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ABSTRACT

The iron ore trading system underwent a transformation in 2010. Until then, long-term contracts dominated the trade and the FOB price was determined through negotiations between supplier and buyer, with the agreed price applied the following year. This system was changed in 2010 to a quarterly index-linked pricing in which the CFR price was applied. Some studies have suggested that the intervention of the Chinese government was the reason for this change, but this study concludes that it was the bargaining between suppliers and purchasers that resulted in this transformation.

Keywords

Long-term contract, spot trading, iron ore price index, the Big Three, China Iron and Steel Association (CISA), dispersed industrial organization, state intervention

1. Overview of long-term iron ore trading contracts

The procurement of iron ore for the mills has been classified as spot trading, captive mine and long-term contracts (Tanaka 2012). The long-term contract was developed by suppliers in Australia and buyers in Japan and is different from the transactions of other commodities such as crude oil.

On the other hand, the long-term contract for iron ore trading has undergone several changes. In the 1960s, the term of validity for volume and price in the original contracts was extended a couple of years, although after 1973, the price was renegotiated annually, the year the Australian dollar was

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revalued. After 1980, so-called benchmark pricing came into being and major steel makers and iron ore producers began to settle the price through one-on-one negotiation, and the first agreed price was followed by other companies in Asian and European markets.

Table 1 Transition of the long-term contract for the iron ore trading

Time	1960's	1970's	1980's	After 2010
Term of volume	Long term	Long term	Long term	Long term
Term of price	Long term (FOB)	One year (FOB)	One year (FOB)	Quarter (or one month) (CFR)
Price decision	Negotiation	Negotiation	Benchmark	Index

In short, the long-term contract for iron ore trading transitioned from the long-term for both volume and price to the long-term in volume but with the price to be renegotiated once a year. This came about because of the increased uncertainty in the global economic environment, whereby the applied price period needed to be adjusted.

However, after 2003, the price of iron ore rose to a record high. The price negotiation for 2009 was extremely difficult due to the financial crisis. The Big Three, Vale, Rio Tinto, and BHP Billiton sent a notice to purchasers saying that they had decided to abandon the benchmark-based price, and instead that they were going to introduce an index-based price from April 2010. Under this new scheme, the volume still remained as it was in the long-term contract, but the price was to be decided by the index instead of a quarterly negotiation. For Chinese purchasers, the term was shortened to one month after 2011.

As a result, the applied price period has become shorter, and the historical benchmark pricing system that endured for decades has been replaced by an index pricing system. Over the long run, a market approach to iron ore trading became unavoidable.

2. Structural changes in iron ore imports and Chinese government responses

The sharp price increases and the transformation of the iron ore trading system were driven by an unprecedented expansion of Chinese imports.

Chinese steel makers were traditionally located next to iron mines to easily secure their ore, but due to poor quality and high costs, domestic mines could not meet the increasing demand. Looking for iron ore abroad, both import volume and import rates rose sharply, resulting in a high dependence on foreign sources, a dependence that reached 86.7% in 2016 and at the same time had a significant impact on the global market.

Though iron ore exists everywhere, the richest mines are concentrated in Australia and Brazil and these are dominated by the Big Three. For this reason, China imported iron ore mainly from Australia, Brazil and South Africa: 62.5%, 21%, 4.4% respectively in 2016. 34.9% of the iron ore output in the world was produced by the Big Three, and in terms of seaborne trade, the Big Three accounted for 69% of market share in 2007. The Japanese secured iron ore through investment in advance and long-term contracts with the Big Three.

China started to import iron ore as a latecomer but became the world's largest importer in a short time. The challenge for China was how to secure a huge amount of iron ore at a low cost to meet rising demand. The Development Policy for the Iron and Steel Industry (July 20, 2005) provided basic guidelines.

First, new investment in the steel sector was to be linked with the phasing out of older facilities in order to upgrade technology, make structural adjustments, and avoid a large expansion of steel production capacity. Second, a strong push for more collaboration with foreign mines through 100% ownership ventures, joint ventures, or acquisitions to establish overseas iron ore supply bases.

