

Metals & Mining Practice

Lessons from the past: Informing the mining industry's trajectory to the next normal

What can previous crisis periods teach us about the impact of the COVID-19 pandemic on the mining sector, and what can we expect going forward?

This article was written by McKinsey's Metals & Mining Practice. The authors include Marcelo Azevedo, Jochen Berbner, Scott Crooks, Sigurd Mareels, and Camila Nucci.



© Opla/Getty Images

The COVID-19 crisis is, in many ways, unprecedented. While governments, industries, and the wider society are working together to understand and address the challenges caused by the crisis to support patients, their families, and communities, the search is on for treatments and a vaccine. Understandably, the ongoing impact of the pandemic on the mining sector remains uncertain; however, we are learning more each day about how the crisis is affecting demand for commodities, supply chains, and operating models.

In the face of today's uncertainty, we can also look back to historical events to explore how analyzing past crisis periods can help us understand the ramifications of the COVID-19 pandemic. Over the past 40 years, there have been six major occasions when the sector has experienced significant shock waves (Exhibit 1). The first was the second oil shock of the 1980s, and the most recent was the commodity-price crisis of 2015–16.

Past crisis periods

Analyses of major crises over recent decades indicate that they each followed a comparable pattern. Looking at commodity prices and supply-and-demand dynamics, each event can be separated into four distinct phases, with each stage having a different duration and extent, depending on the specific historical event in question. Each crisis progressed through a period of price shock, followed by demand shock, supply-and-demand equilibrium, and finally demand recovery and the next normal:

- **Phase one: price shock (two weeks to two months).** The first phase, lasting only weeks or a few months, is characterized by price shocks—often at or even below marginal cost—accompanied by mining-currency devaluation and oil-price corrections as investors flee to US-dollar assets. The steepness of the price falls is dependent on the price immediately prior to the crisis, with the commodities trading at a significant premium to marginal cost falling the most. In the financial crisis, we saw most

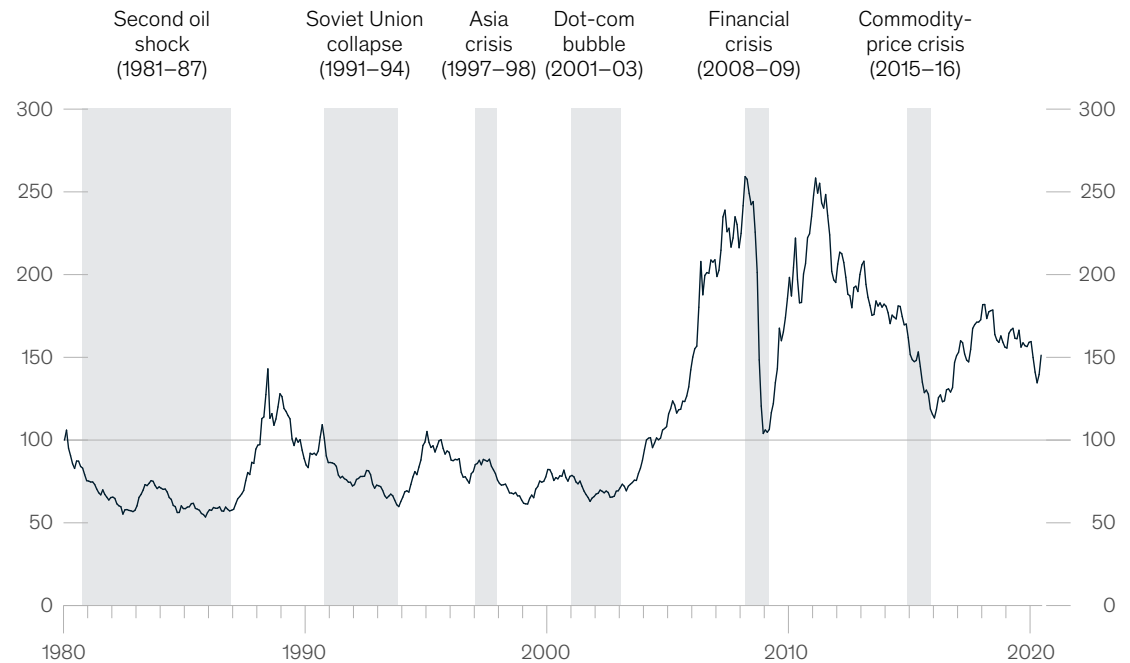
commodity prices fall between 2008 and 2009, with iron ore declining 15 percent, copper 26 percent, and aluminum 35 percent. Typically, gold reacts differently from other commodities in this phase, as investors use it as a safe-haven hedge; in 2009, it rose 12 percent over the crisis period.

