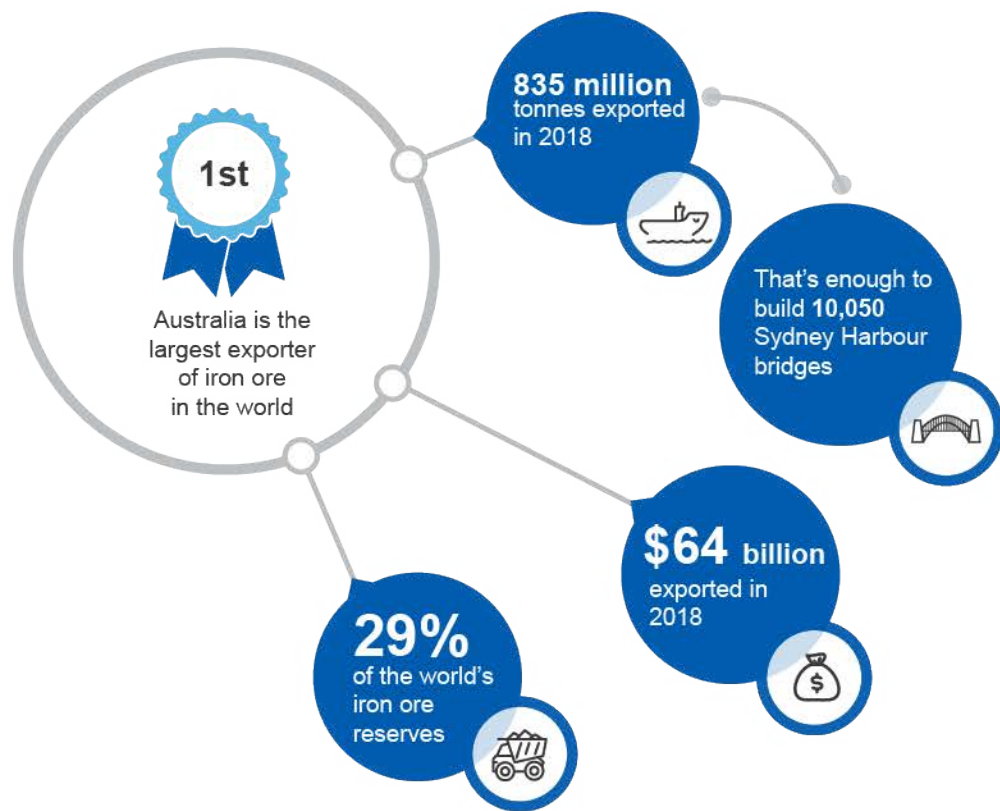


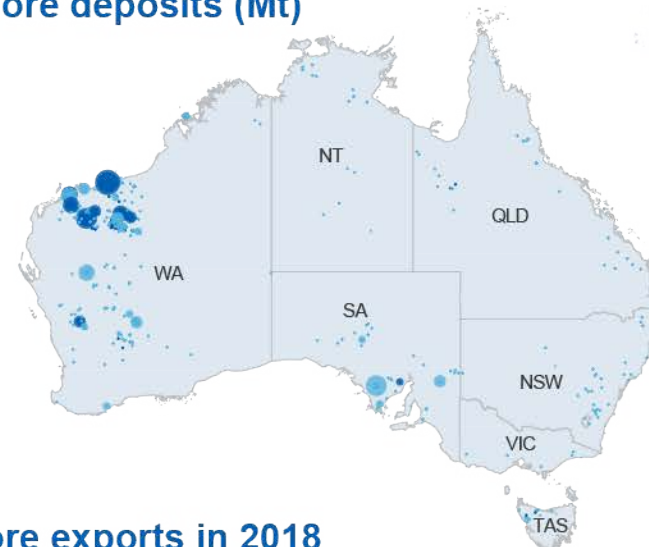
Iron Ore

Resources and Energy Quarterly June 2019

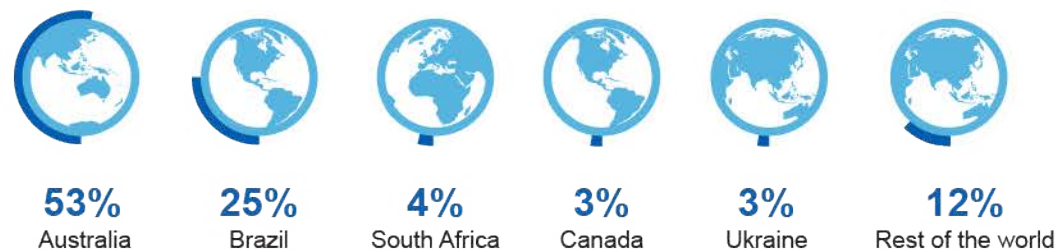


Major Australian iron ore deposits (Mt)

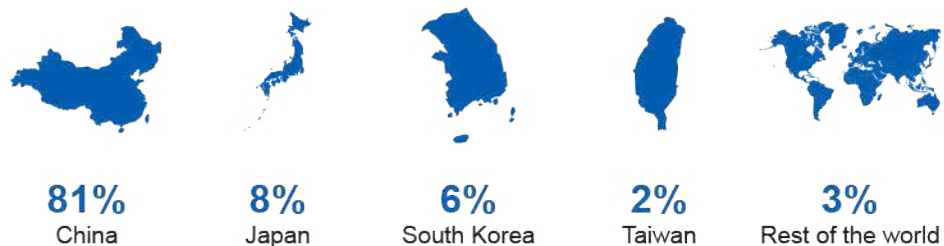
- <229
- 230–813
- 814–1,777
- 1,778–3,042
- 3,043–5,446
- >5,447
- Deposit
- Operating mine



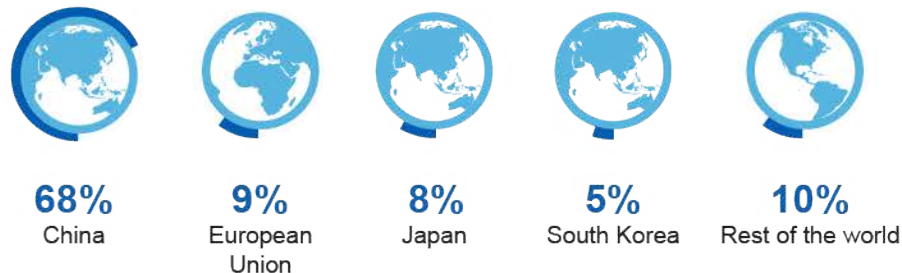
Global share of iron ore exports in 2018



Australia's iron ore key export destinations, 2018



Global share of iron ore imports in 2018



4.1 Summary

- The forecast iron ore price in 2019 has been revised up to average US\$80 a tonne (Free on board (FOB) Australia), due to supply disruptions — primarily in Brazil — and robust demand from China. Australia’s iron ore export earnings are set to increase from \$61 billion in 2017–18 to an estimated \$75 billion in 2018–19.
- The iron ore price is subsequently forecast to decline to average US\$57 a tonne (FOB Australia) in 2021, as the seaborne market returns to balance. Export earnings are forecast to decrease to \$65 billion by 2020–21, as a result of the forecast decline in prices.
- Australia’s iron ore exports are forecast to rise from an estimated 806 million tonnes in 2018–19 to 869 million tonnes in 2020–21, driven by large-scale producers ramping up to long-term production targets.

