The Economist Intelligence Unit

In the pits?

Mining and metals firms and the slowing of the supercycle

A report from The Economist Intelligence Unit

Sponsored by

National Australia Bank

Contents

Preface

In the pits? Mining and metals firms and the slowing of the supercycle is a report by The Economist Intelligence Unit (EIU), sponsored by NAB. It examines the outlook for companies in the mining and metals sector in the wake of slowing industrial commodities prices worldwide. The report is based on EIU forecasts and analysis, extensive industry-level research, and in-depth interviews in key markets with business executives and experts from various companies, including:

- Atlas Iron
- First Quantum Minerals
- Fortescue Metals
- Freeport McMoRan
- Hancock Prospecting
- Heidrick & Struggles, global mining practice
- Japan Oil, Gas and Metals National Corporation
- Mitsui & Co
- Peabody Energy
- White & Case, metals & mining practice
- Whitehaven Coal
- Wood Mackenzie, metals & mining consulting

In certain cases interviewees asked to remain anonymous. We would like to thank all interviewees for their time and insights. Our special thanks are due to Mitsui for their generous time and assistance.

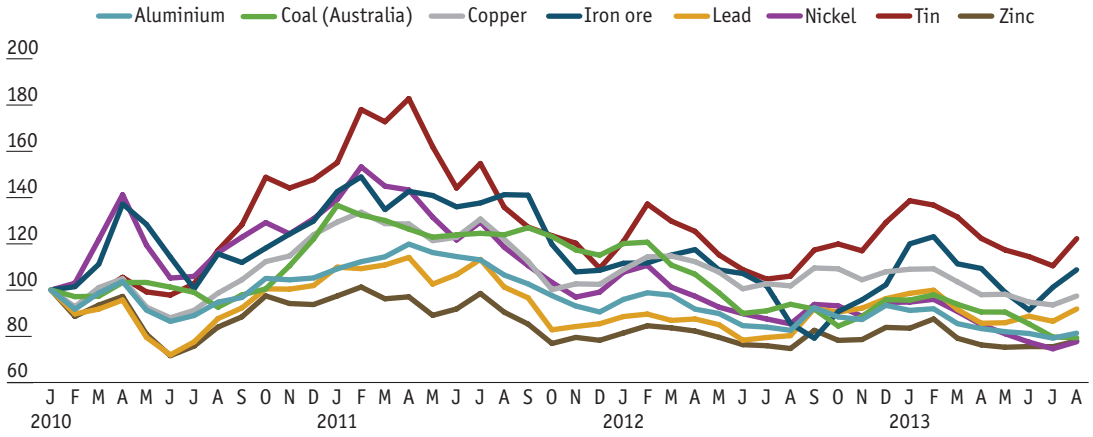
Christopher Clague is the author of the report and David Line is the editor. Madelaine Drohan and Elizabeth Fry assisted with further interviews. The views expressed in this report are those of The EIU alone and do not necessarily reflect the views of the sponsor.

Executive summary

Companies in the industrial raw materials sector are facing a new era. For years, miners of resources such as iron ore, base metals and coal enjoyed a boom driven by incredible demand from China and other emerging markets that were urbanising and investing heavily in infrastructure. Since a peak in 2011, however, prices of many commodities have fallen and concerns have grown about the end of the current "supercycle" (Figure 1). Projects that were once profitable are now unviable. Planned capital expenditure has been slashed. By 2012, as Figure 2 shows, mining companies' revenue growth had disappeared and profitability had plummeted. Consequently, firms across the sector have revamped their management teams,

Figure 1

End of an era?
Price indices, selected commodities
(Jan 2010=100)



Source: World Bank/Haver Analytics

	Aluminium	Coal (Australia)	Copper	Iron ore	Lead	Nickel	Tin	Zinc
Post-financial-crisis peak	2011 - Apr	2011 - Jan	2011 - Feb	2011 - Feb	2011 - Apr	2011 - Feb	2011 - Apr	2011 - Feb
% change from peak to August 2013	-32.1%	-41.9%	-27.1%	-27.0%	-19.5%	-49.3%	-33.1%	-23.0%

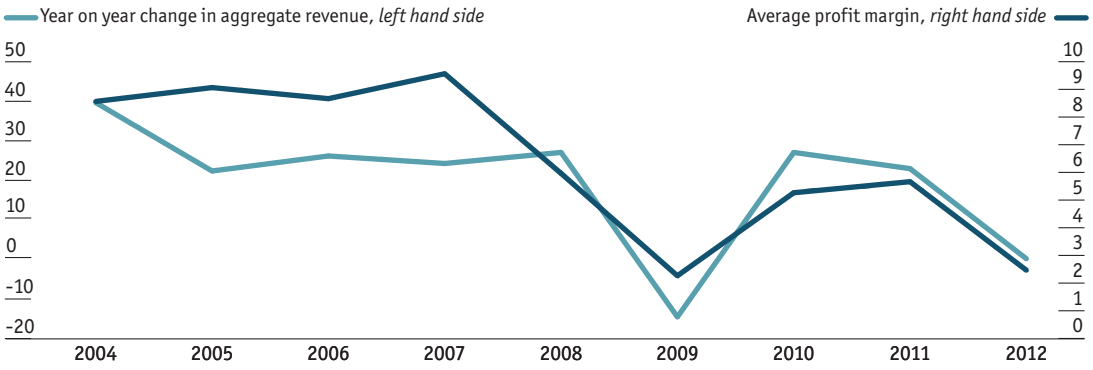
Source: World Bank/Haver Analytics

Figure 2

Not so happy now

Mining company performance 2004-12

(%)



Source: EIU, Orbis/BVDEP. Annual data from 413 companies with more than 100 employees from mining and associated industries (NACE Rev.2 codes 05, 07, 08, 099)

divested assets and adjusted their strategies as shareholders have grown unhappier about falling stock prices.

This is the commonly accepted narrative, but it is far from uniform across all hard commodities, nor across all companies in the industry. Though many accept that the incredible boom of the post-financial-crisis years is over, consensus on whether recent price movements indicate the end of the supercycle—or even on whether such a phenomenon exists—is lacking. Some point to the natural cycles that hugely capital-intensive industries experience, as projects planned years ago come on stream, affecting the supply-demand balance. Others see the current fear about slowing demand (particularly in China) as exactly the right time to plough money into new ventures, to take advantage of the next upturn.

This report looks beyond the short-term news cycle to assess the state of the metals and mining industry as it approaches the post-boom era. Based on extensive industry research and numerous in-depth interviews with executives from companies across the world, the report seeks to answer four questions. Is the commodities supercycle over? How has the industry's change in fortunes in recent years affected investment by mining companies—specifically capital expenditure—and what implications does this have for their future growth? What impact has the slowdown had on M&A, corporate dealmaking and industry consolidation? And finally, what strategic and operational issues do new management teams need to get to grips with to ensure their companies emerge as winners in the new environment?

The key findings of the report include:

- **The supercycle is not over—it's just not as super.**

Analysts, investors and those in the industry itself disagree over whether recent price moves mark the end of the resources supercycle. Academic research suggests that over the long term, prices of scarce commodities are likely to rise (while experiencing greater volatility). Some investors and analysts are more pessimistic, given structural changes in China's economy, while many executives in an industry accustomed to long investment cycles are inclined to downplay the theory altogether. The Economist Intelligence Unit believes continued growth in China (slower, but from a larger base), ongoing global urbanisation, and structural factors such as

higher energy and extraction costs will continue to support prices in the medium term.

- **Counter-cyclical capital expenditure could prepare firms for the next upsurge in demand.**

High prices in the 2000s were partly a result of underinvestment the previous decade, leaving miners struggling to keep up with surging demand. Then over-investment in expansion, particularly by the majors, unbalanced the supply-demand equation. Meanwhile, disgruntled investors are demanding quicker returns from capital employed. Firms must therefore be more cautious and focused about the number and type of investments they make—and CAPEX is falling as a result. But some miners are investing counter-cyclically in preparation for an expected upturn. In addition, remaining resources are deeper and more costly to extract and will require more investment to prepare firms for the next upsurge in demand.

- **The era of the megadeal is over; mid-cycle consolidation will drive a more subdued M&A market.**

Aside from a small number of recent large deals that were long in the making, firms in the metals and mining sector have entered a period in which viable deals are scarce, divestments hard to offload, and further large-scale consolidation a non-starter for both financial and political reasons. The era of the mining megadeal is over, and there are few world-class assets on the market. But further consolidation can be expected among junior and mid-cap firms that need to shore up their balance sheets or find partners for projects they are no longer able to finance on their own.

- **Diversification into mid-cycle commodities is an increasingly attractive option…**

For miners with the resources to do so, buying assets in diversified commodities is one way to gain exposure to the next supercycle, likely to be driven by urban populations' insatiable demand for manufactured goods, energy and soft commodities. Several deals—for example BHP Billiton moving into potash and Freeport McMoRan buying an oil and gas firm—demonstrate the appeal of diversification.

- **…while vertical integration and strategic collaboration can also add value.**

In recent years the industry has seen more end-users and trading houses moving down the value chain into origination and producers moving up the chain into trading in order to capture more value. The former type of deal (e.g. Glencore's acquisition of Xstrata) can create value as traders know producers intimately and can extract value from struggling assets. In addition, miners can also benefit from trading larger shares of their production on open markets. Meanwhile, for junior or mid-cap miners without the resources to diversify, investment on a project basis by strategic end-users can be beneficial.

