

Commodities

16 May 2011 | 80 pages

Commodity Outlook

Fundamentals Back to the Fore

- **Prices better reflect fundamentals** — The sell-off we witnessed recently has brought commodities back to levels that better reflect the supply & demand fundamentals in our view. In copper, we suspect that the cycle high has been set. As excess stock in China is run down, mine supply should start to improve.
- **Global economic growth still strong** — We have shaved our forecasts of global growth on an IP basis to 5.2% in 2011 (previously 5.4%) due to lower US and Japanese forecasts. In China, IP growth should be sustained at around 13-14%. Policy stimuli have been removed but we see only minor monetary tightening will be needed. Commodity intensity will likely be sustained.
- **Bulks the place to be during volatility** — Bulks commodities such as coal and iron ore should hold relatively well during this period of volatility, supported not only by solid demand but severe supply side constraints.
- **Out-of-consensus call – nickel** — The market continues to be bearish on the nickel market but we believe too much trust is being placed on the ability of HPAI projects to deliver. If they disappoint, prices will have to react to induce more high-cost NPI.

Figure 1. Summary of Commodity Price Changes

	Unit	2011			2012			2013		
		Old	New	%	Old	New	%	Old	New	%
Aluminium	\$/t	2,576	2,701	4.9%	2,631	2,688	2.2%	2,593	2,598	0.2%
Copper	\$/t	9,920	9,696	-2.3%	10,000	9,413	-5.9%	9,026	8,646	-4.2%
Nickel	\$/t	28,154	27,366	-2.8%	28,238	27,156	-3.8%	24,803	25,123	1.3%
Zinc	\$/t	2,460	2,280	-7.3%	2,436	2,500	2.6%	2,311	2,469	6.8%
Coking Coal	\$/t	292.5	293.8	0.4%	256.3	270.0	5.4%	170.0	190.0	11.8%
Thermal Coal	\$/t	122	122	0.0%	108	123	14.0%	93	109	17.6%
Iron Ore Spot (China)	\$/t	164	176	7.4%	148	153	3.4%	130	130	0.0%
Gold	\$/oz	1,416	1,443	1.9%	1,380	1,325	-4.0%	1,242	1,225	-1.4%
Platinum	\$/oz	1,731	1,827	5.5%	1,775	1,900	7.0%	1,675	1,775	6.0%
Zircon	\$/t	1,163	1,600	37.6%	1,200	2,000	66.7%	1,200	2,200	83.3%

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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Commodities at a glance – 12-month view

Figure 2. Most preferred / Least Preferred – 12-month view

Bearish	Neutral	Bullish
<ul style="list-style-type: none"> • Steel • Zinc • Lead • Silver • Platinum 	<ul style="list-style-type: none"> • Gold 	<ul style="list-style-type: none"> • Coking & thermal coal • Copper • Nickel • Aluminium • Iron Ore • Palladium

Source: Citi Investment Research and Analysis Note: our 12-month view is based on our price forecast compared with the forward curve.

Figure 3. Commodity price forecasts – spot targets and annual averages

		Spot Targets		Annual Average Forecasts				
		0-3 mos	6-12 mos	2011E	2012E	2013E	2014E	2015E
Energy								
WTI Crude	US \$/bbl	100.0	110.0	94.9	95.0	91.0	88.0	90.2
Brent Crude	US \$/bbl	110.0	120.0	105.1	100.0	90.0	87.0	89.1
Base Metals								
LME Aluminium	US \$/t	2,675	2,775	2,701	2,688	2,598	2,556	2,518
LME Copper	US \$/t	9,250	9,750	9,696	9,413	8,646	8,051	7,077
LME Lead	US \$/t	2,450	2,600	2,626	2,490	2,303	2,129	1,942
LME Nickel	US \$/t	26,000	28,000	27,366	27,156	25,123	21,367	17,932
LME Zinc	US \$/t	2,250	2,450	2,280	2,500	2,469	2,400	2,400
Precious Metals								
Gold	US \$/oz	1,550	1,450	1,443	1,325	1,225	1,125	860
Silver	US \$/oz	35.0	33.0	33.03	26.00	22.38	19.13	16.00
Bulk Commodities								
Hard Coking Coal (benchmark Asia)	US \$/t	330	300	294	270	190	220	220
Thermal Coal (benchmark Asia)	US \$/t	130	130	122	123	109	105	105
Iron Ore Fines (Brockman, FOB)	US \$/t	172	167	165	149	121	104	96
Iron Ore Spot (TSI)	US \$/t	180	175	176	153	130	115	110

Source: Citi Investment Research and Analysis



Key Risks and Drivers

Thermal Coal

We have increased our forecasts of prices for JFY 2012-13 to USD120/t FOB Australia. This is on the back of an expected rise in thermal coal's share of the electricity generating capacity in Japan after the nuclear crisis that hit the country in April. But we also see Chinese remaining significant importers due to the improving competitive position of imported coal vs. domestic Chinese production. Indian imports will likely increase further and European demand is an upside risk.

Coking Coal

Despite coal prices easing back from their recent highs, persistent supply side issues should keep prices well supported. Premium coking coal prices (Peak Downs) are currently trading at \$318/t. We believe the supply-side issues will continue to plague the industry for the rest of the year and can't see mine supply getting back to normalised levels until 2H11. Our current forecasts call for premium hard coking coal to remain above \$300/t for the remainder of 2011.

Iron Ore

We expect the iron ore market to remain in tight supply demand balance until 2014, then move into a surplus as a raft of new projects hit the market. For the remainder of this year, we expect the spot price to remain trade around \$180 as supply side issues are mitigated by a cooling in Chinese steel production. But prices should ease back towards USD150-160/t over the next couple of years.

Nickel

Despite the nickel price falling of 16% since late February, we feel the fundamentals remain strong. Global stainless steel output rose 21% in 2010, and from all accounts this strong rise in production has followed through into 2011. While the Japan earthquake took out over 45ktpy of nickel capacity, its stainless mills were not directly affected. This should help keep the market tight. We also remain cautious on the ramp-up of HPAL projects this year. If they fail to meet expectations, prices will have to react to entice more Chinese NPI producers, who are experiencing cost pressures.

Copper

In the short term there are signs of market softness: increasing scrap supply is reflected in rising TC/RCS; in China there is excess inventory in the hands of traders and speculators. But Chinese fabricators are short, so we expect restocking later in the year. In developed markets demand is robust.

Ongoing supply constraints should keep the market in supply deficit, and we have decreased our forecast to \$9,413/t and \$8,646/t in 2011 and 2012 respectively.

Aluminium

We maintain our relatively positive view on aluminium, and expect prices to be sustained around \$2,600/t.

Two issues will be key in determining prices: Power shortages in China are expected to result in power cuts to aluminium smelters in the next four months, and the sustainability of inventory financing, which shows no sign of unwinding, at least for now.

Zinc

Zinc remains our least favored of the major metals. Zinc has the weakest near-term fundamentals of the major base metals. After a sizeable surplus in 2010, another surplus is likely in 2011. In the short term, we suspect that the zinc price will continue to struggle relative to other base metals. Further out (2014), growth in mine supply is unlikely to keep up with ongoing strong growth in demand, and prices can recover.

Gold

Increased global risk – USD weakness, growing inflationary fears, and continuing sovereign debt risks in Europe - have increased investor appetite for gold, triggering recent price strength. We expect price support at the recent lower levels, driven by strong Asian demand, central bank buying, inflationary fears, continuing EU sovereign debt issues, and potentially on-going geo-political risk. However, during 2012 we expect a weaker investment-demand environment for gold and expect the metal to once more be trading below \$1400/oz at that time.

PGMs

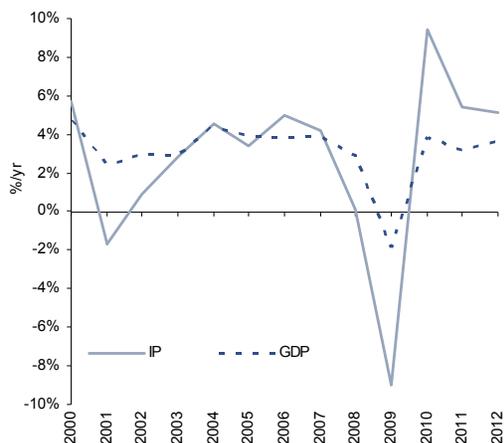
Even though palladium is likely to remain under pressure in the near we expect a strong recovery in the palladium price in 2H11 and into 2012. This is as we continue to forecast a rising deficit market in palladium, mainly due to strong growth in light vehicle (LV) production in gasoline-based markets (US and China). We maintain our medium-term surplus outlook for platinum. We view a range-bound platinum price as likely in 2011 as its precious metal attribute is likely to keep it correlated to our gold price outlook.



Economics

- We have shaved our forecasts of global growth on an IP basis to 5.2% in 2011, from 5.4% previously. Global GDP is also shaved to 3.6% from 3.7%.
- In the US, we have trimmed our forecasts to 5.2% from 5.4% on an IP-basis. GDP is likely to grow by 2.8% in 2011, with manufacturing continuing to expand. A recovery in housing is likely in 2012, which should maintain metal demand growth.
- In Japan, growth will likely be significantly weaker in 2011 (down from 1.2% to -0.6%) but stronger in 2012 (up from 3.9% to 6.3%).
- Euro Area IP growth is expected to be 5.2%.
- In China, our forecast of IP growth is sustained at around 13-14%. The authorities have moved to withdraw policy stimulus, in order to cap inflation. With the impact of previous monetary tightening measures still flowing through, it is likely that only further minor monetary tightenings will be needed. A stronger currency should help contain inflation, but have a mildly beneficial impact on commodity demand. From a longer-term perspective, although we expect a progressive trend towards the consumer as the primary economic locomotive, infrastructure development should continue, and housing growth should be robust. Commodity intensity will likely be sustained.
- Growth in emerging markets other than China, especially India and Brazil, is an important part of our positive outlook for certain commodities.

Figure 4. World IP and GDP



Source: Citi Investment Research and Analysis

Figure 5. Previous and new economic forecasts

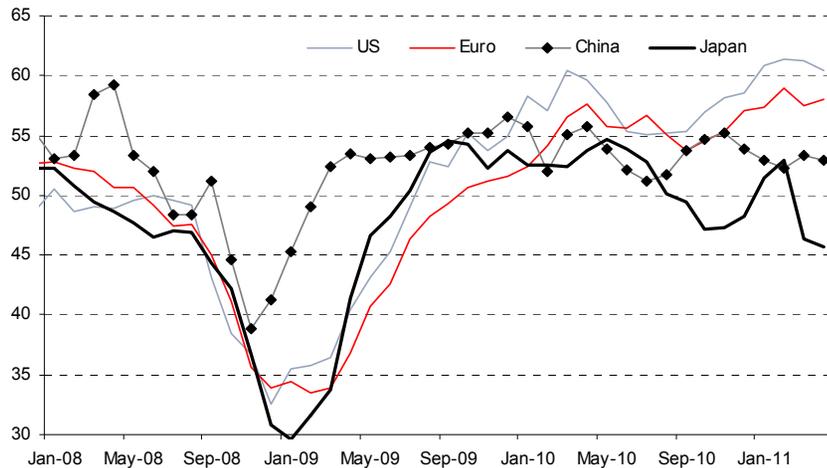
	2010	2011e	2011e	2012e
		old	new	new
Industrial Production				
World	9.4%	4.5%	5.4%	5.1%
USA	5.7%	2.6%	5.0%	3.8%
Japan	15.9%	-0.6%	1.2%	3.9%
Europe	7.0%	4.0%	4.5%	3.0%
S.America	10.8%	5.0%	5.5%	5.0%
China	15.5%	12.7%	13.6%	12.5%
India	9.0%	9.4%	9.4%	9.6%
GDP				
Global	4.0%	3.2%	3.7%	3.8%
Industrial Countries	2.6%	1.8%	2.3%	2.5%
Euro Area	4.4%	1.1%	1.6%	1.4%
China	10.0%	9.0%	9.2%	9.0%
Japan	4.4%	1.4%	1.4%	2.2%
United States	2.8%	2.2%	3.0%	3.3%
India	8.4%	8.6%	8.6%	8.9%

Source: Citi Investment Research and Analysis

Growth Composition

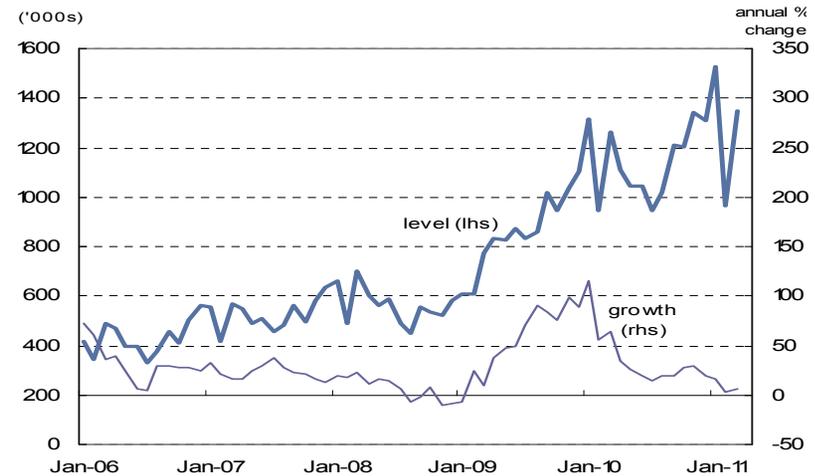
- Country/regional manufacturing PMIs have either leveled out at high levels or, in the case of Japan, declined noticeably.
- We suspect that Japanese activity will recover from the impact of the earthquake/tsunami/nuclear power crisis, though only after taking a substantial hit on the economy and confidence.
- The US economy should continue to recover, as households rebuild their finances and monetary conditions remain relatively loose. A looming fiscal tightening may lessen the pace of withdrawal of monetary stimulus.
- Western Europe has large regional divergences, with Germany remaining strong but peripheral economies suffering from fiscal tightening measures and low confidence.
- In China, it appears that growth is moderating from the very high pace set in 2010. This moderation is to be expected, given both the tightening of monetary policy over the past year and the gradual wind-back of scrappage subsidies on autos and household durable goods. The Chinese authorities appear likely to succeed in engineering a gentle slowdown. As China moves to having monetary policy on the 'restrictive' side of neutral, the Western World will likely move to withdraw monetary stimulus.

Figure 6. PMIs have plateaued, but Japanese earthquake has had a massive impact



Source: Bloomberg, Citi Investment Research and Analysis

Figure 7. Chinese auto sales



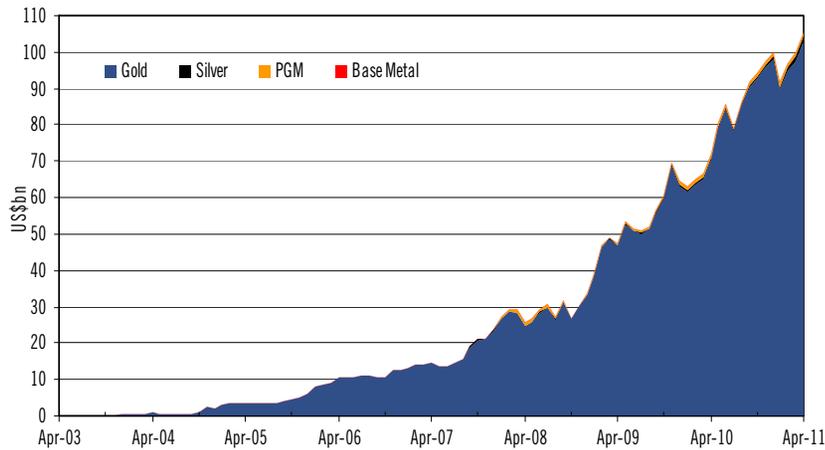
Source: NBS, Citi Investment Research and Analysis

Fund Flows

Accelerating, but mostly price driven

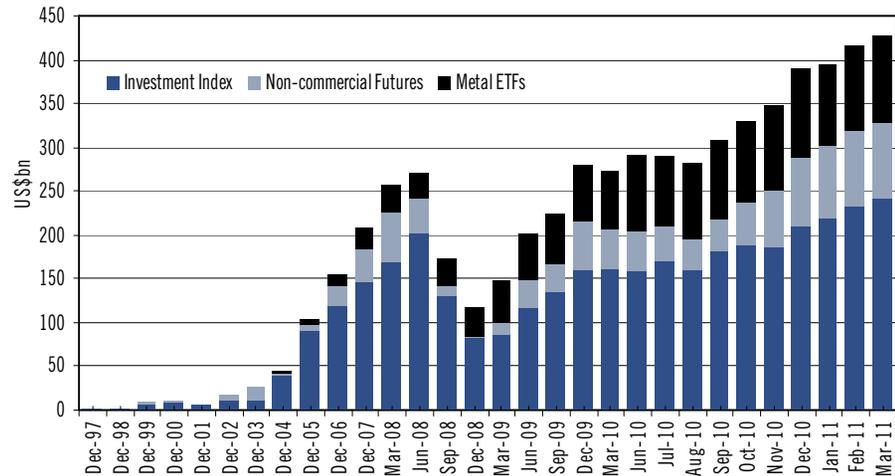
- Investment in commodity markets jumped to USD427bn in March 2011, up 2.7%mom, 56%yoy. Index investments account for the largest proportion of investments funds, accounting for 57%, futures 20%, and ETFs 23%.
- The lion's share of the recent increase in invested funds has been due to rising commodity prices (particularly gold and oil) rather than new inflows.
- EFT holdings have continued to gains after the stellar increases over the past two years. Gold dominates ETF holdings. The recently launched base metal ETFs accounting for only USD45mn of the 109bn total.
- We believe the main drivers of investment – favourable fundamentals, emerging market growth, and a hedge against adverse currency moves – will sustain further inflows in future. However, the pace of inflows may slow in the next year as the outlook for metal demand is tempered by the withdrawal of policy stimulus.
- In earlier work we have argued that the main impacts of increasing fund flows are increased anticipation in commodity markets and an upward shift in the inventory price relationship (due to a change in the balance of buyers and sellers of futures). The most important impact is higher prices and increased market depth and liquidity in our view.

Figure 8. Physically backed ETFs



Source: ETF Securities, Bloomberg, Citi Investment Research and Analysis

Figure 9. Investment fund flows (US\$bn)



Source: CFTC, ETF Securities, Bloomberg, Citi Investment Research and Analysis

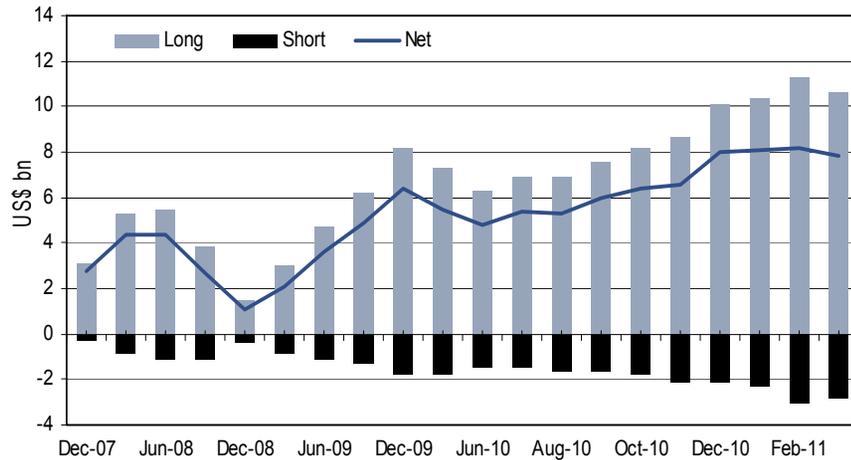
Index Investments

- Index investments account for 57% of the total funds invested, and also the largest share of growth in the March quarter. But, commodity price appreciation accounted for the lion's share of the increase, rather than fund inflows.
- In the case of copper, value invested fell in March, from its all-time high in February. Volume also declined in March, from high levels in February.
- Oil index investment value increased further in the March quarter (up 23.5%), but volumes rose more modestly (up 6.9%).
- For gold value increased 14.7%, volume 12.4%.

Futures

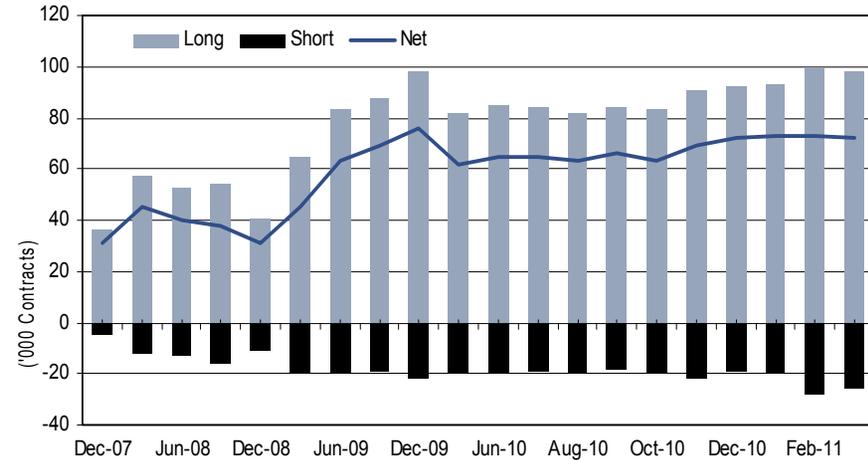
- Futures open positions are down on COMEX. The decline in gold is particularly notable.
- However LME open positions have dropped for some metals, notably copper, but risen sharply for others (notably lead, aluminium and nickel). Lower copper Open Interest reflects a move to liquidate the long position. The rises for lead and nickel appear to reflect a move to go short by the speculative community.

