5 December 2011 | 29 pages

Bulk Commodities

No Short-Term Recovery in Iron Ore Prices

- **Prices downgraded on weak demand** — We have downgraded our 2012 iron ore price by 7% to $148/t (TSI) on the back of a deteriorating macro environment. We were never convinced of the sustainability of the rally in early November, and this appears to be borne out in price action over the past couple of weeks. Major steel mills are still cutting capacity; which has shown up in the latest steel production figures issued by China's CISA showing that daily production in early November was 1.66Mt per day, equivalent to ~607Mtpy. Plus with inventories at relatively healthy levels in China, we can't see why Chinese steel producers would come back into the market aggressively this year.

- **A recovery not expected until 2Q12** — With an early Chinese New Year (23-Jan), it's conceivable that steel mills could shut up shop and not return until mid-February. Therefore we don't expect to see the typical end-of-year restock that is normally the case. But with the Chinese government indicating last week its willingness to stabilise the economy (by cutting the RRR by 50bps), we expect the steel industry to be a little bit more comfortable in reinvigorating capacity once it does return. This should result in a huge surge in steel output in 2Q12, and thus pushing iron ore prices significantly higher. As such, we have set our 6-12m price target at $165/t.

- **Further delays to supply** — Projects continue to be delayed due to a combination of high capital costs, regulatory issues and construction delays. As a result, our expected surplus in 2014 has been significantly reduced to only 14mt (down from 30Mt previously). The previously forecast surplus in subsequent years also been reduced.

- **Costs & freight to keep LT prices high** — We believe rising costs and the recovery of freight rates over the longer term to be supportive of iron ore prices. With capital intensity as high as $180/t, an iron ore price over $85/t FOB is required to produce an IRR of 15%. Therefore we have upgraded our forecasts for iron ore prices in the 2015-2017 period by an average 5% to between $110-$120/t CIF China.

- Commodities

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Figure 1. Change to spot iron ore prices

2011			2012			2013			2014		
Old	New	% Chg	Old	New	% Chg	Old	New	% Chg	Old	New	% Chg
173.2	167.1	-4%	160.0	148.8	-7%	135.0	135.0	0%	125.0	125.0	0%

2015			2016			2017			2018		
Old	New	% Chg	Old	New	% Chg	Old	New	% Chg	Old	New	% Chg
115.0	120.0	4%	110.0	115.0	5%	110.0	110.0	0%	108.0	108.0	0%

Source: Citi Investment Research and Analysis

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

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Short-Term Issues

October rally opportunistic in nature

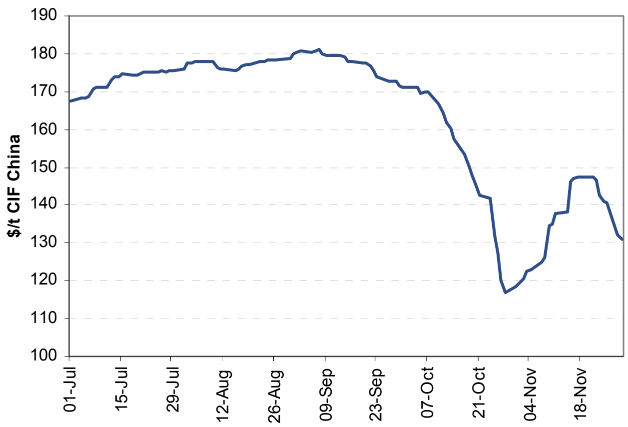
After holding up relatively well against the broad-based sell-off in commodity markets through the northern summer, iron ore finally succumbed to weakening macro economic environment and Chinese steel market. But what surprised us even more than the 35% fall in prices to $117/t, was the subsequent 26% bounce iron ore prices to over $148/t.

While we suggested back in October that prices of $120/t were indicative of a market in far worse condition than it actually was in, the recovery in prices was not indicative of the underlying condition of the physical market (Iron ore prices rapidly approaching key support levels).

We believe the rally was driven by some opportunistic buying my small steel mills in China. These mills buy the majority of their raw materials on the spot market, meaning that the fall in iron ore prices actually increased their margin almost immediately. This would have enabled these mills to offer a more competitively priced steel product as opposed to larger steel mills which are still being hindered by higher contract prices.

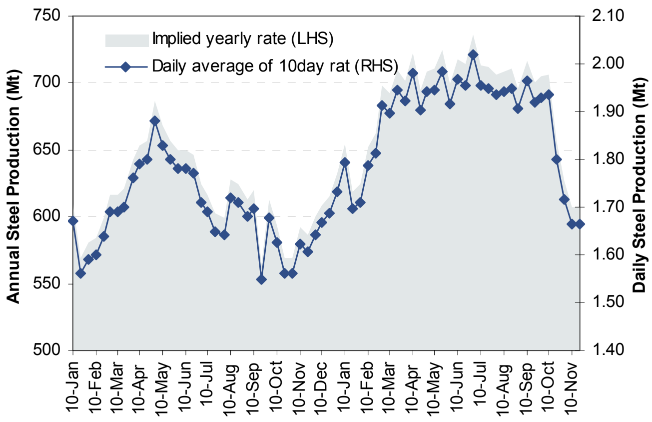
At the same time, after being flooded with spot material while the price was falling, major producers finally eased back on deliveries into the spot market and thus offers dried up in early November, helping create the strong demand for spot iron ore.

Figure 2. Iron Ore spot price has been on a rollercoaster ride in recent weeks.



Source: Bloomberg, Citi Investment Research and Analysis

Figure 3. China's daily steel production rate has plummeted over the past couple of months



Source: CISA, Citi Investment Research and Analysis

Demand is still slowing

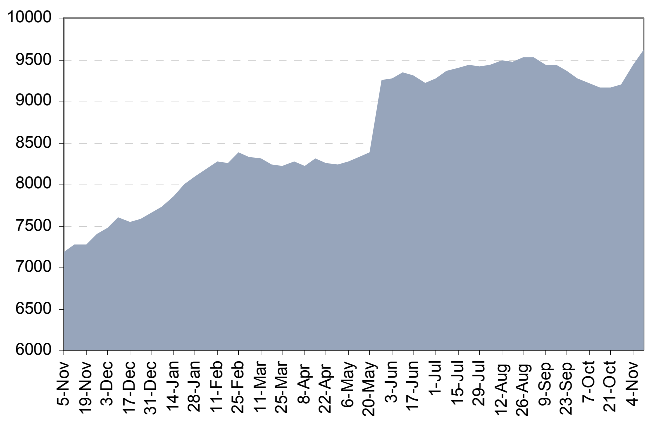
We remain unconvinced that this rally will resume any time soon. In fact, we believe prices are likely to drift lower over the next 2-3 months.

Major steel mills are still cutting capacity; which has shown up in the latest steel production figures issued by China's CISA showing that daily production in early November was 1.66Mt per day, equivalent to ~600Mtpy (Figure 3).

Inventories are also at health levels. Iron ore inventories at the ports have been steadily increasing all year. But the recent increase correlates with the bounce in prices in October, suggesting that some of this buying has not been for immediate

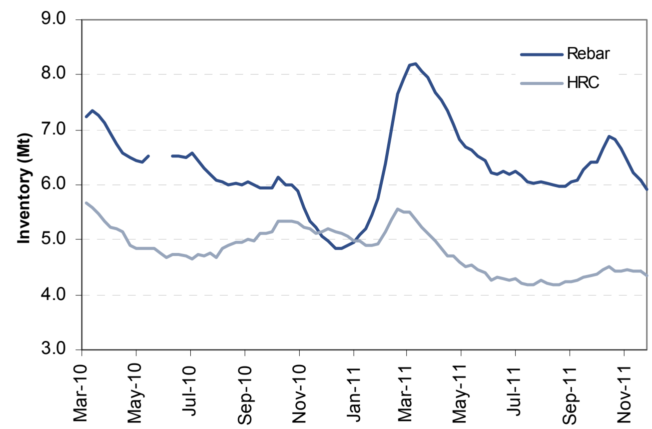
consumption (Figure 4). At the steel mills, inventory of rebar and hot rolled coil are at relatively comfortable levels, despite having fallen from historical levels seen earlier this year (Figure 5).

Figure 4. Iron ore inventories at the port are still on the rise



Source: Bloomberg, Antaike, Citi Investment Research and Analysis

Figure 5. Steel inventory



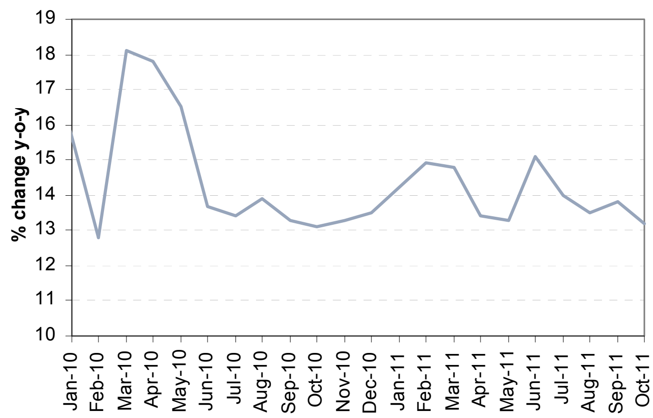
Source: Steelhome, Citi Investment Research and Analysis

On the macro front, we continue to be bombarded with negative indicators. Growth in industrial production has fallen from nearly 15% earlier this year to 13.2% in October (Figure 6). At the same time we have seen China's Manufacturing PMI fall below 50 for the first time since the GFC in late 2008.

Our China economists expect the Chinese economy to grow by 8.4% in 2012, down from 9.1% this year. Due to purchase restrictions, they also expect property investment growth to halve from around 30% this year.

