GLOBAL INSIGHT

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Steel Markets: Causes and Factors Affecting Steel Prices in the Near and Medium Term

A STUDY PREPARED FOR:

AEM/FEMA/NAEDA

PREPARED BY:

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March 2005

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EXECUTIVE SUMMARY

Steel consumers have been adversely impacted by rapidly rising steel prices. Steel is a key input to durable manufacturing, and by far the largest physical input to the machinery sector. In 2004 the prices of almost every steel product at least doubled, with several recording price increases over 250%. The study concluded that generally machinery manufacturers were not able to pass on most of these costs, and suffered declining profits even as their demand grew strongly.

This study looked at the causes of steel price increases, and sought to determine which factors were cyclical and which were permanent. The impact of the individual factors on the machinery industry was then examined. Global Insight finds eight principal reasons for the explosion in steel prices last year:

1. The most important factor explaining recent steel price increases is China. Explosive growth in the Chinese steel industry has produced physical tightness worldwide for the range of steel making raw materials, lifting input prices on a global basis. This is a permanent change, and will affect markets for decades.
2. Declining prices for the past two decades led to under-investment in mill maintenance, and in new mines for iron ore and coal, and in coke ovens. This was a structural problem, but long-term solutions are underway.
3. A depreciating dollar made steel imports more expensive and revived exports markets. This is also a structural change.
4. Section 201 tariffs contributed to extremely low import levels in 2003, which resulted in inventory deficit once domestic demand started rising in 2004. This was a cyclical event.
5. Scrap is a major input to steel making, and prices for scrap are sharply higher for three reasons:
    a. Exports increased as the dollar weakened and Chinese demand boomed, a structural change.
    b. Poor scrap generation and low scrap inventory, both a function of low prices during the past 10 years and the general deterioration in collection infrastructure, a cyclical event.
    c. Bad weather in winter 2003-04, which hampered scrap collection. A relatively minor factor, a cyclical event.
6. High shipping costs, which surged as global trade increased while the fleet of dry bulk carriers (ore) and container ships (scrap) remained relatively constant. Most of the increase was cyclical, but a significant share will be permanent as trade increases with China and India.
7. The temporary closure of an important coal mine triggered a shortage of metallurgical coke. Several steel companies in the United States operated below capacity because they could not obtain sufficient supply.

8. The synchronized rebound in the major industrial blocks. Stronger growth in industrial production in the United States, Europe and Japan was layered on strong Chinese growth.

China is the most important driver in today's global steel market. China accounts for nearly 1/3 of global steel consumption and production, and is the source of over half of the growth. Raw materials supply (ore, coal, scrap, and coke) did not keep pace with Chinese demand, causing tight supply globally. China has pegged its currency to the dollar, helping Chinese exports and making steel markets even stronger. A revaluation of the Chinese currency would be advantageous to the world economy, but the revaluation should be managed carefully so as not to spark extreme inflation and interest rates hikes in the United States while hurting the Chinese banking sector.

The study also looked at short and medium term factors that could affect steel prices. Among the short term factors were the risk of stagnation in Japan and Western Europe, and the possibility that tariffs against low cost steel producers such as Brazil and Russia would be lowered or eliminated. The most important medium term factor is the probable rise of India. Just as China dominates current analysis, India could soon enter a growth pattern and provide a second dose of strong growth to steel demand.

The final section of the study looked at policy options and their effect on steel prices. The options examined were:

1. Further devaluation of the U.S. dollar. Further devaluation will cause steel prices to have a stronger profile, but also increase demand for U.S. made finished goods.
2. Continued consolidation of the steel industry. Consolidation is assumed to lead to somewhat higher prices, but also to introduce a measure of badly needed stability that will benefit both buyers and sellers.
3. Steel trade protection -- Anti-dumping, Quotas, and Voluntary Restraints. These measures have helped protect the domestic steel industry, but have also caused costs to be much higher for the machinery making industry. Prevention of unfair practices should remain a policy goal, but excluding foreign steel simply because the domestic industry is not competitive should be opposed. In the interest of fairness, buyers are seeking representation at trade hearings.
4. Expansion of port facilities. Bottlenecks at port facilities are hampering the flow of trade. However, the most important bottlenecks are at foreign ports, thus outside of domestic policy.
5. The Jones Act. This act serves to protect the domestic merchant marine industry, but causes shipping costs to be artificially high -- costs that are passed on to the steel industry, and ultimately to steel buyers such as machinery makers.
6. Radioactive scrap. Every effort must be made to prevent radioactive materials from entering the scrap industry.
7. Limiting scrap exports. This policy would initially lead to lower steel prices, (because of greater scrap availability) but in the longer term would be self defeating. Lower scrap prices would be a disincentive to scrap collection while trade

restrictions would foster ill-will. Since machinery makers will have better export opportunities as the dollar weakens, they should look to promote free trade whenever possible.

INTRODUCTION

Background

Steel is one of the largest inputs into durable goods manufacturing, and is heavily used in the making of machinery and equipment. Despite its heavy use, steel was not a particularly important topic to many equipment makers over the past decade, for the price was on a downtrend while availability was rarely an issue.

The steel industry changed in 2004, and buyers can no longer take the industry for granted. The spot price of almost every type of steel doubled or worse in 2004, while sporadic shortages interrupted production lines. Steel consuming companies had a difficult time making profits despite strong sales and some price increases of their own. Given this situation, buyers want answers to several questions. Why did prices jump so high, so suddenly? What is the outlook for 2005 and beyond? Is there anything buyers can do to improve the situation?

Nature of the Study

This study is a background paper for a consortium of three trade associations, all involved in the machinery and equipment manufacturing business. The associations are the Association of Equipment Manufacturers (AEM), the Farm Equipment Manufacturers Association (FEMA), and the North American Equipment Dealers Association (NAEDA). The study was prepared by Global Insight Inc (GII), the world's largest private economics consulting firm.

The study attempts to answer the questions posed above, and goes into detail based upon a list of topics specified by AEM/FEMA/NAEDA

Format

This study answers each specified question in turn. The main body of the paper provides a textual analysis of the issue, with summary tables and charts to illustrate key points. More comprehensive supporting tables and charts are located in the Microsoft Excel file `UNDERLYING DATA.XLS`. Comprehensive historical and forecast data on the steel industry is in the Microsoft Excel file `STEEL VOLUME AND PRICES.XLS`

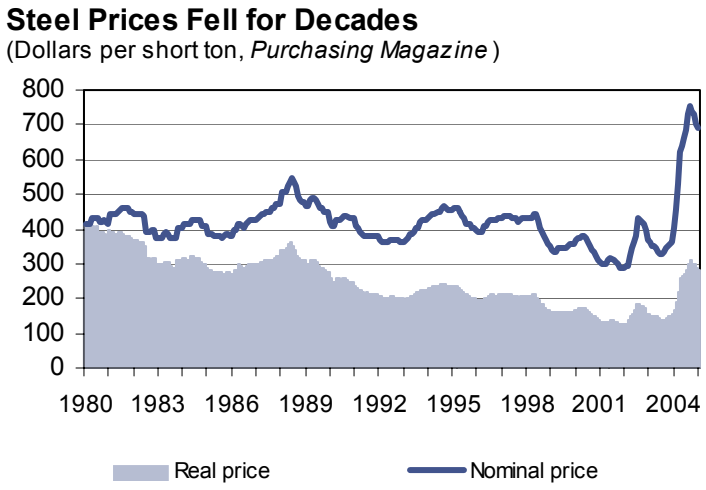
All data may be used internally by AEM, FEMA, and NAEDA, and by member companies. However, data may not be redistributed without express permission of Global Insight, Inc.

