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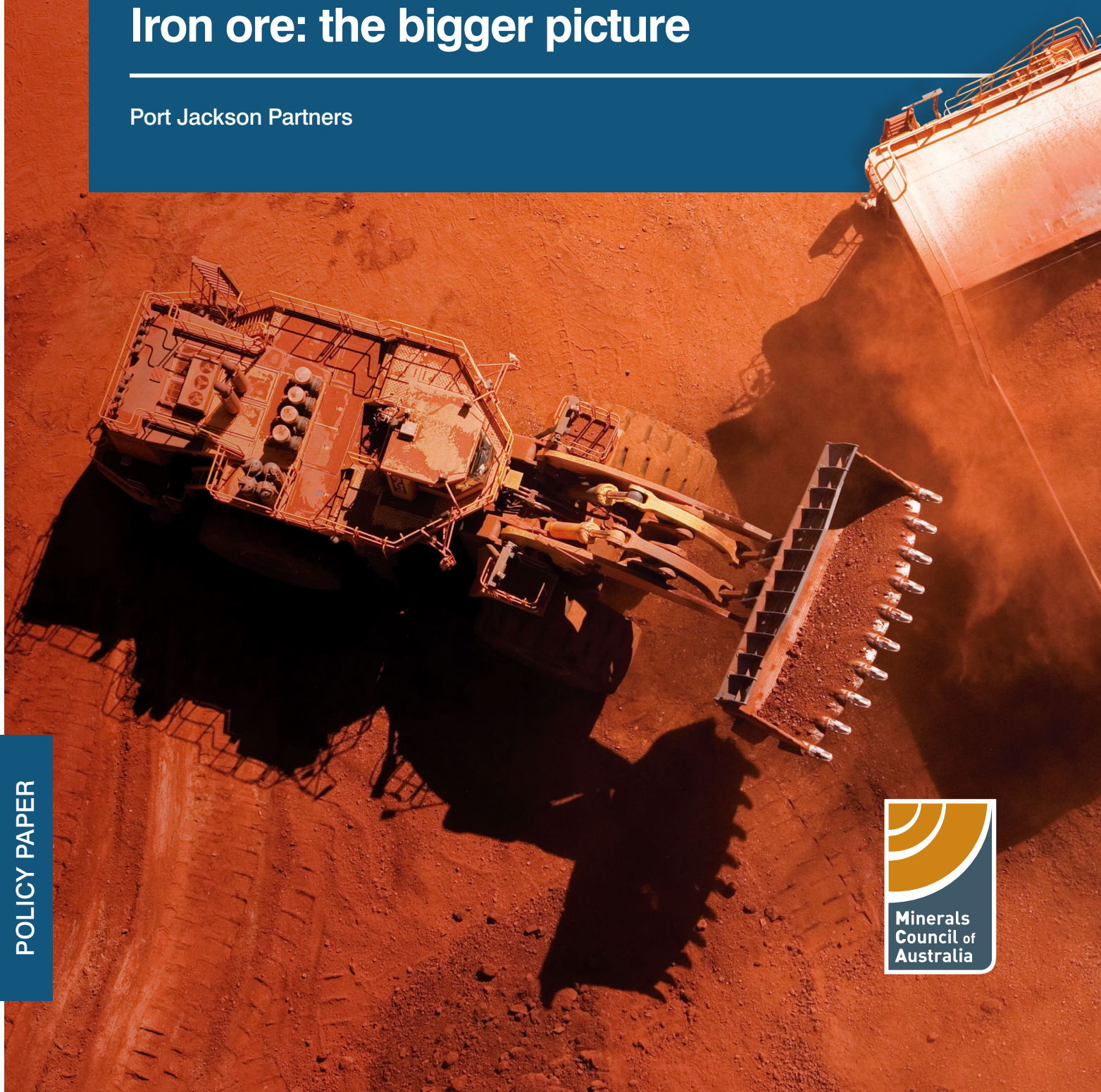
A policy paper commissioned
by the Minerals Council of Australia

Iron ore: the bigger picture

Port Jackson Partners



POLICY PAPER

Minerals Council of Australia

Iron ore: the bigger picture

Port Jackson Partners is a leading Australian strategy consulting firm trusted by CEOs, Boards and senior managers to advise on their most critical business challenges and help them set corporate direction, define business strategies, resolve important commercial issues and shape organisations in order to transform performance and enhance value.

Grant Mitchell, a Director of Port Jackson Partners, led the work on this Report. Grant solves strategic problems for the Boards and CEOs of Australia's leading companies in the resources, agriculture, transport, financial services and energy sectors, among others.

James Uytendaal, Associate, and Veronica Sherwood-Meares, Business Analyst, compiled much of the research, and performed the analysis, that underpins this report.

The Minerals Council of Australia is the peak national body representing Australia's exploration, mining and minerals processing industry, nationally and internationally, in its contribution to sustainable economic, and social development.

This publication is part of the overall program of the MCA, as endorsed by its Board of Directors, but does not necessarily reflect the views of individual members of the Board.

Minerals Council of Australia

Level 3, 44 Sydney Ave, Forrest ACT 2603
(PO Box 4497, Kingston ACT Australia 2604)
P. + 61 2 6233 0600 | F. + 61 2 6233 0699
www.minerals.org.au | info@minerals.org.au

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Foreword

The performance and prospects of Australia's iron ore sector have attracted increased public attention in recent times.

Australia's iron ore industry is one of this country's greatest economic success stories. This success reflects not just the geological gift of the Pilbara's globally significant iron ore deposits. It arises also from the determination and nous of those involved in their development and production.

In 2015, questions have been raised about the state of the industry in Australia and whether or not its performance could be improved. These questions necessarily go to past decisions, future prospects and policy approaches from a national interest perspective.

This report has been commissioned to help address these questions.

Understanding and appreciating Australia's iron ore performance means doing more than focussing on today's, or even last year's, price history. It requires a deeper understanding of the industry's evolution and the market environment within which Australia's iron ore producers compete.

This report by Port Jackson Partners adopts such a big picture perspective, with a fact base of auditable data from annual reports, other market information, reports by industry observers and estimates based on that data.

It will assist those interested in understanding this vital Australian industry.

Brendan Pearson
Chief Executive
Minerals Council of Australia

July 2015

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Overview

The Australian iron ore industry has capitalised on a decade of unprecedented volume and price growth to create a market position stronger after the commodities boom than it was before.

Australia now has a 50 per cent share of the seaborne market, a share built on vastly expanded production volumes which now exceed 650 million tonnes per year. This compares with 170 million tonnes in 2000.

This will enable the industry to add more value to the Australian economy over the next decade than over the previous 10 years. The iron ore industry is likely to contribute more than A$600 billion to the Australian economy over the next decade.

With continued attention to competitiveness and productivity, iron ore represents a robust wealth generation machine for the nation, even at long-term average prices or below.

It's important to look carefully at how this has happened.

For less than a decade – roughly from 2005 to 2013 – Australia's iron ore industry performance was as good as it gets.

Global demand, especially from China, pushed iron ore prices to levels way above long-run averages. Prices peaked at more than US$190 per tonne in 2011, higher relative to trend than for any other major globally traded mineral commodity.

This was unprecedented, and producers responded naturally: they rapidly increased supply. Global seaborne production more than doubled between 2000 and 2013.

In Australia, industry revenue – including operating costs, investment, royalty and tax flows plus returns to investors – exceeded A$70 billion in 2014, a five-fold increase from 2005.

Informed analysts predicted these unique conditions could not last.

Nevertheless, as the market price has declined, and perhaps more steeply than expected, there has been a debate about whether the industry or government policy-makers could have acted to ensure Australia would now be in a different, higher priced world.

Three major points need to be considered:

a) **The actions of the Australian iron ore sector are not the only, and not even the major, drivers of iron ore prices.**

   Iron ore trades in a global commodity market which behaves as global commodity markets always do – a sharp increase in demand followed by a rapid increase in commodity prices, an investment-driven supply response, and finally price declines as demand slows and costs are taken out across the board.

   This has been repeated across other commodities – copper and coal, for example, but also in agricultural commodities – and for the same reasons.

b) **The actions of the Australian iron ore industry over the past decade have been exactly right from a national interest point of view.**

   Expansion has lifted Australia's seaborne market share to 50 per cent, at a time when competitor nations have eroded Australia's share in other commodity markets.

   The core of Australia's iron ore sector is robust. Despite industry-wide cost reductions, more than 80 per cent of Australian capacity is in the bottom half of the global cost curve and will continue to generate strong operating cash flows.

   Even if growth continues to slow, Australian iron ore will remain a powerful

wealth generator for Australia. The annual level of activity in the iron ore sector from ongoing operations alone is now much greater than even investment-driven activity over previous years.

In addition, iron ore employment contributed A$45 billion to the economy over the past 10 years, and will contribute A$78 billion over the next 10 years. This is based on a very conservative analysis that includes modest consensus price forecasts and an assumption of no future growth.

c) History shows market intervention through government policy action is likely to be ineffective at best and counter-productive at worst.

History suggests that the burden of proof is very high for market intervention as a policy lever to control price.

In other industries, Australia has unwound virtually all previous attempts at controlling price through centralised marketing.

Controlling production of iron ore has failed in the past – export controls introduced by Australia in the 1970s led Japan to support Brazilian iron ore investment instead of Australian.

A superior approach is to focus on policies that allow all operators to compete successfully in the global market, and to make their businesses sustainable against a wide range of potential prices, not only those at historic highs.

These policies are focussed on free and open markets for trade internationally, competitive markets for goods and services supplied in Australia, workplace cultures that support productivity, wise investments in people and infrastructure and stable and competitive tax and royalty arrangements.

Australia's iron ore resources are globally significant assets. An ongoing focus on these policies will ensure a strong contribution from the industry in the decade to come.

“History suggests that the burden of proof is very high for market intervention as a policy lever to control price.”

1 The past decade: as good as it gets

For an industry used to modest growth and stable prices, the period since 2000 (and particularly from 2005) was beyond all expectations.

