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Industry View
Attractive

Metals & Mining

Global Commodities Update: Pricing a Deeper Recession

Global recession and now EM hard landing? The dramatic downward acceleration in markets and in the global growth outlook over the past four weeks has raised the possibility of the most severe global recession in 30 years, which would incorporate a hard landing for emerging markets (just 3-4% growth). Although sub-1% global GDP growth is not our base case forecast, there are growing signs that commodity markets are already beginning to price in such a scenario.

Demand growth slumping as China wakes up to recession: Following our recent China materials trip, it is clear that growth is slowing much faster than expected and preservation of capital is becoming critical. We now anticipate a very weak 1H'09 with global demand growth close to zero in all commodities, followed by a cyclical rebound from 2H'09 resulting in demand growth between -1.0% and 2.5% for 2009 as a whole.

Price forecasts downgraded by a further 20-40% for 2009: Historically, commodity prices have traded below marginal costs for more than 12 months, and briefly below average cash costs. We have therefore revised our metal price and iron ore forecasts to levels between average and marginal costs, although the structurally stronger coal markets are still likely to settle above marginal costs, in our view. Thermal coal, coking coal and copper are our preferred commodities.

2H'09 recovery expected boosted by production cutbacks: Our base case is for an increasingly strong recovery from 2H'09, with prices moving higher in 2010 as production cutbacks and cancellations/deferrals result in tightening market conditions against still largely low inventory positions. The biggest risk is the negative feedback loop to China from a long and deep recession in the developed world, and the EM hard landing scenario described above. Our bear case forecasts would be more applicable in such a scenario.

Subjective Probabilities Underlying Our Scenarios

Base Case	Pricing a Deeper Recession	75-80%
Bear Case	EM Hard Landing	15-20%
Bull Case	Return to the Supercycle	0-10%

Source: Morgan Stanley Research estimates

2009 Demand Growth Forecasts Cut Sharply

	New	Previous	Old	New	Previous	Old
	2009 Demand Growth			2009 S-D Balance (kt)		
Copper	1.0%	3.3%	5.2%	127	42	-43
Aluminium	2.6%	7.7%	9.2%	1,098	837	-138
Nickel	2.2%	7.6%	9.5%	54	19	-11
Zinc	1.6%	3.2%	4.5%	236	280	228
Iron Ore	-1.0%	7.0%	7.0%	34	33	-12

Old = 18 June, 2008 ("*Demand Takes a Break*"); Previous = 9 October, 2008 ("*Re-pricing for Recession*"); Source: Morgan Stanley Research estimates

Exhibit 1

Commodity Price Forecast Changes – BASE CASE, Nov 2008

Base Metals:

Period	Aluminium			Nickel			Copper			Zinc		
	New US$/lb	Old US$/lb	*Change %*	New US$/lb	Old US$/lb	*Change %*	New US$/lb	Old US$/lb	*Change %*	New US$/lb	Old US$/lb	*Change %*
2008e	1.18	1.23	*-4%*	9.50	10.15	*-6%*	3.17	3.38	*-6%*	0.85	0.90	*-5%*
2009e	0.95	1.20	*-21%*	5.50	8.50	*-35%*	1.95	3.20	*-39%*	0.65	0.85	*-24%*
2010e	1.20	1.30	*-8%*	7.50	9.00	*-17%*	2.90	3.80	*-24%*	0.95	1.00	*-5%*
2011e	1.40	1.40	*0%*	9.00	8.00	*13%*	3.75	3.70	*1%*	1.25	1.05	*19%*
2012e	1.50	1.25	*20%*	9.00	7.50	*20%*	4.00	3.20	*25%*	1.25	1.00	*25%*
2013e	1.40	1.20	*17%*	8.50	8.00	*6%*	3.50	2.60	*35%*	1.10	0.90	*22%*
2014e	1.25	1.15	*9%*	8.00	8.00	*0%*	3.00	2.25	*33%*	0.95	0.80	*19%*
LT	1.15	1.15	*0%*	8.00	8.00	*0%*	2.00	2.00	*0%*	0.80	0.80	*0%*

Precious Metals:

