

WORKING PAPER 13 ADAMS & WICKES

Standing up to Chinese economic coercion: Is Australia a model of economic resilience?

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Table of contents

Executive summary / 01

Introduction / 02

Quantifying the Impact of China's Economic Sanctions on Australia / 03

Reading the Bilateral Tea Leaves / 07

Implications for Australia's Goods Exports to China / 07

Thermal coal: The testing Ground for China's Diversification Plans / 08

The bigger picture: how far can China spread its trade risks? / 09

Implications for Australian Iron Ore and LNG Exports / 12

Iron ore / 12

LNG / 13

Policy conclusions / 15

- References / 17 Annex 1 / 20 Annex 2 / 22
- Annex 3 / 27

Table of figures

Figure 1: Australia's Merchandise Exports: Average Annual Growth, 2015-21/22 / 03

Figure 2: Australian Exports to China of Iron Ore, LNG and Coal: Volumes and Values / 04

Figure 3: Percentage Change in Volumes of Australian Exports to China and the World: 2019-2022 / 05

Figure 4: Australian Losses from Chinese Trade Restrictions at 2019 Prices / 06

Figure 5: Share of Australian Goods Exports to China and the Iron Ore Price / 06

Figure 6: Growth in the Value of China's Imports from 2015: Selected Countries / 09

Figure 7: China's Imports of Minerals by Source / 10

Figure 8: Volume of Chinese Imports from Individual Economies in Figure 7 and selected Neighbours, 2019-22 / 11

Table of tables

Table 1: Hypothetical Impact in 2022 of Coercion on Gross Australian Export Revenue in the China Market (A\$ million) / 20

Table 2: Hypothetical Gross Losses from Coercion on Goods in the Chinese Market (A\$ millions) / 21

Table 3: Australian Export Volumes before and after the Imposition of Restrictions ('000 tonnes, unless otherwise indicated) / 23

Table 4: Australian Exports of Metallurgical and Thermal Coal before and after Restrictions ('000 tonnes) / 23

Table 5: Australian Export Revenue before and after the Imposition of Restrictions ((A\$ millions. current dollars) / 25

Table 6: Australian Export Revenue from Coal before and after the Imposition of Restrictions: Current Dollars (A\$ millions) / 25

Table 7: Indicative Net Losses from Coercion (A\$ millions at base period unit values) / 26

Table 8: Indicative Net Losses for Different Types of Coal (A\$ millions at base period unit values) / 26

Table 9: Shares by Value of China's Import Market: Selected Commodities (per cent) / 27

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Executive summary

Australia-China relations have deteriorated sharply in the last three years, most visibly because of China's formal and informal bans on some important Australian commodity exports.

Costs to Australia have been significant. The purpose of this paper is to assess those costs to the end of 2022 and to provide some sense of possible future costs if relations, while improving, remain strained and difficult.

Six points come out of our analysis:

- Australia has escaped the worst from Chinese coercion thanks mainly to the good fortune of high international commodity prices.
- Coercion has still come at a considerable cost to Australian export revenue, and the cost continues to grow. Gross losses for the nine restricted commodities in the Chinese market – coal, copper ores and concentrates, frozen beef, wine, cotton, barley, rough wood, rock lobster, and hay - are estimated at around A\$3 billion in 2020. A\$25 billion in 2021 and A\$31 billion in 2022. Net losses after re-direction to third country markets are estimated in the order of A\$11 billion in 2022 and around A\$20 billion for 2020-22, with coal making up the majority.
- Stabilising and then re-setting bilateral relations will continue to be challenging and are likely to slow growth in Australian goods exports to China. A rebound in trade in some commodities - wine and seafood for example - seems probable, if only as a sign of good will from China. But both countries will show a degree of caution in rebuilding trade in coal, particularly because China is attempting to spread its trade risks by diversifying sources of commodity imports. This has a long way to go and needs careful watching.
- Recent declines in the share of Australian goods exports to China mostly reflect movements in the price of iron ore rather than any shift in the fundamentals of the trading relationship.

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- Australia-China trade in iron ore and LNG is not immune to the state of bilateral relations. There is a realistic scenario where Australian exports of iron ore and LNG to China continue at a high level because of mutual dependence, but where Australia faces the prospect of lower international prices and loses market share as China attempts to increase its economic security by widening supply options. This again needs careful watching.
- Australia has significant agency in the bilateral economic relationship based on strong mutual benefits from existing trade and the high priority China places on security of supply. Beijing's leadership might see sharply reducing dependence on Australian resources to become dependent on other, possibly less reliable, suppliers as a poor bargain.

If Australia is to exercise this agency effectively, it must be open to a range of possibilities on China and have at least a rough idea of the desired end point for relations with China in the next 10-15 years. This end point will depend to a large degree on how US-China relations evolve. But this is not necessarily the full story. Australia, like East Asia, must coexist with China. To continue to extract mutual benefit from the Australia-China relationship, we must negotiate our differences with China just like every other country in our region.

An open and continuing public debate is needed to help crystalise views on the ways, means and objectives behind our policies towards China, how we negotiate our differences, how to gauge the success or otherwise of our engagement, and how to work with others in pursuing our interests.

Introduction

In the prevailing explanation of the impact of China's economic coercion against Australia, 'China's bark is shown to be worse than its bite' (for example Rajah 2021; Wilson 2021) and Australia shows the world that it is possible to stand up to Chinese bullying and still prosper.

With the passage of time and tentative improvements in the Australia-China relationship from the change of Australia's government in May 2022 some of the dust has settled on Chinese restrictions on significant Australian exports.² So, now is a good time to review Australia's response to coercion and take stock of its impacts. It is also an opportune time to consider future trade implications arising from strained relations.³

The paper includes a detailed discussion on the costs to Australia of China's sanctions. Two methods are used. The first, set out in Annex 1, uses monthly Chinese customs import data to look at Australia's market share following the onset of sanctions for each of the affected commodities to the end of 2022. The difference between Australia's actual market share post-sanctions and the share held prior to sanctions makes it possible to calculate annual gross losses to Australia's export revenue in the Chinese market. The second method, developed in Annex 2, uses Australian Bureau of Statistics export data. It calculates the net loss, accounting for the extent to which decreased sales in the China market were offset by increased sales to other overseas markets. Both methods suggest significant losses to

Australia, though they have been masked by sharply rising commodity prices for key minerals like coal, and by the recovery in Australian production following the end of drought for commodities like barley.

The paper is organised as follows. The first part looks at gross and net losses to Australian export revenue from blocked trade in the Chinese market. The second examines the proposition that, even if trade is unblocked quickly in sanctioned commodities, re-setting bilateral relations will continue to be challenging and costly for trade. Adding to this challenge, China may be in the early stages of diversifying away from Australia as a source of supply for resources and energy. Potential costs from continuing suspicions in Australia-China relations are explored next for iron ore and liquefied natural gas (LNG). Finally, some policy conclusions are considered.

Quantifying the impact of China's economic sanctions on Australia

China has continued to grow as a market for Australian goods, despite coercion (Figure 1), principally because of high commodity prices since the aggregate volume of key resources exports peaked in 2019 (Figure 2). Australia's terms of trade were at record levels by 2021-22, exceeding the high points of the Korean War wool boom in the early 1950s and

the resources boom in the early years of this century. This substantially boosted aggregate export receipts from the Chinese market and eased our transition to more diversified markets. Rising global commodity prices through 2020 and much of 2021 also made it easier for Australian suppliers to discount products.

Figure 1: Australia's merchandise exports: average annual growth, 2015-21/22



² Coal, copper ores and concentrates, frozen beef, wine, cotton, barley, rough wood, rock lobster, and hay.

³ Services trade is not considered here because of problems with data, the impact of Covid-19 on key services trades like tourism and education, and to keep the paper to a manageable length. This omission is important because services will become increasingly important for Australia, including in our trade with China.

While softened by high commodity prices, Chinese coercion nevertheless caused steep declines in the volumes and values of affected Australian commodities sold to China. As already indicated, two 'back of the envelope' methods are used here to estimate resulting losses to the value of our exports.

> Source. Calculated from Department of Foreign Affairs and Trade (DFAT) Trade Time Series Data and ABS (2023a).

Note. Data are compound annual growth rates for Australian dollar values. All data are for 2015-21 except for one of the entries for China, which is for 2015-22. Some confidential items are excluded. The countries in the graph were Australia's top 15 goods export markets in 2021

"Australia has escaped the worst from Chinese coercion through fortunate timing, but it has still come at a considerable cost."

The first method calculates Australia's share of China's imports for each of the affected commodities over a representative period prior to the introduction of restrictions and assumes that Australia would have maintained this market share had restrictions not applied. Annex 1 provides details. Using this method, we estimate losses in the order of A\$31 billion in 2022. Other studies, including by the present authors (Wickes, Adams, and Brown 2021), have estimated gross losses in export revenue in the Chinese market - that is, not considering diversion of exports to other markets - at A\$20 billion or more per year. This estimate is usually based on the value of exports in 2019 before restrictions were applied. Our higher current estimate reflects the fact that the dollar value of China's import market for

commodities has typically increased since 2019, owing to rising prices and increases in the volume of Chinese imports of those commodities from all sources.