- **Resources nationalism is as strong as ever.**

As commodities prices soared and private-sector companies benefited, governments in resource-rich emerging markets pressed for larger stakes in local projects—or opted to prevent foreign firms from owning assets altogether. Although prices are now dropping, a commensurate dialing down of resource nationalism has yet to occur—as trouble over Rio Tinto's Oyu Tolgoi mine in Mongolia and stricter local-ownership regulations in Indonesia illustrate. When these countries see a steep loss of competitiveness and FDI they may make adjustments to compensate, but this hasn't happened yet.

- **How miners manage the post-boom transition internally will determine how they fare when prices pick up.**

Many mining companies have replaced their CEOs in recent months in the face of shareholder anger over the falling value of their companies, cost overruns and poorly performing projects. With resources increasingly hard to extract, leaders will require more technical geological expertise. New management teams, meanwhile, face a

delicate balance of protecting balance sheets, satisfying shareholders and preparing the ground for future growth. A wholesale reprioritisation of risks is also needed: defaults from over-extended construction companies are now more likely, and risks from forex volatility are sharper. Political risk linked to resources nationalism also requires careful management.

- **"Pit to port" innovation is necessary even in a downturn.**

The competing demands on management will mean increasing pressure to justify investment decisions. Some executives think mining lags other industries in innovating along the production line, given the cyclical nature of the business. With greater investor pressure to return cash, speculative spending on innovation is likely to be the first thing to be cut. But with resources becoming ever more costly to extract, those that do innovate "from pit to port" will have a competitive advantage in future. In addition, those that opt to offload costly infrastructure assets may also be able to free up funds for innovation.

1 The commodities supercycle: Not over, just less super

The view that recent corrections in commodities prices mark the end of the current "supercycle" has gained currency in recent months. The Economist Intelligence Unit believes continued growth in China (slower, but from a larger base), ongoing global urbanisation, and structural factors such as higher energy and extraction costs will continue to support prices in the medium term.

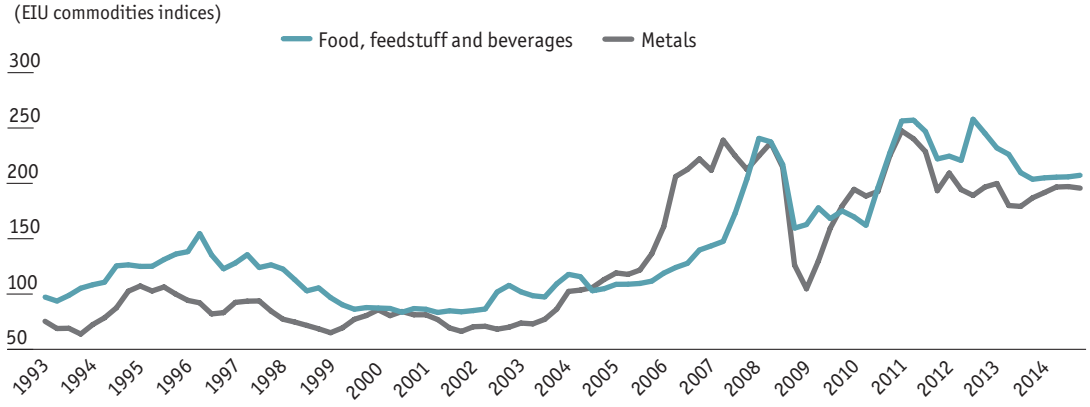
After a rising more or less continuously for most of the past decade, commodity prices have moved downwards in the past 12-18 months, to the point where some individual commodities have hit their lowest point in years. The overall Economist Intelligence Unit Commodities Price Index, a broad measure of commodity prices across food and industrial raw materials, is off 20% from the second quarter in 2011, the index's post-Global Financial Crisis (GFC) peak. Two sub-components of the index, food and metals, are down 12% and 34% respectively, over the same period (Figure 3). Of course, there are a handful of commodities in both groups that have fared better—or less badly—than others, but the trend is clear.

This slump has led some analysts to declare the current commodities "supercycle"—a sustained period of rising demand and prices—to be over. China's slowing economy and its government's push to rebalance the economy towards a more consumption-led growth model is the primary justifications for this analysis, along with the fact that China was the source of such an outsized

Figure 3

Cycling downhill?

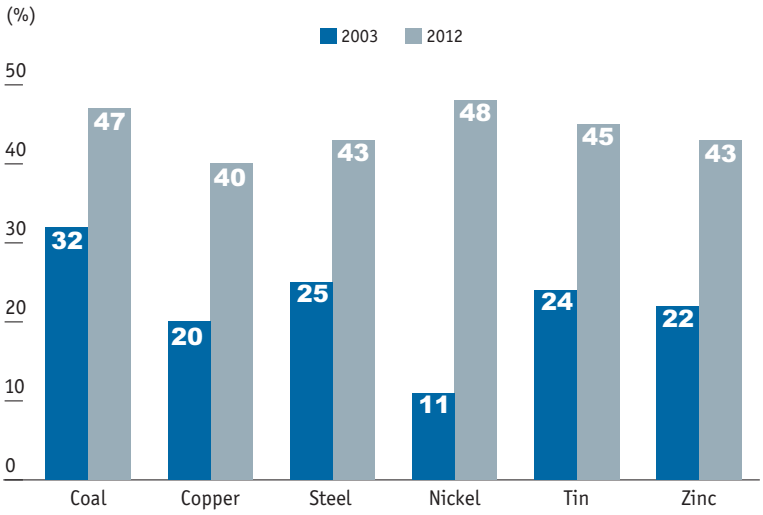
(EIU commodities indices)



Source: The Economist Intelligence Unit

Figure 4

The dragon's share
China's share of global demand



Source: The Economist Intelligence Unit

portion of net demand growth in metals over the past 15 years.

That China has come to account for a significant portion of total end demand across a range of key commodities is not in dispute. Between 2003 and 2012, its share of world demand for nickel increased four-fold, its share of copper demand doubled, and the increase in its share in most other commodities was not much lower (Figure 4). This surge was unprecedented and is likely to remain so—many in the industry emphasise that there will "never be another China".

Nevertheless, many contend that the supercycle is not actually over—rather, it is shifting into a new phase of lower growth, meaning it will just be less super than it was. Those on this side of the debate stress that although China is slowing and rebalancing, it is still growing—and from a larger base than when GDP was expanding at 14% annually. On top of that, the argument goes, the urbanisation story in China and other emerging markets is not yet finished. The urbanisation rate in China, for example, is expected to increase from 50% of the population, the current level, to 65% by 2025. Others have even farther to go.

Who is right? Academics, investors and the mining and metals industry itself do not necessarily agree on whether the supercycle phenomenon exists, let alone where along the cycle the global economy is currently.

Is it a bird? Is it a plane? No, it's a supercycle

The original supercycle idea is generally credited to an early 20th century Russian economist named Nikolai Kondratiev. Kondratiev noted that since the 18th century, global economic growth had tended to occur in long waves of 40-60 years, driven by industrial production, interest rates, foreign trade and technological factors.[1] The Harvard economist Joseph Schumpeter, a contemporary of Kondratiev's, built on this thesis by identifying within the longer "Kondratiev waves" shorter cycles lasting between three to nine years which were driven by additional factors. Schumpeter concluded that while prices would peak in each successive cycle, each peak would be lower than the last because of productivity improvements, among other things.

More recently, academics have revisited the theory and are looking more closely at how the cycles are dated, factors driving them, and the differing impact they have across commodities markets and supply chains. Professor David Jacks of Simon Fraser University in Vancouver, who has applied a large body of evidence to the theory, makes an important distinction between renewable or grown commodities versus non-renewable commodities.

"Until the 1970s, both had similar profiles [in terms of prices], but there has been a clear divergence since then," Professor Jacks says. "Animal products and other renewable commodities have declined 66% since then, while the metals and minerals side is up by 250%." Professor Jacks also concludes that, over time,

[1] http://www.un.org/esa/desa/papers/2012/wp110_2012.pdf

the boom and bust cycles are becoming more volatile, which has implications for investors and the industry alike.[2]

Investors, for their part, only really picked up on the idea of supercycles over the past 10-12 years. The frequency and profile of investment bank and other investment-focused analyst research on the subject started increasing around 2003-04, when China entered its most-intense period of growth. Given the unprecedented size and scale of China's growth, and the effect it was having on commodity prices, this was no surprise. But it wasn't just demand linked to China's growth that made commodities so appealing to investors. By the early 2000s it had become much easier to invest in them, reflected in a greater variety of commodity derivatives traded electronically on a greater variety of exchanges and in a greater variety of bilateral contracts. Retail investors, meanwhile, could access commodities as an asset class more and more easily through exchange-traded funds and other such vehicles.

Finally, there is the view from the industry itself. While most executives in mining and metals companies are familiar with the supercycle theory, that there are cycles—and that some of them are longer and more intense than others—is not much of a revelation to them.

"[The concept] means different things to different people," says an economist at one of the largest global mining companies, "so if you are a hedge fund manager in New York who is fixated on the rotation of assets out of China and into the US because the US economy appears to be recovering, you would think of the supercycle in very different terms than a mining company would." This difference in views between investors and mining companies has been a source of tension as prices have slowed recently (the implications of which are examined later in this report).