Figure 10. Copper index investments – peaked in February with the price



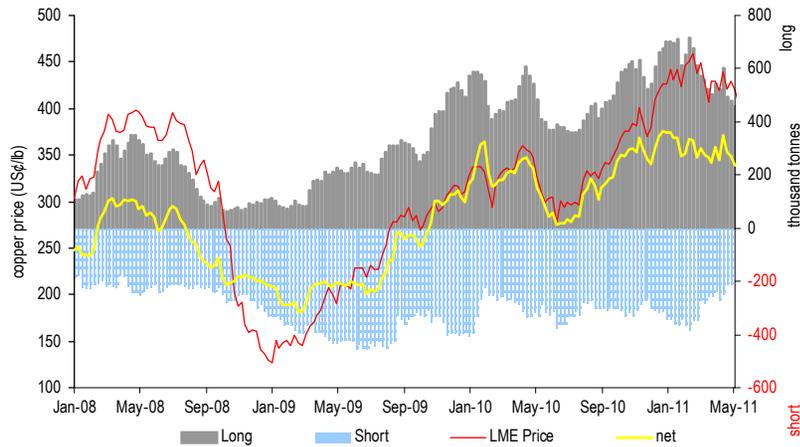
Source: CFTC, Citi Investment Research and Analysis

Figure 11. Copper index investments – but volume increased only 4%



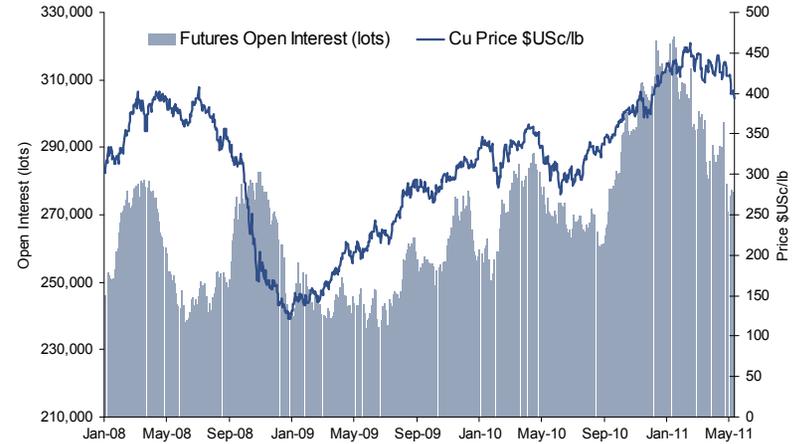
Source: CFTC, Citi Investment Research and Analysis

Figure 12. Comex copper non-commercial futures – net long has declined



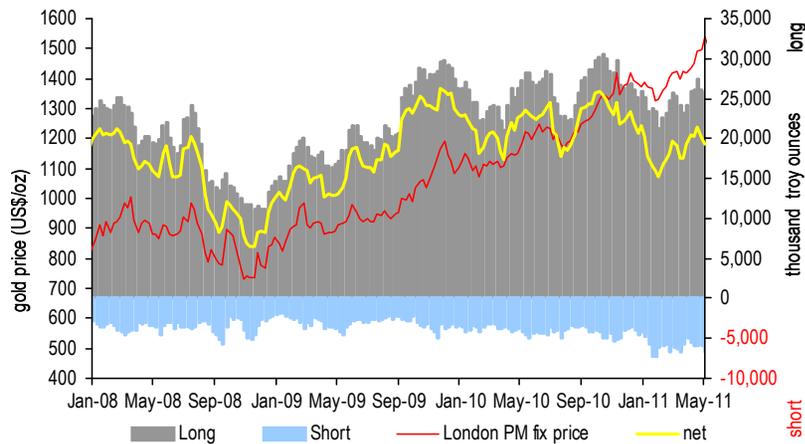
Source: Bloomberg, CFTC, Citi Investment Research and Analysis

Figure 13. Copper LME open interest - has declined as longs liquidate



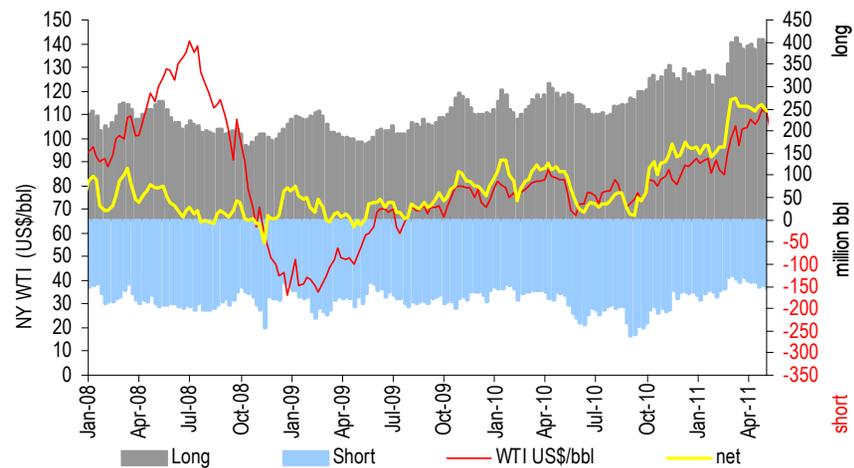
Source: Bloomberg, CFTC, Citi Investment Research and Analysis

Figure 14. Comex gold non-commercial futures – net volumes have declined



Source: Bloomberg, CFTC, Citi Investment Research and Analysis

Figure 15. Comex oil non-commercial oil futures – volumes are stable



Source: Bloomberg, CFTC, Citi Investment Research and Analysis

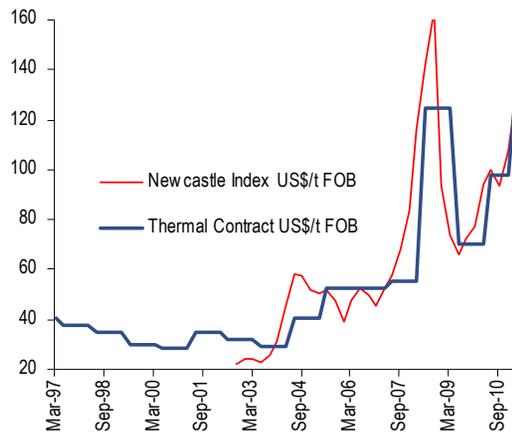


Thermal Coal

Thermal Coal

- We have increased our forecasts of prices for JFY 2012-13 to USD120/t FOB Australia. This is on the back of an expected rise in thermal coal's share of the electricity generating capacity in Japan after the nuclear crisis that hit the country in April. But we also see Chinese remaining significant importers due to the improving competitive position of imported coal vs. domestic Chinese production. Indian imports will likely increase further and European demand is an upside risk.
- Thermal coal prices are remaining resilient, and not just in Asia. We believe the main drivers behind the rally are strong demand in Europe and supply restrictions in the Asian market. The heavy rain in Australia has continued to hamper thermal coal exports. We estimate nearly 8Mt has been lost as a result of wet weather (and the resultant flooding) in Eastern Australia. Since this has occurred at the same time as the Japanese earthquake (where trade flows have been disrupted), the Asian market has remained relatively tight. A scarcity of rail and port capacity has also seen producers give preference to higher priced products such as coking coal semi-soft.
- China looks likely to increase imports over the coming months. Power shortages in China have come much earlier than normal due to a combination of strong demand and a lack of investment in generating capacity. With domestic prices now on a par with Newcastle, Chinese IPPs should be incentivised to source coal from the international market. With the seasonally strong summer period ahead, we expect Chinese thermal coal imports to rise strongly over the coming months.
- The Japanese nuclear crisis should see coal-fired electricity return to favour. In Japan, lost nuclear capacity should be met primarily by gas but coal will likely also see its share increase. In Europe, the public backlash on nuclear power will likely see coal demand rise strongly, particularly in Germany.

Figure 16. Spot vs. contract thermal coal prices



Source: Platts, Tex, Citi Investment Research and Analysis

Figure 17. Thermal coal supply demand balance

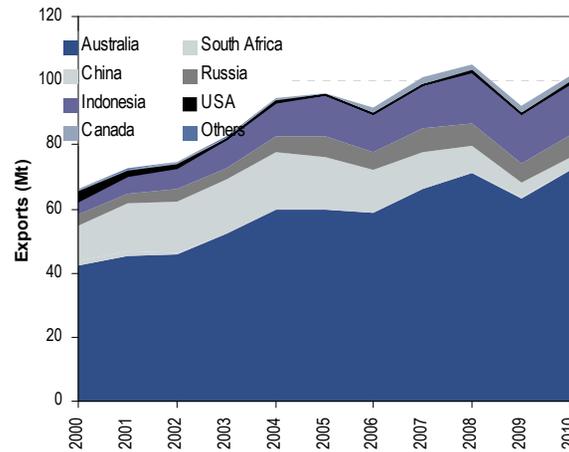
IMPORTS (Mt)	2009	2010e	2011e	2012e	2013e	2014e	2015e
Japan	108.3	119.6	123.1	123.7	124.3	126.1	127.8
S.Korea	80.5	89.1	91.1	94.9	98.6	102.4	135.0
Taiwan	48.6	53.2	62.4	62.4	62.4	62.4	62.4
India	48.2	48.0	54.0	75.0	80.0	85.0	90.0
EC	96.7	90.0	95.0	100.0	100.0	100.0	100.0
China	92.1	119.0	100.0	100.0	100.0	100.0	100.0
Others	108.0	93.6	134.6	134.6	134.6	134.6	140.6
Total	582.5	612.6	660.2	690.6	699.9	710.5	755.9
EXPORTS (Mt)	2009	2010e	2011e	2012e	2013e	2014e	2015e
Australia	139.0	141.3	155.0	175.0	192.0	192.0	212.0
South Africa	59.9	70.0	73.0	78.0	80.0	80.0	80.0
Indonesia	234.3	260.0	280.0	300.0	300.0	310.0	320.0
China	16.9	13.6	15.0	15.0	15.0	15.0	15.0
Columbia	67.9	62.0	64.0	62.0	62.0	62.0	62.0
Vietnam	27.0	24.0	20.0	14.0	14.0	14.0	14.0
Other	39.7	36.9	42.9	42.9	42.9	42.9	42.9
Total	584.7	607.9	649.9	686.9	705.9	715.9	745.9
MARKET BALANCE	2.2	-4.7	-10.3	-3.7	6.0	5.5	-10.0

Source: Platts, Tex, Citi Investment Research and Analysis

Supply

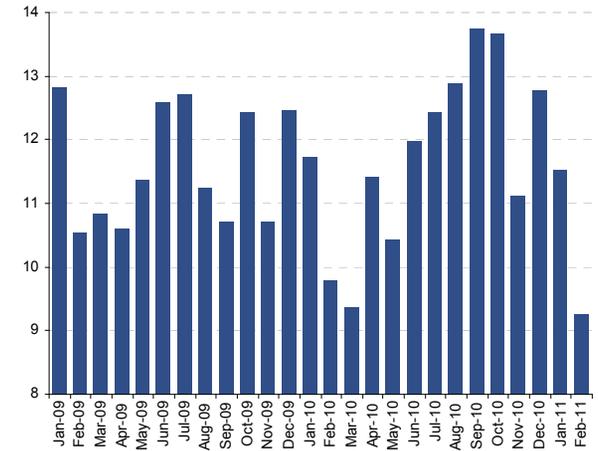
- Prices rallied strongly in January after the floods in Queensland hit thermal coal exports out of the Port of Brisbane (Figure 20). But the panic buying that was evident among utilities has subsided in recent months, resulting in FOB Newcastle spot prices easing back to \$125/t.
- Japan relies heavily on Australian thermal coal. Of the 101Mt Japan imported in 2010, over 72Mt came from Australia (Figure 19). And with the significant disruptions that have occurred in Australia in recent months, the Japanese utilities were keen to secure supply. As a result, FY12 contracts were settled some \$8/t above the spot market.
- China has recently re-sold some cargoes of thermal coal to other Asian consumers, taking advantage of rising international prices. This has placed some pressure on Asia prices.
- At the same time, the Japanese nuclear crisis has resulted in disruption to trade. While the majority of coal-fired power plants are situated in the south of Japan, there have been several plants which have been temporarily shut down either due to damage from the earthquake or subsequently flooded by the tsunami. This has resulted in cargoes originally destined for Japan being redirected to other countries.

Figure 18. Japanese thermal coal imports by country



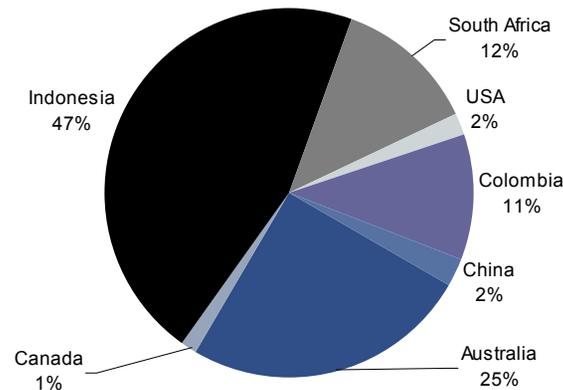
Source: Tex, Citi Investment Research and Analysis

Figure 19. Australian thermal coal exports



Source: Citi Investment Research and Analysis

Figure 20. Thermal coal exports

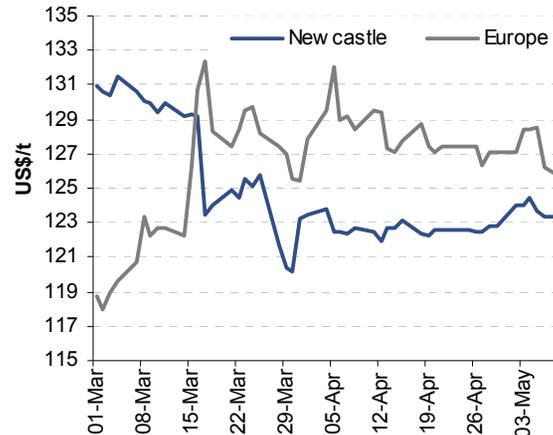


Source: Platts, Tex, Citi Investment Research and Analysis

Demand

- In Europe, the Japanese nuclear crisis has had a profound effect on sentiment. With Germany shutting down over 7.4GW of nuclear capacity, consumers have been scrambling for coal. With the shutdown expected to last three months, we estimate that an extra 1.5 million tonnes of coal will be required; assuming 50% of the shortfall is made up from coal. This has resulted in European coal prices outperforming Pacific prices. Since the being of March, API2 coal has moved from around \$118/t to \$129/t, up 10.2%. At the same time, Newcastle FOB prices have fallen 6% to \$123/t (Figure 22).
- China's thermal coal imports were weak in 1Q11, partly as a result of the closure of the price arbitrage between Qinhuangdao and Newcastle in late 2010 (Figure 23). But with China already suffering power shortages and domestic prices now above Newcastle, we expect China's coal imports to pick up significantly in the coming months. Imports are also competitive on a more fundamental cost basis (Figure 24). Further, we expect more rapid inflation in Chinese costs (closures of small low cost mines, increasing distance to port, rising labour costs), to increase the cost competitiveness of imports (Figure 24).
- Indian demand for imported thermal coal is set to increase dramatically driven by urbanization and associated increasing electrical intensity, and an inability of domestic production to keep pace with demand (Figure 25). As a result, we expect thermal coal imports to rise dramatically over the next five years (Figure 27).

Figure 21. Asian vs European coal prices



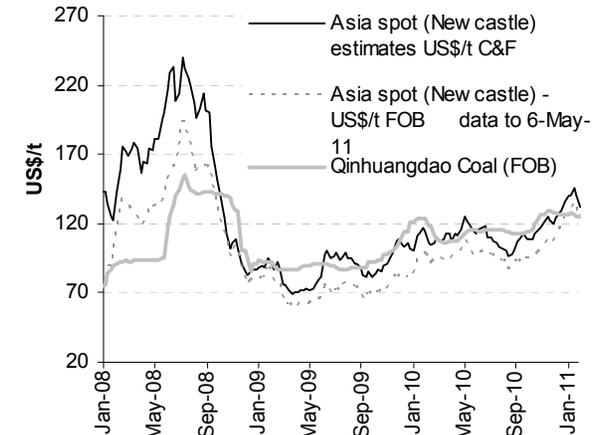
Source: Platts, Bloomberg, Citi Investment Research and Analysis

Figure 23. Competitive advantage

Australian Export Costs	\$/t	Chinese Domestic Costs	\$/t	Indonesian Export Costs	\$/t
FOB Newcastle	48	Mine Production Costs	40	Production Costs	42
Ocean Freight	23	Rail	12	Ocean Freight	10
Taxes/Port	10	Port Coastal Freight	5	Taxes/Port	10
		Costs CIF Southern Port	61		
		Delivered Cost (5500KCal)	61	Delivered Cost (4500KCal)	62
Delivered Cost	81	Delivered Cost (6300KCal)	79	Delivered Cost (6300KCal)	112

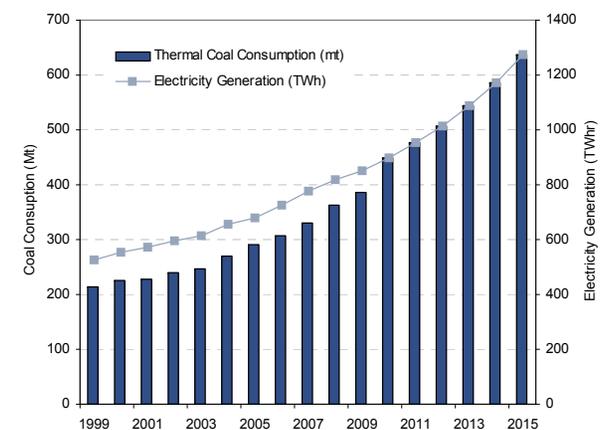
Source: Citi Investment Research and Analysis

Figure 22. Asian coal prices



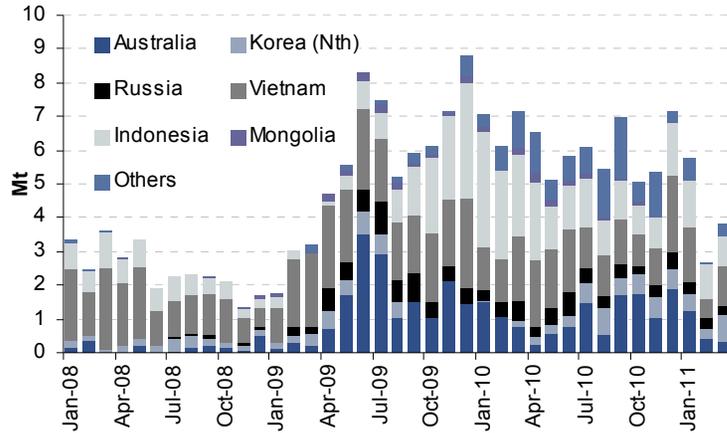
Source: Citi Investment Research and Analysis

Figure 24. Indian thermal coal consumption



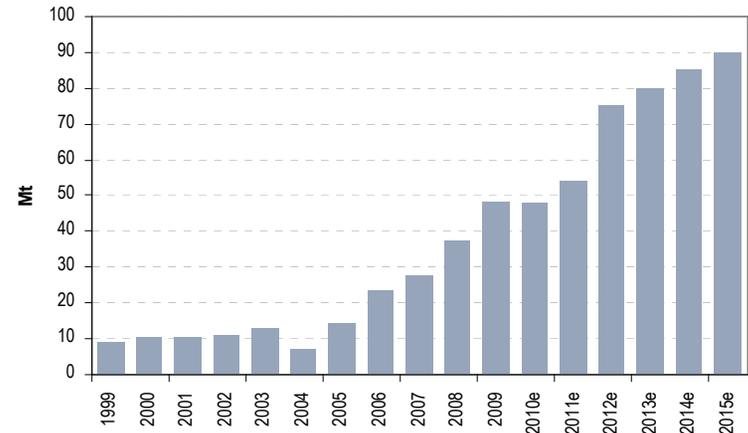
Source: Citi Investment Research and Analysis

Figure 25. Monthly Chinese thermal coal imports



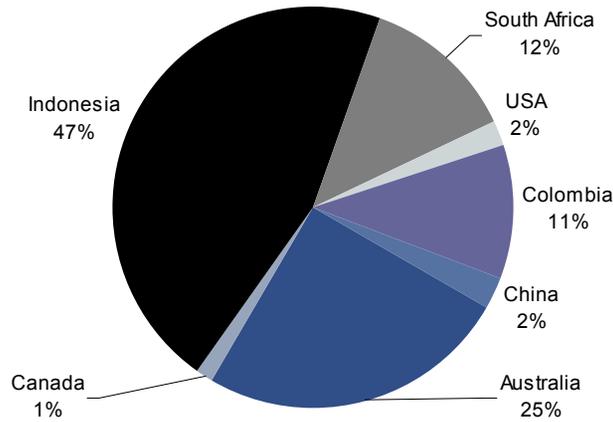
Source: Platts, Tex, Citi Investment Research and Analysis

Figure 26. Indian thermal coal imports



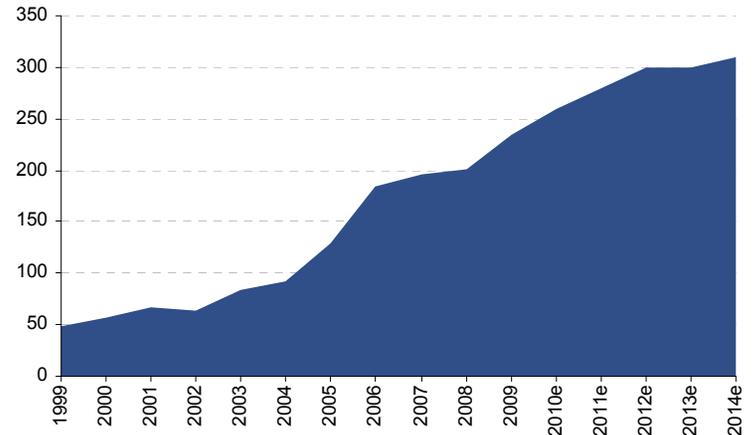
Source: Platts, Tex, Citi Investment Research and Analysis

Figure 27. Thermal coal exports, 2010



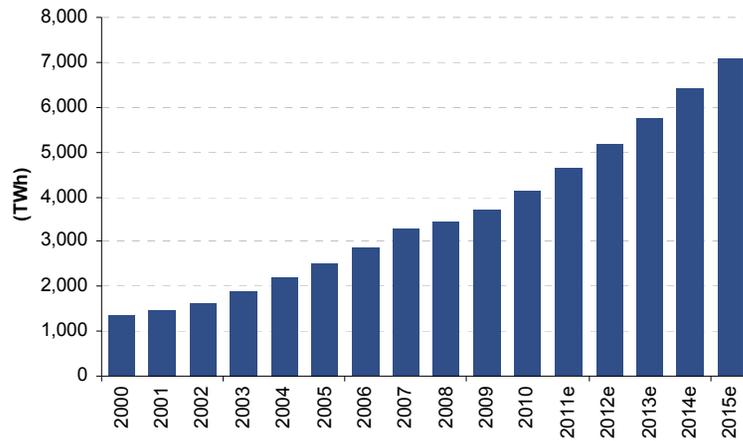
Source: Platts, Tex, Citi Investment Research and Analysis

Figure 28. Indonesian thermal coal exports



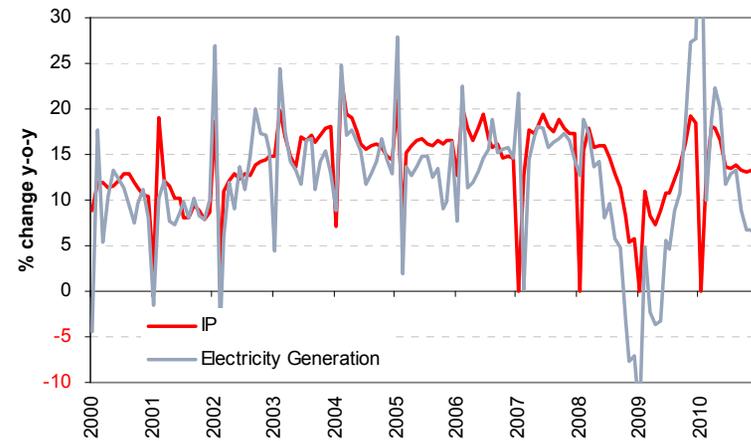
Source: Platts, Tex, Citi Investment Research and Analysis

Figure 29. China generating capacity



Source: Citi Investment Research and Analysis

Figure 30. Chinese electricity generation vs IP



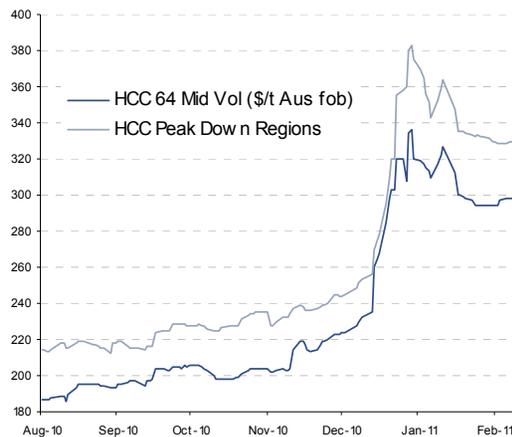
Source: Bloomberg, Citi Investment Research and Analysis

Metallurgical Coal

Coking Coal

- Despite coal prices easing back from their recent highs, persistent supply side issues should keep prices well supported. Premium coking coal prices (Peak Downs) are currently trading at \$318/t, while BHP is reported to have offered customers \$325/t for premium hard coking coal for 2Q11 contracts volumes. We believe the supply-side issues will continue to plague the industry for the rest of the year and can't see mine supply getting back to normalised levels until 2H11. Our current forecasts call for premium hard coking coal to remain above \$300/t for the remainder of 2011.
- Australian coking coal exports are slowly recovering. According to data from the various ports, Queensland exports of coal were down 7% y-o-y to 11.4Mt in March. For 1Q11, total Queensland exports were down 30% y-o-y to 28.5Mt. We are now assuming that lost production for 1H11 will total approximately 20Mt. But with the system running at near capacity last year, there appears little chance that the industry will be able to recover this lost tonnage. As a consequence, we have reduced our coking coal exports for Australia to 140Mt in 2011, a fall of 12% from the record high of 159Mt achieved last year.
- In the short term, Japan's earthquake and tsunami has weakened demand for coking coal in the Asian region. We have anecdotal reports that tonnages are being diverted to nearby customers including China. But longer term we remain extremely bullish. Chinese demand has been growing strongly over the past couple of years, driven by steel production. This has resulted in coking coal imports jumping six-fold over the past two years. The strong steel output has continued into 2011, with China's crude steel production reaching a new record high of 1.945 million tonnes per day in mid-March.

