

The World Iron Market in 2005

DTF Research Note



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Department of Treasury and Finance
Government of Western Australia

INTRODUCTION

Recent Events

On 23 February 2005, Rio Tinto announced that its 100% owned subsidiary, Hamersley Iron, had secured a 71.5% increase in Free On Boardⁱ (FOB) price for all iron ore types in its negotiations with Japan's Nippon Steel for the Japanese financial year beginning 1 April 2005. Its reference price of fine ore, which represents 60% of the traded iron ore marketⁱ, increased from US 35.99 cents per dry metric tonne unit (dmtu) to a record nominal price of US 61.72 cents per dmtu. The Brazilian company, Companhia Vale do Rio Doce (CVRD), had also just negotiated a similar increase in its negotiations with its European, Chinese and Japanese customersⁱⁱ.

Subsequently, on 13 April 2005, BHP Billiton announced a similar price increase with a number of its customersⁱⁱⁱ, after unsuccessfully arguing for a larger FOB price increase than that achieved by CVRD. In this regard, recent increases in international shipping rates have made Australian iron ore, which does not have to be transported as far to reach Asian markets as does Brazilian ore, much cheaper once freight is taken into account. BHP Billiton had argued that Australia's advantage in freight costs should be reflected in a higher FOB price than achieved by the Brazilians.

Increased demand for steel from China's rapid industrialisation is the common reason cited for the iron ore price rise. Indeed, the world indicator price of hot rolled coil steel has risen from US\$247 per tonne in December 2001 to US\$648 per tonne in December 2004^{iv}.

If this increase in iron ore prices is sustained, then the potential benefits to Western Australia are twofold:

- it gives incentive for iron ore producers to invest in the State and expand their output. As an example, Rio Tinto is currently midway through a US\$1.3 billion expansion program to lift capacity of its rail and port operations at its Yandicoogina mine, and has committed to a further US\$290 million for expansion of the Tom Price and Marandoo mines and the construction of new mine capacity at Nammuldi. Additionally, BHP Billiton has announced a US\$575 million expansion of its Pilbara operations over the period to 2005-06; and
- it, along with the increased production, provides a boost to the State's revenue from mining royalties. In 2003-04, Western Australia received \$293.6 million in royalties from iron ore operations in its jurisdiction.

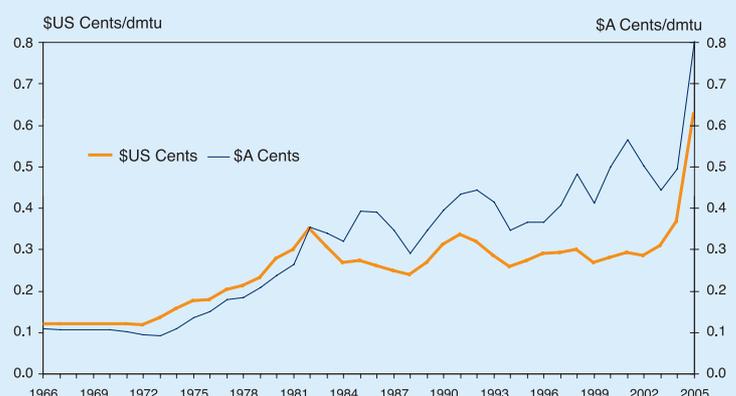
On the negative side, the increase in iron ore prices is associated with a rise in steel prices, which increases the cost of products that utilise steel as an input. This could have consequences not only for the general level of inflation, but on the costs of the State's capital-intensive mining industry.

This paper examines the general state of the world iron ore and steel market in 2005, and likely developments over the period to 2010. While it does not contain a price forecast, it aims to provide an assessment of the likely general trend in prices over the medium term.

The paper is based on information available in early May 2005. The iron ore market, like any other market, is influenced by many factors and any deviation from expected trends could alter the outcomes relative to those suggested in this note.

ⁱ Before transport costs and insurance.

Figure 1: Negotiated Iron Ore Contract Price, Nominal



Source: ABARE Commodity Statistics Bulletin 2004, WADTF Database, Rio Tinto Press Release.



