



## Ore, What Is It Good For?: Iron Ore's Plunging Prices and the Impact on the Major Miners

Though metals and mining equities account for only 17% of the MSCI World Natural Resources Index, their drastic underperformance since 2011 can still be felt in portfolios. Over the last decade, as demand from China and other countries pushed up the slope of demand curves for industrial metals, a supply response by the mining industry led to a massive increase in installed capacity sufficient to meet this demand. Long lead times for mine development mean that a wave of new supply is coming online today to meet this previous level of demand just as it is falling off. As demand from China begins to slow, and these investments in capacity begin to pay off, prices for some metals look to face cyclical and potentially even structural headwinds going forward. In this research brief we discuss the rise and fall of iron ore prices (a clear example of the effect of China's slowing growth), the economic impact on the major listed mining companies that dominate mining indexes, and where prices might go from here.

### Iron Ore: A Beneficiary of China's Growth and a Casualty of Its Slowdown

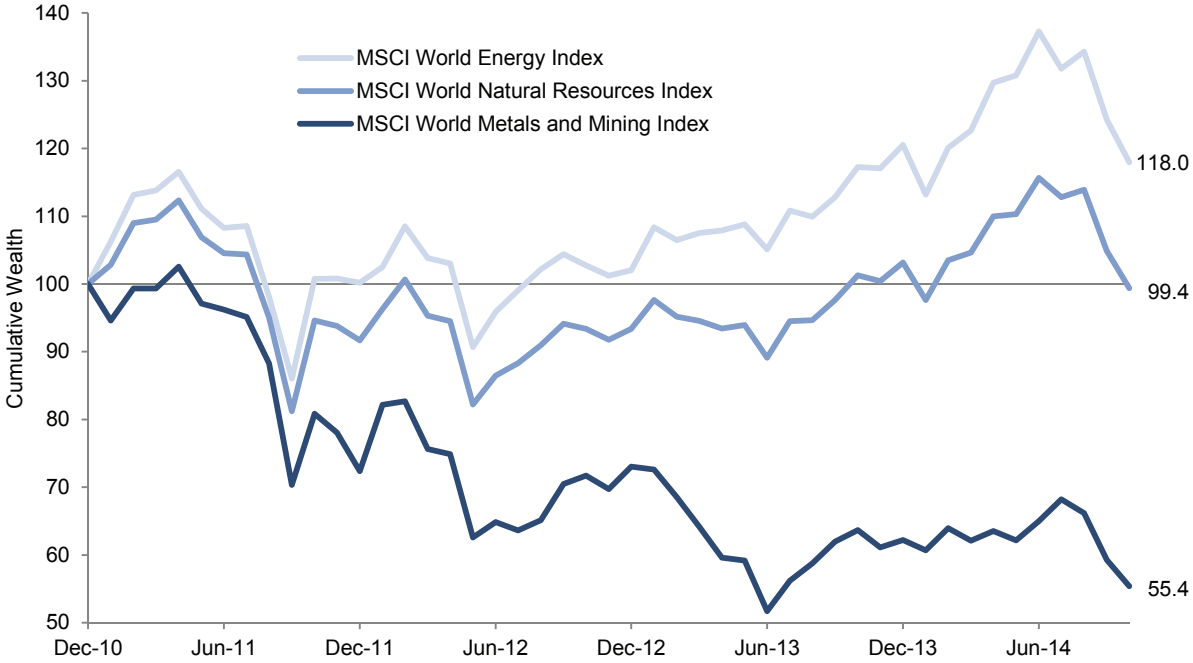
No major industrial metal has risen and now fallen as much as iron ore over the last decade. Iron ore is used primarily to make steel, and China's demand for steel has grown substantially—China now consumes 47% of all steel produced globally (up from 27% in 2003) and of the seaborne iron ore consumed globally, China uses 66%. China is almost equivalent to the United States in terms of steel intensity on a per capita basis.