Figure 31. HCC spot prices, Australia FOB (\$/t)



Source: Citi Investment Research and Analysis

Figure 32. Metallurgical coal seaborne supply demand balance

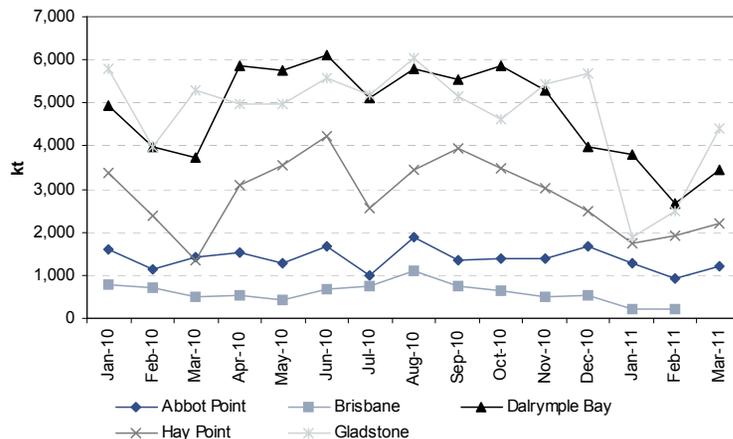
IMPORTS (Mt)	2009	2010e	2011e	2012e	2013e	2014e	2015e
Japan	49.4	58.7	63.9	66.5	66.5	66.5	66.5
South Korea	19.4	26.0	25.3	26.6	27.8	29.2	30.6
India	24.6	38.7	54.9	66.7	74.8	97.8	104.0
EC	28.4	30.2	35.2	37.0	37.0	37.0	37.0
China	30.5	32.2	40.0	30.0	30.0	30.0	30.0
Brazil	12.5	12.9	18.0	18.8	19.7	20.5	21.5
Other	21.4	27.5	29.5	34.6	34.7	34.7	35.6
Total	186.3	226.2	266.8	280.2	290.5	315.8	325.1
EXPORTS (Mt)	2009	2010e	2011e	2012e	2013e	2014e	2015e
Australia	135.1	158.9	140.0	173.0	190.0	192.0	192.0
US	31.4	47.8	53.0	50.0	50.0	52.5	55.0
Canada	20.6	26.1	26.1	26.1	25.0	25.0	25.0
China	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Russia	10.5	10.0	14.0	12.0	12.0	12.0	13.0
Mozambique	1.0	0.0	4.4	6.0	10.0	12.2	12.2
Other	1.2	2.9	3.0	3.0	3.0	3.0	3.0
Total	199.4	246.4	241.1	270.7	290.6	297.3	300.8
MARKET BALANCE	13.2	20.2	-25.7	-9.5	0.1	-18.5	-24.3

Source: Citi Investment Research and Analysis

Australian Supply Slowly Recovering

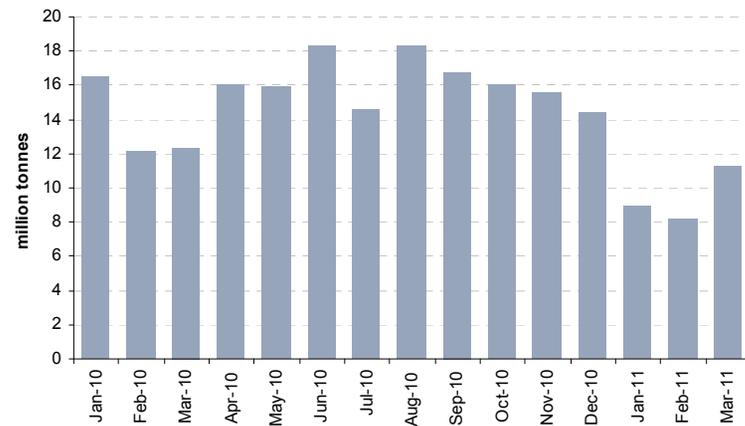
- Trade flows around Queensland, Australia are still hampered by the flooding earlier this year although tonnages are starting to pick up once again. According to data from the various ports, Queensland exports of coal were down 7% y-o-y to 11.4Mt in March. For 1Q11, total Queensland exports were down 30% y-o-y to 28.5Mt. But March has seen some signs of a recovery. Exports jumped over 40% from the previous month. The biggest gains occurred at Gladstone and Dalrymple Bay, the two biggest port terminals in Queensland. Exports from other ports such as Hay Point and Abbot Point remain subdued and well down from their nameplate capacity.
- Based on the 1Q11 export data, lost tonnage so far equates 13Mt. But with exports remaining below capacity the lost tonnage should be significantly higher. Despite most companies lifting force majeure notices and rail and port capacity back to 100% availability, exports are likely to remain affected for the remainder of this year.
- According to the Queensland Resources Council (QRC), three quarters of Queensland's coal mines are still pumping rainwater from their open-cut pits. It appears that environmental issues remain the constraint for getting the industry back to normal, with the case-by-case approach and strict conditions in their special environmental discharge approvals delaying the de-watering activities of many operations in the region.
- If we assume utilisation rates in 2Q11 of approximately 85%, lost production for 1H11 would total approximately 21Mt. However, with the system running at near capacity last year, there appears little chance that the industry will be able to recover this lost tonnage. To complicate matters, the inventory chain has been completely emptied. Therefore any minor disruption to mine, rail or port facilities, exports will likely suffer almost immediately.
- As a consequence, we have reduced our coking coal exports for Australia to 140Mt in 2011, a fall of 12% from the record high of 159Mt achieved last year. This represents a fall of 20Mt from our forecast at the beginning of the year.

Figure 33. Coal exports from Queensland have bottomed out and are now slowly recovering



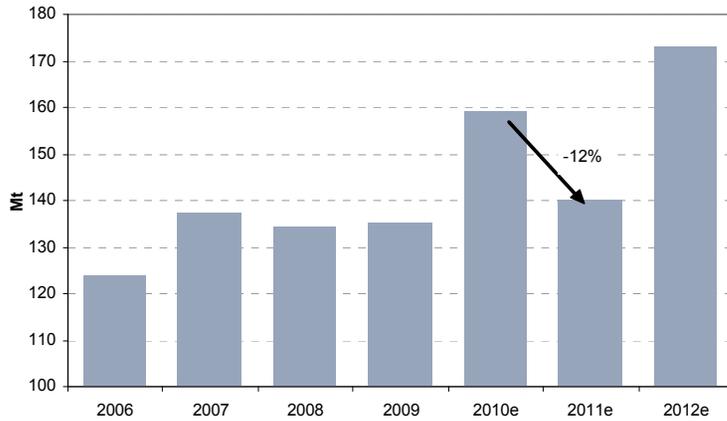
Source: Tex, Company Reports, Citi Investment Research and Analysis

Figure 34. Queensland total coal exports by month



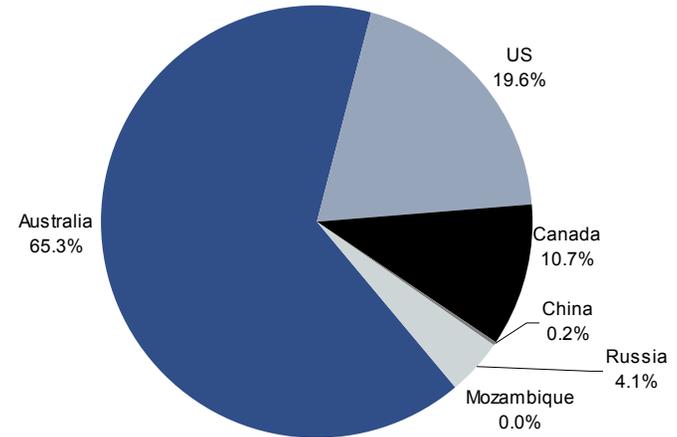
Source: Tex, Company Reports, Citi Investment Research and Analysis

Figure 35. We estimate Australian coking coal exports will fall by 12% in 2011



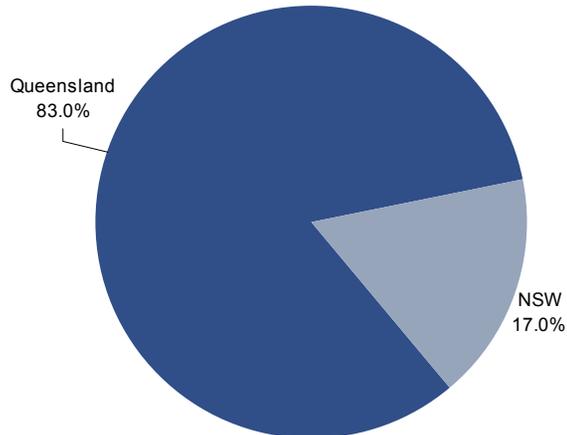
Source: Citi Investment Research and Analysis

Figure 36. Coking coal exports, 2011



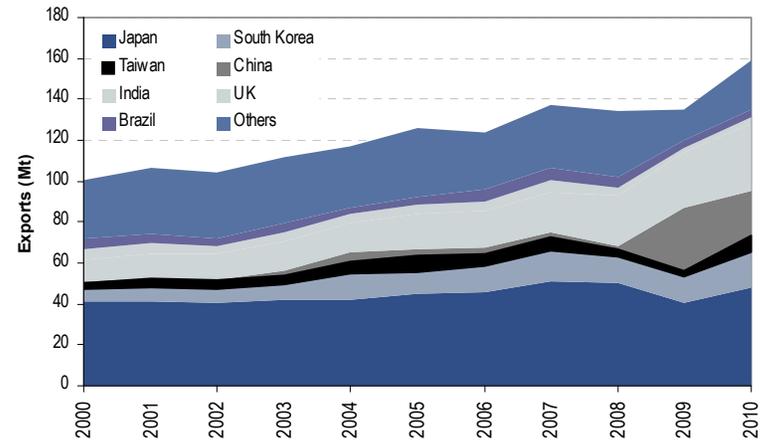
Source: Citi Investment Research and Analysis

Figure 37. Queensland dominates coking coal exports from Australia



Source: Platts, Tex, Citi Investment Research and Analysis

Figure 38. Australian coking coal exports by destination

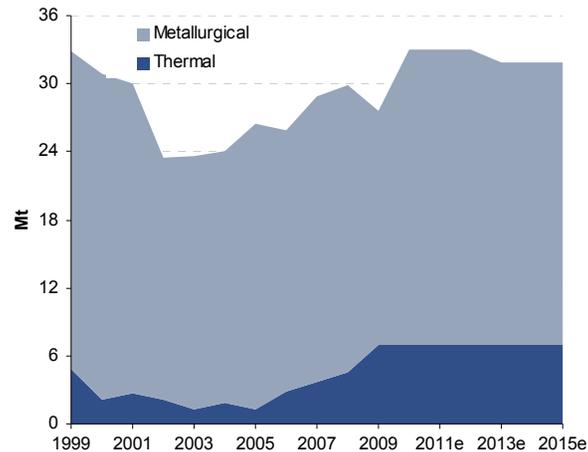


Source: Citi Investment Research and Analysis

Alternative Sources of Supply

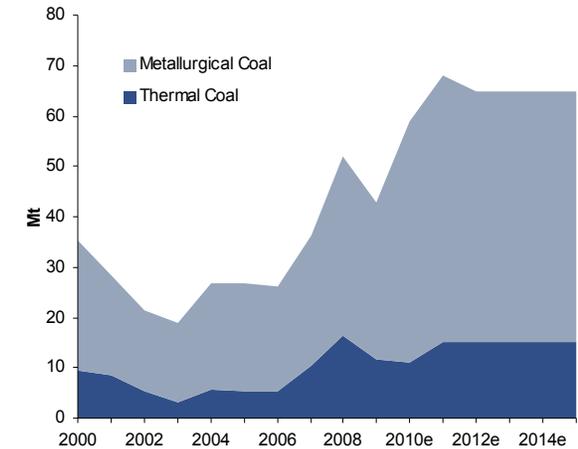
- Any supply shortages has a result of the floods in Australia could be met by USA and Canadian coking coal producers. Canada is the third-largest shipper of metallurgical coal after Australia and the US. Canadian exports would be more stable but the growth would mostly come from PCI coals (Figure 40). Rail capability is also constrained, especially on the southern rail route to the ports in the lee of Vancouver Island. There is ample rail capacity on the northern route to Ridley Island, but less potential for increased coal production.
- For the US to ramp up production quickly to meet the needs of the market in the longer term, it would have to overcome considerable environmental challenges and port capacity would have to expand (at Hampton Roads capacity previously used for coal is now dedicated to other cargoes). But US coking coal producers are highly opportunistic. In the past, they have shown a propensity to sell into international markets at the expense of domestic consumers when prices are high enough. This should result in a pick-up in coking coal exports in the short term (Figure 41).
- Longer term, there are only a few potential sources of new hard coking coal supply; two of the most important are Mozambique and Mongolia. Exports from Mongolia to China are now running at 1.5Mt/pm. Annualized exports to China should be 13.3Mt, up from 4Mt in 2009. Growth in Mongolian exports to China is expected to compete with domestic production, but will also limit growth of seaborne supply. However, the ability of Mongolian producers to fully exploit the potential of the reserves will depend on construction of rail links to the Chinese boarder.

Figure 39. Canadian coal exports



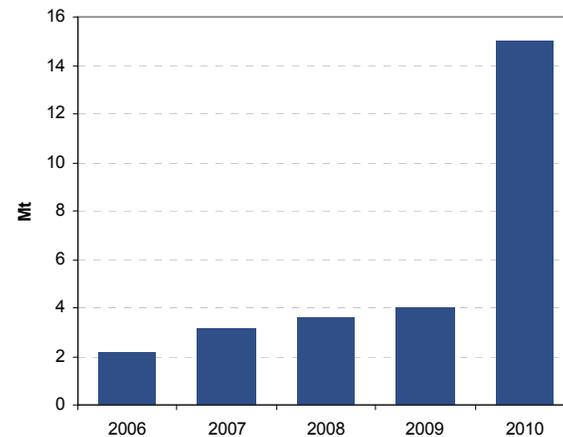
Source: Tex, Platts, Citi Investment Research and Analysis

Figure 40. US coal exports



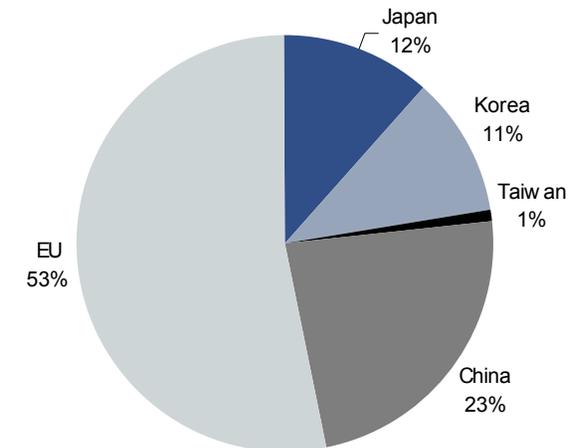
Source: Tex, Platts, Citi Investment Research and Analysis

Figure 41. Mongolian coal exports to China



Source: Tex, Citi Investment Research and Analysis

Figure 42. Russian coking coal exports

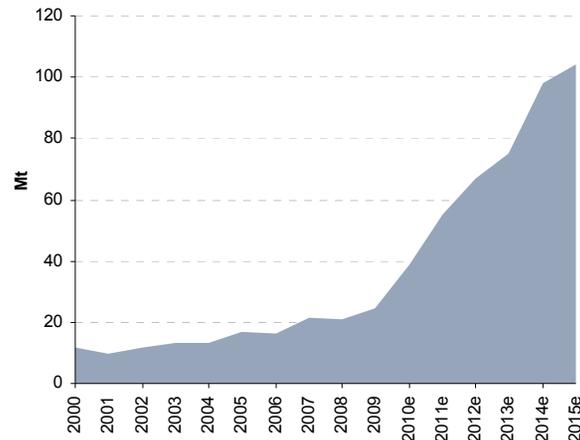


Source: Tex, Citi Investment Research and Analysis

Demand

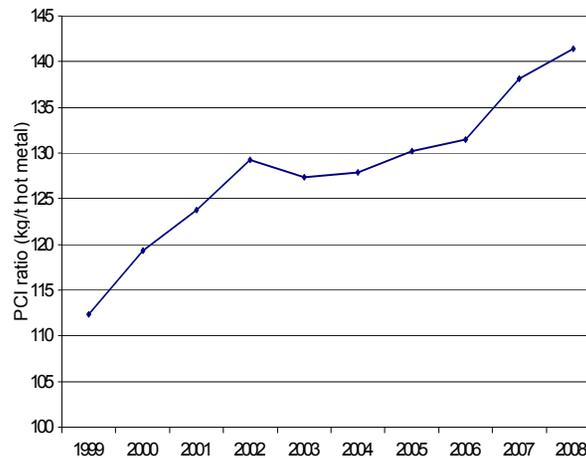
- India demand growth is expected to be explosive as steel production increases, blast furnace production (using coke) displaces sponge iron (using thermal coal) and domestic coal supplies prove inadequate to meet demand (Figure 44).
- Extended periods of elevated prices and tight supply will have important market implications. Steel producers will likely need to increase prices if they are to offset the costs of higher coal (and iron ore) prices. But any increase will be difficult to impose and will probably result in an increase in substitution by scrap.
- Steel production from electric arc furnace process using scrap steel as the principle feed accounts for only around 5% of steel production in China, much less than in other major steel producing economies (Figure 45). This largely reflects limited scrap supply in China, but as the scrap pool increases, supply should also increase and the favourable economics of EAF production, enhanced by expensive BF raw materials, should accelerate the transition.
- The tightness in metallurgical coal markets will likely be centered in high quality hard coking coal enhancing the economics of alternatives. PCI ratios are close to the technical maximum in most mature steel making economies. However, the maximum could increase given the right economic incentives. In emerging steel economies like China there is scope to further increase the average PCI ratio (Figure 46). In the case of semi-soft, stamp charging of coke ovens widely practiced in India, could reduce the proportion of hard coking coal in the coke oven charge from 70% to 35%.

Figure 43. Indian met coal imports



Source: Tex, Citi Investment Research and Analysis

Figure 45. PCI ratio in China



Source: CRU

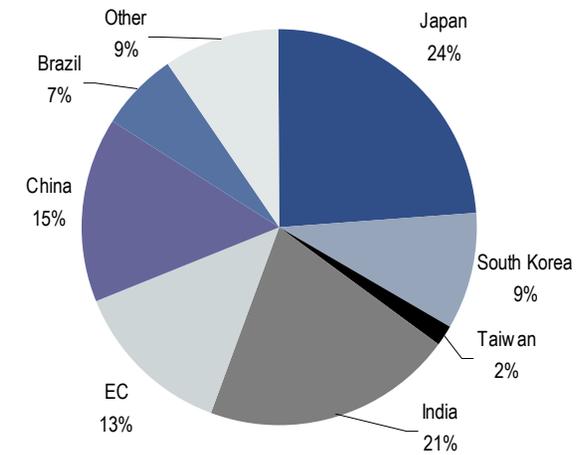
Figure 44. EAF capacity in chain and other economies

	Japan		Korea	
	2008	2009	2008	2009
Crude Steel (Mt)	119	87	54	48
Blast Furnace (%)	72	73	39	27
EAF (%)	28	27	61	73

	Europe		China	
	2008	2009	2008	2009
Crude Steel (Mt)	169	116	500	568
Blast Furnace (%)	62	66	94	95
EAF (%)	38	34	6	5

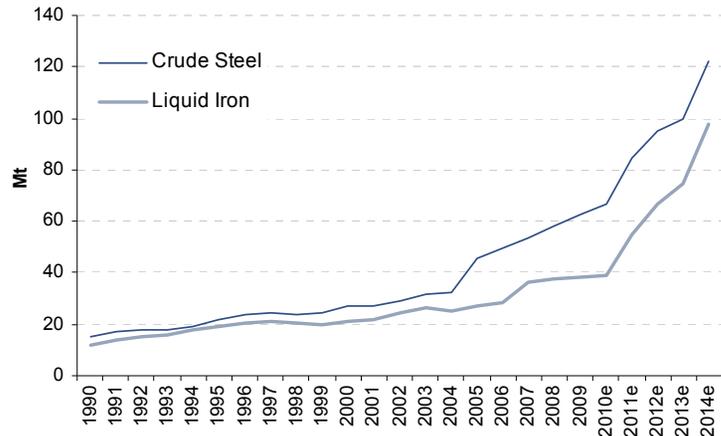
Source: Citi Investment Research and Analysis

Figure 46. Coking coal demand 2011



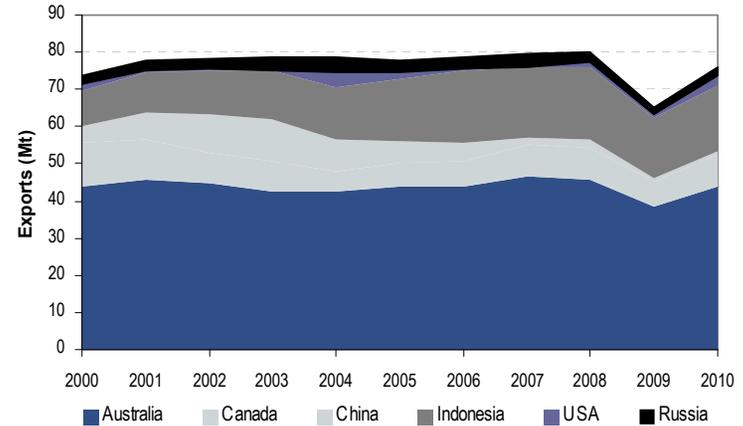
Source: Citi Investment Research and Analysis

Figure 47. Indian crude steel and pig iron production



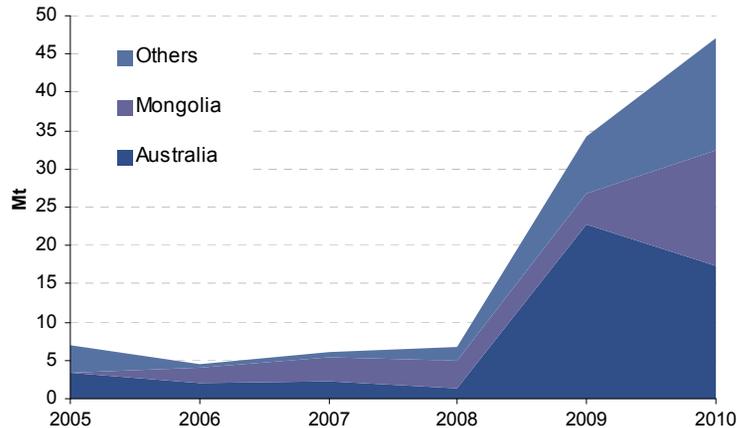
Source: Tex, Platts, Citi Investment Research and Analysis

Figure 48. Japan met coal imports by source



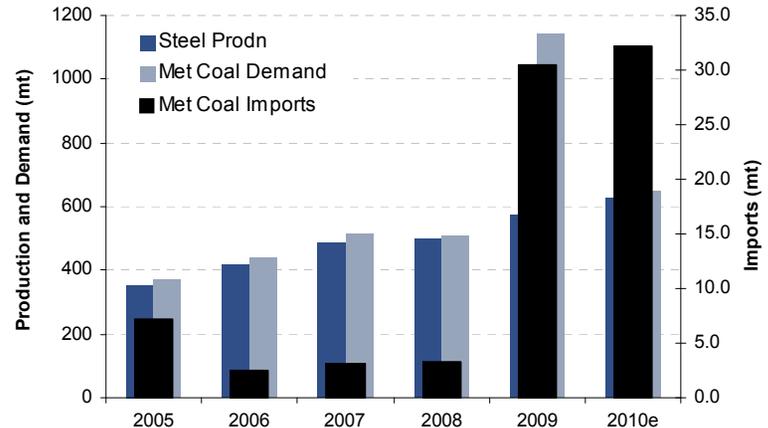
Source: Tex, Citi Investment Research and Analysis

Figure 49. China met coal imports by source



Source: Citi Investment Research and Analysis

Figure 50. Chinese steel production and met coal demand



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



Iron Ore

Iron Ore

- We expect the iron ore market to remain in tight supply demand balance until 2014, then move into a surplus as a raft of new projects hit the market. But post 2015, the emergence of new global growth generators should keep this market relatively balanced. For the remainder of this year, we expect the spot price to trade around \$180 as supply side issues are mitigated by a cooling in Chinese steel production. But prices should ease back towards USD150-160/t over the next couple of years. Over the medium to longer term, prices should remain above \$100/t as demand from emerging markets grows strongly and new supply fails to meet expectations.
- The market continues to be punctuated with supply constraints. The ban on Indian iron ore exports (from Karnataka) has continued to support the market. Despite India's High Court upholding an appeal on the ban, an increase in exports is unlikely in the short term, due to the monsoon season fast approaching. But ongoing will be the government's drive to close illegal mines, which we expect will result in lower iron ore imports. Longer term, Brazil should continue to suffer from challenges in bringing new supply on stream. In particular: new port capacity and environmental permitting at mine sites.
- After lackluster growth in 2H10 (due to energy related constraints), Chinese demand has been considerably stronger this year. Chinese iron ore imports in 1Q11 rose 10% QoQ to 177Mt, driven by increasing crude steel output. According to China Iron & Steel Association, China's daily crude steel output rose to an estimated 1.94Mt in the last 10 days of April, up 3.2% YoY (but flat MoM). But with power shortages already hitting certain provinces, the likelihood of steel output moving higher from these levels is unlikely.