The problem was that although high economic growth created an explosive demand for steel as well as iron ore, the development of new mines and the expansion of existing mines required more money and time to meet production needs. This rapid growth in demand triggered a change in market dynamics. Price increases meant cost increases and profit losses for mills that could not be passed on to end users. How to control the price of iron ore proved to be a difficult task for the mills. Chinese officials and key persons in the Chinese steel industry thought that China, as the biggest importer of iron ore, should have a voice in pricing decisions and decided to have Baosteel take a leadership role in price negotiations as a representative of China. On the other hand, the Chinese government moved to reduce the

number of importers in order to ease competition. There had been 523 companies that imported iron ore into China. Among these, 405 companies had imported less than 300,000 tons each year. In 2005, the Chinese government introduced a system of granting import licenses to those companies that imported more than 300,000 tons the previous year. The criterion was increased to 700,000 tons in 2007, and 1,000,000 tons in 2010. The number of importers remained steady at 112 through 2010, of which 70 were manufacturers and 42 were trading companies.

Wilson (2012) reviewed the restructuring of the Asia-Pacific iron ore market and Chinese governmental resource security policies. He argued that Chinese investment and cartelization policies had resulted in significant changes to the ownership and pricing structures of the Asia-Pacific iron ore market. Hurst (2016) insisted that intervention by the Chinese state in the 2009 benchmark price negotiations resulted in the transition from benchmark pricing to a spot market mechanism.

3. Higher spot prices and the structure of the iron and steel industry in China

The Chinese government (Ministry of Commerce) introduced an import license system to reduce the number of importers, but compared with other major importing countries like Japan, there were still too many importers. This was a key characteristic of the structure of the iron and steel industry in China.

Most iron and steel manufacturers in China were originally state-owned enterprises, but new entrants of other ownership types had emerged since the introduction of the state's open-door policy. For example, the number of mills in China numbered 8012 in 2008. The China Iron and Steel Association (CISA), which is the related industrial association in China, was composed of 165 corporate members and 8 individual members in 2005, and covered most major state owned enterprises and regional industrial associations. Besides these, there were many medium and small sized enterprises that did not belong to the Association. Besides, the market share of the big mills was low. The steel industrial structure in China was and continues to be quite dispersed.

In contrast, the supply side was and remains an oligopolistic market dominated by the Big Three. Before China became a major importer, the number of mills in Japan, Korea and in Europe was limited and acted as a counter weight against the suppliers. However, the numerous Chinese mills had weak bargaining power and triggered the changes in iron ore trading, not only the procurement route, but also the procurement rules.

It was relatively easy for those companies that belong to the Association to procure resources by concluding long-term contracts with Australian and Brazilian mining companies, or through overseas investment. However, it was much harder for middle and small sized mills to gain access to important resources, so they had to go wherever they could to do so. India was one such destination.

NMDC (National Minerals Development Corporation) and MMTC (Minerals and Metals Trading Corporation of India) were in charge of India’s iron ore production and exports respectively. However, due to the continuous expansion of demand, many small suppliers entered the business and began exporting, utilizing spot prices without long-term contracts. This attracted many small Chinese importers to India even though the spot prices, pushed by speculation, were much higher than the benchmark price. Thus, although the Chinese government’s licensing of importers was aimed at easing speculation and stabilizing prices, this in the end, failed.

Table 2 Iron ore import volume to China by exporting countries
unit : 1000 tons

	2005	2007	2009	2011	2013	2015
Australia	112,178	145,651	261,983	296,815	416,984	606,672
Brazil	54,714	98,022	142,593	142,889	155,289	190,936
India	68,553	79,540	107,500	73,260	11,667	2,079
Others	39,815	120,444	116,099	173,783	235,691	151,188
Total	275,260	443,657	628,175	686,747	819,631	950,875

Resource: *Iron Ore Manual* 2016-2017

When the spot price was much higher than long-term contract prices, the Chinese mills that imported iron ore on long-term contracts sold their iron ore to those mills that did not have long-term contracts. On the other hand, overseas mining producers felt that they suffered from low prices and asked

for higher prices because they thought that the mills could bear the higher costs. They were also motivated to reduce long-term contract volumes in order to put more iron ore on the spot market. For this reason, price negotiations for the following year's price were becoming more and more difficult, especially for purchasers.

4. The price negotiation power game between producers and purchasers

Table 3 shows that the price of iron ore soared between 2004 and 2008 at a high rate. As a matter of fact, the price negotiations for each year became harder and prolonged.

Table 3 Iron ore price for Asian market

Year	Date	Price setter	Increase in price
2004	Jan.	Hamersley Iron (Rio Tinto), BHP Billiton, CVRD – Japan	18.62%
2005	Feb.	CVRD – Japan	71.50%
2006	May	CVRD – Japan	19.00%
2007	Dec.	CVRD - Baosteel	9.50%
2008	Feb.	Vale - Japan, South Korea	65.00%
	June	Rio Tinto - Baosteel	79.88%
2009	May	Rio Tinto - Japan, South Korea	-32.95%

Source: Tanaka (2012).