Period	Gold			Platinum			Palladium			Rhodium		
	New US$/oz	Old US$/oz	*Change %*	New US$/oz	Old US$/oz	*Change %*	New US$/oz	Old US$/oz	*Change %*	New US$/oz	Old US$/oz	*Change %*
2008e	855	900	*-5%*	1,575	1,670	*-6%*	348	360	*-3%*	6,582	7,000	*-6%*
2009e	750	950	*-21%*	950	1,500	*-37%*	190	280	*-32%*	2,500	4,500	*-44%*
2010e	825	1,000	*-18%*	1,400	1,800	*-22%*	270	340	*-21%*	3,500	5,500	*-36%*
2011e	850	900	*-6%*	1,800	1,900	*-5%*	360	360	*0%*	4,700	5,750	*-18%*
2012e	800	800	*0%*	1,800	1,850	*-3%*	360	350	*3%*	4,700	5,000	*-6%*
2013e	750	700	*7%*	1,750	1,800	*-3%*	340	350	*-3%*	4,000	4,500	*-11%*
2014e	700	700	*0%*	1,600	1,800	*-11%*	320	350	*-9%*	3,500	4,500	*-22%*
LT	700	700	*0%*	1,500	1,800	*-17%*	300	350	*-14%*	3,000	4,500	*-33%*

Bulks:

Period	Iron Ore (Lump)				Iron Ore (Fines)				Alumina (contract)			
	New US$/t	Old US$/t	*Change %*	YoY % chg	New US$/t	Old US$/t	*Change %*	YoY % chg	New US$/t	Old US$/t	*Change %*	Linkage to LME
2008e	118.24	118.24	*0%*	80%	92.64	92.64	*0%*	80%	326	340	*-4%*	12.5%
2009e	82.77	112.32	*-26%*	-30%	64.85	88.01	*-26%*	-30%	262	331	*-21%*	12.5%
2010e	82.77	106.71	*-22%*	0%	64.85	83.61	*-22%*	0%	336	364	*-8%*	12.7%
2011e	99.32	112.04	*-11%*	20%	77.82	87.79	*-11%*	20%	392	401	*-2%*	12.7%
2012e	104.28	123.25	*-15%*	5%	81.71	96.57	*-15%*	5%	420	350	*20%*	12.7%
2013e	104.28	123.25	*-15%*	0%	81.71	96.57	*-15%*	0%	392	350	*12%*	12.7%
2014e	104.28	110.92	*-6%*	0%	81.71	86.91	*-6%*	0%	350	350	*0%*	12.7%
LT	89.34	89.34	*0%*		70.00	70.00	*0%*		317	313	*1%*	12.5%

Period	Hard Coking Coal			Thermal Coal			PCI Coal			Semi Soft Coal		
	New US$/t	Old US$/t	*Change %*	New US$/t	Old US$/t	*Change %*	New US$/t	Old US$/t	*Change %*	New US$/t	Old US$/t	*Change %*
2008e	300.0	300.0	*0%*	125.00	125.00	*0%*	260.00	260.00	*0%*	240.00	245.00	*-2%*
2009e	250.0	300.0	*-17%*	110.00	150.00	*-27%*	150.00	260.00	*-42%*	130.00	245.00	*-47%*
2010e	270.0	275.0	*-2%*	125.00	150.00	*-17%*	170.00	235.00	*-28%*	150.00	220.00	*-32%*
2011e	275.0	225.0	*22%*	150.00	140.00	*7%*	200.00	180.00	*11%*	180.00	170.00	*6%*
2012e	250.0	190.0	*32%*	140.00	120.00	*17%*	180.00	155.00	*16%*	160.00	145.00	*10%*
2013e	220.0	160.0	*38%*	120.00	100.00	*20%*	155.00	135.00	*15%*	140.00	125.00	*12%*
2014e	190.0	150.0	*27%*	100.00	90.00	*11%*	135.00	115.00	*17%*	115.00	105.00	*10%*
LT	140.0	140.0	*0%*	80.00	80.00	*0%*	100.00	100.00	*0%*	90.00	90.00	*0%*

Source: Morgan Stanley Research estimates

Global Commodities Update — Pricing a Deeper Recession

Highlights

- Metal demand growth has weakened sharply, with developed markets leading the way down, but EM is now following.
- Chinese consumption is also rapidly slowing, with closures suddenly widespread among producers and consumers.
- Supply cutbacks and project deferrals/ cancellations are proceeding at an unprecedented rate, which should result in even tighter markets than before *when* demand recovers.
- Copper, thermal coal and coking coal have the greatest structural problems, so these are our preferred commodities.
- We now anticipate a very weak 1H'09 with global demand growth close to zero in all commodities, followed by a cyclical rebound from 2H'09 resulting in demand growth between -1.0% and 2.5% for 2009 as a whole.
- Our base case is for an increasingly strong recovery from 2H'09, with prices moving higher in 2010. The speed of the bounce-back will depend on the length and depth of the global recession, and whether there is an EM hard landing.

