Going vertical
Cost management in a new era of steel integration
The rumblings have been heard for several years now, but in late March 2010 it finally seems to have happened: BHP Billiton and Vale announced deals that may spell the demise of the traditional, 40-year-old benchmark pricing system for iron ore.\(^1\) While steel manufacturers are fighting back, contract prices are once again soaring, some upwards of 90 percent over last year’s benchmarks.\(^2\) Could the combination of the threat of abandoning the benchmarks and the looming price increases be just the thing to push steel producers back into the arms of vertical integration?

Even before the move by BHP Billiton and Vale—who, along with Rio Tinto, control an estimated 75 percent of the world’s iron ore supply\(^3\)—vertical integration, particularly upstream, was making a comeback in the steel sector. After spending the last decade or so outsourcing and divesting, steel companies are now looking again to mergers and acquisitions (M&A) to unshackle them from the seemingly annual vagaries of iron ore pricing and supply uncertainty. However, before committing to “going vertical” again, steel companies may need to revisit the advantages and disadvantages of vertical integration observed from the past. And while vertical integration may make sense on paper, gaining true competitive advantage as well as capitalizing on the opportunities to capture cost synergies may require a unique post-merger approach.

**Vertical moves make a comeback**

Back in the early days of steel manufacturing in the United States, the vertically integrated model (in which various or all stages of production are owned by one company) reigned as large companies—and equally large personalities—sought to dominate markets. Moguls such as Andrew Carnegie, Henry Ford, and John D. Rockefeller fathered the business model of owning all stages of the supply chain, from the raw materials to the railroads.\(^4\) As globalization made it easier to outsource various stages of production, the vertical model died out. New management philosophies favored focusing on “core competencies” and specialization. Companies looked to invest more in intangible assets and eschew the challenge of staying competitive in a range of fields. Also, especially in recent years, a need for capital drove large divestments of non-core assets.\(^5\)

But with the price swings and supply problems of the past in mind, steel manufacturers are revisiting vertical integration as the model for a post-recession, growing-GDP world.

Steel producers are seeking both upstream and downstream deals, that is, acquisition of both the raw material inputs to production (upstream) as well as distribution and outputs further down the supply chain (downstream). In 2009, there were 110 M&A transactions in the global steel sector at an estimated US$2.18 billion (see figure 1).

**Figure 1: Global M&A**

Of those, the number of vertical deals—upstream and downstream transactions not involving the purchase of another steel works, blast furnace, or rolling mill—made up 67 percent (or 74 of 110 transactions with a value of US$ 1.24 billion). This is up on a proportionate basis from 58 percent in 2008 (with 105 of 180 transactions with a value of US$9.43 billion).\(^6\)

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\(^1\) “Euro Steel Protests Iron-Ore Miners,” TheStreet, 31 March 2010.

\(^2\) “Mittal Stokes Steel-Price Row Predicting 21% Jump,” Bloomberg, 1 April 2010.

\(^3\) Standard & Poor’s Industry Surveys, Metals: Industrial, 6 August 2009.


\(^5\) Ibid.

\(^6\) Deloitte Touche Tohmatsu Global Manufacturing Industry analysis of Thomson Reuters transaction data for deals in 2009 and 2008. Acquirer companies analyzed had primary SIC code of 3312 (Steel works, blast furnaces, and rolling mills). Transactions numbers reflect deals not involving the purchase of another steel works, blast furnace, or rolling mill. 10 April 2010.
Over the past five years, approximately US$4.6 billion has been invested downstream in the acquisition of assets involved in activities such as steel wiredrawing and steel nails and spikes; cold-rolled steel sheet, strip, and bars; steel pipe and tubes; and metals service centers. US$8.3 billion was invested upstream in iron ore, ferroalloy ores, bituminous coal mining, coal, and scrap and waste materials (See figures 2 and 3).  

