

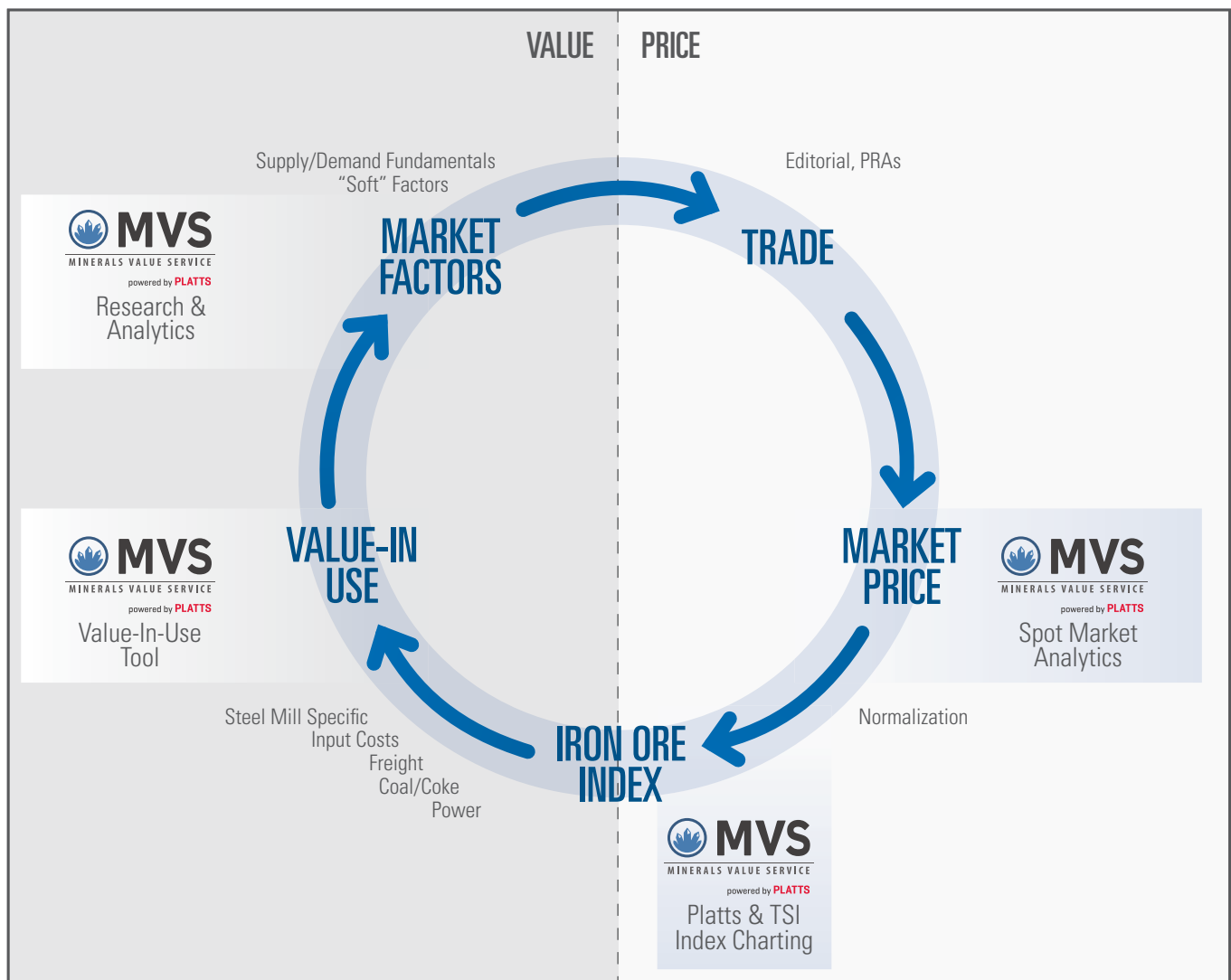
MINERALS VALUE SERVICE (MVS)

Meeting the Information Requirements of Rapidly-Evolving Markets

MVS is increasingly used by the world's leading trading houses, finance providers and miners to better navigate the evolving market by providing pricing tools, data and analytics. It also offers a more complete approach to market evaluation, covering each and every component of the price discovery cycle.

