World Steel Dynamics (WSD) is a leading steel information service in Englewood Cliffs, N.J.

WORLD **STEEL** DYNAMICS

WSD's steel experience, steel database and availability of steel statistics are the principles for performing steel forecasts, studies and analysis for international clients. WSD seeks to understand how the "pricing power" of steel companies the world over will be impacted by changes in the steel industry's structure.

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Pacific Basin Steel: "Battle of the Mastodons."

The Pacific Basin is populated with too many "mega" integrated steel plants — i.e., those with coke ovens and blast furnaces — that produce steel slab, hot rolled band and/or steel plate. Most of these plants sit on deepwater ports and are fairly new and/or have been kept highly productive over the years. Not a single plant, as far as WSD knows, is lacking modern pollution control equipment or is faced with massive catch-up capital spending requirements. In the Pacific Basin, the competition between the mega steel plants might be called the "Battle of the Mastodons."

When a new mega plant is started up, and especially if it has sizable company-owned or -affiliated downstream customers, it will have a damaging impact on the existing mega plants in the region. For example, the new Hyundai Steel plant on the west coast of South Korea, which is not too distant from Seoul, has quickly ramped up steelmaking capacity to about 12 million metric tons. A good portion of its deliveries are to other steel-consuming entities in the Hyundai Group — including Hyundai Motors, Kia Motors and the three largest shipbuilders in the country.

Hyundai and Kia Motors account for about 70% of the automobiles produced in the country. Hyundai Steel, as a result, has had the opportunity to produce about 5 million metric tons of automotive sheet for the Hyundai automotive companies — including perhaps 1 million metric tons exported to other Hyundai automotive plants in other countries.

Three Hyundai Group shipbuilding companies account for about 50% of the tonnage of steel ships that are being built in South Korea. About a year ago, Hyundai Steel completed its second steel plate mill. Hence, the Hyundai shipbuilding companies are now purchasing much less plate from POSCO and Dongkuk Steel.

By WSD's count, there are more than 40 plants operating in the Pacific Basin, with a steelmaking capacity of at least 3.0 million metric tons per year (mmtpy), that are positioned to serve the export market. Plus, four new plants are under construction. Specifically, there are:

- Twelve plants in Japan with a capacity of at least 3 million metric tons. The plants are Muroran, Kimitsu, Nagoya, Hirohata, Yawata, Oita,

owned by Nippon Steel; Kashima and Wakayama by Sumitomo Metal, which has now merged with Nippon Steel; Chiba, Keihin, Kurashiki and Fukuyama under JFE (which is the merger of Kawasaki Steel and NKK); Kakogawa, owned by Kobe Steel; and Kura of Nisshin Steel. The combined steelmaking capacity is about 109 million metric tons. Also, Tokyo Steel's first plant to produce hot rolled band is based on EAF-produced steel and a conventional slab caster.

- Three in South Korea, including POSCO's plants at Pohang and Gwangyang, and the new Hyundai Steel plant at Dangjin. The combined capacity of these plants is about 50 million metric tons.
- Two in Taiwan, which are the China Steel units at Kaoshung and Taichung (Dragon Steel/CSC Group) that have a capacity of 16 mmtpy.
- In China:
  - Sixteen plants at, or close to, "beach areas," including Ansteel's new plant in Bayuquan, Shougang's new plant at Caofeidian, Baosteel's new plant at Ningbo (acquired a few years ago), Shandong Steel's new plant at Rizhao, Baosteel's original plant near Shanghai, Shagang's ever-expanding plant at Zhangjiagang, Qingdao Steel and others, with a total capacity at 128 million metric tons.
  - Two new units are under construction on the coast in the south by central government-owned Baosteel and Wuhan Steel, with a planned eventual combined capacity of 20 mmtpy.
- One in Vietnam, under construction, that's owned by Formosa Plastics (one of the largest companies in Taiwan). Its capacity will be 15 mmtpy. It must be export-oriented, since the steel market in Vietnam is small. Will Formosa Plastics be able to set up a strong research and customer support effort in Vietnam to serve its offshore customers?
- In India, there are at least seven plants, including the large Essar Steel plant on the coast in the northwest, the JSW plant at Dolvi near Mumbai, Vizag on the southeast coast, and the planned new units not far from ports by Tata Steel, SAIL, JSPL and JSW. The combined capacity of these units is more than 20 mmtpy.
- In Indonesia, one new US$2.7 billion unit owned by POSCO and Krakatau Steel will start production in early 2014, with 3.0 mmtpy of capacity including slab and plate.