The actions of various integrated mills seem to support this trend:  

- ArcelorMittal in the past few years has acquired iron ore mines in the Ukraine, scrap businesses in Canada, and coal suppliers in Australia and the United States.  
- OAO Severstal has bought heavily into the U.S. and international coal production businesses to secure coking coal.  
- Wuhan Iron & Steel Group, China’s third-biggest steelmaker, now owns nearly a 22 percent stake in Brazilian iron ore supplier MMX Mineracao e Metalicos SA.  
- Baosteel made a US$1.59 billion bid for a 30 percent stake in Anglo American’s Minas-Rio iron ore project in Brazil in October 2009, following its purchase of a 15 percent stake in Australian iron ore and coal miner Aquila Resources. 

Even the mini-mills have joined in:  

- Steel producers now control about 40 percent of the U.S. ferrous scrap sector.  

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7 Deloitte Touche Tohmatsu Global Manufacturing Industry analysis of Thomson Reuters transaction data for deals in 2009 and 2008. Acquirer companies analyzed had primary SIC code of 3312 (Steel works, blast furnaces, and rolling mills). Downstream target companies had primary SIC codes 3315 (Steel wiredrawing and steel nails and spikes), 3316 (Cold-rolled steel sheet, strip and bars), and 3317 (Steel pipe and tubes), and 5051 (Metals service centers and offices). Upstream target companies had primary SIC codes SIC 1011 (Iron ores), 1061 (Ferroalloy ores, except vanadium), 1221 (Bituminous coal and lignite surface mining), 1222 (Bituminous coal underground mining), 2999 (Products of petroleum and coal), 5052 (Coal and other minerals and ores), and 5093 (Scrap and waste materials). April 10, 2010.  

8 Standard & Poor’s Industry Surveys, Metals: Industrial, August 6, 2009  


10 “China’s Wuhan Steel to Pay $400 Million for MMX Stake,” Bloomberg, November 30, 2009.  


15 “Steel Dynamics—Nuggets of Opportunity,” IndustryWeek, 20 January
Even more, the inflow of investment into “hot spot” regions—those with large untapped supplies of iron ore and coking coal as well as strong scrap markets—has steadily increased. Brazil is the number-one “hot spot” with nearly US$3 billion worth of upstream transactions from 2005 to 2009. In addition to Brazil, the United States (for scrap) and Australia (for iron ore) also continue to be attractive targets for upstream investment. Indeed, the value of upstream deals has increased from US$246.1 million in 2005 to US$656.2 million in 2009—and 2008, before the global downturn hit, saw transaction values at a staggering US$4.5 billion. In terms of downstream investments, most of the transactions from 2005 to 2009 have been concentrated in the United States, and also in Italy, China, and Mexico.\(^\text{16}\)

As expected, China looms large as an upstream acquirer. From 2007 to 2009, the value of Chinese investment has increased steadily, with upstream acquisitions of iron, coal, and scrap reaching more than US$880 million. China is actively seeking opportunities in some of the most attractive upstream markets in the world—Brazil and Australia—with total transaction deals in these countries equaling more than US$600 million in the years 2005 to 2009.\(^\text{17}\) (See “Going upstream: China’s appetite for raw materials,” page 9.)

**Why vertical, why now?**

With growing consumption in emerging markets, raw materials prices have fluctuated significantly over the past decade—iron ore prices have risen from US$28.79 cents per dry metric ton unit in 2000 to US$101 cents per dry metric ton unit in 2010\(^\text{18}\) (see figure 4)—and steel manufacturers are facing increasing pressure in terms of margins. Indeed, Lakshmi Mittal, CEO of ArcelorMittal, recently commented that raw-material costs may push steel rates up nearly 21 percent this year.\(^\text{19}\) And though the steel market is improving, there is much concern that current increased production may flatten out later in the year as inventories are replenished.\(^\text{20}\)

Also, with the potential unraveling of benchmark pricing, not only are manufacturers facing rising raw materials costs, they are also facing increased instability in financial forecasting. With leading iron ore suppliers now looking to negotiate prices on a quarterly or shorter-term basis, planning in terms of pricing will become increasingly difficult.