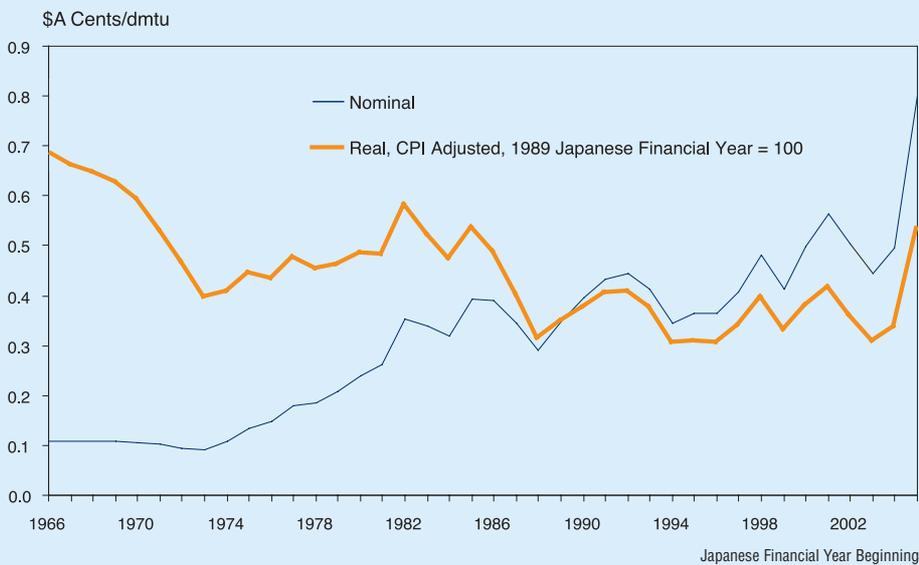
ANALYSIS

The Real Price of Iron Ore

Figure 2 compares the \$A contract price of iron ore achieved by Australian producers in nominal and real terms² since Western Australia's first shipments of iron ore in 1966. While the recently negotiated nominal contract price is the highest on record, the real price is no higher than real prices achieved in the early 1980s, and is much lower than the real prices offered by the Japanese in the 1960s to encourage the establishment of the Western Australian iron ore industry.

Clearly, market conditions from the early 1980s to the early 21st century were less favourable than earlier periods. Does the recent price increase signal a return to a suppliers market? To answer this question, a historical examination of the world iron ore market is required.

Figure 2: Real and Nominal \$A Iron Ore Contract Prices



Source: ABARE Commodity Statistics 2002, DTF Database, ABS Cat. No. 6401. Japanese Financial Year is April to March.

The World Iron Ore Market Since World War Two

The global steel market, and therefore iron ore market, from World War Two to 2000 can be divided into two very distinct periods. The first, from the end of the war until the early 1970s, involved post-war reconstruction in Europe and the West German 'economic miracle', together with the development of several East Asian nations to industrialised status, notably Japan, South Korea, Hong Kong and Taiwan. As will be argued below, however, it also included a period of overproduction. Figure 3 shows that world crude steel production increased by 3.9% per annum over this period.

Figure 3: World Crude Steel Production, 1960-2004



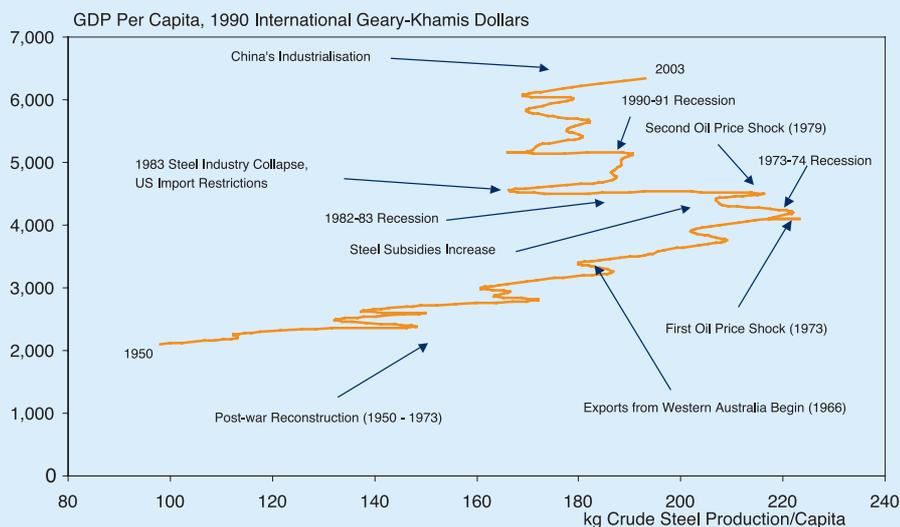
Source: ABARE Commodity Statistics Bulletin 2004.
* Financial Year Ending 30 June.

² Compared with the general level of prices in the economy.