2005: Iron ore prices for 2005 were settled on February 21, 2005 with an all time high 71.50% increase over the previous year. However, Arcelor and Baosteel announced that they would not adhere to this price. In addition, BHP Billiton required a 7.5-10 US dollar premium as a freight differential to the price. In the end, Baosteel agreed to a 71.50% increase with BHP Billiton, who in return withdrew the freight differential requirement. It was the first time that the benchmark price had been challenged.

2006: On May 15, 2006, about a half year after the start of negotiations

on the iron ore price for 2006, CVRD and TKS (ThyssenKrupp) first agreed on prices at a 19% increase. The Chinese side insisted that no price increment be recognized, resulting in the protraction of talks.

2007: New prices for 2007 were agreed upon between CVRD and Baosteel on December 21, 2006, with an increase of 9.5% over the level of the previous year. Although the price was settled at under 10%, a heavy tax (300 rupees per ton) levied by the Indian government to limit iron ore exports caused the spot price to soar. Rio Tinto then announced that it was putting 17 million tons on the spot market. As a result, the execution rate for long-term contracts for the China market dropped to 86%.

2008: On February 15, 2008, Vale agreed with Japanese and South Korean mills on a 65% price increase for 2008. But Rio Tinto rejected this and demanded the CFR price, which included freight costs. The negotiations continued into June, when Baosteel accepted the freight differential request and settled the price increase with Rio Tinto at 79.88%. The result was that North American and South American suppliers followed the price increase rates fixed by Vale, while Asian, Pacific, African and European suppliers followed the Rio Tinto fixed incremental rates.

In any case, under the benchmark pricing system, the rule was that once the price was agreed upon, all other companies would follow suit. Once this rule was broken, the system came to the end.

5. The price negotiation for 2009: Is CISA a cartel?

As price negotiations were becoming increasingly difficult, the search for an alternative solution was beginning. Applying the so-called globalCOAL system to iron ore trading was one of these possible alternatives. GlobalCOAL is an online coal-trading platform owned by Rio Tinto, BHP Billiton, Glencore and AngloAmerican, in which a coal index price is formed, providing a price reference for traders who deal with actual coal.

Utilizing one of the iron ore index prices, issued by three specialized companies was another possibility. The TSI index released in 2006, followed by the MBIO index and the Platts IODEX index in 2008.

As the spot price was much higher than the price of long-term contracts in the first half of 2008, producers continued to rely on spot trading. Rio

Tinto announced that the volume of spot trading would reach 15 million tons in 2008, three times more than the 5 million tons traded in 2007. For BHP Billiton, the 2008 amount was 19 million tons, compared to 11 million tons in 2007. In September 2009, Vale called for price adjustments (11-11.5% above the benchmark for 2008) from Asian importers to make the price the same as that for European manufacturers. Furthermore, BHP Billiton insisted that benchmark negotiations be replaced by index pricing for 2009, which meant that the pricing would be CFR instead of FOB, as the price index would be based on the spot price when the ore landed at the port of Qingdao.

The price talks for 2009 commenced in the midst of the unprecedented economic crisis which was unfolding worldwide. The demand for iron ore decreased sharply; freight rates also plunged. Procurements in the spot market by Chinese importers increased because prices were now lower. Vale had to sell iron ore to China in the spot market due to reduced demand from European mills. Vale also withdrew the price increase requirement issued to Asian importers in September 2008.

Australian producers cut production in response to the crisis. BHP Billiton also offered long-term volume contracts with medium and small sized companies that did not have the opportunity to proceed with although purchase prices would be determined by the index-price. Many Chinese importers were interested in this proposal because the spot price was lower than the long-term price at that time.

However, CISA had a different view of the situation. It decided to take part in price talks because it believed the financial crisis was a good opportunity to get the price back up. CISA intended to strengthen its bargaining power through the harmonization of its members' positions. CISA's position was clear. It believed that long-term contracts should be maintained, but with a 40% price reduction from the previous year, which would return the price to the 2007 level. It also called for a price premium based on import volume. In other words, CISA was moving to build a Chinese model for iron ore imports.