The second method, outlined in Annex 2, is based on Australian export data and is used to estimate the impact on export revenue after considering diversion of exports to other markets. It measures the decline in exports to China of each sanctioned commodity from a base period prior to the introduction of restrictions and the extent to which the decline in exports to China have been offset by rising exports to the rest of the world (RoW) as traders sought new markets.

In terms of volumes, restricted commodities fall into three broad categories (see Figure 3 and Annex 2, Table 3).







- Cotton, barley and hay: Exports to the RoW increased strongly owing to improved growing conditions in Australia, as well as available alternative markets. These increases substantially outweighed the loss in export volumes to China.
- Frozen beef: Exports to both China and the RoW declined because of supply constraints in Australia as herds were rebuilt following a drought (Beef Central 2022; 2023).

In current dollars, the analysis leads to guite different results. Coal exports to China declined from A\$13.7 billion in 2019 to zero in 2022 but rose to the RoW from A\$50.2 billion to A\$141.6 billion (Annex 2, Table 5). This result was driven by sharp rises in coal prices on global markets with the unit value of Australia's coal exports to the RoW rising from A\$165/tonne in 2019 to A\$418/tonne in 2022. Exports of barley, cotton, frozen beef, wine, and hay to the RoW also experienced rises in unit values between 2019 and 2022 (ABS 2023b).

- Rather than working with data at current values, Annex 2 examines the change in export revenue at base period (normally 2019) export prices (or more strictly unit values) of the commodities concerned. The method is closely related to that used by Laurenceson and Pantle (2021), even though the starting point is quite different.4 Estimated losses are shown in Figure 4 for each of the nine restricted commodities
- ⁴ We start with the assumption that the impact of Chinese coercion can be measured by the net impact of changes in export revenue from sales in China (which will be negative) and sales to the rest of the world (usually positive, but mostly less than the losses in China), with both measured at prices in the base period used for the comparison (normally 2019). Box 1 in Annex 2 then shows through a few lines of algebra that essentially the procedure used by Laurenceson and Pantle follows from this. Laurenceson and Pantle do not derive their method in this way



Source: Derived from ITC Trade Map Database, GACC Chinese Customs Statistics Database and OECD ITIC Database. Note. Iron ore, LNG, and coal together made up around three quarters of the value of Australian merchandise exports to China in 2019, the year before most restrictions came into force. Volume data are from quantities set to equal values in the 2015 base year. LNG exports are derived from import data for China, adjusted in the case of values by OECD c.i.f.f.o.b. margin data for the broader 4-digit HS 2711. It has been assumed that the margins for 2021 and 2022, which are not yet available, are the same as for 2020.

and further details are in Annex 2 (Table 7 and Table 8). Overall, losses for the nine are estimated in the order of A\$11 billion in 2022 and at A\$20 billion for 2020-22. As might be expected, coal makes up the lion's share, with other big contributions from frozen beef, wine, wood in the rough, and rock lobster.

Overall, Australia's export diversification has been limited for some commodities. For coal, approximately 35 million tonnes were diverted to RoW markets in 2022, compared with 2019, but 16 million tonnes of that went in additional sales to Australia's biggest coal market, Japan. Another 5 million tonnes went to the fourth biggest market in 2019. India. The apparent success of coal diversification mostly reflects extraordinarily high prices in 2022.

Towards the other end of the spectrum of trade values, about 96 per cent of rock lobster exports by volume went to China



Figure 5: Share of Australian goods exports to China and the iron ore price



in 2019. Three years later, 43 per cent of a much smaller volume went to Hong Kong, 31 per cent to Taiwan, 10 per cent to Vietnam, and six per cent to Thailand. Much of the product going into Hong Kong and Taiwan appears to have been on-sold to China through the 'grey trade' (Xu 2021; Glasgow 2023).

Diversification was successful for cotton, barley, and hay, but losses were still incurred for cotton and barley at base year prices because of lost price premiums in the Chinese market. To the extent that it has occurred, diversification was supported by access opportunities provided particularly by regional and bilateral trading arrangements negotiated over the last couple of decades.

Looking at the changing picture of diversification in Australia's total goods exports, the dominant factor behind China's growing share in recent years was the rising price of iron ore — our key export to China. Unit export returns for Australia by 2021 were almost 80 per cent above the longer-term average for iron ore over the 10 years from 2010 to 2019. Falling iron ore prices from around mid-2021 were then critical in reducing China's share through late 2021 and much of 2022 (Figure 5). China's share is now around 2015 levels — approximately 30 per cent — down from 40-42 per cent from late 2020 to late 2021. This is still high and well above the share directed to Japan, whose share of Australia's exports went through a similar roller coaster ride in response to swings in international coal prices.

Sources. Data at ABS (2023a) and

World Bank World Commodity

Note. Both series in the graph

cent iron, and cost and freight

to China. Some confidential

are 12 month moving averages.

The spot price is for fines, 62 per

items are excluded from the ABS

series and this changes over time:

comparisons over time should

therefore be interpreted with

caution. Dmtu stands for dry

metric tonne unit.

Price Data.

Reading the bilateral tea leaves

The quicker that formal and informal restrictions on Australian exports to China are removed, the better the outcomes for Australian industry, as well as for China.

There are some encouraging signs that Australia-China relations may be beginning to stabilise. Recent high-level meetings across a range of portfolios are a good beginning. Both sides are striking the note that bilateral relations need to be improved and strengthened for mutual benefit, and that building up trust and navigating differences will take time and effort (Wong 2022; Wang Yi 2022).

However, while encouraging, both sides will proceed with caution. Removing or reducing Chinese trade restrictions requires addressing impediments that Australia sees as unfair. It also requires addressing impediments that China has cited as being unfair, including some of Australia's anti-dumping and countervailing cases on Chinese products and recent restrictions on foreign direct investment.

Moreover, addressing current trade tensions is only the first, albeit essential, part of addressing the greater mediumto-long term challenge of stabilising and re-setting bilateral relations. This too will be approached cautiously.

In large part, this is because US-China tensions increasingly set the global context. A 'cold war' mentality has now taken hold in both countries, reducing the Australian Government's flexibility in engaging with China.

In part, Australia's caution will be a response to changes in domestic politics. The more considered tones of the Albanese Government towards China still reveal a wariness and fear that China will use its growing economic and political weight aggressively to upend existing regional and global arrangements. These perceptions are reinforced through popular Australian binary political caricatures, where China plays the villain in its engagement with the international political and economic systems. Consequently, the Australian public is now suspicious and fearful of China (Australia Institute 2022; Lowy 2022). This shift has occurred within the last 3 or 4 years and replaces widely shared views that evolved from the 1970s that China, while different in its economic and political systems, was an economic opportunity and a cooperative partner on several fronts. No Australian Government can afford to be too far out in front of prevailing attitudes on China, notwithstanding the fact that it has an influential role in shaping them.

And, in part, China will take a cautious approach to re-setting Australia-China relations. The priority attached to national security and the economy as motivations for Chinese policy action ebbs and flows. National security appears to be ascendant at present and now takes in disparate areas from politics, the economy, and culture to technology, space, and overseas interests, including China's support for Russia against western interests (including Australian) in Ukraine. Whether this ascendancy continues in years to come is impossible to evaluate. Judging by President Xi Jinping's bleak assessment of the international geopolitical environment (for example Xi 2022), it may well. But Xi shows a capacity for pragmatism, at least judging by the abrupt end of the zero Covid strategy following anti-lockdown protests in Shanghai. China's recently modified approaches to dealing with the



property market and elite entrepreneurs may also be examples of pragmatism in action. And pragmatism will be needed in managing strategic relations, the economy, and trade if China is to escape the middle-income trap and achieve anywhere near the regional and global influence it seeks.

Implications for Australia's goods exports to China

What these shifting currents and priorities in international and domestic politics mean precisely for Australia-China trade is complicated by the slowing pace of China's economic growth, its gradual shift towards more domestic consumption-led growth and the move towards greater self-reliance in some key commodity and technology areas. But two things are becoming clearer.

First, clearing away some of the current restrictions on trade could realistically lead to a rebound in Australian exports of products like wine and seafood. Chinese demand is potentially very strong and Australian products enjoy a good reputation. Australian firms also would be keen to recover some

of the losses incurred in recent years, though they would be mindful of the hard lessons of market diversification. There could be opportunities too for barley: the international market is tight, concerns over food security are strong and the suspension of Australia's WTO case against China on barley is part of a bid both to ease bilateral relations and potentially re-start trade in barley. Similarly, there are opportunities for coal⁵ - imports of Australian coal in March 2023 were the highest since November 2020 and rose strongly in April though rebuilding trade from the ground up will be approached cautiously by both countries.