This time really is different

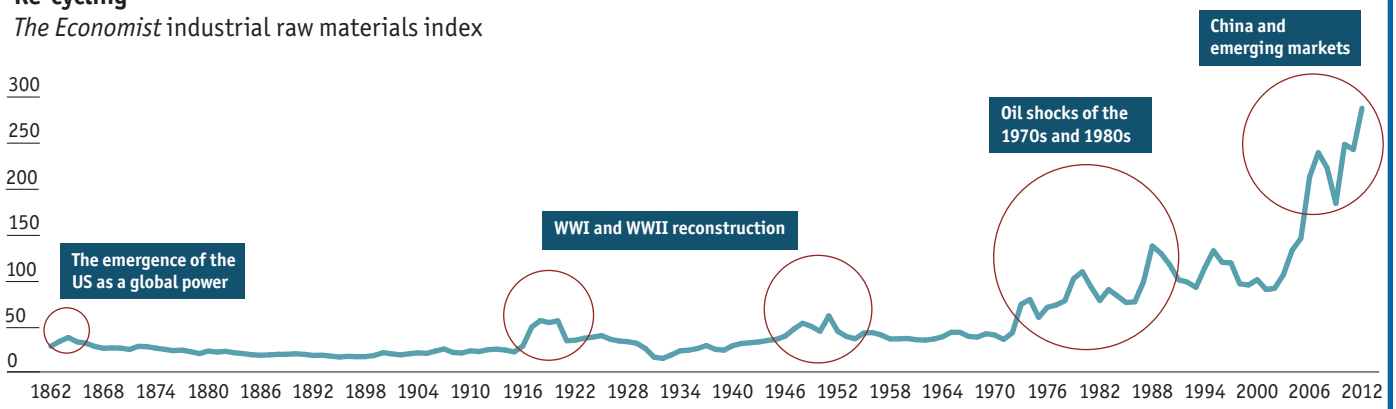
Despite these differences of opinion, the consensus is that the first modern supercycle coincided with the emergence of the US as a global power in the mid to late 19th century. Since then there have been four more such cycles, powered by reconstruction from the first and second world wars, the rise of the Newly Industrialised Countries in the 1960s and 1970s—coupled with the oil price shocks—and, most recently, the rise of China (Figure 5).

Figure 5 shows, *contra* Schumpeter, that each peak in industrial raw materials prices has in fact been higher than the last, and that the latest

[2] http://www.nber.org/papers/w18874

Figure 5

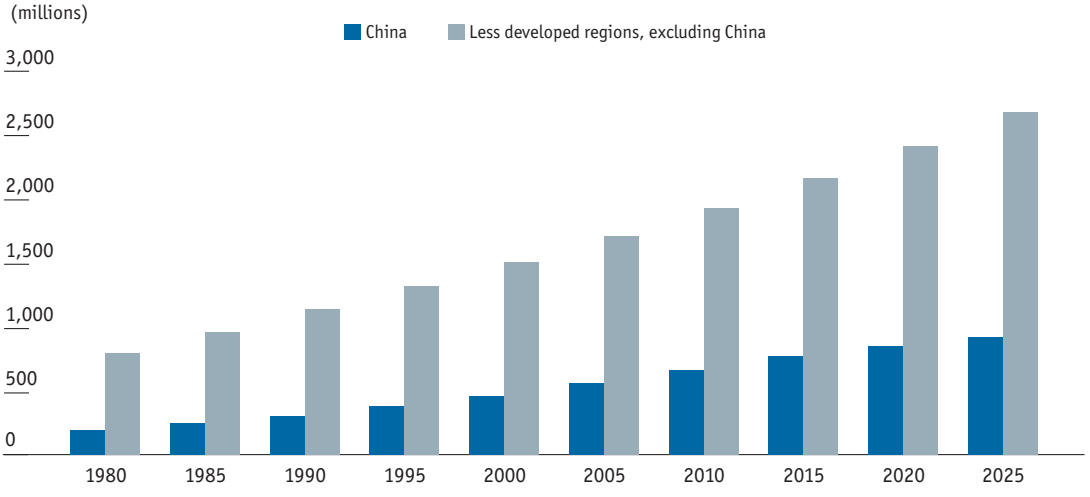
Re-cycling
The Economist industrial raw materials index



Source: *The Economist Guide to Commodities*, 2013

Figure 6

Run to the cities
Urban population
(millions)



Source: UN Department of Economic and Social Affairs, Population Division

China-driven cycle has been the highest yet, by a considerable margin. So why is this cycle so different?

On the demand side, there are four factors at play. The first is that, while global economic growth hasn't been as strong as it was in previous cycles, the growth is occurring from a much larger base than ever before. A global economy that is expanding in absolute terms from a larger base is going to demand a greater volume of inputs, even despite advances in technology.

Then there is the matter of urbanisation. The world has seen massive rural-to-urban migration during past supercycles, but nothing on the scale of that seen during the present one. Between 1990 and 2010 more than 350m people moved into cities in China alone, with an additional 800m urbanising in other poorer countries, according to the United Nations (Figure 6). An urban population is one that lives in more and taller structures, consumes more meat and dairy products, and uses more household appliances, automobiles and other manufactured goods. This all, of course, translates into greater demand for commodities.

Another factor that may have made this cycle different is the recent emergence of commodities as an asset class. In each of the previous cycles, financial instruments related to commodities were almost exclusively used either by producers or end-consumers for hedging purposes. That is no longer the case. In the past couple of decades investment banks, asset managers and hedge funds have all taken greater positions in commodities markets to varying degrees.

While there have been accusations that this trend has led to increasing volatility in commodities prices, especially in soft commodities, research done by the IMF concluded that the data did not necessarily support that thesis.[3] The same report did find evidence, however, that financial investment did cause "co-movement," or convergence among certain groups of commodities, even when underlying fundamentals may have differed. Analysts interviewed for this report therefore expect that as investors move out of these and other commodities, prices are likely to diverge again in the years ahead as fundamentals come back into play.

[3] IMF World Economic Outlook, October 2008, "Does Financial Investment Affect Commodity Price Behavior," p. 88 - 92

Finally, on the supply side, the sheer scale of growth in demand coming from China and other emerging markets wasn't foreseen, or at least not in time for production to be ready to meet that demand. The market for mining and metals products appeared to be moribund in the 1990s, as prices moved steadily downward in the second half of the decade. This translated into lower levels of investment and therefore fewer new projects coming on line. Due to the length of the project cycle in the sector, miners couldn't increase supply fast enough in the early 2000s to meet new demand, leading to a dramatic surge in prices. Whether the current slowdown in investment, for many of the same reasons, is going to seed the next boom is a question addressed later in this report.

Slower but not over

That most commodity prices have come down recently is not in question. What is in question is whether this marks the end of a supercycle across all industrial commodities, a shorter-term adjustment, or the start of a period in which the cycle continues for some commodities but not others.

The EIU's view (illustrated in our forecasts in Figure 7) differs somewhat from the consensus among the investment community and other research firms. We tend to believe that there is still a lot to support prices, especially on the metals side, where production costs are structurally rather than cyclically higher due to rising energy costs and the difficulty of extracting remaining assets. "The drop in prices we've seen so far was just taking froth out of the market," says Caroline Bain, EIU senior commodities economist. "It was counter-intuitive to have such strong commodities prices for so long."

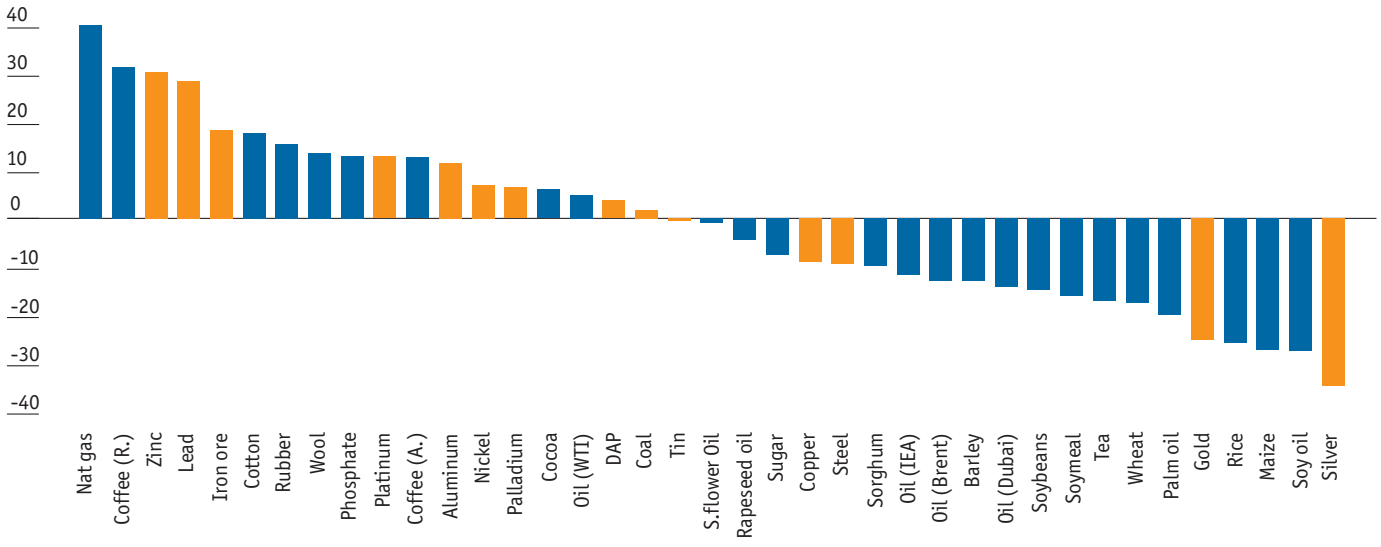
Indeed, although the collective optimism of companies in the mining and metals sector has tempered somewhat, it is a lot more positive than might be expected given current circumstances. The main cause for this optimism has already been mentioned: China's urbanisation story is

Figure 7

Winners and losers

EIU price forecasts: % change between 2013-1017

(Orange bars=metals/mining)



Source: The Economist Intelligence Unit

not yet finished, nor is that of other emerging markets. The UN forecasts that over the next two decades just over 250m Chinese will move into cities—roughly the equivalent of two Japans. That is about 100m fewer people than migrated from the countryside to the cities between 1990 and 2010, but it's hardly bad news for commodity demand. And if the country's *hukou* system of household registration (which restricts internal migration) is reformed, the pace of urbanisation could exceed current forecasts. Moreover, macoreconomic policy focused on driving consumption over investment—in effect, catering to a growing middle class—still implies massive demand for metals and mining products, if not in precisely the same proportions as an infrastructure-driven policy.

