

Research Paper

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Cartels and Competition in Minerals Markets: Challenges for Global Governance



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Executive Summary

Well-functioning global markets for metals and minerals are essential to ensure countries have open access to key raw materials, guard against excessive price volatility and help avoid international tensions over natural resources. This paper provides an overview of the main sources of distortions in these markets and examines their impact on prices and consumer countries. It also explores avenues where enhanced international coordination could contribute to better governance, increased transparency and fewer damaging distortions in these markets.

There is no prospect of a widespread revival of 1970s-style cartels, but countries should work to dismantle the remaining exceptions. Potash, which is dominated by two state-backed private export corporations, is currently the only openly cartelized mineral market. For many producer-country governments, painful lessons from the attempts to establish cartels in the 1970s serve as a powerful deterrent. Russia and South Africa have announced plans for a platinum cartel, but even this exceptional proposal remains vague and its implementation is unlikely.

More sophisticated forms of manipulation in physical mineral markets and associated paper markets continue to cause serious market distortions. Questionable practices by warehousing companies on the London Metal Exchange (LME), for example, act to keep large surplus inventories off markets and inflate delivery premiums that may add over 10% to aluminium prices.¹ Concerns have also recently been raised in other markets, including over pricing mechanisms for silver and zinc. Between 2000 and 2010, at least 15 clandestine private international cartels in the mining and primary metals sector were detected and punished by national competition authorities. Some pricing mechanisms and market platforms have recently undergone major reforms under growing regulatory and public pressure, but it is unclear if they will satisfy growing calls for enhanced transparency.

Export restrictions imposed unilaterally by producer countries are another key source of market turmoil. Export bans by two Indian states on iron ore in 2010, and by the Indonesian government on unprocessed mineral exports in 2014, resulted in large price hikes. Six months after the Indonesian ban came into force, international nickel prices had surged by more than 35%.² Large, mineral-exporting emerging economies are particularly prone to impose such restrictions, as fledgling domestic industries are presenting an increasingly powerful lobby for preferential access to domestic raw materials. China, the largest mineral producer, is often cast as the main culprit, but growing import dependencies for most major minerals make it unlikely that Beijing will impose significant additional restrictions in the future.

While the impact of such distortions is rarely noticed by ordinary consumers, the stakes for producers can be high and the damage to companies and countries is often substantial. For seaborne iron ore (the largest global mineral market), a 1% price increase currently translates into more than \$100 million in annual profits for each of the three companies dominating the market.

¹ This estimate is based on comparisons of 2013 delivery premiums to 2008 premium levels (Wong, 2013). The inflation of delivery premiums from historical averages has been used to estimate the size of distortions in aluminium markets due to warehousing practices (see e.g. Reisman, 2013).

² Chatham House calculations based on IMF commodity price statistics for nickel for the period January to July 2014.

For Chinese steelmakers, the top customers in the global seaborne market, the cost of each 1% price increase could exceed \$800 million.³ Aluminium-consuming industries estimate that the questionable warehousing practices on the LME currently cost them over \$3bn annually.

A growing share of the costs of such distortions is borne by emerging economies, where metals and minerals consumption is rising rapidly. The burden of inflated prices in the cartelized potash market falls, for example, mainly on India, China and Brazil, the main importers of the mineral fertilizer. China, as the world's largest importer of metals and minerals, is particularly vulnerable to mineral market distortions. But other countries such as South Korea, India, Thailand and Turkey have also grown into major customers, rivalling traditional consumer countries such as Japan or Germany.

Anti-competitive practices and export restrictions can also spill over into trade and diplomatic tensions. There is a long list of recent cases where controversial practices in mineral markets have led to international disputes. The collapse of the Russian/Belarusian potash export cartel led to a row between the neighbours in 2013, with Moscow threatening Minsk that it would curtail oil exports.⁴ In another recent case, the LME warehousing rules and the hands-off regulatory approach of the UK Financial Services Authority (FSA) have become subject to sustained criticism in the US, triggering inquiries by regulators and lawmakers.⁵ In February, Japanese officials threatened to sue Indonesia at the World Trade Organization (WTO) over its controversial export ban.⁶

For many distortionary measures examined in this paper, no effective regulatory regime exists and their status is often a grey area in international law. The task of combating distortionary practices in global mineral markets largely rests with national authorities. Effective regulation is often hampered by unclear and overlapping jurisdictions and a lack of detailed and timely data on complex global supply chains and associated financial markets. Key global market platforms and pricing mechanisms, such as the LME, are only subject to national controls and in important aspects are self-regulated, raising questions about oversight and creating significant legal uncertainty. Even in many countries with well-developed competition regimes, private export cartels are still not illegal.

As market patterns and global trade flows shift, regulators in emerging economies are facing particular challenges. New markets and trading platforms in countries such as Singapore, China or the Gulf states are evolving rapidly and are now key conduits for global minerals trade. In many of these countries, transparency measures and robust safeguards are still under development and national authorities lack experience in regulating complex transnational physical and financial markets. The recent metal warehousing scandal in China surrounding the allegedly fraudulent use of warehouse receipts to raise finance illustrates these challenges and their global market impacts.

Important gaps at the multilateral level increase the potential for political or commercial disputes. The WTO currently lacks a legal framework and a toolbox for anti-cartel enforcement, which was dropped from Doha Round negotiations in 2004. International rules and enforcement against export restrictions also remain relatively weak compared with corresponding action on import barriers. International coordination mechanisms that exist for other types of resources (e.g. the International Energy Agency (IEA) for energy and the Agricultural Market Information System (AMIS) for food) and that could help to defuse tensions are largely non-existent for minerals.

³ See page 5, footnote 10.

⁴ Weaver et al., 2013.

⁵ Hotter, 2013.

⁶ Tsukimori and Obayashi, 2014.

Recommendations

Enhanced dialogue and intensified international cooperation in four areas could significantly improve the functioning of global mineral markets:

1. Deal with the last remnants of producer-country cartels

Consumer countries should make a publicly visible case that in an age of interdependence and global supply chains, any remaining forms of producer-country cartels are an anachronism. Given limited means to coerce governments to stop supporting the last remaining mineral cartels in potash, a ‘naming and shaming’ approach in key forums such as the Group of Twenty (G20) and the Organization for Economic Cooperation and Development (OECD) is likely to be most effective. Such action could be initiated by the three largest potash importers China, India and Brazil, and should seek support from others such as the EU and Japan.

2. Prevent damaging export restrictions through win-win arrangements

WTO litigation against export restrictions is unlikely to be a silver bullet and in the short term cooperative policy dialogues, such as those pursued by the OECD, offer the best prospects for concrete results. Such dialogues should also be initiated by major emerging economies and could focus on providing incentives such as investment packages or technology-sharing to entice producer countries to abstain from imposing restrictions. Consumers should continue to push for more specific and stricter WTO rules on export restrictions. Japan, the EU and the US should seek to include similar measures in regional trade negotiations.

3. Strengthen cooperation among regulators on clandestine private cartels and other anti-competitive practices

Concerted action will be required by governments to tackle anti-competitive practices such as clandestine cartels, price-fixing and territorial agreements. Key regulators, such as those in the EU and China, should expand collection and sharing of data and best practice on anti-trust enforcement in minerals markets. In key cases they could also coordinate prosecution. Sustained investment in institutional capacity is required in many emerging economies; this should be supported through bilateral cooperation and via regional forums. Governments should also resuscitate the stalled negotiations on the WTO’s role in competition policy.

4. Enhance governance for transnational market platforms and pricing mechanisms

The responsibility to regulate key nodes in global minerals markets will remain in the hands of national bodies, but coordination is vital given interconnected global markets. International organizations and regulators should strengthen structural cooperation and exchange in the area of physical markets and with greater involvement of emerging economies. An informal high-level forum on regulating physical markets could reinvigorate debate, foster new perspectives and stimulate new partnerships. Governments in key consumer countries should also give their national regulators a clear mandate in minerals markets.

Introduction

Global prosperity and security depend upon more efficient, sustainable and equitable consumption of key resources. The current outlook is one of volatility and continued pressure on global resource production systems, mounting environmental stress and potential political clashes over resource access. Looking to make the most of their natural endowments, many producer countries have also intervened more actively into markets, spurring debates about rising resource nationalism and a ‘new mercantilism’.⁷

International commerce is becoming a front line for such tensions over resources – at a time when the global economy is more dependent than ever on global markets and integrated supply chains. New actors, such as sovereign wealth funds and state-owned enterprises, and tightening links between physical and complex financial markets, further complicate the picture.

Policy debates on natural resources have often focused on energy, food and water, but metals and minerals are also vital for economic competitiveness and development. Large volumes are needed by emerging economies such as China and India for infrastructure, construction and industrial development. Equally, manufacturing sectors in advanced economies such as Germany and Japan depend on access to metals and mineral markets. Detailed data for Germany show that raw materials and components account for 30–60% of manufacturers’ production costs, while energy costs are typically below 10%.⁸

Metals and minerals have perhaps received less attention than other types of resources because price swings or supply disruptions have little immediate or obvious impact on individual consumers. But attempts to manipulate prices, restrict supplies or carve up international markets for metals and minerals can cause direct and indirect welfare losses for consuming industries. In many cases, these are ultimately passed down the supply chain to consumers around the world.

Such distortions can be considerable, as recent examples demonstrate. Companies that consume aluminium have calculated that artificial constraints on warehousing deliveries on the LME cost them at least \$3bn a year.⁹ The moratoria on iron ore exports imposed by two Indian states to combat illegal mining in 2010 may have added as much as \$40 per tonne, or more than 25%, to the price of iron ore in global markets.¹⁰ For European and Japanese steelmakers respectively, this could equate to a \$5bn difference in the costs of raw material imports per year. For China, the impact could have been as large as \$30bn per year.¹¹

It is not only heavy industries or construction that depend on secure supplies; many of the technologies needed to unlock a resource efficiency revolution, advance low-carbon energy and boost food security also depend on the availability and affordability of minerals.¹² Potash-based fertilizers

⁷ Stevens et al., 2013; Lee et al., 2012; Humphreys, 2013.

⁸ Data are for 2011, the last year for which detailed statistics are available. See Statistisches Bundesamt, 2011.

⁹ Richter, 2013.

¹⁰ Crabtree and Farchy, 2013.

¹¹ These numbers are rough estimates, calculated based on multiplying the \$40 price differential with the total imports, which amounted to over 800 million tonnes for China and over 100 million tonnes each for the EU and Japan. Actual impacts may be smaller, e.g. because of existing long-term supply contracts, but the figures provide an indication of the order of magnitude of such effects.

¹² See Dobbs et al., 2011.

could make an important contribution to closing yield gaps in many developing countries, but are often not affordable for low-income farmers. In the second half of 2013, potash prices dropped by over 20% when one of the two export cartels that control global supplies broke down. Speciality metals and minerals such as lithium, flake graphite and rare earths play a growing role for resource-efficient and low-carbon technologies.¹³ Price spikes and supply security concerns for these raw materials, some of which relate to export restrictions or other anti-competitive practices, can slow the diffusion of best-available technology, e.g. for electric vehicles or wind turbines.¹⁴

Allegations over anti-competitive activities in metals markets also have the potential to spill over into broader trade and diplomatic tensions between consumer and producer countries. International coordination mechanisms that exist for other types of resources (e.g. the International Energy Agency (IEA) for energy and Agricultural Market Information System (AMIS) for food) and that could help to defuse such tensions are largely absent for metals and minerals. For example, forming export cartels is still not illegal in most parts of the world, including the US, the EU, China and Japan, and the WTO framework lacks effective mechanisms to deal with cartel-like structures.¹⁵

Meanwhile, national authorities face the challenge of regulating supply chains that stretch across continents, where unclear jurisdiction, lack of coordination among regulators and poor data availability often give potential offenders the advantage.

The purpose of this research paper is to identify and analyse the key policy challenges associated with anti-competitive practices in international metals and minerals markets. Such anti-competitive practices include producer-country cartels in the traditional sense, like the Organization of the Petroleum Exporting Countries (OPEC) but also other major sources of market distortions, including clandestine private cartels, unilateral export restrictions and more sophisticated forms of manipulation of physical and associated financial markets, e.g. through warehousing practices. In particular, the paper will address the following questions:

- Which metal and mineral markets are most prone to cartelization or other forms of anti-competitive behaviour? What are the incentives and risks for companies and governments associated with engaging in anti-competitive practices?
- What are the potential impacts of non-competitive market structures on the global markets for these commodities and major consuming countries? Who are the winners and losers?
- What are the main policy options for consumer countries to improve the functioning and competitiveness in global metals and mineral markets? Where could enhanced international cooperation contribute to solutions?

The next section examines the role of producer-country governments in metal markets and examines their ability and incentives to manipulate global mineral markets. The third section focuses on the role of major companies in global mineral markets and assesses their ability to exercise market power. This is followed by three case studies on three major markets – for potash, aluminium and iron ore – where there have been major concerns in recent years about potential anti-competitive practices. The concluding section reviews the key challenges that national authorities and international institutions face in combating international cartels and other anti-competitive practices in metals and minerals markets.

¹³ Moss et al., 2011.

¹⁴ Jones, 2013.

¹⁵ Martyniszyn, 2012.

The Potential for Market Manipulation by Governments

Governments play an important role in shaping global metals and minerals markets. In some cases this includes direct intervention in production decisions and pricing, but more commonly the impacts are indirect, through practices such as export rules, investment frameworks or competition regulations. Understanding where governments currently intervene and what role they may play in the future requires an analysis of the distribution of global minerals production and the incentives governments face to intervene in markets. This is the topic of this section.

Key players: global mine production is concentrated in 11 mining countries

Large-scale mining activity is concentrated in a few countries, providing only a handful of governments with the opportunity to affect aggregate supply and world market prices. The bulk of metals and minerals is extracted in just 11 countries: four OECD countries (Australia, Canada, the US and Chile), the BRIICS countries (Brazil, Russia, India, Indonesia, China and South Africa) and Peru (see Table 1).

Table 1: Key producing countries for major minerals and metals, 2012

Metal	Dominant countries (% share of global production)	Other major producers (% share of global production)
Iron ore	China (27), Australia (22), Brazil (16)	India (11)
Bauxite	Australia (28), China (18) Brazil (13)	Indonesia (11), Guinea (7), India (8)
Copper	Chile (32)	China (9), Peru (7), US (7), Australia (6)
Zinc	China (35)	Australia (11), Peru (10), US (6), India (5)
Nickel	Philippines (16), Indonesia (15)	Russia (13), Australia (11), Canada (10), Brazil (7), New Caledonia (7)
Lead	China (50)	Australia (12), US (7)
Tin	China (43), Indonesia (18)	Peru (13), Bolivia (9), Brazil (5)
Gold		China (14), Australia (9), US (9), Russia (8), South Africa (6), Peru (6)
Platinum group metals	South Africa (53), Russia (28)	Zimbabwe (5), Canada (5)
Potash	Canada (26), Russia (19), Belarus (17)	China (11), Germany (9), Israel (6)
Phosphate	China (42)	US (14), Morocco (13), Russia (5)

Source: Chatham House calculations based on US Geological Survey data. Countries with over 15% of global production for individual metals are labelled as dominant producers. Countries with over 5% of market share are labelled as major producers.