And second, despite the difficulties and potential costs, China is attempting to

lock-in imports of critical commodities like oil, natural gas, coal, major mineral ores and concentrates, oil crops and cereals from a wider group of countries. This has a long way to go, and faces substantial practical limits, but just as it makes good sense for Australia to spread risk by diversifying export markets, it also makes good sense for China to spread risk by widening import sources for major commodities.

"Strained Australia-China relations could still dampen growth in Australian goods exports to China."

and for broader reasons linked to energy security (IEA 2022a). And it must import large volumes of thermal coal because its increasingly large fleet of efficient coal-fired power plants relies on specific blends of imported and domestic coal. Like other economies, it will scramble to meet growing energy requirements from a range of fossil fuel and renewable sources as it goes through the long transition to decarbonise its economy.
However, Australian and Chinese interest in resuming the coal trade is unlikely to result in levels returning to those reached

Thermal coal: The testing

China is testing the water in lifting its

undeclared ban on Australian coal. It is

on a trade of structural importance to

Interest in resuming trade has risen

companies and Chinese importers.

It is attractive to Australian miners.

dramatically among Australian mining

Relationships at the company level are

strong, and markets like India are price

sensitive, so a possible price premium

Resuming trade is also attractive

to Chinese importers. China badly

miscalculated with its informal ban on

Australian coal at a time of tightening

global supply and demand for energy.

from wherever it could, even with rising

domestic production. For a time in 2022,

and metallurgical coal because stocks of

result of slightly reduced steel production.

power stations were blending thermal

metallurgical coal/coke were high as a

China will continue to import coal to

smooth fluctuations in its energy market

Domestic prices shot up and China

was forced to scramble to get coal

from China for security of supply would

signalling a willingness to move forward

ground for China's

both countries.

be welcome.

diversification plans

in resuming the coal trade is unlikely to result in levels returning to those reached prior to the informal ban. One factor is that China can no longer be regarded as a reliable growth market for thermal coal. Over time, imports are likely to plateau before declining gradually. In broad terms, China is increasing domestic coal production to reduce reliance on imports

⁵ Chinese imports of Australian coal are moving up quickly from virtually nothing at the start of 2023. China imported 73kt of metallurgical coal from Australia in February this year and 285kt in March. The increase in thermal coal imports was more dramatic from 0.134Mt in February to 1.93Mt in March (Wong and Ji 2023). While encouraging, this is only a fraction of monthly imports from Australia in 2019 or even 2020: in those years total coal imports from Australia were 92.1Mt and 70.6Mt respectively. (IEA 2021; 2022a).⁶ A more important factor from a short- or medium-term perspective is that China has adjusted its international trade in coal just as Australia has. It will not go back to dependence on Australia.

Some Australian coal miners obviously will put large volumes into China if they have the capacity, but many will be cautious if this means supplying less to recent big customers like Japan, South Korea, Taiwan, India, and Vietnam. This is partly because the Australian coal industry has gone through an at times difficult transitional period in selling more to established markets while finding new ones, and existing arrangements are highly profitable given current world prices. It is also because of uncertainty regarding the state of future US-China and Australia-China relations: could bans be reimposed in some form if relations deteriorate or even if they just remain strained?

According to Xia and Yao (2022), Chinese importers also would be cautious in reviving large-scale trade. Seaborne coal imports from Russia are increasing strongly. Rail capacity to move thermal coal from Mongolia into China is increasing massively. Mongolia should also get access to seaborne trade markets via a new rail link through China to the East China Sea. Dedicated domestic coal rail networks move coal at low cost from producing areas in Inner Mongolia, Shanxi, and Shaanxi to the rest of China. And, most fundamentally, Chinese buyers will need a sustained signal from the highest levels of government that Australia is again an integral part of its seaborne coal supply mix rather than a swing supplier.

The big questions are around energy security — basically how to increase China's already very high levels of domestic self-sufficiency (particularly in coal) and how it adjusts sources of supply across a range of countries. Australia will be part of the mix but the extent will depend on how far relations can be mended and on the tightness of regional and global coal markets.

The bigger picture: how far can China spread its trade risks?

As the world's largest exporter of goods (ahead of the United States and Germany) and the second largest importer (behind the United States), China is deeply woven into the fabric of world trade. Its manufactures, minerals, and food sectors are closely linked to those of other economies, including many that might not line up with China in the event of a crisis. Its biggest manufactures import, electrical machinery, is closely integrated into value chains involving Taiwan, the Republic of Korea and Vietnam, while its principal export markets are Hong Kong (mainly



⁶ Gosens, Turnbull and Jotzo (2021) present a different scenario based on modelling in which Chinese coal imports fall steeply in response to meeting environmental objectives and better domestic transport infrastructure.

for re-export), the United States, Europe, and Korea. For mineral fuels, China relies heavily on the Middle East and Russia, and Australia is the dominant supplier of metal ores in what is one of China's most concentrated supply lines. And for food and feed, it relies heavily on the United States (especially cereals), Europe (cereals) and Brazil.

While the broad geographical structure of China's sources of supply across continents remains largely unchanged, there have been significant changes at the regional and country levels. Take China's imports from its immediate neighbours and the rest of Asia over 2015-2021 and for 2022 (Figure 6).

Only Indonesia, as a major commodity supplier to China, and Tajikistan as a much smaller supplier, were in the high import growth category for both periods – defined here as an annual average growth in the value of exports of 20 per cent or higher in these years. Uzbekistan and 'Other Asia' excepted, all countries covered in the chart were in the high growth category in 2022:

• China-Russia trade is growing quickly from a high base. The two countries mostly ignored each other in the 1990s and early 2000s as Russia looked to the West, as it has for much of the past 300 years. But this changed into a marriage of convenience with the eastward

Figure 6: Growth in the value of China's imports from 2015: selected countries

Source. ITC Trade Map Database and GACC Chinese Customs Statistics Database.

Note, Growth is In US dollar values. AAG is the average annual growth rate. 'Other High M G Asia' are those countries in Asia (as defined by GACC) where growth rates of imports into China exceeded 20 per cent in 2022. The countries in this group are almost all in the Middle East, with Saudi Arabia, the UAE, Irag and Oman the biggest sources. 'Other Asia' is the rest of Asia as defined by GACC, but with imports from China to itself not counted. It covers, for example, Japan, Taiwan, Malaysia, Thailand, India, Pakistan, and Turkey,



ce?

expansion of the European Union and NATO, great power rivalry in the East and South China Seas, opportunities for China to participate for the first time in large-scale Russian infrastructure and resources projects, and opportunities for Russia to diversify its energy and resources exports. Western sanctions following Russia's invasion of Ukraine have been a key diversification driver both for Russia as a resources exporter and China as an importer.

- Chinese imports from west Asia/the Middle East are growing strongly from a high base. Imports of crude oil (from Saudi Arabia, Iraq, Kuwait, Oman, and the United Arab Emirates) and LNG (mainly from Qatar, but also from Oman) dominate.
- Central Asian countries are starting to play an important role in Chinese trade, particularly in relation to energy supplies. Despite their complex relations with China, these countries have common interests in energy and resources - China in diversifying sources of supply and Central Asia in accessing China's huge growth market. They also have common interests

in improving regional - and wider connectedness (World Bank 2019; Freymann 2021).

Resources and energy (defined as commodities falling under HS25, 26 and 27) constitute the great bulk of Chinese imports from these countries. The proportion varies from country to country. Minerals make up about one-third of China's imports from Indonesia, nearly 80 per cent from Russia and over 90 per cent from Mongolia. The split between metal ores and concentrates and energy resources also varies, though the vast bulk of China's imports from the rest of Asia are energy-related: pipeline gas, LNG, and coal. Imports of copper ores and concentrates are the big exception: their value in 2022 was not too far behind that of LNG.

Figure 7 and Figure 8 focus on growth in the value and volume of Chinese resources and energy imports from the rest of Asia and beyond. The centrality of Asia, and particularly the energy rich countries of west Asia, as sources of supply is immediately apparent: Asia accounts for well over half of China's total imports. Furthermore, growth in

China's minerals imports from many of the sub-regions of Asia exceeds growth in China's total mineral imports.⁷ These increases are occurring across the broad spectrum of energy and resources. Big increases in imports of Russian crude oil, LNG, pipeline natural gas, and coal are especially prominent. China is greatly boosting purchases of natural gas from Turkmenistan, crude oil from Kazakhstan and coal from Mongolia: China has a strong geopolitical imperative to build up these overland trade routes (along with those with Russia) to protect against possible US naval actions against Chinese seaborne energy trade during an international crisis. And it is purchasing more LNG, copper and aluminium ores and concentrates from Indonesia; more tin ores and concentrates from Myanmar; more molybdenum ores and concentrates from Mongolia and Kazakhstan (though the largest increases are in trade with Chile, Peru, and Armenia); and more tungsten ores and concentrates from North Korea - the biggest supplier.