A new era of winners and losers

Even if the outlook for industrial commodities is better than some analysts have forecast, the sector has entered a new phase that will see increased price volatility among other changes, and more downside risks than have been present for some time. At the same time, costs for primary-sector companies are moving structurally higher on the back of rising energy prices, labour costs, and—in some geographies—regulatory costs. These trends will force firms across the industry—and up and down the value chain—to improve efficiency and look harder at projects and acquisitions.

2 Capping CAPEX? Opportunity in adversity

Whilst a slowdown in corporate investment in the mining and metals sector is under way, the factors behind it are not uniform and it is not as broad-based as some would contend. Overinvestment in recent years, combined with many projects coming online and entering a less capital-intensive operations phase, explains some of the dropoff. Most miners are much more conscious of the need to get faster returns on capital, although some firms are investing counter-cyclically to prepare for the next upturn. Meanwhile, what's left in the ground will require greater investment to extract.

There has been a dramatic slowdown in capital expenditure in the metals and mining industry in recent months, a trend that is expected to accelerate into 2014 and perhaps even beyond. The cutback in some economies has been steep: Australia's Bureau for Energy and Research Economics estimated in April 2013 that high-value resource projects worth A$150bn (US$140bn) had been cancelled or delayed in the country in the previous year.[4] Some mining-industry bears forecast that global capital expenditure will be as much as 30% lower by 2015 than it was in 2012. The end of the supercycle provides an easy narrative for explaining this cutback, but it doesn't tell the whole story.

Coming to a natural end

The fact that individual firms, and especially junior and less diversified miners, go through investment cycles has been underplayed in the hype surrounding the ongoing drop-off in mining-sector capital expenditure. A lack of investment in the 1990s, for example, contributed to the early stages of the current supercycle by creating a constraint on the supply side. When China and other emerging markets started to really take off in the early 2000s and began demanding more iron ore, copper and other industrial commodities, there simply wasn't enough supply to keep up, which provided motivation for a spike in investment as prices rocketed.

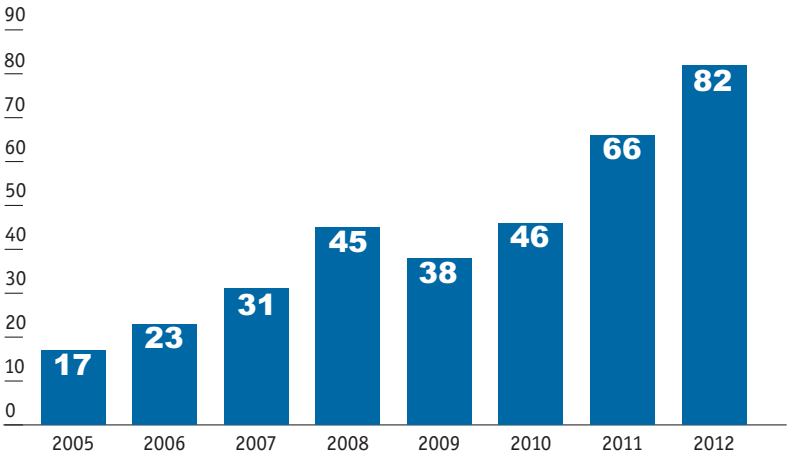
As a result of that, and accommodative capital costs and other factors, miners began a significant push to develop new assets around the middle of the last decade (Figure 8). Considering the lead time on mining projects, it would make sense that a number of these would be now nearing completion and moving into a less capital-intensive operations phase as they come online.

"We've come through a major expansion phase and, yes, we're drawing towards the end of that," says Stephen Pearce, CFO of Fortescue, an Australian iron ore mining company with revenues of US$8.1bn in the 12 months to June 2013. "But it's an exciting time for us when we ramp down our capital spend and ramp up our tonnes and therefore the operating cash flow that flows from those tonnes."

[4] http://www.bree.gov.au/media/media_releases/2013/20130522-investment.html

Figure 8

Overinvestment?
Recent CAPEX by major mining houses
(US$bn)



Source: Glencore Xstrata IR presentation, September 2013

Closer afield

Rather than pull back entirely from capital expenditure, mining and metals firms are also opting to put more money into the maintenance and/or expansion of existing projects, in order to draw the most out of existing assets. This brownfield investment is going to increase—against previous brownfield investment levels rather than CAPEX as a whole—as firms shift focus to delivering immediate return on capital invested, currently a key focus for shareholders.

Vic Svec, senior vice-president of investor relations and corporate communications at Peabody Energy, the world's largest private-sector coal miner, puts this another way, saying his firm's reduction in CAPEX was primarily from what you'd call "growth capital" and future projects originally intended to accommodate increases in volumes. Peabody spent around US$1bn in 2012 and had initially targeted CAPEX of US$500m for this year, but has recently cut that amount by US$100m. "In the current environment, until the market is more capable of paying us for those investments, it makes sense for us to focus on more sustaining and productivity-driven CAPEX," Mr Svec says.

On top of that, a number of marginal projects at the high-end of the cost curve, which could only prove profitable in the best of times and which somehow managed to muddle through the global financial crisis, are just now finally being washed out. Mining executives are hesitant to admit to the failure of specific projects, but a look at some that have been delayed or cancelled in Australia over the past year yields some clear instances of this phenomenon. Australia's Bureau of Resources and Energy Economics identified 18 such projects in its April 2013 report, worth an estimated A $149 billion.[5] BHP Billiton's Outer Harbour and Olympic Dam projects, for example, were shelved on the grounds that they didn't create value for shareholders, while Xstrata's project in Wandoan was cancelled because the associated risks were no longer worth taking due to the present depressed state of the market for thermal coal.

Forging ahead

Nevertheless, some firms are opting to power through this downturn and take advantage of their competitors' subdued sentiment. This means continuing to invest so that they are well-placed to take advantage of the projected upturn in prices that they expect to arise as a result of the current lack of investment. First Quantum Minerals, a diversified Canadian miner with US$2.95bn in revenues in 2012, is one such firm that has opted to continue investment apace. By the end of June 2013 the company had committed to capital expenditures of US$2.36bn, compared to US$897m at the end of 2012.

Clive Newall, First Quantum's president, summarises his firm's countercyclical approach as follows: "What we try to do is the opposite of what the rest of the industry does. When everybody else around you is doing something else, you can build cheaper, you can get better

[5] http://www.bree.gov.au/documents/publications/remp/REMP-2013-04.pdf

First Quantum: Standing sentinel

In contrast to many of its peers who are cutting back on CAPEX, Vancouver-based First Quantum Minerals is pushing ahead with a US$1.9bn copper project in Zambia in the hopes that the project will come online when the market is back on the upswing. The project, named Sentinel and part of a larger project named Trident that includes nickel and other exploration prospects, was started mid-year in 2012, with completion expected in mid-2014.

The investment is something of a contrarian bet, says Clive Newall, First Quantum's president, but one he believes is going to pay off. "The rest of the industry builds projects at the top of the cycle and then sells them at the bottom of the cycle," says Newall, "whereas we try to build through the bottom of the cycle so that we hit the upturn and maximize the return for our shareholders."

When Sentinel does come online, it is projected to have an annual output of 55m tons at an average grade of 0.5%, according to First Quantum's website. This would place it among the largest new copper mines expected to come online over the next 2-3 years.

For other miners, the project, located in a jurisdiction with considerable political risk and questionable infrastructure, might have been one to consider shelving. For First Quantum, which takes the view that the supercycle is not just a China story but one of global urbanisation, it was just a matter of "hold your nerve and keep building."

people, you can build quicker, because stuff is readily available. And then hopefully you hit the ground at just the right moment with your production." (See the case study above.) This is the mining and metals sector equivalent to Warren Buffet's advice to be fearful when others are greedy and greedy when others are fearful.

What's left? Deep and difficult

The much tighter focus on return from capital employed is part of the broader drive toward greater cost savings. But, as Mr Svec from Peabody also notes, geology is a key factor. "Even though you are earnest about wanting to reduce costs in this business, the geology also has to be on your side to make much headway."

It is a truism that metals and mining products are finite resources. What's left in the ground is not as easy to get at as it used to be. Boom time or not, miners tend to pursue those resources that are easier to extract and of higher quality. Over time, it is inevitable that what will remain are reserves that are neither. "That fact is not going away," says the chief China economist for one global miner. "New resources are either deep and difficult to get to, and possibly of a lower grade, or they are located in difficult geographies that are even more expensive to recover."

This is a reasonable view, but the industry has been in this situation before. In 1980 Julian Simon, a professor at the University of Illinois, challenged Stanford professor Paul Ehrlich to a US$1,000 bet over whether the cost of five commodities—copper, tin, nickel, tungsten, and chromium—would increase over the coming decade. Mr Ehrlich, who had gained notoriety for arguing that overpopulation was draining the world of key resources (particularly in his book *The Population Bomb*), bet on prices increasing. In October 1990, following a decade during which all five commodities fell in inflation-adjusted terms, Mr Ehrlich sent a cheque to Mr Simon for US$576.07—the drop in value by 1990 of a basket of all five worth US$1,000 in 1980.[6]

Nevertheless, Mr Ehrlich is eventually going to be proven right. In the medium term, even if prices

[5] In 1990 dollars. Paul Sabin, *The Bet: Paul Ehrlich, Julian Simon, and the Gamble Over Earth's Future*, Yale University Press, 2013

for those five exact commodities do not rise, it is very likely that the prices of a mix of other industrial commodities will.