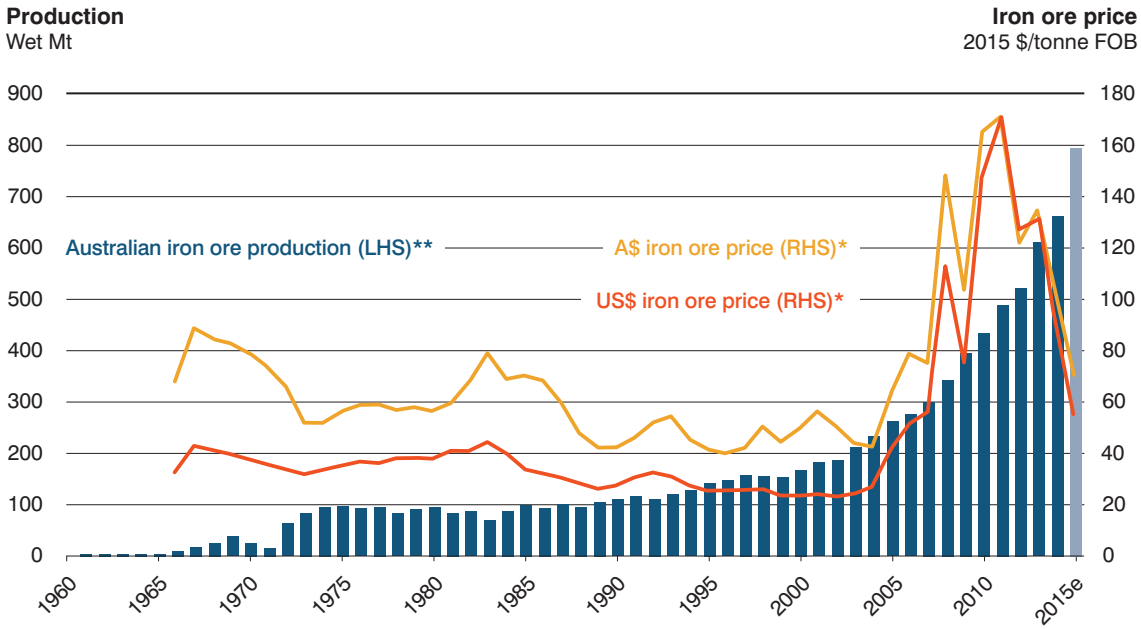
1.1 High growth and high prices combined

For decades, Australian iron ore producers operated in a highly competitive market where earning reasonable returns was a constant challenge (Chart 1). From 1966 to 2000, market prices fell at around 0.8 per cent each year in real terms. This put pressure on producers to achieve growth at consistently lower costs.

The period from 2000 onwards could not have been more different. Australia's major iron ore producers found they no longer needed to undercut competitors' prices to grow volumes. Backed by ample ore reserves, they found a new market dynamic: expansion rewarded by ever higher prices.

The facts bear repeating. From 2000 to 2014, Australia's annual iron ore production rose from 170 million tonnes to around 660 million tonnes – a compound annual growth rate of 10 per cent. Over the same period, prices rose to a peak of more than US$190 per tonne in 2011, before declining to levels in mid-2015 closer to US$54 per tonne. From 2000 to June 2015, prices averaged US$74 per tonne, more than double the average from 1966 to 2000.

Chart 1 **Australian iron ore production and price**

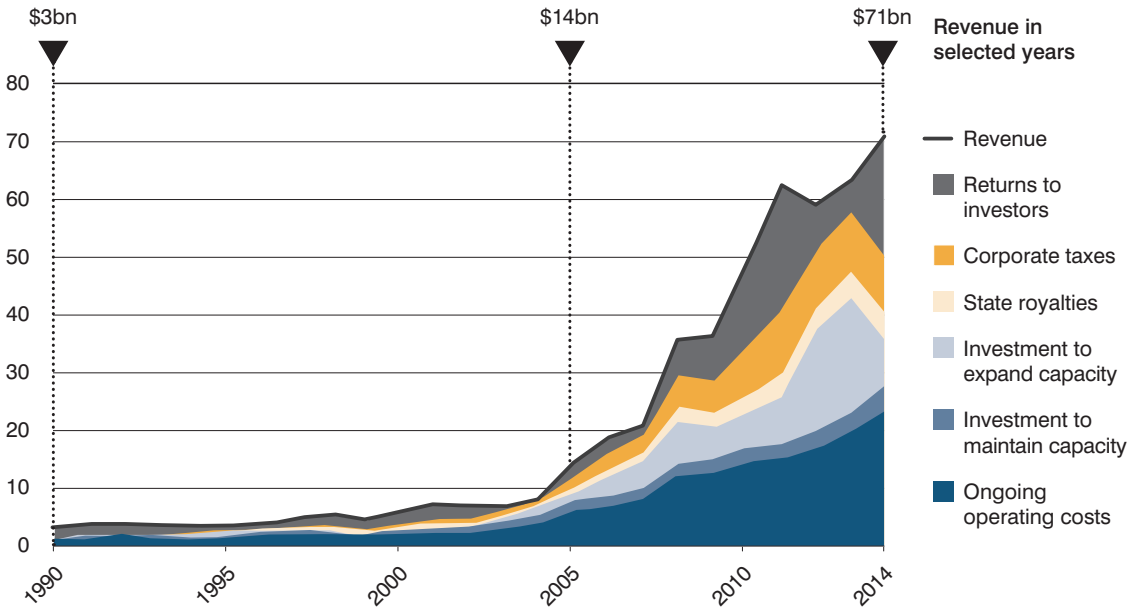


* From April 2008 iron ore price series reflects spot price $/dry tonne for 62% Fe (FOB). Prior to April 2008 the price series reflects the Benchmark pricing system. US GDP deflator used to convert US$ price series to 2015 dollars; AUS GDP deflator used to convert A$ price series to 2015 dollars

** 2015 production is calculated as the average of the FY15 and FY16 forecast production from the Department of Industry and Science (Office of the Chief Economist)

Source: USGS; IMF; World Bank; ABARES; Bloomberg; Department of Industry and Science (Office of the Chief Economist); PJPL analysis

Chart 2 **Pilbara iron ore revenue and expenditure***
2015 A$ Billions



* Revenue and expenditure for Rio Tinto, BHP Billiton and Fortescue Metals Group; based on actual reported data, except BHP Billiton where segment data prior to 2004 has been estimated from BHP Billiton 2005 data and Rio Tinto trends

Source: Annual reports and company information

1.2 Total investment, activity and profits reach historic highs

The true scale of the transformation in Australian iron ore can be seen in the extent of investment and day-to-day operational activity.

Based on a review of company accounts, production and other official reports, and augmented by assessments of industry observers, Port Jackson Partners has estimated – in real terms – the key 'whole of the Pilbara' financials from 1990 to 2014 (Chart 2).[1]

These estimates indicate the wealth the sector has generated for the Australian economy.

- Since 2005, total Pilbara revenue has grown five times – from A$14 billion to A$71 billion in 2014.
- Investment both to expand and to maintain capacity totalled more than A$100 billion from 2005 to 2014, nine times the total spent from 1995 to 2004.
- Expenditure on operating that newly installed capacity also mushroomed – at an average of more than A$1.5 billion per year, every year.
- Taxes and royalties paid to governments totalled almost A$100 billion from 2005 to 2014, more than 10 times the A$9 billion paid from 1995 to 2004.

2 The coming years: as expected, a return to closer to normal

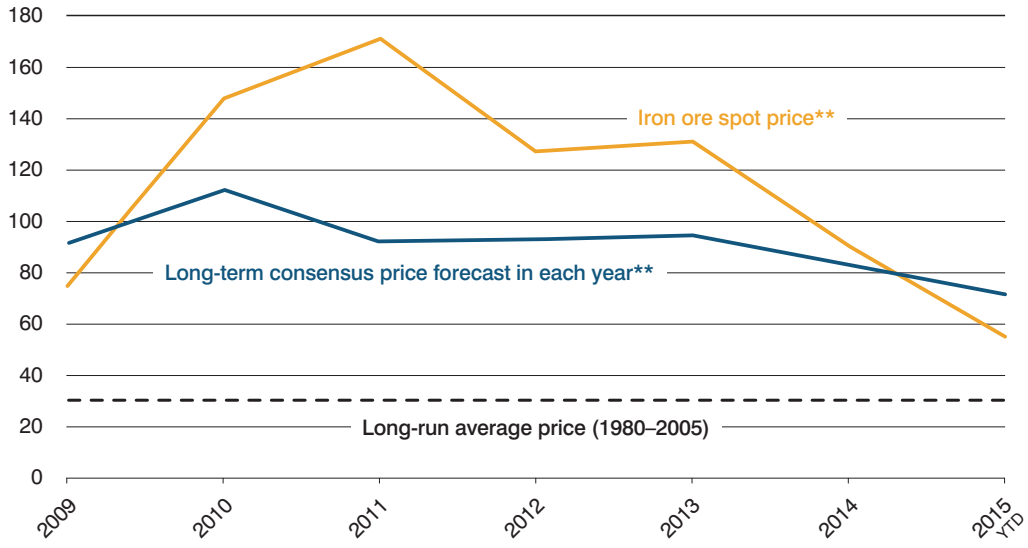
It is naïve to expect that the market conditions that brought great rewards for iron ore miners, their suppliers and Australia over the past decade would be persistent.

Indeed, within the industry, prices were widely forecast to fall.

Market participants' own forecasts of minerals prices are very tightly held for commercial reasons, but investment bank and broker forecasts of commodity prices are better known. Throughout the peak years, broker consensus forecasts for long-run prices remained persistently below prices received in any one year, although above the pre-boom average (Chart 3).[2]

These forecasts recognised that iron ore prices were an unprecedented distance above historic levels, and were likely to return closer to previous levels. Over the last decade, the iron ore price peaked at 5.6 times its average price from 1980 to 2005. At the same time, other commodities tripled or 'only' doubled in price relative to previous levels (Chart 4).