- **Phase two: demand shock (three months to two years).** In the second phase, end-use sector demand declines. Inventory destocking (London Metal Exchange, ports, and so on) is also observed, which in turn leads to some slight price corrections, albeit to a lower level. An extreme example of this is agricultural demand for potash: farmers can rely for up to a year on existing soil content for crops, such that demand may fall significantly. The length of this phase is determined by the size of strategic stocks and the timing of marginal cost-supply reductions.
- **Phase three: new supply–demand equilibrium (one to three years).** This phase is characterized by producers responding to new supply-and-demand dynamics by shutting down high-cost supply and high grading, resulting in a new supply–demand equilibrium, often at lower levels than seen previously. Market changes from the first two phases affect trade flows, which can lead to divergent price trajectories as government stimulus packages alter end-use sector responses. Large stimulus packages were implemented in 2009–10, and we are seeing a similar response in 2020, with major stimulus packages already announced by China, Europe, and the United States. Lower capital expenditure is characteristic of this phase, with expenditure directed to the mines with the highest margins and lowest operating costs as companies focus on rebuilding profitability.
- **Phase four: demand recovery and the next normal (one to five years).** The final phase, which may be reached as soon as a year after the initial shock and last between one and five years, sees global recovery being led by the larger economies and prices rebounding as shortages begin to appear. Lack of capital expenditures,

Exhibit 1

Commodity prices have seen six significant shocks over the past four decades.

World Bank Metals and Minerals Commodity Price Index, index (Jan 1980 = 100)



Source: Commodity Price Index, World Bank, June 2020, worldbank.org

depletion of existing assets, and differentiated demand patterns lead to commodities reacting differently. As the phase progresses, new investment and project restarts are required to address additional demand.

The current crisis

In the COVID-19 crisis, we have seen phase one and are currently experiencing phases two and three. We are seeing price declines for many commodities, but the picture is more nuanced: we also observe some winners, such as gold and uranium. At a recent trough of the crisis, the price-drop range was 5 to 25 percent across major commodities, and prices remain subdued in some cases. For example, metallurgical coal is down 21 percent and thermal coal is down 23 percent, while gold is up

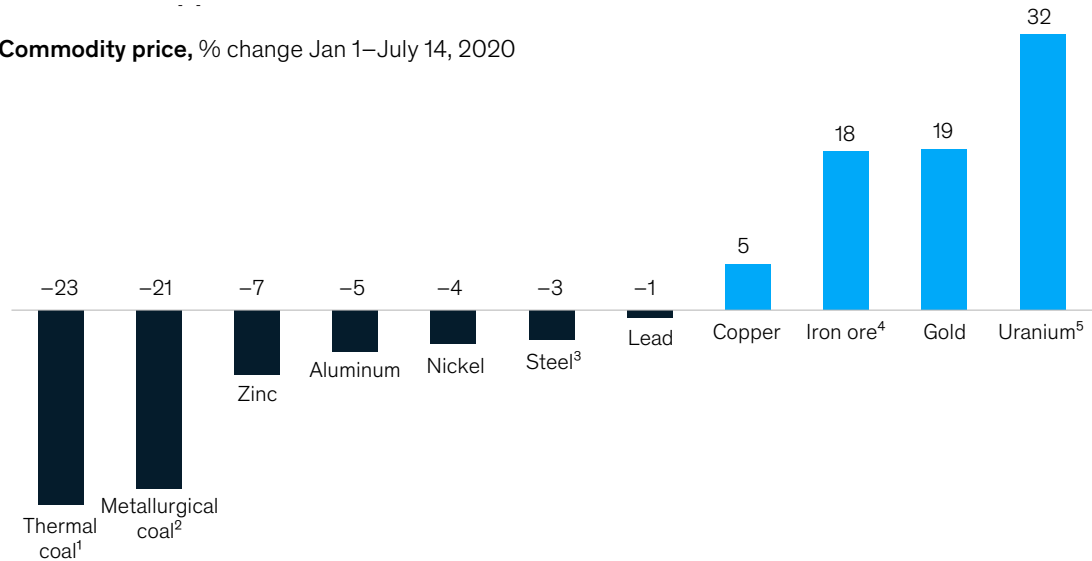
19 percent and iron ore is up 18 percent (Exhibit 2). Currencies in key mining countries were initially devalued by 10 to 30 percent; as a result, many mining jurisdictions became more cost competitive. Over the following months, that partially reversed in some cases, as currencies rebounded. There is, however, a unique aspect to the current crisis: an immediate supply correction driven by lockdown and physical-distancing measures and, in a few cases, exacerbated by disruptions not related to the COVID-19 crisis. Iron ore is a good example of that, with specific supply disruptions in Brazil playing a role in the current price rally.