Ken Brinsden, managing director of Atlas Iron—an Australian iron ore company with revenues of A$695m (US$653m) in 2012-13—links the increasing difficulty of extraction to inevitable cost increases. "The thing that has materially changed is that miners are going into deeper pits and into minor resources that are underwater, and all this implies bigger capital development projects and longer times for commissioning." Which is to say, costs are going to rise. So while it is one thing to talk about prices, as high as they were over the past decade, it is another to recognise that those prices are probably what some parts of the industry will require for base levels of profitability.

So what does this mean for the industry in terms of capital expenditure? At some point—further in the future for some commodities than others—it will mean that what's now on the far right of the cost curve, i.e. most expensive to extract, will be more or less all that's left. That may be some time off, but with the present strategy for most miners being to wring all they can out of the left side of the curve, it's really only a matter of time. This is what leads The EIU and others to forecast higher prices: all else being equal, costs are going to be structurally higher.

3 Running in place: The slowdown in M&A, struggles to divest and hurdles to consolidation

Aside from a small number of recent large deals that were long in the making, firms in the metals and mining sector have already entered a period—if not an era—when viable deals are scarce, divestments hard to offload, and further consolidation is a non-starter for both financial and political reasons. But the market can expect deals among junior and mid-cap firms that need to shore up their balance sheets or find partners for projects they are no longer able to finance on their own.

At the beginning of the recent boom, at the same time as metals and mining firms were increasing their investment in new projects, many were also on the outlook for other avenues to growth, namely mergers and acquisitions. The number and total value of deals rose accordingly. In 2003, firms in the sector completed 756 deals worth just over US$21bn, according to Bloomberg data (Figure 9). By 2007, right before the onset of the global financial crisis, over 1,300 deals were completed at a total value of US$188bn, an increase of US$167bn in only four years.

The M&A market stayed level between 2008 and 2010 but has since fallen off dramatically, with the total number of deals shrinking to a ten-year low in 2012. This year would have been even worse had it not been for the small number of significant deals completed that were long in the pipeline, such as the massive merger of Glencore (an integrated commodities producer

Figure 9

The slowdown in M&A continues

Source: Bloomberg. 2013 data is year-to-date by end-August

and marketer) with miner Xstrata—the largest mining deal in history. This counts for almost half of the total value of M&A activity completed so far in 2013.

The outlook for M&A in the years ahead is not rosy. Besides firms being more careful with their spending, and more careful about over-paying for assets, the universe of attractive deals is shrinking. Few executives interviewed for this report expected many deals to happen in the short to medium term—principally, many said, because there is only a handful of "world class" mining assets, and those in this group seldom become available.

The last gasp?

Thousands of deals have been done in the mining sector over the past decade, but with the exception of Rio Tinto's US$38.1bn acquisition of Alcan (a Canadian miner and aluminium manufacturer) in 2007 none has been nearly as big as Glencore's acquisition of Xstrata. Years in the works, the Glencore-Xstrata deal came under great scrutiny from shareholders, end-consumers and regulators, among others. And not without reason—the merger gives the combined firm control over significant percentages of globally-traded volumes of thermal coal and zinc, among other products such as copper and aluminium.

The question this deal leaves hanging over the industry—and the advisory businesses that profit from M&A—is whether this is the last major deal left to be done for the foreseeable future. "M&A [in the industry] is not going to get serious again, or at least to the levels we're used to, for another 12 months at least", says John Tivey, a partner in the global mining practice of White & Case, a law firm. What is likely in the meantime, Mr Tivey believes, is a series of smaller deals among junior or mid-cap miners that need to shore up their balance sheets or find partners for projects they are no longer able to finance on their own.

The appetite for megadeals may no longer exist but, even if it did, it is debatable any such deal could go forward anyway. The Glencore–Xstrata merger was completed only after major tussles with shareholders and a regulatory approval process that had to go through seven different countries and regions. It ended only when the Chinese Ministry of Commerce (MOFCOM) approved the deal on the condition the combined firm divested significant assets, specifically the Las Bambas copper mine in Peru. That MOFCOM now has a greater say in judging the impact on competitiveness of certain deals will give pause to companies weighing similar deals, not least because Chinese anti-trust or anti-monopoly policy differs from that of Western countries.[7]

A deal more than twice the size of the Glencore–Xstrata merger—the acquisition of the Australian iron ore assets of Rio Tinto, the Anglo-Australian mining giant, by the world's largest miner, BHP Billiton—had in fact been squashed just a few years earlier. Although that deal never got as far as Glencore-Xstrata, there were loud complaints from major iron ore consumers, including China, Japan, South Korea and Germany, all of which argued that such a deal would concentrate too much supply of a product vital to the global economy in the hands of a single company. Those complaints were so loud, in fact, that it discouraged Rio and BHP from even attempting to get regulatory approval.

Not long thereafter, BHP found its efforts to further diversify into the non-metal mining space frustrated again by regulators, this time by the Canadian Foreign Investment Review Board. In 2010, BHP launched a bid for Saskatchewan-based Potash Corp, the world's largest fertilizer company by capacity. The takeover attempt was met with hostility from Potash Corp itself, which claimed the bid undervalued the company substantially, and from provincial and federal politicians and regulators, many of

[7] "Glencore's Long March to Take Over Xstrata," Client Alert, White & Case, April 2013

whom expressed dismay at the idea of ceding control over a "strategic resource" to a foreign firm. The deal was eventually rejected on a number of grounds, including a failure to pass the "net benefit to Canada" test, but it raised questions about the viability of deals on this scale worldwide, as well as the broader issue of resource nationalism.

Resource nationalism

The Potash Corp deal re-raised the spectre of resource nationalism, or the growing tendency of governments to require larger stakes in local resource projects or even prevent foreign firms from owning assets altogether.

As a recent report by Chatham House, the UK international affairs think tank, pointed out, resource nationalism is not necessarily a new phenomenon. Countries have been expropriating assets since at least the late 1930s when Mexico nationalised US and Anglo-Dutch oil companies.[8] However, instances of similar actions were few and far between until around the last decade when the commodities boom took off. These actions have been increasingly focused on protecting metal and mineral resources. The Chatham House report counted 25 such disputes in this area over the past ten years and those were just cases of expropriation, not rejected takeover bids or cases when countries sought to renegotiate deal terms.

The policies that are enacted in the name of protecting national resources can have a chilling effect on mining companies' willingness to invest in certain countries. But not developing the assets—or not developing them well—can at the same time hold back economic growth in those countries. With the cycle now slowing, some wonder if there won't be a commensurate dialing down of resource nationalism.

"Resource nationalism gathered so much momentum during the height of the supercycle," says Mr Tivey. "[Such attitudes] haven't been adjusted to reflect the fact that investors are no longer flocking into certain jurisdictions." If resource-rich countries find themselves struggling to attract investment for this reason, Mr Tivey says, the industry may start to see revisions to fiscal regimes—among other measures—in order to increase competitiveness.

Until that adjustment comes, however, firms will continue to confront problems in this area, as Rio Tinto continues to do with its Oyu Tolgoi copper and gold mine in Mongolia, where the local government is seeking to renegotiate the original terms of the deal (examined in Chapter 4). In Indonesia, too, foreign miners are facing a more difficult operating environment. While economic considerations forced the Indonesian government to temporarily lift taxes and quotas on mineral exports, it has left in place legislation that requires mines to be at least 51% owned by Indonesians by their tenth year of operation. From January 1st 2014, it is also planning to impose a ban on the export of unprocessed metals in a bid to develop domestic refining capacity—a move many miners have warned will have a dramatic impact on inwards investment and employment. Meanwhile, plans are afoot in Mexico for legislation to impose steep royalties on mining profits among other measures.

Rush for the exit

Hard as it has been to find and finalise acquisitions of late, it has proven equally as difficult to find buyers. Rio Tinto, for one, is finding it a particular problem to offload non-core assets. Most prominently, it failed to find a buyer for Pacific Aluminum, its bundle of six Australian and New Zealand aluminum smelting operations, although it ran into similar problems with its diamond business, too. In the end, it decided to withdraw the sale of both assets rather than accept a lower price—a luxury firms of its size can afford, unlike the mid-tier miners that are trying to do the same.

[8] Bernice Lee, et al., Resources Futures, Chatham House, December 2012

Rio Tinto is not alone, however. Miners across the globe with assets for sale are discovering there's a lack of interest from buyers. "When everyone runs for the door at the same time, it causes problems and you've seen that in certain commodities, with people putting their assets for sale at the same time", says John Klepec, chief development officer of Hancock Prospecting, a privately owned Australian miner. Compounding the problem is the fact that few are divesting premier assets. "No one has put the crown jewels up for sale," Mr Klepec says.

Not unless they have to, that is. The most attractive asset now up for sale is Glencore-Xstrata's Las Bambas copper project in Peru. At the time of writing bids for Las Bambas were still being accepted, so the final list of bidders is a matter of speculation. However, China's Minmetals is seen as the front-runner for the project, which is expected to begin production in 2015.

The mid-cycle play

If some mining and metals companies are divesting non-core assets, or at least trying to, others with the means to do so are taking another approach to diversification. They are *acquiring* assets that are, by and large, plays on the next stage of the supercycle, which is projected to be driven by greater demand for consumer products and changes in dietary habits that will increase demand for meat and dairy and the massive amounts of grain that meat and dairy production requires.