**Figure 4: Iron ore price chart**

![Iron ore price chart](image)

In addition to controlling costs, steel manufacturers are looking to secure a steady supply of raw materials to meet demand increases and prepare for markets that are increasingly unpredictable.

Companies like ArcelorMittal and Nucor have been preparing for this eventuality. ArcelorMittal self-supplied nearly 60 percent of its iron ore in the fourth quarter of 2009—and is looking to control more.\(^\text{21}\) Likewise, Nucor has been able to hedge its reliance on scrap for use in its electric arc furnaces by increasing its investment in blast furnaces and iron ore.\(^\text{22}\) As a further hedge against scrap availability, Nucor made a substantial investment in raw materials, as demonstrated by its acquisition of scrap dealer David J. Joseph. Recognizing that fixing input costs may not always optimize unit costs, these companies are likely betting that a steady and predictably priced supply offers the best solution over the sector cycle.

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\(^{16}\) Deloitte Touche Tohmatsu Global Manufacturing Industry analysis of Thomson Reuters transaction data for deals from January 1, 2005 to December 31, 2009. (April 10, 2010)

\(^{17}\) Deloitte Touche Tohmatsu Global Manufacturing Industry analysis of Thomson Reuters transaction data for deals in 2009 involving acquirer companies with primary SIC code of 3312 (Steel works, blast furnaces, and rolling mills). (April 10, 2010)

\(^{18}\) “Primary Commodity Prices,” International Monetary Fund, April 7, 2010.

\(^{19}\) “Mittal Stokes Steel-Price Row Predicting 21% Jump,” Bloomberg, April 1, 2010.

\(^{20}\) “Steelmakers have margin to fight raw material costs,” Reuters, April 6, 2010.

\(^{21}\) Ibid.

\(^{22}\) “Steeling Your Profits,” Ariba SupplyWatch, Q3 2008.
This century’s version of vertical integration also involves the search for newer and higher quality sources of raw materials. With such a high percentage of raw materials currently concentrated in so few hands, buying a stake in known sources is difficult, leading many steel producers to seek out greenfield opportunities for development. Both Kobe Steel and POSCO have acknowledged that greenfield exploration, mainly in Australia, is part of their strategies to become more raw material self-sufficient.\(^\text{23}\) Tata Steel subsidiary Corus is also looking to find new sources in Brazil, Canada, Senegal, and Ivory Coast for iron ore, and Australia and Mozambique for coking coal.\(^\text{24}\) And despite the large quantity of iron ore to be found in China, the relatively low quality is prompting Chinese steel manufacturers to invest in better quality mines outside their borders. As the largest importer of iron ore in the world—and the largest steel producer—China’s actions hold enormous implications for the raw materials market.\(^\text{25}\)

In terms of downstream integration, mature economies are using it as a way to capture sales and improve margins in their slower-growing markets as well as gain access to new markets. A downstream move also can increase manufacturing agility by gaining intimacy with end customers. For example, Nucor’s recent joint venture with Mitsui and Steel Technologies provides Mitsui with an increased North American presence while Nucor gains the opportunity to increase its downstream presence, deepen its penetration in existing markets, and explore future global expansion opportunities with Mitsui.\(^\text{26}\) And Tata Steel’s acquisition of Corus pairs Tata’s low-cost, hot-end plants, in India with Corus’s finishing plants thus supplying and expanding Corus’s enviable distribution channel in Europe.\(^\text{27}\) In the reverse scenario, emerging markets are being targeted for downstream integration to mitigate labor costs as well as gain distribution centers in future high-growth markets and capture distribution margin growth for the mills.

**Look before you leap**

With all the current pressures on steel producers and with their storied past of upward and downward ownership, the movement back to vertical integration may seem like a natural progression; that is, a new era of the fully integrated steel company. But the reality may not be so grand: Andrew Carnegie’s world was a much smaller stage with far fewer complicating factors. In today’s global economy, vertical integration must be considered not only in terms of cost advantage and control but also against a backdrop of concerns external to business imperatives.