- In a market where participants are conscious of real-time events and their impact on pricing, a Value-In-Use approach needs to be dynamic rather than a one-off snapshot, better reflecting changes in related markets. The MVS tool takes into account movements in inter-dependent commodities such as coal and freight.
- Price discovery and VIU analysis also need to be market-focused, not simply technical theory. MVS Spot Market Analytics and research provide a window into the market and a context for pricing.
- It is essential that market observers make use of all available data and are able to call on detailed analysis to support decisions. MVS provides a comprehensive database of steel mill data and logistics information and simplifies them through step-by-step calculations and analysis so that clear conclusions can be derived.

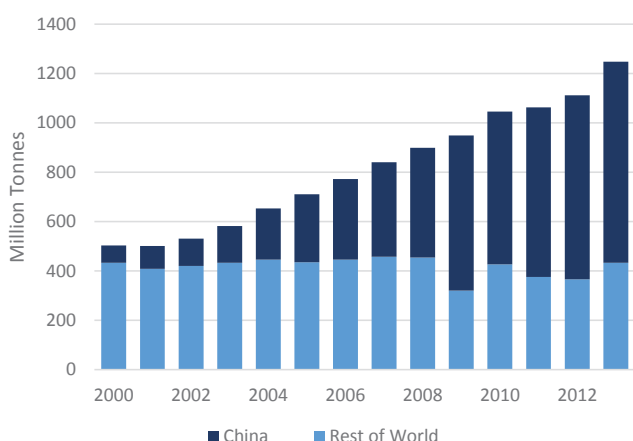
Only by taking a holistic, informed and up to date view of market dynamics can participants expect to extract full value from their operations.



Changing markets and changing requirements

The rapid growth of China's participation in the global iron ore market has seen imports rise to over 800 million tonnes, more than five times the amount a decade ago and representing 65% of the total seaborne market; Japan, United States, India and Russia all follow. With iron ore almost entirely consumed in the manufacturing of steel and two thirds of steel production, demand is inextricably linked with economic growth and development. With GDP growth rate averaging 10% a year over the last decade, heavy infrastructure and property spend has seen China contribute nearly half of global steel production of around 1.6 billion tonnes.

China's rapid rise in the share of the global seaborne market



Source: GTIS, Customs Data

The relationship between the global economy and steel production



Source: IMF, World Steel Association

This growth model has given rise to significant overcapacity in the steel sector in China with marginal and even loss-making steel enterprises having been kept alive by stimulus packages and extended loans. However, with banks tightening credit due to increasing unease over debt levels and concerns over the environmental effects of operating inefficient steel mills, a new pattern of demand is emerging; China plans to cut about 60 million tonnes of steel capacity by 2017, or around 6% of current production. These are now uncertain times for the Chinese steel market and, backed by a determination by the government to act, rationalisation of the sector seems a likely outcome.

While these factors, combined with short-term effects such as inventory levels, have been a driving force behind price movements and volatility, the overall outlook is that China will remain a key market. Most believe that growth in underlying demand is sustainable until at least into the early part of the next decade, albeit at a slower rate.

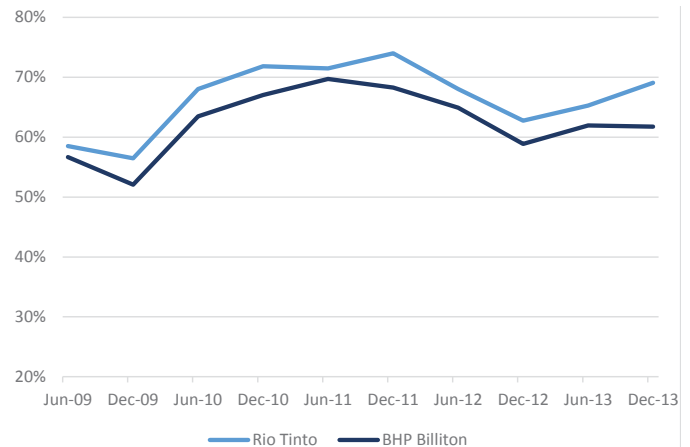
Changes in the demand for iron ore and the information requirements of the market



From a supply perspective, the relatively high prices experienced over a sustained period of time have encouraged significant investment into the sector. Indeed, iron ore has out-performed most major metals over the last five or six years with growth in the spot market and shorter-term pricing. This fact has heavily influenced the capital allocation decisions of the major diversified miners.