These major mining countries share several common characteristics: a large, resource-rich landmass which has been relatively well explored, sufficient infrastructure to connect mines with international markets and a solid skills base. Seven are among the top ten countries by landmass, and none are

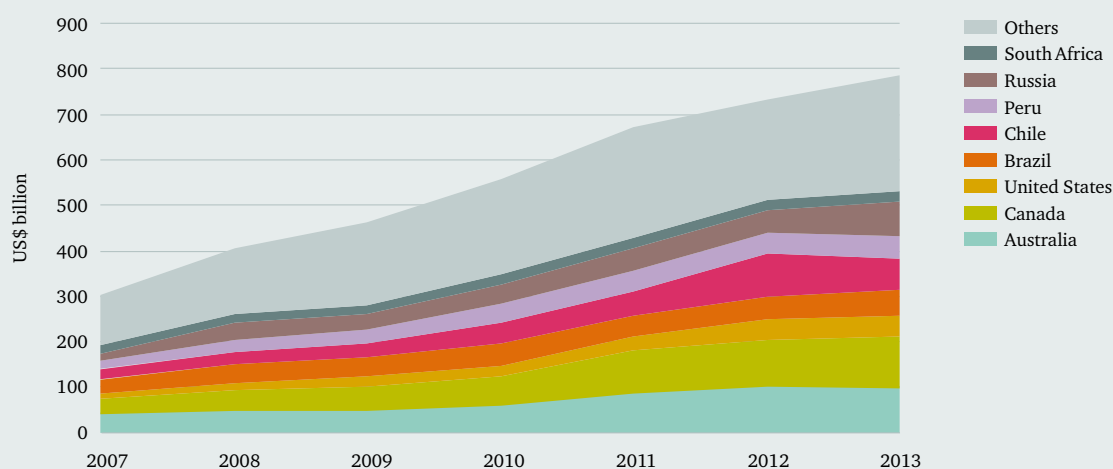
low-income countries. Political conditions are relatively stable in all 11, and their governments tend to be supportive of domestic mining. With the exception of the US, India and China, their economies can be described as ‘resource-led’, where extractive industries are a major contributor to export and government revenues.

Box 1: How likely are new major mining countries to emerge?

In recent years, a small number of resource-rich developing countries, including Mongolia, Mozambique, Zambia, Colombia and Guinea, have been the recipients of large-scale, export-oriented greenfield mining investments. As result, these emerging producers are likely to contribute significantly to global supply growth in the coming years, particularly for copper and to a lesser extent for iron ore and coal. If they continue to be able to attract large-scale investments over the next decade, some of them could join the small group of major mining countries towards 2030.

Until at least 2020, the role of such new entrants will, however, remain fairly limited. Even where production is expanding quickly it does so from a relatively low base. Among the emerging producers, only Zambia and Guinea are projected to provide more than 5% of world supply for copper and iron ore respectively, according to projections by the US Geological Survey (USGS) for 2017.^a

Figure 1: Global mining investment pipeline by country, 2007–13



Source: Chatham House calculations using data compiled by the Raw Materials Group based on announcements from approximately 700 companies in the international mining press. Note that the data significantly under-report investment in China and other emerging economies, which is often not, or only partially, reported outside these countries.^b

In the meantime, the major mining countries discussed above continue to receive the bulk of global investment for exploration and capacity expansion. Comprehensive statistics are not publicly available, but 60–70% of investments reported in the English-language mining press between 2007 and 2013 were located in eight of the 11 major producing countries (see Figure 1). Investment in the remaining three – China, India and Indonesia – is probably significantly under-reported in international media.^c In combination with decade-long lead times for large-scale mines and infrastructure development, this makes sudden trend changes very unlikely.

^a Menzie et al., 2013.

^b For a detailed methodology for these figures, see Larsson and Ericsson, 2014.

^c Larsson and Ericsson, 2014.

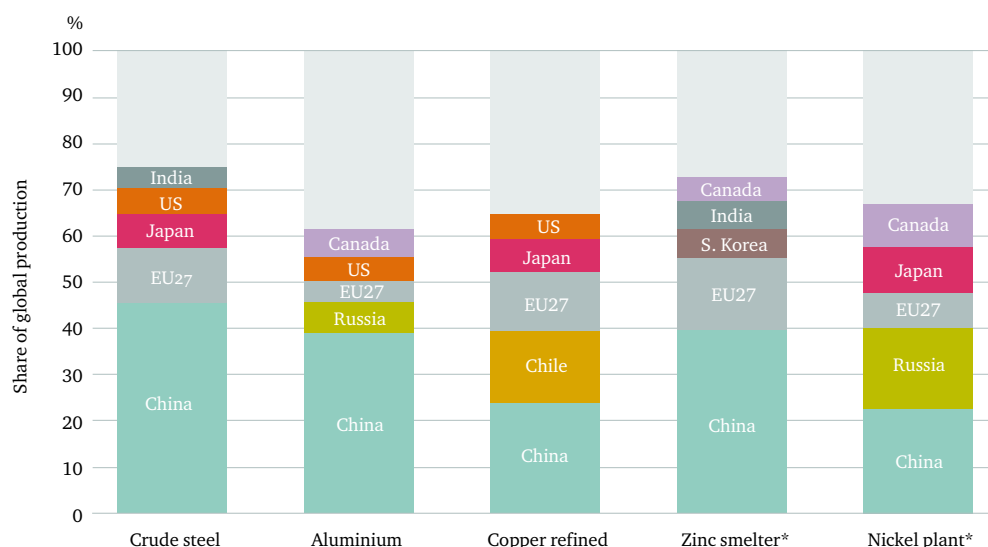
Today, China and Australia are the two mining superpowers. Together they account for roughly half of global iron ore, coal, bauxite, zinc, lead, tin and phosphate mining, and a quarter of gold production. They also play a key role in supplying a host of other metals and minerals, including copper, nickel, silver and potash. Despite efforts by the Chinese government to consolidate the sector, China’s mining industry remains quite fragmented and is primarily focused on supplying domestic markets. In contrast, Australia’s mining industries are dominated by highly efficient large-scale operations that mainly produce for export markets, with China being its largest customer.

In addition to these 11 major producers, a handful of other countries are important suppliers of individual metals or minerals, often thanks to a particular concentration of high-quality reserves in that country. They include the Philippines and New Caledonia for nickel, Belarus and Germany for potash, Guinea for bauxite, Bolivia for tin, Mexico for silver and Morocco for phosphate rock.

Downstream processing industries for most metals are dominated by a smaller number of consumer countries in East Asia, Europe and North America (see Figure 2). The rapid build-up of smelting and refining capacity in China over the past decade has turned the country into the most important downstream producer and it now produces between 20% and 40% of metals worldwide.

Only few other major producer countries, such as Chile, Russia and Canada, have succeeded in developing larger processing industries. Brazil, Indonesia, Australia and South Africa, for example, play a limited role in the downstream sector. Many emerging economies, in particular, are keen to develop downstream processing industries, which are often seen as key enablers for further industrialization and technological upgrading. However, these countries frequently face significant barriers including a lack of available power and infrastructure, and of capital and technical know-how. Existing processing industries in many countries are also often heavily subsidized, making it difficult for new entrants to gain a foothold or become competitive.

Figure 2: Country share of metal production for major metals, 2013



Sources: USGS mineral commodity summaries and USGS projections (USGS, 2013b; Menzie et al., 2013). Data for zinc and nickel EU28 share are from 2011.

Distortions in global mineral markets caused by government interventions

Governments can intervene for a range of purposes and with a variety of tools in mineral markets.¹⁶ Only a few of these interventions, however, are likely to create major distortions in international markets that can be harmful for consuming countries and companies. This section focuses on two types of interventions that are most likely to create such adverse impacts, especially where major producing countries are involved: cartelization, with the goal of restricting output and raising prices; and export restrictions, which are used for a variety of purposes such as encouraging the domestic processing of mine output.

No prospect of a return to widespread producer cartels

The painful lessons from attempts to establish producer-country cartels in the 1970s (see Box 2), and the long period of weak demand and over-capacity that followed in the 1980s and 1990s, have made cartels in mining and metals an increasingly rare phenomenon. As a result, producer-country cartels play only a very limited role in supplying metals and minerals today. The potash case, in which Canada, the US, Russia and Belarus continue to tolerate the two marketing boards that dominate global supplies, is perhaps the closest remaining equivalent to a producer-country cartel. But even these governments do not engage in any formal coordination with one another, and do not openly interfere with pricing and production decisions of the cartelized companies (see the case study on potash below).

Perceptions of a powerful market position may tempt some governments to try to leverage their market positions to shape prices. Russia and South Africa, for example, recently signed a 'framework agreement' to 'influence' the market for platinum group metals (PGMs) at the BRICS Summit in March 2013. South Africa's mines minister explained that the two countries 'want to contribute without creating a cartel, but we want to influence the markets'. According to Bloomberg, the Russian counterpart explained that the planned arrangement 'can be called an OPEC ... the price depends on the structure of the market, and we will form the structure of the market'.¹⁷

Cartels are only promising if most major players collude, and a number of key mining countries face strong incentives and constraints, making any agreement to participate in cartelization efforts unlikely.

It remains unclear how serious the proposal is, and few details have emerged since the summit. In principle, the prospects for a cartel could be unusually promising as both countries control a very high share of the market (South Africa and Russia account for ca. 80% of global supply) and reserves are equally concentrated, creating barriers for entry for potential competitors. In practice, however, the cartel would face substantial obstacles. Production cuts to shore up prices could lead to large job losses in the labour-intensive PGM mining industry. This would be particularly problematic in South Africa where industrial relations are already extremely tense. The alternative of shoring up prices through buffer stocks could prove expensive and ultimately unsustainable, if price targets are set too high. Sustained high prices could also eventually result in permanent demand destruction, as industrial users would undoubtedly redouble their efforts to reduce, recycle or substitute PGMs in catalysts and other major applications.

¹⁶ Stevens et al., 2013.

¹⁷ Arkhipov and Wild, 2013.

Box 2: The failed metals cartels of the 1970

There has been a long history of attempts to establish producer-country cartels for metals and minerals with the aim of controlling supply and raising international prices. The most recent examples include the series of producer cartels that were established in the 1970s for bauxite, uranium, copper, iron ore and phosphate rock (see Table 2).^a

In most cases these were short-lived or struggled to move international prices. A number of major producers declined to join the iron ore cartel, for instance, while many of the cartelized copper producers failed to follow through on agreed production cuts. For the bauxite, uranium and phosphate rock cartels, initial successes in raising prices quickly faded. Disagreements and defections among cartel members followed, leading to a collapse of the cartels after a few years.

Table 2: Producer-country metal cartels formed in the 1970s

Cartel	Dates	Membership	Comments
<i>Bauxite International Bauxite Association (IBA)</i>	1974–1994	Jamaica, Suriname, Guyana, Australia, Guinea, Sierra Leone, Yugoslavia were founding members. Algeria, Cameroon, Ghana and Mali were observers. ^b	Jamaica and Suriname increased prices, expecting others to follow and mitigating the cartel's loss of competitiveness. Australia's non-participation resulted in Jamaica's and Suriname's loss of market share and undermined the IBA. The global recession following the 1973–74 oil crisis hastened the demise of the association.
<i>Phosphate</i> No formal name, initiated by Morocco	1974–1977	Morocco, Algeria, Togo, Tunisia, Senegal and US export cartel Phosrock.	Global recession in 1975 made artificially high phosphate prices unsustainable and prompted farmers to reduce phosphate consumption and use substitute fertilizers. Reduced demand resulted in Moroccan phosphate prices returning to pre-cartel levels by 1977.
<i>Uranium</i> No formal name, initiated by Canada	1973–mid-1980s	France, South Africa, Canada and Australia.	Canada initiated a series of meetings in 1971, which successfully coordinated uranium production and marketing, and increased prices through the 1970s. By the mid-1970s supply concerns receded as new deposits were discovered, and prices fell to pre-cartel levels.
<i>Copper Inter-governmental Council of Copper Exporting Countries (CIPEC)</i>	1967–1988	Chile, Peru, Zaire and Zambia were founding members. Yugoslavia and Indonesia joined later, Australia and Papua New Guinea became associates.	CIPEC was unable to raise prices by cutting production because of mistrust between members and limited market share (in 1975 CIPEC controlled just 37% of global copper supplies). CIPEC's relevance declined as production collapsed in Zaire and Zambia, and the cartel was dissolved in 1988.
<i>Iron Ore Association of Iron Ore Exporting Countries (APEF)</i>	1975–1989	Australia, Algeria, India, Liberia, Mauritania, Peru, Sweden and Venezuela.	APEF was unable to set iron ore export prices because Australia and Sweden were unwilling to participate, and because large iron ore exporters Brazil and Canada refused to join. APEF was reduced to collecting statistics until 1989, when it was disbanded.
<i>Tin International Tin Council (ITC)</i>	1956–1985	<i>Producers:</i> Belgian Congo, Bolivia, Malaya, Nigeria, Indonesia, Thailand. <i>Consumers:</i> Australia, Belgium, Canada, Denmark, Ecuador, France, India, the Netherlands, Spain, Turkey and the UK.	As demand for aluminium and similar materials increased, the relevance of tin declined. In its efforts to defend a high floor price, the ITC was forced to build up ever larger buffer stocks, until eventually it became insolvent and collapsed in 1985. The ITC's sixth and final International Tin Agreement (ITA) expired in 1989 and was not renewed. ^c

Source: This table draws heavily on Radetzki, 2012. Additional sources include UNCTAD; Australia–Guinea–Guyana–Jamaica–Sierra Leone–Surinam–Yugoslavia: Agreement Establishing the International Bauxite Association (1974), published by the American Society of International Law; and Mallory, 1990.

^a For a succinct overview see Radetzki, 2012.

^b American Society of International Law, 1974.

^c Mallory, 1990.

The International Tin Council (ITC) was supposed to manage stocks and prices in the interest of both producer and consumer countries (other similar international commodity agreements (ICAs) existed for agricultural products such as coffee).^d Through a system of buffer stocks and export restrictions the ITC managed to control prices relatively successfully for over two decades. In the late 1970s and 1980s however, the tin agreement became increasingly politicized and began to emphasize the importance of raising prices rather than stabilizing them, increasingly resembling a producer cartel.^e Attempts to defend an unrealistic floor price in an environment of weak demand forced the ITC to leverage acquisitions of growing quantities of buffer stocks, which quickly grew to unsustainable levels. The scheme collapsed in October 1985 when the ITC became insolvent, with the member governments refusing to take on the large debts which the ITC had accrued to finance buffer stocks.

A combination of deteriorating market share of the cartelized producers and cyclical reductions in demand eroded the cartels' ability to control prices. Producer countries often confused large market shares with market power and overestimated the longer-term barriers to entry, to their considerable cost. The Jamaican bauxite industry provides an iconic example. Jamaica used to be the world's second largest bauxite mining country. Attempts to manipulate prices in global markets in the 1970s led to initial windfalls, but deterred investment and led producers elsewhere to ramp up bauxite production. This contributed to a precipitous decline of the industry from which it never recovered. Production levels on the island today are about a third lower than they were in the 1970s, while world production has quadrupled.

^d Gilbert, 2011.

^e Mallory, 1990.