BHP is a prime example of this approach. After Canadian regulators rejected its attempt to buy Potash Corp in 2010, the company is pressing ahead with its bet on potash, a key ingredient in fertilizer, through the Jansen project, a multi-billion dollar potash mine in the Canadian province of Saskatchewan. BHP's commitment to diversifying into this area is so strong that it recently announced it was earmarking an additional US$2.4bn for the project. This is despite the fact that one of the two major global potash cartels, Belarusian Potash, disbanded this year, leading to speculation that potash prices will dive sharply.

Trading houses are also making pushes of their own into agriculture. Glencore acquired Canadian grain trader Viterra for US$7.5bn in December 2012, giving it greater access to Canadian wheat and canola, among other grains and oilseeds. The Japanese trader Marubeni, which is also active in mining and metals, completed a similar deal this year when it bought Gavilon, a US grain trader, for US$3.6bn. Analysts expect even more consolidation in grain trading in the years ahead.

Then there is the recent purchase by Freeport McMoRan, a miner of copper and gold among other minerals, of Plains Exploration and Production, a US petroleum company. Although some of the major miners, like BHP, have long had petroleum businesses, such diversification is not that widespread. Freeport, however, saw an opportunity to diversify at a time when the prices of many of its products tend to move together.

"The oil and gas business has shorter time horizons [compared to mining] where you can make investments more quickly," explains Kathleen Quirk, an executive vice-president and CFO at Freeport. "We see this particular transaction as providing exposure to commodities that we think have good fundamentals and it enables us to have additional value-enhancing growth options."

Up and down the chain

Over the past few years there has been much talk of vertical integration in the commodities sector, with end-users and trading houses moving down the value chain into origination and producers moving up the chain into trading in order to capture more value. While this not necessarily a new trend—Asian steelmakers and Japanese trading houses have long invested in mining and metal assets through joint ventures that guaranteed them a percentage of the offtake—the scale and scope of recent deals has gone far beyond expectations.

The highest-profile instance of this trend was Glencore's acquisition of Xstrata, which gave the trading house access to Xstrata's vast supplies of coal, copper and nickel, among other products. But there have also been smaller-scale acquisitions by trading houses, which are likely to continue as mid-tier and small miners struggle with liquidity constraints.

"Because there is no liquidity in the market, they [the trading houses] are seeking greater vertical integration into products that can add value for them," says Alex Bevacqua, global head of mining and metals at Wood Mackenzie, a consultancy. "For the traders, their value is that they know their clients extremely well, better even than the producers. And that's how they generate value, so they buy small mines that are in financial trouble that they can improve."

Then there are the steelmakers and other end-users, like power companies. As mentioned above, Asian steelmakers—and trading companies—have long invested in mining assets in order to secure their equity tonnage and a certain percentage of the offtake. ArcelorMittal and Austria's Veostalpine, to cite two European-headquartered examples, are estimated to be roughly 50% and 25% self-sufficient, respectively, in iron ore.

Some in the industry, however, don't see steelmakers going far beyond current levels in terms of asset ownership. "Steelmakers do continue to be interested in moving down the value chain to acquire assets," says Shunji Komai, general manager of new business development in the iron ore division at Mitsui, a Japanese trading house, "but more as a matter of hedging rather than becoming their own sole supplier. Plus, there are just not that many competitive projects left [in iron ore] for them to invest in."

The implication here is that if they were easy projects, the steelmakers might be able to handle them, but without knowledge and experience, steelmakers are unable to develop the more difficult assets that remain.

By contrast, some junior and mid-tier miners would welcome this sort of investment on a project basis, especially in the current capital-scarce environment. "There's a lot to be liked about the model," says Ken Brinsden of Atlas Iron. "Having a strategic investor, whether it's an end-user in the form of a mill or in some cases a trader, it might very well make sense to have them invest at the project level, because it provides a source of funds but also because it builds up loyalty to the product and the brand."

4 Managing the transition

Metals and mining firms have already begun addressing the changing landscape they will face in the years ahead. Many have replaced senior leadership, reassessed risk and—to some extent—recognised the need for greater innovation in production and elsewhere along the supply chain. Only time will tell if this is enough to get them through the current downturn and ready for the next upswing.

The mining and metals industry as a whole certainly recognises that the market has turned a corner over the past two years, and that the coming period will be characterised by more and greater difficulties than it has had to face for some time. It is not necessarily a product of the end of the supercycle—to the extent that those in the industry buy into the theory at all, most believe the cycle still has some life left in it. But companies nonetheless face a period of organisational transition. During this phase who should lead and why? How should strategy be adjusted and where? What are the near and long-term risks facing the sector, outside of simply supply-and-demand factors?

Changes at the top

It is well known that most of the major mining companies have changed CEOs in the past year. Eight of the top 10, in fact, are now under new leadership (Figure 10). Some of the outgoing CEOs were pushed out because of deals gone wrong: Tom Albanese of Rio Tinto, for example, who oversaw the company's top-of-the-market purchase of Alcan (which led to writedowns of more than two-thirds of the US$38bn paid) and a US$3bn writedown related to its acquisition of Riversdale Mining, a thermal and coking coal producer in Mozambique. Others, like Vale's former CEO Roger Agnelli and Anglo American's Cynthia Carroll found themselves the victims of underperformance coupled with home-country politics, at least in part. Mick Davis, Xstrata's recently departed CEO, left when Glencore completed its acquisition of the company, leaving Glencore's Ivan Glasenberg as head of the united firm.

While the excesses of the peak-cycle years are an underlying cause of this rotation at the top, it is only part of the story. One aspect of those excesses that rarely shows up in stories of disastrous new investments or failed acquisitions, perhaps because it is too quotidian, is the poor performance of many individual projects. Cost overruns are part of any business that attempts to turn out projects as large as the mining sector does on a relatively regular basis but, even for the mining sector, the last few years have seen average cost overruns spike to new levels.

There are a litany of factors blamed for these overruns, including rising energy and labour costs (the latter of which have grown astronomically in many markets), infrastructure bottlenecks and government demands for larger profit shares.[9] But there is also a growing sense

[9] *Tracking the Trends 2013: The top 10 issues mining companies may face in the coming year*, Deloitte, 2013

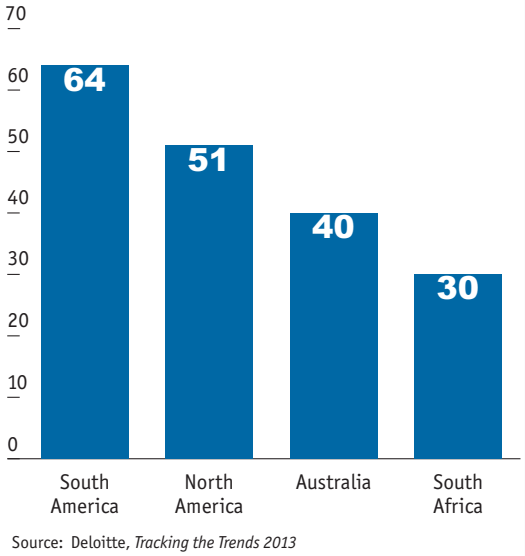
Figure 10: The new guard

Company	Out	In	Date of Change	Background
BHP Billiton	Marius Kloppers	Andrew Mackenzie	Oct-13	Kloppers announced his decision to retire after the company took a US$2.8bn writedown in US shale gas assets purchased in 2011
Xstrata	Mick Davis	Ivan Glasenberg	May-13	Davis resigned after Glencore merged with Xstrata and he lost out on the top job at the new entity, which went to the CEO of Glencore, Ivan Glasenberg
Anglo American	Cynthia Carroll	Mark Cutifani	Apr-13	Major shareholders put pressure on Carroll to leave after the company lost about a third of its market value during the tumultuous five years when she was in charge
Newmont Mining	Richard O'Brien	Gary Goldberg	Mar-13	O'Brien stepped down as the company was struggling with rising costs and falling output
Rio Tinto	Tom Albanese	Sam Walsh	Jan-13	Albanese resigned and accepted responsibility for massive writedowns attributed to the ill-timed purchase of Alcan in 2007
Norilsk Nickel	Vladimir Strzhalkovsky	Vladimir Potanin	Dec-12	Strzhalkovsky left the company as part of a settlement between two feuding shareholders vying for control. The oligarch with the largest stake in the company was Vladimir Potanin, who took over as CEO
Kinross Gold	Tye Burt	Paul Rollinson	Aug-12	Kinross's US$7.1bn acquisition of Red Back Mining did not live up to expectations
Codelco	Diego Hernandez	Thomas Keller	Jun-12	Hernandez's sudden resignation came amid a bitter battle between Codelco and Anglo American over ownership of copper assets in Chile. His departure from the state-owned company was reportedly linked to a dispute over management style with the board
Barrick Gold	Aaron Regent	Jamie Sokalsky	Jun-12	Regent was ousted after the gold miner's performance failed to be lifted by a US$7.7bn acquisition of copper producer Equinox Minerals
Newcrest Mining	Ian Smith	Greg Robinson	Jul-11	Smith resigned at the peak of the gold market and after completion of Newcrest's US$9.5bn takeover of Lihir Gold
Vale	Roger Agnelli	Murilo Ferreira	Apr-11	Agnelli was sacked by the Brazilian government, which blamed him for not investing enough in Vale's home market.

Source: The Economist Intelligence Unit, press, companies

Figure 11

Getting costly
Estimated average % project cost overrun (by region)



Source: Deloitte, *Tracking the Trends 2013*

within the industry that at least some of these factors could have been mitigated had there been more people at the top with technical knowledge and operational expertise, which would have made them better placed to spot problems before they arose.