The oil price has declined by a smaller amount than seen in previous crises: year to date, it is down some 35 percent, whereas it plunged 77 percent in 2008 and it fell 76 percent in 2014-16. The smaller decline

Exhibit 2

Commodity prices, apart from those for specific cases such as gold and iron ore, have dropped, as have currencies.

Commodity price, % change Jan 1–July 14, 2020



Foreign exchange, Jan 1–July 14, 2020, index (Jan 1, 2020 = 100)



¹Australia Newcastle/Port thermal coal, 6,000 kilocalories. ²Australia Peak Downs, Platts hard-coking coal free on board. ³Rockwell hardness on C scale (HRC), domestic, delivered Eastern China. ⁴Platts Iron-Ore Index (IODEX), 62% iron \$/dry metric ton; North China import cost and freight. ⁵Uranium U308 Swap Futures. Source: Bloomberg; Fastmarkets MB; S&P Global Platts

in the current crisis is attributable in part to the oil price's lower starting point at the end of 2019, but 2020 has also been characterized by a dispute between Russia and Saudi Arabia that has created oil-price volatility not previously encountered.

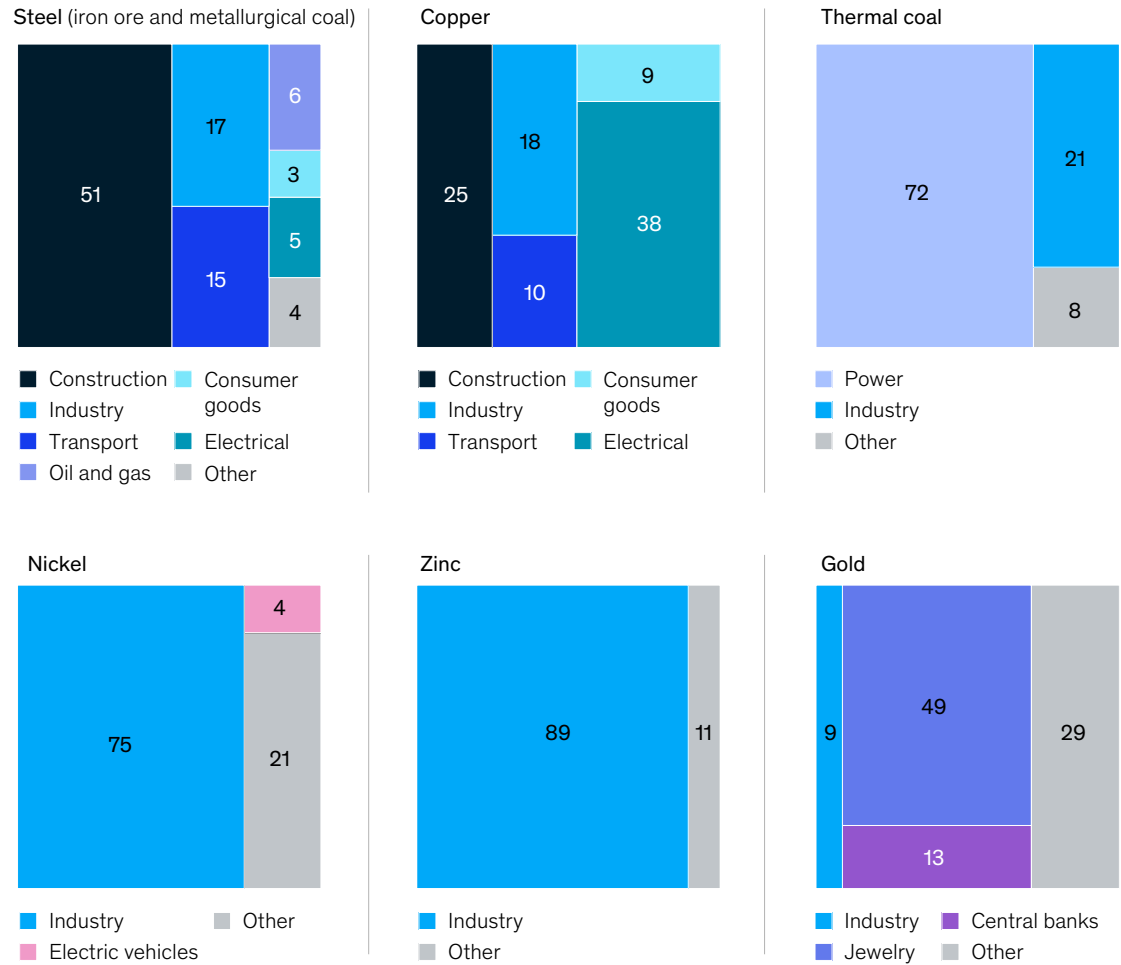
As we start to understand better the impact of crises on the demand for different commodities, it