Chart 3 **Historical and forecast iron ore prices***
2015 US$/tonne FOB

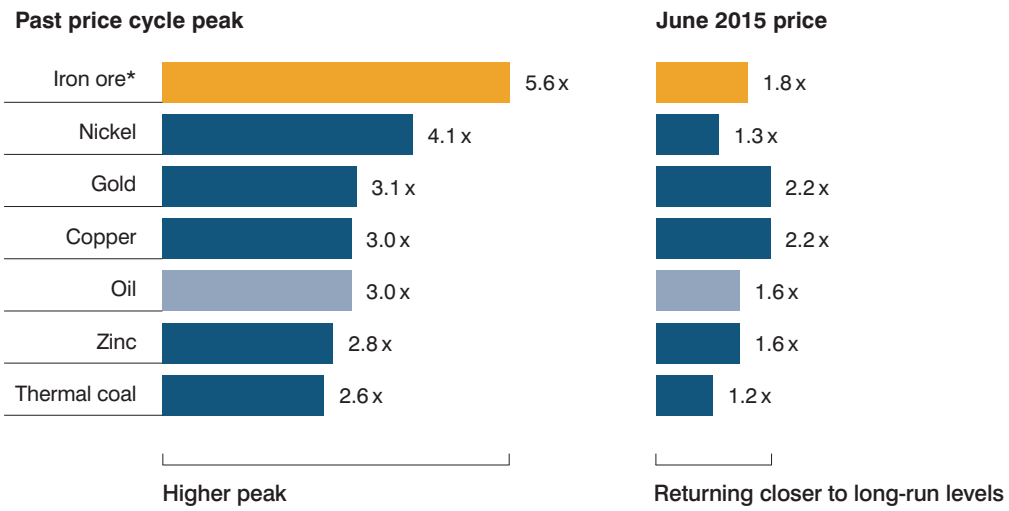


* From April 2008 iron ore price series reflects spot price $/dry tonne for 62% Fe (FOB). Prior to April 2008 the price series reflects the Benchmark pricing system

** Prices reflect average annual or average YTD in the case of 2015

Source: IMF; World Bank; ABARES; Bloomberg; PJPL analysis

Chart 4 **Price of major commodities as multiple of long-run (1980–2005)**
Multiple calculated using price data in real 2015 US$



* From April 2008 iron ore price series reflects spot price $/dry tonne for 62% Fe (FOB). Prior to April 2008 the price series reflects the Benchmark pricing system

Source: World Bank; IMF; ABARES; Bloomberg; PJPL analysis

In all cases, views that prices would decline again have proved correct. The prices of all major commodities are now much closer to their long-run average.[3]

Forecasts that prices will be sustained at levels substantially above long-term averages require very strong cases to be accepted. A reliance on an upward shift in demand, albeit a somewhat persistent one, is insufficient. Genuine shortages of minerals, or equivalently a persistent decline in the grade of mineral ores, are needed to make any such case. Long-run forecasters must also guard against the appearance of new technologies that can irreversibly improve the economics of mining and refining.

The point here is not that any particular price forecast was right or wrong at the time. Rather, it is that participants in the iron ore sector who did not recognise that prices could, and probably would, fall back to levels approaching long-run averages were running against the tide of evidence and the bulk of market views.

Yet the fact remains that current iron ore prices, although still above the long-run average, are now below those many foreshadowed only a few years ago, and some forecasts of spot prices for the next several years suggest further falls will occur.

Under these circumstances, it is natural to ask: 'Is there something we might have done, or something we could be doing now, to prolong the conditions of the recent past?'

3 Australia's current position: low cost growth in the national interest

The bulk of Australia's iron ore production comes from the Pilbara – a globally significant iron ore asset in both size and grade. With this natural advantage, Australia has a vital interest in unfettered, unrestricted access to a deep, global market in iron ore.

The case for 'doing something differently' seems to arise from a dissatisfaction with the way markets work, the role of Australian iron ore producers within them, or a belief that something about the way the Australian industry has evolved means ongoing, unrestricted exposure to the iron ore market is no longer wise.

The evidence in fact supports completely the opposite diagnosis: the global iron ore market is operating as it should, and as all mineral commodity markets do. As a whole, Australia's iron ore industry has responded rationally to market conditions and continues to do so.

3.1 Global trends, not Australian miners, determine market conditions

Global forces, not Australian miners, are responsible for price movements – both up and down.

Customer demands at the core of price and production movements

Commodity demand growth represents customer needs, not suppliers' wishes. Demand for iron ore, copper and other major commodities arises from demand for steel, electric wires and components, and other basic items needed for economic and social development.

This is the explanation for the unprecedented (and probably not repeatable) expansion in global commodity demand and prices over the last 10 to 15 years.

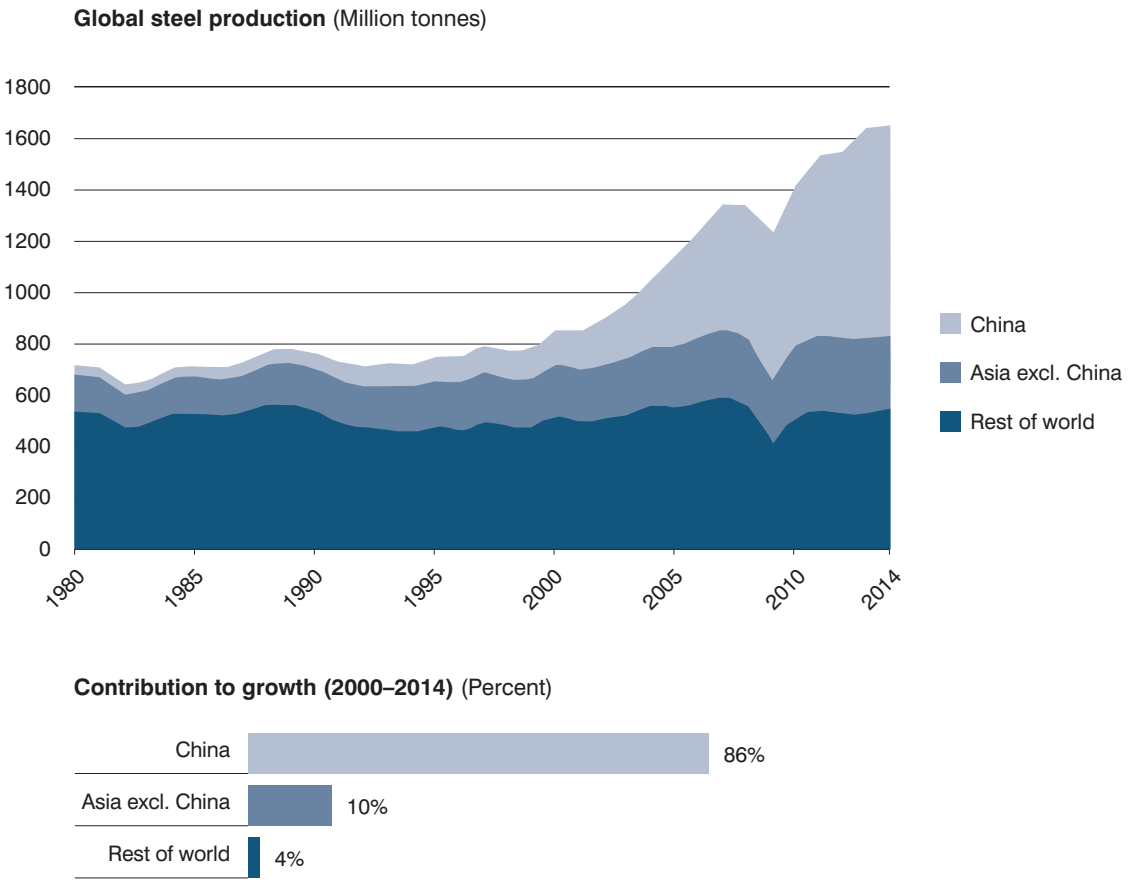
Demand for many basic materials rose sharply after 2000, driven by China's surge in industrial growth. Capital investment, particularly infrastructure construction, formed the core of the Chinese economic growth model.

Indicators of the pace of investment are plentiful.

- Measured as gross fixed capital formation, Chinese investment has grown at an average annual rate of 11 per cent since 2000.
- China's highways have expanded from approximately 1 million kilometres in 1990 to more than 4 million kilometres in 2013.[4]
- Rail investment has resulted in an increase in the length of track from 59 thousand kilometres in 2000 to 66 thousand kilometres in 2012.[5]
- Since 2000, real estate floor space has grown from nearly 7 million square feet to 266 million square feet.[6]

Chinese demand propelled a doubling of global steel production in the last decade, the primary driver of iron ore demand (Chart 5). By 2013, China also consumed around half of global production of copper, nickel and zinc.

Chart 5 **Steel production and growth by region**



Source: World Steel Association; PJPL analysis

This customer driven demand triggered a large supply side response across commodities.

In 2013, global iron ore production was 3.5 times that in 1980. This remarkable increase was approached or surpassed by other mineral sectors (Chart 6).

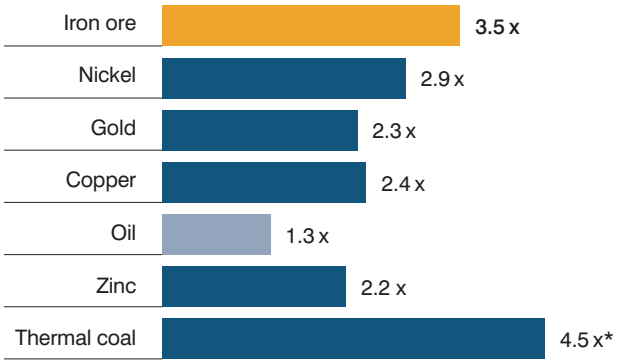
Production of thermal coal, for example, more than quadrupled between 1991 and 2013, and the production increase (were reliable figures available) would likely have been even higher against 1980 levels. Production of other commodities more than doubled between 1980 and 2013.

Unrivalled opportunities have brought increased supply competition

Over the period of strong production growth from 2000, the diversity of iron ore supply broadened sharply. The number of countries producing more than 10 million tonnes per annum rose from 11 to 17 between 2000 and 2015; the number of 5 million tonne per annum operations increased from 40 to 100 (Chart 7).

This new supply was increasingly cost-efficient, as well. Although global production costs rose as new mines were developed, when

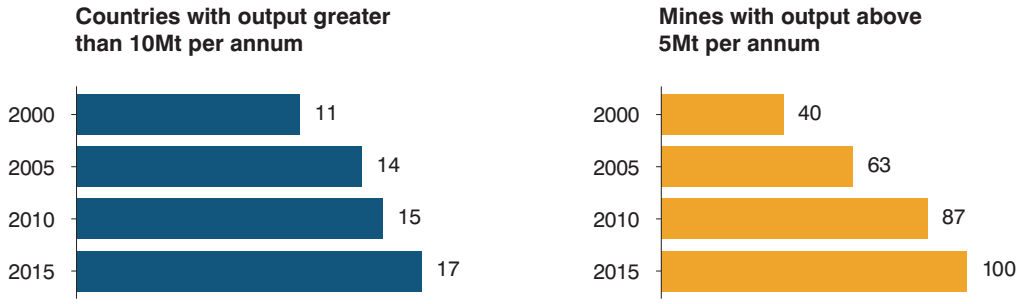
Chart 6 **2013 production as a multiple of 1980 production**



* Multiple of 1991 production (prior data for thermal coal is unavailable)