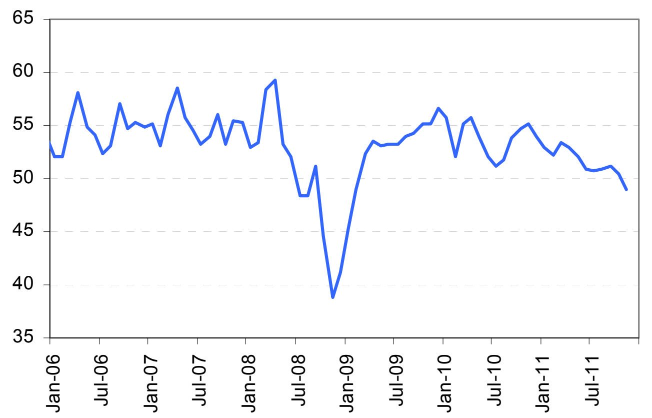
Therefore we can't see any reason why Chinese steel producers would come back into the market aggressively this year

Figure 6. Chinese industrial production



Source: Citi Investment Research and Analysis

Figure 7. China's Manufacturing PMI is close to contraction territory

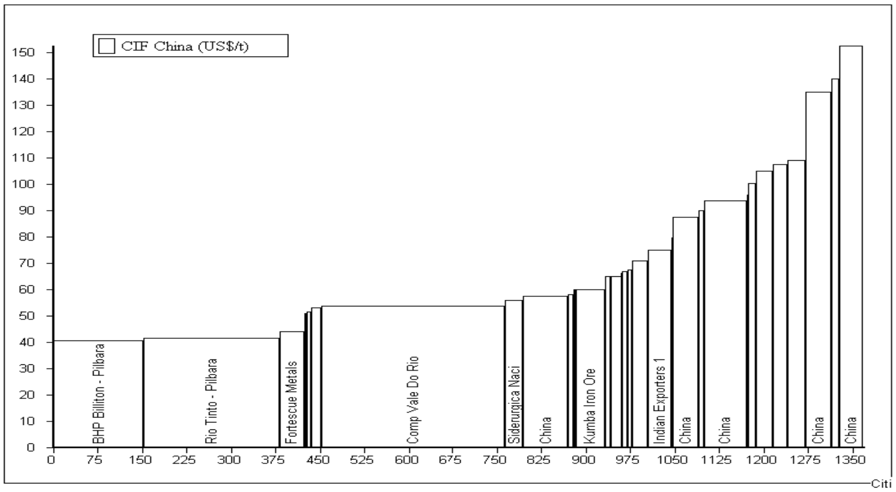


Source: Bloomberg, Citi Investment Research and Analysis

Chinese domestic producers not feeling enough pain

As we talked about earlier this year (Bulk Commodities - Iron ore prices rapidly approaching key support levels), prices fell well below key fundamental support levels and thus we expected high cost producers to react by cutting supply. And while Chinese domestic producers are relatively price elastic, the recovery in prices, since bottoming out at $117/t, has been so quick that it's unlikely that producers would be looking to suspended operations.

Figure 8. 2011 Iron ore cost curve – fines; $/t, CIF China equivalent basis



Source: Citi Investment Research and Analysis

We calculated that iron ore prices of $120/t implied a drop in Chinese steel production of 15% to less than 600Mt (last seen in 2009). Thus to balance the market, we would expect to see around 100Mt of iron ore cut from the market. This would largely come from the higher cost marginal producer in China.

Reaction from producers may be muted initially

The response of Chinese domestic iron ore production to volatility in the iron ore price in the past shows that production is genuinely price elastic. In late 2008-early 2009 a significant amount of production capacity was closed as prices fell. But this all occurred at much lower prices than we are currently experiencing. Back then, the price fell nearly 40% in the space of a few months and bottomed out around US$65-70/t, which resulted in closures almost immediately. But the industry and the cost curve was decidedly different, with a much flatter structure.

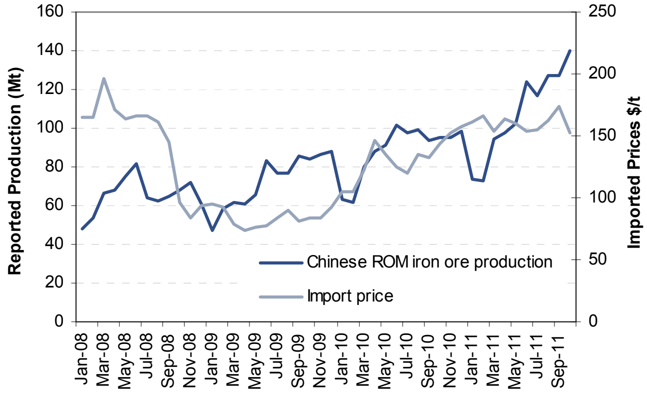
In our cost work above, we have identified a block of Chinese higher cost production with an average cost of $135-150/t which accounts for half of Chinese supply.

In reality, further price falls may not elicit a rapid response to curtail Chinese production. Facing short-run fixed costs, producers may be inclined to maintain production and operate at a short-term loss if they believe that demand and thus price weakness will be relatively short lived.

There are also mines that are captive to steel mills that will stay in operation, cushioned by their intent on driving down import prices. But these operations tend to be the lower cost iron ore operations and thus would need to significantly lower prices than we are currently seeing.

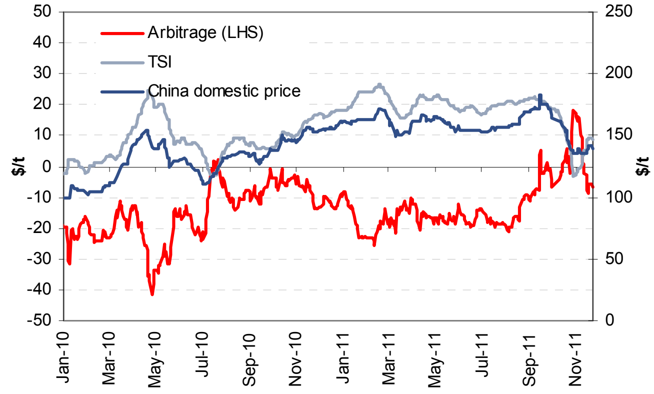
The latest data seems to indicate this remains the case. Based on crude steel production and iron ore imports, Chinese domestic iron ore production actually increased in October to 140Mt (based on average YTD Fe grade of 16%).

Figure 9. Chinese mine supply is relatively price elastic and should react to the current plunge in spot prices



Source: China's NBS, Bloomberg, Citi Investment Research and Analysis

Figure 10. Domestic prices in China are now higher than imported prices



Source: Bloomberg, Citi Investment Research and Analysis

Upside in prices unlikely before 2Q12

As a consequence, prices are likely to drift lower from here. Plus with an early Chinese New Year (23-Jan) just around the corner, it's unlikely we'll see any early 2012 bounce either.

Weakness will likely remain in 4Q11 as market overreact

Markets have been shaken by signs of slowing economic growth across the world. The headlines continue to be dominated by the euro-zone, where fears have grown of financial contagion from the periphery to the core economies. The political complexities of a bailout process preclude a rapid resolution. While catastrophic outcome is still only a tail-risk in our view, it has heightened since 1H'11.

In China, the inherent imbalances of China's export and infrastructure-led growth model are causing increasing risks of a hard landing. For steel and iron ore markets in particular, the weak supervision of the state-owned banking system at the provincial/municipal level may be incubating bad loans in the capital market system, serving as a potential trigger for a "sudden stop", in our view.

In the meantime, we also suspect that Chinese steel mills might be exaggerating the extent of the steel market weakness in an attempt to lower input costs as steel prices rollover. At the moment, steel producers are stuck with relatively high quarterly contact prices of $175-180/t, while spot prices are nearly $30/t lower.

As such, we would expect Chinese steel companies to pullback on any unnecessary iron ore purchases while prices are falling, in the hope that they can buy at a lower price in the future. This could take at least a quarter to wash through before they commence any restocking.

Going to spot prices immediately would allow Chinese steel companies to better manage their margins, especially as steel prices are falling. As a consequence, we would expect that they would be more comfortable in maintain current iron ore consumption through 4Q. But if these contract adjustments are made permanent, we rate the likelihood of Chinese steel companies taking up this new pricing structure on mass as relatively low.

Our base case remains that underlying demand in China remains robust and that over the next 3-6 months we would expect to see a bounce back in prices once macro economic issues stabilise. But for the remainder of the year, prices are unlikely to stage any sort of sustainable rally.

Supply

Delays continue to hit market

We have made some adjustments to our supply forecasts in our model to take into account delays to projects in Australia and Brazil, as well as lower production from India.

This has resulted in a significantly reduced surplus in 2014 of only 14mt (down from 30Mt previously). The previously forecast surplus in subsequent years has also been reduced.

Australia

The Oakajee port was projected to have a capacity of 45Mtpy and was schedule to start up in 2014 (reaching capacity in 2015). It had three foundation customers; Gindalbie's Karara project (which is under construction and will be using Geraldton port during its initial stage 1), Murchinson/Mitbubishi's Jack Hills Expansion Project and Sinosteel's Mt Weld.

But the first cracks started appearing last month when Sinosteel halted work on its $2 billion Weld Range iron ore mining project. The company said it made the decision based on setbacks in the progress of the Oakajee Port and Rail project.

This was followed by the release of feasibility studies into the development of the Jack Hills mine and Oakajee Port and Rail by Murchison. It showed an increase in capex for the mine to A$3.7b (up from $2b in March 2010) and A$5.94b for the port (up from A$4.4b).

The original capex for the total project when the deal with Mitsubishi was announced in 2007 was A$3b, based on construction starting in 2008 and first production in 2011.

Outside of Oakajee, the other critical development is Anketell Ports. Government approval was granted to Anketell Point in March 2010 for development of new deep water port (with a capacity of 115Mtpy) but given approval time frame and construction period, it's unlikely to deliver significant volume until 2015+.

Any slippage of these expansions will likely result in delays to over 70Mt of annual capacity in iron ore exports.