In addition, there are at least eight steel plants in China and three in India located inland that are capable of shipping to the port of export at a reasonable cost.

There are also three independent hot strip mills in the Pacific Basin, two in Taiwan and one in Thailand. These plants are quite competitive when slab is relatively cheap.

EAF-based thin-slab/hot rolled band plants that depend on purchased scrap, pig iron and DRI are operated in Japan (Tokyo Steel), South Korea (Dongbu), Malaysia (Megasteel) and Turkey (MMK). These plants tend to be poor financial performers in the current environment because of the high cost of purchased steel scrap and the inability to use purchased steel slab when it's cheap (because the equipment includes only the finishing "train" of the hot strip mill that rolls a slab typically no more than 65 mm in thickness).

China's Steel Bus Running Into the Great Wall!

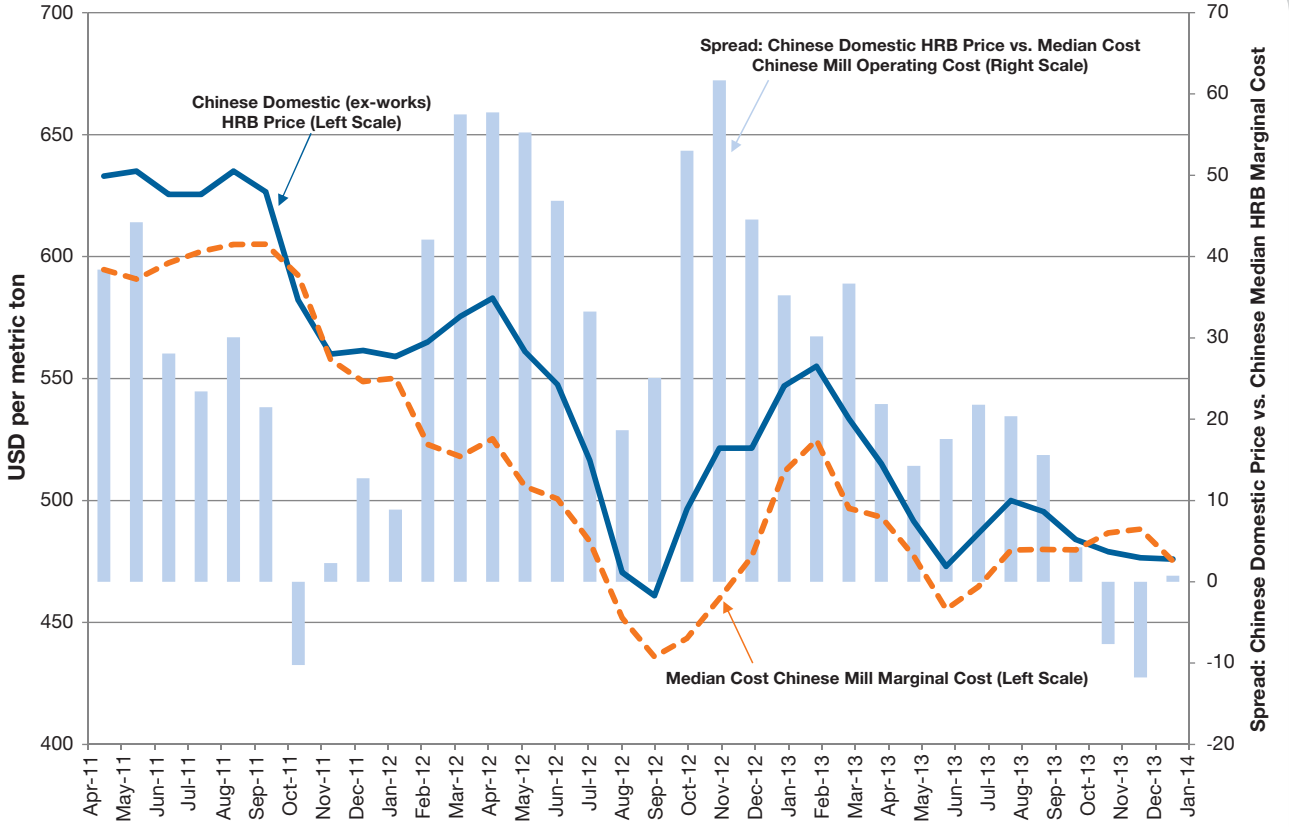
Why has China's ex-works HRB price settled in at the marginal cost of the median-cost Chinese mill?