After the first oil price shock in 1973, world steel production levelled out and grew by only 0.7% per annum over the period until 2000. This period encompassed: recessions in 1973, 1982 and 1991; the end of post-war reconstruction; and the end of the steel-intensive phase of East Asian development.

More recently, steel production has grown at 3.7% per annum from 2000-2004. It has been argued that this increase represents a new period of expansion for the world steel industry, driven largely by the rapid industrialisation of China^v.

Figure 4: World Crude Steel Production Per Capita vs World Real Gross Domestic Product Per Capita, 1950-2003



Source: International Iron and Steel Institute (IISI) World Statistical Yearbook 2004, Madison, A, H7: The World Economy from 1950-2001, <http://www.eco.rug.nl/~Maddison/>, International Monetary Fund.

Figure 4 shows an interesting perspective on the phases of the iron ore market after World War Two. Prior to 1973, economic growth was accompanied by even greater growth in world steel production, leading to increasing global steel consumption per capita. After the post-war boom ended in 1973, however, world steel production per capita actually declined until 1983 before stabilising, despite continued economic growth through to the end of the century. Indeed, world steel production per capita in 2003 was only around the level it was when Western Australia began exporting iron ore in 1966.

While 1973 marked the peak in steel production per capita, over capacity in steel production facilities had developed prior to this year. For the large part, “the surplus was attributable to decisions by government planners, or industrialists working in collaboration with government officials, to undertake ‘heroic’ expansion efforts. These decisions were taken in many countries, reflecting motives ranging from regional development to economic nationalism, but most shared a common characteristic: from a purely economic standpoint, they were irrational”^{vi}.

From 1973 to 1983, substantial government intervention around the world kept many uneconomic steel mills in business and aggregate steel production growing. The growth in steel production flowed on to iron ore demand, which kept real iron ore prices at reasonably high levels.

In 1983, however, many firms in the US steel industry collapsed and President Reagan announced severe ‘voluntary’ import restrictions, which spread the crisis to the rest of the world. At this point, aggregate world steel production declined and real iron ore prices dropped to levels that were maintained until 2004.

The historical view of the world steel market gives two main insights into future iron ore price paths. Firstly, if the expansion of China genuinely represents an end to the thirty-year overcapacity in the world steel industry and a return to per capita steel production growth, then today’s price is actually below the real price at the time when this situation last existed in the 1960s.

Secondly, steel remains a highly political industry, as evidenced by President Bush’s decision to impose tariffs on steel imports in response to the US industry’s difficulties in March 2002. This means that it is possible that iron ore demand may continue to be strong for a time after a rational view would say that it should be declining. Eventually, however, this over capacity of steel must be worked out of the system.



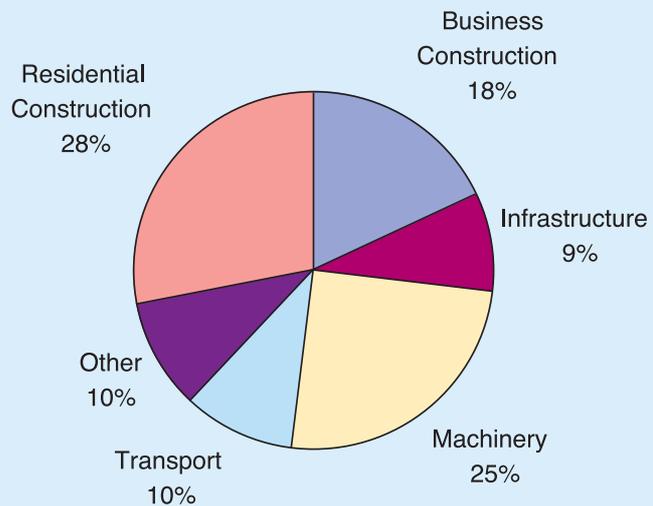
The Impact of China on World Steel Demand

China's path to a market economy that began in 1978 has gathered substantial momentum during recent years and, just as importantly, seems to have reached a particularly steel-intensive phase in its development. Between 1995 to 2003, China's³ economy grew at an annual rate of 8.3% per annum, while steel consumption grew at 12.5% per annum. This compares with growth in steel consumption in the rest of the world of 1.4% per annum^{vii} over this period. China is now the largest consumer of steel in the world^{viii}.

Figure 5 shows that Chinese steel consumption is spread across a number of sectors, with residential construction and business investment comprising the largest shares. Infrastructure, which has been cited as an area that consumes a large amount of steel, represents only 9% of total consumption.

