiton, would lead them to surpass Brazil's Vale in becoming the largest iron ore producer in the world. Iron ore prices are likely to increase in the future.

---

6 *China Iron & Steel Association*, 2009

7 *General Administration of Customs of the People's Republic of China*, 2009

8 "China's steel industry to consolidate amid global crisis", *Xinhua News*, http://news.xinhuanet.com/english/2009-03/12/content_10995040.htm

9 "China's steel sector just keeps growing", *Asia Times*, http://www.atimes.com/atimes/China_Business/HH03Cb03.html

3.7 China has become the world's largest iron ore importer since 2003. More than 50% of its consumed iron ore needs to be imported. The Rio Tinto-BHP Billiton joint venture would strengthen the say of leading suppliers in the world's iron ore pricing. It would inevitably put China's steel industry in a very vulnerable position in bargaining over iron ore prices. The Chinese government and steelmakers have expressed strong opposition to the Rio Tinto-BHP Billiton consolidation deal on the grounds that it has clear monopolistic characteristics (see Appendix 1 for the detailed analysis).

3.8 Moreover, the global economy has yet to bottom out, as evidenced by the 1.4% decline in projected global growth in 2009.[10] The road to global economic recovery is proving to be sluggish and problematic. Facing depressed external demands, triggered by the worsening global economic crisis and uncertain economic future, the foreign trade of China's steel industry will inevitably further decline.

Government's Stimulus Programmes

4.1 In January 2009, the State Council of China released a new development outline for the steel industry 2009-2011 (referred to as the Outline). This Outline maps out comprehensive development schemes, such as structural readjustment and technological upgrading, and at the same time addresses other issues such as lack of economy of scale and production fragmentation. The Outline also sets up important working tasks for conserving resources and protecting the environment for the steel industry.

4.2 In response to the global economic downturn in the short run, and to cope with the existing problems of excessive overcapacity and production fragmentation in the long run, apart from the specific development goals identified in Appendix 2, there are three main objectives unveiled by the Outline. Firstly, in order to strengthen global competitiveness, the steel sector is expected to

[10] "World Economic Outlook Update", *International Monetary Fund*, July 2009

undergo major industrial restructuring. The central government is expected to provide subsidies and loans to support technological research and upgrading in the steel sector.

4.3 Secondly, the steel sector is expected to make significant progress in acquisitions. The central government hopes that China's steel industry can compete more effectively on a global scale and encourages foreign acquisitions by domestic steel enterprises. Thirdly, addressing the prominent issue of production overcapacity is believed to be the top priority. Total production capacity of crude steel should be maintained at around 500 mmt by 2011.

4.4 Wen Jiabao, Premier of China, during his recent visits to large iron and steel firms, has reiterated in speeches that the domestic steel industry faces huge tasks in restructuring production and eliminating outdated capacity, and linking the steel industry with a green economy and new materials to cope with the global financial crisis and enhance long-term industrial competitiveness.[11]

4.5 The Chinese steelmakers should take a proactive role in diversifying products and enhancing quality to meet the demand of the manufacturing, new energy vehicles and ship-building industries. The 4-trillion *yuan* state stimulus package and rejuvenation plans for 10 key industries are expected to provide new opportunities for the development of the steel industry.

4.6 However, the problems of production overcapacity and fragmentation in the steel sector are nothing new, and have existed for a long time. To resolve these problems is a major challenge to the government. Although the central departments of China are attempting to deal with these problems, concrete results have yet to become apparent. There is a lack of policy details to achieve these objectives.

[11] "Premier Wen: economy making steady progress", *China Daily*, online edition: http://www.chinadaily.com.cn/bizchina/2009-06/23/content_8311301.htm

Challenges and Problems

5.1 Although the Chinese government outlines an ambitious plan to strengthen the domestic steel industry's competitiveness on a global scale and to become the influential steel player in the world, implementation of this outline is a difficult task. It is facing at least three serious challenges. Firstly, large-scale overcapacity in production is the most prominent problem.

5.2 According to the Ministry of Industry and Information Technology (MIIT)'s forecast, in 2009, the apparent domestic consumption of crude steel will be merely 470 mmt while the steel production capacity is expected to be more than 600 mmt, a production overcapacity of around 25%. Inspite of facing a sharp fall in external demand and uncertain economic circumstances, domestic steel production, surprisingly, recorded growth during the first six months of 2009.