Source: World Bank; ABARES; BP statistical review of world energy; PJPL analysis

Chart 7 **Growth in iron ore production of scale**
Number



Source: AME

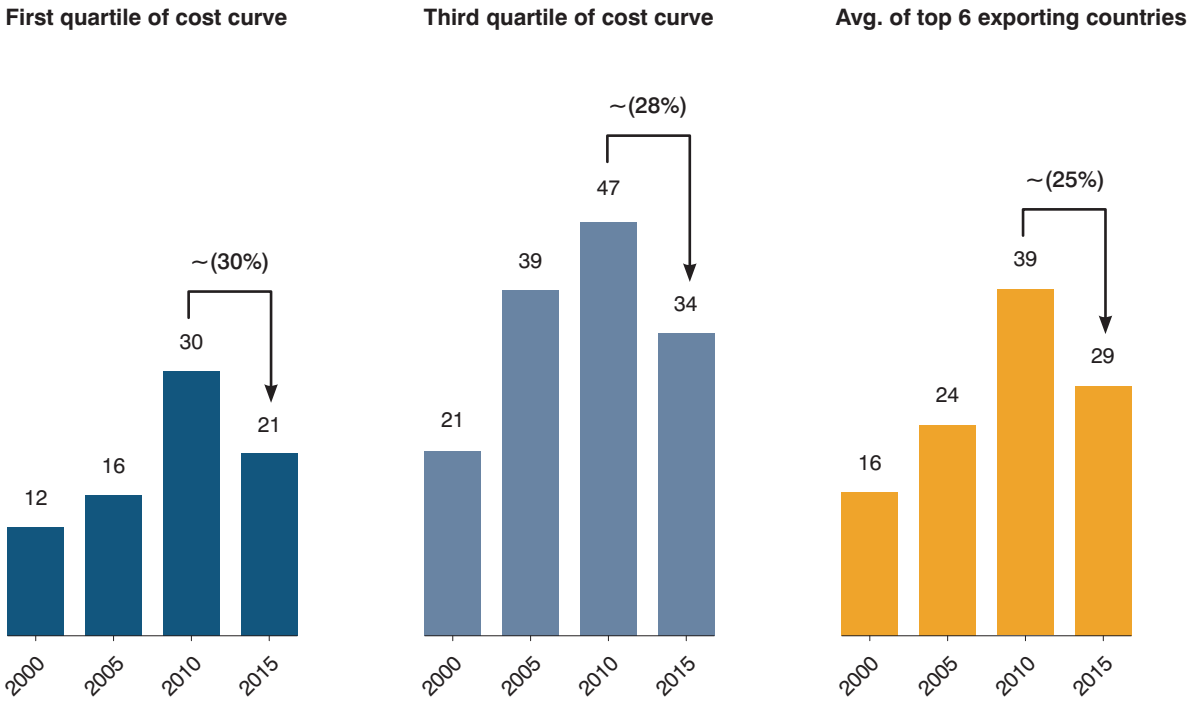
these operations achieved scale and began to operate efficiently, costs fell across the industry (Chart 8).

The average cost for the most efficient 25 per cent of iron ore mines globally declined by 30 per cent between 2010 and 2015. High cost mines, too, made savings, as did mines in the countries most important to traded iron ore volumes.

Some distinctive characteristics of the iron ore industry exacerbated the pace of price falls after the peak, although not the extent of them. The best example is the willingness of Chinese steel producers to support otherwise uneconomic mines for reasons of tied ownership structures. To the extent market prices are linked to the cost of the marginal supplier, such behaviour prolonged higher market prices until the high cost operations began to close.

When production costs fall across an entire commodity sector, while production volumes markedly increase, price falls become inevitable.

Chart 8 **Changes in industry costs (2000–2015)**
2015 US$/tonne FOB



Source: AME; USGS

3.2 Australia's iron ore sector: making the most of market conditions

In a dynamic, global market influenced by diverse factors, it seems unlikely that the actions of a particular producer, or set of producers, could materially influence market outcomes. Nevertheless, the position of Australia's small number of large, low-cost producers invites discussion of their role in the market.

What emerges strongly from this analysis is that over the past decade Australian producers participated in the iron ore market in a way that was both rational and in the national interest. They expanded their production appropriately in response to price signals.

Capital commitments: commercially sound

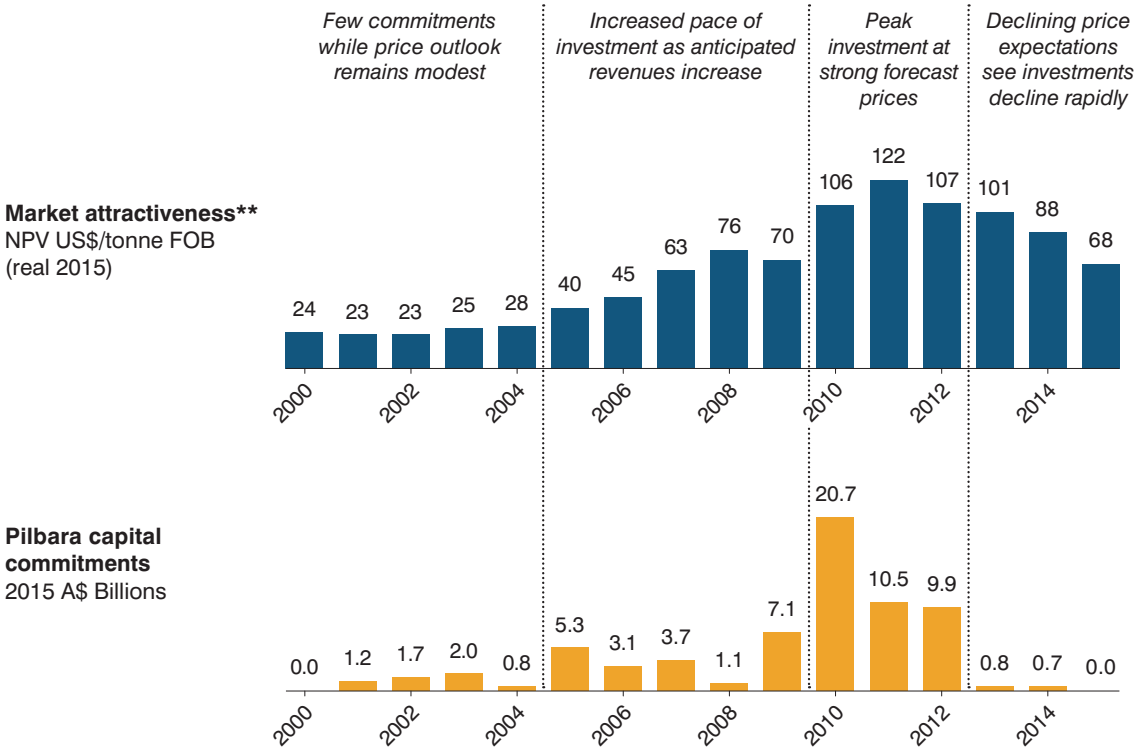
Among the biggest decisions Australian iron ore producers make is whether to commit to large, capital-intensive investments in mines, railroads, ports and other infrastructure. Like price forecasts, the internal decision-making of producers is closely held. However, price expectations clearly play a critical role, and a comparison of investment bank and broker consensus price expectations with capital commitments suggests entirely commercial behaviour.[7]

Chart 9 compares capital commitments – that is, announced commitments rather than actual spending – with a single number representing the value of the next 10 years of consensus revenue forecasts.[8] From 2000 to 2004, although signs of increasing demand were present, market observers continued to anticipate modest revenues.

However, when price expectations began to rise, so too did capital commitments.

Importantly, as price forecasts began to suggest a less attractive market environment, investment commitments declined. Activity continued on the ground but capital commitments slowed markedly.

Chart 9 **Market attractiveness and capital commitment timing***



* Represents capital commitments by Rio Tinto, BHP Billiton and Fortescue Metals Group to major iron ore projects only (does not reflect all capital expenditure)

** NPV of 10 year price forecast. From April 2008 iron ore price series reflects spot price $/dry tonne for 62% Fe (FOB). Prior to April 2008 the price series reflects the Benchmark pricing system. The 2003 NPV price is estimated based on an average of the 2002 and 2004 NPV prices

Source: Company annual reports; IMF; World Bank; ABARES; Bloomberg; PJPL analysis

Market position: making the most of market dynamics

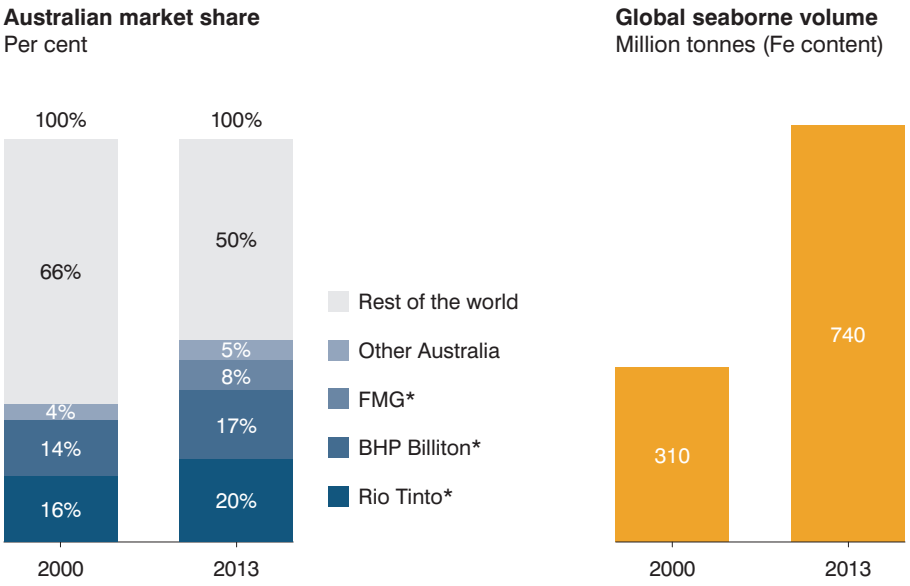
These commercial investment decisions have seen Australia gain a larger share of the seaborne iron ore market.

Since 2000, Australia's seaborne market share has grown by 16 percentage points – from 34 per cent to 50 per cent (Chart 10). Of the approximately 450 million tonnes of additional annual production installed by the Australian iron ore industry, around 250 million tonnes was needed simply to keep up with market demand. The remaining 200 million tonnes represents an increase in market share.

Market share gains may sometimes be seen as unsound, even if individual expansion commitment decisions are rational.

> "What emerges strongly from this analysis is that over the past decade Australian producers participated in the iron ore market in a way that was both rational and in the national interest."