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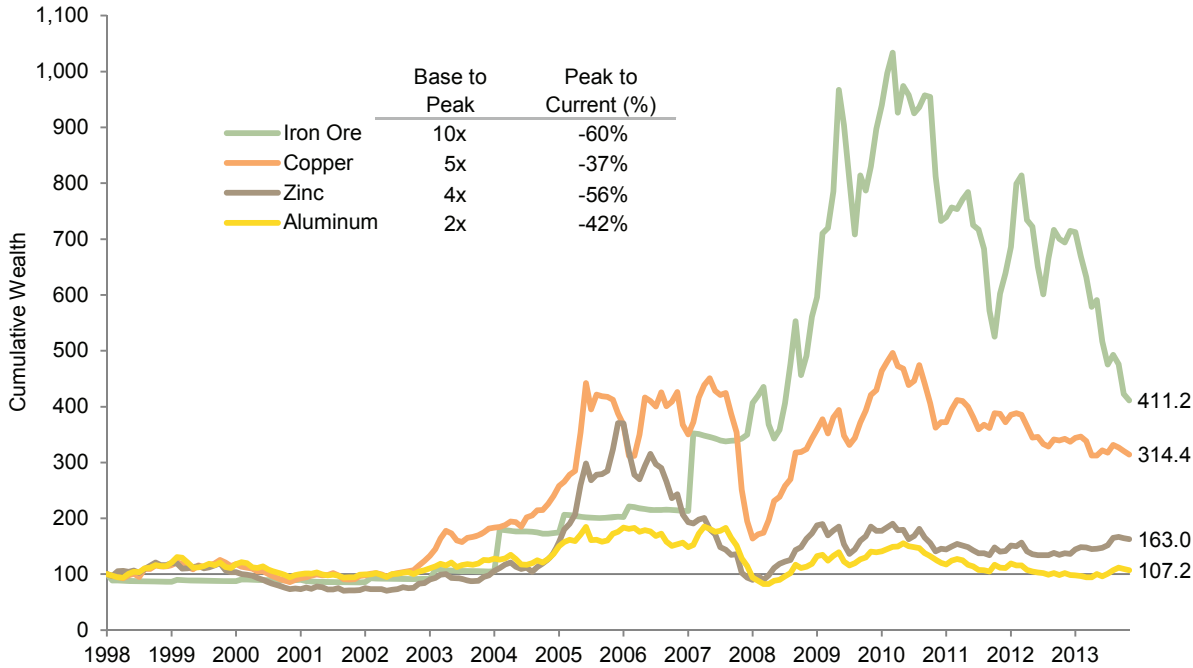
**Natural Resources Equities Performance**

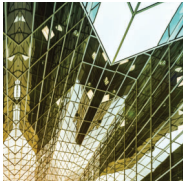
January 31, 2011 – October 31, 2014 • US Dollars • December 31, 2010 = \$100



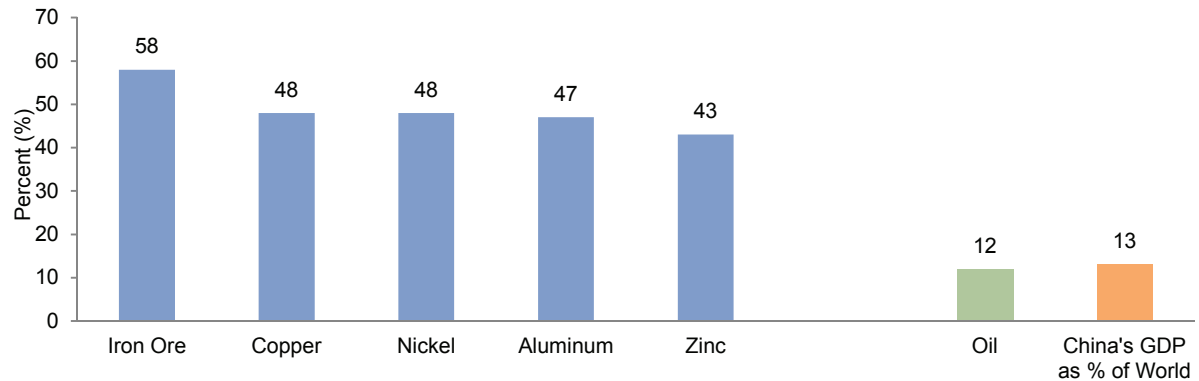
**Real Metal Prices**

January 31, 1999 – October 31, 2014 • US Dollars • December 31, 1998 = \$100





China's Consumption of Metals as a % of Global Consumption  
As of 2013



This year, as port inventories of iron ore in China rose to record levels and concerns over China's growth rate began to take hold,<sup>1</sup> iron ore prices have tumbled. Some market participants expected a surplus in the iron ore market for 2014–16, but the pace at which prices have fallen so far in 2014 has surprised markets and seemingly reset the market's expectations for pricing. The year-to-date 45% decline in the price of iron ore has become a main focus for investors with mining-related exposures—and for good reason. Iron ore accounts for 87%, 53%, and 85% of operating income for Rio Tinto, BHP Billiton, and Vale, respectively, three of the five largest mining companies that dominate mining indexes.<sup>2</sup>