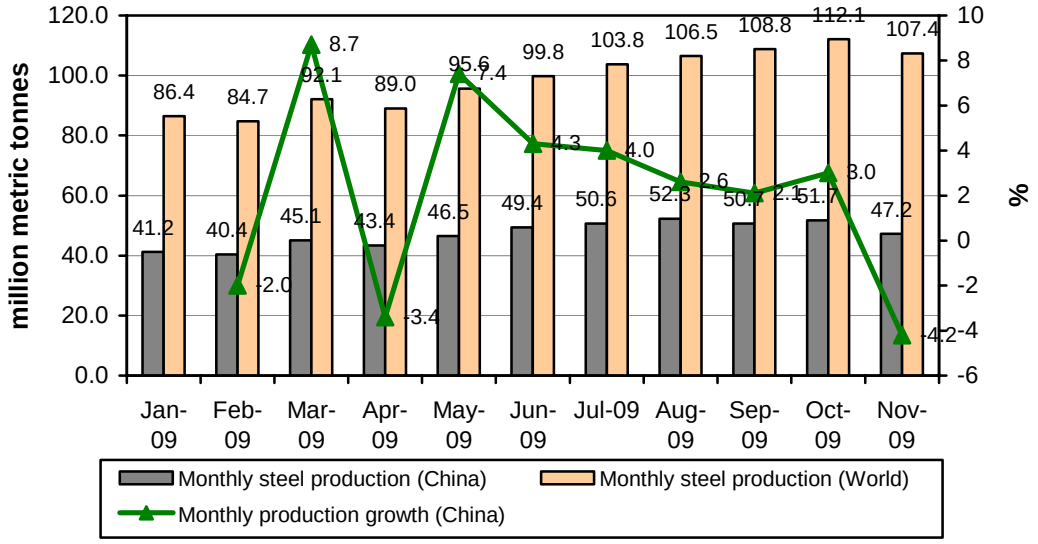
5.3 The monthly production reached 47.2 mmt in November 2009 from 41.2 mmt in January 2009, with monthly growth of 2.3% (see Figure 3). The growth in steel production is also reflected in the sharp increase in imports of iron ore, a key raw ingredient for steel making. For example, the imports of iron ore increased to 53.4 million tons in May 2009 up by 63% from 32.6 million tons in January 2009.[12]

5.4 China is now the world's largest iron ore importer. In particular, a large proportion of imported iron ore comes from Rio Tinto. China is expressing strong opposition to the consolidation deal between Rio Tinto and BHP Billiton, arguing that it would give suppliers a monopoly over iron ore assets and more power in setting their prices. This would inevitably put China in a vulnerable position in the bargaining of iron ore prices, forcing it to accept higher prices in the long-term.

---

12 *General Administration of Customs of The People's Republic of China*, 2009

FIGURE 3 MONTHLY STEEL PRODUCTION OF CHINA AND THE WORLD



Source: *The World Steel Association*, 2009

5.5 On 12 August 2009, Stern Hu and three other Rio Tinto staff were formally arrested by the Chinese government on the allegation of taking bribes and stealing commercial trade secrets. The arrest of Hu has caused the concern of the Australian government and negatively affected relations between China and Australia. This arrest also reflects serious legal problems and irregularities within the iron ore trade in China (see Appendices 3 and 4 for detailed analysis).

5.6 In April 2009, the MIIT issued a strong warning to the steel industry to avoid excessive investment and prevent overcapacity by eliminating backward production methods and ceasing bank loans.[13] However, the warning from the central government, and even repeated remarks by Premier Wen Jiabao himself, proved to be ineffective in curbing production overcapacity. In fact, due to robust domestic demand, steel production growth is projected to have sped up in the third and fourth quarters of this year.

[13] "MIIT issued the emergency public report to restrain the over expansion of production capacity in the steel industry", *China Iron & Steel Association*, http://www.chinaisa.org.cn/show.php?newsid=2152377

5.7 Overcapacity has been mainly due to the rapid production expansion of the SMEs. This is in contrast to the reduction efforts made by the large steel firms. For example, average daily production of the SMEs jumped to 0.34 mmt from 0.29 mmt.[14] Overcapacity might add additional pressure to the downward trend of steel prices in the light of the plunge in external consumption.

5.8 The fall in domestic steel prices would further hit the profit of China's steelmakers. For long-term sustainable development, domestic steel enterprises need to exercise self-restraint in expanding their production capacities. The priority task for the steel sector is to curb over-production.

5.9 In examining unfair practices such as subsidies and dumping, the U.S. Department of Commerce successively raised three anti-dumping and countervailing investigations into the imports of finished steel products from China during June 2009.[15] Taking into account the frequency of these investigations and specific target industry, this was a very unusual move.

5.10 The Chinese steelmakers might need to turn to the export of cheap steel products to the U.S. in light of domestic oversupply. However, it is very easy to trigger anti-import and protectionist sentiments in the U.S. This case reflects that China's steel sector has to speed up its structural readjustment process and eliminate outdated production methods.

5.11 Secondly, production fragmentation is another challenge facing the steel industry. China has more than 7,000 iron and steel companies, far more than any other country (see Map 1 in the appendix). Most of these firms suffer from a lack of competitiveness and low production output. China's steel industry is big, but not strong. Among the 76 key large- and medium-sized enterprises in

[14] "China steel makers report losses as output rises", *China Daily*, online edition: http://www.chinadaily.com.cn/bizchina/2009-04/23/content_7708515.htm

[15] "China scraps anti-dumping duty on newsprint imports", *Reuters*, 30 June 2009, http://www.guardian.co.uk/business/feedarticle/8583969

China, only 10 firms have 10 mmt annual production capacities (see Table 2).[16]

5.12 Compared to the world's leading steel companies, Chinese steel enterprises have employed far more workers. However, crude steel output per employee for domestic steel enterprises was much lower than that for leading firms in the world (see Table 2). Jiangsu Shagang Group has the highest productivity in China, but its output per employee is barely one third that of the world's leading steel companies. This indicates that labour productivity in the Chinese steel firms is low and technical progress is still slow.[17]

5.13 The low technological capability of China's steel industry is also reflected in the measurement of energy efficiency. For example, in comparison to the world's leading nations, the average coke consumption per ton of crude steel in China was 2-3 times higher (see Table 3). Technological advancement is not only important for enhancing energy efficiency and thus improving steel production, but also crucial to achieving sustainable steel development and environmental protection.