4.2 Prices

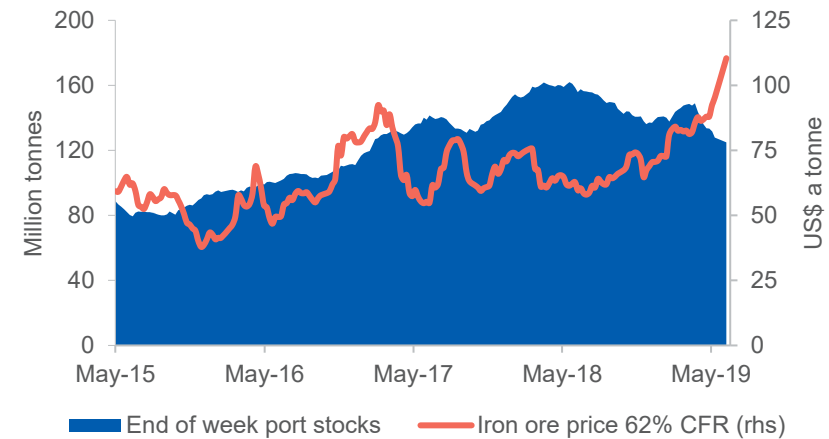
Iron ore prices surge after Brazilian tragedy shocks world supply

The FOB Australia iron ore price (62% iron content) — at which most Australian iron ore is sold — rose by 54 per cent year-on-year to average US\$88 a tonne in the June quarter of 2019, a five-year high, driven by both supply disruptions and robust steel production in China (Figure 4.1).

A decline in Vale’s Brazilian production, stemming from their tragic tailings dam rupture in late January, had the largest impact on seaborne supply. Adverse weather also trimmed supply from operations in the northern region. Vale reports that 90 million tonnes of production has been sidelined since the collapse of the Brumadinho dam, and it will be two to three years before they can produce at their pre-dam rupture target of 400 million tonnes. Cyclone Veronica also temporarily disrupted Australian exports in late March, adding to tightness in global seaborne supply.

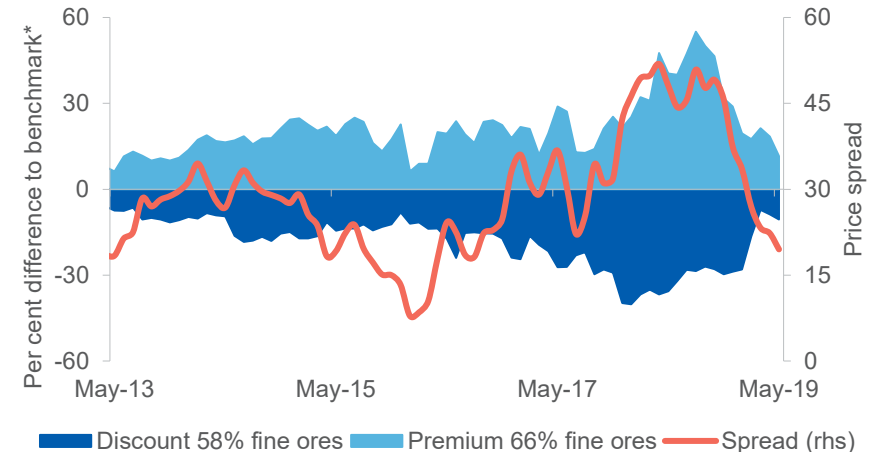
The supply issues helped drive China’s iron ore port stocks down by 17 per cent year-on-year in the month of May 2019. China imports around 70 per cent of world seaborne supply, and port stocks are an important indicator of market balance — the rapid decline in stocks reflected a tighter market and drove prices higher.

Figure 4.1: China's iron ore port stocks and spot price



Notes: China import iron ore fines 62% Fe spot (CFR Tianjin port)
Source: Bloomberg (2019) Antaika iron ore port stocks and Metal Bulletin

Figure 4.2: Iron ore price spread between grades



Notes: *Benchmark used is 62 per cent iron fines CFR
Source: Bloomberg (2019) China import prices

On the demand side, China's steel production continues to grow, driven by healthy profit margins and rising steel prices. Nonetheless, the high price and exceptionally tight supply of high grade iron ore (65% Fe content), have incentivised Chinese steel makers to use lower grade ores, which has led to a reduction in the price spread between high (66% Fe) and low (52% Fe) grade iron ores (Figure 4.3).