With such exceptions aside, overall a sustained revival of the producer country cartels in mining is unlikely anytime soon. Cartels are only promising if most major players collude, and a number of key mining countries face strong incentives and constraints, making any agreement to participate in cartelization efforts unlikely. These include:

- **Potential adverse impact on domestic consumers.** This would be a major concern for China, which faces rising import dependencies for almost all major metals and minerals. Any attempt to restrict output or raise prices internationally would result in higher costs for China's large metal-processing industries, which are likely to outweigh any benefits Chinese mining companies could derive from higher global prices.
- **Strong commitments to free market policies.** In principle, countries such as Australia or Chile could exert considerable influence on global mineral prices or output. But their governments' laissez-faire approach is widely credited with the rapid growth of their export-oriented mining industries. Australia has attracted over \$200 bn in mining investment since 2002.¹⁸ Any government attempts to interfere with prices or output in these countries would face fierce resistance from parts of the political establishment as well as from powerful industry lobbies.
- **Opportunities to free-ride on cartelization attempts.** Many export-oriented producers would see attempts to form cartels by other countries as opportunities to free-ride on price spikes and gain market share at the expense of their cartelized competitors, as during previous cartelization episodes. Countries such as Australia or Brazil were reluctant to get involved in earlier cartelization efforts and are unlikely to support such efforts in the future. This acts as a strong deterrent to other countries that might be more inclined to do so.

¹⁸ Barber, 2013.

Export restrictions by emerging economies pose a growing threat

While a proliferation of producer-country cartels is unlikely to present a major threat to global mineral markets in the short to medium term, another form of government intervention, unilateral export restrictions, constitutes a more credible present and future threat to their functioning.

Export restrictions are applied by a range of governments across metals and minerals markets. In 2010, at least 35 countries made use of one or more export restrictions on metal and mineral raw materials, while the OECD identified almost 1,400 restrictions at the tariff code level.¹⁹ The most common instruments include export duties, but also a variety of other trade restrictions such as export licensing requirements, quotas or even outright export bans. Most of the 75 minerals and metals surveyed by the OECD were found to be subject to at least one export restriction, with metal scrap being particularly heavily affected (presumably because metal scrap is a particularly cost-effective and environmentally friendly source of raw material).

Table 3: Selection of metals and minerals commonly subjected to export taxes, 2009

Product	Countries applying the measure
Iron and steel	Argentina, China, India, Russia, Ukraine
Copper	Argentina, China, Russia, Zambia
Molybdenum	China, Russia, Vietnam
Diamonds	Namibia, Sierra Leone, South Africa
Aluminium	China, Guinea, Russia, Vietnam
Tungsten	China, Russia, Vietnam
Nickel	Russia, Vietnam
Cobalt	Argentina, China, Ukraine, Vietnam
Tin	China, Russia, Vietnam
Pig iron	China, India

Source: Fliess and Mård, 2012.

There is a long history of such export restrictions on raw materials. Before turning to its current *laissez-faire* approach, Australia operated an extensive system of export controls for iron ore, coal and other minerals. Iron ore exports were banned completely between the late 1930s and the early 1960s, first to deny supplies to Japanese industries during the Second World War and later to preserve what were thought at the time to be limited domestic reserves, and prices and quantities of exports remained tightly controlled thereafter.²⁰ In the 1970s these restrictions applied to the bulk of Australia's metals and mineral exports and required ship-by-ship approval by government authorities. While these rules were gradually relaxed, lighter forms of export price controls, for example for coal, remained in place well into the 1990s.²¹

Typically, export restrictions are used as protectionist policies to promote domestic downstream processing and as part of import substitution strategies. But countries also cite a variety of other motivations for imposing these restrictions, ranging from controlling illegal exports, conserving

¹⁹ Fliess and Mård, 2012.

²⁰ Lee, 2013.

²¹ Bowen and Gooday, 1993.

natural resources and protecting the environment to generating revenue and increasing domestic supply security.²² For a number of developing countries with low governance capacity, export taxes offer an attractive (if inefficient) alternative to royalties or other forms of mining taxes because of their lower administrative burden.

There are reasons to believe that emerging economies with large metal exports, such as Indonesia, India, South Africa and Brazil, may increasingly be tempted to use such restrictions in the future. For these countries, raw materials exports are currently an important source of export revenue. But as they continue to industrialize rapidly, metal-consuming industries such as smelters, refineries and steel mills will become both economically and politically increasingly powerful actors. As result, the temptation will grow to grant these strategic industries a cost advantage through preferential access to abundant domestic raw materials instead of exporting them as they currently do.

Box 3: Legal status of export cartels in various jurisdictions

Export cartels are still not illegal in most jurisdictions, and are often either explicitly exempted from anti-trust laws or simply ignored by legislation on domestic markets. Under the US Webb-Pomerene Act of 1918, export-oriented cartels, for example, remain permitted (subject to registration with the Federal Trade Commission) where there is no impact on the domestic market. In Canada too, the 1985 Competition Act exempts export cartels from anti-trust liability and makes no registration requirements. Of 55 countries surveyed in 2005, implicit exemptions were the most common, accounting for 34 countries, while 17 made explicit exemptions, and just four countries offered no exemption.^a Companies clearly use such loopholes: Canpotex (Canadian Potash Exporters), for example, does not coordinate its potash sales in the US market, fearing that its US members could become subject to anti-trust enforcement.

Table 4: Legal status of export cartels in various jurisdictions

Type	Legal status	Example
Explicitly exempted	Exempted under domestic legislation, with notification requirements	US, Australia
	Exempted under domestic legislation, without notification requirements	Canada, India
Implicitly exempted	Domestic anti-trust legislation applies only to anti-competitive conduct in the domestic market	Brazil, China, Singapore
Not exempted	Domestic anti-trust law does not specify geographical scope	Russia, Thailand

Source: Based on Suslow, 2005 p. 785–828.

^a Suslow, 2005.

Policies and policy debates in the emerging economies mentioned above already point in this direction. Indonesia’s attempt to force industries to process ores domestically through a regime of export duties and quantitative restrictions, which came into force in January 2014, is the strongest indication in this regard. South Africa is currently also debating new mining regulation and a beneficiation action plan, both of which may include preferential access regimes for domestic

²² Ibid.

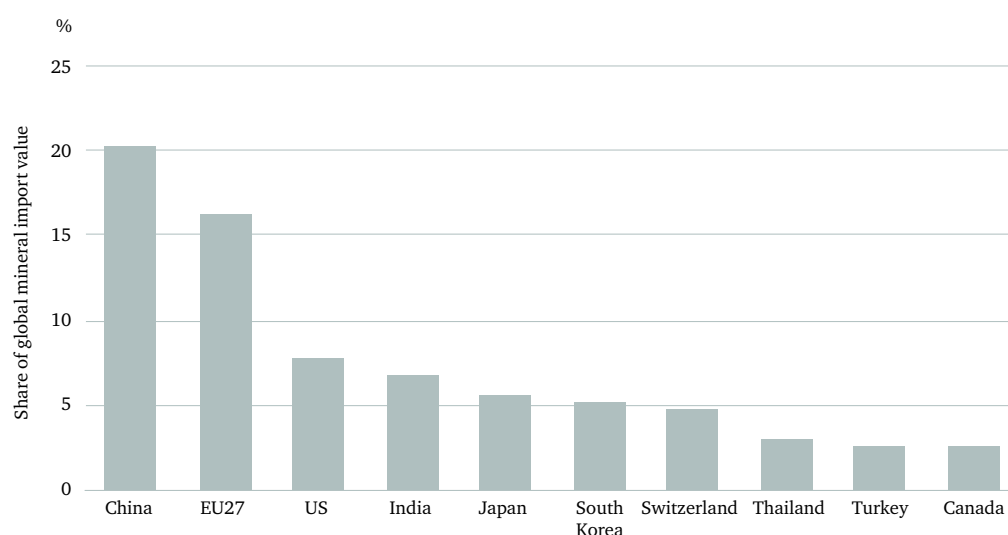
industry. While the rules have yet to be finalized, the current proposal is for a share of the output for certain minerals such as iron ore or coal to be made available to domestic industries at a discount on global market prices.²³

India has also significantly increased its restrictions on iron ore and bauxite exports through export duties, to support domestic steel and aluminium industries.²⁴ A proposed 10% iron ore export tax was debated in the Brazilian parliament in 2012, but ultimately dismissed owing to fears of undermining the competitiveness of Brazilian iron ore exporters.²⁵ China, which is often at the centre of international media concerns over export restrictions because of its quota regime for rare earths, is unlikely to impose significant additional restrictions in the future, given the increasing import dependence for almost all major minerals.

The export moratoria on iron ore exports that were imposed in 2010 by two Indian states, Goa and Karnataka, to combat rampant illegal mining, demonstrate the considerable impact such restrictions can have on global markets. Since their imposition, India's iron ore exports (previously the world's third largest behind Australia and Brazil) have fallen by over two-thirds.²⁶ Analysts have estimated that this has added up to \$40 per tonne, or more than 25%, to the price of iron ore in global markets.²⁷

For Chinese steelmakers, which in 2013 imported a record 820 million tonnes of iron ore in 2013,²⁸ this would equate to an increase of more than \$30bn in material prices. This is certainly an extreme case, as Chinese iron ore imports represent the largest metal and mineral trade stream in the world, and India is among the largest exporters. But for the EU and Japan, both of which import well over 100 million tonnes a year, the impacts would still be in the range of \$5bn each. This shows the considerable economic impacts export restrictions can have for the major importers of metals and minerals.

Figure 3: Top ten countries by share of global mineral imports, 2011



Source: Chatham House Resource Trade Database. Data exclude intra-EU trade. China includes Hong Kong imports.

²³ England, 2014; Creamer, 2014.

²⁴ Metalworld, 2013; Mukherji, 2014.

²⁵ Jamasmie, 2012.

²⁶ Crabtree and Farchy, 2013.

²⁷ Ibid.

²⁸ Hornby, 2014.

Although such distortions are often due to policies put in place by emerging economies, China and other import-dependent emerging economies are at the same time bearing a growing share of the costs caused by such distortions. The burden of inflated prices in the cartelized potash market, for example, falls mainly on India, China and Brazil, the largest customers for the mineral fertilizer. China, as the world's largest importer, is particularly vulnerable but other countries such as South Korea, India, Thailand and Turkey have also grown into major mineral importers, rivalling traditional customers such as Japan or Germany (see Figure 3).

Cases such as South Africa serve as a warning to other governments. The country has largely failed to capitalize on the global mining boom, in part owing to the enduring concerns over proposals for radical changes to export and ownership rules, which have made private companies reluctant to invest in the country.

Imposing such export restrictions, however, also carries risks for producer governments. Mining industries require a steady stream of large-scale investment to maintain production capacity and output, most of which is provided by private investors. These investors tend to be sensitive to any indications of potentially heavy-handed government interventions or policy uncertainty. While Indonesia's export ban has managed to attract some downstream investment, upstream investment has stalled and the inability of many miners to process their ores domestically has led to shutdowns that have caused thousands of job losses in the country.²⁹

In this context, cases such as South Africa serve as a warning to other governments. The country has largely failed to capitalize on the global mining boom, in part owing to the enduring concerns over proposals for radical changes to export and ownership rules, which have made private companies reluctant to invest in the country.³⁰ Lack of investment has contributed to a 60% decline in South African gold production since 2000, and the country has slipped from being the world's largest producer into fifth position. Platinum, iron ore and coal production, the other main mineral exports of the country, have fared better, but have lagged far behind South Africa's rivals such as Australia.

²⁹ Rusmana, 2014.

³⁰ England and Blas, 2011.

The Potential for Market Manipulation by Companies

Policy debates on metals and minerals supply often focus on the role of governments of large producer countries, with less attention given to the critical role of private companies in production, pricing and investment decisions. Today around three-quarters of the global mine production is controlled by private, often multinational corporations. While they are bound by international trade rules and the regulations and policies of the jurisdictions in which they operate, these firms make autonomous decisions on production volumes and pricing strategies. Private entities in mining have far more control than in the oil and gas sector, where governments control three-quarters of supply and 90% of reserves.³¹ Examining the role and strategies of these corporate actors is therefore crucial for understanding the role of anti-competitive practices in metals and minerals.

Figure 4: Market share of five largest producing companies for selected metals, 2012



Source: Chatham House calculations based on company presentations and other industry sources.

³¹ Tordo, 2011.

Box 4: Measuring market concentration

Markets controlled by a few dominant companies are more prone to anti-competitive practices; in comparison, it is much harder for multiple suppliers to agree on production and supply levels and the chances of an agreement being implemented successfully are much lower.

There are no hard and fast rules to determine a ‘large’ market share or ‘high’ market concentration. The most common ways to measure market concentration are the four-firm concentration (C4), which simply adds the market shares of the four largest suppliers, and the Herfindahl-Hirschman Index (HHI), which is calculated by summing the squares of the market shares of the 50 largest firms and multiplying the number by 10,000. For a perfectly competitive market, both the C4 and HHI approach zero, while a monopoly would produce a value of 1 and 10,000 respectively.^a

Market concentrations, in both country and company terms, vary across metals and minerals (see Table 5; automobiles and crude oil are added for comparison). Concentration tends to be relatively high for nickel or bauxite ores, but much lower for gold where small-scale and artisanal miners play an important role in global supply. For minor metals, where markets are much smaller, concentrations tend to be even higher. In addition, country concentrations tend to be much higher than company concentrations, as several larger companies often compete to produce the rich reserves of a particular country (such as iron ore miners in Western Australia or copper miners in the Chilean Andes).

Table 5: Country and company concentration for mining and metals production, 2012

	C4		HHI	
	Countries (%)	Companies (%)	Countries	Companies
Iron ore	76	41	1,644	528
Bauxite	70	41	1,538	598
Copper	54	31	1,271	428
Nickel	55	42	1,008	750
Gold	39	20	552	266
Aluminium	62	31	2,003	270
Steel	66	15	2,483	220
Crude oil	40	45	563	709
Automobiles	53	43	1,049	643

Source: Chatham House, based on data from the USGS, the World Steel Association, the Raw Materials Group, EIA and company records.

^a As a rule of thumb a HHI below 1500 is regarded as unconcentrated and a value above 2500 is considered as highly concentrated. See U.S. Department of Justice and the Federal Trade Commission, 2010. The major definitions are:

- *Small Change in Concentration:* Mergers involving an increase in the HHI of less than 100 points are unlikely to have adverse competitive effects and ordinarily require no further analysis.
- *Unconcentrated Markets:* Mergers resulting in unconcentrated markets are unlikely to have adverse competitive effects and ordinarily require no further analysis.
- *Moderately Concentrated Markets:* Mergers resulting in moderately concentrated markets that involve an increase in the HHI of more than 100 points potentially raise significant competitive concerns and often warrant scrutiny.
- *Highly Concentrated Markets:* Mergers resulting in highly concentrated markets that involve an increase in the HHI of between 100 points and 200 points potentially raise significant competitive concerns and often warrant scrutiny. Mergers resulting in highly concentrated markets that involve an increase in the HHI of more than 200 points will be presumed to be likely to enhance market power. The presumption may be rebutted by persuasive evidence showing that the merger is unlikely to enhance market power.