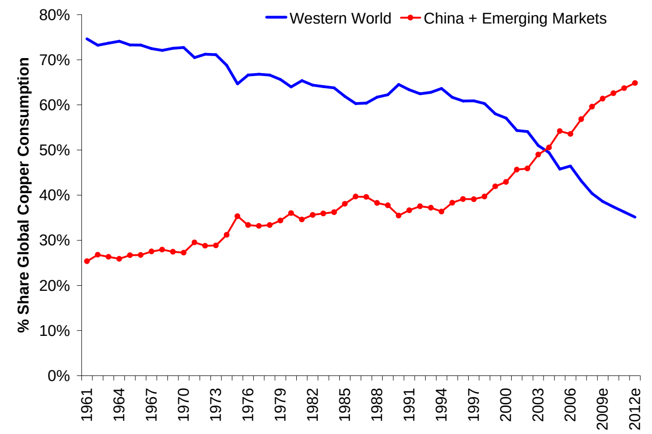
Global recession and now EM hard landing?

The speed of the global growth downturn in the past 3-4 weeks has surprised even the most bearish forecasters, and it has significantly raised the risks of a potential hard landing in emerging markets (EM). This is critical for commodities since during the current decade EM have accounted for almost all of the growth in commodity demand, and in absolute terms EM now represent substantially more than 50% of total global consumption (see Exhibits 2 and 3). Furthermore, a hard landing in EM growth would create a negative feedback loop for developed economies, inducing a much longer and deeper global recession, which in turn would further weaken Chinese growth through reduced export demand. The strong circularity here is clearly a major concern.

On the other hand, it is also critical to recognize that a substantial portion (on average about 60-70%) of the growth in EM commodity demand has been through internal investment, largely in the form of infrastructure spend. This is largely insulated from the global contagion, as most EM have large fiscal surpluses (China has 9% of GDP in the form of cash reserves, plus US$2 trillion of foreign exchange reserves) or ongoing strong petrodollar flows, so we would expect this demand driver to remain relatively unscathed.

Exhibit 2

China and EM account for just under 60% of global copper consumption in 2008e

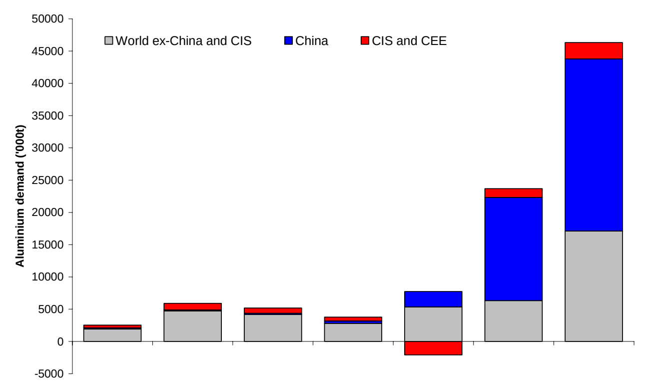


Source: Brook Hunt, CRU, Morgan Stanley Research, e = Morgan Stanley Research estimates

Indeed, from recent meetings in China (see "*China Materials Trip: Wake-up to Recession*", 30th October, 2008) it was clear that infrastructure spend remains very much on track, with many corporates expecting the government to further boost spending above current plans in 2009. Rail and power are the key sectors, as evidenced by the government's recent announcement to spend about US$300bn expanding the rail network from approximately 125,000km to 160,000km by 2010.

Exhibit 3

China and EM account for effectively all of the global aluminium consumption in this decade



Source: CRU, Morgan Stanley Research, e = Morgan Stanley Research estimates

Metal demand forecasts sharply reduced

Following our China materials trip, it is clear that growth is slowing much faster than expected and preservation of capital is becoming critical. We now anticipate a very weak 1H'09 with global demand growth close to zero in all commodities, followed by a cyclical rebound from 2H'09. As a result, we have sharply reduced 2009 demand growth forecasts, as shown in Exhibit 4 below.