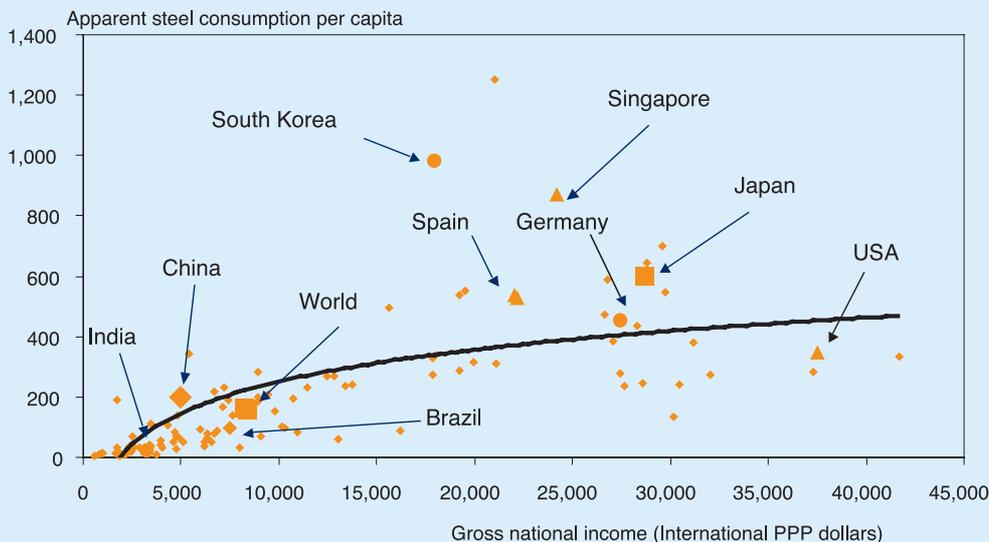
The exciting thing about China for iron ore producers, apart from its sheer scale (with a population of 1.3 billion people in June 2004), is that there is still potential for considerable per capita growth in the market. Figure 6 shows that per capita apparent consumption⁴ of crude steel in China was 197 kg per annum in 2003. Depending on its eventual industrial structure, China could one day have a per capita consumption similar to Japan (603 kg per capita), or even South Korea (985 kg per capita) or Taiwan (1,053 kg per capita).

Figure 5: Chinese Steel Consumption, 2003



Source: Bauert (2004), I. Rio Tinto, China: Doing the Hard Yards, Presentation to the Ceda Conference – The China Story, Perth, 27 August. http://www.riotinto.com/media/downloads/speeches/IBauert_CEDA%20prstn%2027Aug04.pdf.

Figure 6: Annual Apparent Crude Steel Consumption Per Capita vs Real Gross National Income Per Capita, 2003



Source: IISI World Statistical Yearbook 2004, Madison, A, H7: The World Economy from 1950-2001, <http://www.eco.rug.nl/~Maddison/>, IMF. Japanese Financial Year is April to March.

³ Excluding Hong Kong.

⁴ Apparent steel consumption is derived from publicly available production and trade data. Apparent consumption = production - exports + imports.

While the potential upside of iron ore demand from China is enormous, the state of the world iron ore market is very dependent upon this one customer and its march to industrialisation, although the expected development of India will also require substantial amounts of steel. If, for any reason, the Chinese economy stumbles, then the impact on the world steel and iron ore markets could be profound.

While it is generally accepted that, in the long run, China will become an industrialised nation with commensurate steel consumption, there are short-run risks. In this regard, it has been noted that China's competitiveness with the US is likely to reduce due to either an appreciation of the Yuan against the \$US, or an increase in Chinese inflation from the increase in money supply required to maintain the existing currency peg^x.

Table 1: Future World Apparent Steel Consumption at 1995 - 2003 Growth Rates

Year	Production
Apparent Steel Consumption 1995 (Kt)	736,360
Apparent Steel Consumption 2003 (Kt)	969,837
Annual Average Growth, 1995-2003 (%)	3.5
Apparent Steel Consumption in 2010, Based on 1995 – 2003 Growth Rates (Kt)	1,234,117
Total Increase: 2003 – 2010, Based on 1995 - 2003 Growth Rates (%)	27.2

Source: IISI Steel Statistical Yearbook 2004 Table 33, Department of Treasury and Finance Calculations.

There are considerable risks in assuming that past growth rates in steel consumption will continue, but it is useful as a prediction scenario exercise. Table 1 shows that, if the world continues to consume steel at its current rate⁵, then world steel demand will rise by 27% over the period to 2010. This is still a very high rate of growth in historical terms.