## The Impact on the Major Mining Companies

Today's market surplus and the recent decline in prices matters to the iron ore industry because of how concentrated the industry is. The big three iron ore producers supplied 59% of the total seaborne iron ore market in 2013. With iron ore unit costs for the big three estimated between \$20 and \$40 per metric ton, these companies can generate healthy margins even at today's depressed prices. Facing the prospect of a period of oversupply, the big three producers seem to have all chosen the same strategy going forward: to keep producing as much as they can. By doing so, each appears to be making the same bet—that by increasing production and adding more supply to an already oversupplied market, the weakness in iron ore prices will force marginal players out of business. When demand returns, the big three's margins and lower unit costs will allow them to benefit from any subsequent increase in prices or volume as a result of increased market share.

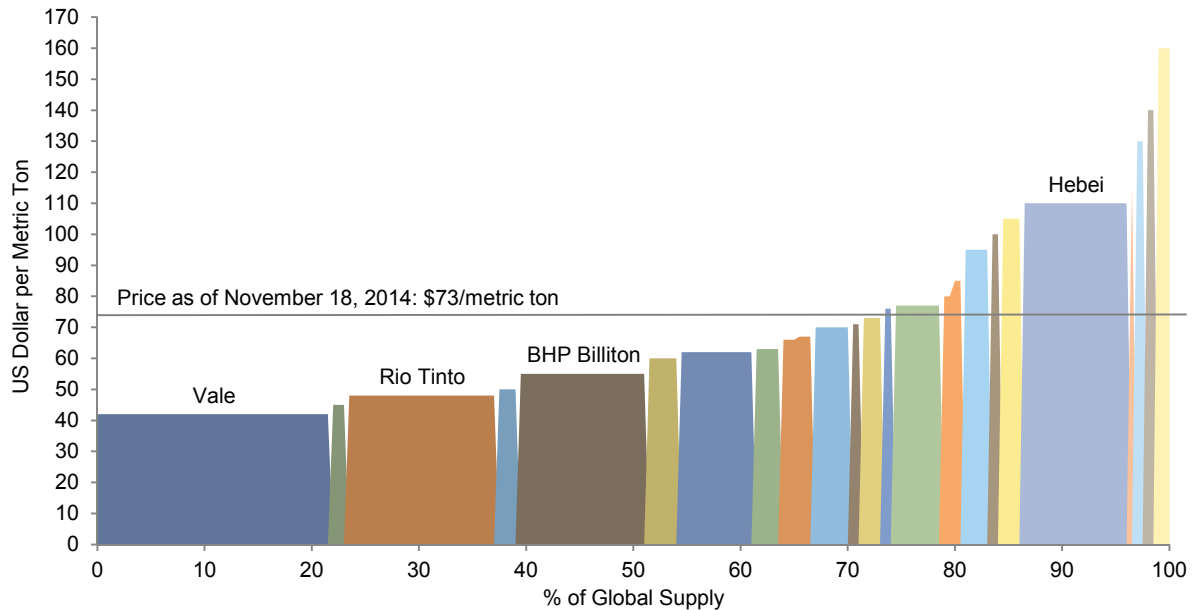
<sup>1</sup> We recently highlighted the challenges China faces going forward to implement reforms and rebalance its economy away from fixed asset investment-led growth to consumption-led growth. See Aaron Costello et al., "China: Prepare for Stress," Cambridge Associates Research Note, October 2014.

<sup>2</sup> Rio Tinto and BHP account for 39% of the MSCI World Metals and Mining Index.



## Global Iron Ore Cost Curve

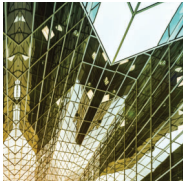
As of September 10, 2014



Over the last decade, margins for the big three expanded due to rising commodity prices and increasing volumes.<sup>3</sup> Based on current market conditions, and what they can control, these companies are now focusing on increasing productivity and reducing costs. This makes sense and there are likely meaningful pockets of costs to be attacked. However, a recent Goldman Sachs analysis points out that when the price of iron ore was assumed to be \$100/metric ton and rising, the opportunity for a company to earn north of \$70 in margin (\$30/unit cost) on each additional unit sold was an attractive proposition. Extending this analysis, aiming to take out \$5/metric ton in costs over time and selling iron ore at \$80/metric ton in a flat price environment to earn \$55 is also attractive, but clearly not as much.