Here are the reasons (see also Figure 1 on the next page):

- In China, the number of mills producing wide hot rolled band, at about 88, far exceeds the number in any other market. In Japan, for example, there are about 20 hot strip mills, of which around 12 are owned by the two largest companies (Nippon Steel & Sumitomo Metal and JFE, each of which is the result of a merger with a large competitor).
- Steel production in China is "sticky" on the downside — i.e., resistant to reduction. Production tends to be sustained if orders are received, no matter what the price, because: (a) the mills have a less direct profit motive, and (b) the local municipality that owns a share of the mill demands that production be sustained. (Note: The local municipality typically appoints the steel company's top executives.) The municipality receives about 25% of the 17% value-added tax (VAT) that's collected when a steel product is sold.

On domestic sales, the steel mill does not pay a VAT because it collects the full 17% tax when it sells its product, and then it rebates to the government the VAT revenues it has received over and above the VAT taxes it has paid. However, on exports, unless there is a rebate, such

Figure 1



Median-cost Chinese mill HRB marginal cost versus Chinese domestic spot price. Source: WSD's WCC for Flat Rolled Sheet and SteelBenchmarker™.

as the 9% credit on boron-added steels, the mill pays the full 17% VAT; but in this case, there is no customer reimbursement, since the mill is already charging what the market will bear.

Why are pricing "death spirals" short outside of China and long in China?

Outside of China, an HRB pricing "death spiral" rarely lasts two months. It occurs when the steel mills' new orders are so low, in part because their customers are seeking to liquidate inventory, that the mill inadvertently builds excess inventory. The inventory must be liquidated because "cash is king." The marketplace is gripped by a "chill" as steel buyers "sit on their hands" — i.e., refrain from placing orders — because they fear prices are declining.

However, once the price declines to, or below, the marginal cost of many of the mills, two corrective developments occur almost simultaneously: first, the mills engage in significant production cutbacks; and second, the mills' order entry rises as steel buyers, who realize the price has fallen to unsustainably low levels, boost their orders.