Looking beyond the Asian continent, Latin America, and Oceania - basically Australia - stand out as major suppliers of

Figure 8: Volume of Chinese imports from individual economies in figure 7 and selected neighbours, 2019-22



resources and energy. Each is a far bigger supplier than Russia. Africa stands out as a region of intense interest for China as a current and future major source of energy and resources: imports from Africa have risen over recent years and are growing from a high base. Europe and North America stand out for different reasons - their relative smallness as suppliers of minerals and, in the case of the United States, volatile supplies linked to US-China tensions. Chinese imports fell during the tariff war, surged (in the case of crude oil, LNG, and some oil-based products) in 2020 and 2021 under the impact of the US-China Economic and Trade Agreement, and fell back again in 2022 with rising tensions. What also stands out is that the value of imports from regions other than Asia, Africa excepted, declined in 2022, with falls for Oceania, Latin America, North America and Europe.

So, what do these continental- and regional-level changes mean for Australia? Is China in the early stages of diversifying away from Australia as a source of supply. particularly for resources and energy.8 Table 9 (Annex 3) reveals overall stability in Australia's share of China's goods

import market. This has stayed in the 5-6 per cent range for the past five years our share contracted to the bottom of the range in 2022 — and reflects Australia's dominance of China's import market for iron ore. But beneath the stability there is much variability and rapid change. Swings in the share of agricultural commodities like wheat can be put down to variability in harvest conditions. But rapid changes in our share of resources and energy import markets are not as easily explained. In the case of LNG, Australia's share fell from almost half in 2019 to a little over 30 per cent in 2022: countries like Qatar, Malaysia, the United States, and Russia were the main beneficiaries. And for commodities like aluminium ores and concentrates, Australia's share has contracted sharply in the last couple of years in line with the rapidly growing shares of Guinea and Indonesia.

None of this suggests that China is downgrading Australia as a key supplier of commodities. But it does suggest that China's regional and broader supply networks for commodities, especially energy and resources, are evolving, and changes in the relative significance of

⁸ Ten commodities, mostly resources and energy, make up well over two-thirds of Australia's total goods exports to the world. In recent years China has taken 30-40 per cent of our goods exports, with iron ore, LNG and coal making up about three quarters of the total prior to restrictions on coal ⁹ For example, the Australian Government pushed back when US President Obama asked Prime Minister Tony Abbott to stop selling iron ore to China (McGregor 2022).

⁷ Import growth from countries like Kyrgyzstan, Tajikistan, Uzbekistan and North Korea since 2019 is from a very low base.

Source, Authors' calculations from the GACC Chinese Customs Statistics Database.

Note. The countries covered are Myanmar, North Korea, Indonesia, Mongolia, Kazakhstan, Kyrgyzstan, Taiikistan, Turkmenistan, Uzbekistan, and Russia. The GACC database does not give a volume figure for natural gas in the gaseous state for 2022. References to ores include concentrates. Precious metal ores do not include silver.

suppliers of commodities can change very quickly.

Australia is not without power in these decisions based on strong mutual benefits from existing trade and the high priority China places on security of supply. Radically reducing dependence on Australian resources to become dependent on other suppliers would, under most circumstances, be seen as a poor bargain by Beijing's leadership. And radically scaling back Australian resources going to China would be seen as an equally poor bargain from most Australian perspectives given the absence of alternative, sizeable markets, especially for iron ore, and costs to economic growth, wealth creation, jobs (directly and indirectly linked to mining), and tax revenue.9

Implications for Australian Iron ore and LNG exports

China's steel and energy sectors are going through structural changes that will impact Australia's export trade regardless of the state of bilateral relations. But the relationship may have a small influence on the pace of some of these changes, and a larger influence on decisions regarding where to source imports.

"The mutual benefits from Australia-China trade in iron ore and LNG are self-evident. But is trade immune to the state of bilateral relations?"

Iron ore

Short of a catastrophic turn in the relationship, China is most unlikely to eliminate, or deeply cut, imports from a highly efficient and reliable supplier like Australia. China typically imports 70-80 per cent of its iron ore requirements and the bulk comes from Australia. Baowu's¹⁰ recent decision to invest in Rio Tinto's \$US2 billion Western Range iron ore mine is a good indication of the continuing importance China attaches to the trade in iron ore. And the Australian Government's recent approval of the investment is a good indication of its importance to Australia.

However, China's steel industry is changing, which flows into its requirements for iron ore (and metallurgical coal) over time. Chinese steel production fell fractionally from 2020 levels in 2021 and again in 2022 primarily in response to Covid-related lockdowns.¹¹ It should rise in the next few years, but peak steel production is probably not too far away judging by structurally slowing economic growth as China comes closer to the technological frontier, ongoing problems in the property sector and cutbacks in infrastructure investment.

Electric arc furnace (EAF) steel production has risen from around 10 per cent of total crude steel output in 2020 and is expected to reach 15-20 per cent by 2025: reducing carbon emissions¹² and increasing use of domestically sourced scrap steel rather than imported iron ore are key policy drivers (Pan and Zhao 2021; Min Zhang and Chow 2022). China also is attempting to boost domestic iron ore production substantially – a hard task given high production costs and lowgrade deposits. On balance, Australian industry expects¹³ that China's total iron ore imports should stay around current levels (somewhat over one billion tonnes per year) for at least several years before trending downward over time.

In parallel, China is attempting to increase resources security by strengthening supply chains through joint ventures in mining operations across Africa, South America, Russia, Myanmar, Kazakhstan, and Mongolia. China could plausibly

reduce imports from Australia by increasing reliance on Brazilian miners like Vale and developing greenfields projects in countries like Guinea. Developments in Guinea at Simandou have been fractious but the mine should be operational within three to five years, producing iron ore with 60 per cent iron content —equivalent to that produced in the Pilbara. Production is expected to be around 5-10mt per year by the mid-2020s ratcheting up to over 100mt per year (Parker 2022; Ker 2023) and possibly 150mt per year (McGregor 2022). If something of this order eventuates, and much depends on Guinea's political stability, Guinea could emerge as one of the world's largest iron ore producers within a few years.

For China, broadening supply options has two advantages:

- Increasing resources security with the sizeable caveat that, in aggregate, increasing imports from Brazil, Guinea, India, Russia, and the rest will not go anywhere near to replacing iron ore from Australia. Politically fragile countries like Guinea also come with considerable risks. There is no feasible alternative to Australia as a source of supply over the medium term, and perhaps over the long term.
- Using the additional capacity from investments in overseas mining operations and a high-level single desk approach to buying and investing in iron ore to reduce international iron ore prices and lessen price volatility.

¹⁰ The Baowu Steel Group is a major Chinese state-owned iron and steel company headquartered in Shanghai. It produces around 120mt of crude steel per year. ¹¹ According to the World Steel Association (2022, 2023), China's crude steel production was 1064.7mt in 2020, 1032.8mt in 2021 and 1013mt in 2022.

¹² Renewable electricity will probably start to feature more prominently in the steel making cycle with hydrogen processing likely, over the long term, to displace at least some coking coal processes. China, effectively, would be able to lower its emissions from iron and steel production by importing 'greener' processed and semi-processed iron and pre-iron. Doing this also would provide demonstrable evidence to overseas buyers of Chinese steel, through certification back through the supply chain, that it is producing green — greener — metals, a requirement whose stringency is most likely to increase over time.

¹³ Confidential background discussion with industry sources.

A new central agency - the China Minerals Resources Group (CMRG) - now controls demand for iron ore imports and negotiates on prices and volumes (Colalillo 2022; McGregor 2022; Global Times 2023). The idea is that CMRG's monopsony power to buy on the international market will match the oligopolistic power of big mining companies on the selling side. China's steel industry is highly concentrated with the top five steel producers accounting for two-fifths of national production and the top ten for three-fifths (Luo and Zou 2022). This should assist the new central agency. But whether it works effectively or not will depend on centralised discipline being imposed on the buying decisions of hundreds of small mills and traders scattered across the country - something that has not happened in the past (Uren 2022).

Reducing volatility in international iron ore prices will impact Australia, but Australian miners are well positioned to respond because their costs are generally lower than their competitors. In other words, they can still make a good profit when international prices fall, which they will.

LNG

China is a massive global growth opportunity for LNG. Natural gas is a key transitional technology for decarbonising its economy, as it is for many others. Domestic production is being ramped up, but demand is so large that domestic production cannot increase fast enough - hence the expanding cross-border infrastructure for pipeline gas and the approximate doubling of projected LNG import handling capacity in the first half of the 2020s (US EIA 2022; Caladrese 2022; IEA 2022b).



The big question is whether China is a massive growth opportunity for Australia. Realising it is far from certain. Geopolitics is one element. Competition from Russia, the 'Stans', Qatar and the 'United States is another:

- Russia has surplus energy as Western markets have dried up and is developing major new pipeline and LNG projects to service Chinese and wider Asian demand.¹⁴ How guickly this demand can be satisfied depends on construction times, the impact of sanctions on Russian access to finance and technology, and the effectiveness of 'workarounds' (Chyong et.al 2023).
- Countries like Turkmenistan and Kazakhstan are increasingly being connected to China through natural gas pipelines as an alternative to LNG. Their 'friendly' country status, like in the case of Russia, gives them a competitive advantage as China seeks more secure land-based sources of supply.