Requirement 1: A thorough analysis and discussion of the factors that caused the recent surge in steel prices while separately distinguishing temporary factors from those long-term structural factors that will impact long-term prices.

Steel prices surged to unprecedented levels in 2004, and did so very rapidly. The causes require an analysis of cyclical and structural factors, that game together in a wave to disrupt the steel market.

The rapid price increases were a combination of demand- and supply-driven. The primary global factor was demand, which manifested itself as tight supply in the United States as import tonnage diverted from the U.S. to China. The U.S. steel industry had a difficult time stepping up and supplying the needed tonnage, leading to shortages and explosive prices.

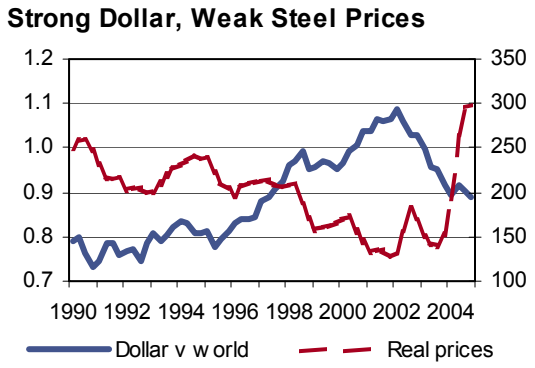
(1.1) The first factor to consider is the decline in steel prices over recent decades. Steel prices have failed to keep up with overall inflation since January 1979, causing real price declines for more than two decades. Worse, nominal prices declined since 1989. While declining prices helped steel buyers, it put continuous pressure on steel makers. Investment and maintenance were curtailed, and steel companies eventually started to go bankrupt. This was a structural cause of weakened steel output, and an inability to react to rapidly changing market conditions.

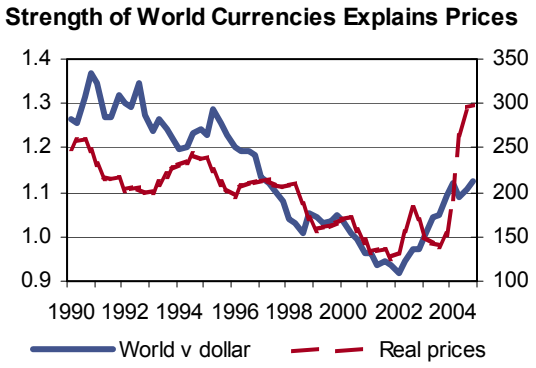


	1980	1985	1990	1995	2000	2004
Nominal	423	382	426	429	356	637
5 yr % chg	--	-9.7	11.5	0.7	-17	*78.9*
Real	400	276	254	219	161	262
5 yr % chg	--	-31.0	-8.0	-13.8	-26.5	*62.7*

**four year change for 2004*

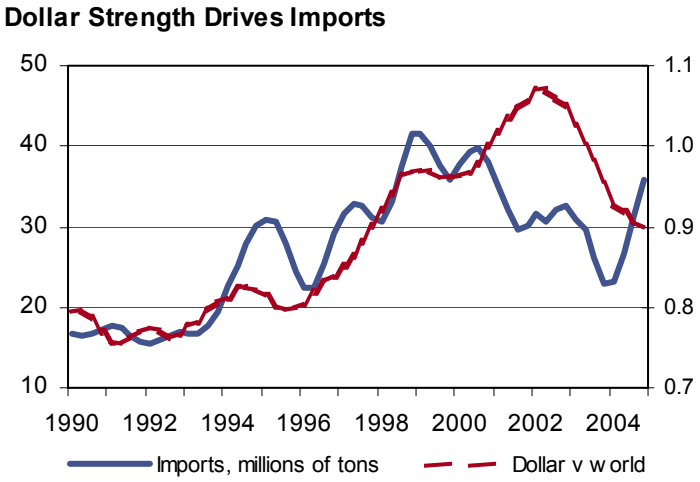
(1.2) The second factor to consider is the weakness of the dollar. The dollar started increasing in value in 1996, and shot to very strong levels following the Asian financial crisis in 1997-98. Every time the dollar became 10% stronger, imported steel became 10% less expensive.

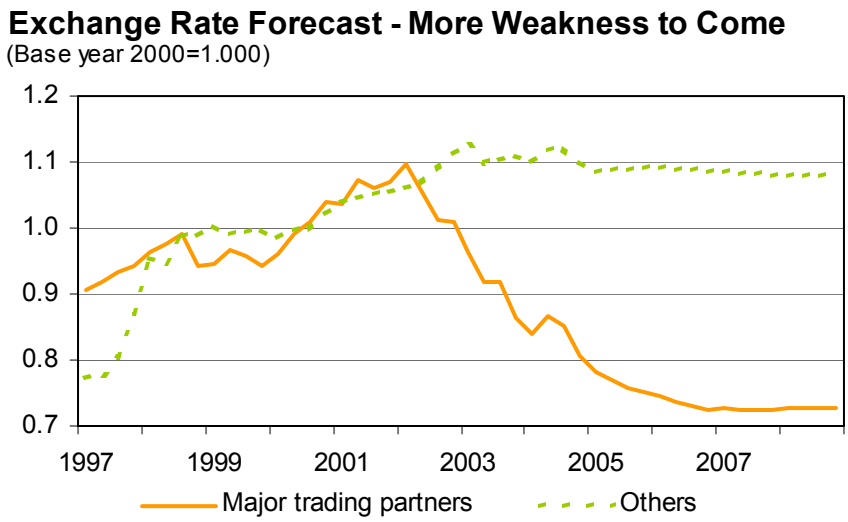




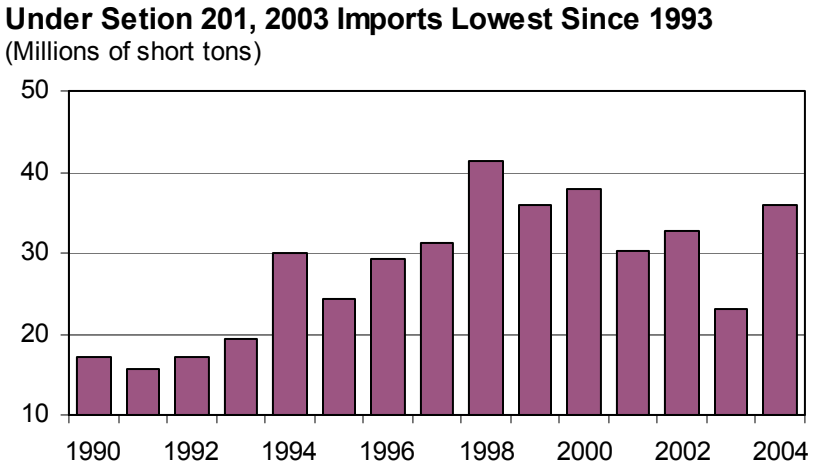
Exchange rate line on the right is simply the inverse of the exchange rate line on the left. As the dollar gets stronger, a buyer can get more imported steel with each dollar. As the dollar weakens, a buyer has to use more dollars to purchase a ton of imported steel. A weak dollar also means that domestic steel is a bargain for other countries. This means exports are a viable market, and domestic buyers have to outbid foreign buyers to keep steel at home.

The strength of the dollar was a strong driver of rising imports. However, in 2002 the dollar started to weaken, and has fallen over 50% against the euro, and over 20% against Asian currencies such as the yen and won. This directly serves to increase import prices. Domestic mills can also raise prices, since imports are unable to undercut them. Moreover, the weak dollar makes exports attractive. The U.S. was a net importer of almost every steel product for the past three decades, but in 2004 there were significant exports. Flat products were particularly in demand, and plate is still exporting almost as much as is imported.