5.14 Although China produced around 36% of the world's steel output in 2007, it accounted for more than 50% of carbon dioxide emissions generated from world steel production.[18] The steel sector still has a long way to go to achieve energy conservation and efficiently utilized input energy.

---

[16] The steel-making companies with annual production capacity reaching at least 10 mmt are internationally recognized as "internationally competitive" firms.

[17] In comparison to the pre-reform period between 1957 and 1980, Jefferson's empirical study found that China's steel industry has achieved productivity growth at an annual rate of 2.5% during the reform era. Please refer to Jefferson, Gary. H., (1990) "China's Iron and Steel Industry: Sources of Enterprises Efficiency and the Impact of Reform", *Journal of Development Economics*, 33(3), pp. 329-55.

[18] "Meeting the Challenge of Climate Change", *International Iron and Steel Institute* (IISI) (2008)

TABLE 2 PRODUCTIVITY OF CHINA'S LARGE STEEL-MAKING ENTERPRISES AND THE WORLD'S LEADING FIRMS, 2007

Enterprise	Crude Steel (mmt)	Total Employees (1,000)	Output per employee (tons)
China			
Baosteel Group	28.5	40	712
Angang-Bengang Group	23.5	196	119
Jiangsu Shagang Group	22.8	26	876
Tangshan Iron & Steel Group	22.7	96	236
Wuhan Iron & Steel Group	20.1	87	231
Shougang Corporation	15.4	80	192
Magang Group	14.1	59	238
Jinan Iron & Steel Group	12.1	41	295
Laiwu Iron & Steel Group	11.6	39	297
Hunan Hualing Iron & Steel Group	11.1	46	241
Other 66 Iron & Steel Groups	Less than 10	n/a	n/a
Comparison with the World			
Nippon Steel (Japan)	35.7	14	2550
JFE (Japan)	34.0	14	2428
POSCO (South Korea)	31.1	17	1829
U.S. Steel (U.S.)	21.5	21	1023

Source: *China Iron and Steel Association (2008)*; *China Steel Yearbook (2008)* and *the World Steel Association (2009)*

TABLE 3 COKE CONSUMPTION PER TON OF CRUDE STEEL OUTPUT OF CHINA AND LEADING STEEL-PRODUCING COUNTRIES (UNIT: KG)

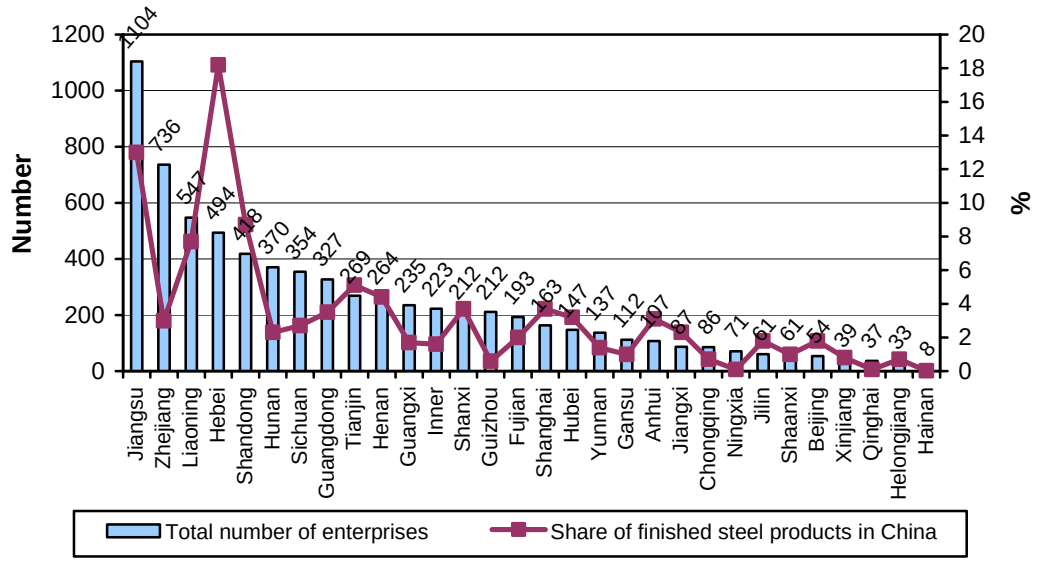
Country	2004	2005	2006
China	**740**	**720**	**710**
Japan	380	380	420
South Korea	230	190	180
The U.S.	200	170	170

Source: *China Steel Yearbook 2008*

5.15 The lack of production agglomeration results in duplicated development and 'cut-throat' style competition among domestic steel enterprises. China's steel industry is perhaps the most fragmented in the world. On average, there are more than 230 iron and steel enterprises in each province (see Figure 4). As

the steel sector is an industry with economies of scale, it makes no sense to maintain so many steel-making firms.