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¹⁴ For example, Russia and China are reported to be close to an agreement on constructing the 'Power of Siberia 2' gas pipeline from western Siberia to China. This is part of a long-term strategy to re-route Russian gas from Europe to Asia (Seddon 2023).

- Qatar is keen to take a large share of growth in the Chinese LNG market.
- China does not intend to become dependent on US LNG or indeed any single supplier for energy security reasons. But, for the foreseeable future, both sides see LNG trade as mutually advantageous. US LNG supplements Chinese supply as needed; some has recently been on-sold to Europe to take advantage of higher prices there (Department of Industry, Science and Resources 2023); it is a bright spot in a fraught bilateral relationship; and longterm US-China supply contracts play a small part in securing long-term finance for US industry expansion.

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Australia's domestic policy settings are another element with the LNG price cap and new emissions reduction measures raising issues around trust and reliability of supply to export markets. This, of course, goes well beyond Australia-China cooperation on LNG (Tillett and Macdonald-Smith 2023).

As indicated previously, Australia's share of China's LNG market has fallen appreciably over the last couple of years. While LNG imports under long-term contracts have continued without a problem, the spot market has dried up.15 Spot and short-term contract trade with China accounts for almost half of all Australian LNG exports to China (Corbeau and Sheng Yan 2022). At this stage it is difficult to assess whether developments on the spot market are predominantly a response to difficult Australia-China relations or to broader economic factors, particularly China's slowing economy and the sharp fall in total Chinese LNG imports in 2022, or a combination of the two, but the challenging relationship is certainly a factor¹⁶

A significant uptick in trade on the spot market could be an early signal of an easing of tensions in the bilateral relationship.¹⁷ A better signal would be if a major LNG project, with China as a principal investor, started to move out of the slow lane into active consideration, though this is overlaid by domestic political considerations that go beyond China. The most unambiguous signal would be an agreement to renew Australia-China long-term supply contracts. To the best of our knowledge (March 2023), Australian suppliers have not renewed any of their long-term contracts, even though many expire in the next few years. Discussions between major Australian and Chinese companies must be taking place but this has not been revealed publicly. Meanwhile, US companies have been busy negotiating new contracts covering periods of up to two decades or more. Russia, Qatar, and other parties also have been busy negotiating long-term supply deals (Hanafusa and Tabeta 2023).

Should Australia be concerned? The global market for natural gas will be constrained and distorted for some time by the war in Ukraine. There is strong global demand for Australian LNG and there are opportunities to diversify markets over time:

• More LNG could be exported to Europe. Over the next two or three years it is expected to account for much of the growth in global LNG trade, but this trade is vulnerable to US competition.

- India is a major growth opportunity in the long term, but it is uncertain how this will play out because affordability is a major concern (IEA 2022b). Qatar also is on its doorstep.
- Growth opportunities in Japan and Korea are limited: LNG demand is widely expected to decline in the decade to 2030.
- Indonesia and emerging Asia could become significant markets, but this depends on price movements and affordability (IEA 2022b). Small increments in Chinese import demand for LNG could dwarf much larger increments in regional demand.

A growing world LNG market gives Australia many options as a supplier. China is one of the principal options. Import demand is likely to grow rapidly and China can spread risk by diversifying sources of supply. Australia has a continuing opportunity to work cooperatively with China on LNG, but the extent to which it is grasped is unclear.

Policy conclusions

Australia is not a model of how to resist Chinese economic coercion.

China's formal and informal bans on commodity imports from Australia have imposed a significant, continuing cost on several key Australian industries. The fact that it is small from the perspective of the whole economy reflects mostly the good fortune of high international commodity prices, and hard work by successive Australian governments in improving access to international markets. Access has been improved through successive multilateral trade rounds, and particularly through bilateral and plurilateral agreements from the Australia Japan Commerce Agreement in the 1950s and experimental free trade agreements with Singapore and Thailand in the early 2000s, to the Regional Comprehensive Economic Partnership Agreement and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership in more recent times.

Australia-China relations are likely to remain challenging and impact trade, even as both sides work on resetting relations.

Prospects are good for removing or lessening Chinese formal and informal barriers to trade with Australia assuming some pragmatism on both sides. However, even if barriers are quickly removed, trade in at least a sub-set of restricted commodities may not rebound to former levels. This applies particularly to commodities like coal where important new trading arrangements have been

explaining some of the losses

Both countries are responding to growing international risks by diversifying trade: Australia by diversifying commodity exports and China by diversifying sources of key commodity imports. This is a sound strategy insofar as it increases the resilience of supply chains, but it is not an optimal solution beyond a certain point. Time and effort spent in collaboratively building a flexible international economy ultimately promises better returns. Conversely, potentially retreating to a policy of trading mostly with 'friends' is costly¹⁸ and runs up against the inconvenient problem that they may change over time.

Risks to Australia's core interests in iron ore and LNG are no longer theoretical or distant.

There is a realistic scenario where Australian exports of iron ore and LNG to China continue at a high level because of mutual dependence, but where Australia faces the prospect of lower international prices and loses market share as China attempts to increase its economic security by widening supply options.

Some of these possible lost opportunities reflect structural changes in the Chinese economy and its own diversification strategies that go well beyond Australia-China relations. But some reflect the state of bilateral relations and are not trivial for trade and direct investment over the medium-to-long term. This is because they apply to key sectors

- ¹⁶ McGregor (2022) refers to China's national oil companies being told to avoid Australian suppliers and a recommendation from the Chinese Academy of Social Sciences to the Chinese Government to reduce dependence on Australian LNG
- ^π Conversely, if Australia had available LNG cargoes and trade went to other suppliers, it could signal continuing tensions, though this would not be conclusive because China maintains close relationships with a broad range of supplier

forged, though much will depend on the state of bilateral relations and on tightness in international coal markets.

of the Australian economy that have underpinned much of our prosperity over recent decades and whose success has made big contributions to federal and state government revenue and to jobs directly and especially indirectly - in rural and regional Australia. It is also because Australia remains heavily dependent on the Chinese market for a narrow range of commodities (Wickes, Adams, and Brown 2022).

In the years ahead, other countries can be expected to go through similar economic transformations to China's - lifting demand and prices for commodities of interest to Australia - but they are unlikely to replace China as the motor of the world economy anytime soon or as a market for Australia's most important commodity exports.

A big imponderable is whether a new global commodities super cycle is about to get underway as part of 'fuelling' the transition to a low carbon future. To the extent that it does, Australia would stand to benefit substantially.

Australia has significant agency in the bilateral economic relationship.

Part of this agency involves our mutual dependence on a range of commodity trades: Australia needs China and China needs Australia for a narrow group of commodities. Part also involves our capacity to pursue core national interests creatively. This has many dimensions, starting with having a flexible and efficient economy with runs on the board from bilateral, regional, and multilateral trade negotiations to increase access opportunities in many markets.

18 Tyers and Zhou (2020) discuss the implications of a catastrophic scenario that would shut down 95 per cent of Australia's trade with China. They find that it would cut Australia's GDP by six per cent and per capita disposable income by 14 per cent once capital flows and employment have had time to adjust. Tyers and Zhou (2022) report modelling that assumes two separate blocs consisting of western nations on the one hand and China, Russia, and like-minded countries on the other. They find a decline in Australia's real GDP of 5.5 per cent, slightly more than for the world, but less than for the European Union. The United States experiences a small fail in real GDP, reflecting its more limited dependence on international trade and gains from inflows of Western investment. The modelling suggests severe effects on employment: a fifth of Australians would lose their jobs. Goes and Bekkers (2022) also examine the impact on economic welfare of full decoupling between western and eastern blocs. Losses range from one to eight per cent in the West and eight to 12 per cent in the East. The weakening trade- productivity nexus is important in

¹⁵ This is not Australia-specific. Gas powered electricity generators in southern China halted spot purchases of LNG in 2022, relying on long-term contracted supply (Department of Industry, Science and Resources 2023).

Building our influence in the bilateral relationship involves moving beyond the frozen outlook towards China of the last couple of years. Policy makers in Australia cannot know, or anticipate accurately, China's economic and political trajectory. Will reform momentum pick up? Will the economy become more, or less, internationalised? Will nationalism intensify or lessen? But being open to a range of possibilities in China's economic and political trajectory — and formulating responses to them — requires resources, systems, and political will. Locking ourselves into a particular 'black and white' view comes much cheaper.

Finally, being open to a range of possibilities on China raises the question: what is Australia's desired end point for relations with China in the next 10-15 years? Clearly it depends on how the international geopolitical environment changes and Australia has little control over that, though we do have agency as a middle power working with others. But at least to some degree, Australian leaders and policy makers need a sense of our national interests in developing relations with China and of the balance of risk and opportunity associated with pursuing those interests. Is the broad aim to get back to the sort of relationship we had a few years ago? Or is it building a more limited, but still substantial and respectful, relationship that welcomes China's growing role in an evolving international system? If so, how does Australia demonstrate this in practical terms? Or is it entirely different? Is it managing a difficult relationship that is not expected to improve much?