"The easy surface resources have already been found," says Jim Hayman, head of mining and metals at Heidrick & Struggles, an executive search firm. "This means leadership at mining and metals firms, which have tended to be made up of chartered accountants and lawyers, may need more miners at the top going forward."

While the recent CEO changes at the top 10 miners haven't always reflected this perfectly, there's enough evidence to support the view. Mark Cutifani, the newly named CEO at Anglo American, for example, comes from an engineering background and has experience in

mine operations. He replaced Cynthia Carroll, who did have a post-graduate degree in geology but, according to her bio, appeared to have spent most of her career on the business side. Marius Kloppers, former CEO at BHP, was much the same—he had a degree in mechanical engineering but also an MBA and at a stint at McKinsey, a consultancy. His eventual replacement, Andrew Mackenzie, who has a PhD in chemical engineering, spent years running the day-to-day operations of BHP's petroleum business.

Striking a balance

During interviews for this report with senior executives from the industry, perhaps the most common refrain was that now that the cycle was slowing down, more attention would need to be paid to maintaining and protecting the balance sheet while at the same satisfying shareholders—many of whom have started clamouring for some of their money back. "I think what companies are trying to do," says Ms Quirk of Freeport McMoRan, "is strike a balance in protecting the balance sheet, continuing to have growth options for the future, and providing returns to shareholders."

On the first score, protecting the balance sheet, the concern is not necessarily that prices have entered a period of sustained downward pressure. Rather, it's that they are no longer going to be moving consistently upward. "It's really just [about] conserving our cash so that we can deal with any volatility that might emerge," says Mr Brinsden of Atlas Iron, in reference to the time horizon for his firm's investment plans.

In addition to pure supply-demand considerations, higher volatility is also a product of the shift in many key commodities toward shorter-term pricing. In the past, long-term supply agreements allowed miners to make equivalent or near-equivalent long-term investment plans. Such long-term planning has been falling by the wayside, as was seen with iron ore years ago and is now happening with coal.

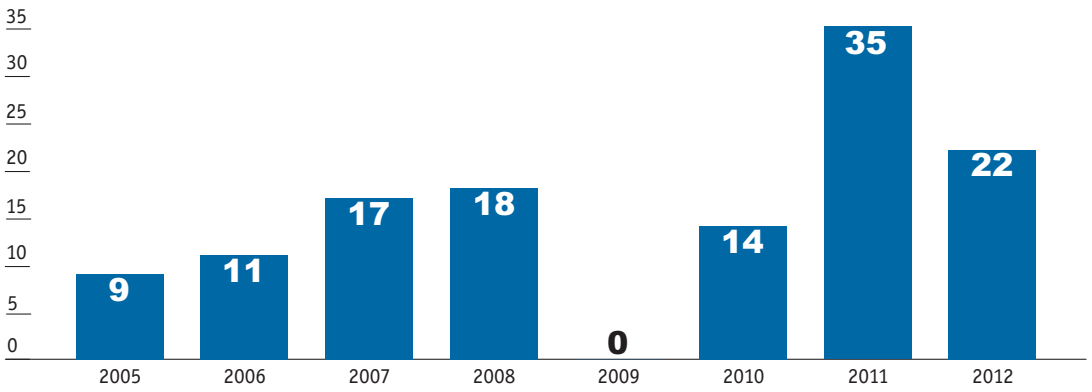
Then there is the issue of dealing with shareholders. Some investors feel that during the height of the recent supercycle firms were not returning cash at a rate that they should have given the profits mining firms were then earning (Figure 12). At first investors may have been willing to tolerate this since money was being spent on projects that were expected to increase shareholder value over the long term. But that is no longer the case; the value of many

Figure 12

Cash back

Major miners' dividends and buybacks (net of share issues)

(US$bn)



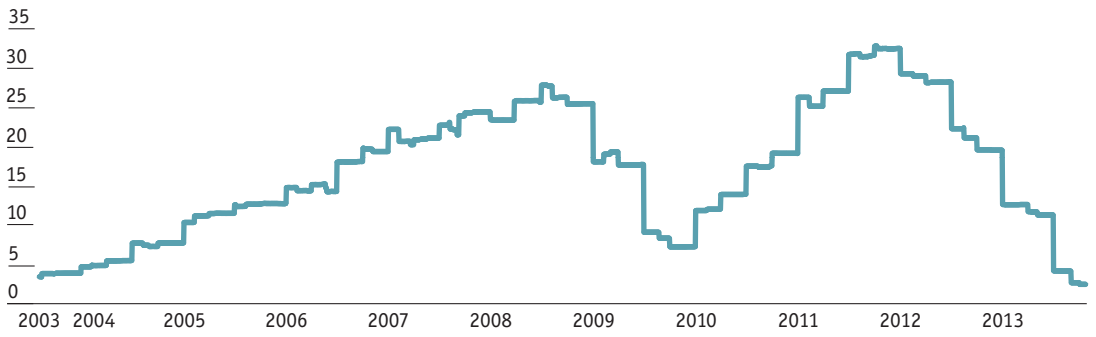
Source: Glencore Xstrata IR presentation, September 2013

Figure 13

Hitting where it hurts

Bloomberg Mining Index 12-month trailing earnings per share

(US$)



Source: Bloomberg

mining companies has plummeted since the 2011 peak, even as CAPEX spending soared—as have earnings per share (Figure 13). Still, the need to make investments hasn't disappeared, creating a tension that will be difficult to resolve.

Stephen Pearce of Fortescue acknowledges this tension in describing two groups of investors. "There is one camp that is very short-term focused and what I mean by that is two or three months. Having a two-to-three-month outlook is not conducive to building long-term, long-life, highly profitable assets." In contrast, Mr Pearce describes the other camp—the group who are "with us for the journey"—as those who see the present time as an opportunity to get on board.

In sum, there is no easy answer for firms juggling increased price volatility and obstreperous shareholders while also trying to ensure options for future growth. Striking the right balance is going to prove more difficult for some firms than others, especially junior and mid-cap miners that may want to expand through the downturn but find themselves constrained by lack of access to financing as banks dial back lending to all but the most attractive projects.

To get over this hurdle, these smaller firms may seek either tie-ups with peers—as discussed in Chapter 3—or alternative forms of financing, such as private equity. The appetite of such investors for mining assets is certainly growing: in October 2013 private equity investors contributed US$1bn to a project launched by Xstrata's former CEO, Mick Davis. Other projects—some also involving former leaders of major mining houses—are seeking to pool private capital while asset prices are low and public equity has lost faith in returns from the industry. However, they are likely to face the same problems finding attractive deals in which to invest as major miners on the lookout for M&A opportunities.[10]

Mitigating risk

Although like their counterparts in the oil and gas sector, mining and metals firms have long faced a lengthy and varied list of risks, the recent slowdown in the cycle—along with other long-term trends—has forced firms to take a harder look at how they approach risk management. This doesn't necessarily mean any of the risks are new—though some are, and others are difficult to anticipate.

[10] See, for instance, "Private equity hunts deals in undervalued mining assets", *Financial Times*, October 9th 2013

For one, the slowdown has led firms to reorder, in terms of probability and impact, the slate of risks of which they were already aware. "I don't think the risks, especially for us as a coal company, have necessarily changed," says Paul Flynn, CEO of Australia's Whitehaven Coal, "but the weighting of the risks changes. So the risk of default from end customers is certainly of more concern now when things are getting tighter. If we know steelmakers are suffering because the price of steel is low, then their desire to fulfill their offtake contracts, from a coking coal perspective, certainly comes into question."

While the supercycle was on an upward path, this was less of a concern. But now, with steelmakers, construction firms and energy companies struggling with overcapacity, weaker demand for housing and, in the case of thermal coal, competition from shale gas, failure to make good on contracts has become more of a risk than before. Interviewees maintain that Chinese buyers, in particular, were a real risk in 2012, having defaulted on a number of coal and iron ore shipments and, although there have been less instances of this since then, it is not far from the memory of either the miners or the traders.

Another risk that has required re-evaluation is that associated with foreign exchange. For commodity-exporting countries, and commodity producers more specifically, the risk over the past few years has been on the side of appreciation versus the US dollar. When the home currency strengthens, because commodities are generally priced in US dollars, profitability suffers. Cash-rich companies have been better able to mitigate risk in this area, according to Mr Pearce of Fortescue, who says his firm has been selective about when they convert US dollars into Australian dollars. "We can be patient," Mr Pearce says. "That strategy has been very successful for us in terms of beating the average rates through the last couple of years."

For other firms, which don't have the luxury of being selective about when they repatriate funds, currency risk may become more of a priority. "Hedging is coming back," says The EIU's senior commodities economist, Caroline Bain. "When the price was more or less going up every year, there was really no need to hedge for most firms. In a more volatile market, like the one we are entering, hedging becomes a need again." That need may vary by country, commodity and company, however.

Another issue, ever present but also moving up the list of priorities, is political risk. This, too, will vary by commodity but will be especially relevant in cases where reserves are shrinking in some countries. Copper is one of the more prominent examples, says Fujiko Matsuhisa, general manager of Mitsui's metal marketing department. "The copper market, as a whole, is too dependent on South American producers and while there are other countries with reserves, such as in the Democratic Republic of Congo and Zambia, these opportunities come with more risks."

Some firms, however, are less hesitant about going into these jurisdictions than others, Mr Matsuhisa notes. As Mr Tivey of White & Case, along with others interviewed for this report, have said, Chinese firms are looking harder at some of these riskier assets, having been burned somewhat recently.

Then there is political risk in the context of resource nationalism, as discussed above. What, if anything, can firms actually do to mitigate this kind of risk? In places like Indonesia, where new localisation requirements are being implemented, foreign firms are pursuing a number of strategies. One is to list projects on the local exchanges, such as the Jakarta Stock Exchange. There remains some debate as to whether this actually satisfies localisation

requirements: although it is widely assumed that it does, only time will tell.