Prices forecast for short term strength before moderating

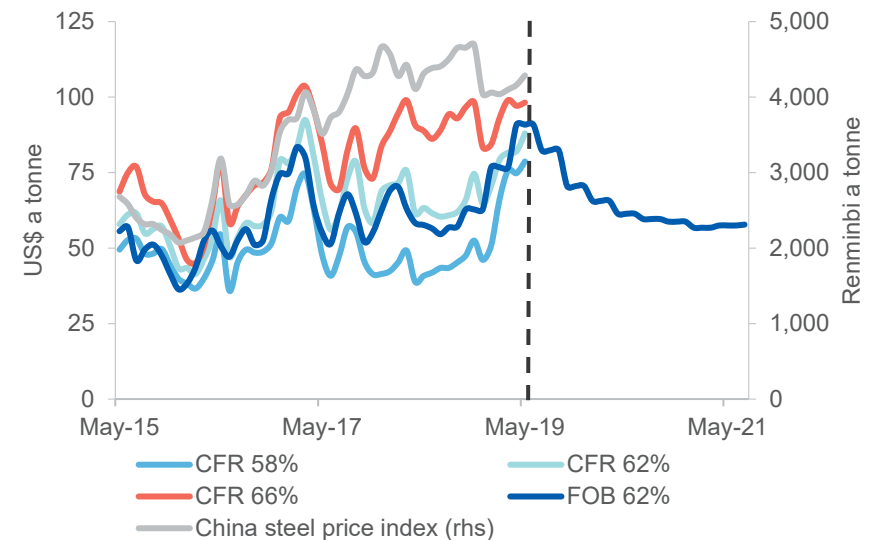
The iron ore price is forecast to increase by 29 per cent year-on-year to average US\$80 a tonne in 2019 (FOB), largely due to the dramatic cut in supply in the aftermath of the Brazilian dam collapse (Figure 4.3). Most of the recovery in Vale's production is expected to take two to three years, and will occur towards the end of the outlook period. However, 30 million tonnes stemming from the court ordered closure of Brucutu was granted regulatory approval to restart on 19 June 2019.

An expected slowdown in global economic growth in 2019 and 2020 is a key risk to the outlook, and will likely lead to less demand for steel-making inputs — metallurgical coal and iron ore. However, China (accounting for half of world steel production) is expected to respond to slowing growth and US-China trade tensions by loosening monetary policy and increasing government spending on (steel-intensive) infrastructure and construction projects.

The Chinese government's capacity to stimulate the economy could more than offset weaker demand elsewhere and thus flow through to higher iron ore and metallurgical coal prices (Figure 4.4). Much depends on the response of Chinese steel and iron ore producers: Chinese steel producers will attempt to use more scrap material, thus displacing iron ore in steel production. Chinese iron ore producers will expand production and re-open operations, in an attempt to reduce imports.

The iron ore price is forecast to decline to average US\$57 a tonne in 2021, as Vale's production recovers and as moderating consumption weighs on China's demand, returning the seaborne market to surplus.

Figure 4.3: Iron ore price by grade and China steel price index



Notes: The OCE forecasts the FOB (free on board) Australia iron ore price, not the benchmark CFR (cost and freight) North China iron ore price.

Source: Bloomberg (2019) Metal Bulletin; Department of Industry, Innovation and Science (2019)

Figure 4.4: Iron ore price and China steel production growth



Notes: China import Iron ore fines 62% Fe spot (CFR Tianjin port)

Source: Bloomberg (2019) China import prices; World Steel Association (2019)