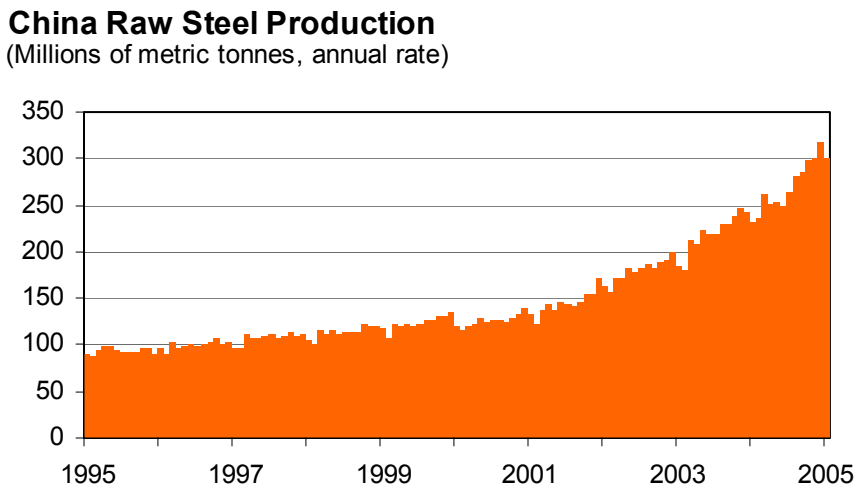


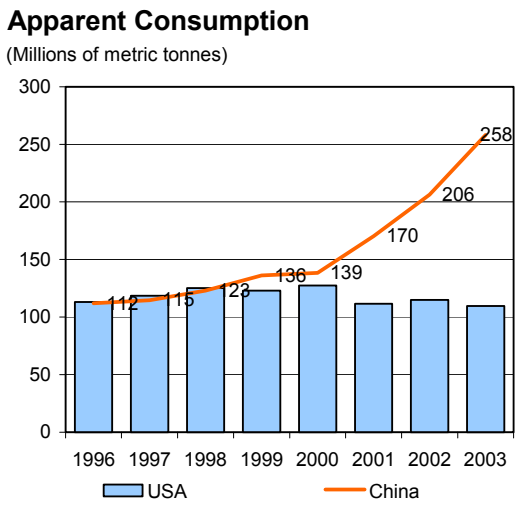


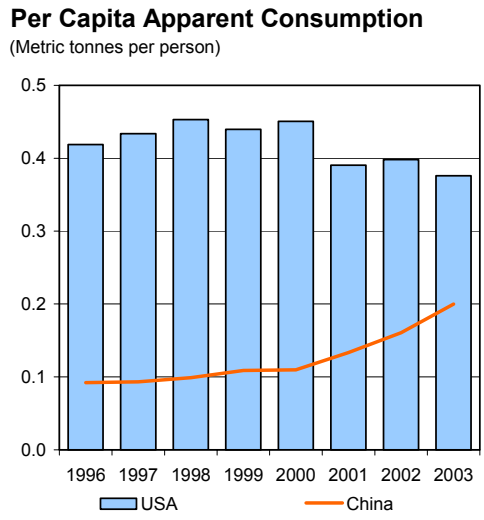
(1.3) The third factor to consider is the Section 201 tariffs placed on steel in March 2002, and lifted late in 2003. Although not as important as the weakening of the dollar, these tariffs served to repress import tonnage into the United States. It is important to note that tonnage would have fallen without the tariffs, for demand was weak and a falling dollar cut the price advantage of imports. However, the tariffs pushed imports below an equilibrium level, causing steel inventories to decline in 2003. Because demand was relatively weak, few raised alarms about the falling inventories. This factor was purely cyclical.



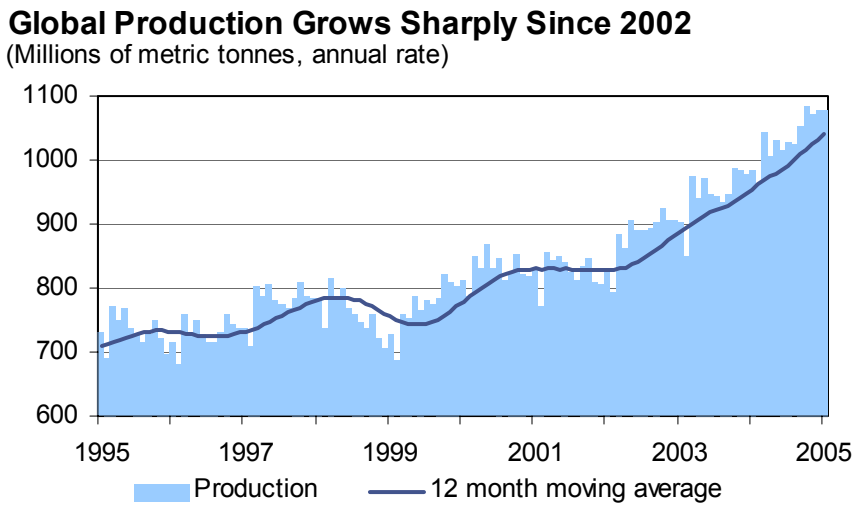
(1.4) The fourth factor (and possibly the most important) was the growth in Chinese steel production and demand. Ten years ago, Chinese steel production and apparent consumption were only slightly higher than in the United States and Japan. Healthy growth from 1995 through 2000 caused China to be the largest steel player in the world, but still somewhat similar to Europe, Japan, and the United States. But in 2001, steel production and consumption exploded, with growth of 14%, then over 20% for 2002-2004. This sudden explosion outstripped global production capabilities, not only for furnace production, but more importantly for raw materials.







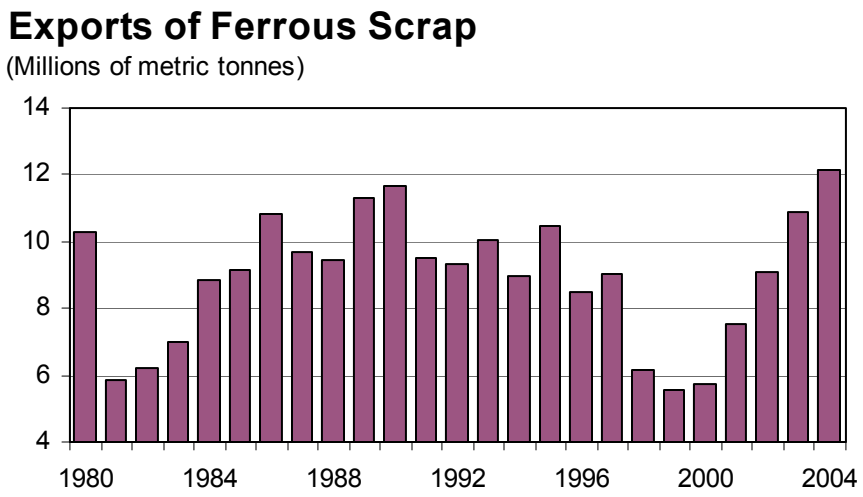
In ten years, global steel production rose from 742 metric tonnes to over 1 billion metric tonnes. Thus, annual production is more than 1/3 higher. Yet global investment in ore mines, metallurgical coal mines, coke ovens, and other raw materials did not keep pace. *See point 1.1 above.* Although the day and week are uncertain, prices make it clear that at some point late in 2003, the global demand for raw materials exceeded the global supply. Prices rose as the market sought balance. This is a structural change. Although China will undergo cyclical swings, the overall increase in steel production and demand is permanent.