is important to acknowledge the diversity of end uses and therefore the (potentially) sharp variations in how they behave (Exhibit 3). Historical crisis periods illustrate that the impact on commodity demand differs by commodity and depends on the exposure mix to end-use sectors. Those sectors are affected in different ways; therefore, the impact on commodities varies.

Exhibit 3

Commodities have significantly different end uses, translating into varied impacts on demand.

Metal demand in 2019 by end-use sector, %



Note: Figures may not sum to 100%, because of rounding.
Source: McKinsey analysis

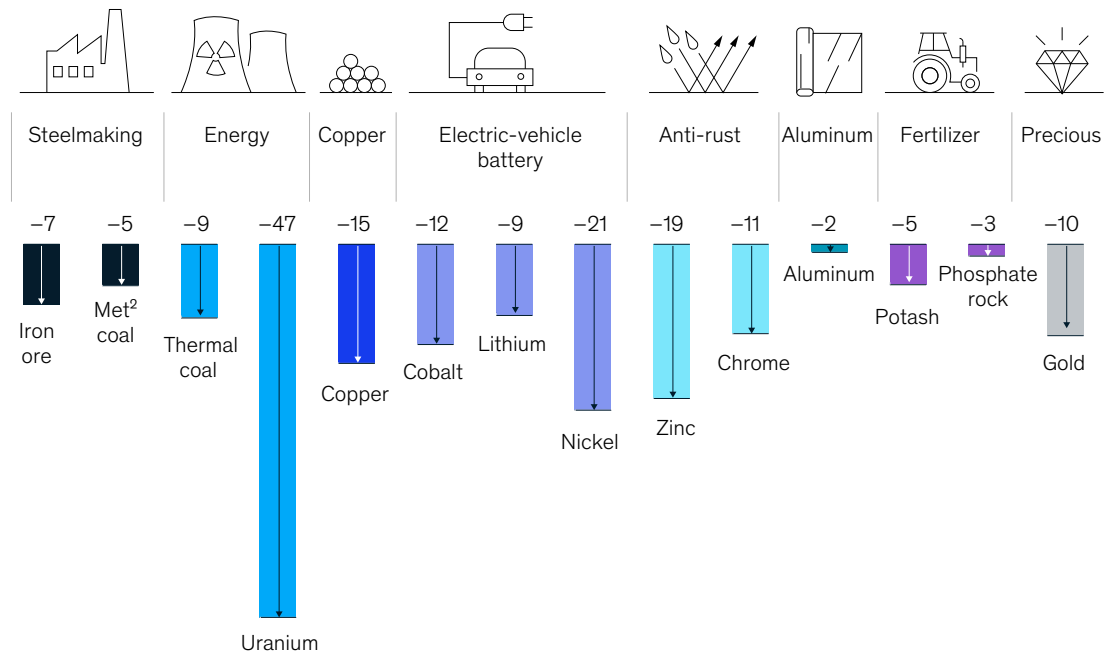
There is no reason to believe that the behavior profile in the current crisis will be any different: some sectors will be hit much harder than others will. Demand for metals with primarily industrial end uses (such as aluminum, nickel, and zinc) are expected to decline in step with GDP decline. Those that are countercyclical (such as gold), with new industry applications (such as copper), or driven by other end uses (such as potash in agriculture production) are likely to be more resilient. Iron ore and metallurgical and thermal coal are likely to be hit hard as construction demand falls along with power requirements, in line with lower levels of economic activity.