Chart 10 **Australian seaborne iron ore market position**



* Assumes all production is exported. Production for FMG, Rio Tinto and BHP Billiton has been calendarised so that production is on a comparable basis

Source: USGS; Department of Industry and Science (Office of the Chief Economist); Company annual reports

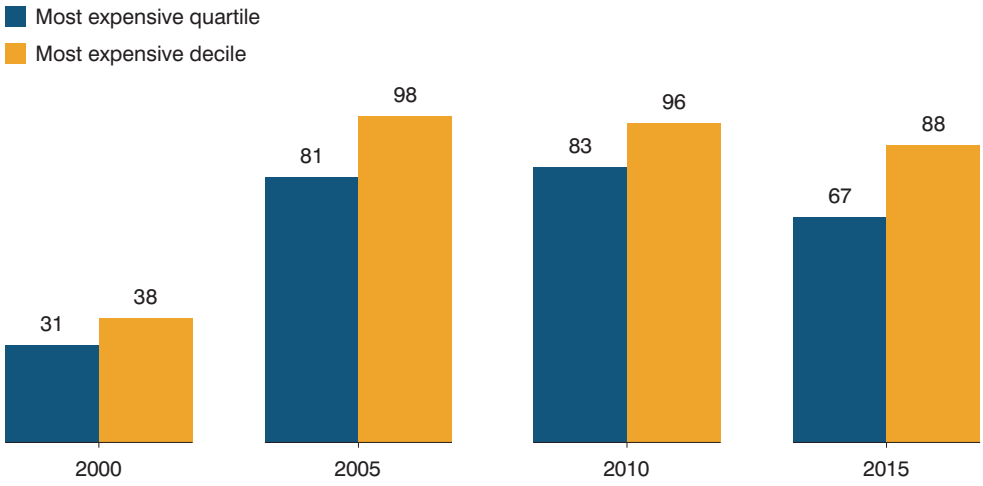
> “Australia has gained share at the same time as it has improved the national cost position.”

Many market participants consider that market prices are set at the level required to sustain the viability of the most expensive producer – the ‘marginal producer’ – needed to satisfy demand. In theory, large expansions by lower cost producers could see customers able to purchase all of their needs at a lower price in a scenario where high-cost producers simply close.

Yet evidence is scarce that Australian iron ore producers have been able to affect the market in this way.

The costs of the ‘marginal producers’ in the seaborne iron ore market – whether defined as the most expensive 25 per cent or the most expensive 10 per cent – remain at levels above those at the onset of the commodities boom, and have declined only modestly since the peak (Chart 11). Of the modest declines in marginal producer costs that have occurred,

Chart 11 **Average unit cost of marginal producers**
2015 US$/tonne FOB



Source: AME; IMF; World Bank; ABARES; Bloomberg; Consensus Economics; PJPL analysis

about half of the price decline is attributable to cost reductions by high-cost producers themselves, not the actions of Australian miners.

Nor can shorter term price dynamics be explained by changes in the costs of marginal producers. For most of the period since 2005, market prices have been de-linked from marginal production costs. Instead, they reflect customers' needs to secure iron ore at a time when supply was very constrained; in all likelihood, if more iron ore had been available, more could have been sold. For this reason, it makes little sense to link Australia's market share gain to the recent disappearance of record prices.

Market share gain a remarkable achievement

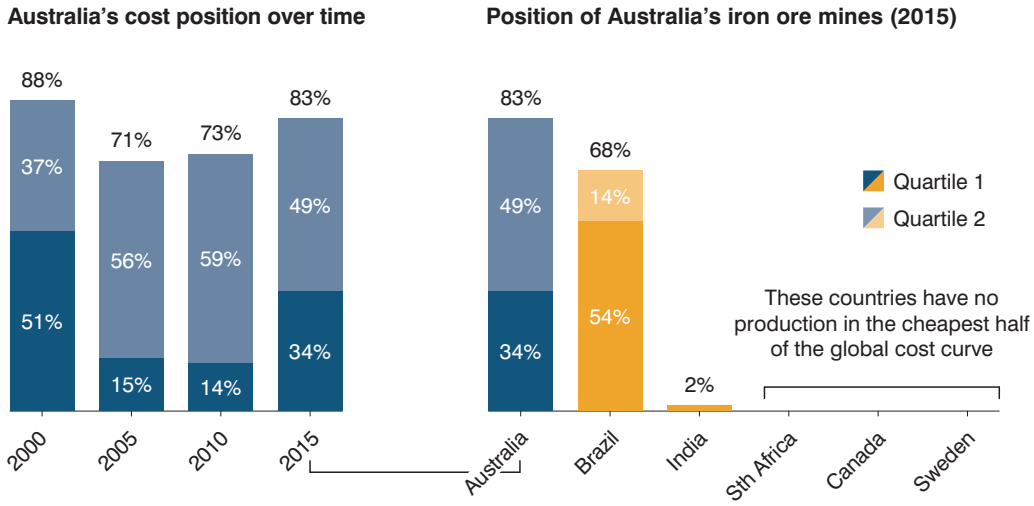
Australia's gain in market share is an achievement, not a drawback – one more remarkable when considered in the context of three other important facts.

First, Australia has gained share at the same time as it has improved the national cost position. In 2000, half of Australia's iron ore production came from operations with costs in the lowest 25 per cent (Chart 12). As Australian producers expanded, and as costs across the industry rose, this position deteriorated.

More recently, however, productivity gains and cost management have begun to re-establish competitiveness. Once again, more than 80 per cent of Australia's production is in the bottom half of the global cost curve – a favourable position compared with other major seaborne producing countries.

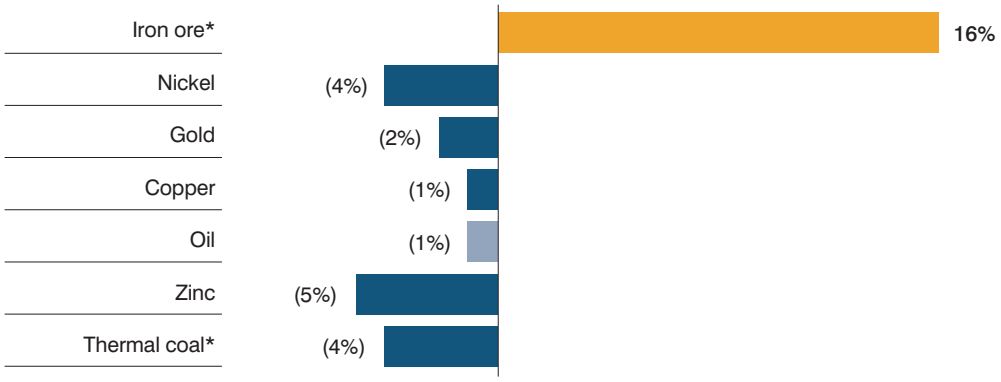
Second, iron ore is the only major mineral commodity in which Australia has gained market share (Chart 13). In nickel, gold, copper, oil,

Chart 12 **Australia's iron ore global cost competitiveness**
Per cent of production by FOB cost curve quartiles



Source: AME

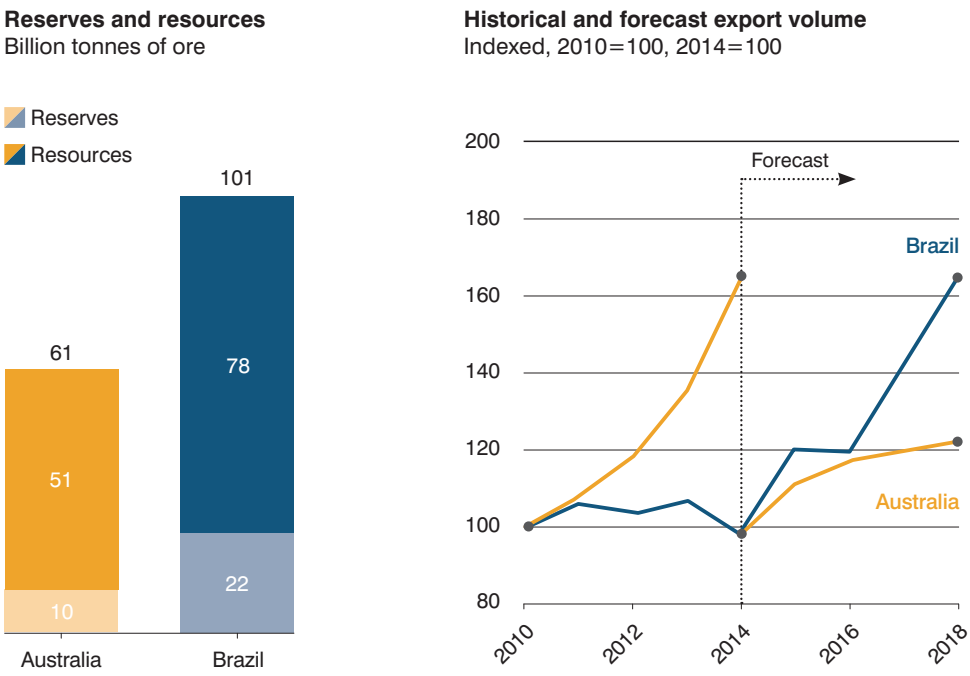
Chart 13 **Change in Australia's market share in key resource sectors (2000–2013)**
Percentage points



* Seaborne market share

Source: Department of Industry and Science (Office of the Chief Economist); USGS; BP statistical review of world energy; Bloomberg

Chart 14 **Capability of Australia and Brazil to grow iron ore exports***



* Australian miners included are Rio Tinto, BHP Billiton, FMG and Roy Hill. Brazilian miners included are Vale and Minas Rio. Reserves include proven and probable. Resources include measured, indicated and inferred

Source: Annual reports; company presentations; Morgan Stanley

zinc and thermal coal, global production growth has outpaced Australia's production increases. As a result, other countries have increased market share at the expense of Australia.

Third, this gain in market share was by no means guaranteed from a supply perspective. Among alternative sources of iron ore, Brazil has the necessary resources and the demonstrated ambition to accelerate volume growth (Chart 14).

Vale, Brazil's largest iron ore producer, has an abundance of expansion projects currently underway. Vale plans to put more volume into the market by 2018 than Rio Tinto and BHP Billiton combined.