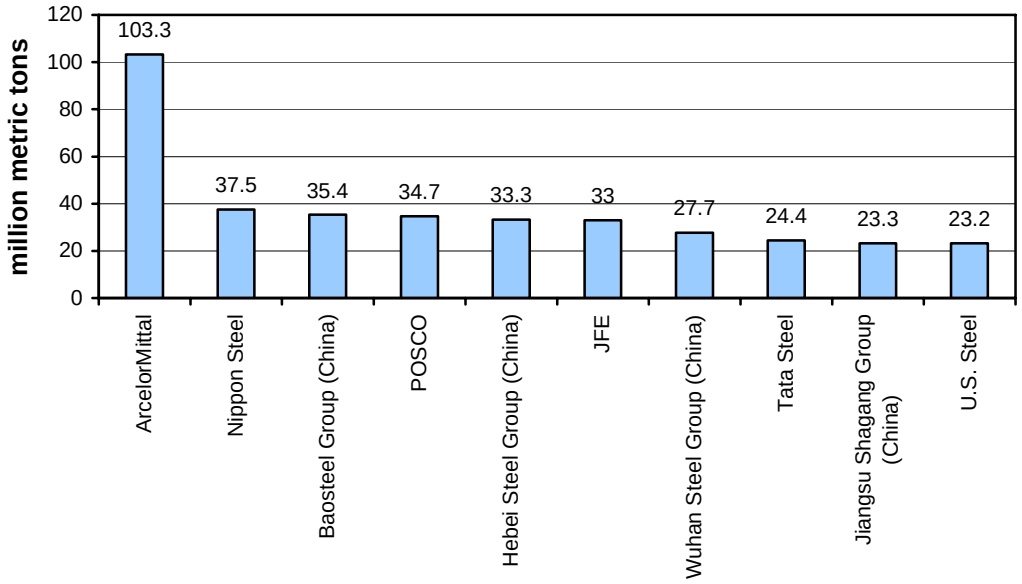
FIGURE 4 REGIONAL DISTRIBUTION OF DOMESTIC IRON AND STEEL ENTERPRISES AND THEIR SHARED OUTPUT IN CHINA 2007



Source: *China Steel Yearbook 2008*

5.16 The share of the top five domestic steelmakers in total steel production of China was merely 27% in 2007. Baosteel Group, China's flagship steel enterprise, made only 35.4 mmt of steel products. In contrast, the world's leading steelmaker, Luxembourg-based ArcelorMittal, produced 103.3 mmt of steel products in 2008, nearly three times higher than Baosteel's (see Figure 5). ArcelorMittal alone produced almost 8% of the world's steel products in 2008.

FIGURE 5 TOP TEN STEELMAKERS IN THE WORLD 2008



Source: *The World Steel Association*. 2009

5.17 M&As are the key strategy for the development of China's steel industry. They not only help the industry cope with the impact of global crisis via production cost reduction, but also strengthen the global competitiveness of the steel enterprises via market share expansion. M&As are also effective means to reducing outdated capacity and increasing productivity in the steel sector (see Appendix 5).

5.18 However, consolidation and integration are never going to be easy for the domestic steel sector. For example, the proposed acquisition of Jilin-based Tonghua Iron & Steel (Tonggang) by the large privately owned Jianlong Steel Holding Group (Jianlong) has been permanently scrapped after a serious riot leading to the death of Chen Guojun, the interim general manager and representative appointed by Jianlong who was killed by the company's angry workers on 24 July 2009 (see Appendix 6).[19] China's steel industry has also been facing serious roadblocks in implementing the M&A strategy. Due to administrative divisions and self-interest, local governments are extremely reluctant to support steel sector mergers.

19 "Killing of China steel plant boss halts sale", *Financial Times*, page 1, 27 Jul 2009

5.19 Thirdly, China's steel industry has established itself as a low value-added, labour-intensive steel producer over the last decade. The development of high value-added products is lagging behind. In the past, competitiveness was based primarily on cheap labour and lax environmental regulations.

5.20 In seeking sustainable development, the Chinese government needs to take prompt measures to readjust the production structure of the steel sector and move it up to the high value-added chain. As a top priority, the government has to adopt certain key measures to promote technological upgrading including tax incentives and state capital subsidies.

5.21 The rapid growth of energy-intensive steel production paid the price of serious environmental degradation in areas near to the iron and steel firms.[20] To protect the environment and build an energy-conservation economy in China, elimination of production methods which use outdated technology and technological upgrading is essential.

5.22 In particular, the lax environmental standards and regulations for the steelmaking sector need to be further strengthened. The highly polluting and energy-guzzling small steel enterprises should be shut down. The rapid expansion of high energy-consuming steel production is unaffordable, both economically and environmentally, in the long run.

[20] Ma Jinlong., Evans, D. G., Fuller, R. J., and Stewart, D. F., (2002) "Technical Efficiency and Productivity Change of China's Iron and Steel Industry", *International Journal of Production Economics*, 76, pp. 293-312

APPENDIX 1

The Chinalco Deal Cancellation by Rio Tinto

On 12 February 2009, Anglo-Australian mining concern, Rio Tinto PLC (Rio Tinto), the world's third biggest iron ore producer, signed a planned agreement with Aluminum Corp of China (Chinalco) for an investment of US$19.5 billion in the former. If successful, the deal would mark the biggest overseas investment in a foreign company made by a Chinese firm. The deal would also help Rio Tinto reduce its overall debt and meet repayment obligations. However, Rio Tinto called off the deal with Chinalco on 5 June 2009, and announced that it would pay a US$195 million break fee to Chinalco. Instead, Rio Tinto and its rival, BHP Billiton, the world's second largest iron ore producer, would combine their iron ore assets and set up a joint production venture in Western Australia. In order to achieve 50% vs. 50% share ratio of this joint venture between these two companies, BHP Billiton is expected to pay US$5.8 billion to Rio Tinto.