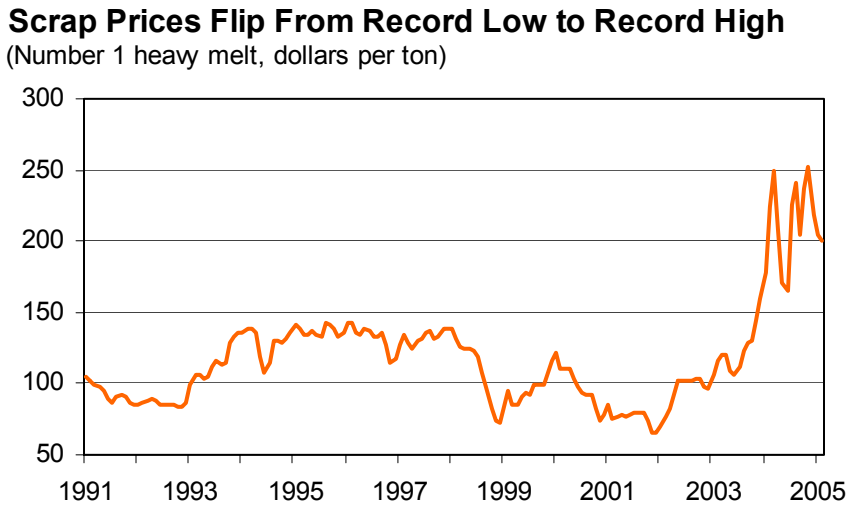
(1.5) Steel prices were also driven higher by the tightness in scrap supply in the United States. Scrap supply was tight for three reasons, two cyclical and one structural. The structural cause is increased exports, a condition likely to persist. The cyclical involved low generation, and bad weather.

(1.5a) The United States has long been a net exporter of scrap, as steel consumed in earlier decades becomes obsolete. That is, cars are junked, appliances are replaced, and buildings are torn down. Each of these events produces scrap. A mature economy, with significant imports of steel plus production from ore, will tend to be a scrap exporter to countries whose economies and steel industries are in growth phases.

The U.S. exported roughly 9 million to 11 million tons of steel scrap each year from the mid-1980's through the mid-1990's. With the Asian financial crisis of 1997 and 1998, and the rapid strengthening of the dollar, exports fell below 6 million tons for 1998-2000, then began to recover. By 2003, exports of scrap were back to old levels. But because a return to old levels was so far above the 1998-2000 tonnage, it was viewed as an abnormality rather than a recovery. In 2004 exports continued to grow, and reached a record level that just exceeded peak levels of the early 1990's.



(1.5b). The first cyclical cause for scrap tightness was low generation. This goes back to the low scrap prices during the export and demand downturn. The price for #1 heavy melt hovered between $130/ton and $140/ton from 1994 through 1993. As exports plunged so did prices, reaching a low of $67 per ton in November 2001. Although there was subsequent recovery, prices stayed below $120/ton. The low prices made many junking activities not worth the time or effort, so scrap generation suffered. We at Global Insight believe that scrap prices will not return to the low levels, and will remain quite expensive in coming years. Thus, the low scrap generation problem is assumed to be cyclical, and no factor for the future.



(1.5c) The second cyclical factor behind low scrap prices was bad weather in Winter 2003-4. This it a rationale that I do not actually accept, but it was widely cited and thus should be addressed. The scenario was that cold weather caused rivers to freeze, thus preventing barge traffic from moving scrap, and high snowfall disrupted rail traffic. However, every winter sees snowfall and frozen rivers without a spike in scrap prices, and the winter of 2003-4 was only slightly harsher than normal. No matter the validity, the winter of 2003-4 is long past,

and certainly cannot be cited as a continuing cause for tight scrap.

(1.6) Raw materials were also made more expensive by a shortage of container ships. Shipping rates increased by a factor of five in 2004. At $20 per metric tonne, shipping cost is almost irrelevant when compared to final product price. But at $100/tonne, shipping is a major addition to the cost of imported iron ore, coal, or coke. Shipping rates have moderated, although they remain above $60/tonne. Additional moderation will occur in 2005 through 2007 as hulls currently being laid at shipyards enter service.

(1.7) A final cyclical supply side factor was the fire at the Pinnacle Mine that broke out at the end of August 2003. The Pinnacle mine is one of the most important in North America for supplying metallurgical coal, producing about 3 million tons of coal each year that is suitable for converting to coke. The mine was out of commission until summer 2004. In earlier years the absence would barely be noticed, and U.S. steel companies could have imported coke from China. But with China now consuming all the coke it can produce there was little or no coke to be had on the open market. The coke shortage was severe enough that several steel companies cut production by up to a half even as prices climbed to the highest level ever. Their tonnage was missed, and supply remained tight. Now that the mine is re-opened, domestic steel production has increased.

The effects from the closure of the Pinnacle mine in 2003-2004 are very important, because there is currently an even larger coal mine outage. The text below is taken from February 13, 2005 report of the Energy Information Administration of the United States Department of Energy, as updated on February 17, 2005. http://www.eia.doe.gov/cneaf/coal/page/coalnews/coalmar.html

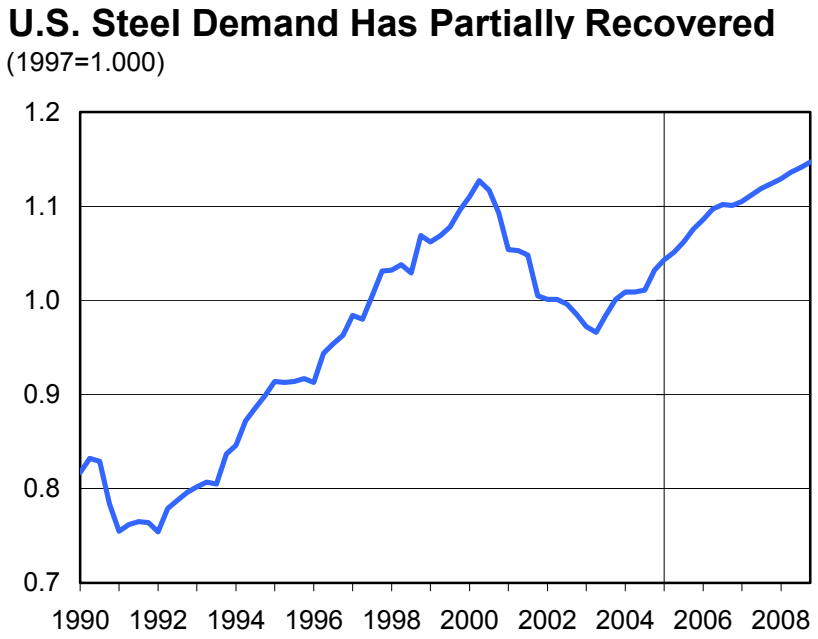
> At Consol's Buchanan coal mine in Virginia, the level of concern is high because the rockfall on Valentine's Day disrupted ventilation systems and sparked a mine fire, which continues to burn. State and Federal mine safety agencies accepted Consol's plan to seal nine shafts and several degasification wells in an effort to suffocate the fire (Coal Trader, February 16, pp 1,5). There is no information on how long the mine might be closed. Sometimes sealed mines, however, smolder for months so Consol expects to pump in nitrogen foam and water via boreholes to help extinguish the fire. Each borehole will take about 4 days to drill (Platts Coal Trader, February 17, pp 1,4).
>
> Any effects on coal prices from the Buchanan mine closing will hinge on the duration of the closure. Roughly 2 weeks' of stockpiled coal was on hand, from which shipments will resume soon. In the stock market, same-day adjustments affected prices of Consol's and competitors' stock. By February 16, steam coal prices in the over-the-counter (futures) market showed increased “buoyancy” attributed to the Buchanan shutdown, despite its product being metallurgical (met) coal (Argus Coal Daily, February 16, p 1).
>
> Logically, impacts of the shutdown might seem to be relevant only to met coal markets. If the mine stays closed for several months, affects would be significant in already tight met coal supplies. This mine supplies about one quarter of U.S. low-volatile met coal. Since most metallurgical coke is produced from blends of bituminous coals, however, a shortage in the low-vol coal supply could have a

multiplier effect on coke production if the low-vol component of trusted coke formulations falls short. Low-vol coal is not widely used to raise steam, so few steam coal mines have production to redirect to the low-vol met coal market. Coal customer experience last year found that coal supplies, even from large, well-run mines are interruptible. In 2004 coal customers experienced shortages related to delayed rail shipments, aging waterways, nonperforming coal contracts, bankruptcies and revalued coal contracts, and mine closures.