These expansions will bring high-quality, low-cost tonnes into the global market and will compete with Australian producers to supply the Chinese market. Notably, the recent approval of 'Very Large Ore Carriers', or Valemax ships, for use in Chinese ports will work to erode Australia's traditional freight cost advantage to Asia.[9]

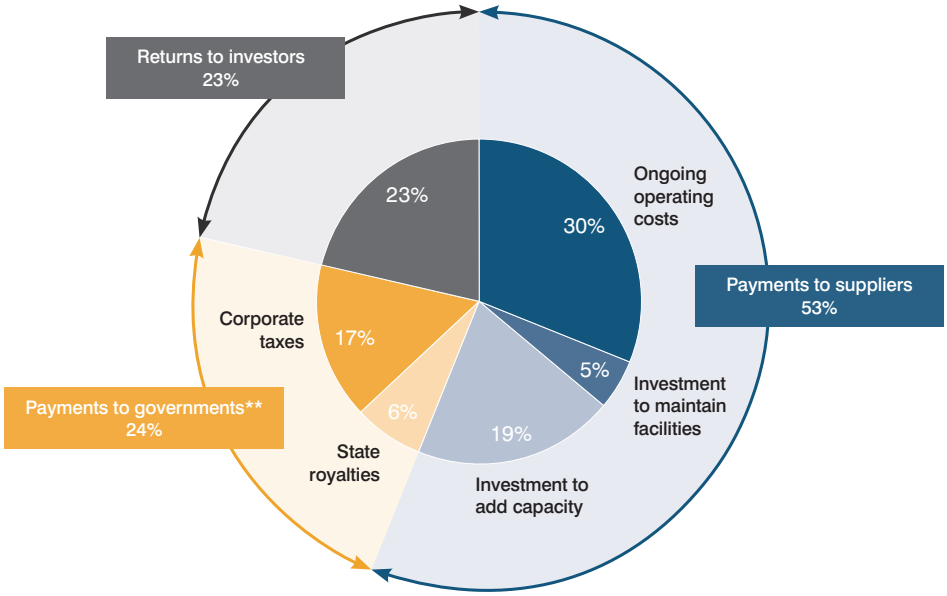
Preparing for a volume-led future: robust wealth generation machine

The benefits of Australia's robust iron ore position, including from the market share gains achieved over the past decade, are being widely shared.

Of the total revenue earned by the major iron ore producers between 2010 and 2014, more than half was paid to suppliers, around a quarter to governments and the remaining 23 per cent to investors, including Australian shareholders (Chart 15).

Any suggestion that the value of these contributions is being unwound through recent iron ore price declines ignores important facts about the new role iron ore is playing in the national economy as a robust generator of annual income.

Chart 15 **Allocation of Australian iron ore value (2010–2014)***
Per cent of A$ revenues earned



* Revenue and expenditure for Rio Tinto, BHP Billiton and Fortescue Metals Group

** Corporate taxes and royalties only. Other government taxes such as payroll taxes, property taxes, customs duties and GST are included in payments to suppliers

Source: Company annual reports; Broker reports, Broker models; PJPL analysis

The next decade will exceed the previous one

A key point to emerge from this analysis is that even taking into account recent price declines, the Australian iron ore industry is now in a position where its contribution to the nation in the next decade will exceed that in the prior 'boom' period (Chart 16).

In the decade from 2005 to 2014, including the period of historically high prices, revenue of the major Australian iron ore producers totalled more than A$430 billion. This was in turn distributed to suppliers, governments and investors.

In the next decade, even with no production growth and prices at much lower levels (as expected by broker consensus), a higher production base will generate more than A$600 billion in revenue. Again, this revenue will be shared between suppliers, governments and investors, with ample capacity for the sector to reinvest in growth.

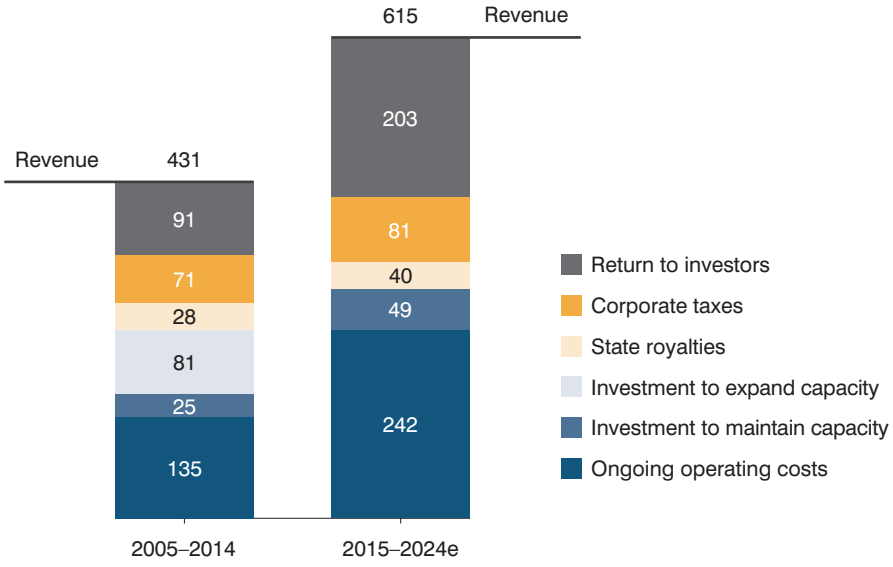
This is in many respects a conservative analysis. Although based on consensus price forecasts, which are clearly uncertain, it assumes no future growth in production volumes. In other words, returns to suppliers, governments and investors over the next decade arise from sustaining the current level of operations.

This means:

- Compared with the last decade, suppliers will benefit from supporting much larger on-going operations. Overall investment, however, will decrease slightly as the focus shifts to sustaining capital investment.
- For governments, royalties and taxes will

Chart 16 **Estimated income and expenditure of major Australian iron ore producers – last decade and next***

2015 A$ Billions



* Assumes no production growth beyond 2014; revenue and expenditure for Rio Tinto, BHP Billiton and Fortescue Metals Group; based on actual reported data, except BHP Billiton where segment data prior to 2004 has been estimated from BHP Billiton 2005 data and Rio Tinto trends

Source: Company annual reports; Broker reports; Broker models; PJPL analysis

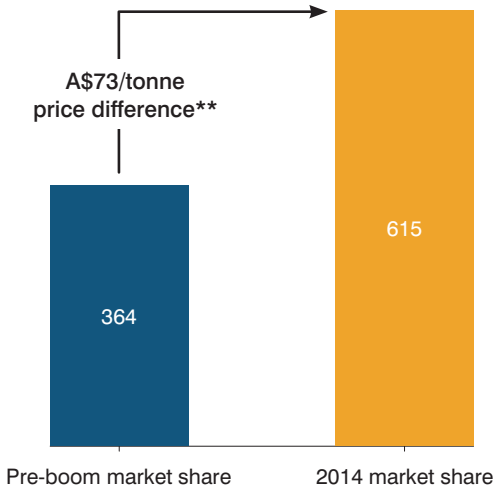
increase as higher volumes more than offset the lower forecast prices.

- Investors will benefit from increased volumes, as well as the ongoing strong cost position of the industry as a whole, despite lower prices.

Likely additional production would increase the estimated contribution. This analysis does not take into account annual production of 120 million tonnes classified by the Department of Industry and Science as 'committed'. These projects would add an additional A$161 billion in contribution. Should Pilbara-based production grow subsequently in line with forecasts of seaborne iron ore volumes out to 2020, at an average rate of 4 per cent per annum, the contribution would increase by a further A$75 billion.[10]

> "... even taking into account recent price declines, the Australian iron ore industry is now in a position where its contribution to the nation in the next decade will exceed that in the prior 'boom' period."

Chart 17 **Estimated contribution of major iron ore producers (2015–2024)***
2015 A$ Billions



* Assumes no production growth beyond 2014 and actual unit costs in both scenarios; revenue and expenditure for Rio Tinto, BHP Billiton and Fortescue Metals Group; based on actual reported data, except BHP Billiton where segment data prior to 2004 has been estimated from BHP Billiton 2005 data and Rio Tinto trends

** US$57/tonne at 2015 USD:AUD exchange rate

Source: Company annual reports; Broker reports; Broker models; PJPL analysis

Volume expansion will be the primary growth driver

In *Opportunity at risk*, a 2012 report for the Minerals Council of Australia, Port Jackson Partners foreshadowed a change in the Australian minerals sector from a position where growth comes from a combination of price and volume to one where the primary driver would be volume gains alone.[11] This analysis showed the Pilbara iron ore producers as well positioned to navigate this important transition, with Australia the beneficiary.

Indeed, the market share gain is an important part of this transition. Without it, the industry's contribution to wealth would be smaller in the next decade than in the one just past.

Put simply, from a national interest perspective, Australia needed the market share growth to outweigh the price declines. In fact, this analysis concludes that long-term prices would need to be A$73 per tonne higher to replace the contribution of the share gain (Chart 17).

Again, this analysis assumes no growth beyond 2014; ongoing volume growth increases the required price gain.

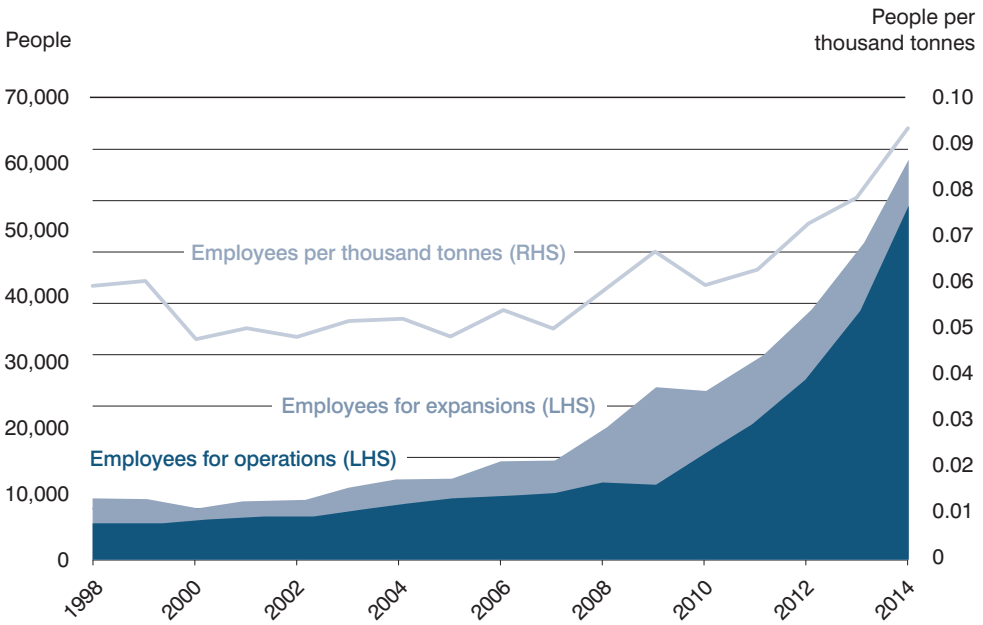
Higher employment in the industry is another important factor that needs to be considered. As the financial returns from the Pilbara iron ore sector were rising strongly, employment was also growing (Chart 18). Direct Pilbara iron ore employment has grown from less than 10,000 people in 2000 to now exceed 50,000 people. As committed production continues to come on-line, long-term operational employment will continue to grow.