Figure 51. Global iron ore supply demand balance

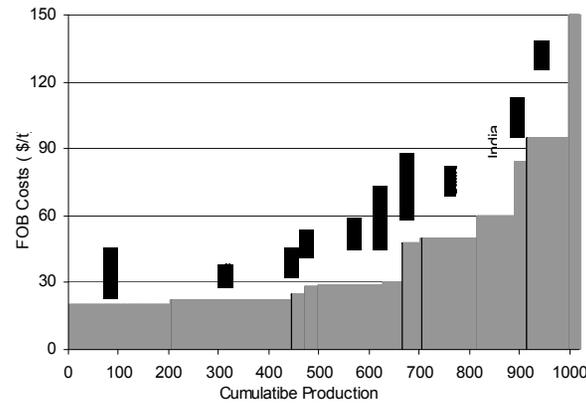
Mt	2009	2010	2011e	2012e	2013e	2014e	2015e	2016e	2017e	2018e	2019e	2020e
SEABORNE IMPORTS												
Japan	115	134	142	148	148	148	148	151	154	157	160	163
Taiwan	12	19	14	14	14	14	14	14	13	13	13	13
EEC	56	95	133	128	128	128	128	134	141	148	155	163
USA	4	7	7	9	9	9	9	10	9	9	9	9
Total	877	972	1,015	1,063	1,120	1,179	1,251	1,385	1,526	1,616	1,700	1,797
SEABORNE EXPORTS												
Australia	362	413	441	480	534	618	693	751	803	830	857	857
Brazil	266	311	318	330	343	375	410	461	506	547	589	629
India	115	102	90	70	65	65	65	65	65	65	65	65
Canada	28	28	25	25	25	25	25	25	25	25	25	25
Africa	55	57	60	72	85	105	115	129	147	167	169	172
Other	44	67	68	53	50	42	45	34	34	34	34	34
Total	870	978	1,002	1,030	1,102	1,230	1,352	1,465	1,580	1,668	1,739	1,782
MARKET BALANCE	-6.8	6.2	-13.2	-32.8	-18.7	50.6	100.8	80.1	54.9	52.4	39.7	-15.1

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

Supply

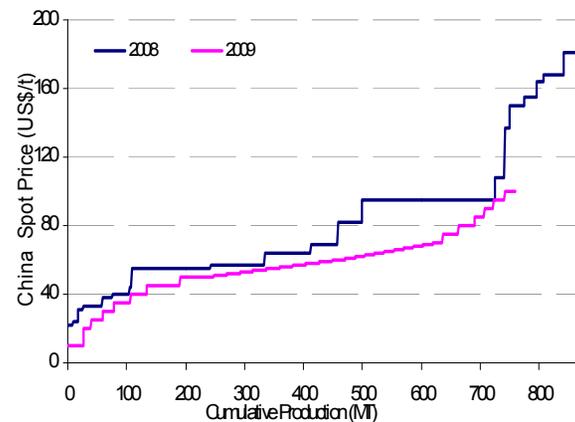
- The bottom end of the cost curve is dominated by the major Australian and Brazilian shipper. However it is notable that some Chinese production is also low cost (Figure 53).
- When calculating the cost of delivering iron ore into China, the curve has a less steep tail and Chinese production is more competitive (Figure 54).
- A more detailed picture of Chinese production costs can be seen in Figure 55. Costs vary widely. The figure also shows that during 2009 Chinese high cost production was sharply curtailed when prices fell to around USD60/t.
- Figure 56 shows the price elasticity of China's production. Production declined in 2008-09 as prices fell, and has rebounded in 2010 as prices have recovered.
- Grade appears to have picked up in 2010, reversing the trend decline. It is also notable that increasing volume and declining grade have closely balanced, so that production of iron units has remained roughly stable.
- Recent information from on the ground in China indicates that the new supply is not particularly low grade, or high cost.
- We expect iron ore production from China to increase. In essence, this is what is required to fill our projected supply deficit.

Figure 52. Iron ore cost curve \$/t FOB



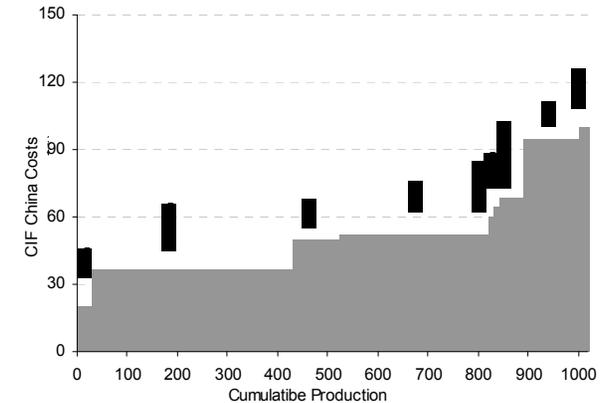
Source: Citi Investment Research and Analysis

Figure 54. China iron ore production costs



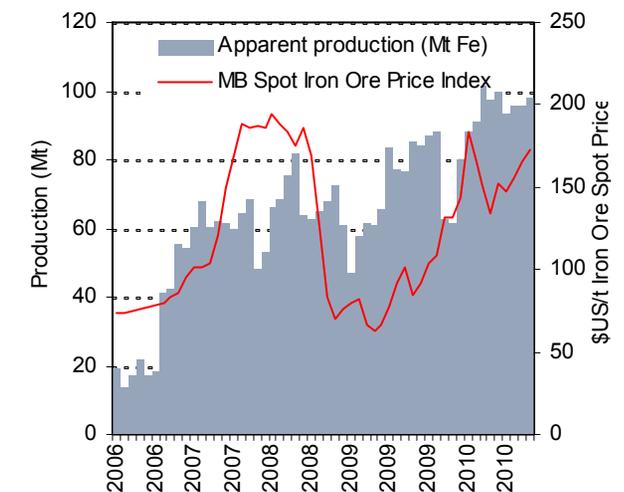
Source: Citi Investment Research and Analysis

Figure 53. Iron ore cost curve \$/t CIF China



Source: Citi Investment Research and Analysis

Figure 55. Chinese iron ore production vs. spot price

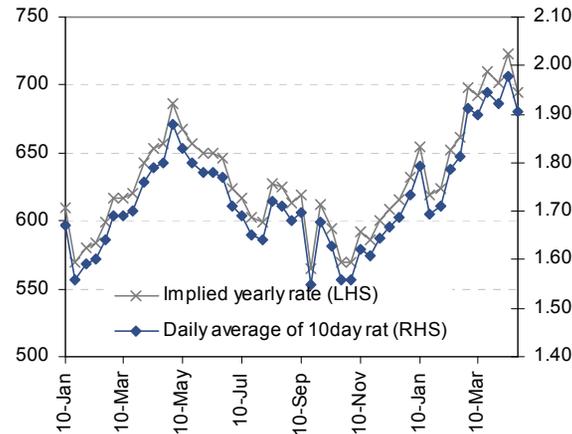


Source: Bloomberg, Citi Investment Research and Analysis

Demand

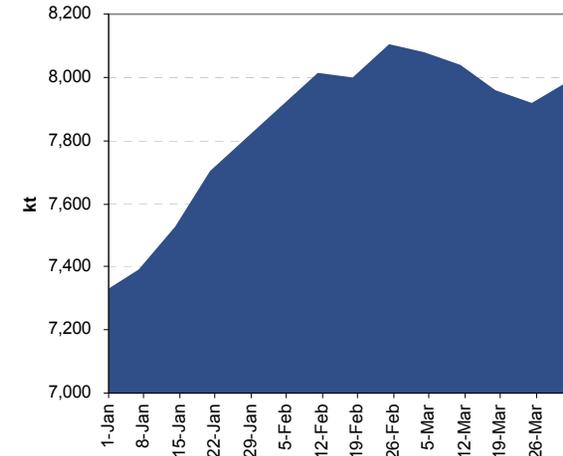
- After a prolonged quiet period in the Chinese iron ore market, physical activity seems to be picking up on the back of stronger-than-expected Chinese steel output. According to data released by China Iron and Steel Association (CISA) recently, China's crude steel production reached a new record high of 1.95 million tonnes per day in April (Figure 57).
- The figure represents an increase of 2.1% from the adjusted figure of 1.9 million tonnes recorded in March, and although down 1.9% from the previous high of 1.98 million tonnes in early April. But it was up 5% from the previous year.
- Despite being at relatively high absolute levels, inventories of imported ores (at Chinese ports) are also falling (Figure 58). After reaching a high of over 8.1Mt in mid February, they have started to trend downwards and are now nearly 2.2% lower. This comes at a time when we have heard anecdotal reports that Chinese customers have been receiving distressed cargoes of iron ore (and coal) originally destined for Japan. The combination of strong Chinese steel production and falling iron ore inventory is an encouraging sign, although it is still early days.
- Steel inventories have risen dramatically since the beginning of the year, up almost 45% (Figure 59) at one point. But after reaching 18.3Mt in late February, inventories have started to fall and are now down 5% from that peak. Steel inventory held by traders have also recorded falls in recent weeks, which suggests that real demand is behind.

Figure 56. Daily Chinese steel production



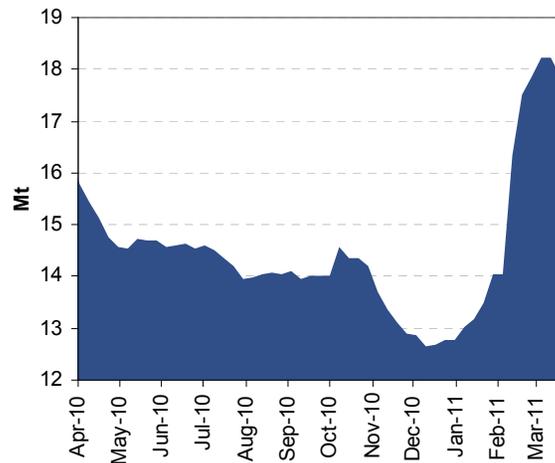
Source: CISA, Citi Investment Research and Analysis

Figure 57. Iron ore inventory at Chinese ports



Source: Bloomberg, Citi Investment Research and Analysis

Figure 58. Chinese steel inventory



Source: Citi Investment Research and Analysis

Figure 59. China's crude steel production & iron ore supply

	2009	2010	2011e	2012e	2013e	2014e	2015e
Million Tonnes							
Crude Steel Production	574	627	650	687	721	743	765
China Imports (Mt iron ore @ 63%)	628	619	633	675	714	736	758
China Imports (Contained iron)	396	390	406	429	450	464	478
Inventory	67	77	65	60	60	60	60
Ore stocks change (Mt of ore)	7	9	-12	-5	0	0	0
Domestic Production (Contained iron)	158	218	219	198	208	207	184

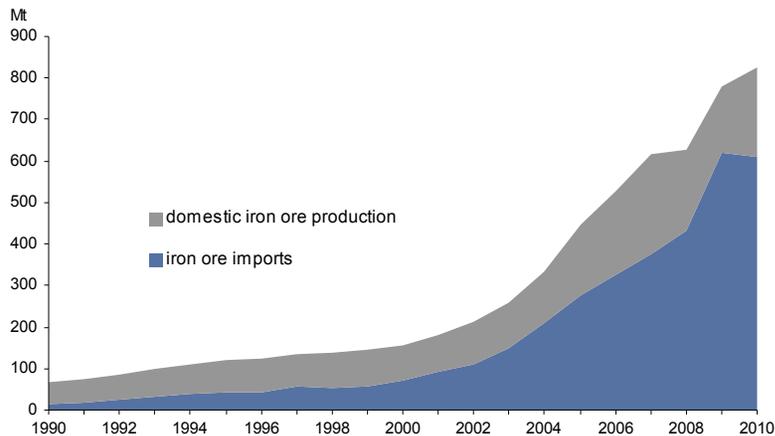
Source: CISA, Tex, Citi Investment Research and Analysis

Figure 60. Production by company

Mt	2009	2010	2011e	2012e	2013e	2014e	2015e
BHP Billiton	111	130	129	150	159	171	206
Rio Tinto	161	171	204	220	225	228	230
FMG	0	2	27	38	43	53	65
Vale	303	302	240	292	310	310	320
Other Brazil	2	5	5	20	20	20	20
China	380	314	251	345	347	314	330
India & Other	94	106	115	102	90	70	65
Total	1050	1029	972	1168	1193	1165	1236

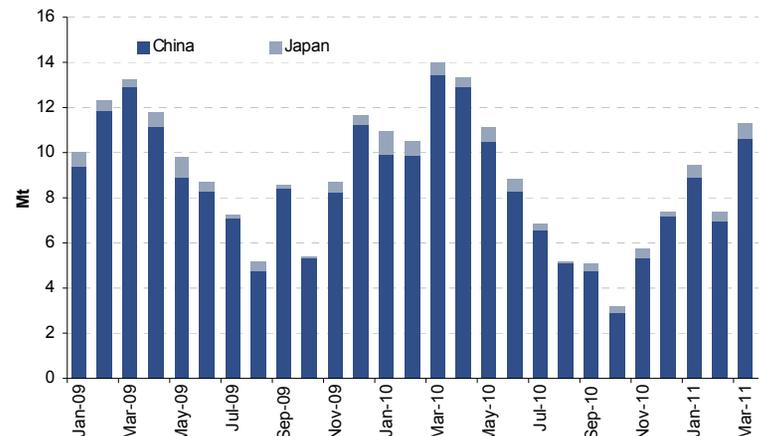
Source: Company Reports, Citi Investment Research and Analysis

Figure 61. China iron ore consumption (contained iron)



Source: Tex, Citi Investment Research and Analysis

Figure 62. Indian exports to China & Japan



Source: Tex, Citi Investment Research and Analysis



Steel



Steel

- Steel markets have softened after a raw material led distributor restock. We have argued in the past that this restock would run out of steam if it was not matched by real demand, and so far that seems to be playing out – global auto production has been impacted by component shortages from the tragic events in Japan, while the pickup in construction activity has been limited to pockets of strength (Germany, France) and not widespread.
- Most importantly, distributors appear to be content with keeping stock levels lean – particularly as building stocks at current steel prices is both expensive and risky. Additionally, imports into regions like the US are picking up as lower priced material from the CIS and Asia finds its way into “richer” markets like the Gulf and W. Coast.

Figure 63. Steel production and demand - history and estimates

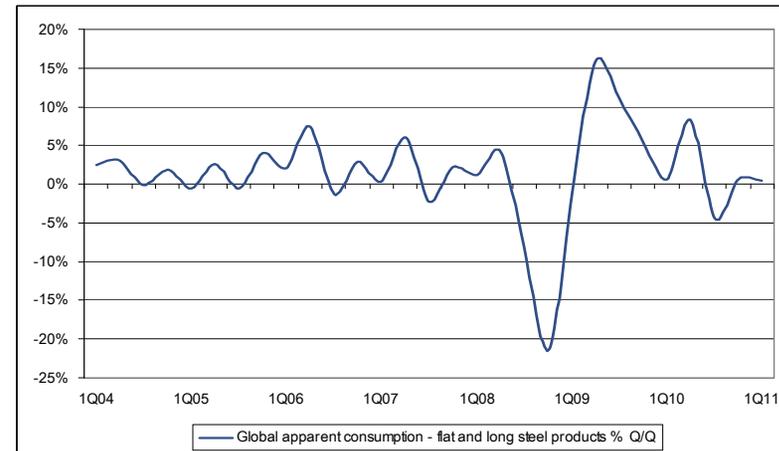
Regional Production - Crude Steel	2006	% chg	2007	% chg	2008	% chg	2009	% chg	2010	% chg	2011e	% chg	2012e
EU (15)	197	20.1%	210	6.6%	197	-6.2%	116	-41.1%	144	24.1%	152	5.6%	161
CIS	120	6.2%	125	4.2%	113	-9.6%	96	-15.0%	107	11.5%	120	12.1%	123
NAFTA	130	3.2%	127	-2.3%	124	-2.4%	81	-34.7%	111	37.0%	118	6.3%	125
Central/South America	46	-2.1%	47	2.2%	48	2.1%	38	-20.8%	44	15.8%	55	25.0%	65
China	423	21.2%	487	15.1%	498	2.3%	565	13.5%	626	10.8%	646	3.2%	661
Japan	116	3.6%	119	2.6%	119	0.0%	88	-26.1%	110	25.0%	109	-0.9%	123
India	43	13.2%	48	11.6%	55	14.6%	56	1.8%	66	17.9%	75	13.6%	86
Global Production	1,254	10.7%	1,306	4.1%	1,341	2.7%	1,202	-10.4%	1,394	16.0%	1,497	7.4%	1,584
Regional Demand - Finished Steel	2006	% chg	2007	% chg	2008	% chg	2009	% chg	2010	% chg	2011e	% chg	2012e
EU (15)	153	7.7%	155	1.3%	140	-9.7%	105	-25.0%	111	5.7%	114	2.7%	117
CIS	44	4.8%	49	11.4%	50	2.0%	38	-24.0%	47	23.7%	48	2.1%	50
NAFTA	135	8.9%	128	-5.2%	115	-10.2%	76	-33.9%	102	34.2%	106	3.9%	109
Central/South America	34	17.2%	38	11.8%	39	2.6%	31	-20.5%	39	25.8%	40	2.6%	41
China	384	49.4%	456	18.8%	476	4.4%	597	25.4%	681	14.1%	739	8.5%	794
Japan	95	1.1%	98	3.2%	95	-3.1%	66	-30.5%	85	28.8%	80	-5.9%	83
India	43	10.3%	42	-2.3%	50	19.0%	55	10.0%	59	7.3%	64	8.5%	70
Global Demand	1,130	18.9%	1,222	8.1%	1,226	0.3%	1,179	-3.8%	1,368	16.0%	1,443	5.5%	1,523
Global Ex China	747	7.8%	766	2.5%	749	-2.2%	582	-22.3%	687	18.0%	704	2.5%	729

Source: CRU, Metal Bulletin, Citi Investment Research and Analysis

Lower Confidence Amongst Buyers

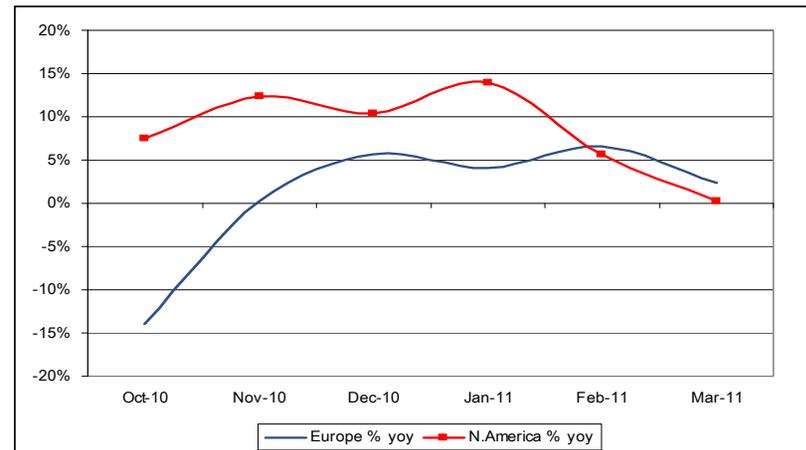
- We think (a lack of) confidence is playing a role in this pause in apparent demand. Distributors are being more cautious about adding to positions after a two month rally and are also, likely concerned by a raft of tightening measures in China and their likely impact on the world's largest steel consumer.
- We have also started to see some evidence of mills starting to reign in production as a result – the March IISI data shows a loss in momentum from both W. Europe and N. America, production in Germany for April registered its first monthly drop since 2009 and utilization rates for crude steel output in the US has dropped by ~3% through late April and May to 73.7%. CRU reports that mill lead times in the US have shrunk by a week to 7 weeks and this would imply a further weakening should be expected in the IISI production data.
- Investors and analysts treat production as a data point for the health of the sector and declining production usually goes hand in hand with declining mill margins.
- Lastly, we note that the ~ €50/t price fall in EU domestic HRC in May-11 has occurred against a backdrop of iron ore prices being relatively stable (a small drop vs. oil and copper). This implies that conversion margins could drop below 30%, or back to the lows seen in Q3 2010.

Figure 64. Loss of momentum in demand



Source: CRU, Citi Investment Research and Analysis

Figure 65. Crude steel production has been declining too, on low distributor appetite and shrinking lead times



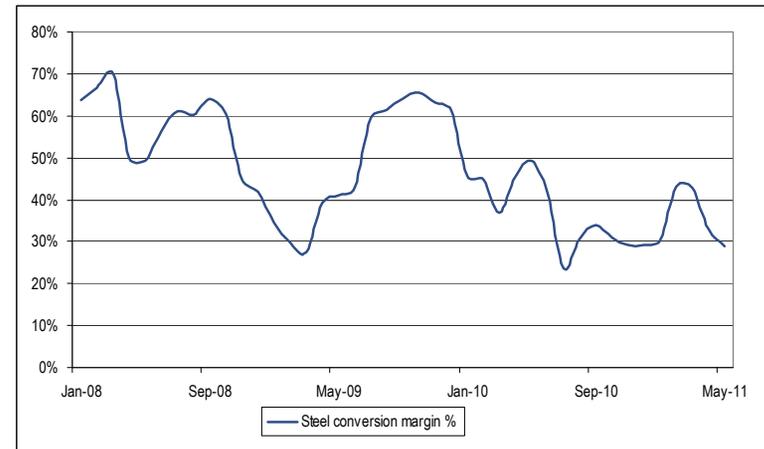
Source: Citi Investment Research and Analysis

What Could Restore Confidence?

- In order for the virtuous circle of confidence and demand to be restored, we think a few factors need to play out:
 - An end to monetary tightening in China would be supportive of sentiment for Chinese construction. Policy tightening appears to be delivering the anticipated results, although our economists point out that there usually a 6-9m lag. If CPI peaks mid-year at 5%+, we think sentiment in the property sector could get a boost.
 - Capacity closures have disappointed steel investors with some high cost US assets (formerly owned by Severstal) now under new ownership. However, ArcelorMittal still has idled capacity in Europe, some of which could be closed (no indications at the moment). More importantly, we think there will be a sharp slowdown in Chinese capacity growth – partly due to a base effect, but also due to tougher hurdles for new plants. We are forecasting capacity growth in China at 2.7% over the next three years, vs. a 19.5% annual growth rate over the last decade.

- Its not all bad news in world ex-China – payroll gains in the US have continued to print at a 200k+ pace and this should continue to drive down the unemployment rate and boost both consumer but also corporate confidence – this can finally give us the much waited-for non-residential and investment recovery, that should in turn boost real steel demand.