Potential Increase in World Supply

A key to examining the future price path of iron ore is to examine the current supply response of the world's producers in response to buoyant market conditions. Table 2 shows that the vast majority of world production occurs in China itself, Brazil and Australia. Australia (BHP Billiton and Rio Tinto) and Brazil (CVRD) are the dominant world iron ore exporting companies.

Table 2: World Iron Ore Production 2003 (Mt)

Country	Production
China	261.1
Brazil	235.0
Australia	212.0
CIS	171.6
India	105.5
Other	241.4
Total	1,226.6

Source: ABARE Commodity Statistics Bulletin 2004, Table 87.

⁵ This implies that China's growth rate slows, but China continues to have the same impact on world consumption due to the fact that its share of production has grown. This also assumes that consumption in other parts of the world continues at its current pace.



A survey of media releases and presentations of the world major producers, and potential projects in the Pilbara, indicates that world supply could increase by 141 Mt per annum between 2004 and 2007, and around 268 Mt per annum over the period to 2010 if more speculative projects are included. Compared with 2003 world production of 1,226 Mt in 2003, the potential growth to 2010 represents an increase in annual production of around 21.9%.

Table 3: Identifiable Planned Iron Ore Expansion to 2010 (Mt)

Company	Expansion 2004	2005-07 Expansion	Possible Future Expansion
BHP Billiton (Pilbara only)	10	8	32
Rio Tinto (Pilbara only)	14	32	3
CVRD	na	76	na
Portman		1	2
Hope Downs	-	-	25
Fortescue Metals	-	-	45
Cape Preston	-	-	20
Total	24	102	142
Cumulative Total	24	141	268
Total Cumulative Identifiable Increase (%)	2.0%	10.3%	21.9%

Source: Company Announcements, Department of Industry and Resources, 2003-04 Western Australian Mineral and Petroleum Digest, Access Economics Investment Database. These expansions have been announced but may or may not proceed.

The supply response from other regions is uncertain, but at current prices it would be surprising if expansion were not attractive, although other regions might need steel for their own development. In this regard, India's government-run freight company recently raised freight prices for export iron, while leaving freight rates for domestically consumed ore unchanged, in an attempt to retain its iron ore production to support its own needs^x.

Other estimates indicate a higher production response. The OECD identified 60 - 65 Mt per annum of increased capacity from the three major producers in 2004, with definite plans for a further 122 Mt per annum from 2005 – 2007^{xi}. It also noted that the supply response from non-traditional producers could be significant. A supply increase of 450 Mt per annum over the period to 2009 has also been reported^{xii}, which would represent a 36% increase on world 2003 production.

Overall, the identifiable world supply response (20 - 36%) is roughly in line with the projected increase in demand⁶ (27%) over the period to 2010. If all potential projects proceed then there could be a small oversupply, while if demand falters to any degree then a substantial oversupply is possible.

⁶ Based on the continuation of world steel consumption growth of 3.5% per annum. It should be noted that this is a projection of recent growth rates, not a forecast.

SUMMARY

In any commodity market, if price exceeds its historical level for any length of time, suppliers have an incentive to increase capacity, which will eventually force price back to somewhere near its historical level (in real terms). However, it often takes considerable time for supply to respond which means that high prices can persist for several years. Additionally, the new mines coming into production may well be higher cost than existing mines, meaning that higher prices are required to keep them operating.

The current world iron ore price level has elicited a potentially very large supply response from the world's major producers that is likely to eventually satisfy, or slightly exceed, projected consumption in 2010. There would, therefore, seem to be little incentive for customers to agree to future price rises of substantial proportions unless future demand growth exceeds recent history.

From the information available, it seems likely that demand will run ahead of supply until around 2007 or 2008, meaning that high prices are likely to persist until this period. After this point, real prices are likely to moderate back towards pre – 2005 levels, or perhaps fractionally higher to reflect newer higher-cost mines.

There is potential for prices to move upwards if BHP Billiton is eventually successful in its arguments to gain a higher FOB price to account for the freight differential between Australia and Brazil to Asian markets. It seems unlikely, however, that this will occur in the future given that BHP Billiton was unsuccessful in such a tight market in 2005.

The major downside risks to this conclusion are: if China stumbles in its path to industrialisation, as the world market is very reliant on continued growth in the Chinese economy; if future economic growth in China is less steel intensive than the past decade; or if the supply response from producers is greater than anticipated.

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