Both companies and the Australian government argue that the abandonment of the original deal with Chinalco and the decision to establish a new joint venture was purely based on market consideration and commercial interests. However, the termination of the planned deal between Rio Tinto and Chinalco has caused wide concern and discontent in China. China claims that, by arguing that one of the key strategic assets of Australia should never be controlled by China, the acquisition deal between Chinalco and Rio Tinto has been politicalized by western politicians and media. China claimed that the consolidation deal between Rio Tinto and BHP Billiton had clear monopolistic characteristics and expressed strong opposition to their joint venture.

As the world's largest iron ore importer, China's discontent is understandable. China's steel industry is very sensitive to any strategic cooperation and alliance between the major iron ore suppliers. China expresses the concern that this kind of move would give suppliers a monopoly over iron ore assets and more power in setting its prices. Currently, more than half of China's iron ore imports come from Rio Tinto and BHP Billiton. The joint venture between these two giants would strengthen their say on the world's iron ore pricing. It would inevitably put China in a vulnerable position in bargaining iron ore prices and forcing it to accept higher prices in the long-term. The Chinese government makes it clear that it would carefully watch any move by this joint venture and use the anti-monopoly law to eliminate market manipulation if necessary.

There is a lesson to be learnt from this investment failure. It is not easy for high-profile state-owned Chinese enterprises to succeed in overseas investments especially when strategic resources or industries like the oil and iron ore sectors are involved. Such success depends on not only well-planned investment proposals that consider commercial interests and various market factors, but also, possibly, a good lobbying strategy to deal with the frequent criticisms of the western media and politicians. Their influence on investment deals cannot be ignored.

References:

1. Chong, Siew Keng and Desmond Chua., (2009) "The Rio Tinto Affair", *EAI Background Brief No. 468*, National University of Singapore.
2. "China steel association opposes Rio – BHP iron ore JV", *Xinhua News*, http://www.chinadaily.com.cn/bizchina/rio_chinalco/2009-06/10/content_8328150.htm
3. "Rio Tinto, BHP deal 'monopolistic', industry warns", *China Daily*, page 13, 9 June 2009
4. "Chinese steel group opposes Rio-BHP venture", *Yahoo News*, http://finance.yahoo.com/news/Chinese-steel-group-opposes-apf-2622493996.html?x=0&.v=1
5. "Rio Tinto-Chinalco $19.5B deal now dead", *China Daily*, online edition: http://www.chinadaily.com.cn/china/2009-06/05/content_8252601.htm

APPENDIX 2 HIGHLIGHTS OF THE NEW DEVELOPMENT OUTLINE FOR THE STEEL INDUSTRY

Number	Summary
General Development	
1	The total production capacity of crude steel is expected to be maintained at around 500 mmt in 2011. The 4% ratio of value-added industrial output of the steel industry in GDP is achievable.
Mergers and Acquisitions	
2	The central government is seeking to establish around five key steel giants with annual production capacity reaching 50 mmt and several large steel companies with annual production capacity of 10 – 30 mmt by 2011.
3	These leading domestic steel enterprises should develop strong self-innovation capability and be competitive globally. The share of the top five steelmakers is expected to account for 45% of total steel production capacity in China in the next three years.
Outdated Production Capacity Elimination	
4	The Chinese government would do well to consider shutting down blast furnaces with capacity of 300 metres or less and electric arc furnaces with capacity of 20 tons and less by 2010. Blast furnaces with capacity of 400 metres or less and electric arc furnaces with capacity of 30 tons or less could be next in line for elimination by 2011.
5	In total, up to 72 mmt in outdated iron-making and 25 mmt obsolete steel-making capacity are expected to be eliminated in the steel industry over the next three years.
Technological Upgrading	
6	China's steel industry is expected to speed up in its technological upgrading. The quality of 60% of finished steel products manufactured by important large- and medium-sized steel enterprises is expected to achieve general world standards by 2011. Self-sufficiency in key finished products is expected to reach 90% by 2011.
7	The central governments would provide around 15 billion *yuan* subsidies and loans to support technological research and upgrading and enhance product quality in the steel sector.
Export Promotion	
8	Export tariffs on key steel products will be scrapped to encourage exports and ease pressure on domestic steelmakers. The export tax rebates for high-tech and high value-added steel products will be increased. From 1 April 2009, the export tax rebate for 59 finished steel products has been increased to 13% from 5%.
Environment Protection	
9	The Outline also sets up important working tasks for resources conservation and environmental protection for the steel industry. Specific targets have been set up for energy consumption reduction per unit of production output: by 2011**,** energy consumption per ton of steel products should not exceed 0.62 tons of standard coal equivalents. The rate of second-hand energies, which can be reused, will reach 100%.