Encouraged by strong cash flow from operations, established producers elected to invest capital in brownfield iron ore projects as a priority. The investment case was further underpinned by a solid long-term outlook for global demand in an industry where there are high barriers to entry due to long project lead times and high capital intensity. “World class” assets remain in the hands of the few; three major producers still contribute two thirds of the seaborne market.

High margin business for major producers (% EBITDA Margin)



Source: Company reports

New projects are highly capital intensive, requiring scalable infrastructure and logistics operations to optimize assets and maximise economies of scale. Investors and the equity markets, eager to gain exposure to the Chinese growth story, rewarded companies able to deliver volume growth.

However, incentivised by the attractiveness of a high-margin business and undeterred by the challenges, there are now a host of new projects in the global project pipeline. This has resulted in a more diverse portfolio of market participants. These assets broaden the geographical scope of iron ore supply, as the boom in exploration activity in the mid-2000s extended to new geological frontiers associated with more varied ore characteristics. Furthermore, a strong Chinese domestic market has developed, providing low-grade, high cost swing supply in periods of high demand. Even the more established iron ore realms such as Western Australia and Brazil now have a much greater range of products, reacting to the needs of the market and enabled by the price level.

Changes in the supply of iron ore and the information requirements of the market



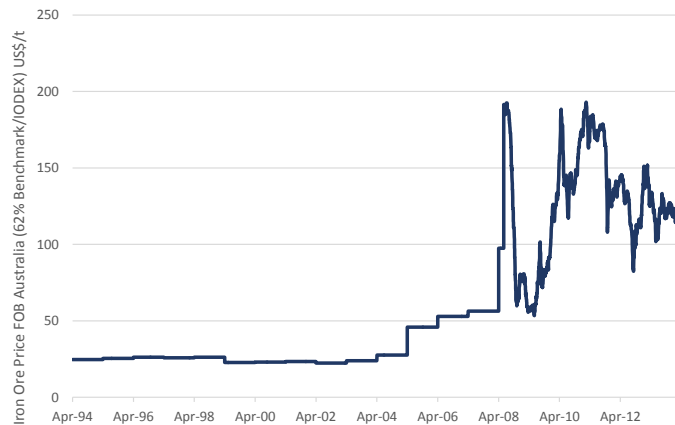
The transformation of iron ore pricing

Historic price performance

Driven by this structural shift in global supply and demand that started over a decade ago, the price of iron ore has been on a strong upward trajectory for the majority of this time, with average annual prices in real terms for 62% Fe sinter fines increasing nearly five-fold in the ten years to 2013. However, while the performance of average prices has been stellar, this trend has also been associated with greater volatility. The rapid rise in prices has been punctuated by demand shocks that have seen iron ore fall significantly over short periods of time, including a fall of over 60% during the global financial crisis.

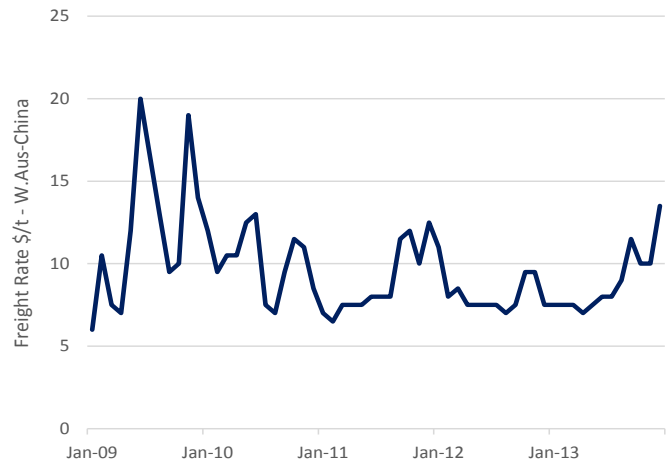
Volatility in other related markets has also played a part; key steel industry inputs such as coal, freight and energy, together with the wider financial markets have brought the need for shorter-term, market-based pricing for iron and steel. Freight rates between Australia and China, for example, have fluctuated from \$6/t to \$20/t since moving to index pricing, or approximately a 5-20% share of the delivered iron ore price to China.