Figure 66. European conversion margins – adjusted for May's price drop



Source: Citi Investment Research and Analysis

Copper



Copper

\$10,000 Seems Unsustainable

- We expect the copper market to be in supply deficit this year and next, before returning to surplus over the next two years.
- But the market appears to have well and truly priced those deficits in. Copper has been unable to rally despite a sharp weakening in the US\$.
- Speculators in China have plenty of inventory, and appear able to fill the mine/scrap shortage until mine production improves. Imports are falling, in reaction to high absolute and relative prices and efforts by the authorities to reign in speculative activity.
- China is tightening monetary policy and withdrawing auto and household durable good scrappage subsidies. This less favourable climate should be partly offset by the impact of still loose monetary conditions in the West.
- Demand in developed economies should steadily improve, but as it does, central banks will likely remove 'uber' loose monetary conditions. As the benchmark for the LME Complex, copper will likely suffer.

Figure 67. Global copper supply demand balance

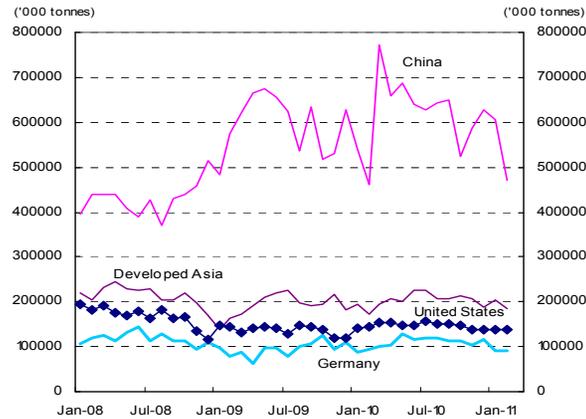
kt	2009	2010	2011e	2012e	2013e	2014e	2015e
Mine Production (Concentrates)	12,466	12,781	13,281	13,884	14,896	15,878	16,592
Secondary Supply etc. (incl losses)	1,440	795	1,450	1,426	2,063	1,791	2,638
Smelter Capacity	17,296	17,590	18,308	19,633	21,742	23,249	25,640
Smelter Production	13,866	13,627	14,738	15,310	16,959	17,669	19,230
Mine Production (Electrowon)	3,338	3,337	3,598	4,010	4,390	4,521	4,445
High Grade Scrap	1,445	2,503	1,800	1,600	1,500	1,500	1,500
Mine Production (Total)	15,804	16,118	16,879	17,895	19,287	20,399	21,038
Refined Production (Total)	18,649	19,467	20,136	20,920	22,849	23,690	25,175
% Change	0.8%	4.4%	3.4%	3.9%	9.2%	3.7%	6.3%
Consumption/Demand	18,238	19,573	20,391	21,088	22,124	23,119	24,149
% Change	0.5%	7.3%	4.2%	3.4%	4.9%	4.5%	4.5%
Surplus/Deficit	411	-106	-256	-167	726	571	1027
Stock Change	283	-128	-256	-167	726	571	1027
Stocks	1,128	1,000	744	577	1,303	1,873	2,900
Stock:Consumption Ratio (wks)	3.2	2.7	1.9	1.4	3.1	4.2	6.2
Price (US\$/lb)	2.41	3.42	4.40	4.27	3.92	3.65	3.21
(US\$/t)	5,318	7,543	9,696	9,413	8,646	8,051	7,077

Source: Wood Mackenzie, Citi Investment Research and Analysis

Consumption

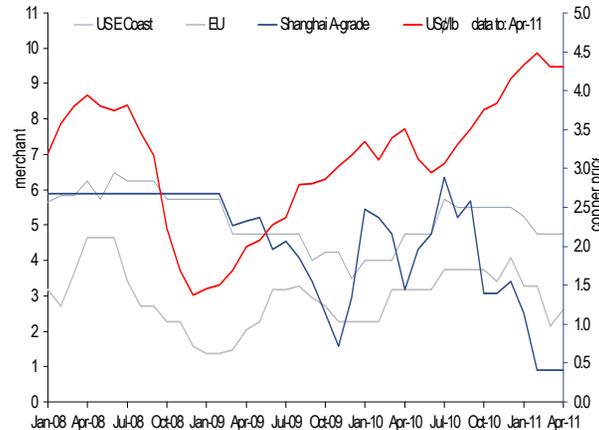
- Swings in Chinese demand remain the overwhelming driving force in the market. China has moved to reverse or withdraw policy stimulus in an attempt to curb inflation. Demand growth has slowed, and recent policy moves could be expected to limit any re-acceleration.
- Developed market demand growth is modest, after a strong 2010. The US housing sector remains deeply depressed, though there are hopes that rising household formation in 2012 will lead to a modest revival in construction activity.
- The impact of the Japanese earthquake is still being measured. Problems with spare parts manufacturing in Japan are having an impact around the world. Japanese consumers have reduced their spending and tourism has been deeply impacted.
- Merchant premia have weakened in the major consuming countries/regions and are particularly weak in China.
- Substitution concerns have eased slightly. Technologies that require larger amounts of copper are becoming more popular, notably in the renewable energy sector. Rising oil prices and increased popularity are set to increase hybrid/electric vehicle sales.

Figure 68. Country/regional demand – China still dominant



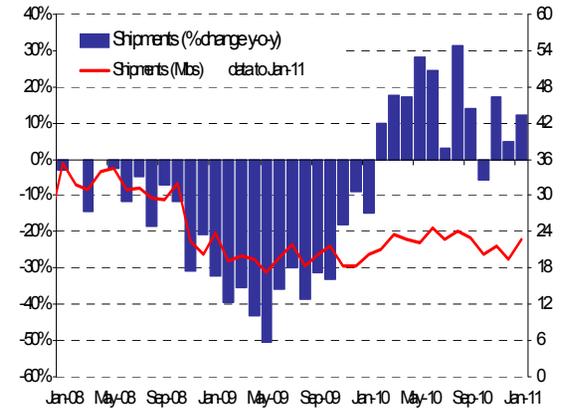
Source: WBMS, Citi Investment Research and Analysis

Figure 70. Merchant premia – weakening



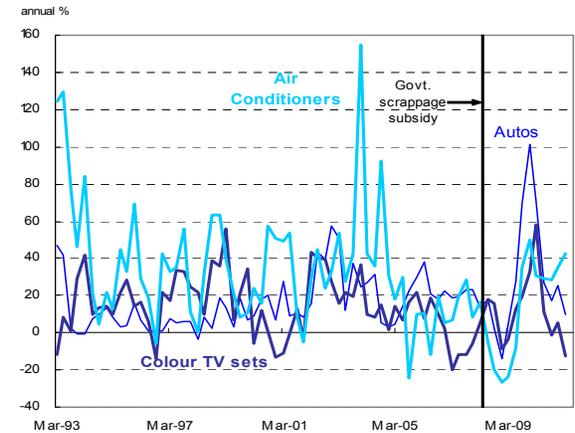
Source: Bloomberg, CIRA

Figure 69. US service center shipments



Source: Bloomberg, Citi Investment Research and Analysis

Figure 71. Chinese auto and consumer durable production



Sources: China NBS, Wind, Bloomberg, CIRA

Demand – By Use and Region

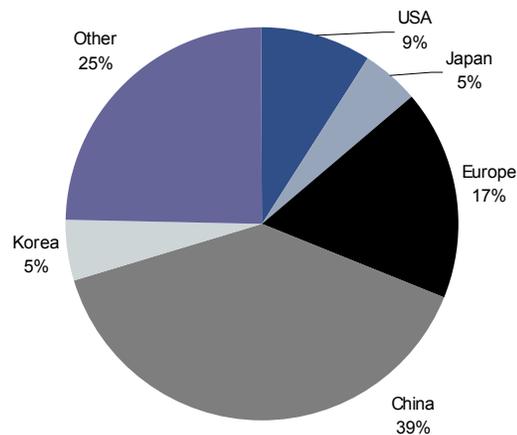
- Global demand is expected to be above trend again in 2011, before slowing in 2012.
- However there are notable regional differences. The US should remain robust, but we expect Japan and Europe will be weaker. The fallout from the earthquake in Japan is still becoming apparent. Rebuilding will occur over the next three years.
- We expect Chinese demand to remain strong, with growth accelerating later in 2011, as inventories are rebuilt.

Figure 72. Copper consumption forecast by region

(% ch yoy)	2009	2010	2011e	2012e	2013e	2014e	2015e
World	0.5%	7.3%	4.2%	3.4%	4.9%	4.5%	4.5%
USA	-18.3%	5.2%	4.2%	4.2%	2.8%	2.8%	2.8%
Japan	-26.1%	21.1%	-1.4%	4.6%	1.1%	1.1%	1.1%
Europe	-18.9%	11.4%	4.3%	2.6%	1.5%	1.5%	1.5%
China	38.7%	3.8%	11.8%	3.8%	8.3%	7.1%	6.9%
Korea	14.2%	-10.1%	7.9%	7.9%	7.9%	7.9%	7.9%

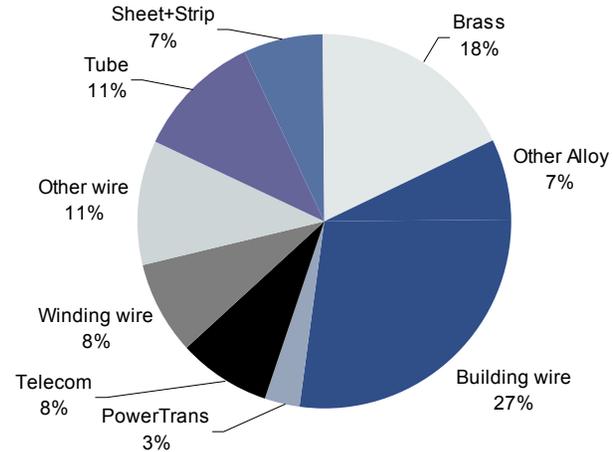
Source: WBMS, Citi Investment Research and Analysis

Figure 73. Copper consumption by region



Source: WBMS, Citi Investment Research and Analysis

Figure 74. Global copper consumption by end use

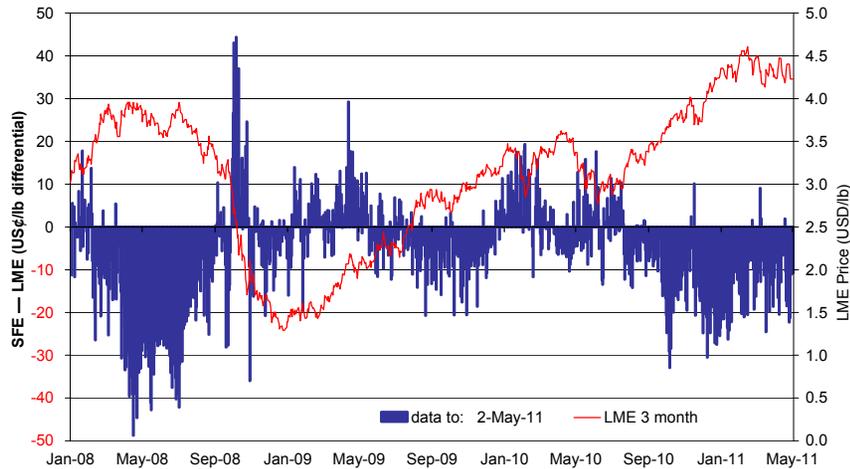


Source: WBMS, Citi Investment Research and Analysis

China

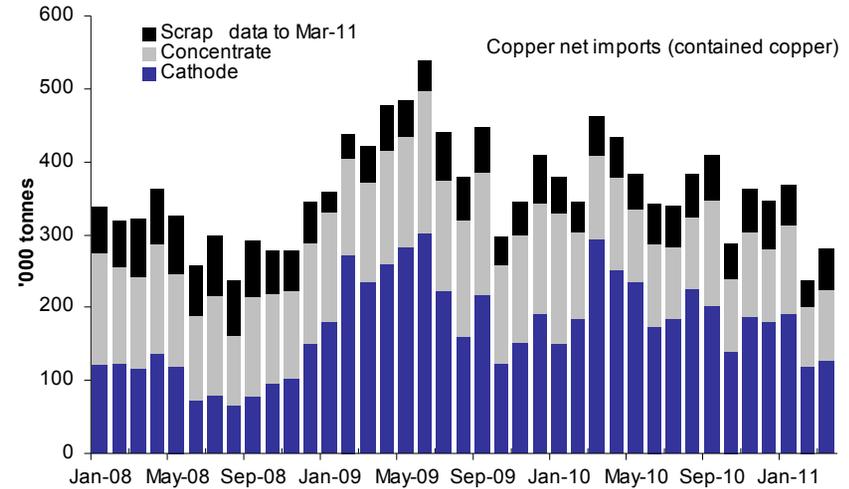
- The Chinese market is adequately supplied right now.
- The LME/SFE differential has narrowed from very wide levels reached at the turn of the year.
- Merchant premia are soft.
- Imports are subdued, but are likely to recover when restocking becomes essential or attractive.
- Scrap supply has increased, and concentrate stocks are ample.
- Inventories on the SFE, in bonded warehouses and in the hands of speculators, increased significantly in 2010, and remain at high levels.
- However, inventories at fabricators are low.

Figure 76. The SFE is at a substantial discount to LME



Source: Citi Investment Research and Analysis

Figure 75. Copper net imports



Source: Customs Data, Citi Investment Research and Analysis

Figure 77. China apparent consumption- unreported stocks increased further in 2010

	2008	2009	2010
Refined Production	3,795	4,110	4,573
plus Imports	1263	2597	2445
less Exports	94	70	36
App Consum (before stock adj)	4964	6636	6982
Stock Change			
less SFE	-7.8	77.5	37.3
less SRB	0	230	0
Apparent Consumption	4972	6329	6945
Underlying Consumption	5081	6031	6851
Unreported stock build	-109	298	94

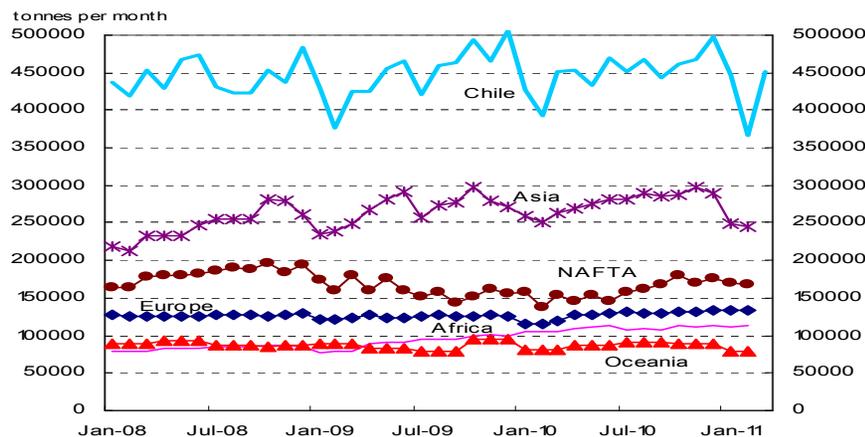
Source: Citi Investment Research and Analysis

Production and Inventories

Mine Supply Constraints Still Rule

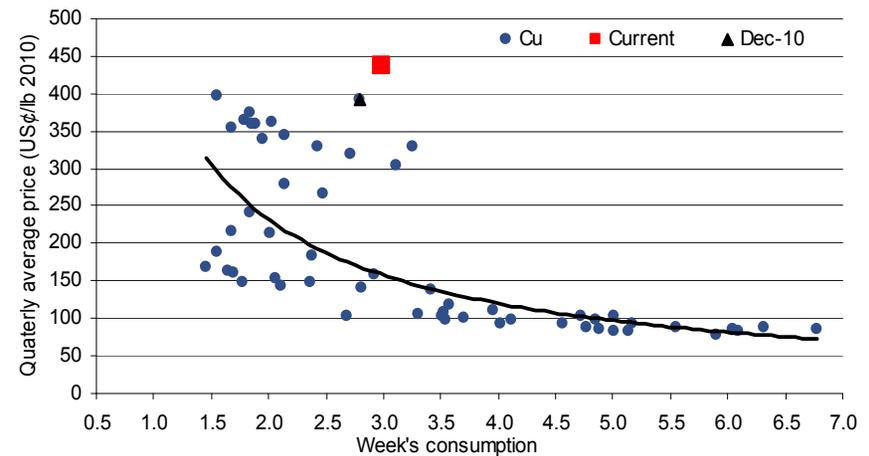
- Mine supply continues to disappoint, with Q1 production reports generally missing. Ore grades continue to fall, though the deterioration might not worsen in the short term (1-2 years).
- Repeated “one off” disruptions – this time rain in Northern Chile in early 2011 has affected mine production.
- And scrap supply has increased, in response to higher prices.
- TC/RCS have increased, as the fallout from the earthquake in Japan removes refining capacity in that country.
- Reported copper inventories rose significantly in the six months to March, but the stocks-to-consumption ratio remains low at around 2.5-3 weeks. Unreported stock builds in China appear to have ceased, as Beijing cracks down on speculators and tightens monetary conditions.
- Further supply deficits in 2011 and 2012 should keep inventories at low levels.
- The price/stocks trade-off has pushed out to record levels. The role of China and the investor in this move has been critical.

Figure 78. Copper mine production by country/region



Source: Citi Investment Research and Analysis

Figure 79 . Copper stocks-to-consumption ratio vs copper price



Source: Citi Investment Research and Analysis

Aluminium



Aluminium

- We maintain our relatively positive view on aluminium, and expect prices to be sustained around US\$2,600/tonne (USc115-120/lb). This, despite a persisting inventory overhang. Two issues will likely be key in determining prices.
- Firstly, power shortages in China are expected to result in power cuts to aluminium smelters in the next four months. These should see the closure of old capacity and production curtailments among producers in regions most affected by power cutbacks.
- The second potential bull point is that inventory remains locked up in financing deals. The potential is for this metal to be locked up for quite some time yet.
- Aluminium demand in developed economies remains robust. Chinese demand growth is also strong.
- The supply/demand outlook is for the aluminium market to swing in and out of supply surplus and deficit over the forecast period, but with stocks remaining at a high level.

Figure 80. Global aluminium supply-demand balance

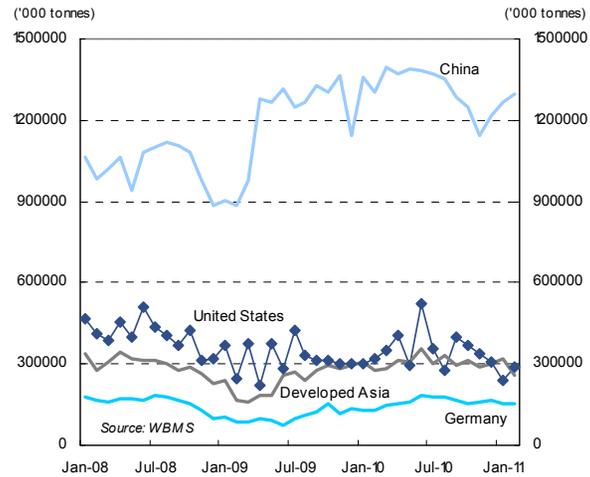
	2009	2010	2011e	2012e	2013e	2014e	2015e
Smelter Capacity ktpy	49,317	50,268	52,084	53,709	56,095	60,241	65,857
Refined Production	37,127	40,811	43,500	47,078	48,863	52,351	56,744
Capacity Utilization (%)	78%	82%	85%	89%	89%	90%	90%
Supply Incr (%)	-6.4%	9.9%	6.6%	8.2%	3.8%	7.1%	8.4%
Consumption/Demand	34,726	39,680	42,754	47,051	50,201	53,377	56,782
Consumption Incr. (%)	-5.9%	14.3%	7.7%	10.1%	6.7%	6.3%	6.4%
MARKET BALANCE	2,401	1,132	746	27	-1,338	-1,026	-37
Stocks	6,485	6,501	7,247	7,273	5,935	4,909	4,872
Stock Change	1,777	16	746	27	-1,338	-1,026	-37
Stocks (weeks)	9.7	8.5	8.8	8.0	6.1	4.8	4.5
Price: US\$/lb	0.78	0.99	1.23	1.22	1.18	1.16	1.14
US\$/t	1,712	2,173	2,701	2,688	2,598	2,556	2,518

Source: Wood Mackenzie, Citi Investment Research and Analysis

Demand

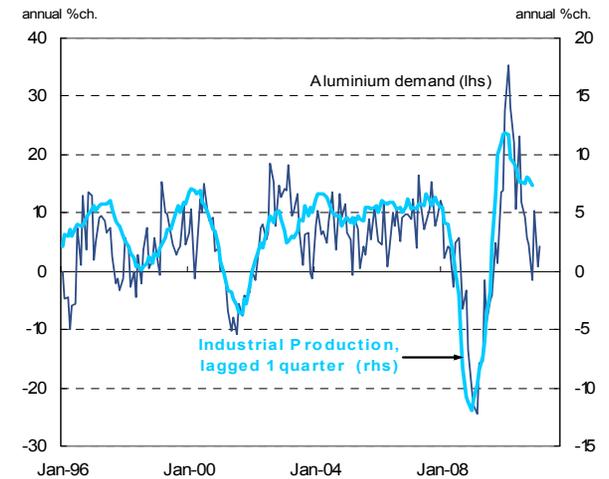
- Demand growth in developed economies is slowing, although levels remain robust.
- China remains the 'elephant in the room'. Chinese demand growth is likely to moderate from an extremely high pace set in 2010.
- Global demand growth seems likely to remain strong.
- Merchant premia have eased in Europe and China. They remain high in the US, reflecting tightness induced by inventory financing and LME shipping rules.

Figure 81. Country/region demand



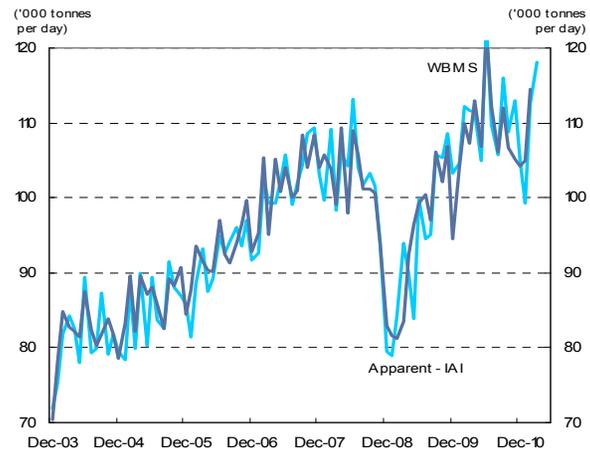
Source: Aluminium Assn., Citi Investment Research and Analysis

Figure 82. Demand vs industrial production



Source: Bloomberg, Citi Investment Research and Analysis

Figure 83. Daily demand was very strong in March

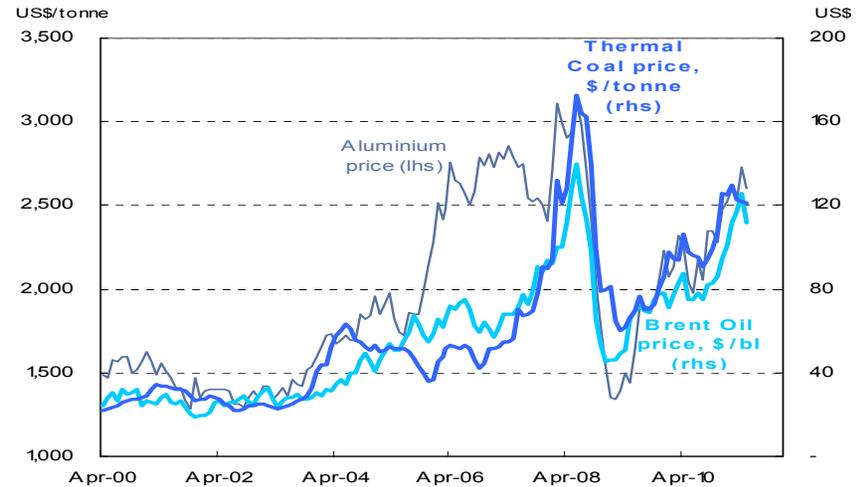


Source: CRU, Citi Investment Research and Analysis

Price Drivers: Energy – Yes; Stocks – No, Not Right Now

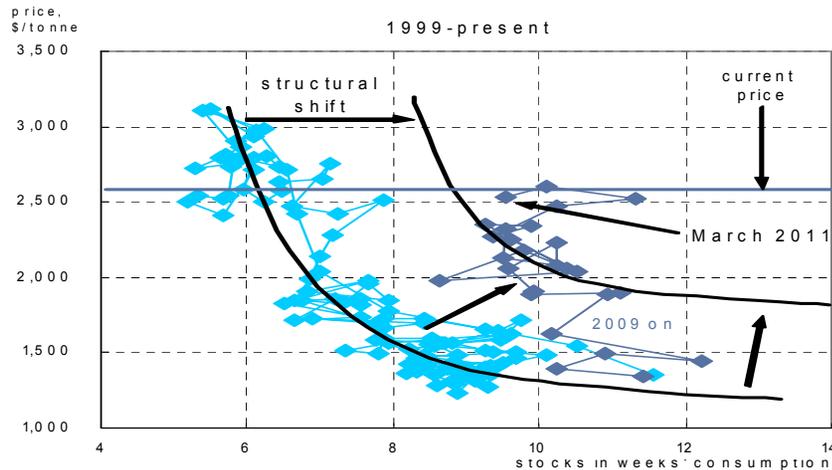
- Rising energy prices are helping to drive prices higher.
- The large amount of metal in warehouses is not exerting downward pressure on price, because a large portion is still tied up in financing deals.
- Premia are high in the US. The jump in premia reflects growing lead times to secure physical metal as strong aluminium demand overwhelms tight supply, due to continued large amounts of metal being tied up in financing deals. Incentives of up to USD150/t are luring more metal into warehouses across North America. In Detroit alone, up to 1.1 million tonnes of metal sit in warehouses under financing deals.
- Key risks are higher interest rates and a flattening of the curve. But interest rates seem set to stay low for some quarters yet, and sustained producer forward selling does not seem likely for another few hundred dollars yet.