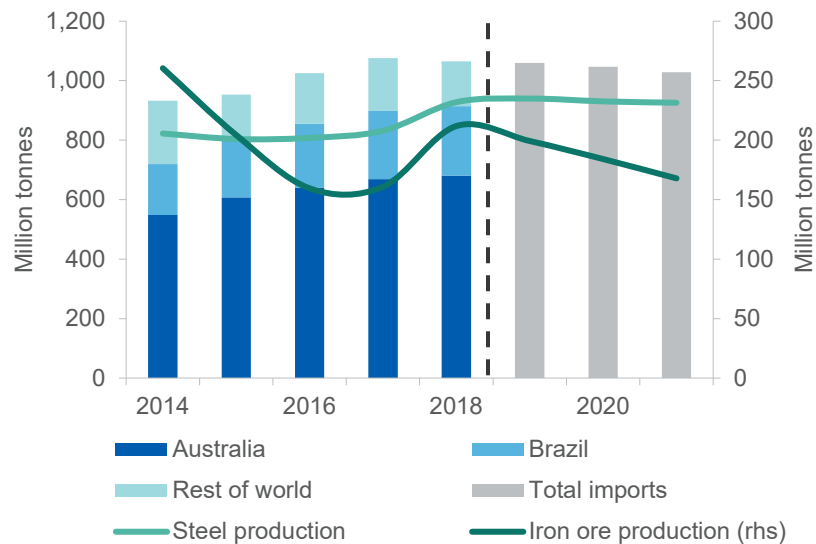
4.3 World trade

China's iron ore imports forecast to gradually decline

China's iron ore imports declined by 4.9 per cent year-on-year in the five months to May, to 425 million tonnes, despite record high steel production. The decline in imports of iron ore to China — which accounts for roughly 70 per cent of imported seaborne supply — reflects both the supply disruptions stemming from Brazil and, to a lesser extent, Australia, but also higher domestic iron ore production and the rising use of scrap material — which is displacing some iron ore use.

China's iron ore imports peaked at 1,075 million tonnes in 2017, and are forecast to decline over the outlook period — down to 1,029 million tonnes in 2021 (Figure 4.5) — driven by an expected decline in steel output and rising scrap use (see the *steel* chapter).

Figure 4.5: China's iron ore imports and production



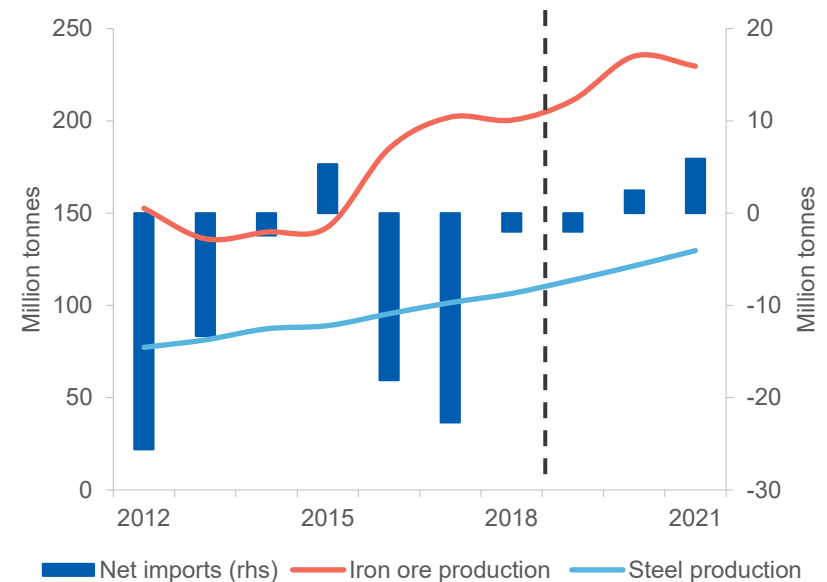
Notes: China's iron ore production is quality adjusted. 2018 import figures are estimates.
 Source: Bloomberg (2019) Antaike Information Development; Bloomberg (2019) China Customs General administration; Department of Industry, Innovation and Science (2019)

India set to become a net importer of iron ore

India's iron ore production is forecast to increase by 4.6 per cent annually, from an estimated 200 million tonnes in 2018 to 230 million tonnes in 2021. Rising iron ore production will be driven by rapidly growing demand from the domestic steel industry. However, ongoing challenges in accessing land and capital, insufficient infrastructure to transport ore, complex regulations and community objections, are likely to hinder the development of new mines over the outlook period.