Figure 11. Port Expansion Summary

Port expansion status	Capacity Increase (mt)	Nominal Capacity (mt)	Date of anticipated completion
Port Hedland - Inner Harbour - 320mtpa	166	320	2012
Port Hedland - Inner Harbour - 470mtpa	150	470	2015
Port Hedland - Outer Harbour	400	400	2016+
Dampier	23	140	2010
Geraldton	16	20	2010
Esperance	11	18	N/A
Cape Lambert	123	180	2015+
Oakajee	45	45	2014
Anketell Point	115	115	2015+

Source: Company Reports, Citi Investment Research and Analysis

Brazil

Vale has been warning about delays to its projects for some time. In late June, it reduced its official 2015 iron ore production forecasts to 469Mt, from 522Mt. The company attributed the lower target to a slower ramp-up of Serra Sul S11D and a delay in the start-up of Apollo to 2015 (from previous assumption of 2014).

But just this week, Vale announced further delays. In particular, the Carajas +40mt expansion is delayed into 2H13 from 2H12. The Serra Sul +90mt expansion is delayed into 2H16 from 2H14. The net result will likely be that Vale's iron ore capacity remains in the 300-320mt range through 2013 – effectively unchanged in six years.

The original target was an aggressive one and the market had discounted it. But the revised targets show that the issue in Brazil that we have long talked about (including environmental constraints) about not abating any time soon.

Indian exports on structural decline

The Karnataka government had banned iron ore exports out of Karnataka with effect from 29 July 2010, in an attempt to curb illegal mining. The Karnataka High Court had upheld the ban in Nov 2010, hoping that the state government would be able to put in place measures to prevent illegal mining/transportation of ore within six months of the ban. A resolution was finally reached in April allowing the ban to be lifted, although the court placed some stringent conditions on the industry including a new mining law. This has resulted in very little iron ore being exported from Karnataka before the monsoon season set in. Therefore we expect exports to remain subdued until late this year.

We expect India's iron ore exports to decline approximately 15% to 101Mt in 2011 vs 118Mt last year. This would present 52% of production.

Longer term, we believe exports will be under pressure from a combination of logistical constraints, higher costs and increasing demand from the domestic steel industry.

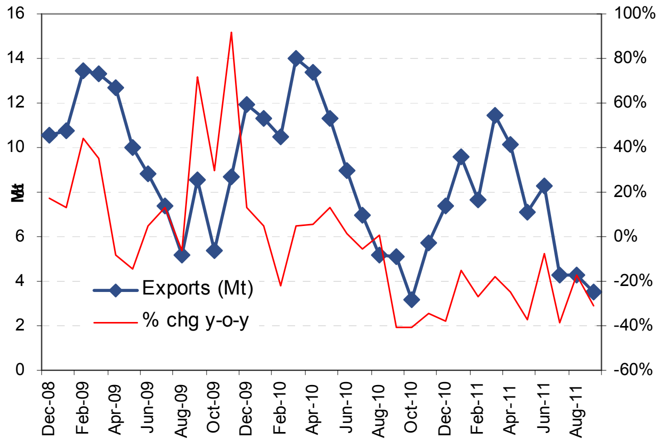
Logistic constraints

Shortage of adequate road/rail capacity is a problem across the Indian mining sector. Our discussions suggest roads/rail are currently operating at full capacity (there is material lying at the mines to be lifted). This results in producers limiting output at times despite having clearances. Not only is there a shortage of rakes, but there is a shortage of line capacity – particularly in Orissa. Some states have restrictions on the timing of the movement of trucks carrying ore. In Goa, ore can be moved only from 8AM to 6PM (Mon to Sat). Also, rail freight costs for iron ore exports have been rising, currently Rs2,500-3,000/t.

Higher export duty

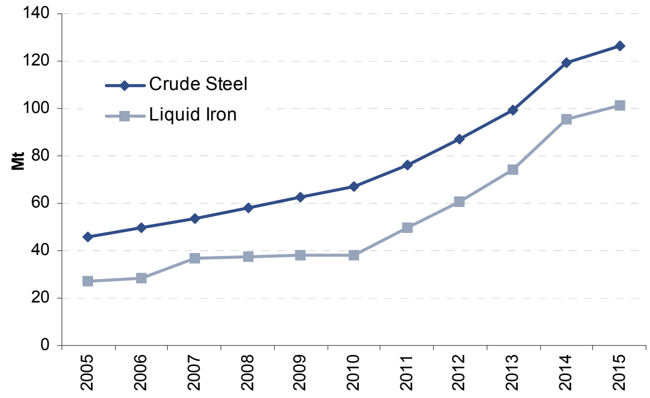
Export duty on iron ore fines was raised from 5% to 20% and on lumps from 15% to 20% in the Budget. Iron ore exporters are lobbying for a roll back and are hopeful of a positive outcome. Our industry source believes that ~10mt of pellet capacity is likely to be commissioned next year. Given the constraint on logistics – fines currently being exported are likely to be diverted for pelletisation and export volumes out of India should decline going forward.

Figure 12. Indian exports have fallen substantially this year due to a ban on illegal mining in Karnataka



Source: Bloomberg, Tex, Citi Investment Research and Analysis

Figure 13. Indian steel production is set to soar over the next five years



Source: WSA, Citi Investment Research and Analysis

Increasing domestic demand

Indian steel production is set for a boom period over the next decade (Figure 13).

Based on our forecast of crude steel production of over 125Mt in 2015 and 160Mt by 2020, India would need nearly 210Mt and 260Mt of iron ore respectively to remain self sufficient. For exports were to remain at around 100Mt, domestic production would have to increase by 10% per year over the next five years.

With domestic production currently at just over 200Mt and no shortage of resources (estimated to be in the vicinity of 30 billion tonnes) this target would seem achievable. But with the issues mentioned above buffeting the industry, we believe it's unachievable and thus expect iron ore exports from India to slowly decline over the next few years. In fact, we are currently forecasting exports to fall to around 65Mt by 2013.

This will undoubtedly keep the international seaborne market tight

Demand

Steel capacity growth slows

Our base case is for slowing capacity growth to tighten the steel market in 2013 (Figure 14). But until then, demand from developed economies is set to remain weak.

- We recently made a few changes to our steel supply/demand model. Our estimates for Chinese capacity have been revised up to 810mn tonnes in 2012, although the overall trend of sharply slowing capacity growth remains intact. Production is now forecast at 728Mt in 2012
- We have also factored in the capacity closures that have been announced in Europe, by and large from ArcelorMittal.
- Lastly, we have incorporated the lower GDP forecasts from Citi's economists.

We see the steel market staying oversupplied in 2012, although we expect the slowing capacity growth to result in a very strong steel market in 2013 and 2014.

China

In the short term, we believe steel prices, production and steel mills' profitability should all find a bottom. Restocking or demand recovery could trigger a price rally, and we anticipate this by 2Q12.

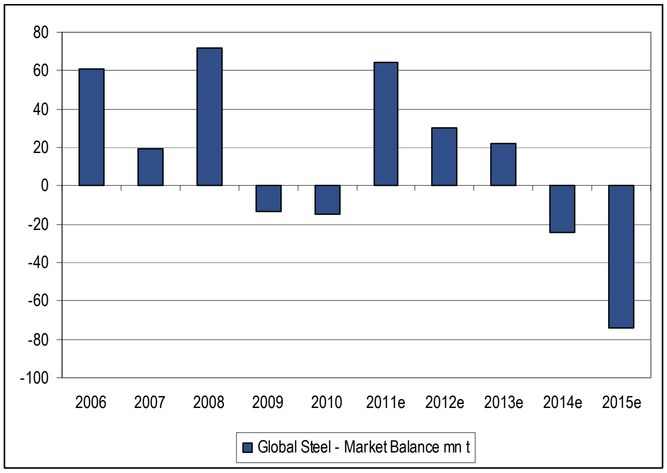
Longer term we remain convinced that China has reached peak capacity and that as economic growth begins to slow, steel output will revert to a more sustainable level.

Our analysis of US steel production from the 1960s to date tells us that US needs only half of its peak capacity, with the country moving to a post-development phase. We envisage peak production for China by the end of the 12th FY at around 850 Mt. Thus we calculate that China will only require about 425 Mt of steel capacity for the long term.

We forecast 5.0% growth in steel capacity and 6.7% of growth in demand in 2012. Utilization should trend up; however, the homogeneity of product and the irrationality of producers kill profitability.

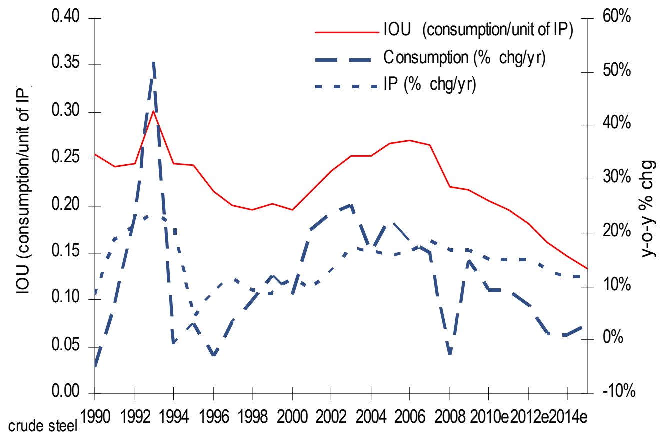
Capacity expansion is currently on hold; however, we do see new capacities ramping up, in the name of technology renovation, or environmental compliance replacing small furnaces with large ones. Hebei, standing alone, has a pipeline of 21 Mt, 13% of the existing capacity.

Figure 14. We see the possibility of a fairly tight steel market in 2013 and 2014



Source: CRU , IISI , Citi Investment Research and Analysis

Figure 15. China steel intensity and consumption forecast



Source: NBS, Bloomberg, Citi Investment Research and Analysis

Europe

The European construction market is very likely to have a very poor 2012, in our view. The last Euroconstruct forecasts stood at +4.4% growth in W. European construction in 2012. We think this number will probably be revised down and our own view is flat at best and down 2-3% realistically. Country forecasts that look most vulnerable to downgrades are France (+2.95 % forecast), Germany (+9% forecast), Italy (+6.6% forecast) and Spain (+5% forecast). With governments tightening their belts across the board, the hit should be much more on infrastructure and public sector spending, which are typically more steel intensive than residential construction.