Why did CISA stick to the long-term contract? No doubt, maintaining management stability by avoiding price fluctuations was one basic reason. Furthermore, the mills worried that their influence on the pricing decision could be diminished and that they would lose any opportunity to negotiate with producers under the index-pricing system. In addition, CISA considered

that index pricing could not be accepted because the samples for the Platts index were too small, plus the index price also included desired selling and buying prices, which were not scientific or accurate. It also was concerned that suppliers might manipulate freight prices.

CISA warned the Chinese mills that had accepted the index-pricing proposal after the price plunge in 2008 to not conclude index-pricing contracts with producers after April 1, 2009. They warned that if they did so their import licenses would be revoked.

On the other hand, CISA was flexible on the applied price resettlement period of one year or a half-year, as well as the possibility of a price renegotiation if the spot price moved too much up or down. However, the price negotiation for 2009 turned out to be much more difficult than that of preceding years.

All steel companies in East Asia expected new prices to be settled at the levels of fiscal year 2007 and called for a price reduction of approximately 40% for Australian ore. The negotiations between Nippon Steel and Rio Tinto that had gone through a prolonged deadlock due to the financial crisis were finally settled on May 26, with a 32.95% price reduction. BHP Billiton followed but with some added exemptions whereby the quarterly price, the spot price, and the index price were to be applied to the expired long-term contracts.

Chinese steel mills did not follow the foregoing agreed-to prices. Instead, CISA made an agreement with FMG, the third largest mining company in Australia, whereby the price for all FMG iron ore sold to Chinese mills would be reduced 35.02% for the period July 1 to December 31, 2009. For the first time, China did not reach a pricing settlement with the Big Three.

The reason the Chinese mills did not realize a 40% price reduction was that the Big Three believed that demand in China would remain strong thanks to the 4 trillion RMB economic relief package that had been announced by the Chinese government. Trying to strengthen its bargaining position in the price negotiations with the suppliers, CISA asked its members to reduce their iron ore imports by 20%. This, however, did not work because CISA had no binding enforcement power.

Another reason for China to take an unyielding stand was its failed investment in Rio Tinto. Chinalco provided financing of 19.5 billion US dollars on February 12, 2009 in order to increase its stock share from 9.3% to

18%, which would have given it a stronger voice vis-à-vis the iron ore producers. Rio Tinto, however, canceled the agreement and instead concluded a joint venture with BHP Billiton.

6. Application of index pricing for iron ore trading

When the 2009 price talks broke off, focus turned to the negotiations for the upcoming year. The 9th International Forum of Iron and Steel Raw Materials opened on October 15, 2009. This was to have been the starting point for negotiations for the following year. However, the Big Three were absent. Instead, they made a unilateral announcement on October 16 that they were going to change the pricing method from negotiation to index and that the applied price period would be revised from one year to one quarter. As a result, it can be said that the era of index pricing began on April 1, 2010.

Though the three indexes use different samples are different as well as different accounting methods, the landed price (CFR) in Chinese ports is collected from mines, mills and trading companies. The index price released daily by the three indexes providers serves as a reference for traders and the same three indices dominate the market for the pricing of physical iron ore as well as the trading of iron ore related financial products.

Chinese mills, the biggest consumers of iron ore, had no choice other than to accept the index price made by the foreign providers, based on the landed price in Chinese ports. CISA was unhappy about this, and decided to release its own price index (CIOPI) as a countermeasure. The price was announced in RMB with the price of domestic production included. However, this price has been criticized for being neither neutral nor fair because it is not determined by a third party. Therefore, it is not trusted or widely used. CISA has recently proposed a mixed index that combines CIOPI with the foreign price index.

The shift from fixed to spot pricing was accompanied by greater market volatility and wide divergences. Financial markets picked up on this trend and such instruments as swaps, options, and futures for iron ore were created by financial institutions. Credit Suisse and Deutsche Bank launched over-the-counter markets in spot iron ore in 2008, while the Singapore Exchange, SGX offered swaps in 2009 and futures in March 2013. SGX was first to reference an iron ore index (The Steel Index TSI) for settlement.

In October 2013, the Dalian Commodity Exchange started trading in iron ore futures and introduced spot goods for delivery, a traditional way to make the futures price closer to the spot price. SGX is mainly used by mining companies, mills and trading companies as a hedge. In contrast, a large number of individual investors in the Dalian Commodity Exchange trade for speculation, with huge volumes and price volatility observed.