Exhibit 4

2009 Demand Growth Forecasts Cut Sharply

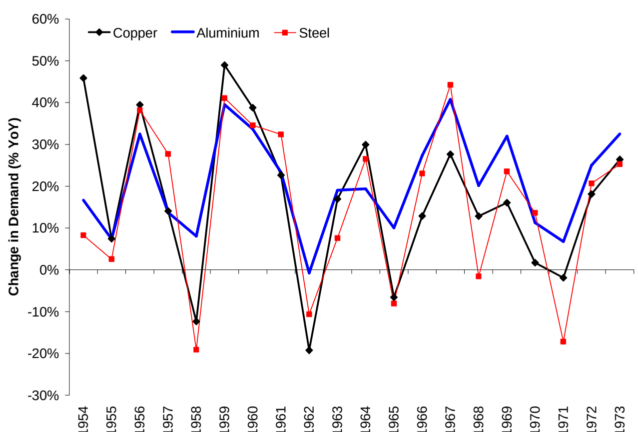
	New	Previous	Old	New	Previous	Old
	2009 Demand Growth			2009 S-D Balance (kt)		
Copper	1.0%	3.3%	5.2%	127	42	-43
Aluminium	2.6%	7.7%	9.2%	1,098	837	-138
Nickel	2.2%	7.6%	9.5%	54	19	-11
Zinc	1.6%	3.2%	4.5%	236	280	228
Iron Ore	-1.0%	7.0%	7.0%	34	33	-12

Old = 18 June, 2008 ("*Demand Takes a Break*"); Previous = 9 October, 2008 ("*Re-pricing for Recession*"); Source: Morgan Stanley Research estimates

Our base case is for an increasingly strong pick-up from 2H'09 with demand growth returning in a characteristic "V-shaped" recovery. This has been typical of slowdowns/ recessions in industrializing economies, and is clearly illustrated in Exhibit 5 by the progression of demand growth in Japan.

Exhibit 5

Japanese demand growth of copper, aluminium and steel, 1954-1973, showing V-shaped recoveries



Source: CRU, IISI, Morgan Stanley Research

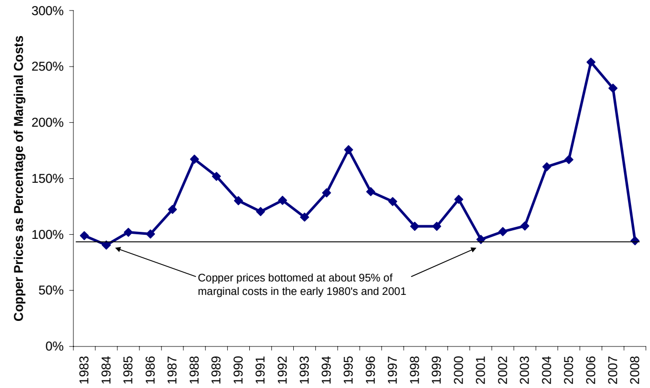
Price forecasts cut by 20-40% for 2009

We looked at how low commodity prices have traded in the past relative to both marginal costs and average cash costs, in order to define cost-based quantitative parameters for our base case price forecasts. The biggest issue is that of course costs generally move directionally with prices, particularly in the case of aluminium where the two main inputs are alumina and power, which are both set with direct reference to LME prices.

Historically, in recessionary periods metal prices have traded below marginal costs for more than 12 months, and at times have (briefly) traded below average cash costs. In general, however, the lowest annual average price has tended to be about 75-95% of the marginal cash cost (see Exhibits 6 and 7).

Exhibit 6

Copper prices have historically bottomed at about 95% of marginal costs

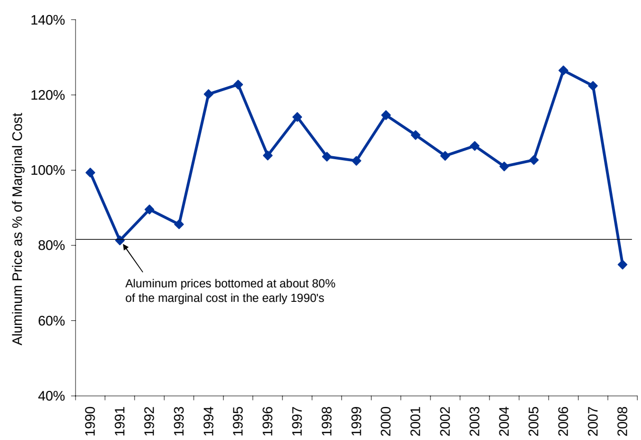


Source: CRU, Morgan Stanley Research

We believe that prices are unlikely to average below this historical range to marginal cash cost in 2009; indeed, in past cycles banks were usually prepared to support producers in cash negative positions for at least a year (usually when it was clear that cost-cutting initiatives could address the situation). However, in current credit markets no bank is likely to lend money to a producer who is cash negative, in our view. Hence we believe that working capital squeezes will be much more quickly reflected in production cuts and mine closures.