On the supply side, the situation is new, however. As the COVID-19 pandemic has hit geographies and countries at different times and to varying extents, the immediate supply correction varies sharply across commodities (Exhibit 4). Although some countries (such as Australia) have seen limited impact, others (such as South Africa) have witnessed severe lockdown measures, with a knock-on effect on mine sites. The overall impact on each commodity differs, with fertilizers and aluminum resilient while the average monthly production of nickel and zinc is down by approximately 20 percent. An extreme example is uranium: almost 50 percent

Exhibit 4

Supply disruptions will have a different impact on each commodity.

Estimated supply-disruption impact compared with 100% production capacity, % (monthly impact)¹



¹Monthly impact estimated based on May 2020 figures; only includes disruptions following COVID-19 outbreak and existing disruptions (eg, large iron-ore-capacity disruption in Brazil).

²Metallurgical.

Source: MineSpans by McKinsey; McKinsey analysis

of the global supply ground to a halt in May 2020 as Kazakhstan stopped production. Additionally, disruptions not related to the COVID-19 crisis are in place—and will continue throughout the year—as part of the nature of the mining sector.

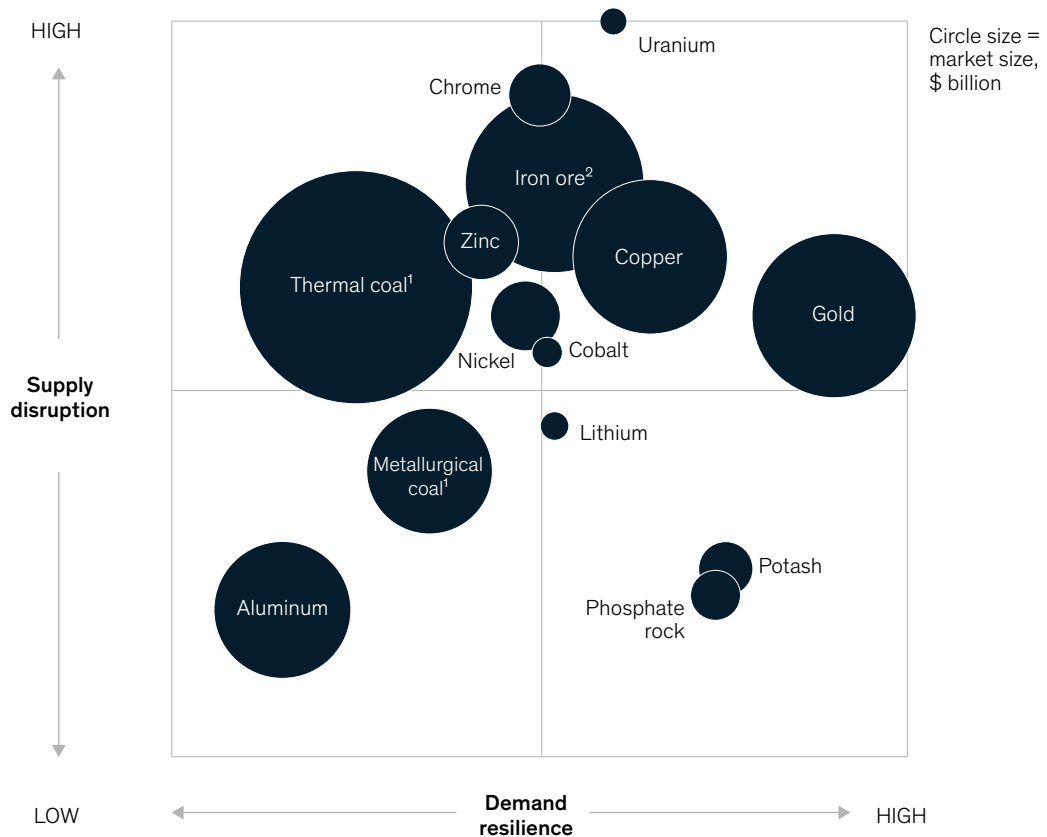
We anticipate that the price behaviors for major commodities could vary significantly for the remainder of the year (Exhibit 5). Key factors will be the extent of demand loss and time to recovery; the timing, location, and extent of supply disruption; and