**Geopolitical concerns**

The current merger trend within the steel sector involves a significant number of cross-border transactions. Especially with upstream integration, raw materials are often sourced in territories where producers are not typically operating—and the effort to invest in or develop those sources is often complicated by geopolitical concerns outside a company’s control. Producers looking to vertically integrate abroad may need to contend with a range of thorny issues—from complicated bureaucracies to civil unrest. Political concerns are of particular significance when dealing with a country’s natural resources. Raw materials are tightly intertwined with a country’s identity particularly when viewed in terms of national security. Take the high-profile case of China’s burgeoning foreign direct investment in Australia’s natural resources—which prompted cries of protest from Australian politicians and has strained Chinese-Australia relations.\(^\text{28}\) And in India, which has exported nearly 60 percent of its iron ore in the past, there are the new tariffs and duties being imposed on iron ore exports in response to a growing outcry from local steel manufacturers and others, who believe the country needs to meet its own steel needs first.\(^\text{29}\)

\(^{23}\) “Kobe Steel Joins Mills in Search for Mines as Ore Prices Rise,” Bloomberg, 1 April 2010.

\(^{24}\) “Corus may ally with CSN for iron ore mining,” SteelGuru, 22 November 2009.

\(^{25}\) “Iron ore exports to China: India loses to newer markets,” The Hindu, 23 February 2010.

\(^{26}\) “Mitsui USA to Form Joint Venture With Nucor Corporation,” PR Newswire, 3 March 2010.

\(^{27}\) “Pedal to the Metal: Challenges of Tata Steel’s Corus Takeover,” India Knowledge@Wharton, University of Pennsylvania, 31 October 2006.

\(^{28}\) “Chinese investment in resources seen ‘bolder, more prominent,’” Miningweekly.com, 2 March 2009.

Other concerns are the tenuous security situations in some of the less developed areas where natural resources are located. Major steel producers who are attempting to develop mining in India’s eastern states are now facing tense local conditions in the wake of recent rebel attacks on Indian security forces that left 76 dead. The threat of social unrest has real impact: India-based steel producer NMDC posted significant declines in profits after a pipeline used for transporting ore was damaged by rebels. And this is only the latest challenge for POSCO in this region: a US$12 billion steel unit and iron-ore mine has been delayed for several years due to opposition from the local population.

**Overall integration concerns**

While any integration has its issues, vertically integrating can be particularly challenging. In addition to all the cultural obstacles of getting two separate companies to work together, there is the essential “foreignness” of the acquired business itself to contend with—such as a producer learning the distribution business. And by focusing on additional activities, the fundamental core business may suffer. Acquiring a complementary business in response to economic conditions, such as high raw materials costs, can also tie up capital and inhibit a company’s ability to respond to economic conditions. And cost advantage, while a compelling argument for upstream integration when production inputs are expensive, may evaporate when those same inputs begin to drop in price.

**Making the most of vertical moves**

Even despite the challenges, the fact remains that vertical integration in today’s globalized economy can be a profitable move. With little excess supply in the raw materials market and margins further down the value chain becoming tighter, a successful vertical integration can bring a steel manufacturer a competitive edge. Indeed, according to Daewoo Securities, POSCO’s efforts to procure iron ore mines in India may boost its share price by more than 20 percent. This value can also be seen in such vertical moves as that of Steel Authority of India Ltd. (SAIL) and Indian Iron and Steel Company (IISCO)—who both gained significantly from their merger. IISCO’s iron ore mines at Chiria, Gua, and Mandharpur—considered to be the best in the country—now provide SAIL with total deposits of more than 3.2 billion tons of ore and more than 125 million tons of coking coal. In return, SAIL’s capital infusion updated IISCO’s rolling mills, coke production, and mining facilities.