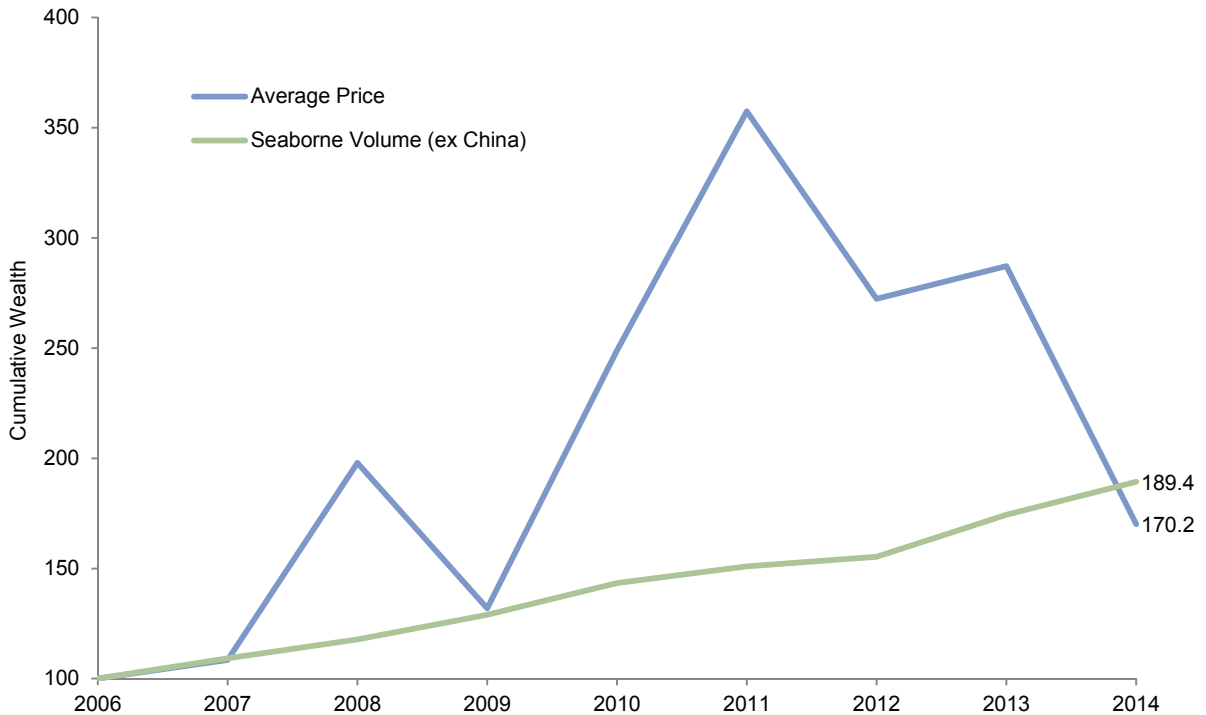
Focusing exclusively on unit costs and margins masks some of the additional demands on cash flow for these companies, including maintenance capital expenditures, debt servicing, and debt repayment. Additionally, given their size, cash flow profile, and investor base, investors in major mining companies are placing an increasing emphasis on return of capital rather than growth from high-risk, high-reward projects. Mining companies have a notorious history of bad acquisitions, equity raises, and shareholder value destruction, and after years of consolidation the big three have come under increasing pressure from shareholders to focus on returning capital via dividends, buybacks, and dividend growth.

<sup>3</sup> While the focus of this brief is on the big three mining companies given their dependence on iron ore and their outsized impact on mining equities, many of these observations apply to other mining companies as well.



### Iron Ore: Change in Price vs Volume

2007–14 • US Dollars • 2006 = \$100



Changing unit economics, a weak commodity price environment, and changing shareholder bases all suggest a structural shift may be underway in miners' business models (for the big three and likely beyond). Going forward, increasing volumes, not price, may drive mining companies' business models, which could lead to lower margins, lower multiples, lower investor enthusiasm, and potentially lower volatility. Of course, iron ore prices have already fallen substantially. As we discuss in the next section, there are some valid reasons prices could increase in the future, and a bet on the mining sector today looks increasingly like a bet on rising commodity prices.