Source: *National Development and Reform Commission, the People's Republic of China*, 2009

APPENDIX 3

Iron Ore Price Negotiations between Chinese Steel Enterprises and Global Suppliers

In recent years, China has been working hard to engage in the negotiation of iron ore prices and to achieve influence consistent with its status as the world's largest steel producer and biggest iron ore importer. On 31 May 2009, China rejected the iron ore price cut of 33% negotiated by Rio Tinto, Japanese and South Korea steelmakers, claiming that the price was still unacceptably high. The China Iron & Steel Association said that this price would hurt China's steel industry and cause overall losses to domestic steelmakers. It insisted that a minimum 40% price cut in the annual contract for iron ore purchase, which had already been resisted by the world's leading suppliers, must be achieved before China's steel firms can sign this year's iron ore supply contract. China is threatening to abandon the benchmark system of annual iron ore negotiations, which has been a key symbol of the world's steel industry for 40 years, and turn to the spot market for supplies.

On 9 July 2009, Shanghai State Security Bureau arrested Stern Hu, General Manger of iron ore sales and marketing at Rio Tinto's Shanghai office, and three other Rio Tinto staff. China accused Stern Hu of stealing state secrets with his bribes to staffs of Chinese steel-making enterprises. It said that, according to evidence obtained, Hu's behaviour has caused huge losses to China's economic interests and is a threat to national economic security. It is believed that some senior staff from the Chinese steel mills is also involved in this case and might be investigated by the Chinese security department. However, the western media widely speculates that the arrest of Hu and the other three Rio Tinto staff was connected to the Chinalco deal cancellation by Rio Tinto. The case is seen as payback for the broken deal. The arrest of Hu has also caused concern and discontent of the Australian government.

Stern Hu's detention is expected to worsen hostile relations between Rio Tinto and China's steel industry caused by the failure of the Chinalco deal. It could also affect and delay the ongoing iron ore price talks between Chinese steelmakers and global major iron ore producers. By announcing these arrests, China intends to not only show the iron ore giants that it means to take a more proactive role in the bargaining of iron ore prices, but also more importantly, clean up all irregularities within the iron ore trade in China.

References:

1. "Rio employee accused of bribery", *Financial Times*, http://www.ft.com/cms/s/0/5cf0e9fc-6d15-11de-9032-00144feabdc0.html
2. "Rio case shakes foreign groups into reassessing China methods", *Financial Times*, page 3, 18/19 Jul 2009
3. "Rio worker 'stole secrets'", *BBC News*, http://news.bbc.co.uk/2/hi/business/8141766.stm
4. "Australia warns China on spy case", *BBC News*, http://news.bbc.co.uk/2/hi/business/8150985.stm
5. "Last attempt to save iron ore benchmark", *Financial Times*, http://www.ft.com/cms/s/0/04e61204-448f-11de-82d6-00144feabdc0.html

APPENDIX 4

Analysis of the Arrest of Rio Tinto's Staff by China

On 12 August 2009, Stern Hu and three other Rio Tinto staff were formally arrested by the Chinese authorities on the allegation of giving bribes and stealing commercial trade secrets. However, in contrast to earlier reports made by the state media, the suspicion of their involvement in stealing state secrets from China was not mentioned.

The arrest of Rio Tinto's staff reflects serious problems facing China. Firstly, China's entire legal system is still problematic, as reflected in the lack of transparency and independence, and in the ambiguity of national security and state secrets law. Lawyers do not have access to the detainees without investigators' permission. Secondly, the iron ore trade in China suffers from administrative irregularities and the monopolistic control by a few large steel enterprises and middlemen. Currently, there are only 112 steel firms and agencies in China trading in iron ore. Smaller steel firms need to negotiate with large domestic firms to obtain iron ore supplies for production. This creates huge price differences between imports of iron ore by these large monopolies and actual domestic re-selling of iron ore to other small steel firms in China. This allows a few monopolistic companies to maximize their profits and reflects the power of internal staff of the few large steel enterprises in deciding quantity of iron ore imports, giving them the opportunity to take bribes from foreign companies. Besides, internal problems have actually weakened the power of domestic steel enterprises in their negotiations with global mining concerns.

To rectify this problem, China should designate a national stockpiling policy to help domestic steel mills. By establishing national iron ore storage, China's steel industry can not only avoid market fluctuation risks and stabilize import prices of iron ore, but also achieve other objectives including production cost saving, iron ore supply security and influencing world trade prices of iron ore. However, national storage is costly, and the optimal level of stockpiling to hold is hard to be determined. It would not be possible to establish national stockpiling if serious irregularities within the iron ore trade sector in China persist.

References:

1. For the research on the role and impact of commodity price stabilization and national stockpiling, and the potential means to achieve price stabilization, please refer to Newbery, D. M. G. and Stiglitz, J. E., (1982) "Optimal commodity stock-piling rules", *Oxford Economic Papers*, 34(3), pp. 403-27
2. Chong, Siew Keng and Desmond Chua., (2009) "The Rio Tinto Affair", *EAI Background Brief No. 468*, National University of Singapore.
3. "Rio case shakes foreign groups into reassessing China methods", *Financial Times*, page 3, 18/19 Jul 2009
4. "Beijing's peculiar definition of state secrets", *Financial Times*, page 7, 24 Jul 2009
5. "The disorderly phenomenon of the iron ore trade", *Xinhua News*, http://news.xinhuanet.com/fortune/2009-07/14/content_11705743_2.htm
6. "China arrests Rio Tinto workers", *BBC News*, http://news.bbc.co.uk/2/hi/business/8196529.stm

APPENDIX 5

M&A: A Key Development Strategy

M&As are the key strategy for the development of China's steel industry. They are important to not only help the industry cope with the impact of the global crisis via production cost reduction, but also strengthen the global competitiveness of the steel enterprises via market share expansion. Acquisition is also important to enhancing the negotiation position of domestic steelmakers in importing steel-making raw materials. Fragmentation has weakened the bargaining power of China's steel industry over iron ore prices as firms negotiate individually with the global suppliers. M&As would allow large domestic steel enterprises act as a negotiation bloc to obtain a bigger say in iron ore price talks.