Iron ore prices moved higher and more volatile (62% Fe, \$/t)



Source: Platts, MVS Research

Volatility in related markets such as freight (Aus-China, \$/t)



Source: Platts

The evolving pricing mechanism

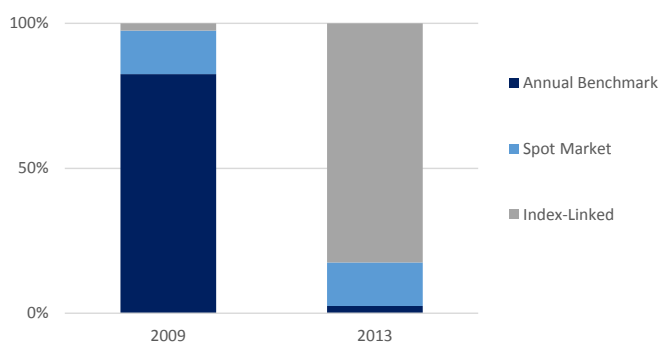
For over forty years, the iron ore market was associated with long-term pricing contracts, illiquidity and low volatility. Iron ore was traded under benchmark contracts, with prices settled annually each April between the miners, largely based in Australia and Brazil, and the steel mills in Europe, Japan and more recently, China.

The catalyst for change was in part the structural changes to supply-demand patterns described above, but also changes in the broader commodity and financial markets. Freight rates were a key development; in 2008 Australian miners negotiated a different settlement than Vale in Brazil for the first time in order to account for the significant freight differential that had started to develop over the previous two years, reaching a \$50/t differential at its peak. In short, with an environment of high volatility and short-term pricing for most other related commodities, reaching a consensus on long-term contracts for iron ore proved challenging for most market participants.

During particularly strong price rallies in 2007-2008 and then again following the global financial crisis in 2009, there was significant de-coupling of spots from and the benchmark price. Iron ore producers had been forced to supply their customers with iron ore at the low prices fixed in advance, despite the fact that prices had risen sharply.

As a result, the market increasingly released iron ore material into the spot market, which better reflected the economic fundamentals.

Transition from annual benchmark pricing to index-linked CFR

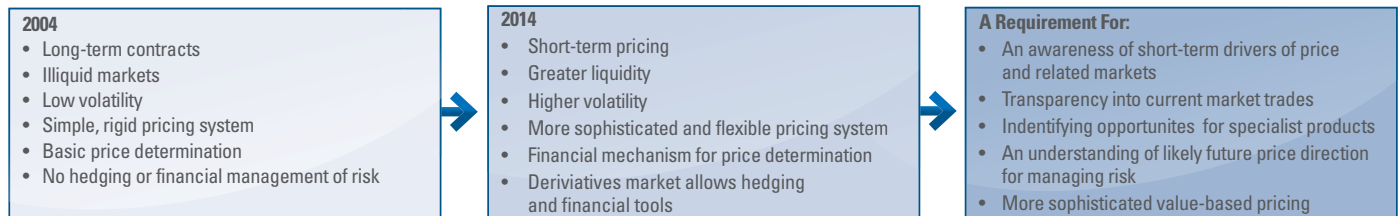


Source: Platts, MVS estimates

In order to resolve the divergence from benchmark and to help provide greater transparency to the evolving spot market, price reporting agencies such as Platts and The Steel Index (TSI) began to provide independent reference prices to spot market trades in the form of an index. Price determination is then based on multiple daily prices, but with long-term commitments linked to a reference based on short-term transactions.

With the spot market growing, a number of exchange-traded instruments began to emerge. The iron-ore derivatives market, which was pioneered in 2008, symbolized a huge step forward in providing convergence between the financial and physical market, whilst also helping to provide further liquidity. A number of financial exchanges and clearing houses now offer iron-ore swaps clearing, including CME group, Singapore Exchange (SGX), LCH. Clearnet and ICE. SGX began trading in April 2009 and now handles approximately 80% of the global iron ore swap volume.

Changes in the pricing of iron ore and the information requirements of the market



A summary of MVS features

MVS Spot Market Analytics

MVS Spot Market Analytics incorporates comprehensive spot market trade data gathered by Platts in the compilation of their benchmarks price indices. It offers a window into the physical market in an easy-to-use format, and enables the user to establish a unique insight into the market value of specific premia or discounts historically and today. Our analysis can then highlight patterns and underlying long-term trends.