A few major companies dominate global metals supply

A high degree of market concentration is common in the mining sector, where large economies of scale, high capital costs and significant technical and managerial know-how are needed to mine metals and minerals at competitive prices. This favours industry structures dominated by a relatively small set of large companies (see Figure 4), which control most of the ‘tier one’ assets: very large, favourably located, long-life and low-cost mines that provide the backbone of global mineral supply. Jointly, the four largest companies in iron ore, bauxite, and copper mining control 41%, 41% and 31%, respectively, of global mine production (see Table 5).

Today, the largest mining companies can be roughly divided into two separate types: large Western mining multinational corporations (MNCs), such as BHP Billiton or Rio Tinto, and mostly nationally focused mining companies from emerging economies (see Table 6). The major South African mining companies can be considered part of the former group because of their close ties and historical overlap with UK and other Western mining companies and financial centres.

Western mining majors have a long history of dominating the global mining industry and continue to lead the sector in terms of output, financial resources, cutting-edge technical and managerial know-how and international presence. They are listed on exchanges such as the London Stock Exchange, New York Stock Exchange, Toronto Stock Exchange or Australian Securities Exchange and access finance mostly through traditional sources, such as equity offerings or loans from large investment banks. Many of these companies are ‘diversified’ miners, mining several metals and minerals, although there are some, often smaller, so-called ‘pure play’ companies focusing on mining a single metal (such as the Fortescue Metals Group, which focuses exclusively on iron ore).

Table 6: Top 40 listed mining companies

	Western mining companies	Home country	Emerging-economy mining companies	Home country
Top 10	BHP Billiton	Australia/UK	Vale	Brazil
	Rio Tinto	UK/Australia	China Shenhua Energy	China
	Glencore	UK	Coal India	India
	Xstrata	UK		
	Anglo American	UK		
	Potash Corp	Canada		
	Barrick Gold	Canada		
Top 40	Fortescue Metals	Australia	China Coal Energy	China
	Newcrest Mining	Australia	Inner Mongolia Baotou	China
	Eldorado Gold	Canada	Inner Mongolia Yitai Coal	China
	First Quantum Minerals	Canada	Jiangxi Copper	China
	Goldcorp	Canada	Yanzhou Coal Mining	China
	Kinross Gold	Canada	Zijin Mining	China
	Silver Wheaton	Canada	NMDC	India
	Teck Resources	Canada	Grupo México	Mexico
	Yamana Gold	Canada	Industrias Penoles	Mexico
	Antofagasta	UK	Minera Frisco	Mexico
	Polyus Gold International	UK	KGHM Polska Miedz	Poland
	Freeport-McMoRan	US	MMC Norilsk Nickel	Russia
	Newmont Mining	US	Uralkali JSC	Russia
	Mosaic	US		
	AngloGold Ashanti	South Africa		
	Gold Fields	South Africa		
	Impala Platinum	South Africa		

Source: PWC, 2013 p. 51. Note that this table does not include large unlisted mining companies, such as Chilean Codelco, the world’s largest copper miner, or companies focused mainly on smelting and refining rather than mining, such as Rusal or ArcelorMittal.

The major emerging economy mining companies, such as Norilsk Nickel (Russia), Codelco (Chile), China Shenhua, Grupo Mexico, Adaro (Indonesia), National Mineral Development Corporation (NMDC) (India) or Kazakhmys (Kazakhstan), have a long-standing focus on developing key domestic deposits, often with a focus on a single commodity. Many of these companies are at least partly owned or closely aligned with their respective national governments. Their main sources of finance are also often domestic, and sometimes include sovereign wealth funds or governments.

The importance of these non-Western mining companies has increased markedly since 2005, when just eight of the top 40 listed mining companies by market capitalization were from emerging economies other than South Africa. By 2013, this number had doubled to 16, with three emerging-economy based companies among the top ten. In line with the growing global role of their home economies, the importance of mining companies from emerging economies will continue to increase.

Currently, however, only very few of these emerging-economy mining companies have the ambition, technical know-how and capital needed to develop large-scale projects overseas. In fact, most of the emerging-economy companies listed in the right-hand column of Table 6 have few, if any, significant overseas assets. Companies such as Brazilian Vale and Indian Vedanta – with a strong international profile making them increasingly indistinguishable from Western mining MNCs – are the exception to the rule (again in marked contrast to the oil sector, where many non-Western oil companies today are clearly already global players).

For many of the emerging-economy miners, attempts to build up an overseas presence outside their home markets have proved difficult. Heavy investment in overseas assets over the past decade often ended up netting expensive, second-class assets. Many overseas projects have struggled with delays and cost overruns, and emerging-economy miners have been confronted with challenges such as political instability and discontent from local communities. Chinese Mining Association Vice President Wang Jiahua stated in 2013 that as much as 80% of Chinese overseas mining investments had 'largely failed'.³² As a result, many companies such as Russian Norilsk Nickel have decided to abandon their overseas investment strategies and refocus on their domestic markets.

Given these difficulties, only a few emerging-economy mining companies are likely to transform into global players by 2020. Apart from Brazil's Vale and India's Vedanta, which increasingly resemble the business model of Western mining multinationals, these are likely to comprise mainly several major Chinese and to a lesser extent Indian state-owned mining companies such as China Minmetals, Chinalco or NDMC, which are using their considerable financial leverage to increase their presence abroad.

At the same time, however, the role of emerging economies in the global mining industry is increasing indirectly through continued equity investment in key Western mining companies. Investors with an emerging-economy background still only form a small part of Western mining and metals companies, but this share is growing quickly. The hostile takeover of Arcelor by Indian Mittal Steel in 2006 for \$33 bn created the world's largest steel producer ArcelorMittal. A similar bid by Chinalco for Rio Tinto failed in 2009 owing to political concerns of some of Rio Tinto's largest shareholders, but Chinalco's current 9% stake still makes it Rio Tinto's largest shareholder. Qatar's sovereign wealth fund is Glencore's second largest shareholder with an 8% equity stake.

While there has been much public attention on the growing role of state-owned enterprises (SOEs) from emerging economies in mining and metals, the evidence suggests that their role in global markets is relatively limited and will only gradually expand. In the near to medium term, powerful SOEs with a strong

³² England and Blas, 2014.

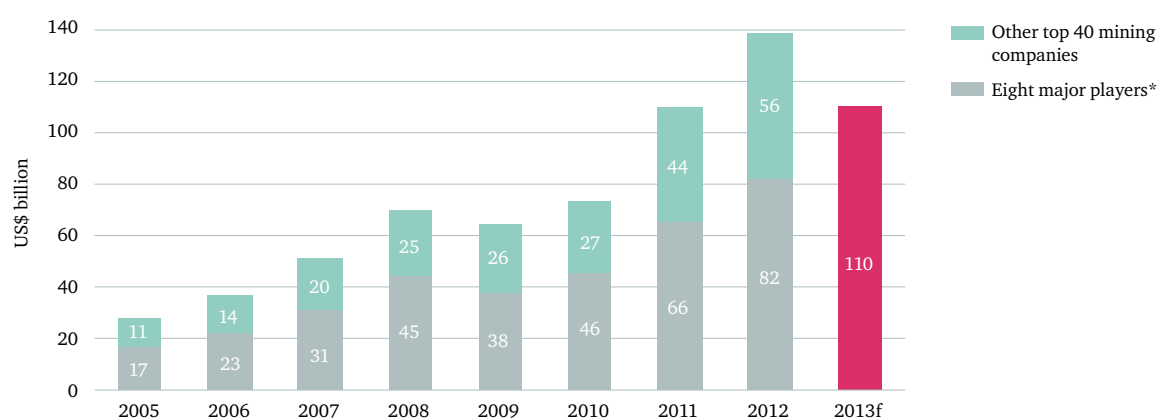
global presence and cutting-edge technology will remain the exception rather than becoming the rule. This stands in stark contrast to other sectors such as oil and gas where SOEs play a much stronger role.

Capital requirements and high investment risks are the key barriers for new entrants

Barriers to entry are a prerequisite for sustaining anti-competitive practices over time, because they prevent potential competitors from accessing markets in which anti-competitive rents exist. For potential entrants into the mining sector, large capital requirements and high investment risks act as the most important barriers to entry.

To gain a significant foothold in the business of supplying one of the major metals, a potential entrant will have to invest at least several billion US dollars to mount a competitive, large-scale mining operation. It will take many years to recover these investments and to begin reaping profits. Substantial cost overruns and delays on initial project schedules, sometimes of several years, are now quite a common occurrence in the sector for large greenfield projects. Rio Tinto has yet to ship a single tonne of iron ore from one of the world's largest greenfield mining projects at Simandou in Guinea, which it began to develop in 1998. Meanwhile, the operation faces the full set of complex risks affecting mining operations, from volatile commodity prices and exchange rates to uncertain permitting and potential conflicts with host governments and affected communities.

Figure 5: Capital expenditure by the top 40 listed mining companies



Source: PWC (2013) and previous editions; GlencoreXstrata (2013), 'Investor day' company presentation, 10 September. *Anglo American, BHP Billiton, Freeport, Rio Tinto, Teck, Vale, Vedanta and GlencoreXstrata.

While the rewards are potentially large, only a small number of investors have deep enough pockets, the patience and the appetite to take on such huge risks. Where they do, they tend to turn to trusted partners with the necessary expertise and a long track record of successfully delivering on such complex projects – in other words, the major incumbents in the mining industry. Smaller companies (so-called juniors) tend to develop projects only through the less risky and capital-intensive exploration phase, and will sell them off to a small number of 'majors' if the deposit turns out promising enough to warrant the investment in an actual mine.

This explains why the major mining companies account for the lion's share of global investment in mining (see Figure 5) and why there have been only very few new entrants into the small club of large-scale miners,

despite the fact that the metal price boom of the past decade has offered companies substantial resource rents. In fact, apart from some of the mining companies from emerging economies discussed above, there have been only two notable entrants over the past decade: Xstrata (now part of GlencoreXstrata), which was assembled mainly through a strategy of leveraged buyouts and acquisitions; and Fortescue Metals Group, which managed to gain a foothold in the Australian iron ore business and was backed by cash-rich Australian investors including Gina Reinhart, Australia's richest person. As a result, competitive pressures in the mining sector mainly result from the threat of expansion by existing competitors rather than entry by new players.

Box 5: The end of the traditional international company cartel model

In the past, many parts of the international mining and metals industry were organized in cartels or cartel-like structures. These include the multilateral arrangements between governments discussed in the previous chapter, but also a series of international agreements between private companies to sustain prices and limit competition. Such cartels were often formalized in agreements and secretariats, including arrangements on sales territories and disciplines for potential violators.

The 'Producer Groups' for zinc and lead offer a good example. They included companies from Australia, the UK, Germany, France and Spain as well as Canada, and dominated markets from the 1940s to the 1970s.^a A more recent example is the 'East of Burma Agreement', an alleged collusive arrangement to limit competition between European, Japanese and Korean steel mills in one another's markets, which is thought to have operated from the 1980s into the early years of this century.^b

As is the case for producer-country agreements (see above), these cartel-like structures have been less of a feature in international mining since the 1980s, for two main reasons. First, increasingly stringent anti-trust legislation – initially in the US and then in Europe and now globally – has forced most formal cartels to cease to operate. Second, the growing diversification of supply over the second half of the 20th century has made it more difficult for mining and metals companies to successfully enter and maintain collusive arrangements, clandestine or otherwise.

In aluminium, the market share of the two largest North American producers, Alcoa and Alcan, was gradually eroded from almost half of non-socialist supply in the 1950s to 22% in 1990. The end of the Cold War led to a further diversification of metals supply. Today Alcoa and Alcan (the latter now a subsidiary of Rio Tinto) control less than 15% of world supplies and have to compete with a Russian and two Chinese companies of similar size.

The global nickel market tells a similar story. In the 1950s, the Canadian International Nickel Company (INCO) controlled up to 80% of global nickel supplies outside the Soviet bloc. With superior deposits, access to cheap electricity and proprietary processing technologies, it set global output targets and prices, acting as a swing producer and extracting considerable resource rents. In the 1970s INCO failed to respond to aggressive pricing strategies of new entrants and its market share declined rapidly to less than 30% of non-socialist supply by 1990.^c The company was sold to Brazilian miner Vale in 2006 and together with Vale's own nickel assets today accounts for approximately a tenth of world supply, behind Russian miner Norilsk Nickel, which controls around 15% of the global market.

Since 2000, this trend towards lower company concentrations has reversed somewhat on the back of a wave of international mergers and acquisitions in mining. This includes the formation of the world's largest mining company, BHP Billiton, through a merger in 2001, the takeover of Alcan by Rio Tinto in 2007, and, most recently, the Glencore and Xstrata merger in 2013. But despite this consolidation, company concentrations remain much lower than during the heyday of metals and mining cartels in the middle of the 20th century.

^a Tsokhas, 2000.

^b Jenny, 2002.

^c Radetzki, 2013.

Combating manipulation in evolving global mineral markets requires vigilance and flexibility by regulators

The formal private cartels and producer groups which in the past were an important part of the structure of the international mining and metals industry have largely ceased to exist. Most fell victim to enhanced anti-trust legislation in the US and Europe or disintegrated under the pressure of declining company concentration throughout the second half of the 20th century (see Box 6). The remaining exception is the case of potash – examined in detail in the next chapter – where most of the major producer companies are still openly organized in two export cartels.

Private companies' attempts to manipulate prices and supply nevertheless remain a significant threat to metals markets, even if they tend to take more subtle forms than in the past. There were at least 15 cases where anti-trust authorities uncovered and punished attempts to form clandestine international private cartels in mining and primary metals between 2000 and 2010.³³ Given that such 'private international hardcore cartels' present the most extreme form of anti-competitive practices – and that cartel members will make considerable efforts to conceal them – they could be the tip of the iceberg of manipulative practices in the sector.

Policy-makers need to consider not only the role of mining and metals companies but also a number of financial and trading companies, from the big investment banks to powerful private trading houses such as Trafigura BV or recently listed Glencore.

Detecting and deterring such anti-competitive practices in increasingly complex global minerals markets is no easy task for national competition authorities and regulators. Policy-makers need to consider not only the role of mining and metals companies but also a number of financial and trading companies, from the big investment banks to powerful private trading houses such as Trafigura BV or recently listed Glencore. These players often own important production, processing and logistics assets in global mineral supply chains. More importantly, their trading and financing activities give them important market-making functions. This means they are some of the most powerful and best-informed players in metals and minerals markets – and can open the door for potential abuse. Most of the warehousing companies at the centre of contention in the LME case that is affecting both aluminium and zinc markets are controlled by such entities.

Box 6: Manipulation, regulation and reform in gold and silver pricing

Precious metal pricing mechanism, which have recently come under public scrutiny, exemplify both the involvement of financial actors in mineral markets and the regulatory challenges involved. Gold prices are set in London twice per day by conference call between five investment banks – Barclays, Deutsche Bank, HSBC, Bank of Nova Scotia and Société Générale – while silver prices are set once per day in a call between the last three banks. Both follow an iterative price discovery process, whereby the chairman announces an opening price, which the banks relay to customers and on which they accept orders, before declaring 'buy' or 'sell'. This process is repeated until both buyers and sellers are established, and orders in and out balance, at which point the price is 'fixed'.

³³ Connor, 2012.