Exhibit 7

Aluminium prices have historically bottomed at about 80% of marginal costs



Source: CRU, Morgan Stanley Research

We have therefore revised our metal price and iron ore forecasts to levels between average and marginal costs, although in each case considerably closer to marginal costs and generally in-line with the historical ranges. The exceptions have been thermal coal and coking coal, as in both cases we believe these markets are structurally stronger with long-term supply constraints, and given that they are contract markets priced almost exclusively on supply-demand fundamentals they are likely to settle above marginal costs, in our view.

Already an unprecedented supply response

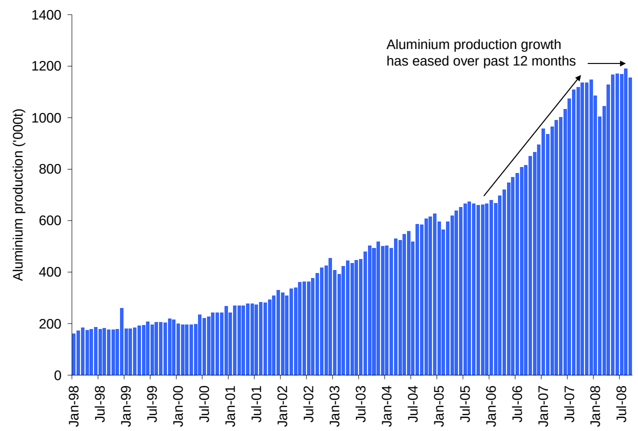
Announcements of production cutbacks, capex reductions and new project deferrals or postponements have come almost daily over the past 4-5 weeks. The scale and timing of these is unprecedented – producers have in the past taken many months if not years, rather than just a few weeks, to make these decisions. This is a function of the incredible pace of the downturn and the effective closure of the credit markets.

In particular, on our China materials trip we were surprised to find that closures are suddenly becoming widespread across both producers and consumers, and in all commodities. This belies the view that cost of capital and return on capital measures are not relevant in China, and suggests that all operations have a "pain-point" which is being increasingly reached. Most vulnerable are small and medium sized producers in second and third tier cities, who will find it difficult to obtain financing to bridge them through these difficult markets. This will inevitably lead to consolidation in production, in our view, which has been a target for the Beijing government for some time, particularly in steel and aluminium.

Aluminium production has already been cut in China, with CBI reporting that last week 2.2Mt of capacity was shut-in with a further 700kt-1Mt of potential cuts to come. This compares with production in 2007 of 12.3Mt and total capacity of close to 15Mt, based on our numbers. Indeed, aluminium production has been slowing throughout 2008, with three of the nine months to date showing lower year-on-year production after the very strong growth of the past few years (see Exhibit 8).

Exhibit 8

Chinese aluminium production has eased significantly over the past 12 months



Source: CRU, CBI China, Morgan Stanley Research

Copper production and zinc production are also being cut – Chinese smelter officials indicated this week that 2Mt out of China's 4.6Mt of refined copper capacity is reducing output, while a number of zinc smelter cutbacks are also underway. Meanwhile, production capacity outside China is also being shut, with CRU estimating that a cumulative 1.8Mt of zinc mine supply is set to be removed in the 2009-13 period (total annual mine production is currently about 12Mt). In addition, CRU have also estimated that at least 135kt of primary nickel production will be lost in 2008 (just under 10% of the market), while Vale last week announced a delayed start-up for the tier 1 Goro and Onca Puma projects, which combined are set to add 120kt of new capacity.

We anticipate further production cutback announcements over the coming weeks as producers increasingly come to terms with the very sharp price fall over the past 2-3 months. In turn, this should result in even tighter markets than before when demand recovers.

Bear Case – The EM Hard Landing Scenario

As in our previous report ("*Re-pricing for Recession*", 9th October, 2008) we have once again considered bear and bull scenarios to accommodate the unprecedented nature of current trading. The bear case essentially reflects the EM hard landing scenario discussed above, and is based on the following assumptions:

1. A deep 2-year recession for 2009 and 2010, with global GDP growth sub-1% in 2009 and a hard landing for EM (growth of not more than 3-4%).