**Achieving cost synergies**

Though the target business in a vertical integration is complementary, this doesn’t mean that there aren’t opportunities to capture cost synergies from the deal. From integrating overlapping areas to enhancing supply chain efficiencies, a vertical acquisition does indeed offer the ability to drive out costs. Take Novolipetsk Steel’s (NLMK) proposed acquisition of John Maneely Company (JMC), for example. NLMK, through its joint venture with Dufecco Group, has two manufacturing facilities in the United States, which are significant suppliers of hot rolled coils (HRC) to JMC and the largest supplier of HRC to JMC’s Wheatland division. NLMK had announced expected synergies of approximately US$35 million from the vertical integration of its steel assets in North America with JMC’s low-cost processing capabilities prior to the transaction being terminated due to the global financial crisis.

With an upstream integration, the main way cost advantage is obtained is through cost management, that is, better control of raw materials. As noted above, steel companies are increasingly at the mercy of the iron ore oligopoly. With the demand for iron ore expected to only intensify as economies like China, India, and Brazil continue to expand, iron ore suppliers are loathe to lock in prices long-term: they want to maximize variability and, thus, profitability. This means that manufacturers’ efforts to control costs will be constantly thwarted by the volatility of raw material pricing. By integrating upstream, steel manufacturers are able to lock down costs and ensure a consistent supply, enabling better cost management overall.

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31 “Company relies on India project to offset negative factors,” Daewoo Securities, 26 March 2010.
33 “Novolipetsk Steel Completes Acquisition of U.S. Steel Pipe Manufacturer,” Azomaterials, April 2010.
With a downstream integration, achieving cost synergies can come from reaching critical mass—that is, taking advantage of the combined size of the companies. This allows greater purchasing power in terms of inputs such as energy—a major cost in steel production. In fact, a significant amount of deal value—as much as 25 percent in a steel manufacturer, where capital costs are higher than most industries—can come from seeking out operational synergies that minimize variable costs. Strategic sourcing may even reduce direct and indirect costs by up to 15 percent.

Downstream moves also provide greater insight into customer needs and can improve working capital and inventory management. This is especially critical with steel manufacturing as it can help take excess inventory out of the system as manufacturers gauge customer demand and allow more agility in production planning. And with downstream, there are significant opportunities to reduce costs from variability by focusing on quality improvements using discipline approaches such as lean Six Sigma. By creating one long supply chain with the application of best practices in terms of quality control, efficiency, and overall expense management, even incremental improvements can improve margins and costs overall.

With both up- and downstream moves, a key way to capture cost synergies post-merger still remains the integration of back office and redundant functions. Even if the target maintains a significant amount of autonomy—as may be the case with an acquisition such as an iron ore mine—there are often opportunities to streamline operations, especially in such areas as human resources, finance, and information technology. The post-merger integration (PMI) process also is an optimal time to take a systematic approach to reduce selling, general, and administrative expenses across the entire spectrum of functions in both entities.

Integration best practices

Though cost synergies and management are typically the driving force behind a vertical move, there are still lessons to be learned from the integration practices of successful horizontal mergers. Indeed, to achieve cost advantage post-merger, a business must see past the benefits of a vertical move and understand how to anticipate and plan for its unique challenges.

Intensified due diligence and early integration planning. While due diligence is critical to any merger, it may be particularly important in a vertical move due to the unfamiliarity of the target’s core business functions. And though a vertical move may seem like a good idea in terms of cost advantage, the health of the acquisition cannot be ignored. Acquirers should be aware of their blind spots and intensify their due diligence accordingly. The complexities of integrating various functions—including management teams; sales, marketing, and product functions; production facilities; and logistics and purchasing operations—can be overwhelming to a newly combined organization. Often times, outsourced functional expertise can assist in key integration processes, such as creating the integration management office, developing the integration blueprint, and developing and capturing synergies.