Political, business and community leaders may glimpse answers. An open and continuing public debate is needed to help crystalise views on the ways, means and objectives behind our policies towards China, how we negotiate our differences, how to gauge the success or otherwise of our engagement, and how to work with others in pursuing our interests. But is there the political will to make it happen?



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Annex 1: Estimating the gross cost of Chinese coercion on Australian export revenue: method based on losses in market share.

As the main text has indicated, the first method of estimating losses to export revenue is based on hypothetical shares in the Chinese market in the absence of coercion. Hypothetical Scenario A (HS-A) calculates the simple average of market shares over a representative period prior to the onset of coercion, while HS-B and HS-C consider possible seasonality in the data.¹⁹ The difference between the hypothetical share and the actual share after trade restrictions were implemented makes it possible to estimate lost export revenue. The representative period varies with the commodity and method used

but can go back as far as January 2016. Shorter periods are used where Australia's market share was undergoing marked change, as was the case with wine.

The original import data are measured c.i.f. and are adjusted to make them comparable with export data, which are measured f.o.b. We use 2020 estimates (the latest available) from an OECD database on c.i.f.-f.o.b. margins for this purpose.

Table 1 sets out the results of these three methods for the 2022 calendar year.

Table 1: Hypothetical impact in 2022 of coercion on gross Australian export revenue in the China market (A\$ million)

HS	Abbreviated Commodity Description	Under HS-A	Under HS-B	Under HS-C
2701	Coal	-19,163	-19,114	-19,262
2603	Copper ores and concentrates	-3,790	-3,802	-3,793
0202	Frozen beef	-2,751	-2,798	-2,782
2204	Wine of fresh grapes	-712	-716	-714
5201	Cotton, neither carded nor combed	-1,720	-1,552	-1,527
1003	Barley	-1,445	-1,423	-1,428
4403	Wood in the rough	-670	-646	-673
030631	Rock lobster	-651	-554	-590
121490	Hay and other forage products	-136	-133	-135
	Total above (A\$ billion)	-31.0	-30.7	-30.9

Source: Authors' calculations based on GACC Chinese Customs Statistics Database, UN Comtrade Database and OECD ITIC Database.

The three different counterfactual scenarios are as follows.

- A. Australia maintains the share of the Chinese import market it had secured on average in the past. In most cases the past representative period goes back 48 months prior to the commencement of trade restrictions. For coal, for example, we find that restrictions commenced in October 2020. The previous representative period therefore starts in October 2016 and our average market share over these four years was 50.7 per cent.
- B. Australia secures a market share that includes a specific seasonal component. Again, taking the case of coal, it makes the hypothetical market share for, say, January 2021, as the average for the shares in January 2016, 2017, 2018, 2019 and 2020.
- C. Australia secures a market share that includes seasonality, with adjustment factors obtained from the SHAZAM econometrics package and added to, or subtracted from, the past average market share from Scenario A. For rock lobster, for example, shipments in March have typically been approximately 17 per cent above the underlying series. The hypothetical share for March 2021 adds this to the share over the representative period, which for rock lobster is almost 53 per cent going back 36 months before restrictions commenced. The result is a series that includes a seasonal component.

19 It is sometimes difficult to identify the month when coercion commenced. With cotton, for example, Australia's market share failed to turn up strongly in June/July 2020 as was usual in those months, but other evidence puts the starting month as around October 2020 (see Laurenceson and Pantle 2021, p.12). Here, June 2020 is used as a starting point for the market share analysis, but the totals for losses only cover October 2020 to December 2022.

Table 2: Hypothetical gross losses from coercion on goods in the Chinese market (A\$ millions)

HS	Abbreviated Commodity Description	2020	2021	2022
2701	Coal	-1097	-14,725	-19,114
2603	Copper ores and concentrates	-350	-3,519	-3,802
0202	Frozen beef	-574	-1,775	-2,798
2204	Wine of fresh grapes	-45	-721	-716
5201	Cotton, neither carded nor combed	-319	-903	-1,552
1003	Barley	-561	-2,169	-1,423
4403	Wood in the rough	-46	-807	-646
030631	Rock lobster	-135	-381	-554
121490	Hay and other forage products	0	-75	-133
	Total above (A\$ billion)	-3.1	-25.1	-30.7

Source: As for Table 1. Results are for the HS-B scenario.

Total hypothetical losses for 2020. 2021 and 2022 are shown in Table 2. Rising from A\$3 billion in 2020, they were around A\$25 billion in 2021 and A\$31 billion in 2022. This is higher than estimates normally cited, which cluster around A\$20 billion per year. Although the scope of the A\$20 billion estimate is usually not defined, it is taken here to refer to the projected annual loss of sales in the Chinese market under coercion. This is clear in an early estimate of this kind by the Perth USAsia Centre, which found that annual trade worth A\$19.3 billion could be affected by Chinese trade restrictions, apparently based on 2019 data for coal, beef, wine, cotton, and barley (see Hurst 2020). The same study found that A\$47.7 billion could be affected if services like education and tourism were also made subject to coercion. The present authors concluded in 2021 that there could be a projected annual trade loss for goods of

A\$23 billion in the Chinese market from coercion (Wickes, Adams and Brown 2021, p.13).

The basic reason for the higher estimates for the method used in this annex is that the Australian dollar value of Chinese total imports of these goods increased considerably over the period. For example, between 2019 and 2022, the value of coal imports increased by around 60 per cent in Australian dollar terms, and the dollar value of copper ores and concentrates imports by 66 per cent. For coal, this was the result of higher prices on world markets: Chinese imports of bituminous coking coal and of other bituminous coal declined appreciably in volume terms. For copper ores and concentrates, it was the result of price and volume effects, but mostly the former: volumes increased by about 15 per cent, well short of the increase in dollar value.

The method used in this annex accounts for both increases in the quantity of commodities imported by China (on the assumption that Australia would have taken a share of this growth in the absence of restrictions) and rising prices. It provides a good estimate of the current dollar value of the cost of restrictions.

Table 3: Australian export volumes before and after the imposition of restrictions ('000 tonnes, unless otherwise indicated)

Commodity	То	2019	Part of 2019	Part of 2020	2021	2022
Coal	China	92,765	30,151	8,023	182	0
	RoW	303,865	103,338	115.202	365,600	338,832
Copper Ores, etc.	China	1,025.9	225.5	21.5	0	0
	RoW	869.1	172.2	263.1	1,640.2	1,591.7
Frozen Beef	China	295.8	177.5	72.0	148.5	157.1
	RoW	697.5	363.9	300.6	555.4	556.9
Wine ('000 litres)	China	135,476	16,262	313	6,375	3,076
	RoW	612,288	48,940	55,293	625,078	640,152
Cotton ('000 kg)	China	382,182	51,412	6,523	35,913	29,139
	RoW	161,142	16,782	20,652	669,818	1,086,983
Barley	China	1,587.0	246.6	100.9	0	0
	RoW	1,285.2	351.4	1,760.0	8,718.5	8,002.4
Wood in the rough ('000 m3)	China	4,201	360	66	21	0
	RoW	161	8	108	1,507	725
Rock Lobster ('000 kg)	China	8,339	1,248	6	28	7
	RoW	321	40	393	5,907	5,805
Hay, etc	China	242	Not app.	285	121	159
	RoW	1,083	Not app.	714	1,071	1,442

Source: Calculations from ABS (2023b) data.

Note. The column headed 'Part of 2020' is from the month when restrictions are considered to have been introduced. Part of 2019 is for the same months of the year for 2019. For hay, coercion was found to start in March 2021: the figures for 'Part of 2020' and 2021 therefore cover only March to December of those years.

Table 4: Australian exports of metallurgical and thermal coal before and after restrictions ('000 tonnes)

То	2019	Part of 2019	Part of 2020	2021	2022
China	34,330	6,252	697	182	0
RoW	88,772	15,052	19,640	110,481	106,173
China	8,453	1,838	110	0	0
RoW	51,878	16,817	17,630	54,917	53,437
China	0	0	0	0	0
RoW	922	Not app.	Not app.	1,413	948
China	49,982	15,344	3,639	0	0
RoW	162,236	57,208	61.313	198,787	178,274
	To China RoW China RoW China RoW China RoW	To 2019 China 34,330 RoW 88,772 China 8,453 RoW 51,878 China 0 RoW 922 China 49,982 RoW 162,236	To 2019 Part of 2019 China 34,330 6,252 RoW 88,772 15,052 China 8,453 1,838 RoW 51,878 16,817 China 0 0 RoW 922 Not app. China 49,982 15,344 RoW 162,236 57,208	To 2019 Part of 2019 Part of 2020 China 34,330 6,252 697 RoW 88,772 15,052 19,640 China 8,453 1,838 110 China 8,453 16,817 17,630 China 0 0 0 RoW 922 Not app. Not app. China 49,982 15,344 3,639 RoW 162,236 57,208 61.313	To 2019 Part of 2019 Part of 2020 2021 China 34,330 6,252 697 182 RoW 88,772 15,052 19,640 110,481 China 8,453 1,838 110 0 RoW 51,878 16,817 17,630 54,917 China 0 0 0 0 RoW 922 Not app. Not app. 1,413 China 49,982 15,344 3,639 0 RoW 162,236 57,208 61.313 198,787

Source: Calculations from ABS (2023b) data.