2. Prices trading below average cash costs in 2009 on a spot basis. Although as there is no historical precedent for a full-year average to be as low as the average cash cost, we assume prices are about 10% above average cash costs (but in each case closer to average costs than marginal costs).

3. 2010 similar but with a marginal recovery – prices still below marginal costs which should ensure that a sizeable amount of capacity is closed, which even with weak demand should result in markets moving back into deficit.

4. 2011 – prices set at about the marginal cost.

5. 2012/13 - a modest rally with prices 20-40% above marginal costs but well below previous highs.

6. 2014 and beyond revert back to the normalised price, which is set as the marginal cost (i.e. 90th percentile of the cost curve) in a slow growth scenario (i.e. global growth above 3% but well below 4%).

Exhibit 9

Bear Case Prices vs Current Marginal Cash Costs and Incentive Prices

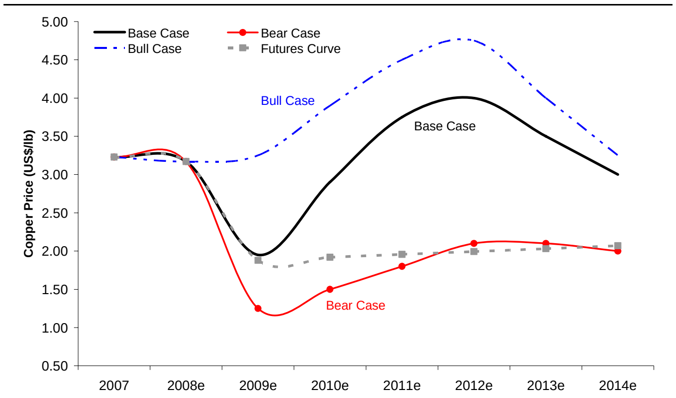
US$/lb	2009e	2010e	Marginal cash cost	Incentive price
Copper	1.25	1.50	1.70-1.80	2.50-3.00
Aluminium	0.85	0.90	1.05	1.30-1.40
Nickel	4.00	4.50	6.50	8.00
Zinc	0.50	0.55	0.75-0.8	0.90

Source: Morgan Stanley Research estimates

Clearly, this is an extreme scenario, which in the normal course of events would be irrational. Marginal producers would be unable to run at the implied deep cash negative positions for any length of time (certainly not a full year), resulting in substantial supply cuts which would relatively quickly rebalance markets and boost prices – this, of course, is how commodity markets 'normally' work. However, it is interesting that our bear case scenario is very close to the current futures curve for copper (see Exhibit 10), although it is significantly below the current futures curve for aluminium (see Exhibit 11).

Exhibit 10

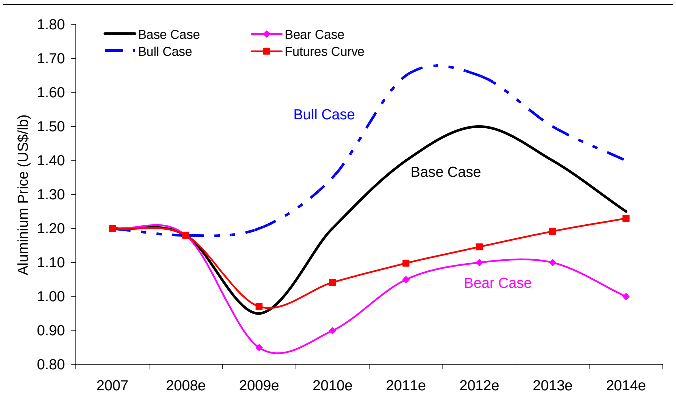
Base, Bear and Bull Case Scenarios for Copper



Source: Reuters, e = Morgan Stanley Research estimates

Exhibit 11

Base, Bear and Bull Case Scenarios for Aluminium



Source: Reuters, e = Morgan Stanley Research estimates

Exhibit 12

Commodity Price Forecasts – BEAR CASE, Nov 2008

Base Metals:

Period	Aluminium			Nickel			Copper			Zinc		
	Bear US$/lb	Base US$/lb	*Diff %*	Bear US$/lb	Base US$/lb	*Diff %*	Bear US$/lb	Base US$/lb	*Diff %*	Bear US$/lb	Base US$/lb	*Diff %*
2008e	1.18	1.18	*0%*	9.50	9.50	*0%*	3.17	3.17	*0%*	0.85	0.85	*0%*
2009e	0.85	0.95	*-11%*	4.00	5.50	*-27%*	1.25	1.95	*-36%*	0.50	0.65	*-23%*
2010e	0.90	1.20	*-25%*	4.50	7.50	*-40%*	1.50	2.90	*-48%*	0.55	0.95	*-42%*
2011e	1.05	1.40	*-25%*	6.00	9.00	*-33%*	1.80	3.75	*-52%*	0.70	1.25	*-44%*
2012e	1.10	1.50	*-27%*	7.00	9.00	*-22%*	2.10	4.00	*-48%*	0.80	1.25	*-36%*
2013e	1.10	1.40	*-21%*	7.00	8.50	*-18%*	2.10	3.50	*-40%*	0.75	1.10	*-32%*
2014e	1.00	1.25	*-20%*	6.50	8.00	*-19%*	2.00	3.00	*-33%*	0.70	0.95	*-26%*
LT	0.90	1.15	*-22%*	6.00	8.00	*-25%*	1.50	2.00	*-25%*	0.60	0.80	*-25%*

Precious Metals:

Period	Gold			Platinum			Palladium			Rhodium		
	Bear US$/oz	Base US$/oz	*Diff %*	Bear US$/oz	Base US$/oz	*Diff %*	Bear US$/oz	Base US$/oz	*Diff %*	Bear US$/oz	Base US$/oz	*Diff %*
2008e	855	900	*-5%*	1,575	1,670	*-6%*	348	360	*-3%*	6,582	7,000	*-6%*
2009e	600	750	*-20%*	750	950	*-21%*	150	190	*-21%*	1,200	2,500	*-52%*
2010e	650	825	*-21%*	800	1,400	*-43%*	155	270	*-43%*	1,500	3,500	*-57%*
2011e	700	850	*-18%*	950	1,800	*-47%*	175	360	*-51%*	1,800	4,700	*-62%*
2012e	700	800	*-13%*	1,150	1,900	*-39%*	200	380	*-47%*	2,000	5,000	*-60%*
2013e	600	750	*-20%*	1,150	1,850	*-38%*	200	370	*-46%*	1,900	4,500	*-58%*
2014e	550	700	*-21%*	1,100	1,800	*-39%*	190	360	*-47%*	1,750	4,500	*-61%*
LT	500	700	*-29%*	1,000	1,800	*-44%*	180	350	*-49%*	1,500	4,500	*-67%*

Bulks:

Period	Iron Ore (Lump)				Iron Ore (Fines)				Alumina (contract)			
	Bear US$/t	Base US$/t	*Diff %*	YoY % chg	Bear US$/t	Base US$/t	*Diff %*	YoY % chg	*Bear US$/t*	Base US$/t	*Diff %*	Linkage to LME
2008e	118.24	118.24	*0%*	*80%*	92.64	92.64	*0%*	*80%*	326	340	*-4%*	*12.5%*
2009e	59.12	82.77	*-29%*	*-50%*	46.32	64.85	*-29%*	*-50%*	234	262	*-11%*	*12.5%*
2010e	53.21	82.77	*-36%*	*-10%*	41.69	64.85	*-36%*	*-10%*	252	336	*-25%*	*12.7%*
2011e	55.87	99.32	*-44%*	*5%*	43.77	77.82	*-44%*	*5%*	294	392	*-25%*	*12.7%*
2012e	61.45	104.28	*-41%*	*10%*	48.15	81.71	*-41%*	*10%*	308	420	*-27%*	*12.7%*
2013e	61.45	104.28	*-41%*	*0%*	48.15	81.71	*-41%*	*0%*	308	392	*-21%*	*12.7%*
2014e	61.45	104.28	*-41%*	*0%*	48.15	81.71	*-41%*	*0%*	280	350	*-20%*	*12.7%*
LT	51.05	89.34	*-43%*		40.00	70.00	*-43%*		248	317	*-22%*	*12.5%*