Moreover, this growth has occurred at a time when salaries in the iron ore sector grew at a faster rate than the national average in real terms (Chart 18).

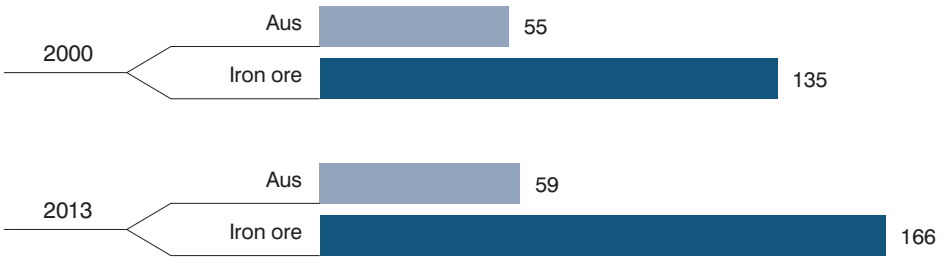
Even if the sector achieves no further growth over the next decade, payments to employees are likely to be A$78 billion over this period, up from A$45 billion in the decade to 2014 (Chart 19).

Chart 18 **Western Australian iron ore labour force**

Estimated Pilbara iron ore employment figures*



Estimated iron ore earnings per employee vs. Australian average
2015 A$ thousands



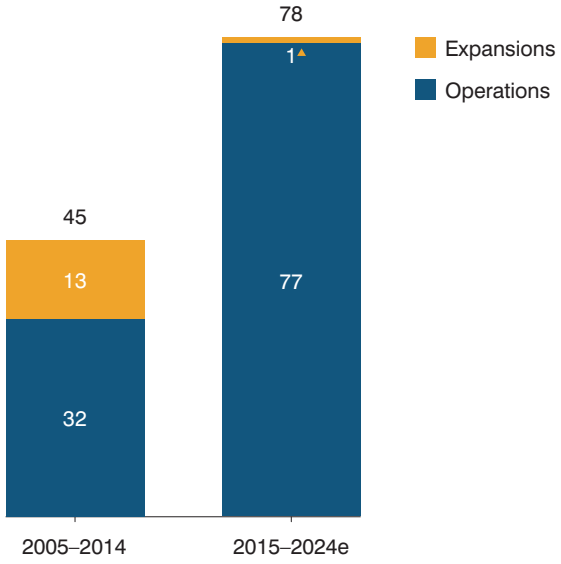
* Split between employees for operations and expansions estimated based on data from the resources and energy major projects list published by the Department of Industry and Science and applied based on iron ore production in Western Australia

Source: Government of Western Australia Department of Mines and Petroleum; ABS; World Bank; Company reports; Department of Industry and Science (Office of the Chief Economist); PJPL analysis

Investors are most exposed to price movements

It can sometimes be forgotten that it is investors, not governments or suppliers (including employees), who are most exposed to price changes (Chart 20). Thanks to an increased focus on productivity and cost management, most of Australia's iron ore production is now sustainable at long-term consensus price estimates. Hence, even if prices decline, volume can be maintained.

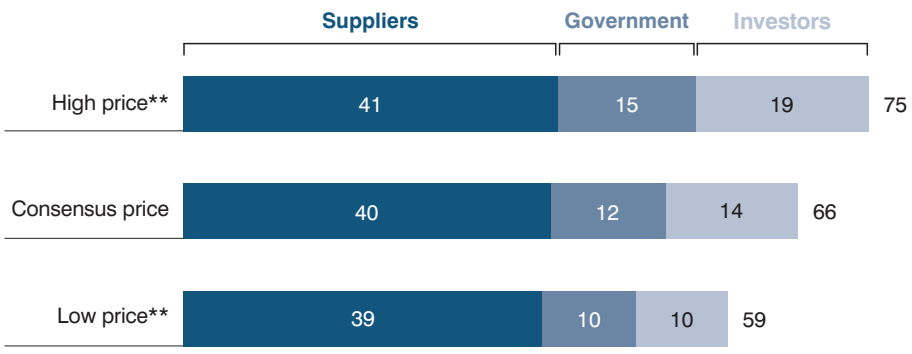
Chart 19 **Pilbara contribution to WA employment – last decade and next***
2015 A$ Billions



* The forecast wage level is based on the average between 1997–2013 in order to reflect the likelihood of lower wage levels under decreased mining activity (0% growth assumed). Iron ore employment levels are assumed to decrease to a 'steady-state' by 2018; the initial decrease in employment from 2013 reflects the drop-off of employees that are estimated to be involved in expansion activities currently underway and assumed to be completed, as well as a drop off in some operating employees during 2015 and 2016; assumes no production growth beyond projects in progress

Source: Government of Western Australia Department of Mines and Petroleum; ABS; World Bank; Department of Industry and Science (Office of the Chief Economist); PJPL analysis

Chart 20 **Sharing in the spoils – allocation of Australian iron ore value (avg. 2015–2019)***
2015 A$ Billions per annum



* Assumes 4 per cent annual growth in iron ore sector

** Low price and high price scenario represent +/– US$10/t in iron ore pricing

Source: PJPL analysis

3.3 Market intervention: the burden of proof is very high

The success of Australia's iron ore sector over the past decade is clear. Therefore, any proposed policy changes that alter the way Australia operates and competes in the global iron ore market need to deliver large, certain benefits to be in the national interest.

Possible alternative policies could include attempting to improve the iron ore price received through centralised marketing or otherwise controlling production.

History suggests that such actions are ineffective at best and counter-productive at worst.

Shared marketing: unwound in other industries

Statutory marketing authorities have a long history in Australia. Three main points can be made based on this experience.

First, very few of the statutory marketing authorities established still exist (Table 1).

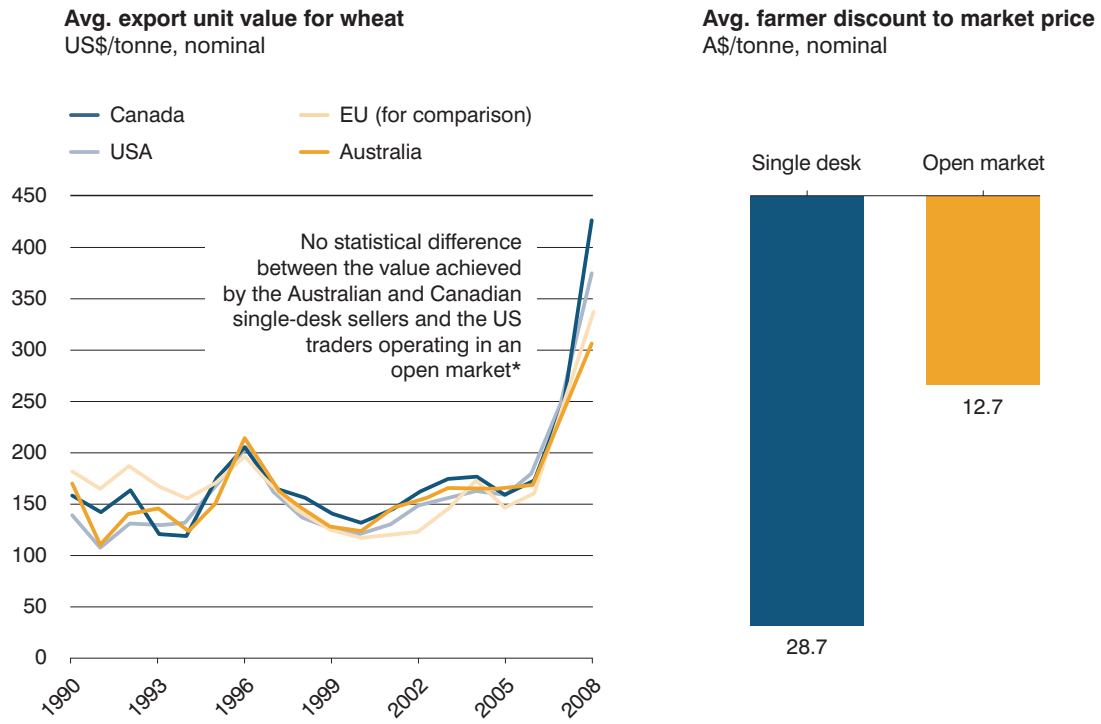
Second, evidence for the success of statutory marketing authorities is thin. Looking at wheat, for example, an examination of prices throughout the period the wheat marketing authority was in place suggests Australia was

Table 1 **Examples of unravelled commodity desks and boards in Australia**

Commodity	Body and years of operation
Wheat	• Australian Wheat Board (1939–1999) • AWB (1999–2008)
Dairy	• Australian Dairy Produce Board (1935–1975) • Australian Dairy Corporation (1975–2001)
Cotton	• Cottoning Marketing Board – QLD (1926–1989)
Potatoes	• Potato Marketing Board – NSW (1947–1956) • ACT Potato Marketing Board (1949–1951) • Potato Marketing Board of Tasmania (1927–1977) • Queensland Potato Marketing Board (1947–1954) • SA Potato Board (1948–1986) • Potato Marketing Board – VIC (1935–1958)
Tobacco	• Australian Tobacco Marketing Committee (1990–1997)
Dried fruits	• Dried Fruits Board of NSW (1927–1997)
Meat	• Meat Industry Authority – NSW (1971–2000)
Grains	• Oats Marketing Board – NSW (1972–1991)
Eggs	• Poultry Farmer Licensing Committee – NSW (1972–1989)
Wool	• Australian Wool Corporation (1973–1991)
Bananas	• Banana Industry Committee – NSW (1987–2010)
Citrus	• Central Coast Citrus Marketing Board – NSW (1967–1993)

Source: Productivity Commission; Government archives

Chart 21 **Export prices received for wheat**



* Analysis of variance statistical test at 5 per cent statistical significance

Source: Food and Agriculture Organisation; ABARES

not able to achieve export prices any higher than other countries (Chart 21). Moreover, the share of the total wheat price received by farmers (that is, after paying for the costs of the statutory market authority) has increased following the removal of controls.

Finally, apart from transport advantages, in which Australia has the benefit of proximity to China, none of the circumstances typically identified as necessary for statutory marketing authorities to succeed can be deemed to exist in iron ore (Table 2).

Controlling production: already a failed iron ore strategy

Another possible policy response (sometimes but not always the focus of statutory marketing authorities) is to restrict production artificially. The usual presumption is to avoiding 'flooding the market' with cheap supply.

Policy approaches of this sort ignore the benefits demonstrated above from active competition to gain market share. They also ignore the almost inevitable backlash from customers associated with supply restrictions.