The most recent "unofficial" indications are that the situation is not as serious as it might be, and that the mine may be up and operating with one to two months. It should be emphasized that this is not official, but nonetheless is heartening.

If this mine stays closed for an extended period of time, it will have serious consequences to the supply side for domestic steel. In particular, it will hit integrated steel mills, the primary makers of high value sheet in the United States. Bar, structural, and plate would not be hit as hard.

(1.8) The final factor in the rapid escalation in prices during 2004 was higher demand. This rationale is very valid, but often misapplied. Demand in the United States, and indeed much of the industrialized world, is only in the recovery phase, and still far below the steel needs of the cyclical peak of late 2000. The real increase in demand goes back to China. A boom in construction, along with rapid industrialization and outsourcing, is causing Chinese demand to increase by more than 20% per year, or about half of the total U.S. output each year for the past four.



The factors cited above manifested themselves in the United States in the form of extremely tight inventory. Buyers were legitimately concerned about having to close production lines for lack of steel. Mills took full advantage and raised prices continuously. Now that inventory

has passed from deficit to excess, prices are declining and will continue to do so through 2005 and 2006, although at a slower pace than the original increases.

One factor that bears discussion is the consolidation of the steel industry. Consolidation did not lead to the price increases. As the above analysis should make clear, price would have increased in 2004 no matter how many steel companies there were, for the real issue was ore and coke supply, not furnace capacity. However, as raw materials supply normalizes and prices begin to decline, consolidation will have a major effect in slowing the pace of decline, and most importantly in putting a floor under prices.

When there were 50 steel companies in the United States, each too small to have individual influence on the market, the incentive was to operate at full capacity and let prices move where they may. Now that there are effectively two large and three medium integrateds, and effectively one large and three or four medium electric furnace mills, it is likely that there will be adjustment of production in order to defend prices. The practical effect will be the end of super-bargain prices available during the periodic price crashes, but also there will be more stability and less risk to holding inventory.

Requirement 2: A thorough analysis of the surging steel demand in China and its impact on the both the U.S. and global steel markets, identifying long-term trends and potential impacts for our domestic steel market.

Steel demand in China is the most important single factor in the current global steel market. From being one of several important players in the early and mid 1990's, China is now by far the most dominant steel producer and consumer in the world. China's appetite may slow, but it is not yet satisfied and will not be for at least another decade, probably longer.

This study will first look at an overall macroeconomic forecast for China, and then look at what this means for the steel industry.

(2.1) Macroeconomic Outlook The economy will maintain strong momentum into 2005, at least in the first half of the year. Economic growth regained momentum in the final quarter of 2004. Export growth is showing no signs of cooling, with external demand still healthy, particularly in the all-important U.S. market. Consumer demand has remained steady. Most importantly, there are indications that the government has relaxed on the austerity measures—liquidity growth has picked up again in recent months after nearly a year of deceleration.

Despite the overheating, there remain substantial deflationary forces in the economy, reflected by consumer price inflation's sharp deceleration in recent months. The government therefore fears that too much tightening could revive deflation and damage domestic demand. As a consequence, Beijing will remain cautious in its economic policies on all fronts. Fiscal priming will continue, although at a more moderate pace. Monetary conditions will remain accommodative. The increasingly controversial fixed exchange rate policy is also likely to remain longer then we previously expected. Despite hot money inflow's continued pressure on domestic liquidity growth, the government's worries over deflation and the lack of strong non-state domestic demand is likely keep the renminbi peg in place for a while.

In sum, over the short- to medium term, growth will moderate, but remain strong. There will be no out of control inflation as in the past overheating cycles. Price increases are likely to be mild. The fixed exchange rate policy is here to stay for at least another couple of years, though the benefits of such policy has been steadily eroding.

(2.2) China Exchange Rate Analysis We believe that Beijing will maintain its renminbi peg to the dollar for another two or three years. The government is still concerned about deflation and the structural weakness in non-state domestic demand. Consequently, it is highly undesirable at the moment to alter the fixed exchange-rate policy, given that all alternatives would lead to a more expensive renminbi, which is deflationary, as well as making exports less competitive (devaluation is basically unacceptable in the international community). This does not mean that the fixed exchange rate is not causing problems for China. Most fundamentally, as Beijing has gradually relaxed capital movement restrictions while continuing to hold onto the currency peg, China's monetary conditions have become increasingly dependent on US monetary policy, which is not always in synch with China's macroeconomic conditions.

Moreover, in addition to generating increased trade friction, the fixed exchange rate has also exacerbated China's accelerating liquidity growth/economic overheating problems. It is therefore clear that the costs of maintaining the peg are gradually catching up to the benefits. Given that there is much uncertainty revolving a currency policy shift, stability-oriented Beijing is thus unlikely to make the change any time soon.
To examine Beijing's exchange rate policy more systematically, there are essentially six policy options available to the government:

1) Revalue the renminbi.
2) Widen the renminbi trading band.
3) Free float the currency and open the capital account.
4) Repeg the renminbi to a trade-weighted basket of currencies.
5) Adopt a managed float system.
6) Maintain the currency peg, while offering an outlet for foreign exchange earnings and finding ways to relieve appreciation pressures.

The Chinese government thus far has adopted the last policy option, by encouraging more domestic firms to invest overseas, allowing exporters to retain more foreign exchange earnings, and cutting export tax rebates. It has chosen this option because the other alternatives are not immediately viable.

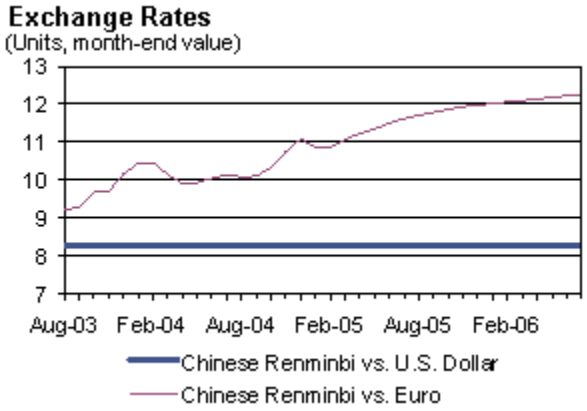
Option 1 (revaluation) is problematic because in order for a revaluation to be credible it needs to be large enough, since it is widely believed that the renminbi is undervalued by some 20–40%. A small revaluation would almost certainly induce more “hot money” inflows and fuel speculation over further revaluation, which would exert more pressure on China’s liquidity growth. A large revaluation, however, would place the Chinese economy in a precarious position, since exports are the only non-state source of economic growth.

Option 2: A much recommended exchange-rate policy option by analysts and the press has been a widening of the renminbi’s trading band. But this alternative is also problematic in the near term. Again, too small a widening would not only offer insufficient relief to the trade

and liquidity imbalances, but also encourage speculation of a further widening of the band; too large a widening, on the other hand, runs the risk of the renminbi appreciating to levels harmful to export growth.