The tool can be used to identify relative pricing for quality variations in the market, both in terms of chemistry and physical characteristics. For example, tracking relative premia of lump over fines or differences in ore quality and grade.



MVS Spot Market Analytics, charts give a clear indication of where real market trades for lump have been relative to the fines index. For example, we can observe that lump premia held up well in the second half of last year and even in the early part of this year at around \$0.25/dmtu.

MVS Research can help provide a context. For example, in this case, while recent historic trends would suggest

the differential might close on falling prices, there has been underlying stronger demand for direct charge ores due to restrictions on sintering related to environmental policy. This was despite tight margins at most steel mills.

Furthermore, coupled with an apparent preference for lump over fines, MVS Spot Market Analytics also provides a track of quality premia displayed from real data trades that form the basis of the index. For example, over the same time period, we also observed a widening spread between the relative price performance of different ore grades. The spread between 62% and 65% Fe held in the early part of this year at around \$12/t, versus a three year average of \$9/t.



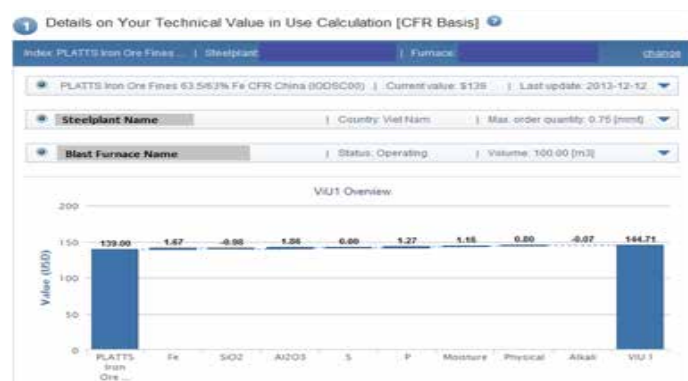
However, the more recent step down in prices has seen the spread close to the historic mean, perhaps an indicator of where we might see lump prema heading, at least in the short-term as mills continue to feel the squeeze.

MVS Value-In-Use

Value-in-Use is not a new concept, but MVS is unique because it models hundreds of blast furnaces, helping traders to find value in new markets for a physical product. We believe this approach is an excellent fit for the requirements of the market and the move to a short-term pricing model.

Using Value-In-Use enables you to define your product in the marketplace for a differentiated product that rarely fits the exact specifications of the Index benchmark. In addition, it accounts for geographical location and the relative value the product could have for any given steel mill.

Value-In-Use can act as a starting point for negotiation and price discovery that goes further than a price reference, taking into account the cost variables such as freight rates and raw material prices. All of these factors form an integral part of the decision making process when arriving at a bid or offer. These drivers can change on a daily basis and impact any given product's relative to value position in the marketplace.



The VIU functionality provides a dynamic insight into how a specific product compares to a competing product or to any index in any blast furnace at a given time.

For example, the VIU model looks in detail at the chemical components such as silica, alumina, sulphur and phosphorus and calculates a premium or discount for each, relative to the benchmark.

MVS Research & Analytics

With greater liquidity and financial convergence comes greater responsiveness to “real-time” market movements and macro events. Any market pricing tool therefore requires some view of the broader market and, in this respect, our research aims to provide a context for Value-In-Use and spot market trades. In particular, an insight into the pattern of underlying demand and supply, inventories and trade flows can explain general price movements outside the boundaries of a specific product.

There are also many inter-dependents that impact on both price and the relative premium and discount to an index. Value-In-Use considers the markets for raw materials and logistics that go into the steelmaking process. Parameters such as coke prices, energy prices and transport costs change on a daily basis and our research can help participants to focus in on key drivers by highlighting the importance of market movements that impact a VIU calculation.

Finally, there are also fewer direct market drivers that can influence price or VIU. Macro-economic, financial or political events such as credit market conditions, government environmental policy, or an export ban all have an influence on price. These considerations are less-obviously modelled, but form part of our research and analytics scope.

For more information or for a demo of the MVS platform please get in touch with our team via:

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