Note. As for Table 3. The entry for semi-soft metallurgical coal also covers pulverised coal for injection.

Annex 2: Estimating the cost of coercion to Australian export revenue after trade diversification: method based on ABS export data

The second method used to assess the cost of coercion to Australian export revenue is based on Australian Bureau of Statistics (ABS) export data. This approach is not as effective as the one described in Annex 1 for measuring gross losses in the Chinese market for restricted commodities, since it is based on pre-coercion values of trade and does not take into account growth in the Chinese market for these commodities.²⁰ But it can be used effectively to examine net changes to export revenue - that is, after diversion of all or part of sales

to the rest of the world²¹- since it takes into account sales in these markets. The method used here is very similar to Laurenceson and Pantle (2021), though the starting point is quite different.

Table 3 shows trends in the quantity of Australian exports to China and the RoW for the nine commodities subject to restrictions. For coal, the quantity exported to China between the base year of 2019 and 2022 declined by around 93 million tonnes. This was partly offset by a rise in exports to the RoW of around 35 million tonnes, leaving a net fall in total

²⁰ In general, estimates of gross losses to Australian export revenue in Annex 2 are appreciably different from those found by using the method sketched in Annex 1. For coal, for example, Table 5 shows the loss of export revenue in the Chinese market at around A\$13.7 billion between 2019 and 2022, whereas the estimated loss in Annex 1 was of the order of A\$19.2 billion. For copper ores and concentrates, gross exports to China fell by around A\$2.3 billion, well down on the Annex 1 estimate of around A\$3.8 billion. These differences should not be surprising and occur mainly because the counterfactual scenarios for the two methods are different. In Annex 1, the results are obtained by assuming that, in the absence of coercion, Australia would have maintained its share of the Chinese import market (with some adjustments for seasonality). Using Table 5, the 2022 outcomes are mostly compared with those that applied in the 2019 base year.

²¹ The Rest of the World comprises all countries other than China and Australia

exports of about 58 million tonnes. This broad pattern was also true for copper ores and concentrates, wine, rough wood, and rock lobster.

For barley, outcomes were different, with rising exports to the RoW vastly exceeding declining exports to China. Cotton and hay followed the same pattern, reflecting for all three commodities better growing conditions in Australia, as well as available alternative markets. With frozen beef, a third pattern is apparent: the quantity exported to China and the quantity sold to the RoW both declined owing to supply constraints from herd re-building after drought (Beef Central 2022; 2023). Given the importance of coal, Table 4 separates out the contribution of the main types of coal of export interest to Australia. It shows that exports to China of hard coking coal, semi-soft metallurgical coal and thermal coal all fell between 2019 and 2022 by more than exports to the RoW rose: hence there was a substantial 'loss of trade' for Australia in each of these categories. The fourth type of coal identified in the table – 'other metallurgical coal' – was not sold to China over this period.

Table 5 considers changes in export trade to China and the RoW in current Australian dollars. The most striking result is again for coal. The value of exports to China fell from A\$13.7 billion in 2019 to zero in 2022, while exports to the RoW rose nearly threefold from A\$50.2 billion to \$141.6 billion. At a disaggregated level, thermal coal exports to the RoW rose more than three-fold in value, and hard coking and semi-soft metallurgical coal exports more than doubled in value (Table 6).

These results are, of course, the result of sharply rising prices on global markets. In Australia's case, the unit value of coal exports to the RoW rose from A\$165/ tonne in 2019 to A\$418/tonne in 2022. Exports to the RoW for several other commodities affected by coercion, including barley, cotton, frozen beef, wine, and hay, also experienced rises in unit values between their base year and 2022.

Box 1: Different approaches to estimating the losses from coercion

We began the process of looking at changes in export revenue by examining the changes in current Australian dollar terms. The extent of global price rises for many commodities made this an unsatisfactory way of estimating gains from trade diverted to the rest of the world (ROW) in the context of losses from coercion by China. We then shifted to an approach that examined these same gains and losses valued at prices in the base period (for losses in 2022, the base period is 2019, except for hay where it is 2020). As a formula, under this approach:

1) Rev2-Rev1 = PC1(QC2-QC1) + PRoW1(QRoW2-QRoW1)

Here Rev2 and Rev1 refer to revenue in the second period (say 2022) and the base period. PC1 and PRoW1 refer to prices (or more accurately unit values) in the base period, while QC and QRoW are the quantities of exports to China and to the RoW. Typically, under restrictions, the first term of the right-hand side will be negative, and the sign and magnitude of the second term on the right will determine whether changes in exports to the rest of the world are sufficient to outweigh losses in exports to China.

Equation 1 can be modified so that:

2) Rev2-Rev1 = PC1(QC2-QC1) + PC1(QRoW2-QRoW1) - Prem1(QRoW2-QRoW1)

Where Prem1 is PC1-PRoW1, the price premium in the base year for exports to China. Then:

3) Rev2-Rev1 = PC1[(QC2-QC1)+(QRoW2-QRoW1)] - Prem1(QRoW2-QRoW1)

Although they do not use an equation to describe it, equation 3 essentially captures the approach used by Laurenceson and Pantle (2021). When QC2–QC1 is negative (as is usual) and QRoW2-QRoW1 is not large enough to offset this, the first term in square brackets on the right of the equation is what they call the 'lost trade' in the commodity after restrictions. The last term on the right-hand side is the loss of premium associated with successfully diverted trade.

There are some differences in our approach to the method used by Laurenceson and Pantle because we also look at gains from diverted trade where exports to China are at a discount (rather than a premium) in sales to the RoW. For the eight commodities with a base year of 2019, four - coal, copper ores and concentrates, wood in the rough, and rock lobster - had lower unit values for sales to China. Where there is a price discount, Prem1 is negative but no changes to the formulae are required. The approach in the present paper also gives much greater weight to the possibility of seasonal influences affecting the data and it brings the results up to the end of 2022.

For barley, cotton and hay, where the increase in the quantity exported to the RoW after restrictions exceeds the quantity lost in China, the approach used requires some modification. Here we set QRoW2- QRoW1 = QC1-QC2. That is, the volume of successfully diverted trade is constrained to equal the loss of exports to China.

Table 5: Australian export revenue before and after the imposition of restrictions (A\$ millions, current dollars)

Commodity	То	2019	Part of 2019	Part of 2020	2021	2022
Coal	China	13,706	4,069	804	25	0
	RoW	50,234	14,532	11,454	63,479	141,627
Copper Ores, etc.	China	2,261	480	79	0	0
	RoW	4,003	788	1,168	7,717	7,116
Frozen Beef	China	2,306	1,422	557	1,313	1,698
	RoW	4,648	2,543	1,958	3,955	4,791
Wine	China	1,137	158	3	30	16
	RoW	1,813	157	214	2,101	2,083
Cotton	China	1,116	149	16	102	106
	RoW	452	46	51	1,800	4,248
Barley	China	591	87	30	9	0
	RoW	452	126	480	2,679	3,349
Wood in the Rough	China	603	49	12	3	0
	RoW	36	2	13	200	115
Rock Lobster	China	711	108	0	2	1
	RoW	30	4	17	311	313
Hay, etc.	China	116	Not app.	130	53	81
	RoW	534	Not app.	362	472	741

Source: Calculations from ABS (2023b) data. Note. As for Table 3.

Table 6: Australian export revenue from coal before and after the imposition of restrictions: current dollars (A\$ millions)

Commodity	То	2019	Part of 2019	Part of 2020	2021	2022
Hard coking Coal	China	8,347	1,202	105	25	0
	RoW	22,310	3,030	2,717	26,627	50,787
Semi-soft metallurgical	China	1,381	257	11	0	0
	RoW	9,133	2,670	1,930	9,913	22,651
Other metallurgical	China	0	0	0	0	0
	RoW	109	Not app.	Not app.	274	371
Thermal	China	3,978	1,137	192	0	0
	RoW	18,676	5,773	4,448	26,664	67,818

Source: Calculations from ABS (2023b) data.

Note. As for Table 3. The entry for semi-soft metallurgical coal also covers pulverised coal for injection.