Option 3: currency flotation and capital account liberalization—is also not a viable option, because of China's effectively insolvent banking sector and underdeveloped financial system. Should Beijing open up the capital accounts and allow foreign banks to conduct renminbi business, the more efficient foreign banks will be able to offer higher interest rates to Chinese depositors. This could create a bank run and risk a collapse of China's state-owned banks. Moreover, as economists Ronald McKinnon and Gunther Schnabl have pointed out, free floating the exchange rate under an underdeveloped financial system would be extremely volatile.* The reason is that for an economy like China that lacks a well-developed bond market, interest-bearing bonds of various term structures are not available to cover its currency forward contracts. As a result, natural market makers for foreign exchange cannot exist. Floating an exchange rate in an economy without natural foreign exchange market makers would be excessively volatile.

The option of repegging the renminbi to a basket of currencies (option 4) is another alternative that has been frequently suggested. However, as McKinnon and Schnabl indicated, the basket peg option is also undesirable for China. Because the country still lacks a developed financial market, Chinese firms engaged in merchandise trade cannot buy renminbi forward contracts to hedge against exchange-rate risks. But since much of China's trade is quoted in dollars (even trade with non-U.S. partners), the government can provide an informal hedge by keeping the yuan-dollar rate stable. Trade quoted in other major currencies could be hedged by purchasing forward contracts of those currencies against the dollar and then converting to the domestic currency through the pegged rate. So, if Beijing repegs the renminbi to a basket of currencies, exchange rate hedging would no longer be possible.



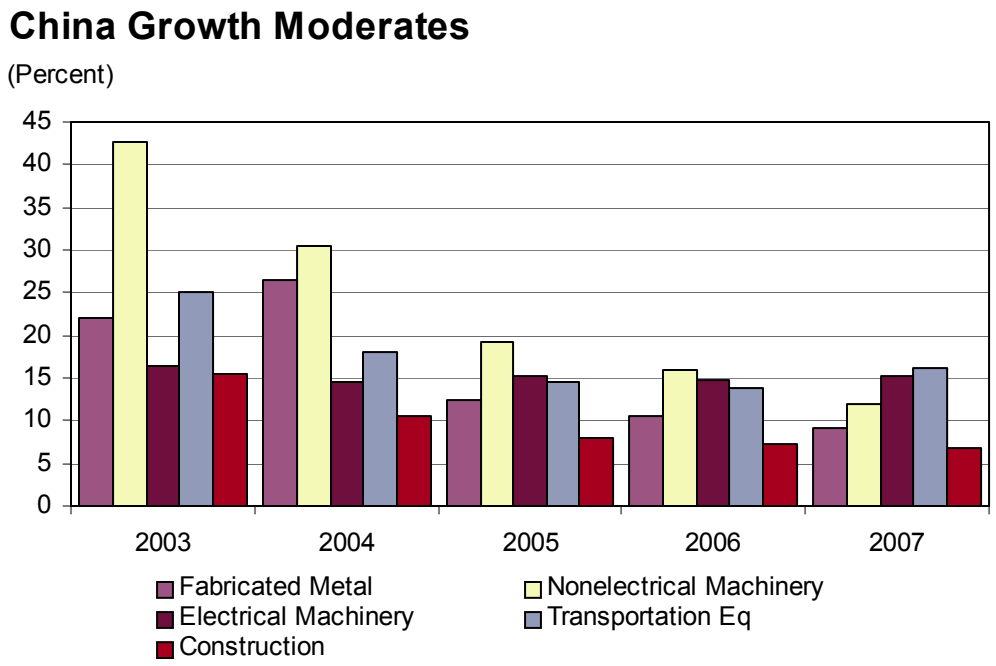
Therefore, until appreciation pressures subside and China's financial system becomes better developed, Beijing will be very cautious about moving on the fixed exchange rate policy. Moreover, despite recent revaluation rumors, the recent risk is actually tilted more heavily toward Beijing prolonging the fixed exchange-rate policy. It is trying to engineer a soft landing for China's overheating economy. In the past, when the government tried to contain overheating, it would devalue the currency, because the source of the overheating was always domestic. Thus, the government needed export growth to offset its austerity measures. Right

now, the international political pressure on Chinese exports obviously makes it almost impossible to devalue the renminbi. But it is understandable if Beijing chooses to keep the fixed exchange-rate policy to maintain export competitiveness, while they try to dampen domestic investment.

Nevertheless, the fundamental policy conflict exposed by the current overheating episode remains. China's capital account has become increasingly porous as a result of the government's incremental liberalization measures on capital movements (especially the recent moves to encourage fund outflows). Consequently, the country's monetary-currency policy mix has gradually come to resemble what is sometimes called the macroeconomic "trilemma"—a country cannot simultaneously maintain a fixed exchange rate, independent monetary policy, and open capital account. The result is a fixed exchange rate that is under pressure with greater frequency. In addition, China's monetary conditions have fallen increasingly under the influence of the US Federal Reserve. Indeed, the results of a simple regression of China's M2 money-supply growth on the US federal funds rate over the period June 1995 (when the renminbi was pegged at 8.3 per dollar) to the present show the fed funds rate coefficient becoming increasingly significant, and negative (i.e., a lower funds rate causes Chinese M2 growth to jump), when the sample starting point moves past June 1996.

It is inconceivable that Beijing is willing to defer monetary policy decisions to Washington, since China's business cycle is often not in sync with the US cycle. Therefore, unless Beijing is willing to reverse its capital account liberalization moves, alternatives to the fixed exchange-rate regime must be seriously considered over the medium term.

** McKinnon, Ronald and Schnabl, Gunther (2003), "The East Asian Dollar Standard, Fear of Floating, and Original Sin," Stanford University, Department of Economics, Working Paper 03-007.*



(2.3) China's Impact on Steel. A major impact of Chinese demand on the global steel market is felt at the raw materials point. There is more demand for steel than can be satisfied by current mine and coke oven capacity. Output by steel consuming industries is literally constrained by lack of steel, and steel production cannot be increased faster than new mine and coke capacity comes online. China is single-handedly responsible for 61% of the increase in global steel production since 1995. While Central and Eastern Europe will see faster growth rates in the next several years, China is so much larger that it will continue to have the highest tonnage increases.

For China to get the steel it craves, other countries must do without. This is literally what happened to the United States in 2004, when tonnage that would normally have flowed to the United States at a low price, was diverted to China at high prices. To obtain necessary imports, the U.S. had to bid against the Chinese. As prices rose, other countries exported steel to the U.S. and China, and had to forego production from steel consuming industries.

The current Chinese steel industry is two different industries in one country. Many mills are from the Mao era. They were built for politics as much as for efficiency; they use far too much worker hours per ton; they have high waste ratios of the physical inputs such as ore and coke; and the steel they produce is of inferior quality. In short, they are old, polluting, inefficient, and have sub-par profit margins. But since they provide jobs, and since steel prices are so high that almost any furnace can turn a profit, these mills are still in operation.

The mills built in recent years as the Chinese industry expanded are a different story. Many are less than ten years old, so they use modern technology and are a long time away from wearing out. These mills are looking to serve end markets that demand higher quality steel, such as motor vehicles and appliances. Thus, the steel is beginning to be on par with the best in the world.

The era will soon end where anyone in the Chinese steel industry could make money, no matter how inefficient they were. Raw materials are expensive. New mines will bring prices down somewhat in late 2005 through 2007, but they will remain above old levels. As China tightens credit the inefficient mills will find it difficult to maintain profit margins. The Chinese government wants to curtail steel production and curtail pollution. Older mills would already be closed if local governments did not fear the unemployment of the workers. Local governments subsidize inefficient mills as make-work programs, despite efforts of the central government to pare back. There are clear signs that the central government will not continue to tolerate local defiance.