North America

We see some marginal improvements in US construction data. Josh Levin, our US homebuilder's analyst, points out that the inventory of existing homes for sale has been declining for 8 months, and now stands at multi-year low.

The current inventory of 3.48mn homes does not include the so called "shadow inventory" of homes in or on the brink of foreclosure, but it is hard to put a negative spin on the drop in inventories. Josh argues that at the margin, the inventory statistics are bullish for US homebuilders and should help pricing.

US construction spending is also showing signs of improvement and the September housing starts data was the highest headline start since April 2010. The improvement was driven by multi-family starts – the rental market is strong and is attracting new construction.

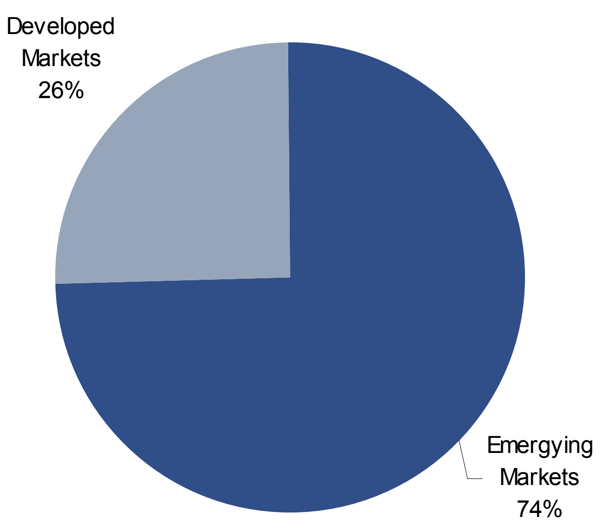
In the same vein as construction, auto demand from the US seems to be performing better than expected. Our US autos analyst Itay Michaeli notes that mid-October SAAR is running in the low 13 million level (flat/up slightly from Sept.) and the Japanese majors are regaining market share. We continue to look for 2012 SAAR at 13.9 mn units, up 8.5% yoy – a rare bit of good news for metal and steel demand in the western world.

Emerging Markets a Key Part of Bulk Commodity Demand

Despite markets downgrading expectations of global economic growth, we believe the bulk commodity markets should hold up relatively well as their exposure to developed economies is relatively low.

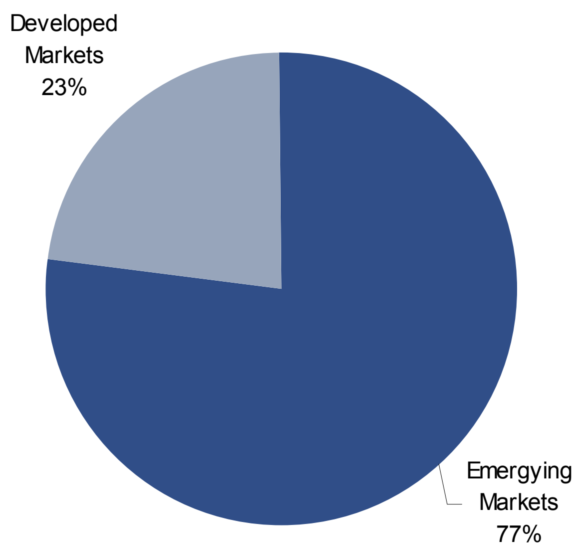
Like in most other commodity markets, emerging markets have been the driver of growth in bulk commodities in recent years. But in the case of iron ore, emerging markets are also the dominant consumer on an absolute level (Figure 16 and Figure 17).

Figure 16. Share of iron ore demand in 2011



Source: Citi Investment Research and Analysis

Figure 17. Share of iron ore demand in 2012



Source: Citi Investment Research and Analysis

We estimate emerging markets consume over 74% of all iron ore exported around the world. Because of China's dominance in the Asian steel market and its reliance on the international iron ore seaborne market, Chinese demand for iron ore makes up the bulk of the emerging market demand.

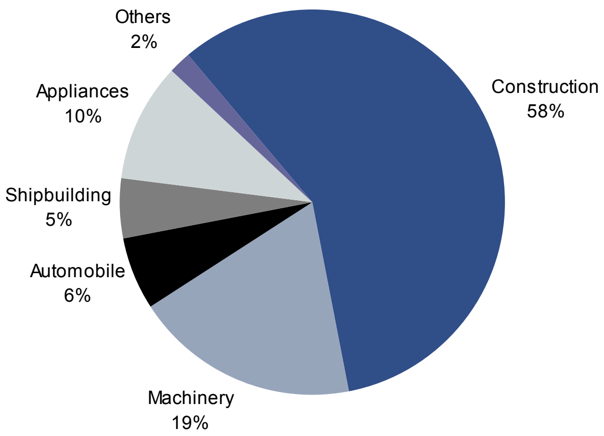
Domestic demand driving steel consumption in China

We estimate that the construction sector consumes approximately 58% of all steel produced in China. The next biggest sector is machinery, while appliances, shipbuilding and auto sector are also big contributors (Figure 18).

The construction sector would be largely driven by domestic demand, so there would be little effect from weakness in OECD countries.

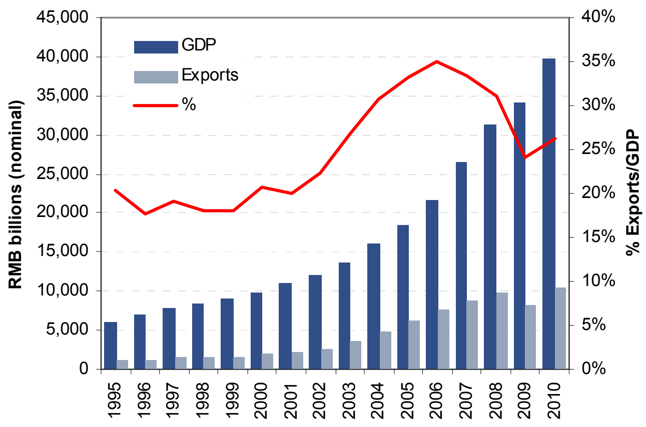
January-October fixed asset investment in China grew by 28.7% YOY, down from 34% in 1Q12, reflecting the impact of credit tightening. However, property investment and machinery investment was strong, likely reflecting social housing programs and increased investment in machinery due to higher labor cost.

Figure 18. Chinese steel consumption by sector



Source: Tex, Citi Investment Research and Analysis

Figure 19. China's exports as a % of GDP



Source: Bloomberg, Citi Investment Research and Analysis

While China's GDP has become less reliant on exports over the past few years, it still sits around 25% (Figure 19).

While construction is primarily domestic driven, there are still plenty of other sectors which have an export component. In particular, autos, machinery and appliances stand out as the sectors which would be exposed to a weaker outlook in the OECD.

If we assumed that 25% of steel demand in sectors such as Machinery and Appliances were exported, approximately 70Mt of steel (in 2011) would be exposed to developed economies. This represents approximately 10% of current output.

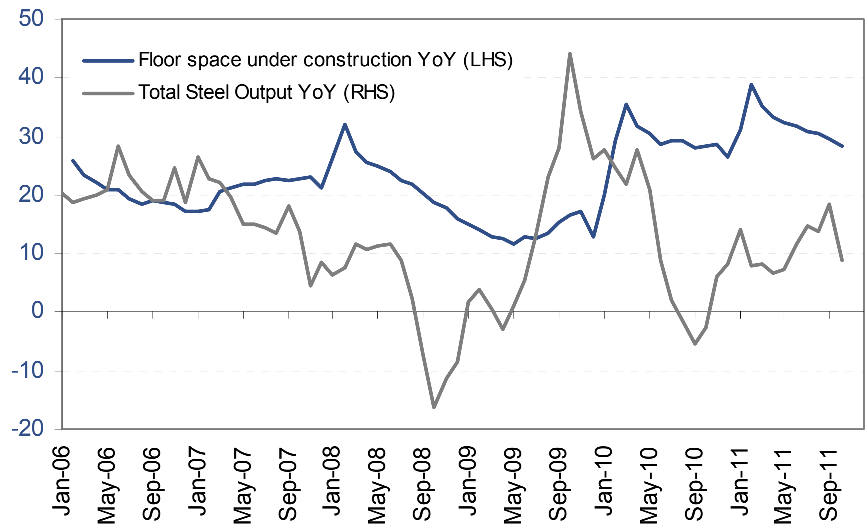
Slowdown in housing will hit iron ore demand…

The property sector has been the top target for the central government's tightening since 2007 and the government continues to show strong determination to cool the sector.

According to NBS, national property sales in Oct 2011 were RMB451bn, down 10% YoY, which led to slower Jan-Oct 2011 of 10% YoY growth. Overall sales momentum continues to slow and the physical market is weakening as expected, especially in tier 1 & 2 cities with home purchase restriction. Since April, our Chinese property analysts find the negative impact on second/third tier cities' physical markets has also been increasing. They also believe that the tightening impact will continue to reflect in subsequent months.

Despite the falling sales and prices, construction has held up. Floor space of commercial buildings under construction is up 21.7% YoY to 1,604mn sqm in Jan-Oct 2011. Pace remains comparable with the 28.4% YoY growth in March. But with the austerity measures and tight financing environment expected to go on, it's hard to see this level maintained.

Figure 20. Commercial housing and steel/iron ore demand



Source: NBS, Citi Investment Research and Analysis

In 2010, China's apparent consumption of steel was approximately 588Mt of steel (626Mt produced minus 39Mt exported). Assuming 17% was consumed in the residential housing sector, iron ore demand in residential housing was nearly 160Mt.

Based on expected level of steel production in 2011 and 25% YoY increase (YTD Jan-Oct) in residential floor space under construction, 200Mt of iron ore (at an annualized rate based on @ 62% Fe) is being consumed in the residential housing sector.