### Where Will Prices Go From Here?

For the iron ore market, a period of excess supply will likely test the high end of the cost curve. At today's prices, many high-cost producers face unsustainable business prospects. High-cost producers should in theory shut down and halt operations after a long period of losses when marginal costs exceed marginal revenue. However, high-cost producers could stay in business longer than many anticipate, affecting future supply, demand, and inventory balances. Mines do not simply cease operations the moment they become unprofitable. In fact, most mines are never really closed, and the decision to lower





operations to a “care and maintenance” level typically takes months, if not years. Further, the incentives and the nature of operations for state-owned and even some private producers in China are much different from those of the big three or other publicly traded companies.

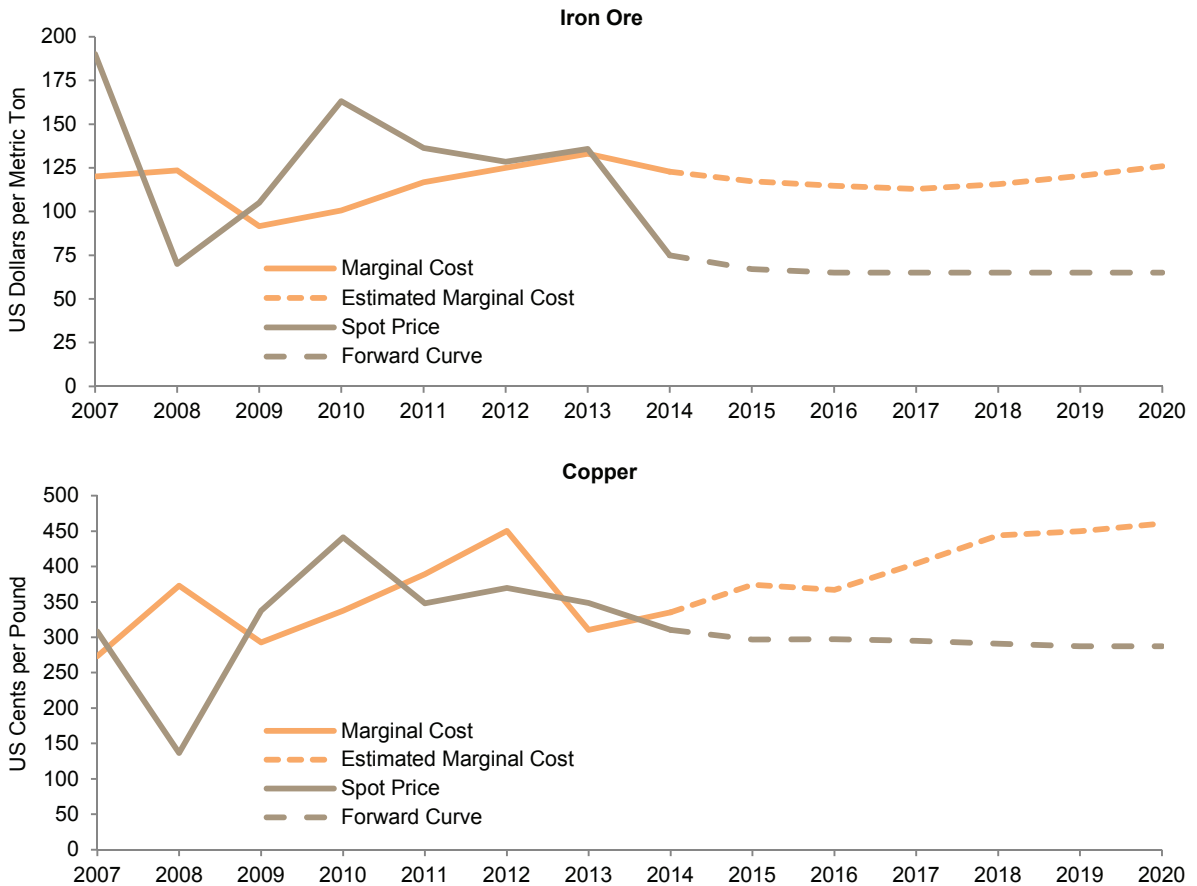
This brief has focused on iron ore but it is worth noting that not all industrial metal prices are down year-to-date and some mining equities have performed well. Yet iron ore is the most important metal to the major mining companies that dominate mining indexes. Copper, while a distant second in terms of importance to the big three, is also experiencing a period of excess supply in the physical market that isn’t expected to clear until 2016 based on visible production forecasts and demand estimates. Though copper has different drivers of demand and is used in more applications and industries than steel, it is still highly exposed to Chinese demand, with 45% to 50% of China’s demand for copper coming from the construction sector.