Figure 84. Aluminium price vs energy prices



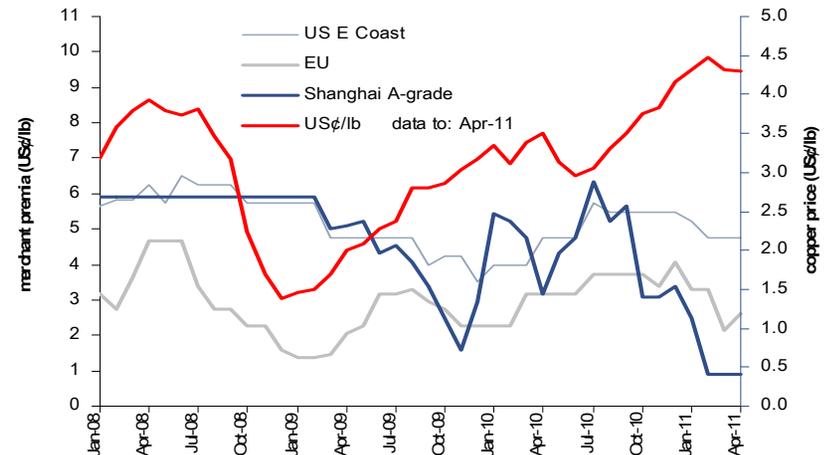
Source: Citi Investment Research and Analysis

Figure 85. Aluminium stocks-to-consumption vs price



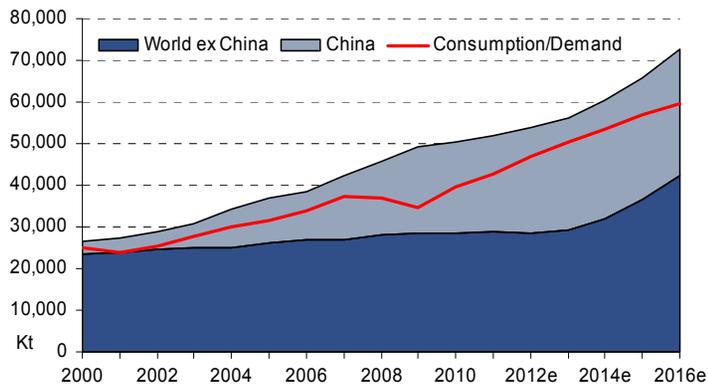
Source: Citi Investment Research and Analysis

Figure 86. Margins are enhanced by high merchant premia, especially in the US



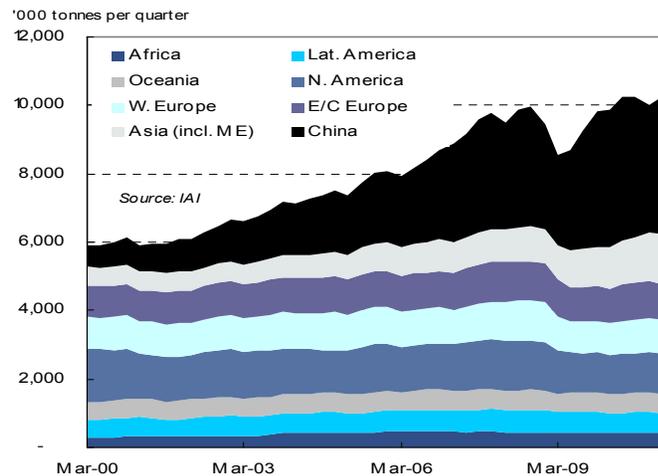
Source: Citi Investment Research and Analysis

Figure 87. China has banned the approval of new capacity



Source: Citi Investment Research and Analysis

Figure 88. China's aluminium production has recovered from the H2 Cuts



Source: Citi Investment Research and Analysis

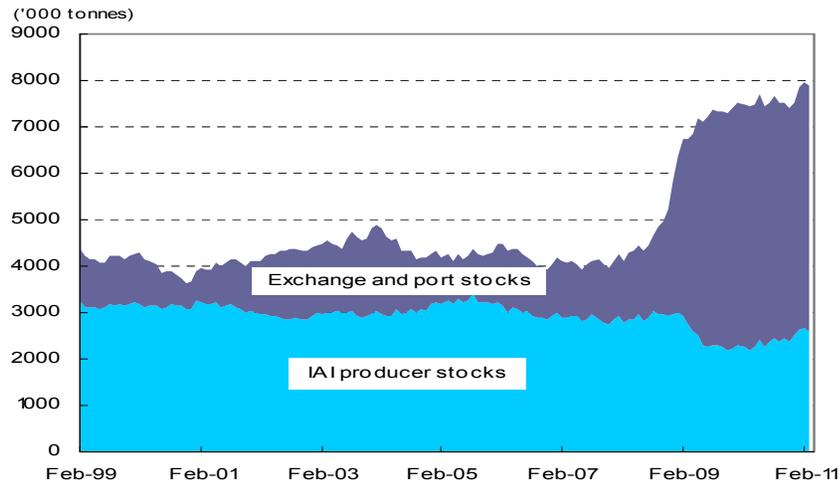
China's Aluminium Production

- In 2010, in an effort to meet energy-intensity targets, the government forced the closure of much energy hungry capacity.
- We estimate 1.8Mt of aluminium smelter capacity was closed.
- There have been some significant restarts after the Chinese New Year holidays, and new capacity has come on stream. Production hit a record in April 2011.
- Energy shortages are now starting to impact on production, and we expect production to struggle for the next few months.
- Going forward, Beijing appears much more determined to prevent the creation of excess capacity. The Chinese Government has announced a ban on the approval of applications for the construction of new capacity. This ban has cast doubt on 7.7mn tonnes of capacity (23 smelters).
- We suspect that the authorities aim to be self-sufficient only in aluminium consumption, given likely ongoing power shortages.
- China will participate in joint ventures in overseas production facilities. A recent example is a joint development fund between China and Venezuela will invest \$403 million in CVG Alumino del Caroni SA, after the state-run Venezuelan aluminum producer declared an operational and financial emergency.

Inventories

- At ~8Mt, reported inventories are almost double the level averaged in the decade prior to 2009. There is probably another 2Mt off market.
- A huge blow out in the contango at the height of the global financial crisis saw 3-4 million tonnes of metal tied up in financing/rent deals.
- Some investors simply bet on a long-term price recovery, ETF style.
- Most of the financing deals are being rolled, as the contango remains favourable.
- The metal appears likely to remain there until such time that interest rates rise noticeably and/or producer forward selling caps the back end of the curve (causing a flattening of the curve).
- The last time the curve flattened sharply (mid 2008), the aluminium price was well above \$3,000/tonne.

Figure 90. Inventories are Himalayan



Source: Citi Investment Research and Analysis

Figure 89. Spreads

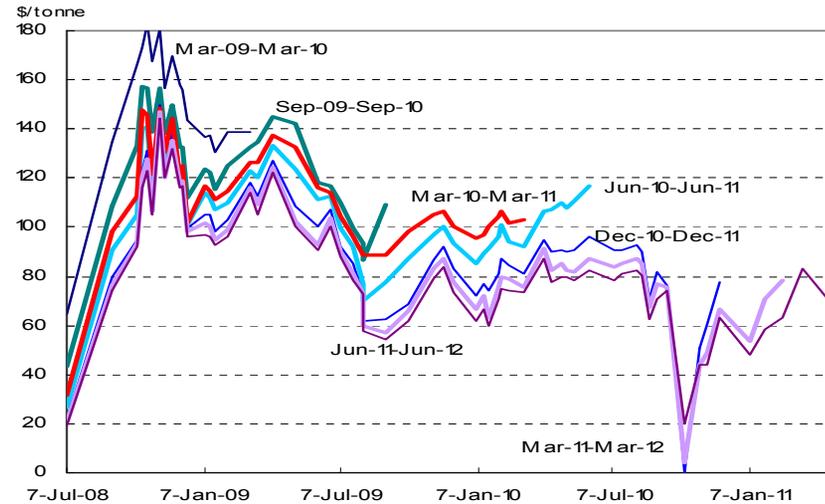
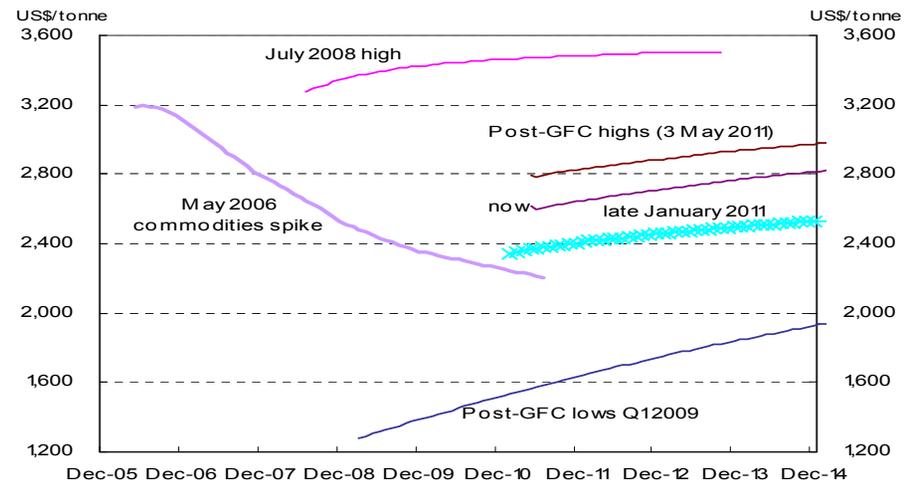


Figure 91. Stocks:weeks should remain high



Source: Citi Investment Research and Analysis

Nickel



Nickel

Jury Still Out on Supply Side

- Despite the nickel price falling of 16% since late February, we feel the fundamentals remain strong. Global stainless steel output rose 21% in 2010, and from all accounts this strong rise in production has followed through into 2011. While the Japan earthquake took out over 45ktpy of nickel capacity, its stainless mills were not directly affected. This should help keep the market tight. We also remain cautious on the ramp-up of HPAL projects this year. If they fail to meet expectations, prices will likely have to react to entice more Chinese NPI producers, who are experiencing cost pressures.
- Despite this, we have trimmed our price forecasts to reflect the recent market sell-off which saw nickel fall 10% in one day. We feel prices are unlikely to breach \$30,000/t in the short term and have downgraded this year's forecast by 2.8% to \$27,366/t. But from current levels, our forecasts still calls for nearly 15% upside.
- The ramp-up of production at Goro, Ramu, Barro Alto and Ambatov are the major uncertainties in 2011. Despite the company optimism, we believe the coming nickel laterite projects are likely to experience delays in ramp-up, are unlikely to achieve name plate capacity, and will incur significantly higher operation cost and much higher capital costs. Even the non-leaching projects face considerable technological hurdles. This view is supported by history. Laterite leaching projects have consistently fallen short of expectations in both the duration of ramp-up and ultimate production achieved.
- Strong demand in 2010 appears to have carried through into the 1Q11. Stainless steel producers have been re-stocking and there has also been strong demand from the steel alloy and super-alloy sectors. LME stock moves since the start of year support the idea that demand has been firm. After hitting over 138kt in January, available metal has fallen nearly 16% to less than 116kt.

Figure 92. World nickel supply demand balance

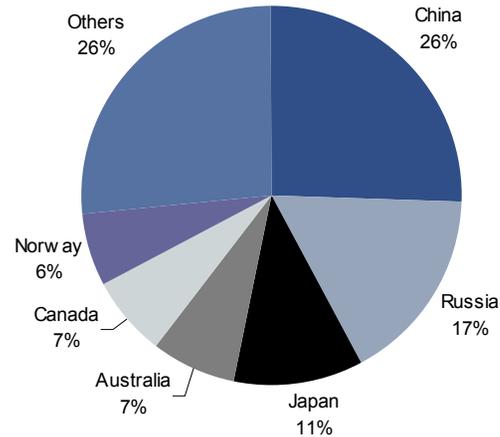
kt	2009	2010	2011e	2012e	2013e	2014e	2015e
Mine Capacity	1,439	1630.8	1754.34	1962.5	2105.44	2199.08	2254.29
Mine production	1,364	1,538	1,746	1,904	1,969	2,089	2,187
Refined capacity	2,274	2,343	2,428	2,562	2,582	2,582	2,582
Refinery utilization	63%	66%	68%	71%	71%	75%	79%
Nickel in Pig iron	73	124	127	123	130	132	132
Metal production	1,327	1,517	1,622	1,769	1,830	1,942	2,032
Supply	1,327	1,517	1,622	1,769	1,830	1,942	2,032
Supply (%)	-2.1%	14.4%	6.9%	9.1%	3.4%	6.1%	4.7%
Consumption/Demand	1,298	1,504	1,613	1,738	1,820	1,915	1,956
Consumption (%)	0.5%	15.9%	7.3%	7.7%	4.7%	5.2%	2.1%
Surplus/Deficit	29.3	13.2	8.9	31.4	9.6	26.2	76.1
Reported stocks	163.6	143.2	152.1	183.6	193.2	219.4	295.4
Stock change	8.1	13.2	8.9	31.4	9.6	26.2	76.1
Stocks (wks)	6.6	5.0	4.9	5.5	5.5	6.0	7.9
Price - US\$/lb	6.65	9.89	12.41	12.32	11.40	9.69	8.13
- US\$/t	14,661	21,814	27,366	27,156	25,123	21,367	17,932

Source: Citi Investment Research and Analysis

Supply

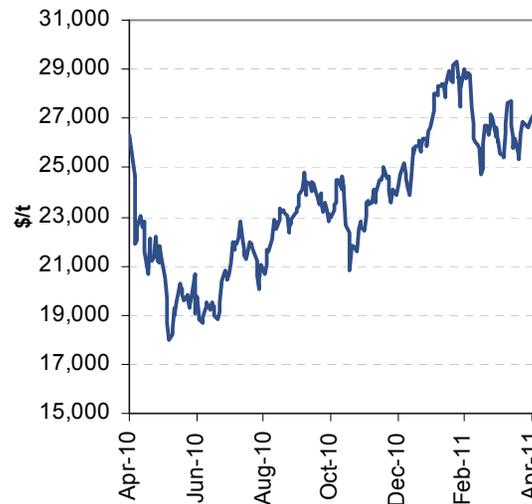
- Monthly global refined production breached the 130,000/tonne mark in the last month of 2010, helped by the ongoing recovery in Canadian production (Figure 95). Canadian production in December 2010 was around 90% of pre-strike levels, and this should have improved further over the past few months.
- Chinese output has hit new record levels in recent months. Chinese nickel pig iron (NPI) production will come under scrutiny during 2011, after the Chinese Government's new Five-Year Plan announced that it will focus on economic growth which is both more energy efficient and creates less pollution.
- The nickel industry didn't escape the Japanese earthquake. Pamco was the only nickel producer that was damaged during the earthquake, as it is situated in the port of Hachinohe, which was one of the worst affected areas. But it is a significant producer, producing over 45kt in 2010 and making up nearly 25% of Japan's total refined production. But more importantly, it constitutes approximately 60% of the country's ferronickel output, a raw material Japanese stainless mills use extensively.
- At this stage the operation is planning to recommence operations in June, followed by shipments in July. But the issue of compromised power supply and an inability to transfer feed materials from the wharf area to the plant could hinder the plants ability to ramp back up to full capacity.

Figure 93. Share of refined production by country



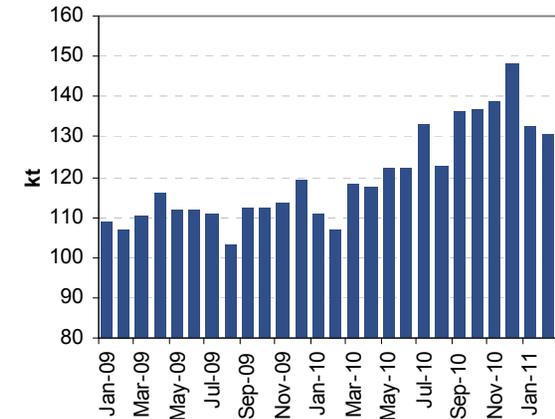
Source: Wood Mackenzie, Citi Investment Research and Analysis

Figure 95. LME nickel price



Source: Citi Investment Research and Analysis

Figure 94. Monthly refined production



Source: Wood Mackenzie, Citi Investment Research and Analysis

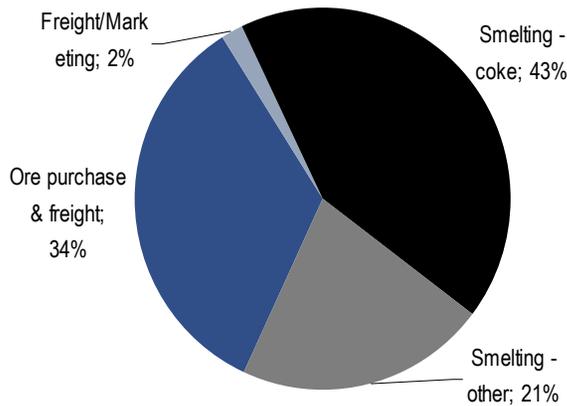
Nickel in Pig Iron

- Nickel pig iron (via the blast furnace route) is produced by mixing finely crushed nickel laterite ore with coke, limestone and other material. We estimate that the average Chinese NPI blast furnace produces nickel at \$15,200/t. Of this, the cost of coke makes up 43% (Figure 97). This cost estimate is based on \$170/t coking coal. If this were to rise to \$300/t, the average costs would rise to \$24,000/t.
- We estimate this rise in coking coal prices could make over 25% (or at least 30kt) of the industry uneconomic. With NPI producers being some of the most responsive and price-sensitive producers in the market, we suspect output would fall relatively quickly once these issues start making an impact.
- Nickel pig iron producers are facing not only increasing costs, but also raw material supply constraints. With many of its traditional sources looking to ban nickel ore exports, Chinese NPI producers may struggle to expand production even if prices rise (Figure 98).

Laterites

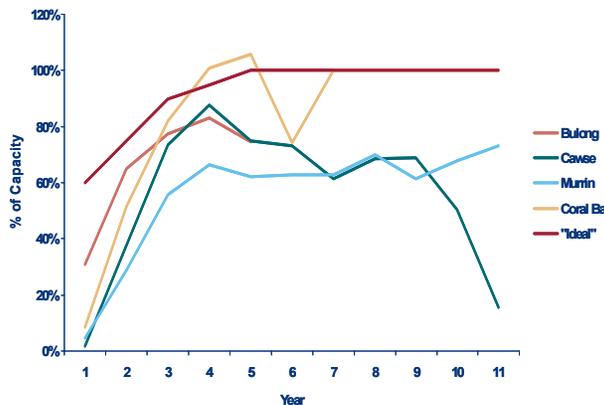
- Laterite leaching projects have consistently fallen short of expectations in both the duration of ramp-up and ultimate production achieved. Comparing our nickel supply forecasts in 2008 and 2009 made in 2006 with the outcome, supply was 100-200kt less than expected (Figure 99)
- Upcoming nickel laterite projects will likely struggle to reach planned capacities (Figure 100) and should take longer to do so.

Figure 96. Nickel pig iron costs



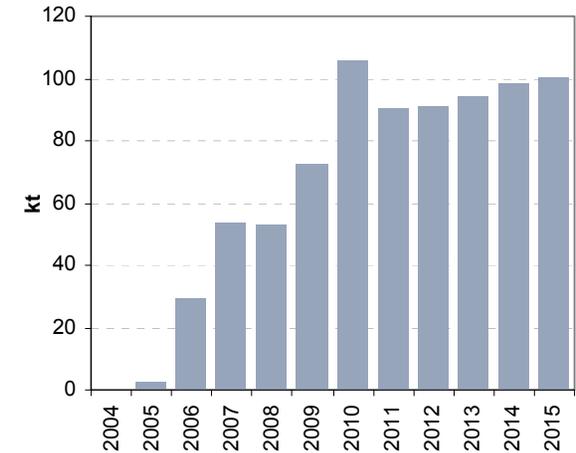
Source: Wood Mackenzie, Citi Investment Research and Analysis

Figure 98. Leaching projects – actual vs. projected



Source: Citi Investment Research and Analysis

Figure 97. Nickel pig iron production



Source: Citi Investment Research and Analysis

Figure 99. Nickel laterite projects with company estimated capacities and commissioning periods

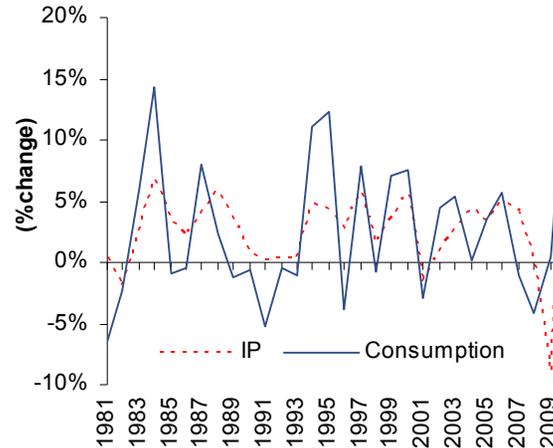
Project	2010	2011	2012	2013	2014	2015
Ambatovy		7	18	28	42	53
Barro Alto		10	22	33	40	44
Bonao				15	35	42
Caldag				27	27	31
Coral bay	27	27	27	27	27	27
Fenix					5	9
Goro	4	22	40	52	60	63
Koniambo				16	26	39
Niquelandia		6	9	10	11	11
Onca Puma		11	28	48	57	63
Ramu	4	13	23	26	31	35
Ravensthorpe			16	29	36	38
Tagoung Hill		6	14	20	23	23
Talvivaara	21	21	39	51	53	59

Source: Brook Hunt, Citi Investment Research and Analysis

Demand

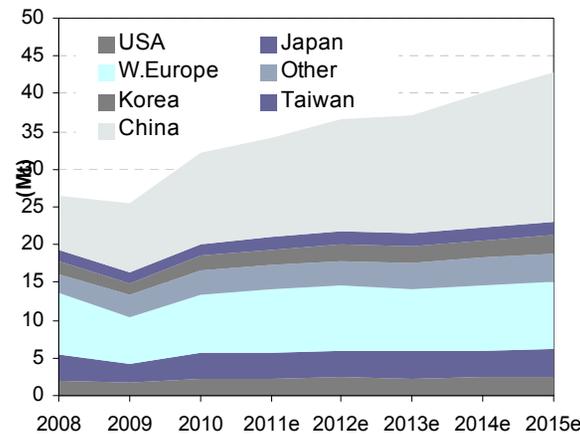
- Nickel consumption is highly correlated with world IP (Figure 101). With Developed Economies showing signs of stronger growth in 2011, we expect nickel demand to recover accordingly.
- Stainless steel production is dominated by Western Europe and China (Figure 103). But most of the growth out over the forecast period is coming from China (at around 10%). But markets such as USA, Europe and Japan should produce growth rates above trend in 2011.
- Usage statistics show that demand was strong as 2010 ended, and this strength appears to have carried through into the first 10-11 weeks of 2011. Stainless steel producers have been re-stocking and there has also been strong demand from the steel alloy and super-alloy sectors. LME stock moves over the past month support the idea that demand has been firm. From over 125,440 tonnes in the middle of last month, available metal has declined to less than 121,225 tonnes. Cancelled warrants are running at high levels.