Positions on the gold and silver panels have traditionally been freely traded, most recently in 2004, when Barclays acquired its position from NM Rothschild & Sons for roughly US\$1m.^a However, after Deutsche Bank resigned from both the gold and the silver fix in early 2014, ostensibly as part of a wider strategic shift away from commodities, no buyers for the position were found.^b The operation of both fixes has fallen under the remit of the London Bullion Market Association (LBMA), which is jointly regulated by the Prudential Regulation Authority (PRA) of the Bank of England and the UK Financial Conduct Authority (FCA).

Recent allegations of price manipulation have prompted regulatory scrutiny and legal action. The FCA launched investigations into alleged manipulations of the gold fix in 2013^c and fined Barclays US\$44 million in May 2014 for its 'failings'.^d The US Commodity Futures Trading Commission (CFTC) is also investigating the matter,^e and 27 legal cases against the five banks on the gold panel are pending in US federal courts as of August 2014.^f A lawsuit against the three banks on the silver panel – for allegedly rigging the silver price – was filed in New York in July 2014.^g A US jeweller followed suit in November 2014, launching a class action against four banks for allegedly manipulating platinum and palladium benchmarks.^h

These lawsuits come in the context of mounting public and regulatory pressure to improve transparency and safeguards for pricing mechanisms in several physical and financial markets (including investigations into alleged crude oil price manipulations at the price collection agency Platts, and scandals about the manipulation of the London overnight interbank lending rate, LIBOR, and misconduct in foreign exchange markets). A market consultation held by the LBMA in early 2014 found that over a quarter of respondents considered the price discovery method for silver to be 'not sufficient'.ⁱ Elke Koenig, President of German financial regulator Bafin, described allegations of price manipulation as 'particularly serious' because – unlike for the LIBOR – the reference values are based on transactions in liquid markets.^j

The LBMA embarked on extensive reforms aimed at achieving an 'electronic, auction-based and auditable process' for the silver fix following the resignation of Deutsche Bank.^k After a consultation process, responsibility for the new silver fix was eventually awarded to Chicago Mercantile Exchange Group (CME) and Thomson Reuters.^l Similarly, the World Gold Council (WGC) has stressed the need for reform to establish a 'single, trusted, benchmark reference price' for the global gold market.^m Five principles – that the fix is based on executed trades, is a tradable price, has highly transparent input data, is calculated from a deep and liquid market, and represents a physically deliverable price – reportedly receive broad support among market participants.ⁿ In July 2014 the banks on the gold panel announced that the gold fix would be replaced by the end of the year.^o After an LBMA consultation process, Intercontinental Exchange (ICE) was named as the new administrator of the gold fix, which is due to enter into operation in early 2015.^p

^a Rice, 2014c.

^b Denina, 2014.

^c Larkin, 2014.

^d FCA, 2014b.

^e Harvey and Brown, 2014.

^f Longstreth, 2014.

^g Hurtado, 2014.

^h Sanderson, 2014.

ⁱ London Bullion Market Association (LBMA), 2014a.

^j Matussek and Suess, 2014.

^k Larkin, 2014.

^l LBMA, 2014b.

^m World Gold Council (WGC), 2014.

ⁿ WGC, 2014.

^o Rice, 2014d.

^p LBMA, 2014c.

In this context, data availability and information asymmetries present a central challenge to regulators. Making regulatory decisions typically requires reliable and timely statistics on market structure, production capacity, inventories, and output and sales volumes along the supply chain, as well as detailed information on the pricing of different product grades in different locales.

For many metals and minerals, such data are often not available in the public domain. Resource companies and investors rely mostly on a small number of expert consultancies to provide these detailed statistics, to which national governments, competition authorities and international organizations often lack access. As result, competition authorities will typically have to rely on data submitted by competitors of the companies under investigation when making decisions about anti-trust cases or deciding on whether to grant permission to mergers and acquisitions. The activities in opaque physical markets are often particularly difficult to track even for market participants and in many cases escape the purview of regulatory authorities, which are frequently focused on trading in equity and other financial markets.

These challenges are further complicated as new global trading hubs emerge in places such as Singapore, Dubai or China. Chinese financial institutions have been actively expanding their role in trading and financing through targeted mergers and acquisitions. The Industrial and Commercial Bank of China (ICBC) acquired the London commodity operations of South Africa's Standard Bank in early 2014.³⁴ The LME itself was acquired by Hong Kong-listed Hong Kong Exchanges & Clearing Ltd in 2012.³⁵ Existing Chinese operations have also expanded rapidly – in 2013 the Shanghai Futures Exchange (SHFE) announced its intention to expand its warehousing network in order to compete with the LME.³⁶

Box 7: Market segmentation plays a key role in anti-competitive practices

A key practical problem for detecting anti-competitive practices lies in delineating the 'relevant market' in which a mining or metals company actually competes. Global markets for a single metal are often fragmented into several sub-markets. A company's global market share might seem quite small, but it could still engage in anti-competitive practices in a particular market segment where it enjoys a dominant position and is shielded from its competition. This can often make it surprisingly difficult to determine to what extent companies effectively compete with one another.

What the relevant sub-markets are and how strong the barriers are between them are therefore often among the most salient points determining what sways regulatory decisions, such as approvals for mergers and acquisitions or anti-trust proceedings. Two particularly common forms of market segmentation stem from geographic and infrastructure barriers and qualitative differences in product grades.

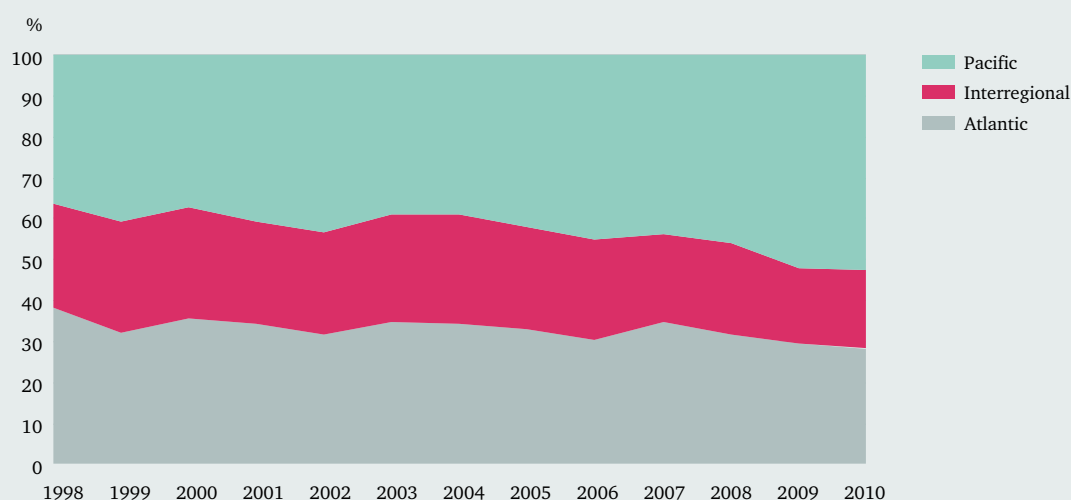
A combination of prohibitively high transport costs, infrastructure constraints or trade barriers can limit arbitrage and competition between different world regions. As a result, providers of the same commodity can compete in separate geographical markets where supply structures and prices can differ somewhat. These geographic boundaries are rarely absolute, but they can lead to competitiveness concerns. The European Commission forced Glencore to reduce its position in zinc markets by making its 2012 merger with Xstrata conditional on relinquishing long-term supply contracts. While Xstrata and Glencore together controlled only around 10% of the global zinc supply, their post-merger share of the European zinc market exceeds 35% even after implementation of the Commission's conditions.

³⁴ Standard Bank, 2014.

³⁵ London Metal Exchange (LME), 2012.

³⁶ Bloomberg News, 2013.

Figure 6: Geographical boundaries in global coal trade



Source: Chatham House Resource Trade Database.

Perhaps the best example of the pervasive impact such geographic boundaries can have on resource markets comes from natural gas and liquefied natural gas, rather than from metals and minerals. Here transport costs and infrastructure constraints act to create distinct European, North American and Asian gas markets with large and sustained price differentials. Coal markets, especially thermal coal markets, are similarly divided into a Pacific and an Atlantic market with a limited amount of crossover trade. The existence of swing producers such as Canada and South Africa that have access to both markets, however, has so far prevented the emergence of high and sustained price differentials in these markets. Seaborne iron ore provides another example of the impact of such geographic boundaries, with distance to markets being a key factor for the competitiveness of different producer countries owing to the high transport costs for the bulk metal.

Different grades of material can also act to create a set of sub-markets with limited competition across them, particularly where these grades are linked to different processing routes. Recent developments in nickel markets provide a good example of this. Usually, nickel is produced from relatively high-grade ores that are refined into ferro-nickel that is then mainly used for the production of stainless steels. High international nickel prices have spurred the development of an alternative processing route in China that allows for the processing of cheaper, low-grade nickel ores into so-called nickel pig iron (NPI). NPI-based stainless steel is of inferior quality and a relatively inefficient production process. But it does allow the use of cheap, previously unused low-grade nickel ores, resulting in significant growth in the nickel supply in recent years (NPI now accounts for 20% of the global nickel market).

Low-grade nickel ores and higher-grade ores (used for conventional nickel production across the world) act as imperfect substitutes and compete in distinct but related markets. NPI does ease the pressure on global nickel supplies by reducing the share needed to meet demand for low-quality products, but could not respond to a sudden demand surge for high-quality nickel products. Given that their production capacity and business model are geared towards processing cheap low-quality Indonesian ores, Chinese NPI producers similarly cannot simply replace Indonesian supply with much more expensive ores from elsewhere. This gives Indonesian exporters a degree of leverage over their Chinese customers, even though the global nickel concentrate market is quite diversified. It also explains why Chinese NPI companies have been hit particularly hard by the decision of the Indonesian government to ban the export of unprocessed ores.

Evolving legal frameworks and the limited experience of regulators in dealing with complex global physical and futures markets make these new marketplaces vulnerable to manipulation and abuse. Concerns about the use of metals such as copper in bonded warehouses as collateral in potentially risky financial deals exemplify such challenges.³⁷ Approximately 10% of China's short-term foreign exchange lending since 2012 is thought to be associated with copper financing.³⁸ Domestic regulation is challenging owing to the involvement of non-Chinese actors in the trade – regulation introduced by China's State Administration for Foreign Exchange (SAFE) in 2013 appears to have had little immediate impact.³⁹

Regulators face growing challenges managing global mineral markets as a result of the overlapping trends of increasing 'financialization' of physical commodity markets, shifting trading patterns with greater roles for market platforms in emerging economies, difficulties in delineating relevant markets, and the need to consider a complex set of actors, from mining and metals companies to banks and private trading houses. The next section provides three in-depth case studies of individual markets, revealing the challenges involved for regulators.

³⁷ Hornby and Rice, 2014.

³⁸ Kaminska, 2013a.

³⁹ Keohane, 2014.

Anti-competitive Practices in Contemporary Minerals Markets: Three Case Studies

This section consists of three case studies highlighting key areas for policy-makers concerned with the competitiveness of global metals and minerals markets. The first focuses on the global potash market, the only major mineral market that remains openly cartelized. It analyses the lessons from the so-called ‘potash war’ that led to the breakdown of one of the two export cartels in 2013 and highlights the nexus between governments and companies in sustaining private export cartels.

The second case study examines recent concerns about the functioning of global aluminium markets, which are related to the warehousing system of the LME, the primary global exchange for aluminium and many other non-ferrous metals. It shows that complex trading practices can lead to significant supply and price distortions and highlights how trading houses and financial institutions have benefited from these practices.

The third case study focuses on iron ore, by far the largest and most valuable segment of global metals and mineral markets. It examines the concentrated nature of international seaborne iron ore trade and examines recurrent concerns about barriers to entry and price coordination among major actors in the market.

A crumbling cartel? The 2013 ‘potash war’

Global agricultural production uses three key nutrients – potash, nitrogen and phosphate – to replenish soil and increase crop quality and yield. Increased potash use could make an important contribution to improving global food security. Potash deficiency affects agricultural yields in many parts of the developing world and increased use of potash-based fertilizers could help to close yield gaps in many of these countries.⁴⁰ High prices can have adverse effects on poverty reduction,⁴¹ as they act as key barriers to poor farmers’ access to potash fertilizers.

Potash production is concentrated in Canada, Russia, Belarus and China, which together accounted for 60% of global production in 2012. Reserves are even more concentrated, with Canada and Russia accounting for 80% of proven global reserves, according to USGS data.⁴²

Major agricultural producers, such as China, Brazil, the US, India and Indonesia, account for over two-thirds of global consumption. Global use is projected to increase steadily owing to population growth and rising demand for resource-intensive agricultural products such as biofuels, oilseeds and meat.⁴³

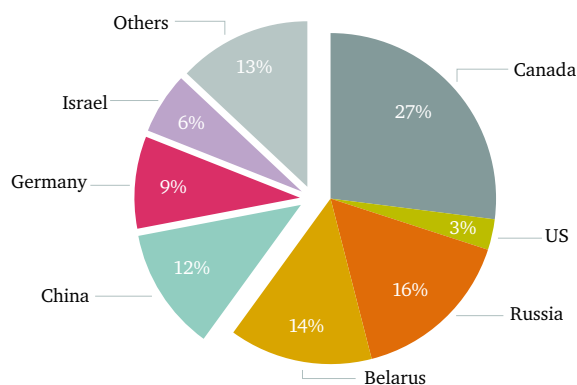
⁴⁰ Mueller et al., 2012.

⁴¹ Hoekman and Martin, 2012.

⁴² US Geological Survey (USGS), 2013b.

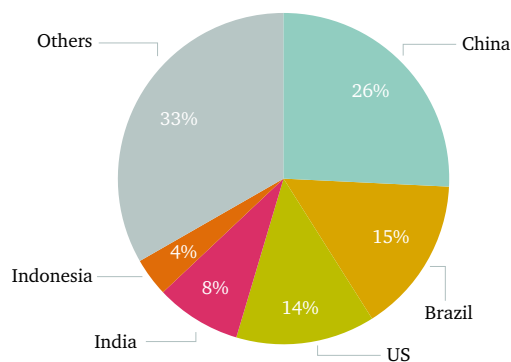
⁴³ Ibid.

Figure 7: Potash production by country, 2012



Source: USGS estimates.

Figure 8: Potash consumption by country, 2012



Source: FAOSTAT 2013.

An increasingly concentrated potash sector

Through a series of mergers and takeovers, company concentration in potash mining has increased significantly since the end of the Cold War. The top five potash miners accounted for less than 40% of the industry’s output in 1990.⁴⁴ As potash prices rose through the late 2000s, significant consolidation occurred. This included major takeovers in 2011 such as Uralkali’s acquisition of Silvinit JSN and the acquisition of Canadian miner Potash One by German fertilizer company K + S AG.

In recent years, global potash markets have been dominated by two export cartels, Canpotex and BPC. Canpotex, which has operated since the 1970, is the marketing organization for the potash output of the three largest North American potash producers, PotashCorp, Agrium and Mosaic. In 2005, the largest Russian and Belarusian producers, Uralkali and Belaruskali, agreed to market their output through a joint venture, the Belarusian Potash Company (BPC), in which Belarusian Railways later acquired a 5% stake.⁴⁵ Company reports suggest the five largest potash companies accounted for roughly two-thirds of global production and sales, and over 70% of global capacity in 2012.⁴⁶

⁴⁴ Ericsson and Gylesjö, 2012.