Therefore any fall in housing prices, or more importantly the amount of floor space under construction, would have a sizeable effect on iron ore demand.

…but social housing should pick up some of the slack

Beijing has ordered all local governments to devote more resources to build social housing. Earlier this year, the Chinese government announced its 12th Five-Year Plan (FYP, 2011-15), which focused on more balanced growth, with domestic demand as a new source of growth, science and technology as a driving force for industrial upgrading, and energy saving and environment protection as an important yardstick for better growth.

As part of this FVP, the government plans to build 36 million units of social housing, starting with 10 million units in 2011 and 2012. That compares with 5.7 million units in 2010.

If we assumed an average area of 70 sqm per apartment and each unit consumes 30kg steel per square meter, we calculate the demand increment from social welfare housing could be nearly 9Mt steel, which equates to approximately 14Mt of iron ore (Figure 21).

This would go some way to making up the loss from any slowdown in the commercial residential housing sector.

Figure 21. Consumption of steel & iron ore from social housing development

	2010	2011	2012
Social Housing Units	5.8	10	10
Average Apartment (sqm)	70	70	70
Steel per sqm	30	30	30
Total Steel Consumption	**12.2**	**21.0**	**21.0**
Iron Ore Demand (@62% Fe)	**18.9**	**32.5**	**32.5**

Source: NBS, Citi Investment Research and Analysis

Iron Ore still tight under a lower growth scenario

Our Global Economics Team recently downgraded their forecast for global growth in 2012 for the sixth consecutive time, and are now forecasting 2.5% in 2012 (Global Economic Outlook and Strategy, 28 November).

Forecast uncertainty is ever present. But visibility is extraordinarily poor in late 2011, subject to political resolutions with unusually large economic consequences around the world. Therefore any retrenchment of our economists' forecasts for global growth has important implications for our own outlook for steel & iron ore demand and prices.

Notably, these downgrades have been driven by a weaker demand forecast for Europe, with growth now seen at -1.2% for 2012. This is down from +1.2% growth only a few months ago, showing how quickly things have changed. In the US, they are still expecting modest but sustained growth in 2012 and beyond. Our China economist team also sees a deceleration of Chinese growth from 9.6% growth in 1H11 to 8.6% in 2H11, and 8.4% growth for 2012. Overall, we see OECD growth now at 0.9% for 2012 and 1.2% for 2013.

For iron ore, we have cut our estimate of growth in steel production in the Europe to -9.1% while the US holds flat. We are also now assuming that 25% of China's export driven sectors remain flat. We also remain of the view that China's steel intensity of use is declining and thus growth in steel production will be significantly below GDP levels. In fact, we are now assuming that steel output grows by only 6.4% to 728Mt.

This has resulted in our global steel production growth estimate being cut from 5.2% to 3.9% in 2012. This equates to an incremental fall of 46Mt of steel output or just over 44Mt of iron ore demand in 2012 from our previous estimates.

Despite these relatively conservative demand forecasts, the iron ore market will remain tight, with an implied deficit of over 50Mt. Therefore even if we see lower growth for all major regions, the iron ore market should remain in deficit.

Short-term target prices

The combination of weaker Chinese demand over the next few months and the easing of supply disruptions should result in prices easing back from current levels.

But with macro indicators pointing to a relatively soft landing as the Chinese government tries to rein in growth to control inflation as well as iron ore having a relatively small exposure to weak OECD markets, the downside looks relatively limited.

As a consequence, we have cut our short-term (0-3 month) price target to $125/t. But based on the expectations of a pick-up in steel and iron ore demand from Japan in 2012 and continued high levels of FAI in China, we see prices picking up in the New Year. As such, our 6-12 month target remains at $165/t.

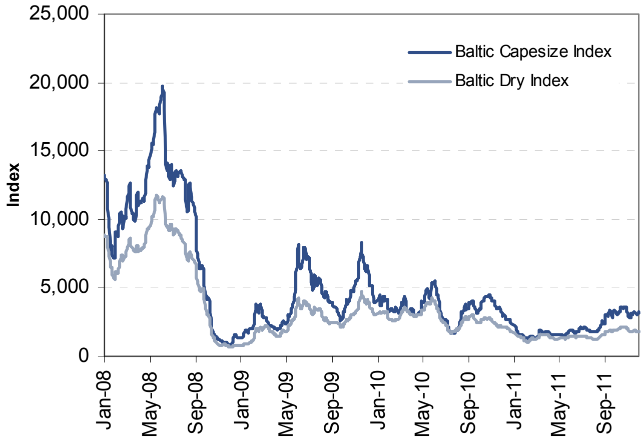
Costs

Rising costs & freight to support LT prices

We believe rising costs and the recovery of freight rates over the longer term to be supportive of iron ore prices.

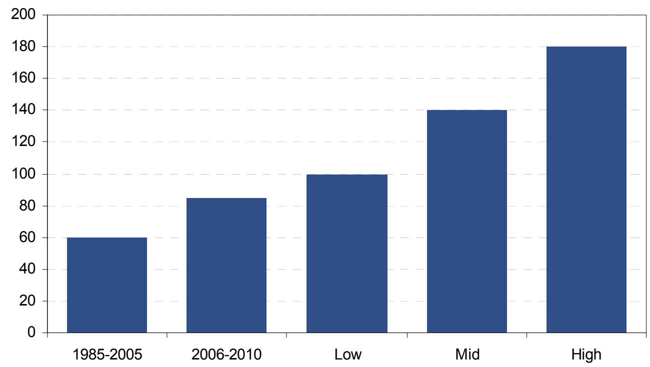
The dry bulk shipping market remains depressed and looks like it can only get worse. Our Asian Shipping Team stated recently that's rates are likely to continue to decline (Asia Shipping Wave - Irrational Behavior and Oversupply Overwhelm Tepid Macro Outlook). In particular, they point to the unrelenting order book. YTD deliveries account for 15% of the fleet at the beginning of 2011, and while this was partly offset by YTD demolition amounting to 4% of the fleet, the YTD fleet growth remains significantly higher than ~5% demand growth in 2011

Figure 22. While the Baltic Capesize freight rate has picked up recently, it remains at depressed levels



Source: Bloomberg, Citi Investment Research and Analysis

Figure 23. Capital cost inflation is rising across the sector



Source: Citi Investment Research and Analysis

But there is a growing feeling that once the current wave of deliveries peters out, rates will start to increase.

Shipyard delivery slippage is likely to be ~32% this year: Over 78mn DWT of bulk carriers have been delivered in the first 10 months of 2011. This implies a slippage of 32% when compared to scheduled deliveries for 2011. However, given deteriorating ship financing environment, slippage may increase in 2012.

This has significant implications for the iron ore industry.

Industry average costs have been increasing very rapidly in recent years, at around 30%/year. And while some of this has been the result of resource currency strength, labour shortages and materials prices remain on an upward trend. But capital cost inflation has also been rampant. Capital intensity has risen from $80/t (between 2006-2010) to as high as $180/t for some recently announced projects. At this level, projects need an iron ore price over $85/t FOB to produce an IRR of 15%.

Assuming only a mild recovery in freight rates to $15/t, if the spot price fell below $100/t CIF China, some project developers in Australia and Brazil would have to seriously consider their investment. It's even possible that some current producers whose FOB costs are touching $80/t would come under increasing cost pressures.

Therefore we have upgraded our forecasts for iron ore prices in the 2015-2017 period by an average 5% to between $110-$120/t.

Supply & Demand Forecasts

Figure 24. Global Seaborne Iron Ore Market Balance

Mt	2008	2009	2010	2011e	2012e	2013e	2014e	2015e	2016e	2017e	2018e	2019e	2020e
Seaborne Imports													
Japan	140	115	134	133	137	137	137	137	140	143	146	149	152
Korea	50	42	58	69	75	76	78	79	86	93	100	108	117
Taiwan	16	12	19	14	15	15	15	16	16	16	16	16	17
China	444	628	619	658	711	741	760	781	800	820	852	886	922
EEC	125	81	120	115	96	105	106	108	109	110	111	112	113
USA	9	4	7	7	9	9	9	9	9	9	9	9	9
Other (inc 3G)		20	40	40	40	45	79	127	218	315	360	396	444
Total Seaborne Imports (incl. minor markets)	**814**	**902**	**997**	**1,056**	**1,082**	**1,129**	**1,185**	**1,257**	**1,377**	**1,505**	**1,593**	**1,676**	**1,773**
Seaborne Exports													
Australia	308	362	413	433	480	531	596	674	735	785	815	842	842
Brazil	282	266	311	308	330	342	373	402	454	502	538	575	611
India	106	115	102	90	70	65	60	48	51	53	56	59	61
Canada	22	28	28	25	25	25	25	25	25	25	25	25	25
Africa	44	55	57	59	70	83	100	107	111	126	143	146	149
Other	42	73	69	71	56	53	45	48	37	37	37	37	37
Total Seaborne Exports	**804**	**870**	**980**	**986**	**1,031**	**1,099**	**1,200**	**1,304**	**1,412**	**1,528**	**1,614**	**1,684**	**1,726**
Implied Surplus/Deficit	-9.4	-32.2	-16.3	-69.5	-50.5	-30.0	14.8	47.4	34.8	23.6	20.9	7.8	-47.5