Figure 100. Nickel consumption vs. IP



Source: Wood Mackenzie, Citi Investment Research and Analysis

Figure 102. Stainless steel production



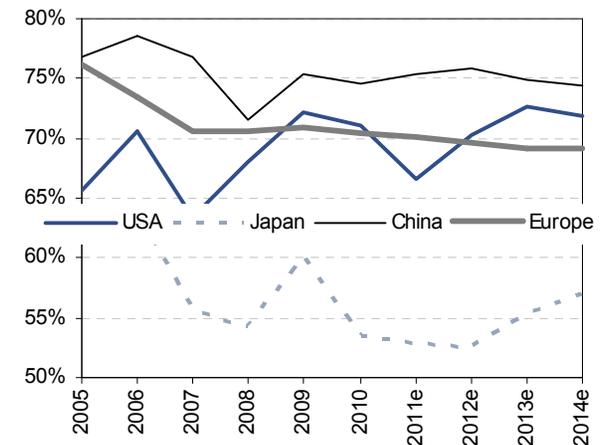
Source: CRU, Citi Investment Research and Analysis

Figure 101. Stainless steel production grew by 21% in 2010



Source: Wood Mackenzie, Citi Investment Research and Analysis

Figure 103. Austenitic ratios



Source: Citi Investment Research and Analysis



Zinc

Zinc

- Zinc has the weakest near-term fundamentals of the major base metals. After a sizeable surplus in 2010, another surplus is likely in 2011.
- Zinc stocks have surged over the past few months, as demand growth moderates from high levels. The wind-down of China's scrappage subsidy scheme (for autos and consumer durable goods) appears likely to cause consumption growth to slow from high levels in 2010.
- For zinc stocks to start falling in a meaningful fashion, significant production cutbacks are likely to be needed. But at current price levels, miners and smelters are still unlikely to cut production voluntarily.
- China has just announced that it will close down 337,000 tonnes of 'outdated' zinc smelting capacity this year, which is a very encouraging start. In the short term, we suspect that the zinc price will continue to struggle relative to other base metals.
- Further out (2014), growth in mine supply is unlikely to keep up with ongoing strong growth in demand, and prices can recover.
- Developing market demand should remain strong, and zinc seems likely to benefit from new applications, such as in agricultural fertilizer and anti-microbial brass. Chinese consumers galvanize a relatively small amount of steel, though this is improving.

Figure 104. Global zinc supply demand balance

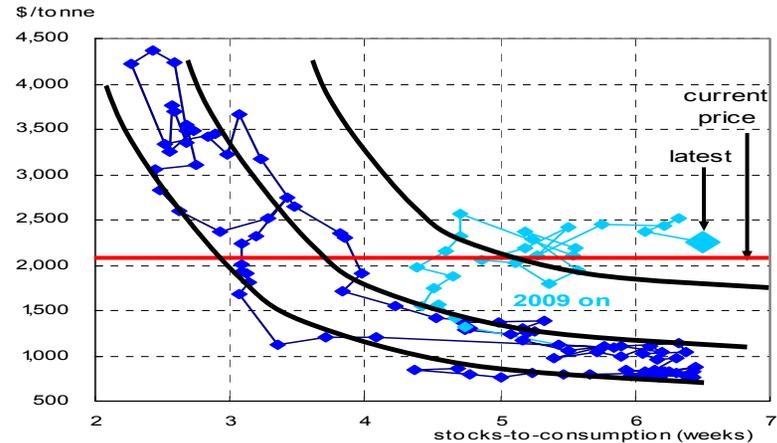
kt	2009	2010e	2011e	2012e	2013e	2014e	2015e
Mine production	11,380	12,110	13,119	14,603	15,405	15,854	16,592
Available concs	11,128	12,455	13,211	13,885	14,542	15,260	15,659
Concs required	11,128	12,455	13,211	13,885	14,542	15,260	15,659
Metal production	11,368	12,750	13,528	14,167	14,803	15,488	15,868
Smelter Capacity	11,181	12,669	13,734	14,913	16,091	16,835	17,063
Primary prodn	10,614	11,879	12,601	13,243	13,870	14,555	14,935
Secondary prodn	754	870	928	924	933	933	933
Supply	11,368	12,750	13,528	14,167	14,803	15,488	15,868
Supply (%)	-3.1%	12.2%	6.1%	4.7%	4.5%	4.6%	2.5%
Consumption	11,065	12,344	13,276	13,926	14,772	15,614	16,512
Consumption (%)	-3.6%	11.6%	7.5%	4.9%	6.1%	5.7%	5.7%
MARKET BALANCE	303	406	253	241	32	-127	-644
Reported stock change	288	122	253	241	32	-127	-644
Total stocks	1,005	1,126	1,379	1,620	1,652	1,525	881
Stocks (wks)	4.7	4.7	5.4	6.0	5.8	5.1	2.8
Price (US\$/lb)	0.79	0.98	1.03	1.13	1.12	1.09	1.09
(US\$/t)	1,732	2,161	2,280	2,500	2,469	2,400	2,400

Source: Wood Mackenzie, Citi Investment Research and Analysis

Supply

- New supply and existing stocks are too high at present, hence the sharp decline in price over the past three months.
- Global exchange stocks are more than 1.2million tonnes. Combined with industry stocks, total global reported stocks are now as high as the mid 1990s.
- While some stocks are tied up in financing/rent deals, there appears to be a fair amount of available material.
- Notwithstanding the impact of rising production costs and structural change, the zinc price still seems too high.
- Mine supply will likely become a major issue in the next few years, as existing large mines are exhausted and new mines fail to match the old mines' output.

Figure 105. China is a metal exporter, but to become an exporter



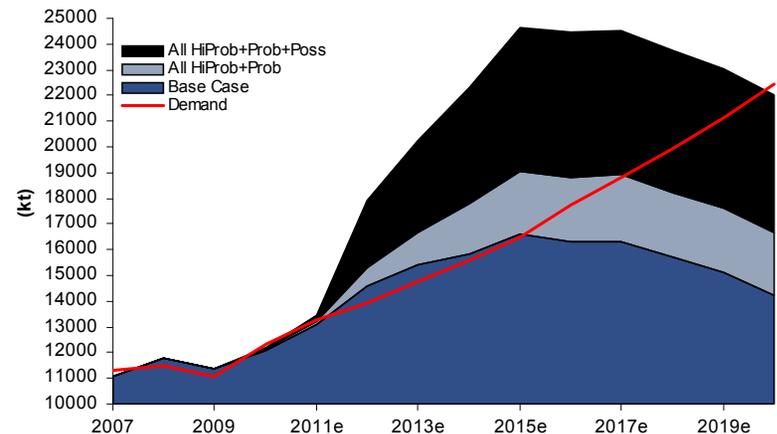
Source: China Customs, Citi Investment Research and Analysis

Figure 106. China to become a metal importer

kt	2009	2010	2011e	2012e	2013e	2014e	2015e	2016e
Mine Capability	3176	3700	3812	3929	3966	4001	4002	3962
Mine Production	3,092	3,700	3,710	3,824	3,860	3,894	3,895	3,856
Metal Production	4,357	5,164	5,831	6,346	6,628	6,628	6,703	6,728
Consumption	4,888	5,306	5,741	6,100	6,690	7,266	7,883	8,829
Consumption (%/yr)	17.9%	8.5%	8.2%	6.3%	9.7%	8.6%	8.5%	12.0%
Conc Surplus	-1265	-1465	-2121	-2522	-2767	-2733	-2807	-2871
Metal Surplus	-532	-141	90	246	-62	-638	-1181	-2102

Source: WBMS, Citi Investment Research and Analysis

Figure 107. Demand to outstrip supply from 2014 on



Source: Wood Mackenzie, Citi Investment Research and Analysis





Gold



Gold

- Increased global risk – USD weakness, growing inflationary fears, and continuing sovereign debt risks in Europe - have increased investor appetite for gold, triggering recent price strength.
- While the gold sector got accustomed to net Central Bank sales prior to the credit crisis, Mexico bought over 93 tonnes of gold in Q1 2011 (taking their gold holding to 100 tonnes) and the Russian Central Bank (the largest gold buyer in 2010) has continued to add to gold reserves during 2010. Because of this strong start to the year we are forecasting net official sector purchases of 240t in 2011 after purchases of 73t in 2010 and net sales of 41t in 2009
- Gold has encountered significant resistance at the psychologically important levels of \$1000, \$1200, \$1400 and more recently at \$1600/oz. The retracement from the \$1600 levels follows the earlier patterns but we believe that the \$1600 level could be a far tougher level for gold to surpass than these earlier resistance levels.
- We expect price support at the recent lower levels, driven by strong Asian demand, central bank buying, inflationary fears, continuing EU sovereign debt issues, and potentially on-going geo-political risk. However, during 2012 we expect a weaker investment-demand environment for gold and expect the metal to once more be trading below \$1400/oz at that time.

Figure 108. Supply and demand

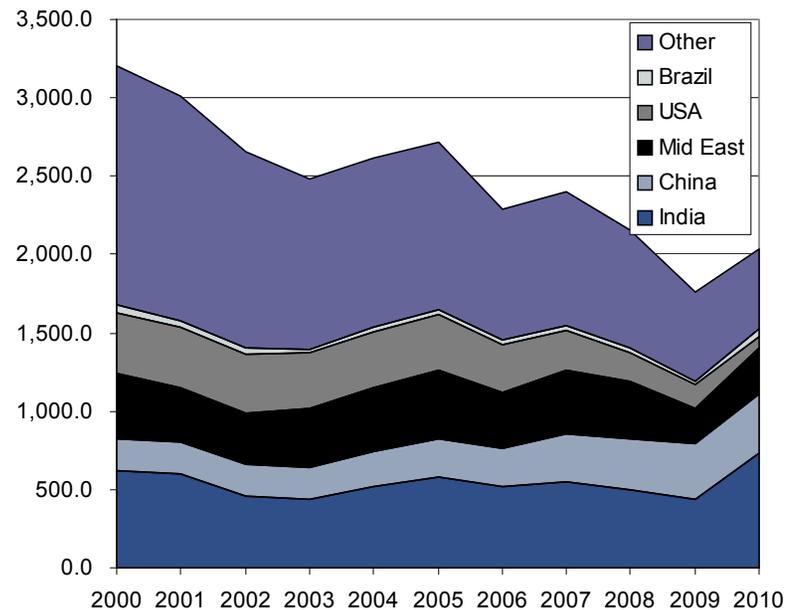
	2009	2010	2011e	2012e	2013e
Mine Production	2,575	2689	2796	2810	2825
Net Central Bank Sales	41	0	0	0	0
Scrap Supply	1,668	1,654	1,779	1700	1625
Net producer hedging	-116	0	0	0	0
Total Supply	4,168	4334	4575	4510	4450
Jewellery	1660	2017	2033	2065	2169
Other Fabrication	725	760	770	878	922
Official Sector Purchases	0	73	240	190	160
Physical bar investment	830	880	950	900	810
Net Producer de-Hedging	116	103	38	0	0
Total Demand	3331	3833	4031	4033	4060
Implied Other Investment	837	501	544	477	390
Price	972	1,229	1,416	1,380	1,242

Source: WGC, GFMS, Citi Investment Research and Analysis

Demand

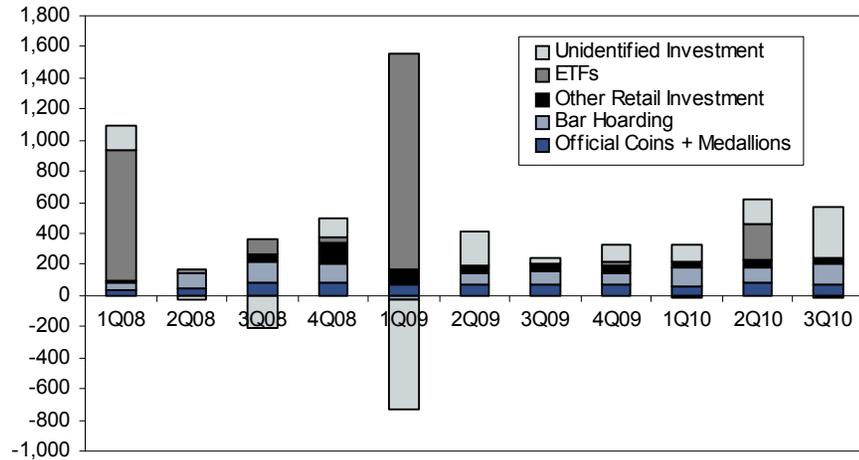
- Fabrication demand recovered strongly in 2010 but we expect a more subdued rise in 2011 as strong investment demand and the resulting higher prices negatively impact price-sensitive jewellery demand.
- India was the strongest market in 2010, reaching a record of over 730 tonnes. Chinese demand was also strong, for both jewellery and coins.
- In 2011 Indian and Chinese demand have started strongly. In part this is a seasonal effect (peak wedding season in India and Chinese New Year) but strength will likely continue beyond these seasonal effects.
- A measure of the strength in demand is that the bullion suppliers premium has increased to more than USD3/oz from the already high USD1/oz.

Figure 109. Jewellery demand rebounded in 2010



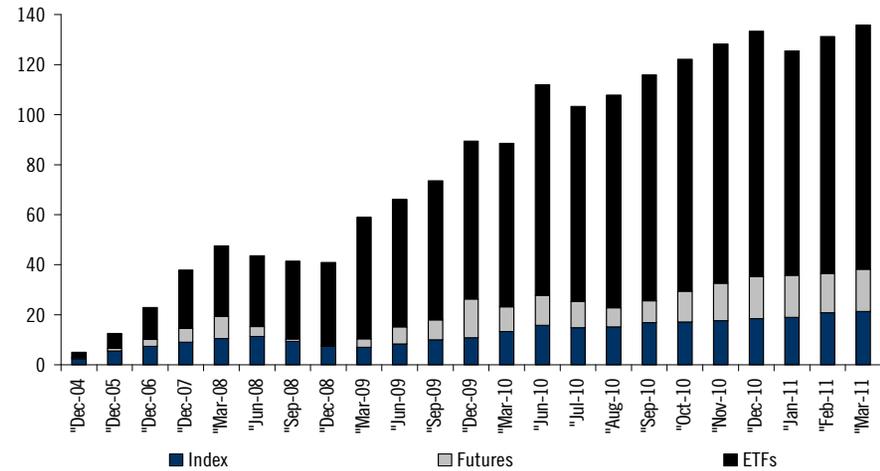
Source: GFMS, Citi Investment Research and Analysis

Figure 110. Gold investment demand



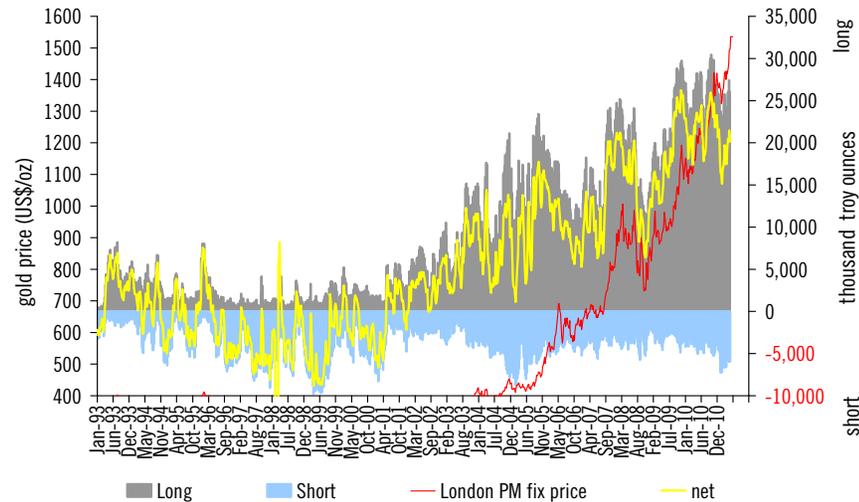
Source: GFMS, WGC, Citi Investment Research and Analysis

Figure 111. Fund investment (US\$bn)



Source: Citi Investment Research and Analysis

Figure 112. Non-commercial futures



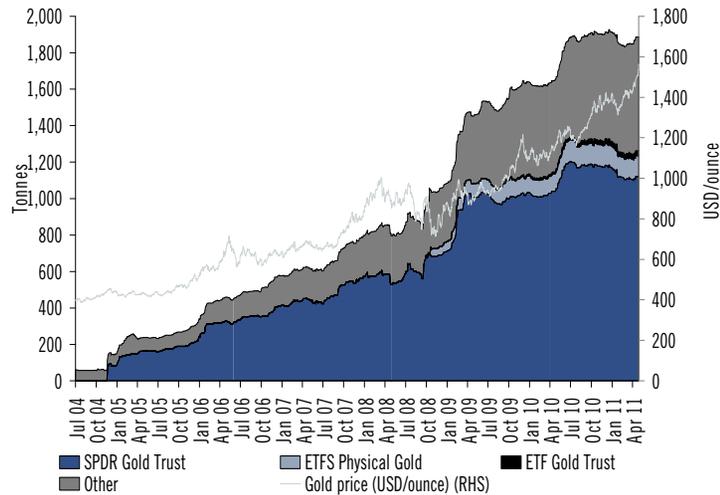
Source: Citi Investment Research and Analysis

- Comprehensive data on investment demand is only available up to 3Q10. It shows a modest slowing with a marked fall in identified investment.
- Fund Investments continued to increase, due to a combination of rising prices and inflows.
- Recent data on futures shows that net open positions have increased sharply over the Dec-10 to Mar-11 period, which drove prices sharply towards the end of April.
- The threat to the global financial structure during the credit crisis has led to high-net-worth individuals seeing gold as an insurance against such instability in future and this insurance-role will likely continue to assist demand while concerns remain about sovereign risk and the longer term issue of whether the dollar will still be the world's reserve-currency in 5-10 years time.

ETFs

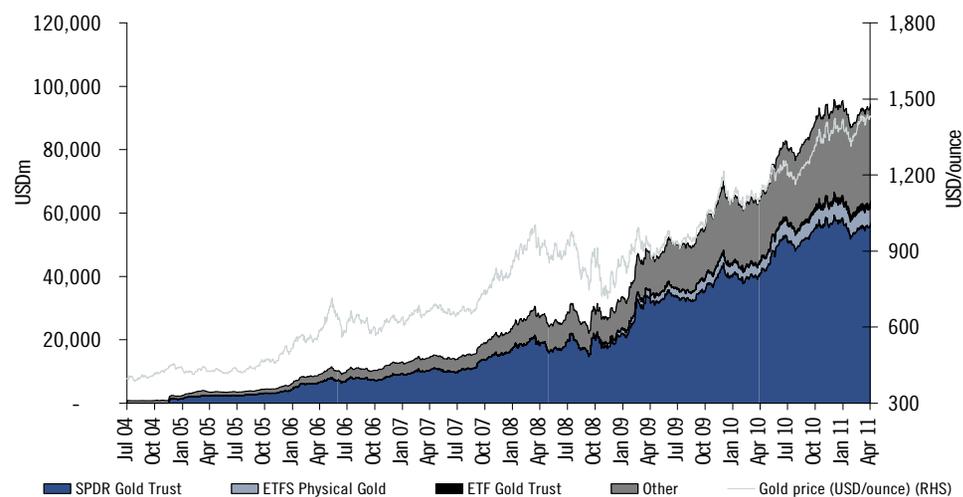
- ETFs dominate fund investments, accounting for three quarters of investment holdings, and are a barometer of investor sentiment.
- The 50% increase in holdings during the global financial crisis was the most notable manifestation of gold's role as a safe haven during that period.
- The holdings jumped a further 15% in 2Q2010 in response to USD weakness.
- From January until end of March 2011, we observed a 3% decrease in volume and value respectively.
- However, during April 2011 holdings have increased 2% in volume which supported higher prices towards USD1,550/ounce.
- The recent strength reflects growing inflationary fears, a weaker USD, coupled with continuing EU Sovereign debt issues.

Figure 113. ETFs by volume (tonnes)



Source: Citi Investment Research and Analysis

Figure 114. ETFs by value (USDbn)



Source: Citi Investment Research and Analysis



Platinum Group Metals



Platinum

- We maintain our medium-term (2011-15) surplus outlook for platinum. This is mainly as we expect a decrease in Western European LV production in 2011, while mine supply and recycling is likely to increase. We view a range-bound platinum price as likely in 2011 as its precious metal attribute is likely to keep it correlated to our gold price outlook.
- Johnson Matthey (JM) recently reported an estimated 295k ounce surplus market for platinum in 2010. We were surprised by this outcome, as platinum's precious metal attribute (rising investment demand) and industrial attribute (recovering auto production through stimulus packages) aligned in 2010. Our forecasts initially indicated a 293k ounce deficit market. The differences between our numbers and those published by JM were mainly due to lower-than-expected jewellery (JM: 1,685k ounces vs. CIRA: 1,856k ounces) and investment demand (JM: 435k ounces vs. CIRA: 755k ounces).
- The fact that 2010 turned out to be a surplus year for platinum only accentuates our cautious medium-term outlook for the supply-demand fundamentals of this market. We continue to expect medium-term (2011-2017) supply surpluses in all three of the macroeconomic scenarios we considered, even despite our generally more bullish scenario assumptions. This is as growth in mine supply (from existing mines and mines currently in construction, and rising auto catalyst recycling is likely to more than offset the growth in demand for platinum.
- Both our worst case and base case scenarios indicate a surplus market up to 2020, while our best case predict a surplus market up to 2015. This is unless production from existing mines can be trimmed, or mines currently in construction can be delayed.

Figure 115. Platinum global supply demand balance

Summary (000 ounces)

	2005	2006	2007	2008	2009	2010E	2011E	2012E	2013E	2014E	2015E
Demand											
Gross Auto catalysts	3,795	3,905	4,145	3,650	2,185	2,985	3,091	3,290	3,409	3,524	3,577
Net Jewellery	1,965	1,640	1,455	1,365	2,245	1,685	1,414	1,457	1,622	1,724	1,864
Investment	15	-40	170	555	660	435	275	223	121	72	72
Industrial	1,690	1,830	1,845	1,725	1,140	1,720	1,806	1,896	1,966	2,033	2,102
Total Demand	7,465	7,335	7,615	7,295	6,230	6,825	6,586	6,867	7,119	7,352	7,615
Supply											
Mining											
Southern Africa	5,273	5,462	5,240	4,686	4,693	4,563	4,758	4,925	5,165	5,451	5,546
Russia	890	920	915	805	785	810	815	799	783	767	752
North America	365	345	325	325	260	340	372	386	381	376	371
Rest of world	112	103	120	124	178	178	180	180	180	180	180
Auto catalyst Recycling	770	860	935	1,135	840	1,096	1,222	1,316	1,387	1,464	1,543
Total Supply	7,410	7,690	7,535	7,075	6,756	6,987	7,347	7,605	7,896	8,238	8,391
Surplus/(Deficit) balance	-55	355	-80	-220	526	162	761	738	777	886	776

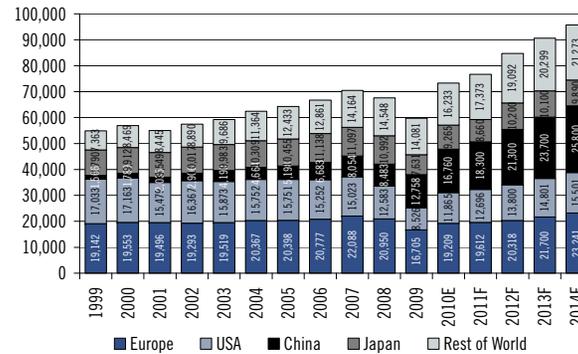
Source: Johnson Matthey, Citi Investment Research and Analysis

Demand

Sustained growth scenario

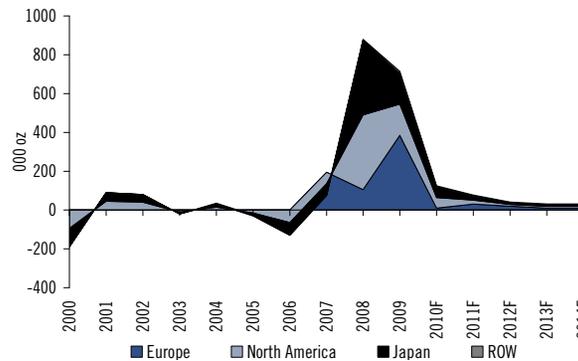
- Under our sustained growth scenario, we expect the market to be in surplus of 761k ounces in 2011, similar to our forecasts under a protracted growth scenario. This is mainly due to the fact that the effect of rising LV production is likely to be offset by lower jewellery demand, slowing inflows into ETFs and a pick-up in autocatalyst recycling. The market remains in surplus from 2011 onwards as growth in European LV production lags that of the US and China, while platinum supply from autocatalyst recycling and mines increase steadily.
- The recovery in global LV production and a likely rise in PGM prices results in a sharp decrease in net jewellery demand, especially in price-sensitive regions like China. Buoyant equity markets, decreasing levels of risk and rising PGM prices are likely to result in a net ETF inflows decreasing to 275k ounces in 2011 (2010: 435k ounces).
- Autocatalyst recycling increases sharply to 1.23m ounces in 2011. This is as improved consumer confidence and increasing LV sales results in more old vehicles being traded-in and scrapped. Rising PGM prices also incentivise refineries to recover and recycle more PGMs.