Within two to three years, China will begin a program of currency revaluation. The RMB will rise in value, making Chinese exports less competitive and imports more of a threat. The revaluation will have a negative impact on most of the Chinese economy, for it is heavily dependant on exports. As demand for steel grows at a slower pace and pricing pressure increases the older, less efficient mills are likely to close. This process occurred in the former Soviet Union (FSU) in the early 1990s, where steel production went from near 150 million tonnes per year to under 70 million. The FSU rebounded, with about 115 million tonnes in 2004, much of it newer and more efficient. China will follow a slightly different path. Total tonnage will not decrease, there will just be slower growth as new mills supplant old ones.

The net effect of currency revaluation on AEM/FEMA/NAEDA will be positive, but it will be bad for the purchasing department. A revaluation by China will make the dollar even weaker, and prices will be higher than otherwise. Prices will be falling, but they would fall farther if China did not revalue. However, a China revaluation will make it much easier to raise prices for finished products. Thus, costs will increase, but prices should increase more, giving a net positive to margins.

Steel mills have great fear that China will turn into an exporter and flood the world markets with cheap steel. This is possible over a short term horizon (two quarters, three at max) but not on a long-term basis. If prices did fall precipitously all mills would see sharply lower revenue. Because raw materials will remain tight, their price will fall less than finished steel, squeezing margins. The margin squeeze will finally force the older mills out of business, a process that will be going on in the rest of the world at the same time. The closing of capacity and curtailing of output will serve to curtail global supply, and allow prices to rebound.

Requirement 3: An analysis of other potential global factors that could affect steel prices.

Beyond China, there are other global factors which could affect steel prices in the short, medium, and long term. The largest factor is India, which will be discussed in the medium and long term section

Short Term

One factor which will not have appreciable effect on steel prices is the December 26 tsunami. The tsunami was a human disaster of horrible proportions. But economically it will have little effect. Most of the areas destroyed did not have significant heavy industry. Moreover, most of the rebuilding will not be steel intensive. It is outside the scope of this study, but there is the interesting question of whether rebuilding will stimulate demand for construction

machinery that would work to benefit AEM/FEMA/NAEDA.

In the short term, there is a real risk that Western Europe and Japan will sink back into stagnation, and a slight risk of recession. Petroleum prices are having a large impact. Each of these areas are almost completely dependant upon imports, so the rise in petroleum means wealth is flowing out of Western Europe and Japan, heading to OPEC. The only saving grace is that oil is priced in dollars, so the strong euro and yen mean oil is cheaper than for the United States.

Western Europe and Japanese growth continues to disappoint. There are structural problems, primarily regarding labor. While American workers may envy the generous vacation and benefit packages European workers get, unemployment hovers near 10% in many of the major economies there. It is difficult for American workers to compete with low wage rates in China and Asia. It may soon be impossible for European workers to compete.

If Japan and Western Europe stagnate, it will make steel prices marginally lower, but it will hurt demand for finished AEM/FEMA/NAEDA products. The weak dollar is opening Japan and Western Europe to exports from the United States, so weak demand means a potential export market will wither.

Another short term event to consider is the lowering of tariffs. There are highly restrictive steel tariffs and quotas against two of the world's lowest cost producers, Russia and Brazil. These measures are up for review. When hot rolled sheet sold for $260 per ton, it was easy for domestic steel mills to say they needed protection. Now, as hot rolled sheet sells for $640 per ton, and was over $700 late in 2004, it will be easier for buyers to demand lifting of controls than it will be for sellers to justify retention.

The most rapid growth in the next several years will come from Central Europe (Poland, Slovakia, Czech Republic, Hungary) and Eastern Europe (Ukraine, Russia). The entry of Central European countries into the EU will allow them to compete directly with western countries. Given the lower wage rates, the competition will be fierce. These countries need to invest in infrastructure to modernize Communist era factories, so there will be demand for construction grade steel, and possibly for construction equipment. Much of the European auto industry will eventually migrate to Central Europe, and other heavy industry may well follow.

As the steel mills of Central and Eastern Europe are privatized, the buyers have been American (USX bought mills in Slovakia and Serbia) or Western European (Mittal bought mills in Poland and Kazakhstan, and is looking at Ukraine and Russia). The combination of western management and local labor rates will mean higher steel output at a lower cost per ton.

Medium Term

In the medium term India will be the dominant topic. Everything that China has done to the global steel industry in the past three years, India will repeat over the coming decade. China had a huge population, generally well educated, living in relative poverty and not fully utilized, and a government that has embraced a market economy. India has a huge

population, generally well educated, living in relative poverty and not fully utilized, and a government that is beginning to embrace a market economy. China grew in the 1990s and busted out in 2001. India is growing, and will bust out sometime in the next few years.

The path of Indian growth will be similar to, but not exactly the same, as that of China. China retains more control of the private life, but less of the economy, than does India. India is a highly regulated economy that is just liberalizing. The fact that many onerous economic controls will linger, while there is intellectual freedom, implies that India will have higher growth in services and lower growth in goods. This is not to imply that India will not have growth in steel and heavy industry, just that it will not be as spectacular as in China. But if there is outsourcing of customer support and programming, it will occur in India, not China.

What does this mean for steel? India will see growth in the steel industry, but nothing like China experienced. However, the effect on the global steel industry will be the same. If India does not make cars and appliances, it will still import them from somewhere else as incomes rise. That is, India will drive steel demand through imports of steel containing goods, rather than through production or imports of steel. And with a population almost as large as China, there is much upside.

Because of the increased demand, the forecast trend for steel prices is positive, reversing the long declines of the 1990s. As China continues to grow strongly, and India enters a period of rapid growth, there will be more pressure on raw materials. The mine expansions currently underway will just be enough to furnish global demand given the Chinese economy. To furnish India as well, there will have to be another round of expansion. It is quite probable that there will be another spike somewhere in the future, for much the same reasons as the current one. The spike will be followed by another round of mine expansion, again alleviating the pressure.

Requirement 4: An analysis identifying policy options for both the private and public sector that could be employed to stabilize or reduce steel prices in the near- and medium-term.

(4.1) Further Devaluation of the U.S. Dollar. The devaluation of the dollar will cause hardships to your purchasing departments, but will be a net positive to your companies. Input materials cost more with a weak dollar, but sales opportunities and pricing power rise. Unless and until the dollar becomes so weak that it sparks harmful inflation, a continued weakening of the dollar should be viewed as a positive.

That being said, it would be disastrous for the Chinese to completely revalue their currency in an immediate, abrupt step. It is a classic case of "Be careful what you wish for, you might just get it." The analysis is as follows:

> The dollar has weakened greatly against many currencies, particularly the euro and the yen. However, the current account deficit (essentially, the sum of years of net imports) is approaching a dangerous level of near 6% of GDP. Other countries that approached this level have seen currency meltdowns. So, the dollar is vulnerable to further rapid devaluation.

The Chinese government has a tiger by the tail. They extended too easy credit, creating an asset bubble and banks with portfolios of bad loans. Think of Japan and real estate in the late 1980s and early 1990s. The only reason that the Chinese banking system hasn't come crashing down is that China is a huge net importer, and foreign currencies are re-stocking banks with money.

Now look at what happens if China suddenly revalues. The revaluation would probably make the Chinese RMB worth up to 30% more vs the dollar. As Chinese exports suddenly shrink the Chinese banking system could literally collapse, reminiscent of the U.S. banking system as we plunged into the Great Recession. At the same time, the U.S. dollar drops 30% against the yuan, and sets off panic selling against other currencies. The dollar could plunge as the Thai baht and Korean won did in 1997.

To defend the dollar and prevent hyperinflation, the Federal Reserve would have no choice: it would have to abruptly constrict the money supply, and raise interest rates well into the double digit range. Export markets would be captured by the United States, but those markets would constrict as the global economy shrank. And with double digit interest rates and tight money supply, the United States would see a true, deep recession in construction, business investment, consumer durables, and every other interest rate sensitive sector. Domestic companies would have the market to themselves, but the market would not be worth having.