India is forecast to become a small net importer of iron ore from 2020 onwards, as the government pursues ambitious steel production targets, but tightly regulates the domestic iron ore industry and continues to clamp down on illegal iron ore mines (Figure 4.6).

Figure 4.6: India's iron ore imports and domestic production



Source: World Steel Association (2019); Department of Industry, Innovation and Science (2019)

Brazilian supply shock to dampen export growth in the short-term

Global seaborne iron ore supply is forecast to decline by 4.1 per cent to around 1,530 million tonnes in 2019, driven by events stemming from the Vale dam collapse in Brazil in late January (Figure 4.7).

Vale's production is expected to gradually recover over the next three years, steadily moving towards the 400 million tonne target it set before the Brumadinho tailings dam collapse. In the meantime, the supply of high grade (65% Fe content) iron ore will be limited, only improving with the ramp up of Vale's S11D project at the Carajás complex, and the restart of their Brucutu operations.

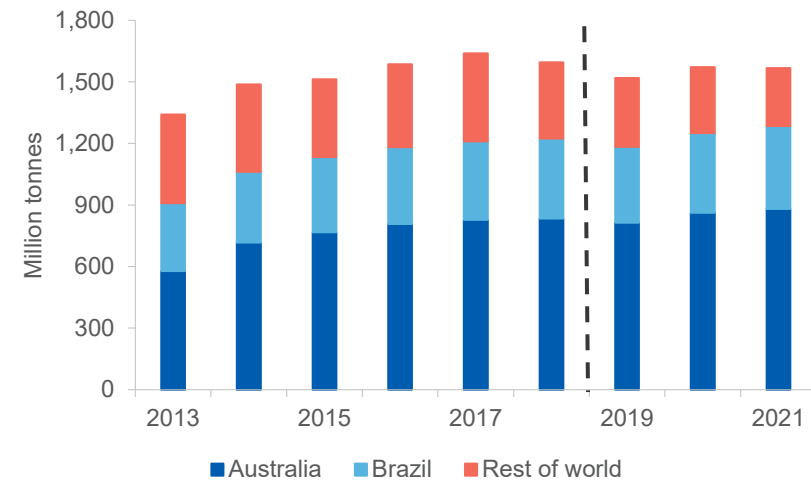
The full recovery in Vale's production hinges upon 60 million tonnes of production associated with the use of tailings dams. Of this amount, 30 million tonnes is expected to come back on line if Vale can successfully convert these mines over from wet processing — which relies on water to remove impurities from run-of-mine ores — to dry processing, which does not require the use of tailings dams.

Vale will also need to prove to government authorities that the subsequent use of blasting will not impact the stability of associated tailings dams (otherwise it is unlikely they will be granted permission to restart).

The other 30 million tonnes involves operations which are expected to continue using wet processing and tailings dams. The restart of wet processing — expected to take two to three years — requires Vale to prove to authorities that the tailings dams are safe to operate, and in some cases, undertake various measures to strengthen existing dam structures.

Elsewhere in Brazil, Anglo American's Minas-Rio continues to ramp up towards nameplate capacity of 26 million tonnes, producing 4.9 million tonnes of high grade iron ore in the March quarter 2019. Vale's high grade Samarco mine — closed since the tailings dam burst in November 2015 — is expected to return to production by 2020, with output gradually ramping up to nameplate capacity of 32 million tonnes.

Figure 4.7: Outlook for global iron ore exports



Source: World Steel Association (2019); Department of Industry, Innovation and Science (2019)

Supply elsewhere to gradually help ease the market deficit

Australia, the world's largest producer of iron ore, is forecast to increase production from 2020 onwards — but has limited capacity to ramp up in 2019 and was adversely impacted by Cyclone Veronica (Section 4.4).