China's steel industry has been making good progress in terms of consolidation and 17 M&As were successfully completed in 2008. There is the shining acquisition example of Handan Iron and Steel and Chengde Xinxin Vanadium and Titanium Co. by Tangshan Iron and Steel (Tangsteel), the sole listed subsidiary of Hebei Steel Group. Since the merger, Hebei Steel Group has become the second largest steelmaker in China and challenged the dominant status of Baosteel Group. Leading enterprises may need to play an influential role in the consolidation and acquisitions of many small domestic steelmakers.

However, the implementation of the acquisitions strategy is never going to be easy for the domestic steel sector. China's steel industry has been facing serious roadblocks in its M&A strategy. Firstly, due to administrative divisions and self-interest considerations, local governments are extremely reluctant to support steel sector mergers. Although great acquisition efforts were made by large steelmakers, a growing number of newly established SMEs are also emerging in China, such as Dalian-based Dongbei Special Steel Group. These firms have local government-dominated characteristics and are the result of local protectionism. In attempting M&As, domestic steelmakers have encountered resistance from local authorities, as steel firms are the backbone industry of many local regions with their huge contribution to local tax revenue. The local governments are also concerned that the steel sector mergers might result in a big rise in unemployment rates and are likely to use various means to protect their steel sectors.

Secondly, many merging enterprises would face difficulties restructuring internal management teams and building an integrated corporate culture. M&A success largely depends on coordinating and incorporating different internal management teams and blending different cultures into a united whole. This would involve substantial time and efforts on the part of these enterprises.

References:

1. "Hebei Iron arms merger to challenge Baosteel", *China Daily*, online edition: http://www.chinadaily.com.cn/bizchina/2009-06/25/content_8320496.htm
2. Li, Zhongmin, 2009. "Three Strategies to Enhance the Global Competitiveness of China's Steel Industry", *Policy Brief No. 09017*, International Trade and Investment Series, Chinese Academy of Social Science.
3. "The agglomeration dilemma for the steel industry: the re-emergence of small iron and steel enterprises in China", *China Iron & Steel Association*, http://www.chinaisa.org.cn/show.php?newsid=2153382
4. Wu Yanrui., (2000) "The Chinese Steel Industry: Recent Developments and Prospects", *Resources Policy*, 26, pp. 171-178.
5. "Steel sector consolidation to continue", *China Daily*, online edition: http://www.chinadaily.com.cn/bizchina/2009-03/09/content_7553574.htm

APPENDIX 6

The Tonggang Incident: A Setback for the Government-backed Acquisition Strategy

On 22 July 2009, the proposed deal for acquiring Jilin-based Tonghua Iron & Steel (Tonggang) by the large privately owned Jianlong Steel Holding Group (Jianlong) was approved by the Provincial State-owned Assets Supervision and Administration Commission (SASAC), in Jinlin. However, this planned deal has been permanently scrapped by the provincial government of Jilin after a serious riot leading to the death of Chen Guojun, the interim general manager and representative appointed by Jianlong to run Tonggang who was killed by angry Tonggang workers on 24 July 2009. The steel workers were worried that they might lose their jobs after the company's takeover by Jianlong. In an attempt to stop the police, government officials and ambulances from rescuing Chen Guojun, who was beaten up, the workers blocked roads and threw bricks on them. The riot also led to the shutdown of production in Tonggang's seven blast furnaces, and Tonggang workers prevented supplies of raw materials by blocking railway tracks.