(4.2) Consolidation of the Steel Industry – A Dual Edged Sword. For stability of prices, the trend toward consolidation should be encouraged, although this would mean less bargains available during steel market crashes. A consolidated industry will be able to vary production to stabilize prices, which is good. Inventory held by buyers would see less fluctuations in value, and planning could be conducted on a more rational basis. Moreover, a healthier steel industry will assist in ensuring long-term availability of supply. On net, the pain from spikes should be worse than the gain from crashes, so this is likely positive for steel buyers.

To encourage consolidation buyers should be ready to withhold objection to all but the most abusive domestic mergers. As long as there remains international competition, domestic mergers should be relatively benign. If one company is able to monopolize a market, then such a merger should still be resisted. It is doubtful that a large market like merchant bars or hot rolled carbon sheet could be monopolized, but there will always be a danger for thinly traded and produced specialty products such as exotic alloys or special sizes of stainless.

(4.3) Steel Trade Protection – Anti-dumping, Quotas, and Voluntary Restraints. The incredible price spike of 2004 has removed most of the wind from protectionist sails. Rarely has there been a better time to petition the International Trade Commission in opposition to anti-dumping penalties, quotas, and tariffs. A legitimate action against dumping should not be opposed, for dumping is an unfair trade practice. But much is labeled dumping which may not really meet the definition. With steel companies completely unable to claim current economic hardship, an objective look at current anti-dumping penalties that face sunset review might yield favorable results.

Trade, and remaining on the radar of Congress and the International Trade Commission, are

very important arenas for action. When Section 201 tariffs were proposed, many analysts (this one included) were shocked by how little negative reaction there was from steel buyers. After the imposition of Section 201 buyers became much more active and vocal, and applied pressure that helped to have the tariffs lifted. The lifting of Section 201 could be considered a first step, with more rational application of anti-dumping laws and the sunset removal of tariffs still to go. Continued contacts with Congress are key in trade issues. If people don't object, Congress assumes either a policy does not cause harm, or it doesn't cause enough to cost votes.

The Knollenberg Resolution is a good start, but resolutions are non-binding. Mandatory evaluation and consideration of the interests of buyers in trade cases is the next step, and the step that would truly make a long-term difference.

(4.4) Expansion of Port Facilities. Expansion of port facilities will be an important factor in coming years, but the most crucial bottlenecks are foreign, and thus will be difficult for domestic initiatives to have an effect.

The supply of raw materials for making steel will increasingly have to be imported, as North American ore and coal deposits are strained to their limits. Increases in port capacity will help with the import of raw materials, and will also aid in the export of AEM/FEMA/NAEDA finished output. The port problem is far more acute in other nations than in the United States. China is pushed past the limit, with ships having to circle at sea until dock space comes open. Brazil and Australia are also in need of expansion, as the demand for their iron ore grows.

(4.5) The Jones Act. The issue may never actually be acted on, for the proponents are steadfast and the opponents are not as strong. The Jones Act is a World War I era bill that requires only American flagged and crewed ships to be able to carry cargo between U.S. ports. The intent is to protect the U.S. maritime industry. However, there are almost no American flagged freighters. Rather than protect domestic shipping from foreign competition, the Jones Act simply destroyed domestic shipping and pushed cargo to alternatives such as inland waterways, trucking, and rail. The Jones Act drives up costs for steel makers and every other industry that uses, or would use, seagoing freight in the United States. As such, it is a burden not only to the steel industry but to steel consumers. It is not an accident that large volumes of scrap from Philadelphia head to Turkey instead of to electric furnace mills in the Southeast. I believe repeal of the Jones Act to be a worthy goal, but the effort is a bit like tilting at windmills.

(4.6) Prevention of Radioactive Scrap. An issue that is of more interest to steel companies than to buyers is the prevention of the Department of Energy from selling scrap that was used in nuclear reactors. However, if steel buyers are purchasing potentially radioactive scrap, it lowers your confidence in your products, upsets your customers, and eventually drives up costs. Steel companies want to keep reactor scrap completely out of the market. Initially, DOE wanted to sell scrap from nuclear facilities without notifying end users, but has backed off of this position. It remains very important that such scrap not be allowed into the stream of commerce, else steel from electric furnace mills will become suspect in the eyes of consumers.

(4.7) Limiting Scrap Exports – A Bad Idea. As seen in section 1.3 above, scrap exports increased greatly in recent years, and were a contributing factor to the huge increase in scrap prices. In response, there have been proposals to limit scrap exports, so that steel mills in the United States could obtain supply at a lower price.

This is an unwise course of action for several reasons. First, AEM/FEMA/NAEDA will see export opportunities climb as the dollar continues to weaken. As such, you should be constantly on guard for any action that could lead to retaliatory trade barriers from trading partners. AEM/FEMA/NAEDA will be able to undercut foreign makers on price, and these foreign makers of equipment would be all to happy to use scrap exports as a tool to impose export restrictions on U.S. made equipment.

The second reason for opposing export restrictions is that they are simply unfair. No member of your associations approve of a law preventing exports of equipment just so that buyers in the United States could get a below-market price. Yet that is exactly what the scrap export restrictions would do.

Ukraine has imposed restrictions on scrap exports, and is facing retaliation from the European Union. Interestingly, one target of retaliation is exports of finished steel, so the mills who pushed for scrap restrictions are facing some of the greatest losses. Truly a lose-lose situation.

Staff

The staff proposed for the study includes John Anton, Principal and Director of the Global Insight Steel Service, and David Eil, Associate Economist, within the same group. Biographies of these two individuals are provided below.

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Overview:

John Anton is the director of Global Insight's Steel Service and the ferrous metals industry analyst for the firm's Pricing and Purchasing Service. The outlook for steel production is formed by close monitoring of the industry and contact with executives at steel makers and end users. In addition to producing regular forecasts of steel production, demand and price, Mr. Anton is also responsible for managing Global Insight's relationship with major steel clients, including the some of the largest mills in the United States, Japan, and Europe.

Topics for Discussion:

Anton's specific issues and areas of expertise include:

- Supply, demand, and prices of a broad range of steel product grades and end markets
- The effects of trade actions and tariffs on the steel industry
- Steel industry consolidation, and the impact on supply and prices
- The growing internationalization of steel producers and consumers

Professional and Educational Background:

Mr. Anton joined Global Insight in 1995. Prior to that time, he was in the private practice of law, specializing in small business representation and in criminal defense work. Before attending law school, Mr. Anton worked three years at the Bureau of Labor Statistics as an Economist/Statistician.

He received a B.S. in economics from the Florida State University and a J.D. from the Marshall-Wythe School of Law at the College of William and Mary.

Public Profile:

In addition to his work with Global Insight clients, Mr. Anton regularly provides steel industry analysis to magazines and dailies such as *Purchasing Magazine, Investor's Business Daily, the Wall Street Journal,* and *Engineering News Record*.

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Overview:

David Eil is an economist with our steel and pricing and purchasing service. The outlook for steel and other industries is formed by close monitoring of industry trends, government policy changes, and the use of econometric models that quantify the relationships between pieces of data in the models that he manages. In addition, Mr. Eil produces regular forecasts health care goods and services pricing. Mr. Eil is also responsible for managing Global Insight's major multi-client health care study, *The Future of Employer Health Benefit Plans*, which is used by the DCAA.

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- The effects of public policy on the health care industry
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- The growing internationalization of the U.S. economy

Professional and Educational Background:

Mr. Eil joined Global Insight in January 2004. Prior to that time, he was doing economic analysis for anti-dumping cases before the International Trade Court. He received a B.S. in Quantitative Economics and International Relations from Tufts University.