Box 1 sets out the approach used here to estimate losses for trade affected by Chinese coercion. Broadly, the method used looks at the net change in export revenue between a base period (normally 2019 or part of 2019) and the year or part-year of interest (say 2022). The comparison is made at the unit values applying in the base period. Given the importance of seasonal influences affecting trade (not only for agricultural commodities but for commodities like coal as well), comparisons are made for seasonally equivalent periods. For example, 2022 is normally compared with 2019, the last full year before restrictions were applied for most commodities.

The results of applying the formulae in Box 1 to monthly ABS data are set out in Table 7. They show substantial losses for coal of around A\$7.9 billion in 2022, and losses of more than A\$2 billion and A\$1 billion for frozen beef and wine respectively. Wood in the rough and rock lobster also showed appreciable losses. There are sizeable positive results for 2021 and 2022 for copper ores and concentrates because they appear to have traded at a significant discount in the Chinese market in the 2019 base year.

Overall indicative net losses for the commodities subject to restrictions using the method outlined in this annex were of the order of A\$11 billion in 2022 and cumulatively around A\$20 billion for 2020-22. These results need to be treated with caution because they assume that China's restrictions were the dominant variable affecting the quantity of commodities traded. While this is sound, it is inevitably an oversimplification. In the case of coal, for example, export volumes in 2022 were also impacted by extremely wet weather affecting mining operations, mining staff shortages and buyers' responses to high prices.

Table 7: Indicative net losses from coercion (A\$ millions at base period unit values)

HS	Commodity	Part of 2020	2021	2022
2701	Coal	-1,318	-3,474	-7,926
2603	Copper ores and concentrates	-19	1,291	1,068
0202	Frozen beef	-1,287	-2,096	-2,018
2204	Wine of fresh grapes	-135	-1,045	-1,029
5201	Cotton, neither carded nor combed	-120	-40	-41
1003	Barley	1	-33	-33
4403	Wood in the rough	-13	-295	-475
030631	Rock lobster	-72	-196	-207
121490	Hay and other forage products	Not app.	8	8
	Indicative Totals	-2,963	-5,880	-10,653

Source. Authors' calculations from ABS (2023b) data.

Note. Results are obtained using the equations in Box 1. The base period is 2019 for the entries for 2021 and 2022, except in the case of hay. 'Part of 2020' represents the months for which restrictions were applied and varies according to the commodity.

For hay, restrictions are not judged to have commenced until March 2021 and hence the 2020 entry is marked not applicable. For hay, the figure for 2021 applies to March-December and the base periods are March-December 2020 (for the entry for March-December 2021), and 2020 (for the entry for 2022).

Table 8: Indicative net losses for different types of coal (A\$ millions at base period unit values)

AECC	Commodity	Part of 2020	2021	2022
	Hard coking Coal	-144	-2,847	-3,974
	Semi-soft metallurgical	-112	-846	-1,107
	Other metallurgical	0	0	0
	Thermal	-453	229	-2,132

Source. Authors' calculations from ABS (2023b) data.

Note. Results are obtained using the equations in Box 1. 'Part of 2020' represents the months for which restrictions were effectively applied and varies according to the type of coal. Totals do not sum to the value given for coal in Table 5 partly for this reason, but mainly because equation 1 in Box 1 does not yield this result where separate commodities are examined

Annex 3

Table 9: Shares by value of China's import market: selected commodities (per cent)

	2015	2016	2017	2918	2019	2020	2021	2022
Wheat (HS 1001)								
Australia	40.7	40.4	40.9	17.2	6.1	15.9	28.4	55.6
Canada	35.2	26.9	15.3	53.5	54.9	29.0	26.5	20.9
France	0.1	0.0	0.0	0.0	14.5	27.8	14.1	16.1
United States of America	20.9	26.0	37.9	14.4	7.5	20.6	28.3	7.0
Kazakhstan	3.1	6.7	5.5	12.8	10.0	2.1	1.6	0.3
Other	0.0	0.0	0.4	2.1	7.1	4.6	1.0	0.1
Iron Ore (HS 2601)								
Australia	62.2	61.5	60.7	60.3	61.2	59.4	60.8	64.5
Brazil	21.1	22.0	22.8	24.2	22.0	21.6	21.4	20.4
South Africa	5.3	4.8	4.6	4.3	4.3	4.1	3.9	3.8
Peru	1.0	1.0	1.1	1.4	1.5	1.3	1.9	2.1
Canada	1.2	1.0	0.7	1.0	1.2	1.8	1.7	1.5
Chile	1.2	1.3	1.1	1.3	0.7	1.3	1.4	1.3
India	2.6	1.7	1.3	1.2	1.6	2.6	2.0	1.0
Other	5.3	6.8	7.7	6.5	7.5	7.9	6.9	5.4
Aluminium Ores and Concentra	tes (HS 2606)							
Guinea	0.7	25.4	44.1	50.6	48.1	48.1	52.6	61.0
Australia	36.5	37.8	33.4	31.6	31.2	30.8	28.4	21.4
Indonesia	0.0	0.0	2.0	8.7	14.2	17.6	18.3	15.6
Montenegro	0.3	1.0	1.6	0.7	0.7	1.0	0.1	0.6
Türkiye	0.0	0.1	0.0	0.2	0.4	0.6	0.3	0.5
Malaysia	37.5	12.1	5.8	0.6	0.6	0.2	0.2	0.2
Other	25.0	23.5	13.1	7.6	4.8	1.8	0.1	0.7
Crude Oil (HS 2709)								
Saudi Arabia	15.5	13.4	12.6	12.4	16.6	15.7	17.0	17.8
Russian Federation	12.8	14.4	14.6	15.8	15.4	15.5	15.7	16.0
Iraq	9.4	9.2	8.5	9.4	9.8	10.8	10.3	10.7
UAE	3.8	3.3	2.5	2.8	3.1	5.6	6.3	8.8
Oman	10.4	9.5	7.5	7.2	6.8	7.2	8.7	8.0
Australia	0.8	1.0	0.5	0.3	0.5	0.3	0.1	0.4
Other	39.3	40.6	44.0	44.4	41.2	42.5	40.5	38.3

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Table 9: Shares of China's import market: selected commodities (per cent)

	2015	2016	2017	2918	2019	2020	2021	2022		
LNG and Associated Hydrocarbon Gases (HS 2711)										
Australia	7.0	17.0	19.3	23.1	33.9	32.6	28.0	18.1		
Qatar	13.1	12.5	14.5	13.8	15.9	14.4	11.0	15.5		
Russian Federation	0.4	0.4	0.5	0.8	2.8	5.5	4.7	12.0		
Turkmenistan	30.7	23.8	19.8	15.9	2.0	2.1	0.7	11.3		
United States of America	6.4	6.0	7.6	4.1	0.3	9.2	19.3	10.4		
Other	42.3	40.3	38.3	42.3	45.0	36.1	36.2	32.7		
LNG (HS 271111)										
Australia	18.3	42.0	42.1	42.1	45.8	44.4	37.0	30.6		
Qatar	31.7	23.4	22.7	18.8	16.3	14.5	11.1	22.1		
Malaysia	15.9	9.2	9.9	9.4	9.4	7.4	9.2	13.1		
Russian Federation	1.2	0.9	1.2	1.5	4.0	7.4	6.3	12.9		
Indonesia	14.0	10.1	8.1	9.0	7.3	7.5	6.3	5.9		
United States of America	0.2	0.9	4.3	4.1	0.4	4.6	14.1	4.2		
Other	32.7	23.6	19.8	24.2	24.2	21.7	22.3	11.2		
Natural Gas in the Gaseous Stat	e (HS 271121)									
Turkmenistan	79.3	72.6	76.6	68.4	68.6	61.6	57.8	57.5		
Russian Federation	0.0	0.0	0.0	0.0	0.0	5.8	9.5	22.3		
Kazakhstan	0.5	0.7	2.1	10.1	7.8	14.1	13.0	6.1		
Myanmar	16.4	17.6	13.8	9.2	13.8	12.9	17.7	6.0		
Uzbekistan	3.8	9.1	7.6	12.3	9.8	5.6	1.9	6.0		
Australia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Oher	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1		
All Merchandise Imports										
Taipei, Chinese	8.6	8.8	8.4	8.3	8.4	9.7	9.3	8.8		
Korea, Republic of	10.4	10.0	9.6	9.6	8.4	8.4	8.0	7.4		
Japan	8.5	9.2	9.0	8.4	8.3	8.5	7.7	6.8		
United States of America	9.0	8.5	8.4	7.3	6.0	6.6	6.8	6.5		
Australia	4.4	4.4	5.1	4.9	5.9	5.7	6.1	5.2		
Other	59.1	59.1	59.4	61.4	63.1	61.0	62.1	65.3		

Source. ITC Trade Map Database. GACC Database.

Note: The table does not fully show an important transformation that has occurred in the natural gas import market since 2015. In 2015, the value of natural gas in the gaseous state imported by China exceeded the value of imported LNG. By 2022, the value of LNG purchased was almost three times imports of natural gas in the gaseous state. Turkmenistan is the main source of the gaseous product.

Standing up to Chinese economic coercion: Is Australia a model of economic resilience?



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