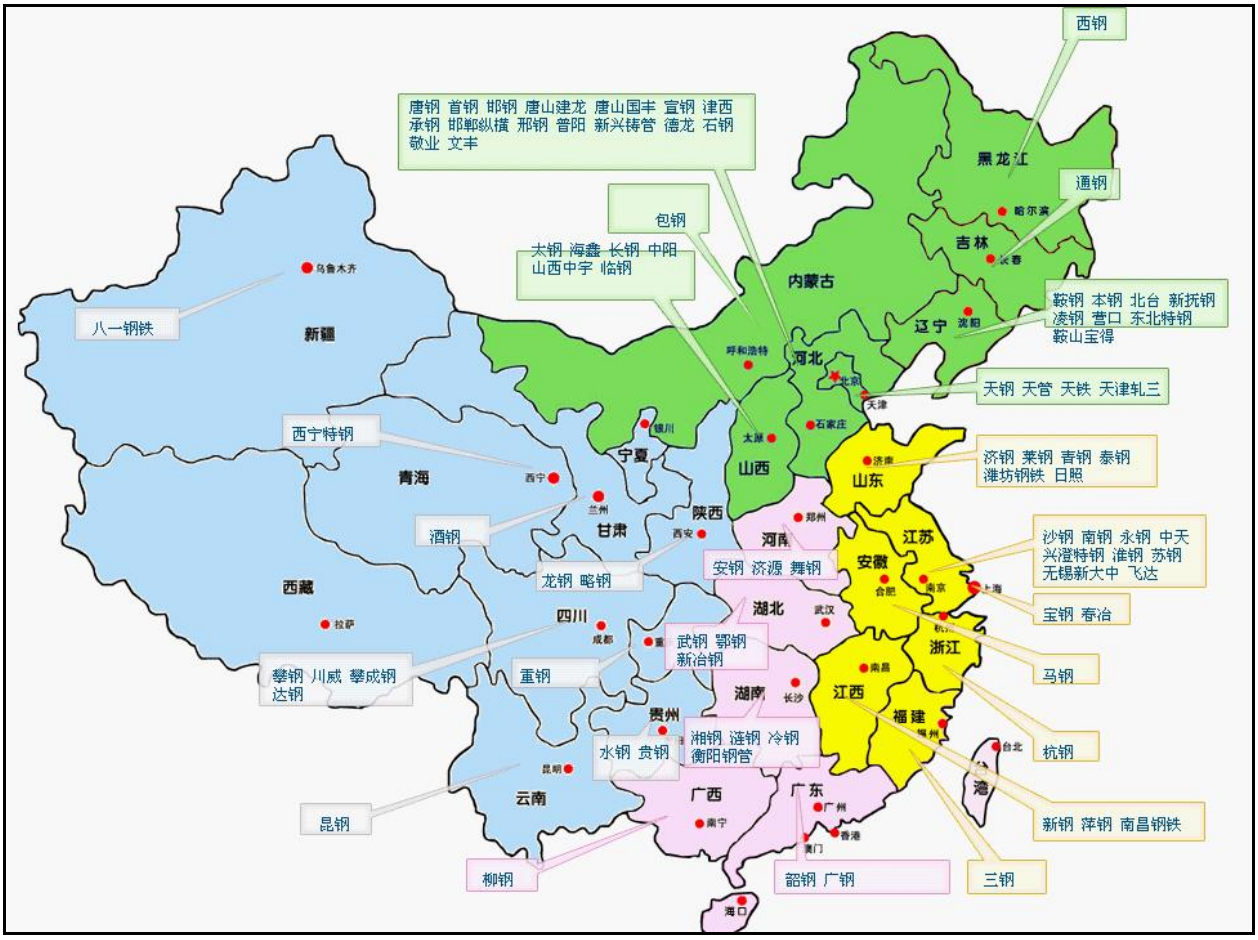
Tonggang is the largest state asset in Jilin province, with annual steel production capacity of 7 mmt. The planned acquisition by Jianlong is widely expected to increase the productivity of Tonggang and strengthen its overall competitiveness. The deadly Tonggang incident and consequent acquisition deal cancellation has proved to be a serious setback for the restructuring of the steel industry and the reduction of overcapacity made by the central government.

The death of Chen might be an isolated case. However, the Tonggang incident highlights the importance of establishing mechanisms for social dialogue and negotiation in China. This serious incident reflects the lack of communication between government, management and workers. Restricted access to information leads to the spread of rumours and false news among workers. In contemporary China, the lack of effective legal channels and other social forums for workers to voice their grievances and complaints has led them to adopt brutal and extreme means. During the pre-reform period, state workers enjoyed enormous welfare benefits in areas such as life-long employment, education and health care. In their eyes, the state-owned enterprises are "iron rice bowls" and insurance of their lifelong employment and salary. The reforms of state-owned enterprises (SOEs) and acquisition strategies within the steel industry have taken away many forms of welfare, which were taken for granted by the workers for many years. It is a painful process for the state workers. In the northeast provinces of China where there are high concentrations of state-owned industries and enterprises, state workers have expressed strong resentments for privatization of state-owned firms and any acquisition plan of SOEs by private enterprises. SOE reforms and state-oriented consolidation strategy have paid too much attention to the commercial interest of local regions and development of their steel mills without addressing the interest of state workers.

References:

1. "Size of deadly steel factory protest exaggerated: official", *China Daily*, 29 Jul 2009, online edition: http://www.chinadaily.com.cn/cndy/2009-07/29/content_8484267.htm
2. "Murder Bares Worker Anger Over China Industrial Reform", *The Wall Street Journal*, http://online.wsj.com/article/SB124899768509595465.html#printMode
3. "Manger killed in plant riot", *China Daily*, 27 Jul 2009, online edition: http://www.chinadaily.com.cn/life/2009-07/27/content_8475878.htm
4. "Chinese steelworkers fight privatization effort", *The Wall Street Journal*, http://online.wsj.com/article/SB124863589915981859.html#printMode
5. "Jianlong Told to Drop Tonghua Buyout After Clashes (Update2)", *Bloomberg News*, http://www.bloomberg.com/apps/news?pid=20601087&sid=a0G6pTJV10mM

MAP 1 REGIONAL DISTRIBUTION OF THE MAJOR IRON AND STEEL ENTERPRISES IN CHINA



Source: http://www.lzqhw.com/qhpz/UploadFiles_4138/200903/20090324170621380.jpg