⁴⁵ Information from the ‘Corporate Profile’ section of the official Belarusian Potash Company website. Available online at: <http://www.belpc.by/en/about/>.

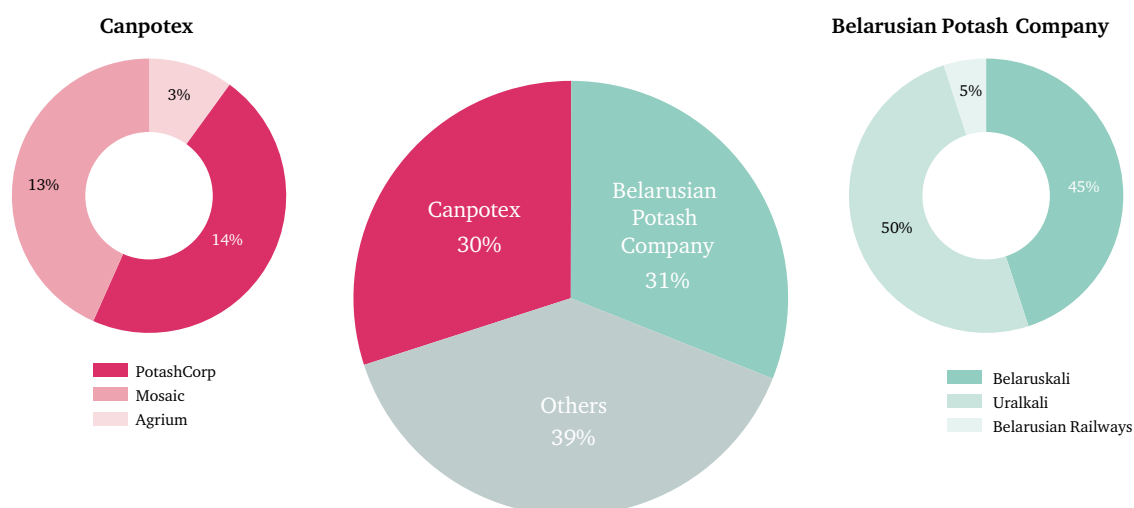
⁴⁶ Accurately gauging market shares by company is difficult owing to a dearth of information in the public sphere. Company reports on market shares for potash are not always consistent (see below). Some companies quote production statistics while others use sales or capacity, complicating comparisons.

Largest potash companies by production, sales volume and capacity, 2012

Production		Sales volume		Capacity	
Uralkali	16%	Uralkali	16%	PotashCorp	18%
PotashCorp	14%	Belaruskali	15%	Uralkali	17%
Belaruskali	14%	PotashCorp	14%	Belaruskali	16%
Mosaic	12%	Mosaic	13%	Mosaic	14%
K+S	10%	K+S	10%	ICL	9%
Others	35%	Others	32%	Others	27%
Top 5	65%	Top 5	68%	Top 5	73%

Sources: Production figures for individual companies from Mosaic, 2014. World production used to calculate market shares taken from US Geological Survey (USGS), 2013b. Sales volume figures from K + S, 2013. Production capacity figures from PotashCorp, 2012.

Figure 9: Potash sales volume by company, 2012



Source: K + S, 2013.

Together, Canpotex and BPC account for approximately two-thirds of global potash sales (see Figure 9) and have used their dominant position to maintain high prices by keeping production below competitive levels. Canpotex and BPC do not cooperate formally and negotiate their prices separately each year with the largest consumers such as China and India. But both organizations responded to a drop in demand in 2008 and 2009 following the financial crisis by cutting output simultaneously.⁴⁷

Mining companies around the world are vying to take a share of the lucrative potash market, but it remains unclear how many mines outside the cartel will ever go into production. Up to 40 potential mining projects are under development globally, by both the cartelized incumbents and potential entrants.⁴⁸ But developing potash mines is particularly risky and expensive, with costs estimated to be at least \$2.5 bn through an initial five-to-seven-year development phase.⁴⁹ The need for specialized potash storage facilities and dedicated, ‘just-in-time’ supply chains to minimize inventories is an important factor explaining these high costs. At the same time potential entrants face the constant threat that the incumbent low-cost producers could use their spare capacity to increase output and lower prices for extended periods to drive would-be competitors out of the market.

This makes attempts to enter the cartelized potash market a decade-long gamble with billions of dollars at stake, and even the world’s most powerful mining companies have struggled to gain a foothold. BHP Billiton has already spent \$1.2 bn on Jansen, the world’s largest greenfield potash project in Canada, and has committed another \$2.6 bn until 2017. But it still has not made the final commitment to open the mine and is currently looking for partners to share the cost of the project. At this pace of investment, the company would need to push back the initial timeline for opening the mine from 2015 to 2020.⁵⁰ Vale, which had spent \$2.5 bn develop another large-scale greenfield project in Argentina, was forced to suspend the project indefinitely in March 2013 after rampant cost inflation undermined the project’s economics.⁵¹

⁴⁷ Jenny, 2012.

⁴⁸ US Geological Survey (USGS), 2013b.

⁴⁹ Jenny, 2012.

⁵⁰ Wilson, 2013.

⁵¹ Pearson, 2013.

Government support helps to sustain the private export cartels

The export cartels are not only protected by economic barriers to entry, but also by political support from home governments that benefit from the tax revenues and jobs created by the cartel. The Canadian government blocked BHP Billiton's \$39 bn takeover bid for PotashCorp (the largest member of Canpotex) in November 2010. Using its authority under the Investment Canada Act, the government argued in a terse statement that the sale was not 'likely to be of net benefit to Canada', only the second time the government had used these powers in 25 years.⁵²

At the time the Canadian government offered no explanation for its decision, but concerns that BHP Billiton could undermine the Canpotex cartel are likely to have played a key role. BHP Billiton's Canadian Head Graham Kerr had confirmed that the company would honour PotashCorp's existing Canpotex contracts, but reiterated that BHP Billiton believed 'in running our assets 100% of the time and selling our products at market price',⁵³ implying that the company might ramp up production and spark a price war following the acquisition.

Uralkali's motivations to end output restraint and abandon the cartel are reminiscent of Saudi Arabia's decision to abandon its output restraint under OPEC quotas in 1986. Like Saudi Arabia, Uralkali is the largest and lowest-cost producer and had seen its market share steadily eroded in recent years.

The Belarusian government's recent actions to sustain BPC during what international media have dubbed the 'potash war' were less subtle. The potash war was sparked in July 2013 by the decision of Uralkali to end its marketing agreement with BPC, effectively dismantling the cartel. Its announcement that it would switch from its 'price over volume' strategy to a 'volume over price' strategy led to an instant drop in the share prices of major potash companies as analysts feared an international potash price war that would erode price premiums.

Uralkali's motivations to end output restraint and abandon the cartel are reminiscent of Saudi Arabia's decision to abandon its output restraint under OPEC quotas in 1986. Like Saudi Arabia, Uralkali is the largest and lowest-cost producer and had seen its market share steadily eroded in recent years. The company accused Canpotex of pursuing an aggressive pricing policy that undermined BPC's sales in South America and Asia,⁵⁴ and Belaruskali of having broken the cartel arrangements by agreeing to sales outside BPC.⁵⁵ With other potash producers 'free-riding' on Uralkali's output restraint, the company was being hit at once by declining prices and falling market share. While a decision to abandon BPC would clearly lead to further price declines, Uralkali could still gain by recapturing market share from other potash producers.

Uralkali's decision to abandon BPC provoked a furious response from the Belarusian government, which derives 20% of its government revenues from state-owned Belaruskali.⁵⁶ The government, under President Alexander Lukashenko, began to apply political pressure to oust Uralkali's majority shareholders and restore the cartel, and even went so far as to arrest Uralkali's CEO on a state visit to Minsk.

⁵² Industry Canada, 2010; Donville, 2010.

⁵³ Dvorak and Kilman, 2010.

⁵⁴ Uralkali, 2014.

⁵⁵ Kuznetsov, 2014.

⁵⁶ Weaver and Sharman, 2013.

Table 7: Timeline of the ‘potash war’, July 2013–March 2014

31 July 2013	Uralkali announces its pull-out from the Belarusian Potash Company (BPC), accusing its Belarusian partner Belaruskali of violating the agreement and selling outside the cartel. ^a Share prices of potash companies slump and potash prices drop over 20%, from \$443 in July 2013 to less than \$350 by the end of 2013. ^b
26 August 2013	Belarus, which depends on Belaruskali’s revenues for ca. 20% of its government budget, invites Uralkali’s CEO Vladislav Baumgertner for talks, but arrests him on charges of ‘abusive exercise of power and abuse of office’ during the visit. ^c
18 November 2013	Suleiman Kerimov, Uralkali’s largest shareholder, agrees to exit the company by selling his stake to Onexim, an investment vehicle of fellow Russian oligarch and long-time business ally Mikhail Prokhorov, in a deal valuing Uralkali at ca. \$20 bn. The move is seen as a concession to Belarusian president Lukashenko, who had publicly demanded a change of ownership at Uralkali.
21 November 2013	Belarus extradites Uralkali’s CEO Baumgertner to Russia. ^d
2 December 2013	Uralchem, a Russian fertilizer company controlled by Minsk-native Dmitry Mazepin, acquires 20% of Uralkali, including the 11.8% stake of two oligarchs, Galchev and Skurov, who were seen as close to Kerimov.
23 December 2013	Uralkali replaces its CEO Baumgertner, who initiated the break-up of the cartel, with Dimitry Osipov, previously a senior Uralchem executive. ^e
21 January 2014	Uralkali sells 700,000 metric tons of potash to China at just \$300/metric ton. This compares with around \$400/tonne charged previously. Chinese spot prices drop to just over \$300/tonne in response. ^f
26 February 2014	Sergey Chemezov, a close ally of President Putin, is nominated for the upcoming board elections in March. He is rumoured to potentially become the chairman of the board.
5 March 2014	Onexim and Uralchem, now Uralkali’s largest shareholders backed by Prokhorov and Mazepin respectively, publicly back the idea of a potential renewal of the partnership with Belaruskali, fuelling speculation about a restoration of the cartel. ^g

^a Wilson and Terazono, 2013.

^b Culati, 2014.

^c Weaver and Sharman, 2013.

^d Ibid.

^e Kavanagh, 2013.

^f Fedorinova and Yun, 2014.

^g Farchy, 2014.

The Belarusian hard-ball tactics eventually succeeded in forcing the majority shareholders who had agreed to the break-up of the cartel to sell their stakes; and it appears increasingly likely that the cartel will be restored under Uralkali’s new owners. For now, the company appears committed to its volume-over-price strategy. The company has announced plans to increase production by 3.9 million tonnes (or 8% of total 2013 potash sales) before the end of 2014,⁵⁷ and is reported to have signed potash deals with China at \$305 per tonne, compared with an average potash price of \$400 per tonne in July 2013.⁵⁸ But at the same time Uralkali’s new majority shareholders have called for negotiations to restore the partnership with Belaruskali in order to end the ‘potash war’.⁵⁹

⁵⁷ Culati, 2014.

⁵⁸ Ibid.

⁵⁹ Farchy, 2014.

Warehousing and anti-competitive practices in aluminium markets

Understanding the function of the LME warehousing system

Warehouses play an important role in aluminium markets – as they do in other metals markets – by allowing both consumers and producers to store excess metals. Surplus aluminium is absorbed by warehouses in times of slack demand, and stocks can be made available in the event of an aluminium shortage.

Many warehouses in international trading hubs or consumption centres are ‘warranted’, or monitored and approved by the LME. The LME ensures proper business conduct at these warehouses and ensures that material stored there meets strictly standardized quality criteria. When metal owners deliver metal into an LME warehouse, they receive a receipt or ‘warrant’ in return and become liable for warehousing fees. When the owners want to withdraw the metal, they ask the warehouse to cancel the warrant and the metal is ‘loaded out’ to them.

LME warehouses and their associated warrants serve an important market-making function. Standardized LME warrants – or guaranteed entitlements to physical stocks of specific quality stored in LME warehouses – can be freely traded by consumers, producers and financial institutions. This creates a liquid paper market for aluminium, helping price discovery and allowing consumers and producers to hedge prices and transfer risks in options and futures markets. The price of an LME warrant for aluminium serves as the international benchmark for aluminium prices.

The paper market is backed by and closely aligned with the physical market. Traders can always buy a warrant at the LME at the prevailing spot price and by cancelling the warrant they can trigger physical delivery of the aluminium from the warehouse. Equally, traders always have the option to deliver aluminium to an LME warehouse and receive a warrant, which can in turn be sold at the LME for the same price. If many warrants are created because producers deliver excess supplies to LME warehouses, their price (and in turn the international benchmark price of aluminium) falls. When many warrants are cancelled because consumers require additional supplies from warehouses, their price increases.

Only a small fraction of the international aluminium trade is conducted through these official LME warehouses, which in practice act as buyers and sellers of last resort. Consumers generally buy direct from the sophisticated supply chains of producers that deliver the metal promptly to where it is needed, and they rarely cancel LME warrants to obtain aluminium from warehouses. However, the LME price serves as a reference for these direct producer-to-consumer aluminium sales, with producers charging a small premium above the LME price for immediate delivery.

These premiums can fluctuate – owing to local shortages or oversupply – but are kept in check as long as producers and consumers retain the option to trade with the LME warehouses at the LME price. This option ensures that local prices do not diverge too much from LME prices, and that local supply and demand information is fed back into the LME benchmark price.

Long queues are undermining the LME system

This set-up has served producers and consumers well for many decades, but growing queues at some of the largest LME warehouses have caused increasing concern among consumers. When a lot of warrants are cancelled at a specific warehouse, delivery queues can form as the warehousing company struggles to load out metals fast enough.

Historically, queues have been a transient phenomenon with limited impacts on markets, but since the financial crisis they have increased steadily. At some LME warehouses customers have to wait over two years for delivery after cancelling their warrant⁶⁰ and an estimated 45% of aluminium stored in LME warehouses is currently awaiting delivery.⁶¹

The reasons for the emergence of long queues are complex. Following the financial crisis aluminium demand collapsed and oversupply expanded from less than 1 million tonnes to over 12 million tonnes. The LME's minimum load-out rate – which requires warehouses to deliver 800–3,000 tonnes of metal per day, depending on the size of the warehouse and the amount of metal stored in it⁶² – had been designed to avoid such problems. With ballooning inventories at the largest warehouses, this rule was becoming increasingly ineffective.

The volume of aluminium tied up in speculative deals has been cited as a major driver of expanding aluminium inventories and exacerbated queues, supporting a perception within the industry that queues were ‘deliberately extended to increase the profits of warehouse owners and financiers’.