the size of existing inventories. Commodities with resilient demand and significant supply disruptions—COVID-19-crisis related or otherwise—will fare better, while those linked to severely affected end uses and limited supply corrections will see lower prices for longer. Short-term price trend depends on a combination of supply disruption and demand resilience. In fact, a few sharp differences can already be observed, with some leaders and laggards emerging.

Exhibit 5

The short-term price trend for each commodity will be different.

Demand resilience vs supply disruption



¹Seaborne; subject to larger disruptions based on possible Chinese import restrictions.

²Seaborne; includes disruptions related to COVID-19 crisis and other disruptions.

Source: MineSpans by McKinsey; McKinsey analysis

Historical crisis periods illustrate that the impact on commodity demand differs by commodity and depends on the exposure mix to end-use sectors.

Among the leaders, gold has been performing its usual countercyclical safe-haven role, with rising prices, compounded by supply disruptions in key producing countries. Iron ore has proven remarkably resilient because of a convergence of factors. Disruptions not related to the COVID-19 crisis in Brazil—May 2020 had the lowest Brazilian iron-ore monthly export volume for that month since 2009—have combined with a relatively resilient Chinese steel industry to see prices surpass the mark of \$100 per metric ton in June, despite record exports from Australia. Copper prices are already above precrisis levels, with supply squeezed by lockdowns in Peru, although demand should return with country-level stimulus packages and especially investments in renewables and new grid infrastructure. Meanwhile, spot-uranium prices, partially driven by the previously mentioned large supply correction in Kazakhstan, have risen by some 32 percent since the beginning of the year.

At the other end of the spectrum, metallurgical coal has seen limited supply disruptions, as Australia, which is responsible for more than 70 percent of the seaborne supply, has fared relatively well in the pandemic. Early in the crisis, the loss of seaborne demand from other regions had been partially compensated for by a shift of more volumes to China, while Chinese domestic supply was affected by the

crisis. Since then, the slowdown has started, which, combined with the recovery of Chinese supply, has caused prices to continue to fall. With thermal coal, a similar story emerges. How the seaborne coal markets (metallurgical and thermal) respond will be heavily influenced by government regulations and Chinese import quotas. In the first and second quarters of 2020, Chinese import of coal has been strong. In the absence of an increase in quotas, the second half of the year could see a price decline. Another commodity to be hit sharply has been aluminum: its end sectors (such as automotive) have been severely affected from a demand point of view, and there has been limited smelting-capacity correction.