Two projects in the Democratic Republic of Congo are set to ramp up over the outlook period: the Sapro group recently delivered its first shipment of high grade (65% Fe) iron ore to China, and is expected to ramp up to 12 million tonnes by 2022; and the Glencore and Zanga joint venture is expected to supply 2 million tonnes of high grade iron ore over 2019 and 2020.

Tacora's Wabush high grade iron ore mine in Canada is on track to restart in June and gradually ramp up to 6 million tonnes.

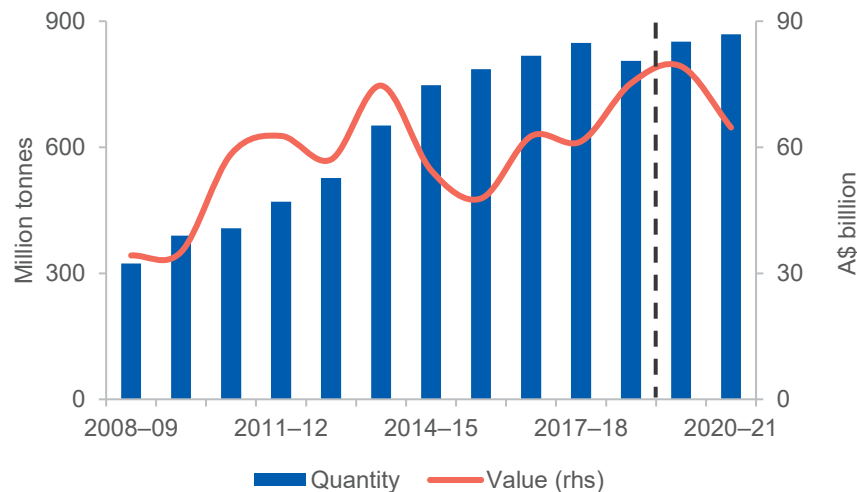
4.4 Australia

Australia's iron ore export earnings boosted by higher prices

Australia's iron ore export earnings are estimated to have increased by 23 per cent to \$75 billion in 2018–19, the second highest level on record (Figure 4.8). Export earnings benefited from rising prices, which more than offset the impact of lower volumes — which were adversely impacted by weather related events in the first half of 2019. Australian producers also benefited from a relatively low exchange rate, as well as a narrowing in the price spread between high and low grade ores — as Chinese steel makers substituted low grade ores to mitigate the loss of Vale's high grade supply.

Export values are forecast to rise to \$79 billion in 2019–20, driven by elevated prices and export volumes, before declining to \$65 billion in 2020–21. Driving the decline will be falling prices, as the seaborne market returns to a more balanced position from the second half of 2020 onwards.

Figure 4.8: Australia's iron ore export volumes and values



Source: ABS (2019) International Trade, Australia, 5368.0; Department of Industry, Innovation and Science (2019)

Australia's iron ore export volumes forecast to grow

Australia's iron ore export volumes declined by 5.2 per cent year-on-year in the March quarter to 188 million tonnes, primarily driven by the impact of Cyclone Veronica in late March — which disrupted port operations in the Pilbara region.

Export volumes are forecast to increase by an annual average of 3.9 per cent over the outlook period, from 806 million tonnes in 2018–19 to 869 million tonnes in 2020–21. Higher volumes will be underpinned by the development of three of the world's largest iron ore projects, namely: Fortescue's Eliwana, set to commence in December 2020 and produce 30 million tonnes per year; Rio Tinto's Koodaideri, expected to commence in late 2021 and produce 43 million tonnes per year; and BHP's South Flank, set to produce 80 million tonnes annually and replace existing production from the Yandi operations in 2021.