Source: Citi Investment Research and Analysis

Figure 25. Global Steel Capacity & Production Forecasts

Regional Capacity - Crude Steel	2005	2006	2007	2008	2009	2010	2011e	2012e	2013e	2014e	2015e
EU (15)	180	178	178	178	178	178	179	173	173	173	173
Other Europe	69	71	74	74	74	74	75	75	75	75	75
CIS	118	124	127	133	133	133	136	137	142	142	142
NAFTA	149	149	149	149	148	148	151	152	152	154	154
Central/South America	55	57	60	64	64	65	73	76	82	90	95
China	425	470	610	644	687	742	789	810	819	827	827
Japan	122	123	123	124	127	130	130	130	130	130	130
India	35	38	43	51	55	61	75	91	109	128	134
Other Asia/Pacific	119	120	122	123	123	133	138	145	145	148	150
Africa/Middle East	46	49	55	56	58	58	59	60	63	65	65
Global Capacity	**1,317**	**1,379**	**1,541**	**1,596**	**1,646**	**1,722**	**1,804**	**1,848**	**1,888**	**1,930**	**1,944**
% change Y-o-Y	**6.4%**	**4.7%**	**11.7%**	**3.6%**	**3.1%**	**4.6%**	**4.8%**	**2.5%**	**2.2%**	**2.2%**	**0.7%**
Regional Production - Crude Steel	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011e**	**2012e**	**2013e**	**2014e**	**2015e**
EU (15)	164	197	210	197	116	144	152	138	152	154	155
% change Y-o-Y	-2.5%	20.2%	6.3%	-6.0%	-41.1%	24.0%	5.5%	-9.1%	10.0%	1.1%	1.1%
Other Europe	57	62	30	62	48	54	66	64	66	67	67
% change Y-o-Y	-4.5%	8.3%	-52.4%	109.9%	-22.0%	12.4%	20.3%	-3.0%	3.5%	2.3%	0.0%
CIS	113	120	125	113	96	107	120	120	125	128	128
% change Y-o-Y	-0.2%	5.9%	4.3%	-9.2%	-15.0%	11.7%	11.6%	0.4%	3.7%	2.3%	0.0%
NAFTA	126	130	127	124	81	111	117	118	129	131	138
% change Y-o-Y	-5.2%	3.4%	-2.4%	-2.5%	-34.4%	36.2%	6.2%	0.7%	9.0%	1.3%	5.9%
Central/South America	47	46	47	48	38	44	62	67	73	81	86
% change Y-o-Y	-1.3%	-1.5%	3.1%	1.2%	-21.0%	15.6%	41.8%	8.5%	9.1%	9.8%	6.1%
China	349	423	487	523	590	656	710	729	737	744	765
% change Y-o-Y	24.4%	21.2%	15.2%	7.3%	12.9%	11.2%	8.2%	2.6%	1.1%	1.0%	
Japan	112	116	119	119	88	110	111	114	114	114	114
% change Y-o-Y	-0.2%	3.3%	2.8%	-0.6%	-26.3%	25.2%	0.8%	3.5%	0.0%	0.0%	0.0%
India	38	43	48	55	56	66	71	82	104	115	121
% change Y-o-Y	16.7%	11.9%	13.8%	13.5%	2.5%	17.6%	7.4%	15.3%	26.4%	11.2%	4.7%
Other Asia/Pacific	95	85	79	92	80	95	117	127	130	133	135
% change Y-o-Y	4.9%	-10.8%	-6.7%	16.6%	-12.8%	18.7%	23.1%	8.4%	2.3%	2.5%	1.6%
Africa/Middle East	32	33	34	34	32	36	51	54	57	58	58
% change Y-o-Y	5.9%	1.7%	5.6%	-2.5%	-3.5%	10.6%	43.5%	5.4%	5.0%	2.2%	0.0%
Global Production	**1,133**	**1,254**	**1,306**	**1,366**	**1,227**	**1,424**	**1,578**	**1,614**	**1,687**	**1,725**	**1,768**
% change Y-o-Y	**6.1%**	**10.6%**	**4.2%**	**4.6%**	**-10.2%**	**16.1%**	**10.8%**	**2.3%**	**4.5%**	**2.3%**	**2.5%**

Source: Citi Investment Research and Analysis

Bulk Commodity Forecasts

Figure 26. Bulk Commodity Spot Targets

	Market Data		Forecasts			Returns		
	Spot	3m Fwd	12m Fwd	0-3 mth	6-12 mth	5 year	3 mth rtn	12 mth rtn
Exchange Traded Prices								
Thermal Coal (Newcastle)	112	112	115	118	130	105	5.4%	13.3%
Thermal Coal (API2)	112	113	119	123	125	105	9.1%	5.2%
Iron Ore Spot (TSI)	134	140	130	125	165	100	-10.4%	26.8%

Source: Citi Investment Research and Analysis

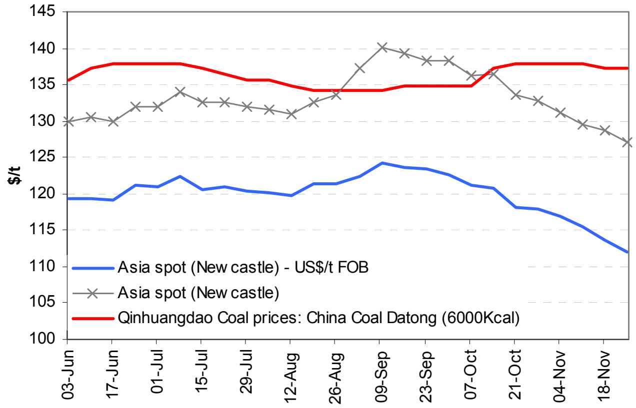
Figure 27. Bulk Commodity Average Price Forecasts

	2011e	2012e	2013e	2014e	2015e	2016e	2017e
COAL							
Contract Prices (US$/t)							
Hard coking	289	275	248	240	230	215	235
Semi soft	216	190	165	160	148	143	157
Thermal benchmark	122	139	148	152	145	139	142
LV-PCI	223	193	168	163	151	146	159
Spot prices (US$/t)							
Asia	127	135	144	158	145	139	142
Europe	128	135	144	158	145	139	142
IRON ORE							
Asia (US¢/DMTu)							
Lump (Brockman)	288	241	213	192	183	171	162
Fines (Brockman)	262	219	194	175	167	156	148
Yandi fines	262	219	194	175	167	156	148
Asia ($/t)							
Lump (Brockman)	182	152	134	115	110	103	97
Fines (Brockman)	165	138	122	110	105	93	89
Spot $US/t	167	149	135	125	120	115	110

Source: Citi Investment Research and Analysis

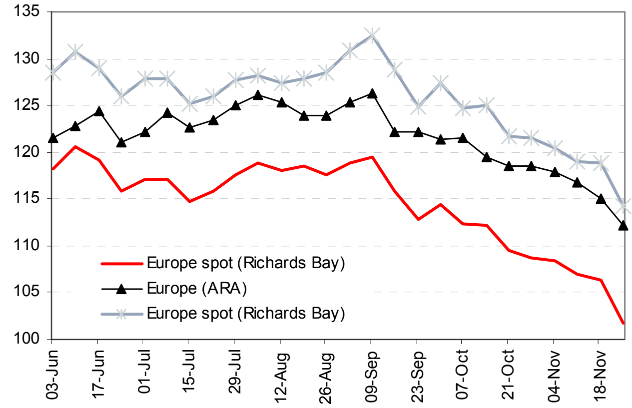
Bulk Commodity Charts

Figure 28. Asian Thermal Coal prices



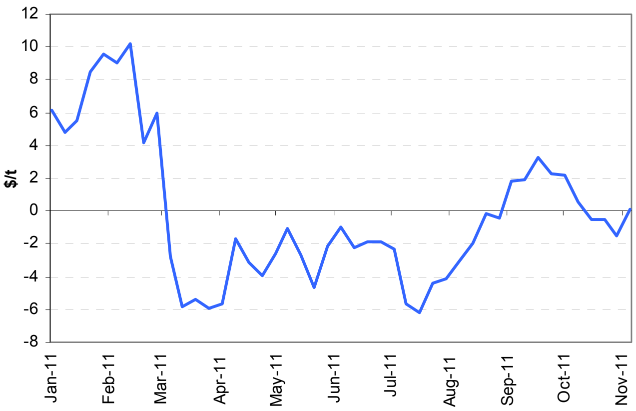
Source: Bloomberg, Platts, Citi Investment Research and Analysis

Figure 29. European Thermal Coal prices



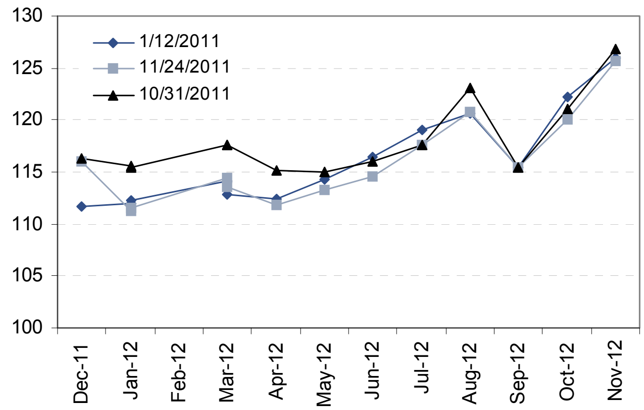
Source: Bloomberg, Platts, Citi Investment Research and Analysis

Figure 30. Newcastle/API2 Spread



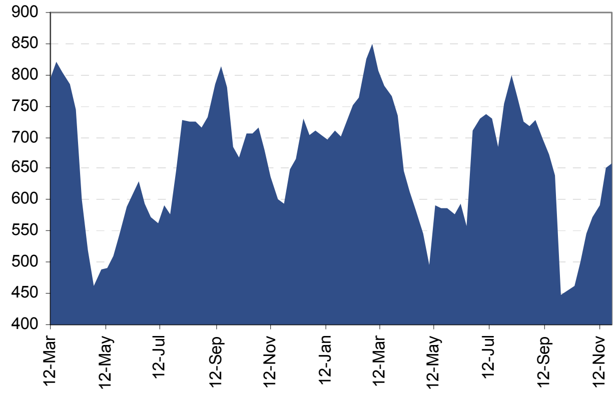
Source: Bloomberg, Platts, Citi Investment Research and Analysis