Along the same lines, mining houses are beginning to discover that there are legitimate local institutional and family office-style investors who are able and willing to take stakes in projects. In the past, when foreign firms went with this approach, they would typically have to fund their partner's portion of the project, which simply added another layer of risk to what tended to be already risky projects. Now, however, as wealth has increased across the developing world, local institutions and family offices have the funds to make these investments on their own, removing the need for backing from the miners.

Another option firms have is to involve international and multilateral institutions, such as the World Bank and the IFC, in the investment structure in countries with high levels of risk. These institutions can lend the project credibility in terms of economic development, as well as providing assistance in negotiating and working with local governments. "People will say this strategy has been used for years," says Mr Tivey, "but the majors actually moved away from it, thinking they would just finance the entire project from their own balance sheet." Mr Tivey believes that the majors will be moving back to this model in the years ahead.

This will only help to reduce risk, however, not eliminate it altogether, as Rio Tinto's recent problems with the Oyu Tolgoi project in Mongolia demonstrate. Earlier this year, the IFC committed to providing US$400m in loans to the project, which is a joint venture between Rio, which owns 66% through its Turquoise Hill Resources subsidiary, and the Mongolian government, which owns the rest. That hasn't been enough to prevent disputes from arising across a range of issues, including the size and scale of the investment, the number of workers required and how involved the government should be in decision-making (see box below).

In contrast to the Oyu Tolgoi case, where the Mongolian government appears to be focused

Blame it on Rio?

Perhaps the highest-profile ongoing dispute between a developing country and a global miner is the one between Rio Tinto, an Anglo-Australian mining giant, and the government of Mongolia over the Oyu Tolgoi gold-copper mine. In recent months, the Mongolian government has made numerous complaints about cost overruns, the composition of the workforce at the site, and control over decisions related to these and other issues. The fundamental problem, however, is that the Mongolian government is seeking to renegotiate the terms of the October 2009 Investment Agreement it reached with Rio Tinto through its subsidiary, Turquoise Hill Resources, so that it can take a controlling stake in Oyu Tolgoi.

Rio's response so far has been to hold fast to its position that it is not prepared to renegotiate the agreement, a position it reiterated in a recent press release addressing the issue, which pointed out that the agreement can only be amended "by mutual, written consent of all three parties." The question is whether this is the right approach to take in this specific instance as well as more generally wherever and whenever similar disputes arise.

For the industry, were Rio to eventually consent to renegotiating the agreement, it could set a dangerous precedent, exposing firms across the world to increased risk. For resource-rich countries, an increase in this form of risk will raise the "hurdle rate" for mining firms to make the investment, which could leave their resources undeveloped, says one adviser to global miners.

On the other hand, miners may need to be more aware of and responsive to local political environments. "On the face of it," says the adviser, "it does look like they [Rio] are just sticking their head in the sand and saying 'This is the deal you did and this is the deal you have to stay with'." There's probably a limit to that approach, however, and Rio may be testing it on this project. How it fares will be watched carefully by its peers.

on ensuring that more benefits accrue to the country as a whole, there are political risks around revenue-sharing agreements that are nearly impossible to resolve. In some African countries, for example, when governments take stakes in projects, it is assumed by many in and outside the industry to be more for the enrichment of politicians and leaders than for the enrichment of the country. Complicating the issue further is the fact that many of these leaders have become accustomed to the nature of oil and gas investments, which have high upfront capital costs but low operating costs. That mining projects require continuous, often large operating expenditure is a source of frustration for the leaders, which, in turn, can create problems for the miners.

Some risks simply can't be prepared for, at least not fully. As recently as 2007 or 2008, for example, if you had asked a coal executive what the biggest risk to his or her business was, shale gas would not have rated a mention. Natural gas prices were above US$12/mmbtu in the summer of 2008 and coal was by far the cheaper feedstock for electricity generation. Just two years later the natural gas price was US$4/mmbtu, on its way to below US$3, and US coal miners found themselves looking overseas to find markets, which had a ripple effect on thermal coal prices the world over. Although US natural gas prices have risen in recent months, and are forecast to continue doing so, the thermal coal market is still dealing with the fallout from this "grey swan".

Other so-called "grey swan"-type risks, like the slowdown in China—and the supercycle more broadly—can be anticipated and, to a certain degree, prepared for through a variety of means. "In terms of market realisation," says Mr Bevacqua of Wood Mackenzie, "intelligent management of risk and utilisation of scenario planning will be a must. But right now, we don't see many companies using scenario planning tools." Only one company interviewed for this report, Freeport McMoRan, noted that they plan for the future using scenarios rather than specific price forecasts because there are many possible paths for the global economy and many geopolitical factors that can affect commodities.

Prioritising innovation

If the mining and metals industry is going to streamline operations while at the same time returning cash to investors, cutting back on CAPEX and, eventually, having to exploit deeper and more difficult resources, it is going to have to develop new and innovative ways to do so. However, the problem is that although the industry as a whole has made advances in some areas, in general, mining and metals firms have lagged other sectors in terms of innovation.

"Has there been a level of innovation and adoption of technologies to match other industries?" Mr Klepec of Hancock asks. "The answer is no. There's a gap. And that's because we ride cycles up and down and this kind of investment is the first to get chopped when times are tough." To be sure, the majors have made advances in the area of automated trucks and high-capacity rail lines, but Mr Klepec and others believe the industry needs to automate and innovate all the way from "pit to port." Without that, the structural movement upward in costs will be even higher.

So is the industry going to break out of this pattern? There is some hope that, along with the diversified majors, mid-tier miners who are now moving into the operations phase of development in key projects will be able to devote more energy and capital towards innovation. "We're trying to use those great brains that delivered our expansion," says Mr Pearce of Fortescue, "as we transform ourselves into a major operating company so that we can get the most out of those assets we've built."

At the same time, some interviewees also hope that miners will offload the infrastructure assets that they have taken on over the past decade. Such assets contribute a significant proportion of the investment in major resources projects over the past decade, placing a massive burden on miners' balance sheets. By offloading the ownership and management of such assets to dedicated infrastructure firms, miners could in theory free up capital for innovation. However, many majors are still reluctant to give up the kind of control over production and capacity that ownership of the infrastructure confers—so this model may be a long time in developing.

5 Conclusion: What the future holds

It has been at least a decade since the mining and metals sector faced such an uncertain environment in terms of the supply-demand balance, investor attitudes and their own internal operating models. Firms must therefore adjust their strategies to reflect the fact that the supercycle is not as super as it once was.

Making do

With less access to financing, greater expectations from investors and demand on a lower upward trajectory, mining and metals firms are going to have to operate on a different model than they have over the past decade. What does this mean in practice? "The world has changed dramatically," says Mr Bevacqua of Wood Mackenzie, "and that is something that the mining houses have to understand."

In the recent past, mining firms could sell whatever they produced and that meant, regardless of how much costs continued to grow, they could and did continue to produce. That is no longer the case; firms have to do "more homework" in the areas of capital expenditure, operating efficiency, process innovation and elsewhere. In other words, mining firms have to become more disciplined. That makes them no different to companies in other sectors going through downturns.

There is one exception, of course: the time horizon in the mining and metals sector is longer—and in most cases, much longer—than that for consumer goods, automotives and many other industries. It is even longer than that for other commodities, such as food and agriculture and energy, where an investment can pay off comparatively quickly. For that reason, making do with lower spending now could very well seed the next boom, just as it did the 1990s, when the sector was in the doldrums and found itself unprepared as a consequence for the demand explosion in the early part of the next decade.

Bucking the trend

So, is now the right time to pursue counter-cyclical investments? Maybe—but firms taking this step run the risk that the current downturn in commodity prices will be sustained. Growth in China is not what it once was, and while there was once hope that demand in India and other emerging markets could compensate, serious doubts have crept in given recent turbulence and India's failure to pass necessary reforms.

This, and recent developments in Indonesia and Brazil, make many pessimistic. "You have to pay attention to other emerging markets," says the chief economist of a major mining company, "but they are not going to replace China in terms of significance. China is essentially irreplaceable."

The EIU view more or less matches that. We tend to look at absolute growth rather than the

headline GDP figures: by this measure, China is still expanding at a pace commensurate with sustained aggregate growth in demand for key commodities. When China's economy was growing by 10-14%, the economy was much smaller. In terms of incremental demand for industrial commodities now, with the economy growing at "only" 7.5%, it works out approximately the same in volume terms.

Eventually, however, the Chinese economy—and other emerging market economies—are going to grow slower both in headline and absolute terms. When that time comes, the current supercycle will be truly and definitively over. Until then, given the reforms outlined above, there is still potential for the mining and metals sub-sector to benefit, even if there are likely to be rough patches along the way.

LONDON
20 Cabot Square
London
E14 4QW
United Kingdom
Tel: (44.20) 7576 8000
Fax: (44.20) 7576 8500
E-mail: london@eiu.com

NEW YORK
750 Third Avenue
5th Floor
New York, NY 10017, US
Tel: (1.212) 554 0600
Fax: (1.212) 586 0248
E-mail: newyork@eiu.com

HONG KONG
6001, Central Plaza
18 Harbour Road
Wanchai
Hong Kong
Tel: (852) 2585 3888
Fax: (852) 2802 7638
E-mail: hongkong@eiu.com

GENEVA
Rue de l'Athénée 32
1206 Geneva
Switzerland
Tel: (41) 22 566 2470
Fax: (41) 22 346 9347
E-mail: geneva@eiu.com