Financial speculation on aluminium markets is also frequently cited as a major driver of increasing warrant cancellations and exacerbated queues. The volume of aluminium tied up in speculative deals has been cited as a major driver of expanding aluminium inventories and exacerbated queues,⁶³ supporting a perception within the industry that queues were ‘deliberately extended to increase the profits of warehouse owners and financiers’.⁶⁴

Lengthening queues undermine the functioning of the LME system for three reasons. First, while there are no shortages of aluminium available, long queues mean that for consumers it may no longer be a viable option to resort to deliveries from LME warehouses if they feel that producers charge too high a premium above LME prices. Predictably, premiums for delivery of aluminium from producers have multiplied from their historical averages to as much as 15% of the LME benchmark aluminium price in Europe and to 25% in the US.⁶⁵ Consumer companies have claimed that these inflated premiums cost industrial users \$3 billion a year.⁶⁶

Second, under LME rules, warrant holders remain liable for warehousing fees until they receive physical delivery, even after they have cancelled their warrant. Warehouse owners can continue to charge their customers storage fees while they remain stuck in long queues, adding to the costs for consumers. Accordingly, many warehouses have little incentive to increase load-out rates and reduce queues. By contrast, warehouses that operate without queues allege that their competitiveness is being undermined.⁶⁷ High warehousing fees, large inventories and long queues at some of the major warehouses have combined to turn the metal warehousing business into one of the most profitable segments of the metals and mining industry in recent years (see Box 8).

⁶⁰ Hume, 2014a.

⁶¹ Clarke, 2014.

⁶² London Metal Exchange/Europe Economics, 2013.

⁶³ Onstad, 2014a.

⁶⁴ Rice, 2014b.

⁶⁵ Hume, 2014a.

⁶⁶ Reisman, 2013.

⁶⁷ London Metal Exchange, 2013.

Third, long queues can interfere both with the spot price discovery mechanism and with futures prices. The rent paid on warranted metal and the length of the queue begins to influence LME prices. A 2010 study on warehousing practices commissioned by the LME found that premiums increase in line with the length of queues, as do spreads between future and physical prices.⁶⁸

Box 8: Investment banks, physical commodities and the warehousing business

The increasing profitability of the metals warehousing business has attracted major commodity trading houses such as Glencore and Trafigura, as well as many of the world's largest investment banks such as Goldman Sachs, JP Morgan and Morgan Stanley. Indeed, investment banks and trading houses now dominate the metals warehousing market, with the five trading houses and banks listed above operating 75% of the LME's 778 licensed warehouses in late 2013.^a

Trading houses and investment banks can directly profit from owning and operating warehouses in a number of ways. Rent and other fees charged to warrant holders for the storage of physical aluminium stocks provide a lucrative income, particularly when queues for metal lengthen, as rent and other fees continue to be charged. Furthermore, operating warehouses reduces storage costs and increases profit margins where banks are engaged in the 'cash and carry' trade.

Movement within the warehousing system – between public and dark warehouses – also plays a key role in market-making. It has been reported that the five firms that dominate LME-licensed warehousing also own unlicensed shadow facilities or 'dark inventories'.^b By moving public aluminium inventories to the dark system, a de-stocking effect is created, suggesting a tightening market. Taking dark inventories public creates the opposite perception – that there is surplus aluminium supply. The net amount of available aluminium has not changed in either scenario.

Ownership of public and dark inventories provides banks with an insight into activity within the physical market that has implications for price discovery. JP Morgan acquired the oil, gas and metals businesses of physical trader RBS Sempra Commodities in July 2010 for \$1.7 bn. At the time of the deal, JP Morgan's Global Head of Commodities Blythe Masters stated that as financial commodities represented just a small fraction of the real commodity picture, 'we need to be active in the underlying physical commodity markets in order to understand and make prices'.^c

Participation in aluminium warehousing may also enable banks to profit from providing additional services to existing customers. Where customers found their balance sheets constrained by large (albeit profitable) trades, banks also reportedly offered to finance the trades in return for some of the margin.^d Financing the trades effectively removes them from the balance sheet, 'freeing up' the customers' trading position and enabling them to increase their trading activity.

^a Shumsky, 2013.

^b Ibid.

^c Meyer and Farchy, 2013.

^d Kaminska, 2013a.

While lengthy queues present complex technical issues, the overall winners and losers are relatively clear. Banks benefit from new profit streams and an enhanced understanding of the underlying market in physical commodities. Warehouses that operate with queues are beneficiaries, as they are able to charge rent and other fees for the storage of surplus metal for increasing time periods.

⁶⁸ London Metal Exchange/Europe Economics, 2013.

Producers also benefit. First, a large oversupply is kept off market, supporting aluminium prices and high premiums. Second, by locking investors into futures prices, producers are able to obtain finance at more reasonable rates, easing any cash-flow constraints. Aluminium-consuming industries are the losers, paying for both inflated delivery premiums and warehousing fees while inventories are caught up in queues. Unsurprisingly, many aluminium consumers have argued that excessive premiums and queues place unfair economic and logistical burdens upon them.

While this case study focuses on aluminium, market distortions on the LME due to warehousing practices also extend to other metals, including zinc.

Responses to the warehousing problem have so far been ineffective

Consumer concerns have prompted greater political, regulatory and public scrutiny of warehouse practices. The LME received at least 18 complaints between March 2009 and August 2010 regarding delays in loading out.⁶⁹ The UK Financial Conduct Authority (FCA), the European Commission and the US Commodity Futures Commission (CFTC) have all launched inquiries. With articles discussing warehouse market abuse emerging in the mainstream press – from the *New York Times*⁷⁰ to *Rolling Stone*⁷¹ – the salience of the issue in the public sphere is rising. Analysts at Australian banking group Macquarie cited a sketch on *The Daily Show* in July 2013 as evidence that aluminium warehousing has not only entered the public psyche, but that ‘pressure for change will become irresistible’.⁷² In November 2014 the US Senate published a report investigating Wall Street’s involvement with physical commodities – highlighting the involvement of Goldman Sachs and a number of other banks and trading houses in aluminium warehousing, and alleging that physical commodity holdings can confer an unfair trading advantage.⁷³

The LME’s introduction of a linked ‘load-in load-out’ rule is intended to address these concerns. In 2010 the LME commissioned an independent assessment of its warehousing policy and its delivery provisions and proposed load-out reforms in July 2013. After a three-month consultation period with aluminium market stakeholders it announced the final rule in November 2013. As of 1 April 2014, warehouses with queues of over 50 days were to deliver 1,500 metric tons more metal than they acquire per day. The FCA described the rule ‘as a first step towards strengthening LME’s warehousing arrangements and increasing the transparency of its market’.⁷⁴

However, producers and warehouses strongly opposed the rule. An increased load-out rate will almost certainly reduce aluminium prices, which could jeopardize the commercial viability of many aluminium smelters in an oversupplied market and constrain their ability to obtain finance. Without high premiums, some 80% of US and Chinese aluminium production and the majority of Australian and Indian production would be loss-making, according to Deutsche Bank.⁷⁵ Klaus Kleinfeld, Chief Executive of Alcoa, called the move to revise warehousing rules ‘very irresponsible’.⁷⁶

⁶⁹ Ibid.

⁷⁰ Kocieniewski, 2013.

⁷¹ Taibbi, 2014.

⁷² Rowley and White, 2013.

⁷³ US Senate, 2014.

⁷⁴ FCA, 2014a.

⁷⁵ Farchy, 2013.

⁷⁶ Ibid.

In contrast to this, many metal consumers have claimed that the LME's proposed reforms would be ineffective. The impact of the rule on queues remains unclear, as with queues of over 600 days at the largest warehouses, reducing stockpiles will take years. Large consumers such as US beverage company MillerCoors had suggested the rule would do little to reduce queues.⁷⁷ The LME has acknowledged such concerns with the establishment of a 'premium contract' enabling consumers to hedge against increasing premiums, although this is unlikely to be available until early 2015.

Implementation of the LME's rule now appears likely to proceed, despite legal action launched by the world's largest aluminium producer, Rusal. The company alleged that the rule presents a 'human rights' violation owing to its interference in its economic interests, and argued that the LME failed to explore alternative options such as limits on warehouse charges.⁷⁸ The UK High Court of Justice initially ruled against the LME on 27 March 2014 and called the consultation process 'unfair and unlawful'.⁷⁹ LME Chief Executive Officer Garry Jones said that the LME was 'really surprised' and 'not happy' to lose the case. Although it won the subsequent appeal in October 2014,⁸⁰ aluminium producers, traders and consumer may still face sustained regulatory uncertainty. Ongoing public and policy debates focus on whether alternative options explored by the LME's consultation process may be more effective in reducing queues and restoring 'effective' warehouse practices.

Some investment banks now appear to be looking to exit the warehousing and physical commodities sectors, ostensibly because of increasing regulatory pressure. In March 2014, JP Morgan initiated the sale of parts of its physical commodities unit to Geneva-based Mercuria Energy for \$800 million.⁸¹ The bank had announced in July 2013 that it was seeking buyers for its commodities assets owing to 'different factors, including the impact of potential new rules and regulation'.⁸² Similarly, Goldman Sachs has reportedly held talks with potential buyers for its controversial aluminium warehouse businesses over the past year, although more broadly it remains committed to commodities trading.

Market anticipation of regulatory reform may also have unintended consequences. As of October 2013 an estimated 7–10 million tonnes of aluminium was stored in shadow warehouses, compared with 5.5 million tonnes in LME-licensed warehouses, whereas one year earlier the figures had been roughly equal.⁸³ Significant de-listing of inventory in anticipation of the LME's new rule would serve to reduce transparency in the aluminium market and lessen the LME's relative role in price discovery.

Iron ore: pricing strategies, competitiveness and collusion

The structure of global iron markets

The iron ore market is the world largest metal market with almost three billion tonnes of useable ore being mined in 2013, and production almost tripling since 2000.⁸⁴ A significant share of the heavy bulk commodity is produced and consumed in the country of origin, as high transport costs and the absence of infrastructure such as railways and deep-sea ports prevents supplies from being traded in global export markets.

⁷⁷ Troszkiewicz and Kolesnikova, 2013.

⁷⁸ Ibid.

⁷⁹ Rice, 2014a.

⁸⁰ Onstad, 2014b.

⁸¹ Hume, 2014b.

⁸² Sheppard and Leff, 2013.

⁸³ Shumsky, 2013.

⁸⁴ US Geological Survey (USGS), 2013a.

This gives rise to complex market dynamics between a series of separate domestic markets, in which domestic producers compete with overseas imports for domestic customers, and a globally connected seaborne market in which consumers from different countries compete for total global seaborne supplies. Falling transport costs have meant that the importance of the seaborne market has increased relative to domestic markets. Since the 1990s, exports have grown around 50% quicker than production levels⁸⁵ and now as much as half of global iron ore supplies is traded internationally.

China is the world's largest iron ore producer, supplying over a quarter of global consumption. China's high domestic demand, the low quality of its ores and high production costs mean, however, that Chinese iron ore plays little role in the seaborne market and is almost exclusively consumed domestically.

The internationally traded market is dominated by the world's second and third largest iron ore producers, Australia and Brazil, which between them provide 70% of global seaborne supplies. Countries such as India, South Africa and Canada are other important exporters, but have much smaller market shares. The quality of export-grade ores is generally higher than those mined and consumed domestically. The iron content of Brazilian and Australian ores for exports is typically above 60%, compared with 30–40% in Chinese ores.

Exports from Brazil and Australia, and hence the global seaborne market, are largely controlled by three mining companies, Brazilian Vale and Anglo-Australian Rio Tinto and BHP Billiton, which are often referred to as the 'Big Three'. Although these control only approximately 38% of global mine production, they control roughly two-thirds of seaborne trade.

Historically, shipping distances have meant that Brazil (and hence Vale) has had a distinct advantage in supplying Europe and North America with iron ore, while the two Australian producers dominated exports to Asian markets such as Japan, Korea and China. However, Vale has made increasing efforts to lower transport costs to gain a greater share in the fast-growing Chinese market, which by now is more than double the size of the European and Japanese markets combined. The company has developed a new fleet of dry shipping vessels – dubbed 'Valemax' – which are the biggest in the world and were specifically designed to decrease freight costs to China and make Brazilian iron more competitive with Australian ores.⁸⁶

How competitive is iron pricing?

The high concentration of the global seaborne market and high barriers to entry have been the source of long-standing questions among European and Asian importers about the competitiveness of the seaborne market. A series of mergers and acquisitions, such as the formation of BHP Billiton in 2001, the consolidation of Brazilian exports under Vale over the last decade, and the failed merger attempt between Rio Tinto and BHP Billiton, has raised concerns about the potential for collusion on prices and supply.⁸⁷ A sharp increase in iron prices since 2004 has added to these concerns.

⁸⁵ Valiante and Egenhofer, 2013.

⁸⁶ Murphy, 2012.

⁸⁷ Ericsson, 2012.

Figure 10: Average monthly iron ore price, 1980–2013



Source: IMF (2012), Primary commodity price tables.

With the growth of Chinese imports, Chinese authorities have become particularly concerned about the competitiveness of these markets. A one-dollar move in iron ore prices can translate into over \$100 million in profits for each of the big miners, creating large incentives to fix prices.⁸⁸ The stakes for China, where steel mills imported 820 million tonnes in 2013, are even higher. While Chinese officials have repeatedly criticized the global iron ore ‘monopoly’, the ‘Big Three’ have claimed the market is competitive, pointing to sustained high supply growth and new entrants in the Australian market such as Fortescue Metals Group Ltd. (FMG) as evidence.

Since the mid-2000s, concerns over price manipulation focused on the benchmark pricing mechanism for iron ore, culminating in the breakdown of the system that had lasted for over five decades.⁸⁹

Historically, prices for many metals, ores and concentrates were often fixed for specific periods, whether for a quarter or a year. Price levels were either set unilaterally by producers or determined through bargaining among key players. The negotiated price then served as a benchmark for price formation in the rest of the market. Over time, spot pricing – where the price for an individual delivery contract is negotiated ‘on the spot’ between a buyer and a seller – has become increasingly common.

Benchmarks for iron ore pricing used to be negotiated annually between the ‘Big Three’ seaborne iron ore-producing companies (BHP Billiton, Rio Tinto and Vale) and Japanese steelmakers, their biggest customers. But China’s iron ore imports overtook Japan’s in 2003 and continued to grow rapidly, leading to demands by Chinese companies for a seat at the negotiating table.

Iron ore miners disagreed among themselves about the viability as well as the usefulness of prolonging the benchmark pricing system. Those in favour of market-based pricing saw the potential of higher windfalls for the companies and argued that a spot-pricing system could reduce tensions with consumer governments, compared with the increasingly contentious negotiation rounds. Others, notably those relying heavily on their revenue from iron ore, felt that the benchmark system should be maintained, as it protected mining companies from short-term price slumps.

⁸⁸ Financial Times LEX, 2014.

⁸⁹ Blas, 2009.

At the same time, spot market trading became increasingly common, especially for the thousands of smaller steel mills in China that were unable to guarantee offtake of large quantities. With continuous upward pressure on prices between 2002 and 2008, spot markets became more attractive, especially for smaller producers, because their prices would typically be higher than benchmark prices. When the spot market crashed in 2008, many Chinese buyers reneged on their benchmark contracts and bought instead at a discount in the spot market. This meant that producers who stuck to the benchmark system ended up losing in both good and bad times.

Meanwhile, price negotiations between iron ore miners and Chinese steel producers became increasingly politicized, culminating in the arrest and sentencing of four Rio Tinto negotiators on charges of accepting bribes from Chinese steel mill owners, and accusations that they had colluded to inflate the prices of iron ore imports to China.⁹⁰ In March 2010, the Big Three eventually abandoned the benchmark system; spot negotiations became the dominant pricing mechanism.