Revisions to export earnings

The forecasts for Australia's iron ore export earnings in 2019–20 has been revised up by \$12.5 billion, reflecting an upwards adjustment to the iron ore price in the wake of the Brumadinho tailings dam collapse on 25 January 2019 and robust steel production in China. The iron ore price is expected to be higher than previously forecast — and for a longer period — due to the limited capacity of other operations in Australia and elsewhere to ramp up and replace Vale's production loss of high grade supply, at least in the short term.

Iron ore exploration expenditure expected to rise over the outlook

Australia's iron ore exploration expenditure increased by 18 per cent year-on-year to \$59 million in the March quarter 2019 — the strongest growth since 2012. Iron ore exploration expenditure has picked up due to the strong surge in prices and is expected to increase over the outlook period. Strong demand for high grade iron ore — driven by Chinese steel makers' efforts to improve productivity and manage carbon emissions — is likely to support future exploration targeted at finding high grade iron ore reserves.

Table 4.1: World trade in iron ore

	Million tonnes				Annual percentage change		
	2018	2019 ^f	2020 ^f	2021 ^f	2019 ^f	2020 ^f	2021 ^f
Total world trade	1,595	1,529	1,570	1,568	-4.2	2.7	-0.2
Iron ore imports							
China	1,065	1,060	1,047	1,029	-0.4	-1.2	-1.7
European Union 28	148	150	152	153	1.4	1.4	0.2
Japan	129	130	131	129	0.5	0.7	-1.1
South Korea	73	76	75	75	3.0	-0.4	-0.4
India	16	12	15	17	-24.5	20.8	14.6
Iron ore exports							
Australia	835	814	862	881	-2.5	6.0	2.2
Brazil	390	370	388	403	-5.0	4.9	3.8
Ukraine	35	30	29	30	-14.3	-3.3	1.7
India	18	14	12	11	-21.6	-14.1	-11.1

Notes: ^f Forecast.

Source: World Steel Association (2019); International Trade Centre (2019); Department of Industry, Innovation and Science (2019)

Table 4.2: Iron ore outlook

World	Unit	2018	2019 ^f	2020 ^f	2021 ^f	Annual percentage change		
						2019 ^f	2020 ^f	2021 ^f
Prices ^{bc}								
– nominal	US\$/t	61.2	80.1	61.4	57.5	30.9	-23.4	-6.3
– real ^d	US\$/t	62.6	80.1	60.0	55.0	28.0	-25.2	-8.3
Australia	Unit	2017–18	2018–19 ^s	2019–20 ^f	2020–21 ^f	2018–19 ^s	2019–20 ^f	2020–21 ^f
Production								
– Steel ^{hs}	Mt	5.71	5.78	5.78	5.79	1.2	0.0	0.2
– Iron ore	Mt	900	890	903	912	-1.1	1.5	1.0
Exports								
Steel	Mt	1.15	0.90	0.99	1.00	-21.4	9.8	0.2
– nominal value	A\$m	926	949	751	752	2.4	-20.9	0.2
– real value ^{hi}	A\$m	945	949	733	717	0.4	-22.7	-2.2
Iron ore	Mt	848	806	852	869	-5.0	5.7	2.0
– nominal value	A\$m	61,392	75,233	79,266	64,691	22.5	5.4	-18.4
– real value ⁱ	A\$m	62,616	75,233	77,408	61,657	20.2	2.9	-20.3

Notes: **b** fob Australian basis; **c** Spot price, 62 per cent iron content basis; **d** In 2019 US dollars; **f** Forecast; **h** Crude steel equivalent; Crude steel is defined as the first solid state of production after melting. In ABS Australian Harmonized Export Commodity Classification, crude steel equivalent includes most items from 7206 to 7307, excluding ferrous waste and scrap and ferroalloys; **i** In 2018–19 Australian dollars; **s** Estimate.

Source: ABS (2019) International Trade in Goods and Services, Australia, 5368.0; Bloomberg (2019) Metal Bulletin; World Steel Association (2019); AME Group (2019); Company Reports; Department of Industry, Innovation and Science (2019)