Figure 116. Global LV production (000 units)



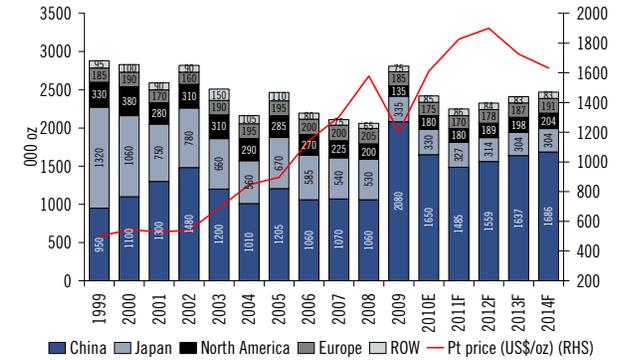
Source: JD Power, Citi Investment Research and Analysis

Figure 118. Net platinum ETF flows (000 oz)



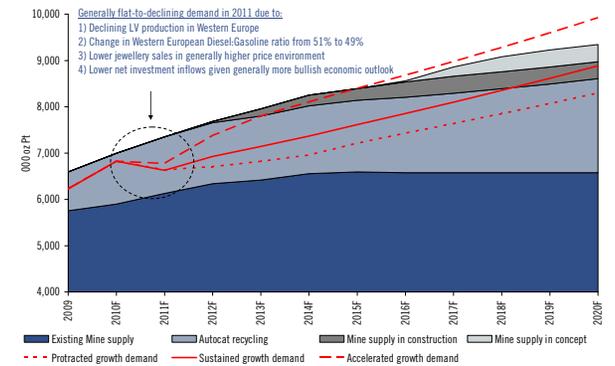
Source: Johnson Matthey, Citi Investment Research and Analysis

Figure 117. Net platinum jewellery demand (000 oz)



Source: Johnson Matthey, Citi Investment Research and Analysis

Figure 119. CIRA platinum supply-demand outlook (000 oz)



Source: Citi Investment Research and Analysis



Palladium

- Even though palladium is likely to remain under pressure in the near term (as the March 11 earthquake in Japan may have resulted in parts shortages and production cut-backs in some gasoline based markets) we expect a strong recovery in the palladium price in 2H11 and into 2012. This is as we continue to forecast a rising deficit market in palladium, mainly due to strong growth in light vehicle (LV) production in gasoline-based markets (US and China). There is additional upside to our already-bullish view if Russian stock sales decrease – a consensus view at this stage.
- Assuming further 900k ounce stock sales from Russia in 2011, we forecast a small surplus to a balanced market for palladium in 2011 for all scenarios considered. Any decrease in Russian stock sales is likely to push the market into deficit. We expect the palladium market to move into a rising deficit in the medium term. Our bullish stance is based on our view of 1) sustained growth in auto demand from China, 2) a recovery in US auto production from cyclical lows, and 3) further potential upside should Russian stock sales decrease (a consensus view, but not included in our forecasts).
- We believe growth in Chinese auto demand over the next decade will be driven by 1) sustained growth in GDP/capita, and 2) increasing light-vehicle density. Given the relative preference for smaller gasoline engines, we believe this growth will be a strong demand driver for palladium. Even though US vehicle density shows noticeable weakness, we believe this to be predominantly cyclical rather than structural. As a result, US auto production may be exponentially leveraged to any macro-economic upside, and even in our sustained growth scenario. General consensus suggests that Russian stockpiles are likely to be depleted over the next 12-24 months. Intuitively, we agree, but given the lack of transparency, we do not include a “depletion scenario” into our forecasts. Even so, the selling of 1m ounces pa. still produces a bullish outlook. As a result, a depletion of Russian stocks would only add to our already-bullish outlook.

Figure 120. Palladium global supply demand balance

Summary (000 ounces)

	2005	2006	2007	2008	2009	2010E	2011E	2012E	2013E	2014E	2015E
Demand											
Gross Auto catalysts	3,865	4,015	4,545	4,465	4,050	5,150	5,665	6,419	6,990	7,581	8,023
Net Jewellery	1,430	1,005	715	855	705	560	547	554	583	614	650
Investment	220	50	260	420	625	670	316	256	170	121	121
Industrial	2,465	2,350	2,325	2,075	1,885	2,050	2,153	2,260	2,344	2,423	2,506
Total Demand	7,980	7,420	7,845	7,815	7,265	8,430	8,681	9,489	10,087	10,739	11,300
Supply											
Mining											
Southern Africa	2,730	2,910	2,900	2,570	2,550	2,705	2,923	3,234	3,448	3,729	3,906
Russia	3,925	3,220	3,050	2,700	2,675	2,700	2,750	2,700	2,650	2,650	2,650
North America	910	985	990	910	755	560	703	795	870	980	1,050
Rest of world	145	135	150	170	160	165	180	180	180	180	180
Auto catalyst Recycling	625	805	1,015	1,140	965	1,317	1,521	1,712	1,836	1,966	2,099
Total Supply	9,030	8,755	9,595	8,450	8,065	8,457	8,977	9,521	9,885	10,405	10,785
Surplus/(Deficit) balance	1,050	1,335	1,750	635	800	27	297	32	-202	-334	-515

Source: Johnson Matthey, Citi Investment Research and Analysis

Demand

- Under our Sustained growth scenario (which forms out base case), we expect the market to be in a growing deficit from 2012 onwards. This is mainly due to our view of a continued recovery in US auto production and sustained 10-15% medium-term growth in Chinese LV demand. The positive effect is likely to be somewhat offset by lower jewellery demand, slowing inflows into ETFs and a pick-up in autocatalyst recycling.
- The recovery in global LV production and a likely rise in PGM prices are likely to result in decrease in net jewellery demand, especially in price-sensitive regions like China.
- Buoyant equity markets, decreasing levels of risk and rising PGM prices are likely to result in net ETF inflows slowing significantly from the highs achieved during the Global Economic Crisis (GEC).
- Autocatalyst recycling increases sharply to 1.52m ounces in 2011. This is as improved consumer confidence and increasing LV sales results in more old vehicles being traded-in and scrapped. Rising PGM prices also incentivise refineries to recover and recycle more PGMs.

Figure 121. Global LV production (000 units)

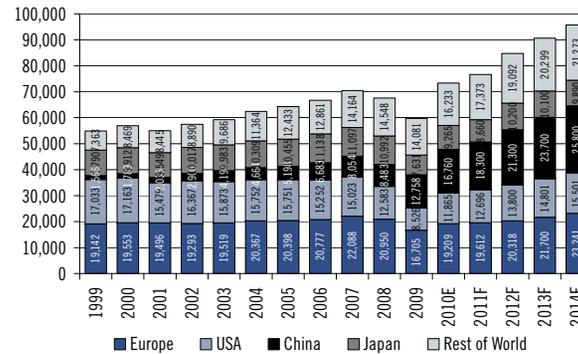
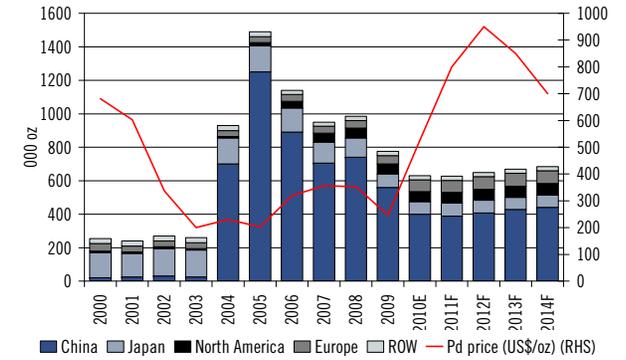
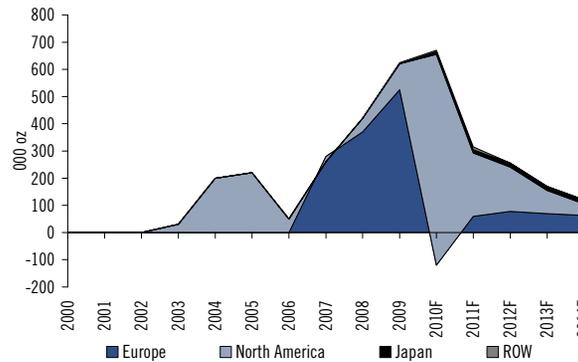


Figure 122. Net palladium jewellery demand (000 oz)



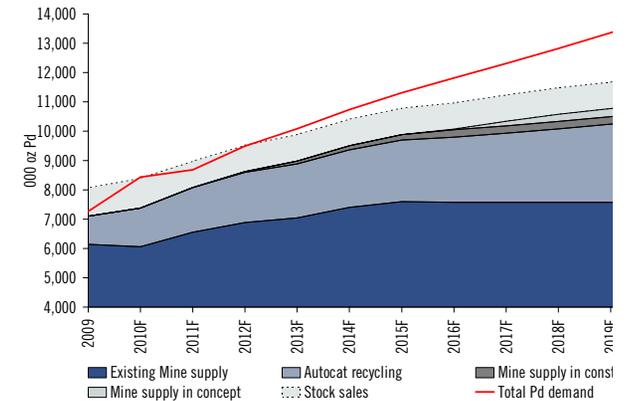
Source: JD Power, Citi Investment Research and Analysis

Figure 123. Net palladium ETF flows (000 oz)



Source: Johnson Matthey, Citi Investment Research and Analysis

Figure 124. CIRA palladium supply-demand outlook under a protracted growth scenario (000 oz)



Source: Johnson Matthey, Citi Investment Research and Analysis

Source: Johnson Matthey, Citi Investment Research and Analysis





Price Forecasts



Price Forecasts

Figure 125. Commodity price forecasts – metals, half yearly

HALF YEARLY		Spot	Jun-11 est	Dec-11 est	Jun-12 est	Dec-12 est	Jun-13 est	Dec-13 est	Jun-14 est	Dec-14 est	Jun-15 est	Dec-15 est	Long term
AVERAGE EXCHANGE RATES													
A\$/US\$		1.06	1.01	1.04	1.05	0.95	0.87	0.85	0.85	0.85	0.84	0.84	0.80
EURO/US\$		1.42	1.41	1.47	1.49	1.43	1.38	1.38	1.37	1.37	1.36	1.36	1.10
US\$/ZAR		6.90	6.92	6.96	7.21	7.75	8.24	8.45	8.98	8.98	9.56	9.56	10.00
PRECIOUS METALS													
Gold	US\$/oz	1,502	1,436	1,450	1,350	1,300	1,250	1,200	1,150	1,100	950	950	950
Silver	US\$/oz	34.8	34.4	31.6	27.0	25.0	23.3	21.5	19.8	18.5	16.0	16.0	12.00
Platinum	US\$/oz	1,764	1,804	1,850	1,900	1,900	1,775	1,775	1,632	1,632	1,500	1,500	1,500
Palladium	US\$/oz	715	780	823	925	975	850	850	700	700	550	550	550
BASE METALS													
Aluminium	US\$/lb	119	120	125	123	121	119	117	116	116	115	114	100
	US \$/t	2,618	2,640	2,763	2,713	2,663	2,613	2,583	2,565	2,546	2,528	2,509	2,205
Alumina: LT contract/Aust export	US\$/t	n.a.	395	414	406	399	397	393	390	387	394	401	390
Copper	US\$/lb	397	440	440	433	421	402	382	376	354	332	310	220
	US \$/t	8751	9,691	9,700	9,538	9,288	8,860	8,433	8,296	7,807	7,322	6,832	4,850
Molybdenum	US\$/lb	16.69	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
Nickel	US\$/lb	11.09	12.23	12.60	12.42	12.22	11.79	11.00	10.08	9.30	8.53	7.74	6.50
	US \$/t	24452	26,952	27,780	27,375	26,938	25,988	24,258	22,231	20,504	18,796	17,069	14,330
Cobalt	US\$/lb	17.58	15.00	15.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	13.00
Zinc	US\$/lb	98	106	101	110	117	113	111	109	109	109	109	80
	US \$/t	2158	2,335	2,225	2,425	2,575	2,500	2,438	2,400	2,400	2,400	2,400	1,764
Lead	US\$/lb	105	119	119	115	111	107	102	99	94	90	86	75
	US \$/t	2308	2,626	2,625	2,538	2,443	2,350	2,255	2,176	2,082	1,989	1,895	1,653
Tin	US\$/lb	13.3	14.4	13.2	12.1	6.4	11.1	10.8	10.3	9.5	8.8	8.1	5.44
	US \$/t	29300	31,656	29,000	26,750	14,000	24,375	23,875	22,655	21,022	19,407	17,774	12,000
Uranium	US\$/lb	57.5	58.1	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.00
INDUSTRIAL MINERALS													
Mineral Sands													
Rutile	US\$/t	875	740	888	950	950	1,000	1,000	1,050	1,050	1,050	1,050	550
Zircon	US\$/t	1650	1,400	1,800	2,000	2,000	2,200	2,200	2,400	2,400	2,400	2,400	850
Ilmenite	US\$/t	130	130	140	150	150	160	160	170	170	170	170	120
Synrutile	US\$/t	n.a.	610	732	800	800	850	850	900	900	900	900	500
TiO2 Pigment	US\$/t	n.a.	1,906	1,930	1,954	1,978	2,002	2,027	2,052	2,078	2,104	2,130	1,900

Source: Citi Investment Research and Analysis

Notes: Rutile, synrutile, ilmenite, zircon are average Australian export prices. Forecasts are nominal; long-term prices are real.

Figure 126. Commodity price forecasts – bulks, half yearly

HALF YEARLY		Spot	Jun-11 est	Dec-11 est	Jun-12 est	Dec-12 est	Jun-13 est	Dec-13 est	Jun-14 est	Dec-14 est	Jun-15 est	Dec-15 est	Long term
COAL													
Contract prices													
Asia													
Hard coking	US\$/t	321	278	310	280	260	190	190	220	220	220	220	170
Semi soft	US\$/t	254	217	225	200	186	131	131	120	120	120	120	110
Thermal benchmark	US\$/t	130	114	130	125	120	113	105	105	105	105	105	90
LV-PCI	US\$/t	275	228	229	203	188	133	133	135	135	135	135	120
Europe													
Hard coking	US\$/t	321	278	310	280	260	190	190	220	220	220	220	170
Semi soft	US\$/t	254	217	225	200	186	131	131	120	120	120	120	110
Thermal benchmark	US\$/t	130	38	44	46	44	51	50	52	53	88	142	90
Spot prices													
Thermal Asia	US\$/t	123	130	143	125	120	113	105	105	105	105	105	90
Thermal Europe	US\$/t	127	126	143	125	120	113	105	105	105	105	105	94
IRON ORE													
Asia													
Lump (Brockman)	US\$/DMTu	n.a.	282	296	272	247	219	204	189	175	170	166	120
Fines (Brockman)	US\$/DMTu	n.a.	256	269	247	225	199	186	172	159	155	151	111
Yandi fines	US\$/DMTu	n.a.	256	269	247	225	199	186	172	159	155	151	104
Asia \$US/t													
Lump (Brockman)	\$US/t	n.a.	177	186	171	156	138	129	119	110	107	105	74
Fines (Brockman)	\$US/t	n.a.	161	170	156	142	126	117	109	100	98	95	68
Spot \$US/t	\$US/t	179.6	179	173	160	145	130	130	115	115	110	110	
PETROLEUM													
Oil (WTI)	US\$/bbl	98.21	97	93	95	95	91	91	87	89	90	91	80
Oil (Brent)	US\$/bbl	113.68	108	103	100	100	90	90	86	87	89	90	78

Source: Citi Investment Research and Analysis

Notes:

1. all bulk prices are FOB
2. hard coking coal is BHP Goonyella to Japan; semi-soft coking coal is Hunter Valley to Japan; thermal benchmark is 6,300kcal/kg Chubu contract with Australian shippers
3. LV-PCI: low volatile (<20% volatiles) pulverised coal injection material



Figure 127. Commodity price forecasts – metals, calendar years

CALENDAR YEAR		Spot	2006a	2007a	2008a	2009a	2010a	2011a	2012e	2013e	2014e	2015e	Long term
AVERAGE EXCHANGE RATES													
A\$/US\$		1.06	0.75	0.84	0.86	0.79	0.92	1.03	1.00	0.86	0.85	0.84	0.80
EURO/US\$		1.42	1.26	1.37	1.47	1.39	1.33	1.44	1.46	1.38	1.37	1.36	1.10
US\$/ZAR		6.90	6.76	7.09	8.34	8.42	7.32	6.94	7.48	8.34	8.98	9.56	10.00
PRECIOUS METALS & DIAMONDS													
Gold	US\$/oz	1,502	604	694	870	972	1,229	1,443	1,325	1,225	1,125	950	950
Silver	US\$/oz	34.8	11.6	13.5	15.0	14.5	20.2	33.0	26.0	22.4	19.1	16.0	12.0
Platinum	US\$/oz	1,764	1,143	1,318	1,577	1,199	1,614	1,827	1,900	1,775	1,632	1,500	1,500
Palladium	US\$/oz	715	319	401	352	270	529	801	950	850	700	550	550
Rhodium	US\$/oz		4,496	5,419	6,530	1,638	2,376	2,480	3,000	3,000	3,500	3,000	3,000
BASE METALS													
Aluminium	US\$/lb	119	117	120	118	78	99	123	122	118	116	114	100
	US\$/t	2618	2,569	2,647	2,604	1,712	2,173	2,701	2,688	2,598	2,556	2,518	2,205
Alumina: LT contract/Aust export	US\$/t	n.a.	343	368	369	247	304	405	402	395	389	398	390
Copper	US\$/lb	397	305	324	317	241	342	440	427	392	365	321	220
	US\$/t	8751	6,719	7,137	6,999	5,318	7,543	9,696	9,413	8,646	8,051	7,077	4,850
Molybdenum	US\$/lb	16.69	24.6	30.4	30.7	12.1	15.9	15.0	15.0	15.0	15.0	15.0	15.0
Nickel	US\$/lb	11.1	11.0	16.9	9.6	6.7	9.9	12.4	12.3	11.4	9.7	8.1	6.5
	US\$/t	24452.0	24,265	37,177	21,119	14,862	21,814	27,366	27,156	25,123	21,367	17,932	14,330
Cobalt	US\$/lb	18	18	29	42	15	18	15	10	10	10	10	13
Zinc	US\$/lb	98	148	148	85	79	98	103	113	112	109	109	80
	US\$/t	2158	3,261	3,272	1,873	1,732	2,161	2,280	2,500	2,469	2,400	2,400	1,764
Lead	US\$/lb	105	58	115	95	79	97	119	113	104	97	88	75
	US\$/t	2308	1,288	2,540	2,100	1,744	2,148	2,626	2,490	2,303	2,129	1,942	1,653
Tin	US\$/lb	29300	3.94	5.84	8.46	6.34	9.24	13.76	9.24	10.94	9.91	8.43	5.44
	US\$/t	57.50	8,685	12,884	18,643	13,974	20,382	30,328	20,375	24,125	21,838	18,591	12,000
Uranium	US\$/lb		47	99	64	46	46	54	50	50	50	50	50
INDUSTRIAL MINERALS													
Mineral Sands													
Rutile	US\$/t	875	480	484	500	553	584	814	950	1000	1050	1050	550
Zircon	US\$/t	1650	755	785	764	855	881	1600	2000	2200	2400	2400	850
Ilmenite	US\$/t	130	80	84	117	84	94	135	150	160	170	170	120
Synrutile	US\$/t	n.a.	406	417	418	420	440	671	800	850	900	900	500
RBM Chloride Slag	US\$/t	875	402	411	404	408	419	420	420	420	420	420	400
TiO2 Pigment	US\$/t	n.a.	1865	1905	1956	2105	2100	1918	1966	2015	2065	2117	1,900

Source: Citi Investment Research and Analysis

Notes: Rutile, synrutile, ilmenite, zircon are average Australian export prices. Forecasts are nominal; long-term prices are real

Figure 128. Commodity price forecasts – bulks, calendar years

CALENDAR YEAR		Spot	2006a	2007a	2008a	2009a	2010a	2011a	2012e	2013e	2014e	2015e	Long term
COAL													
Contract prices													
Asia													
Hard coking	US\$/t	321.00	118	102	253	172	191	294	270	190	220	220	170
Semi soft	US\$/t	254.00	61	63	196	116	139	221	193	131	120	120	110
Thermal benchmark	US\$/t	130.00	53	55	108	84	91	122	123	109	105	105	90
LV-PCI	US\$/t	n.a.	73	67	201	129	144	228	196	133	135	135	120
Europe													
Hard coking	US\$/t	321.00	118	102	253	172	191	294	270	190	220	220	170
Semi soft	US\$/t	254.00	63	65	198	117	139	221	193	131	120	120	110
Thermal benchmark	US\$/t	130.00	50	52	115	68	85	126	123	109	105	105	90
Spot prices													
Thermal Asia	US\$/t	122.71	49	65	130	72	97	136	123	109	105	105	90
Thermal Europe	US\$/t	127.19	50	62	121	71	97	134	123	109	105	105	94
IRON ORE													
Asia													
Lump (Brockman)	US\$/DMTu	n.a.	91	101	177	134	196	289	259	212	182	168	120
Fines (Brockman)	US\$/DMTu	n.a.	72	79	129	109	177	263	236	192	165	153	111
Yandi fines	US\$/DMTu	n.a.	67	78	129	109	177	263	236	192	165	153	104
Asia \$US/t													
Lump (Brockman)	\$US/t	n.a.	58	64	111	85	124	182	163	133	115	106	74
Fines (Brockman)	\$US/t	n.a.	45	50	81	69	112	165	149	121	104	96	68
Spot \$US/t	\$US/t	180	50	52	115	68	85	126	123	109	105	105	
PETROLEUM													
Oil (WTI)	US\$/bbl	98	66	72	99	63	83	95	95	91	88	90	80
Oil (Brent)	US\$/bbl	114	65	73	95	63	83	105	100	90	87	89	78

Source: Citi Investment Research and Analysis

Notes:

1. all bulk prices are FOB
2. hard coking coal is BHP Goonyella to Japan; semi-soft coking coal is Hunter Valley to Japan; thermal benchmark is 6,300kcal/kg Chubu contract with Australian shippers
3. LV-PCI: low volatile (<20% volatiles) pulverised coal injection material
5. forecasts are nominal; long-term prices are real

Notes



Notes



Notes



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Appendix A-1

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