While benchmark prices give producers and consumers the advantage of stable, predictable prices (and hence revenues and costs), spot markets offer immediate opportunities to respond to changing market expectations – although this also makes them more volatile in nature. Iron ore prices have indeed entered a period of unprecedented volatility since the abolition of the benchmark pricing system.

⁹⁰ Humphreys, 2011.

Responding to Cartels and Anti-competitive Practices in Global Minerals Markets: An Agenda for Cooperative Action

Maintaining open, orderly and well-functioning global metals and minerals markets remains a major challenge for global resource governance. Despite the demise of formal collusive arrangements, the threat of attempts by producer governments and companies to increase prices, restrict supplies or carve up markets remains real. State-backed private cartels that restrict supplies in potash markets, the questionable warehousing practices on the LME that affect the price of aluminium, and the 2014 price spike in nickel caused by contentious Indonesian export restrictions are three recent examples.

With complex global supply chains and blurred boundaries between physical and financial markets, the threat has shifted from producer-country cartels to much more subtle, yet potentially equally damaging practices. Opaque pricing mechanisms and weakly governed market platforms are vulnerable to manipulation by powerful market participants, including trading houses, major producers and financial institutions. The ongoing debates and litigation around the manipulation of pricing mechanisms for precious metals demonstrate this point.

Interconnected markets mean that collaboration across borders is key to improve regulation and address distortions. At present mineral markets receive limited attention from many governments, and where governments engage they are often pursuing a narrow national agenda

Combating such practices is an urgent task for policy-makers, not only to avert the substantial adverse economic impacts of these distortions, but also to prevent the international tensions to which they can give rise. The effects of market distortions and disruptions for metals and minerals are publicly much less visible than those for other key resources such as fossil fuels or agricultural products. But the limited evidence that is available points to billions of dollars in damages to consuming industries, which eventually are passed down supply chains. In many cases market distortions can also contribute to bilateral tensions or trigger acrimonious trade disputes.

While the different types of anti-competitive practices have similar impacts – higher prices for consumers, supply constraints or market inefficiencies – successful policy responses require a case-by-case approach that takes key actors and specific political economy dynamics into account. The options for responding to export restrictions imposed by sovereign states, for example, look very different from those designed to improve regulation of transnational trading platforms.

In all cases, however, interconnected markets mean that collaboration across borders is key to improve regulation and address distortions. At present mineral markets receive limited attention from many governments, and where governments engage they are often pursuing a narrow national agenda. For example, anti-trust enforcement in metals markets remains piecemeal, and anti-competitive market structures are often only assessed when regulators are required to approve major mergers or acquisitions.

Working together, there are significant opportunities for large consuming countries to exert joint leverage in global markets and international institutions to catalyse reform in key areas. Costs and inefficiencies resulting from anti-competitive practices ultimately affect companies and consumers in all countries, but it is the major mineral importers, such as the EU and China, which are worst affected. Enhanced cooperation among these actors would, however, require looking beyond existing raw materials-related trade tensions, particularly around steel and speciality metals such as rare earths.

Finding the right avenues to bring these issues onto the global policy agenda is part of the challenge. International coordination mechanisms that exist for other types of resources – for example the IEA for energy and the AMIS for food – are largely absent for metals and minerals. An informal mechanism promoting the joint collection and sharing of data and information could help enhance early warning, provide a forum for the negotiation and resolution of public cartels, and support early action against private market manipulation.

This section sets out policy options on how best to address four major challenges that have been identified throughout the paper: dealing with the last remnants of producer-country cartels; preventing damaging export restrictions; improving the governance of global market platforms and pricing mechanisms; and strengthening cooperation among regulators on clandestine private cartels and other anti-competitive practices.

Dealing with the last remnants of producer-country cartels

Consumer countries should make a publicly visible case that in an age of interdependence and global supply chains, any remaining forms of producer-country cartels are an anachronism. They could, for example, ratchet up diplomatic pressure on the very small number of governments that are still supporting the only remaining openly cartelized mineral market, potash. This would also serve to discourage governments that are toying with the idea of establishing new producer-country cartels, such as South Africa and Russia in the case of platinum.

Given limited means to coerce governments to stop supporting the two potash cartels, a ‘naming and shaming’ approach is likely to be most effective. Owing to its strong commitment to open markets and trade, political pressure on the Canadian government to abandon its tacit support for Canpotex could offer a promising starting point. Canpotex plays a key role in sustaining the oligopolistic structure of the global potash market, and its collapse could force the Russian and Belorussian government to change their strategy, even if they are less amenable to public pressure.

Such action could be initiated by China, India and Brazil, the three largest potash importers, which bear the brunt of the cost of the cartel. Support for such an initiative could also be sought from other major mineral importers such as the EU, South Korea and Japan (which are less directly affected, but have a strong interest in improving the functioning of global mineral markets more broadly); as well as endorsement from a wider set of stakeholders with an interest in promoting food security or market liberalization (such as the G77, international NGOs, and the World Economic Forum). A first step could be to put the issue on the agenda of the Organisation for Economic Co-operation and Development (OECD) and G20.

Preventing damaging export restrictions

In the short term, cooperative policy dialogues rather than formal negotiations offer the best prospects for concrete results. Given the widespread use of export restrictions in mineral markets and the strong domestic political support they enjoy in many cases, convincing governments in producer countries to abstain from using them remains challenging. The OECD, in particular, has developed an extensive programme of work to demonstrate the limited effectiveness of export restrictions in achieving the policy goals of producer countries and examining alternative strategies and policy tools. This has also involved informal dialogue between the OECD and countries that are imposing such restrictions.⁹¹

Such dialogues should also be pursued by major emerging economies, which are both most likely to impose future restrictions and likely to bear much of the cost. South-south cooperation could focus on providing incentives such as investment packages or technology-sharing for producer countries to abstain from imposing export restrictions. Such dialogues could be part of the BRICS Forum, for example, with an initial focus on avoiding the implementation of damaging restrictions proposed in South Africa (see Box 9).

Box 9: Could there have been a win-win alternative to Indonesia's export restrictions?

The case of the Indonesian export restrictions provides a good example of the rationale and potential for such an exchange. In some aspects, Indonesia's restrictions can be considered successful in the sense that it managed to attract significant foreign downstream investment from companies seeking access to the country's raw materials. Chinese companies, the biggest customers, have committed billions of dollars to build at least seven smelters in Indonesia.^a International companies with large assets in the country, including Freeport McMoRan, Newmont, Vale, Norilsk Nickel and Rusal, have also committed to invest in new smelters.

These investments have, however, come at a high price. Since January, thousands of miners have lost their jobs and Indonesia has forgone half a billion dollars' worth of export revenue per month as mining companies have been unable to export their products and put operations on hold.^b While downstream investment has increased under pressure from the ban, it has also made the country unattractive for foreign upstream investment and its reputation has been badly damaged beyond the mining sector. In the meantime, Chinese nickel importers, in particular, have suffered from the ban and the subsequent price spike.

Effective diplomacy could potentially have avoided the imposition of the restrictions and led to a win-win solution for Indonesia and foreign investors. Pledges by importers for a generous downstream investment package of a similar size as is being currently discussed could perhaps have convinced the Indonesian government that imposing restrictions would be unnecessary. Obviously, agreeing such deals is difficult, as the acrimonious negotiations between miners and the Indonesian government after the imposition of the restrictions have shown. But given the high stakes for both Indonesia and its customers, an attempt to broker a diplomatic solution would certainly have been worth pursuing.

^a Mineweb, 2013.

^b Fabi and Asmarini, 2014.

⁹¹ See e.g. OECD, 2014.

Recent WTO rulings against export restrictions on minerals have confirmed that it is possible in principle to contest discriminatory measures, but litigation is unlikely to be a ‘silver bullet’. Two complaints against China have been upheld, but whether future challenges will be as successful for different types of export restrictions remains unclear, and governments will need to weigh carefully the potential political fall-out from WTO litigation. Although Japan, for example, has threatened to take Indonesia to the WTO over its export ban for unprocessed minerals, it has not done this so far, nor has any other country.

Governments should continue to push for more specific and stricter WTO rules around export restrictions, but progress is unlikely in the near term. These could require member countries to abstain from imposing export restrictions on raw materials (or in a weaker form, to register them in advance); or to use less distortionary instruments such as taxes instead of quotas. But the adoption of such measures would be predicated on progress in the broader multilateral trade agenda, which in recent years has been limited. Even in a more conducive environment for global trade negotiations, many governments will remain concerned about the potential implications for national sovereignty.

In the meantime, large consumers such as Japan, the EU and the US should seek to include similar measures against export restrictions in regional trade negotiations such as the TTIP and TTP, as well as negotiations of bilateral trade and investment treaties.

Strengthening cooperation among regulators on clandestine private cartels and other anti-competitive practices

Concerted action will be required by governments to tackle anti-competitive practices in metals markets such as clandestine cartels, price fixing, territorial agreements, and customer allocation and non-competition agreements. The 15 clandestine private international cartels in the mining and primary metals sector that were detected and punished by national competition authorities between 2000 and 2010 provide evidence for this. National competition policy and enforcement are the principal remedy, but enhanced international cooperation and more attention among regulators to the specific challenges in global minerals markets could improve their effectiveness.

Key consumer countries should expand sharing of data and best practice on anti-trust enforcement in minerals and metals markets and coordinate prosecution. Accessing data on complex global commodity markets – both physical and financial – remains a key challenge for many national regulators. Detecting market manipulation and making anti-trust decisions requires up-to-date, reliable statistics on market structure, production capacity, and output and sales volumes along the supply chain, as well as detailed information on the pricing of different product grades in different locales. Currently, the lack of data in the public domain makes it difficult to provide conclusive answers even to relatively straightforward questions, such as to what degree the seaborne iron ore or global aluminium markets should be considered competitive markets.

Sustained investment in capacity-building is required in many emerging producer countries, which could be supported through bilateral cooperation. Many emerging economies have increasingly sophisticated competition legislation and enforcement mechanisms – at least 52 separate domestic competition laws have been enacted since 2000 and at least 30 countries have investigated hardcore cartels since 2002, with Brazil, South Korea and South Africa standing

out for their aggressive anti-cartel campaigns. Nevertheless, national authorities may benefit from additional support and knowledge exchange with developed consumers such as the EU and Japan to help overcome constraints including a lack of technical capacity or of detailed and timely market information.

In the short term, regional forums are a promising starting point for strengthening cooperation around anti-trust enforcement in mineral commodity markets. Regional economic groups such as COMESA,⁹² ASEAN⁹³ and SADC,⁹⁴ for example, are actively working to coordinate their competition regimes. International cooperation on competition legislation has also found its way into the ongoing trade negotiations for the Trans-Pacific Partnership (TPP)⁹⁵ and the Transatlantic Trade and Partnership (TTIP).⁹⁶ Ensuring that such efforts to enhance coordination of competition policy in plurilateral agreements are successful could make a valuable contribution to global anti-trust enforcement.

Governments should also consider resuscitate negotiations on the WTO's role on competition policy, which have been stalled for a decade. The Working Group on the Interaction between Trade and Competition Policy (WGTCP) was established during WTO negotiations in Singapore in 1996. The 2001 Doha declaration tasked the WGTCP with investigating core principles (transparency, non-discrimination, procedural fairness), hardcore cartels, voluntary cooperation mechanisms, and ways to support and reinforce competition institutions in developing countries. Competition policy was, however, dropped from the Doha work programme in 2004, the WGTCP is now inactive and WTO engagement is limited to responding to national requests for technical assistance.⁹⁷

Improving governance for key transnational market platforms and pricing mechanisms

Governments and regulators need to improve the governance of major pricing mechanisms and global market platforms for metals and minerals. The existing pricing and trading mechanisms have evolved organically among market participants, and remain in many aspects self-regulated and only subject to oversight from national regulators in the jurisdiction in which the mechanism is physically located. Where such national regulation is insufficient or ineffective, transparent and efficient global metals and minerals markets can be undermined.

Regulators should be given a stronger mandate to develop a coherent response at national level. There are many reasons for lapses in regulatory oversight from national authorities: the responsibility for regulating physical markets is not always clearly assigned, and financial regulators may pay limited attention to what, from their perspective, are relatively small and obscure markets. In the UK, for example, while the FCA is in principle responsible for regulating the LME, it does not consider itself responsible for the warehousing arrangements of the exchange and has so far chosen to stay on the sidelines of the LME reform debate. In other cases, regulatory regimes for emerging-market platforms – e.g. in China, the Gulf or Singapore – are under development and regulators sometimes lack experience or capacity in supervising complex transnational commodity markets.

⁹² Common Market for Eastern and Southern Africa (COMESA), 2014.

⁹³ Association of Southeast Asian Nations (ASEAN), 2014.

⁹⁴ Southern African Development Community (SADC), 2014.

⁹⁵ Fergusson et al., 2013.

⁹⁶ Council of the European Union, 2014.

⁹⁷ World Trade Organization (WTO), 2014.

An informal high-level forum focusing on regulating transnational mineral markets could reinvigorate debate, foster new perspectives and stimulate new partnerships. The responsibility and authority to regulate key nodes in global minerals markets will remain in the hands of national bodies, but coordination is vital given interconnected global markets. A new forum could include key national regulatory authorities, international organizations and leading experts, and focus on key trends in market and trading infrastructure for minerals and their regulation.

International organizations should seek to strengthen structural cooperation and exchange by providing a more systematic evidence base. Addressing knowledge gaps about complex and fast-evolving markets could be a valuable first step, for example by conducting an authoritative review of pricing mechanisms, market platforms and the associated regulatory mechanisms for major traded minerals. This could become a catalyst for action, by identifying weaknesses in current arrangements and national authorities that require targeted support and capacity-building. This would need to be co-led by international organizations such as the International Monetary Fund (IMF) or OECD and regulators in key consumer countries.

Acronyms

AMIS	Agricultural Market Information System
APEF	Association of Iron Ore Exporting Countries
ASEAN	Association of Southeast Asian Nations
BPC	Belarusian Potash Company
BRIICS	Brazil, Russia, India, Indonesia, China and South Africa
Canpotex	Canadian Potash Exporters
CFTC	US Commodity Futures Commission
CIPEC	Inter-governmental Council of Copper Exporting Countries
CME	Chicago Mercantile Exchange Group
COMESA	Common Market for Eastern and Southern Africa
FCA	UK Financial Conduct Authority
FMG	Fortescue Metals Group Ltd.
FSA	UK Financial Services Authority
HHI	Herfindahl-Hirschman Index
ICBC	Industrial and Commercial Bank of China
IBA	International Bauxite Association
ICAs	international commodity agreements
ICE	Intercontinental Exchange
INCO	Canadian International Nickel Company
ITA	International Tin Agreement
ITC	International Tin Council
LBMA	London Bullion Market Association
LME	London Metal Exchange
NDMC	National Mineral Development Corporation (India)
NPI	nickel pig iron
OPEC	Organization of the Petroleum Exporting Countries
PGMs	platinum group metals
PRA	Prudential Regulation Authority
SADC	Southern African Development Community
SAFE	China's State Administration for Foreign Exchange
SHFE	Shanghai Futures Exchange
SOEs	state-owned enterprises
TTIP	Transatlantic Trade and Partnership
TTP	Trans-Pacific Partnership
USGS	United States Geological Survey
WGC	World Gold Council
WGTC	Working Group on the Interaction between Trade and Competition Policy

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