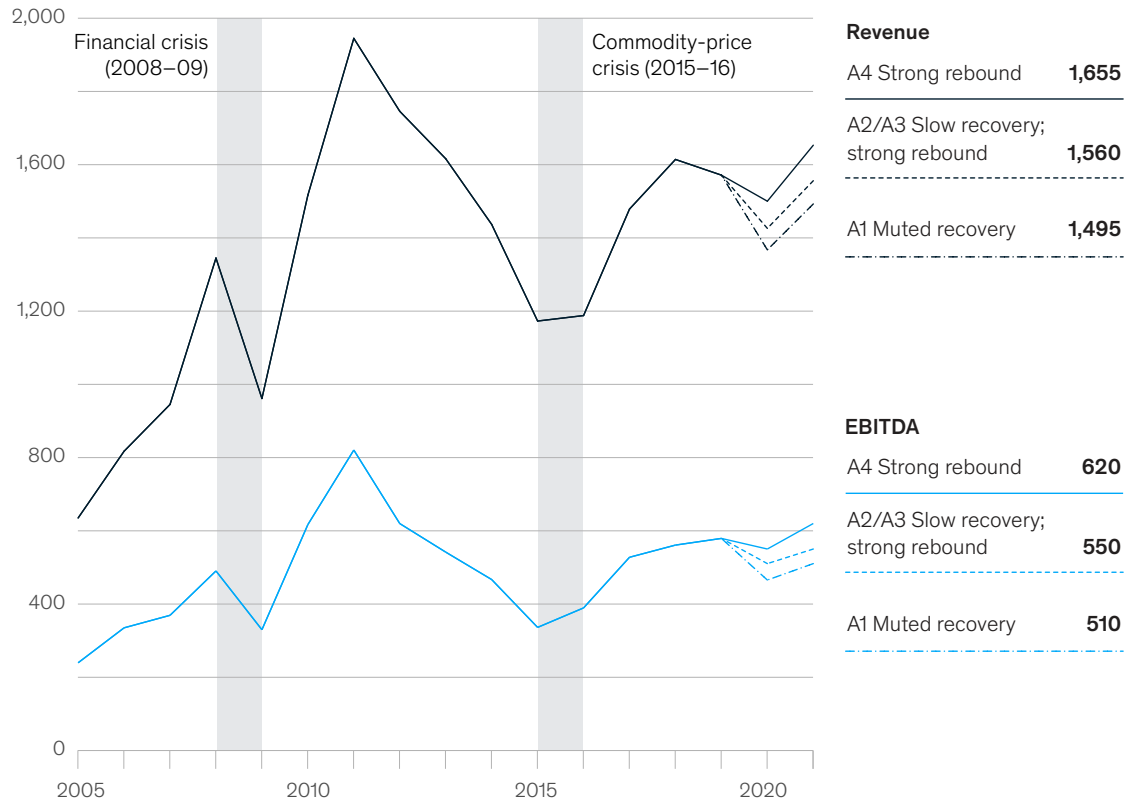
Looking ahead, there is still significant uncertainty, naturally, around the shape of the recovery graph and the effectiveness of public-health responses in controlling the spread and impact of the virus. McKinsey has developed a set of nine macroeconomic-recovery scenarios that incorporate three archetypes of viral spread and three degrees of economic-policy effectiveness.¹ To understand the implications for the mining sector, we have assessed the potential impact on industry-level revenues and earnings before interest, taxes, depreciation, and amortization (EBITDA) under four scenarios—A1, A2, A3, and A4—that represent different shapes of economic recovery (Exhibit 6).

¹ For more about the scenarios, see Kevin Buehler, Arvind Govindarajan, Ezra Greenberg, Martin Hirt, Susan Lund, and Sven Smit, "Safeguarding our lives and our livelihoods: The imperative of our time," March 2020, McKinsey.com.

Exhibit 6

Revenue and earnings performance in the mining industry will vary according to recovery archetype.

Mining revenues and EBITDA¹ by recovery scenario, \$ billion



¹Earnings before interest, taxes, depreciation, and amortization.
Source: McKinsey analysis

Based on that assessment, we suggest that the mining industry risks losing an estimated \$30 billion to \$120 billion in EBITDA in 2020 versus 2019 because of the COVID-19 crisis, despite an expected revenue loss of \$90 billion to \$200 billion. We

believe that the mining sector will remain relatively resilient and that part of the revenue loss driven by volume and price impact will be absorbed by the lower costs prompted by underlying currency devaluations versus the US dollar, as well as lower energy prices.

Marcelo Azevedo is an associate partner in McKinsey's London office, where **Scott Crooks** is a specialist; **Jochen Berbner** is a partner in the Kazakhstan office; and **Sigurd Mareels** is a senior partner at the Brussels Innovation Center, where **Camila Nucci** is a senior analyst.

Designed by Global Editorial Services
Copyright © 2020 McKinsey & Company. All rights reserved.