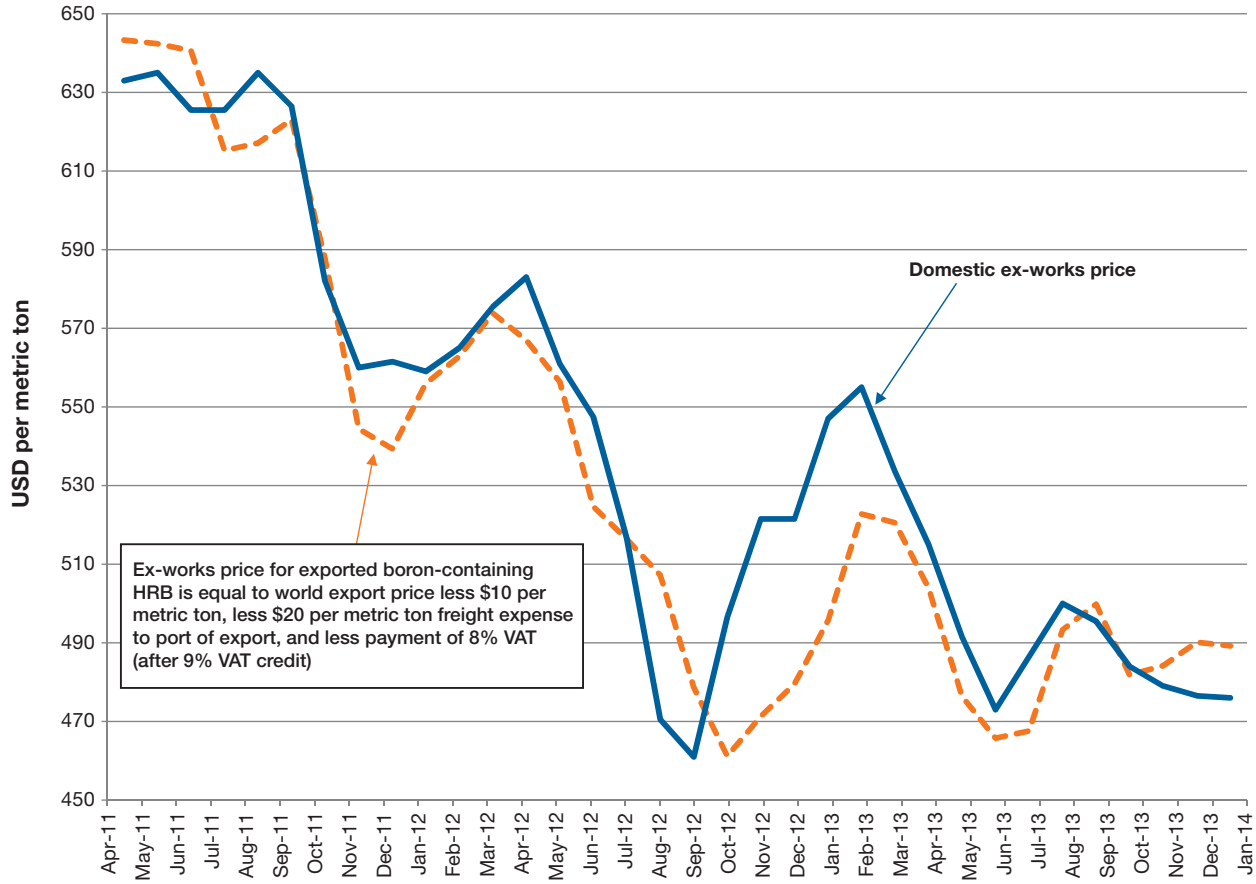
In China's case, a death spiral condition may be sustained for a year or more because the mills don't cut back production as long as they have orders on hand, no matter what the price.

See also Figure 2 on the next page.

How long will it take before death spiral pricing conditions in China change the "behavior pattern" of that country's medium-sized and larger steel mills?

It may take two years of death spiral pricing before there's a huge cutback in the steel mills' capital outlays — i.e., not until 2015. Financial pressures at present are mounting in part because more mills have leveraged balance sheets than a few years ago. Capital outlays are not yet down sharply because the medium-sized and

Figure 2



Chinese HRB ex-works export price versus domestic ex-works price. Source: WSD's WCC for Flat Rolled Sheet and SteelBenchmarker™.

larger steel mills can make up their cash shortfalls by borrowing from government-owned banks. However, the current condition may not be sustainable because: (a) more municipalities are facing huge debt repayment problems; and (b) the interest rate on funds borrowed from the state banks is expected to rise.

Capital spending by China's steel mills, which amounted to US$80 billion in 2012 and about US$84 billion in 2013, may fall to about US$70 billion in 2014. By 2016–2017, WSD forecasts it will drop to US$30–45 billion per year. Interestingly, if steel industry capital outlays drop by US$40 billion per annum, this development alone might reduce the steel consumed in the construction of steel plants by 15 million metric tons. ✦