The Australian iron ore industry has run this policy experiment before.

Brazil is Australia's largest and most aggressive competitor in the seaborne iron ore market. Brazil's iron ore reserves approach the quality of the Pilbara in terms of grade, logistics costs and market reputation.

In an earlier era, Australia's failure to respond to customer needs – and to signals in the

Table 2 **Situations where a single-desk may be effective**

Situation	Description
Monopoly	• The country is the sole producer of the commodity
Transport advantages	• Where transport costs from Australia to the importing country are lower than competitors
Seasonal advantages	• When Australia has a seasonal advantage over Northern Hemisphere rivals (who must incur storage costs in order to sell in their off-season)
Product differentiation	• Where Australian producers could dominate a narrowly-defined market by creating a differentiated commodity or product type
Quantitative import restrictions	• Where import quotas of importing countries allow Australia to capture premiums
Strategic or 'strong' selling	• Countering attempts by other countries to affect international prices by moving into gaps in the market when competitors restrict supply

None of these situations are present in the global iron ore industry, except for transport advantages.

Source: Productivity Commission

global market for iron ore – gave Brazil the opportunity to build its position in the market at Australia's expense.

From the early 1960s, the development of Australia's iron ore industry occurred in close partnership with Japanese customers.[12] In the 1970s and 1980s, however, resort by Australia to export controls – as well as industrial relations problems – encouraged Japanese steel mills and trading houses to support Brazilian iron ore investment (Chart 22).

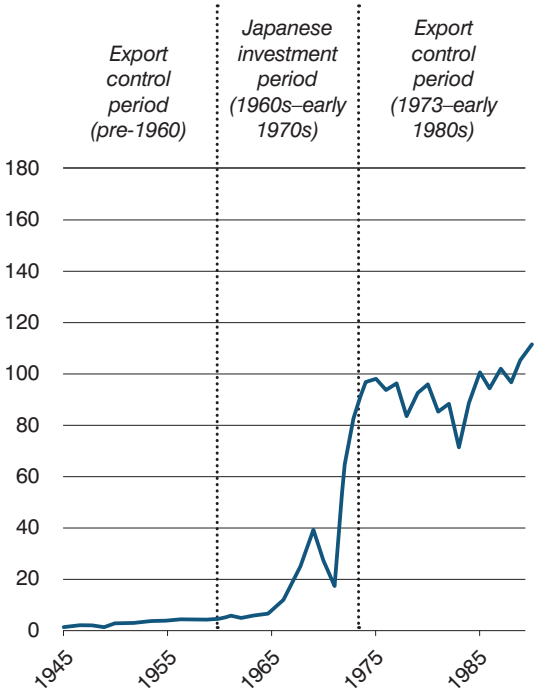
The subsequent volume trajectories of the two industries were sharply different: stagnation for Australia, rapid growth for Brazil.

With both countries able to deliver cost competitive production, this policy difference and its impact is instructive.

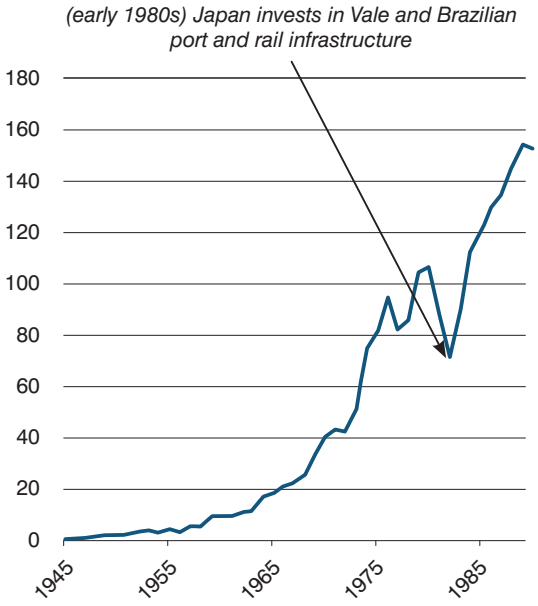
“In an earlier era, Australia's failure to respond to customer needs – and to signals in the global market for iron ore – gave Brazil the opportunity to build its position in the market at Australia's expense.”

Chart 22 **Iron ore production and Japanese investment**

Australian iron ore production (1945–1990)
Tonnes (millions)



Brazilian iron ore production (1945–2000)
Tonnes (millions)



Source: USGS; Iron ore country: Unlocking the Pilbara

4 The right response: stay focussed on cost competitiveness

Focussing on long-term competitiveness, instead of influencing market outcomes, should be Australia's priority. This means focussing on actions that accept – rather than avoid – the realities of global commodity markets.

As we described in *Opportunity at risk*, a combination of industry and public policy actions is needed. And as volume replaces prices as the source of iron ore growth, the room for complacency in these areas disappears.

Although progress has been made in some areas since that report, more remains to be done.

- **Focus on creating and maintaining free and open global markets.** The resources industry is Australia's most export-oriented industry and a foundational source of comparative advantage in global commerce. Iron ore is our largest export earner. It embodies Australia's national interest in free and open trade, as a medium-sized, resource-rich economy with a vital stake in global growth and economic development.

  Aside from the obvious need for Australia to maintain free and unimpeded access to international markets (especially in developing Asia), exposure to global competition also serves to spur cost consciousness, innovation and productivity, thereby ensuring Australian business can adapt quickly to changing market conditions and customer needs.

- **Ensure efficient and competitive access to goods and services in Australia.** Domestic policy frameworks similarly need to support cost competiveness through efficient supply chains. To remain competitive, Australian iron ore projects must have access to the most competitive global suppliers of business inputs. The same imperative of competitive, efficient supply applies to goods and services that are not traded internationally.

  Maintaining best practice regulatory regimes for energy, transport, water, land access, telecommunications and other infrastructure services helps to underpin future export success and market share in iron ore. Conversely, export-oriented industries are least able to sustain the burdens imposed by badly-designed domestic laws and regulatory policies, including those which inappropriately demand local content, increase energy prices or frustrate the creation of competitive local shipping services.

- **Productivity-enhancing workplace cultures.** The Productivity Commission's review of workplace laws provides an opportunity to bring productivity closer to the centre of workplace policy and engagement in Australia. Workplace productivity requires an approach that allows employers and employees to reach agreements that better match business imperatives.

- **Investments in people and communities.** The boom years in iron ore created new opportunities for tens of thousands of Australians, including real economic opportunities for the first time for a large number of Indigenous Australians in Pilbara communities.

More subdued industry conditions underscore why good policy and genuine partnerships across government, industry and community groups are needed now more than ever, to secure gains that have been made and to underpin long-term high-wage iron ore jobs.

Reforms to improve education and training systems and to move towards more industry-led approaches (with training linked to employment outcomes) provide one avenue for improving economic outcomes both from an individual standpoint and from an industry-wide competitiveness perspective.

Efficient and timely social infrastructure development continues to be needed, both to support current operations and future growth opportunities. The Australian Government's White Paper on Northern Australia offers a useful framework for leveraging cooperation across different levels of government to ensure the most efficient and effective models for infrastructure provision and service delivery are developed across the Pilbara.

- **Competitive and stable tax and royalty arrangements.** These arrangements should focus on the long-term objective of ensuring investors and governments share reasonably in the benefits of mineral resource development.

  As Port Jackson Partners stressed in *Opportunity at risk*, the essential characteristic of investment in mines and infrastructure, such as railroads and ports, is that it is sunk and irreversible. If economic outcomes turn out to be good, the investment is valuable. If not, the investment cannot be shifted to an alternative economic use. Even small changes in taxation settings can have large impacts on future investment by virtue of increasing government risk.

  Australia is a high tax jurisdiction for iron ore mining. The corporate tax rate of 30 per cent is relatively high in a world where capital is increasingly mobile. The increases in state royalties that characterised the boom years inevitably mean higher effective tax rates as prices have fallen.

  Releasing a tax discussion paper in March 2015, the Australian Government called for a 'national conversation' on tax. One idea would be for governments at all levels in Australia to commit to regular benchmarking of our tax and royalty regimes as a way of ensuring investor confidence in our resource taxation arrangements.

Australia's iron ore resources are globally significant assets – high-quality, and well matched to global commodity markets. Smart moves over the last decade, combined with policy actions that remain focussed on productivity, will ensure that the sector's capacity to generate enormous wealth for the nation will continue.

Endnotes

[1] A variety of public data sources have been used as different producers report Pilbara operations in different ways. Not all of the data needed for the analysis is present in company accounts. It is also important to note that this analysis aggregates return to both debt and equity investors. Hence, it does not take into account the different capital structures of iron ore businesses within the Pilbara.

[2] This analysis is based on an average of a large number of investment banks and broker houses.

[3] Copper and gold are arguably exceptions. In the case of copper, it has been suggested that industry-wide declines in copper ore grades, the aging of key mines and production difficulties at some large operations have meant the industry has been slower to meet ongoing high levels of demand. Whether higher-than-average prices are permanent or just somewhat persistent remains to be seen. Gold's role as a financial asset also complicates separating price movements associated with demand for gold as a metal from those for gold trading purposes.

[4] Reserve Bank of Australia, *Infrastructure Investment in China*, Bulletin, June quarter, 2014.

[5] The World Bank, *World Development Indicators.*

[6] National Bureau of Statistics of China.

[7] This can only ever be a broad analysis as iron ore producers would form their own views on price movements. However, it is very likely that movements in expectations would be highly correlated, even if some forecasts displayed more foresight than others.

[8] This is the present value of these revenues, calculated by adjusting future revenues by application of an interest rate to allow for the fact that some revenues appear some years into the future.

[9] These ships carry between 365,000 and 400,000 tonnes of iron ore, around double the next largest ships in Vale's fleet. Platts McGraw Hill Financial website, 19 May 2015.

[10] Committed production reflects Department of Industry and Science, *Resources and Energy Major Projects April 2015*, June 2015. Seaborne volumes based on Morgan Stanley forecast from March 2015.

[11] Port Jackson Partners, *Opportunity at risk: Regaining our competitive edge in minerals resources*, Report commissioned by and prepared for the Minerals Council of Australia, September 2012.

[12] David Lee, *Iron country: Unlocking the Pilbara*, A public policy analysis produced for the Minerals Council of Australia, 9, June 2015.

Minerals Council of Australia
Level 3, 44 Sydney Ave, Forrest ACT 2603
(PO Box 4497, Kingston ACT Australia 2604)
P. + 61 2 6233 0600 | F. + 61 2 6233 0699
www.minerals.org.au | info@minerals.org.au

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