



# The development of the Asian iron ore market: A lesson in long-run market contestability



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## ABSTRACT

This paper provides a historical analysis of how the growth of Japan's post-World War Two iron ore demand led to the development of the Asian iron ore market. The paper analyses bilateral advantages that geographic closeness provided to Japanese and Australian iron ore traders, and calculates how the bilateral quasi-profits arising from geographic closeness were divided between them.

The model estimates that Australia's freight advantage to Japan was worth on average around US \$124.8 million per year between 1985 and 2003—over that period iron ore trade between Australia and Japan was worth on average US\$909.9 million per year. The freight sharing agreement between Australia and Japan provided US\$32.3 million per year of the transport cost differential to Australian exporters, while Japanese importers received the remaining US\$92.5 million.

Despite the long-run nature of the Australia–Japan bilateral advantage, the development of the Asian iron ore market was influenced by strategic government interventions which aimed to capture short-run rents. The short-run interventions by the Australian government threatened Japan's market access security and catalysed the development of Brazil's iron ore export capacity, which remains as Australia's largest competitor in the Asian market.

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## 1. Introduction

The structure of the Asian iron ore market and the institutions governing its functioning were developed in response to the post-World War Two (WWII) growth of Japan's steel industry and its need to secure market access to low cost supply, which was not available domestically.

Following WWII, modernisation and expansion of domestic steel production was considered vital for Japan's industrial development. Part of Japan's economic strategy relied on reducing the cost of a range of downstream steel-intensive industries, such as shipbuilding, automobiles, construction, machinery and consumer electrical producers (Yonekura, 1994).

Japan's steel industry was developed over three rationalisation plans, from 1951 to 1970. During the rationalisation plans Japanese steel production increased from 7 mt/a in 1951 to 70 mt/a in 1970. The rationalisation period also saw the large-scale introduction of basic-oxygen furnace (BOF) technology and integrated steelmaking. The adoption of BOF technology<sup>1</sup> and integrated steel making

reduced the Japanese steel industry's dependence on scrap iron and shifted the industry toward greater iron ore consumption (Yamawaki, 1988; Kawasaki, 1985).

As Japan's demand for steel surged its domestic supply of iron ore dried up and its post-WWII steel demand growth flowed through to demand for iron ore imports. From 1950 to 1970, Japan's demand for iron ore imports rose from 1.4 mt/a to 102 mt/a (Kawasaki, 1985, p. 362).

The Asian iron ore market developed out of Japan's need to secure market access to low cost iron ore. To understand the factors impacting the development of the Asian market this paper first discusses the post-WWII development of the Australian iron ore market and Japan's role in that development; next, it introduces the concept of bilateral monopoly and calculates how bilateral quasi-rents deriving from geographic advantages were divided between Australian and Japanese traders; it then analyses the impact of short-run opportunistic interventions by successive Australian governments in pricing outcomes, and how these interventions impacted the structure of the Asian and global market over the long run.

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<sup>1</sup> The switch to BOF technology from open-hearth furnaces (OHF) by the large integrated steel mills during the late 1950s and early 1960s considerably reduced their (integrated mills) dependency on ferrous scrap as an input to produce steel. The earlier OHF technology deployed by the integrated producers required a 1:1 ratio of ferrous scrap and pig iron to produce carbon steel. In contrast, BOF

(footnote continued)

technology permitted the integrated mills to use a mere 1:9 ratio of ferrous scrap and pig iron to produce carbon steel (Nair and Kotha, 2001).

## 2. The development of Australia's iron ore industry

Drysdale (1970, p. 200) describes Australia's geographic proximity to Asia as "easily the most important [factor favouring] ... growth in Australian exports of minerals and metals to Japan." The importance of geographic closeness between Australian and Japanese iron ore traders in the development of the Asian market will be analysed in the following section.

Securing low cost iron ore market access was central for Japan's steel industry revitalisation. During the 1950s, Japanese iron ore importers had little access to capital or experience to warrant investing overseas in the development of new sources of supply; instead they used consortium purchasing to secure iron ore on short-term contracts. The transaction costs associated with market search costs and negotiating short-term supply contracts were high for Japanese iron ore importers as they relied on 86 suppliers in 14 countries (Boyce, 2001, p. 168).

During the 1950s, Japan was paying on average around 50 per cent more for iron ore imports than European competitors due mainly to transport costs (Rodrik, 1982, p. 549). In 1956, a Japanese Ministry of International Trade and Industry (MITI) mission concluded that reducing the freight costs associated with importing iron ore would be essential to reduce the cost of imports (Yonekura, 1994, p. 217).

Australia was the most suitable potential source of low cost iron ore supply for Japan due to the country's geographic closeness and putative availability of high quality, low cost supplies. But Australian iron ore exports had been embargoed in 1938 on the basis reserves could not sustain its domestic demand<sup>2</sup>.