Handling geographical differences. As noted above, many of the vertical acquisitions within the steel sector involve targets in unfamiliar territories. Cross-border deals demand even stronger due diligence as the range of risks increases when dealing with a foreign government. For example, there may be government regulations regarding the ownership of certain business and natural resources by a foreign enterprise. Additional and varying regulations may apply to labor, land use, reporting methods, and the repatriation of profits, among others.
One way to navigate international challenges, however, is to partner with a local entity. Just recently, POSCO decided to work with the state-owned SAIL in a joint venture to move its projects in eastern India forward. While POSCO can bring technological expertise to the venture, SAIL has the ability to navigate the local bureaucracy and regulatory environment.  

Early integration planning and operational analysis. The best way to ensure the integration goes smoothly is to start planning early on in the process. This is of particular importance with a vertical integration as the cultures and processes may be radically different in the target company, not to mention the special challenges of a cross-border acquisition. While some vertical mergers may leave the target intact, to achieve economies of scale, especially with a steel manufacturer’s acquisition of a downstream target, some integration will be necessary.  

The shape of things to come
There is no doubt that steel manufacturing in 10 years may have a very different look than it does today. Horizontal consolidation in what is a largely fragmented market is sure to continue. And this scale may be just the thing to battle the oligopoly within the raw materials sector. Until then, though, it appears that vertical integration may be one way for steel manufacturers to win competitive advantage and control costs in this uncertain economy. As the world economies recover and the middle classes of the BRIC countries continue to grow, demand for steel will intensify. To meet the needs of this new customer base and improve margins, downstream moves make a lot of sense. But it is the uptick in upstream that is today’s headline—with steel’s quest to control raw materials a nod to the past as the industry looks to the future.

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**Going upstream: China’s appetite for raw materials**

As the world’s largest producer of steel, China is increasingly feeling the impact of volatile raw materials pricing—driving a move toward vertical integration. By some estimates, the new short-term pricing system, if established, could push costs for China’s steel makers up by around US$13 billion a year.\(^{41}\)

To battle this, China has invested around US$2.8 billion in vertical integration deals over the past five years (from 2005 to 2009). Approximately 64 percent of China’s US$816 million in transactions in 2009 alone targeted iron ore investments — a significant rise from 2.5 percent in 2008 (see figures 5 and 6). On a global basis, China’s investment in iron ore resources represents approximately 24 percent of total global M&A deal values in 2009.

Numerous Chinese steel producers have already made aggressive moves toward raw-material self-sufficiency. Chongqing Iron and Steel Group recently won approval to acquire Australian iron ore mining assets, and, according to its president, Dong Lin, the group should be 100 percent self-sufficient in iron ore in 2012.\(^{42}\) And just in February of 2009 alone, Aluminum Corp of China (Chinalco) purchased assets in Rio Tinto, Minmetals took over OZ Minerals Ltd, and steel mill Valin bought into Fortescue Metals Group.\(^{43}\)

Relative to other countries, China ranks third behind the United States and Brazil in terms of total value of upstream deals during the last five years (from 2005 to 2009), but leads Russia and India in terms of the number of deals (see figure 7). Key countries of interest to Chinese upstream investments include Australia, Brazil, and Canada. Most recently, China has also made moves into the Africa region (see figure 8). This past March, the China-Africa Development Fund (CADF) transferred its stake in Liberia’s Bong Iron Ore Mine to Wuhan Iron and Steel.\(^{44}\) CADF and Wuhan also signed an agreement on mineral resource use in Africa (CADF was set up by the China Development Bank as an investment vehicle in Africa).\(^{45}\)

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\(^{41}\) “China’s Steel Mills May Have to Accept Iron Ore Markup,” TradingMarkets.com, 26 April 2010.


\(^{43}\) “China Hebei Steel sees iron ore deal in April,” Rueters, 5 March 2009.


\(^{45}\) “China-Africa Development Fund,” SWF Institute, April 2010.
Figure 7: Top 10 upstream acquiring countries

<table>
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<th>Value (US$M)</th>
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<td>China</td>
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<td>India</td>
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Figure 8: Destination of China’s investments in raw materials

Deloitte Touche Tohmatsu (DTT) global manufacturing industry

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