Figure 31. API2 Coal Forwards



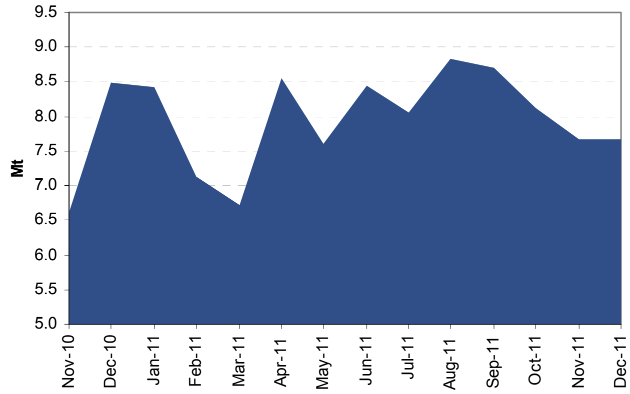
Source: Bloomberg, Citi Investment Research and Analysis

Figure 32. Thermal coal inventories in Chinese ports



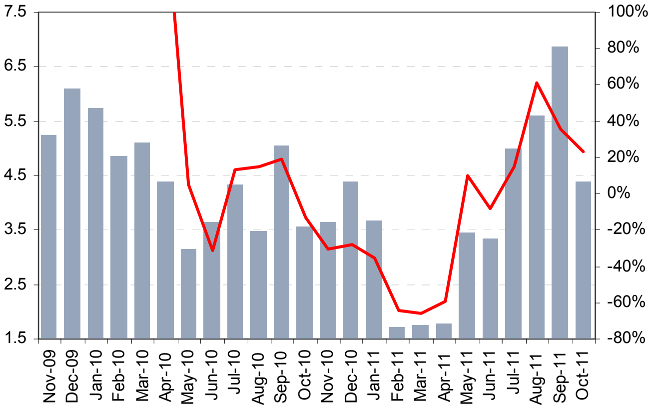
Source: Bloomberg, Citi Investment Research and Analysis

Figure 33. Thermal coal inventories in Newcastle Port



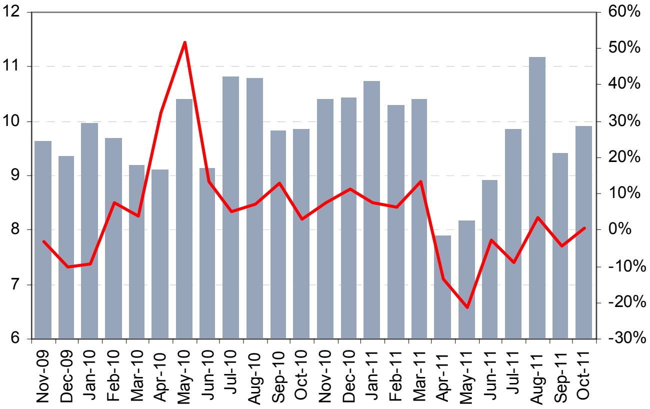
Source: Bloomberg, Citi Investment Research and Analysis

Figure 34. China Thermal Coal Imports



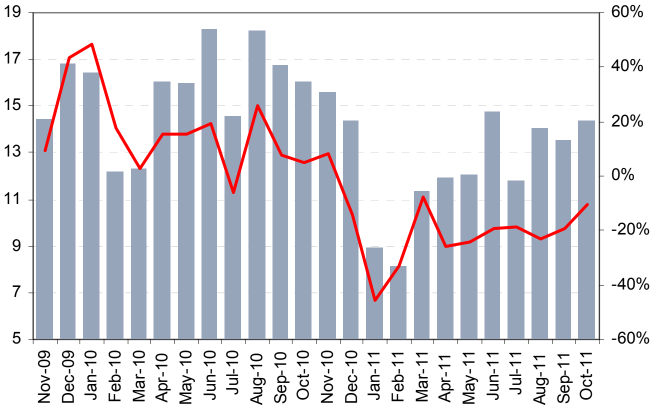
Source: Bloomberg, Tex, Citi Investment Research and Analysis

Figure 35. Japan Thermal Coal Imports



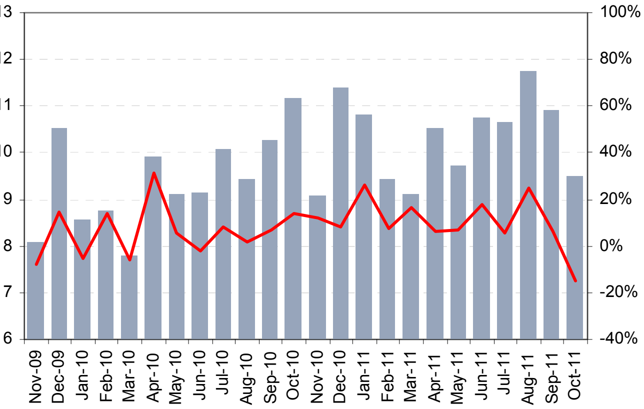
Source: Bloomberg, Tex, Citi Investment Research and Analysis

Figure 36. Australian Coal Exports - Queensland



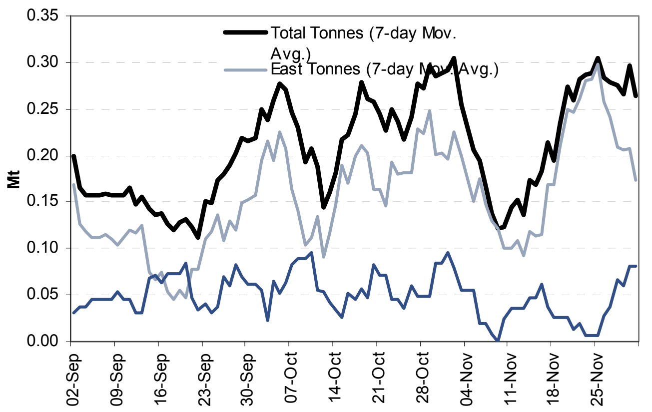
Source: Company Reports, Citi Investment Research and Analysis

Figure 37. Australian Coal Exports - NSW



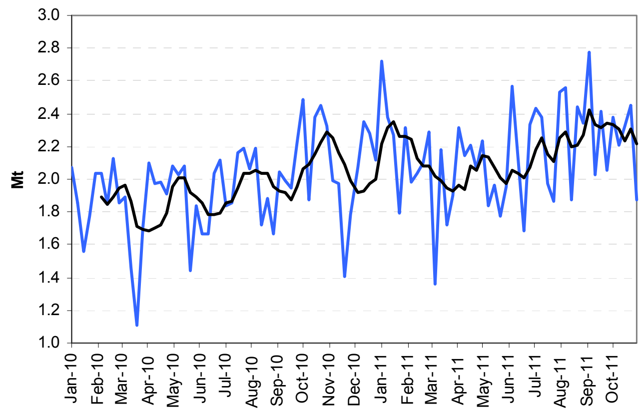
Source: Company Reports, Citi Investment Research and Analysis

Figure 38. Coal Exports from Richards Bay (SA)



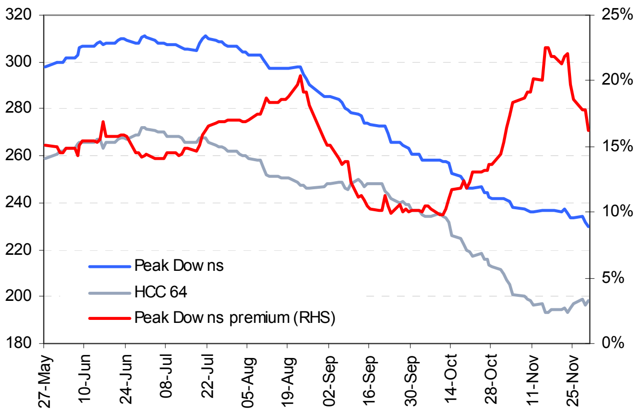
Source: Bloomberg, Citi Investment Research and Analysis

Figure 39. Weekly Coal Exports from Newcastle (AUS)



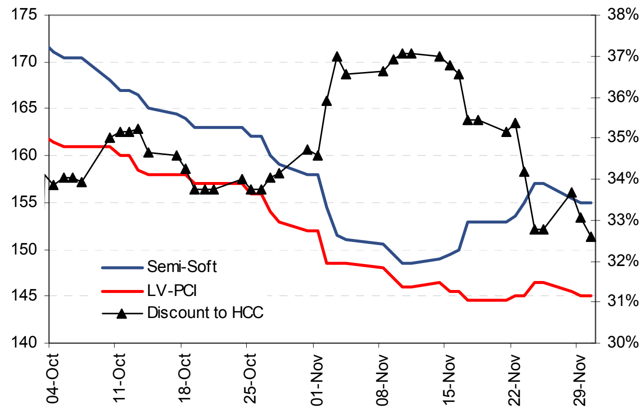
Source: Bloomberg, Citi Investment Research and Analysis

Figure 40. Hard Coking Coal Prices



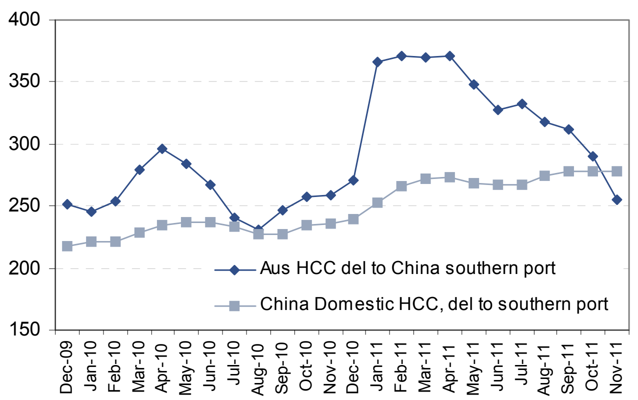
Source: Platts, Citi Investment Research and Analysis