In 1959, the Western Australian state government authorised a new iron ore survey to reassess the scale of iron ore endowments and evaluate the validity of the iron ore export embargo. The results of the new iron ore survey led to the upward revision of estimates of recoverable iron ore from 263 mt to 275 mt of high-grade ore (60 plus per cent ferric content), 223 mt low grade ore (30–45 per cent) and "probably many hundreds of millions of tons" of iron ore below 30 per cent iron content (Siddique, 2011, p. 7).

The increased estimates of iron ore reserves and a series of inter-governmental meetings between Japan and Australia were successful and the embargo was lifted in 1960<sup>3</sup> (Byrnes, 1994). The removal of Australia's iron ore embargo meant domestic and multinational mining firms were able to invest in the extraction of iron ore for export.

When the embargo was lifted in 1960, Australia was producing 4.4 mt/a for domestic consumption. The domestic consumption of iron ore meant that much of the existing production came from 'captive' mines (around 42 per cent in 1960) or was traded under LTCs (around 19 per cent in 1960); only 1.7 mt/a (around 39 per cent) was available to be exported on the 'free market'. The free market supply was traded mainly under short-term contracts (renegotiated annually) with European buyers. But the long distance between Australian iron ore exporters and European buyers resulted in high transport costs and made Australian exporters the

marginal suppliers to the market (Smith, 1978, p. 246).

Japan's emergence as a growing source of demand for iron ore<sup>4</sup> provided Australian exporters a far more cost-effective trading partner due to their geographic advantage in the Asian iron ore seaborne market. The bilateral freight advantage between Japanese iron ore importers and Australian exporters created a constrained bilateral monopoly<sup>5</sup>—the geographic closeness of the two countries promised the low cost iron ore Japan sought and the proximate market required by Australian exporters to secure market access. But the rigidities created by existing contracts and ownership arrangements following the embargo being lifted meant there was little supply available to Japan's steel industry over the short run.

The ability to export to the international market following the lifting of the export embargo caused an iron ore exploration boom in Australia and several large endowments were identified between 1961 and 1964 (Wilson, 2011, pp. 134–135). By 1964 the concessions to develop the newly discovered iron ore endowments had been allocated, which allowed long-term contracts (LTC) negotiations to commence.

LTCs defined the price and quantities of iron ore to be traded between partners, generally over a period of 10 to 16 years. Incomplete foresight was acknowledged in the contracts and led to the inclusion of contract loopholes such as options to vary the defined annual tonnage, usually within the margin of  $\pm 10$  per cent. Price was fixed for a number of years but was variable over the short run within a range, usually around  $\pm 7.5$  per cent. Smith (1978, p. 247) notes:

"At the time when the initial contracts were drawn up, in the early 1960s, the possibilities of price variation built in to contracts would have appeared to offer the possibility of a more or less fixed real price over the life of the contract, so long as the price was increased by the maximum amount on each negotiation. At the same time, the limited possibilities for price reductions gave protection to Australian producers against any drastic reduction in the 'world' price."

Table 1 shows that of the 19 companies involved in the seven consortia financing Australian iron ore projects between 1961 and 1965 only two were Japanese, 10 were American, six were Australian and one was based in the United Kingdom (Lee, 2013, p. 74). The Japanese reliance on LTCs to secure Australian iron ore market access was mainly due to capital export controls imposed by the Japanese government until 1971.

LTCs with Japanese importers were vital to Australian iron ore concession holders to secure financing from foreign mining firms and banks. Manners (1977, p. 167) explained the importance of LTCs at the time:

"This huge scale of capital investment meant that mining companies became increasingly reluctant to invest in new extraction and preparation facilities without some assurance of a continuing market for their output. In fact, under the market conditions of the early sixties, it was only by working their facilities fairly close to their capacity that any hope could be entertained by mining interests of meeting the considerable interest charges on capital, amortising their plant, and getting a reasonable return on their investment. The result was a growing commitment of iron ore production to particular markets, either through the negotiation of long-term contracts or as a result of investments by the iron and steel industry in mining operations."

Table 2 shows that by 1974 Japan's LTCs import commitments

<sup>2</sup> In 1938, the Commonwealth Geological advisor, W.G. Woolnough, supported the Lyons government's decision to prohibit the export of Australian iron ore on the basis that unless known accessible reserves were conserved then Australia would become an iron ore importer within less than a generation. In reality, the embargo was a reaction to increasing paranoia over Japan's capacity to wage war (Tsokhas, 1995, p. 889).

<sup>3</sup> Lobbying by the West Australian and Japanese governments ultimately led to a partial relaxation of the ban in late 1960. Under the new regulation mines were limited to exporting to 1 mt/a or 50 per cent of output (whichever was lower), and BHP was prohibited from exporting the production from any of its existing mines in order to ensure exports would not redirect existing production from domestic steel production (Boyce, 2001).

<sup>4</sup> Japanese demand for iron ore imports had grown from 1.4 mt/a in 1950 to 14.9 mt/a by 1960 (Kawasaki, 1985, p. 362).

<sup>5</sup> 'Constrained' as opposed to a 'pure' bilateral monopoly in the sense there were other potential trading partners, Europe for Australian exporters and smaller spot transactions from a range of countries for Japanese buyers.

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