Beyond the next one to two years, the supply side outlook for both iron ore and copper becomes more positive, or at least less negative. Based on current estimates, today’s surpluses in both iron ore and copper could actually turn to deficits post-2016 assuming demand from China remains strong. For many commodities that have benefitted from China’s rapid ascent, the material dug out of the ground today—and what will be available in the future—is lower in quality, more difficult to extract, concentrated with mid-tier producers, located in more remote areas, and more costly to transport. Each year going forward, as supply is brought online to meet demand, more copper and iron ore will likely come from these types of producers with less flexible balance sheets, higher cost structures, and lower-quality assets.

At a micro level, these factors could support iron ore and copper prices in the future, and estimates of future marginal costs for both are above today’s spot and current futures prices—a key point of tension in today’s markets. The figure on the following page appears long-term positive for both copper and iron ore prices; however, with both facing supply gluts and uncertainty surrounding future demand, where the high end of the cost curves end up settling (which is where the marginal producers are) remains to be seen. As the entire industry focuses on reducing costs and increasing productivity, removing high-cost supply from the market may actually have a deflationary effect on future industry cost curves and commodity prices insofar as cost-cutting measures and productivity enhancements can shift the entire industry cost curve downward. Producers on both the high and low end of the curve could lower their costs, resulting in flatter cost curves and lowering future marginal cost support levels and ultimately commodity prices.



Spot Prices, Forward Curves, and Estimated Marginal Costs: Iron Ore and Copper  
2007–20



### The Bottom Line

The underlying economics of the countries, companies, and industries that have benefited the most over the last decade from China’s 10% annual real economic growth via credit and fixed asset investment are changing in the face of a Chinese slowdown. Though mining equities are a modest slice of most natural resources equity indexes, the plunging prices for iron ore and some other metals in 2014 have dragged down mining equity indexes and taken natural resources equities with them. Prices for iron ore and other metals like copper, and the mining companies that depend on these commodities, face cyclical and potentially structural headwinds. From a cyclical standpoint, how the current period of excess supply in iron ore and copper gets absorbed by the market will be critical. Longer term, how the industry balances lower-quality (higher-cost) supply to meet slower demand growth from China, and the effect of a potentially more balanced supply/demand outlook on prices for those key commodities, will be important considerations. ■



## Contributors

**Alex Jones, Senior Investment Associate**

## Exhibit Notes

### Natural Resources Equities Performance

Source: MSCI, Inc. MSCI data provided "as is" without any express or implied warranties.

### Real Metal Prices

Sources: International Monetary Fund, Thomson Reuters Datastream, and US Department of Labor - Bureau of Labor Statistics.  
Note: CPI data as of October 31, 2014.

### China's Consumption of Metals as a % of Global Consumption

Sources: Bloomberg L.P, Goldman, Sachs & Co., and Thomson Reuters Datastream.

### Global Iron Ore Cost Curve

Sources: Bloomberg Intelligence and Bloomberg L.P.

Notes: Hebei is the largest iron ore producer in China. Costs include cash costs plus estimates of shipping to China. Iron ore price as of November 18, 2014. Small suppliers lumped together for graphing purposes.

### Iron Ore: Change in Price vs Volume

Source: Morgan Stanley.

Notes: Data represent the annual change in the price of iron ore vs. the annual change in the volume of seaborne iron ore supplied, ex China, indexed to 100 as of 2006. Data for 2014 are estimated for seaborne iron ore supplied and as of October 31, 2014, for iron ore prices.

### Spot Prices, Forward Curves, and Estimated Marginal Costs: Iron Ore and Copper

Sources: Bloomberg, L.P., First State, Global Financial Data, Inc., and Thomson Reuters Datastream.

Notes: Dotted lines for marginal cost series indicates forecasts for 2014 through 2020. Spot price and forward curves data are as of November 18, 2014.

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