When the futures price starts to influence the spot price, steel makers engage in risk management of their raw materials through derivatives, while at the same time adjusting their marketing strategy toward their purchasers, adopting such measures as shortening the steel contract period or using derivatives for steel products.

While the price index emerged as the pricing standard in the trading of physical iron ore, the impact of futures prices also increased on the spot price.

Except for the index price and the futures price, suppliers and buyers joined forces to seek a fair and transparent price. The electronic platform serves as a good example.

GlobalORE in Singapore and China Iron Ore Spot Trading Platform (it changed its name to Beijing Iron Ore Exchange Ltd Co. in August 2014) in Beijing opened at almost same time in May 2012. Both are joint capital operations between suppliers and mills and trading companies. The Big Three provide iron ore directly and take part in the transactions. They expect the two platforms to play a role as a market window.

Bidding is another way to get a spot price. It is common for producers to call for a bid, although in some cases, mills and trading companies will offer a bid. Bidding volume offered by the Big Three reached 50MT in 2016.

There are various pricing methods for iron ore at this stage, such as the index price, the futures price, the platform price, the bid price and so on. As a matter of fact, these prices influence one another. The platform price and bid price may be reported to the index. Conversely, the index provides a reference for platform and bid traders. SGX chooses the index as its reference for settlement. The Beijing Iron Ore Exchange Ltd Co. has decided to use the Dalian futures price as a settlement price in order to enhance the Chinese presence.

Conclusions

Spot trading, captive mine, and long-term contracts are classified as three different ways for iron ore procurement. The long-term contract system was developed by Australian suppliers and Japanese purchasers and played a key role until 2010. Volume and prices were fixed for a certain time period and prices were revised through negotiations between suppliers and purchasers. It was an ideal system for both sides in a balanced market where there was no price leader.

But the unprecedented demand that emerged from China totally changed the market. Exporters, Australian exporters in particular, are highly dependent on the Chinese market, while Chinese mills also have a high dependence on overseas imports. The Chinese steel industry itself can be characterized as having an overly dispersed structure, which played a significant role in the transformation of the long-term contract system, a system that had been in existence for decades.

On the supply side, the Big Three responded to the demand from China by expanding their supply capability in order to maintain their market share. But looking at the demand side, there have been too many mills in China. Large mills could procure iron ore through long-term contracts with the Big Three, but small mills were unable to do so, instead turning to India to purchase iron ore on a spot rather than a benchmark basis. As a result, spot prices soared to exceed long-term prices. The Big Three could not ignore this. On the other hand, when freight costs fluctuated, Australian suppliers began to require freight premiums as compensation. Hence, the benchmark pricing system fell into crisis.

The soaring of iron ore prices resulted from the unprecedented expansion of demand in China. To secure this essential commodity, the Chinese government encouraged overseas investment, while at the same time introducing measures such as issuing import licenses and assuming a role in price negotiations in order to stabilize prices.

Wilson (2012) focused on Chinese steel industry policy (2005) and saw the import licensing system as a cartel. Hurst (2016) also identified CISA, the negotiator for the 2009 price talks, as a cartel. Both argued that those interventions by the Chinese state brought about the breakdown of the benchmark system.

This study, however, concluded that the import license introduced by the

Ministry of Commerce in 2005 and CISA's role in the price talk for 2009 can hardly be seen as a cartel. The introduction of import licensing was a government initiative but its purpose was to reduce the number of importers in order to tamp down import speculation. Even so, the 118 licensed iron ore importers that remained can hardly be called a cartel. The iron ore import market continued to be highly competitive with no common position to be seen. Moreover, CISA is not a government organization; it does not even represent the entire industry. CISA demanded that its members cut their import volume in order to strengthen its bargaining power, but the threat did not work because CISA did not have the power to enforce this. More important, CISA expected to keep the long-term contract going, whereas in contrast, it was BHP Billiton and Rio Tinto that supported the introduction of the price index to replace the long-term contract.

The yearly price settlement negotiations between producers and purchasers became more difficult because they were conducted on a commercial basis. In the negotiations, producers had the advantage and exerted leadership while the purchasers on the Chinese side lacked a strategy. Finally, although CISA, an industrial organization, came to the front as a negotiator, it did not have the authority to represent the entire industry, so it was not able to work as a cartel and was actually betrayed by the 4 trillion RMB Chinese government stimulus program, causing it to lose the game against the suppliers. As a result, the benchmark system for iron ore trading was replaced by index pricing, and moved ever more towards a free market approach.

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