Figure 41. Metallurgical Coal Prices



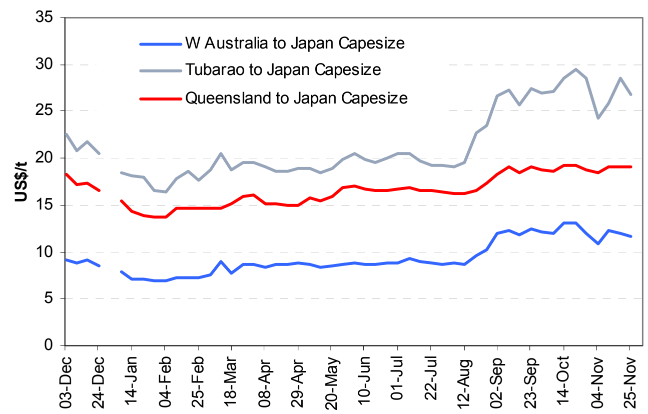
Source: Platts, Citi Investment Research and Analysis

Figure 42. Coking Coal Arb



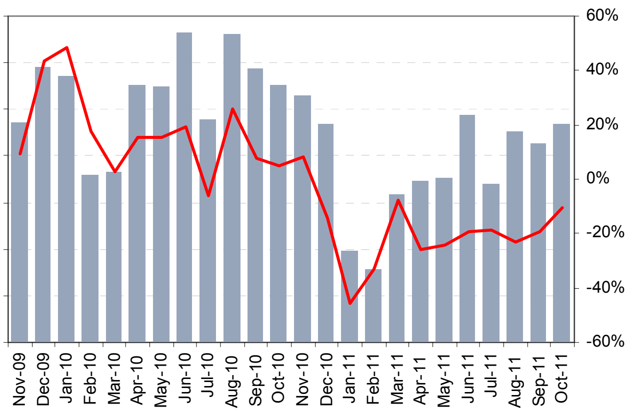
Source: Platts, Bloomberg, Citi Investment Research and Analysis

Figure 43. Coal & Iron Ore Freight Rates



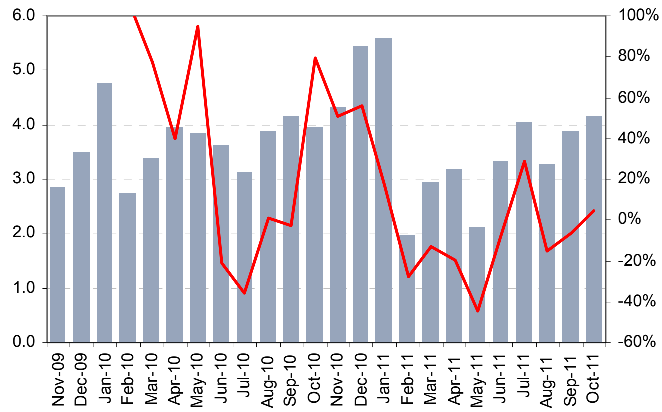
Source: Platts, Bloomberg, Citi Investment Research and Analysis

Figure 44. Australian Coal Exports - Queensland



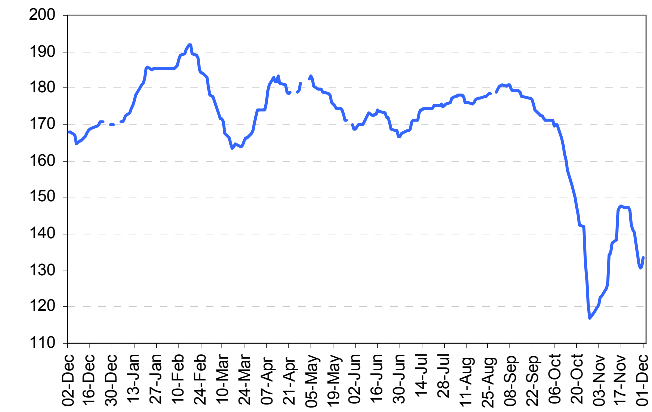
Source: Company Reports, Citi Investment Research and Analysis

Figure 45. China Met Coal Imports (inc Mongolia)



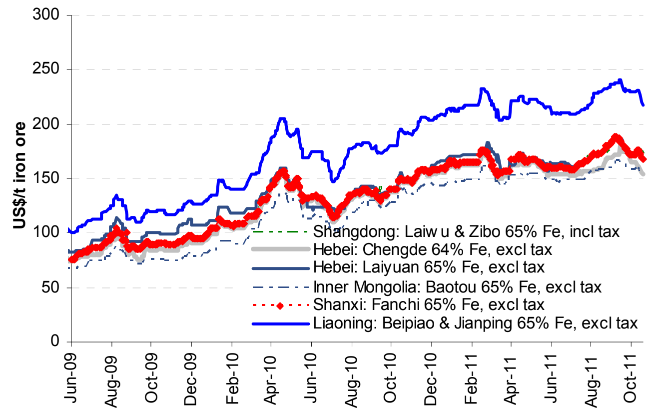
Source: China Customs, Tex, Citi Investment Research and Analysis

Figure 46. TSI Spot Iron Ore Price



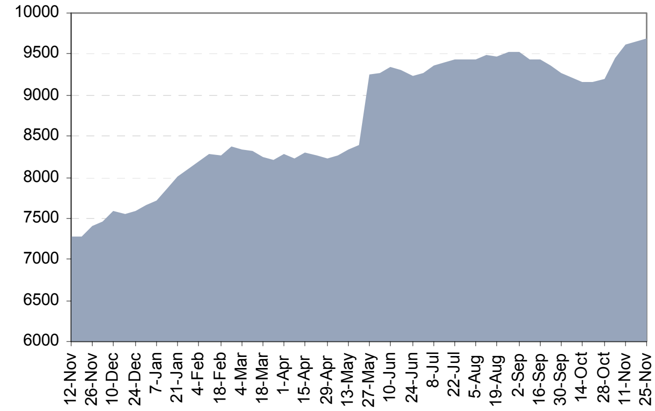
Source: Bloomberg, Citi Investment Research and Analysis

Figure 47. Chinese domestic iron ore prices



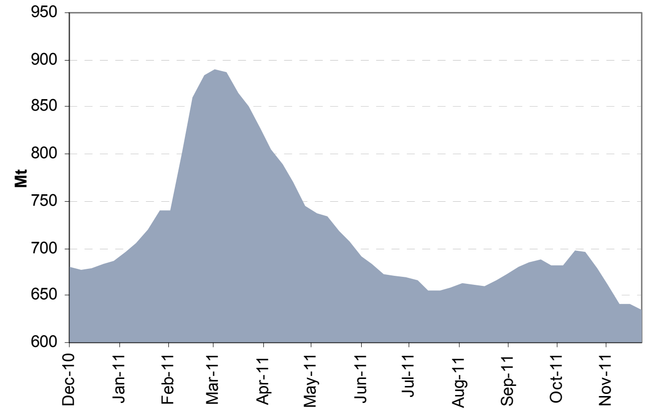
Source: Bloomberg, Citi Investment Research and Analysis

Figure 48. China Weekly Iron Ore Inventories at the Port



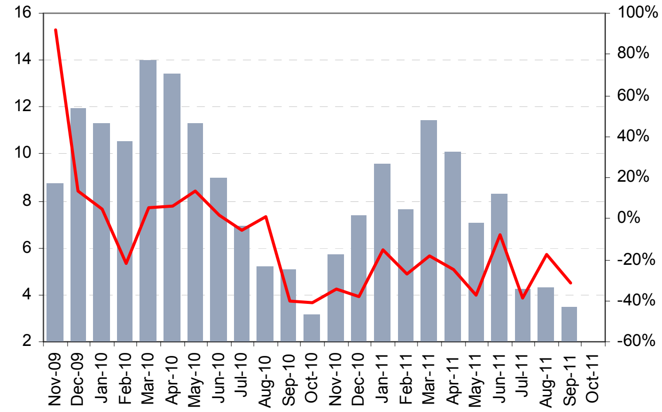
Source: Bloomberg, Citi Investment Research and Analysis

Figure 49. Chinese Steel Inventory



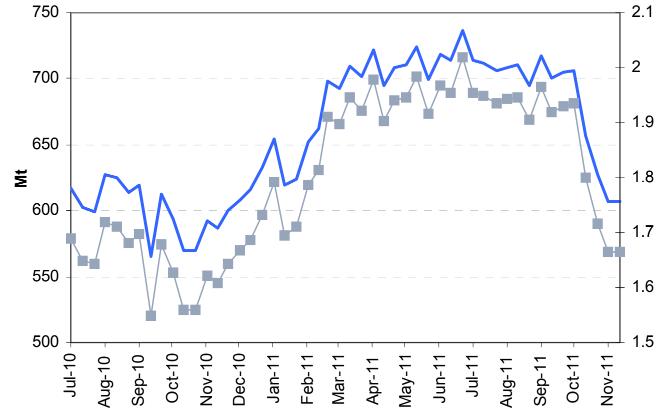
Source: Bloomberg, Citi Investment Research and Analysis

Figure 50. Indian Iron Ore Exports



Source: Tex, China Customs, Citi Investment Research and Analysis

Figure 51. Chinese Steel Production



Source: CISA, Bloomberg, Citi Investment Research and Analysis

Appendix A-1

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The research analyst(s) primarily responsible for the preparation and content of this research report are named in bold text in the author block at the front of the product except for those sections where an analyst's name appears in bold alongside content which is attributable to that analyst. Each of these analyst(s) certify, with respect to the section(s) of the report for which they are responsible, that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc and its affiliates. No part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendation(s) or view(s) expressed by that research analyst in this report.

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	12 Month Rating			***Relative Rating***		
Data current as of 10 Oct 2011	**Buy**	**Hold**	**Sell**	**Buy**	**Hold**	**Sell**
Citi Investment Research & Analysis Global Fundamental Coverage	59%	34%	7%	10%	79%	10%
% of companies in each rating category that are investment banking clients	45%	42%	37%	50%	43%	46%

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CIRA's stock recommendations include an investment rating and an optional risk rating to highlight high risk stocks.

Risk rating takes into account both price volatility and fundamental criteria. Stocks will either have no risk rating or a High risk rating assigned.

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