Period	Hard Coking Coal			Thermal Coal			PCI Coal			Semi Soft Coal		
	Bear US$/t	Base US$/t	*Diff %*	Bear US$/t	Base US$/t	*Diff %*	Bear US$/t	Base US$/t	*Diff %*	Bear US$/t	Base US$/t	*Diff %*
2008e	300.0	300.0	*0%*	125.00	125.00	*0%*	260.00	260.00	*0%*	240.00	245.00	*-2%*
2009e	140.0	250.0	*-44%*	80.00	110.00	*-27%*	95.00	150.00	*-37%*	95.00	130.00	*-27%*
2010e	140.0	270.0	*-48%*	85.00	125.00	*-32%*	100.00	170.00	*-41%*	100.00	150.00	*-33%*
2011e	150.0	275.0	*-45%*	95.00	150.00	*-37%*	110.00	200.00	*-45%*	110.00	180.00	*-39%*
2012e	150.0	250.0	*-40%*	95.00	140.00	*-32%*	110.00	180.00	*-39%*	110.00	180.00	*-39%*
2013e	130.0	220.0	*-41%*	90.00	120.00	*-25%*	100.00	155.00	*-35%*	100.00	140.00	*-29%*
2014e	115.0	190.0	*-39%*	75.00	100.00	*-25%*	85.00	135.00	*-37%*	85.00	115.00	*-26%*
LT	90.0	140.0	*-36%*	50.00	80.00	*-38%*	60.00	100.00	*-40%*	60.00	90.00	*-33%*

Source: Morgan Stanley Research estimates

Bull Case – A Return to the Supercycle Scenario
Our bull case is predicated on a strong recovery in global growth and a return to the Supercycle scenario, as follows:

1. Growth in the US recovers to the 4% range, Europe to the 2.5-3.0% range; Chinese GDP growth back to the 10-12% range, with fixed asset investment close to 30% year-on-year; EM growth back to the 6.5-7.0% range.

2. 2009 prices are determined as follows: base metals as the average of the 10 quarters from 1Q06 to 2Q08 which approximate the peak pricing period (nickel has been adjusted to exclude the artificial squeeze in 1Q and 2Q07); precious metals as the average of the past 4 quarters; for bulks it is 2008 plus 5-10% for iron ore and coking coal; while for thermal coal it is approximately the mid-term contracts signed by Xstrata (at US$155/t).

3. 2010 is approximately equal to the highest ever quarterly average, and bulks are about +10% over 2009.

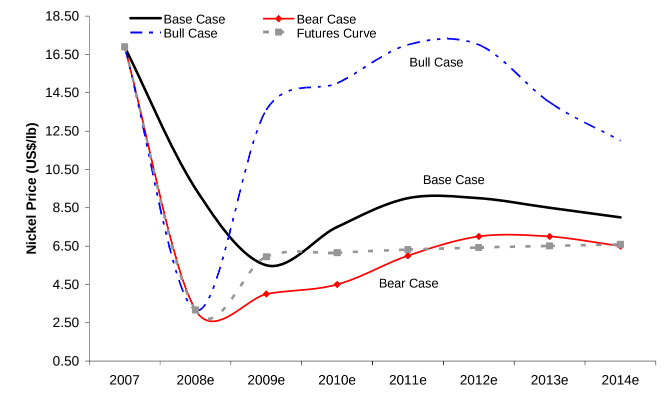
4. Prices peak in 2011 and 2012 at levels approximately equal to the all-time high (nominal) spot prices.

5. From 2013 prices mean revert to long-term averages which are set about 10-20% higher than the base case.

Given the huge uncertainty in financial markets at present, we believe this scenario is the least likely of the three – we would subjectively rate the probability of the scenarios playing out as follows:

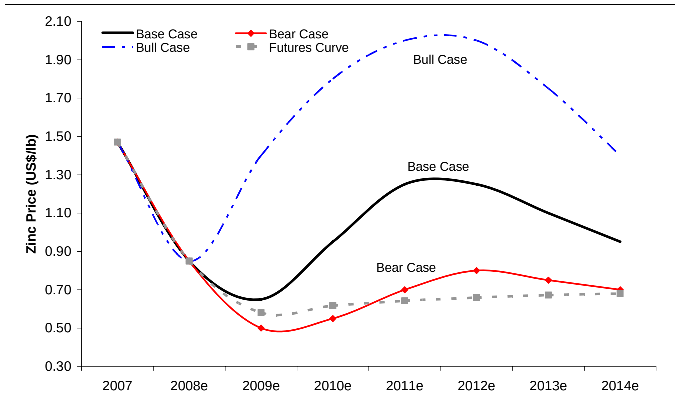
- Base Case: 75-80% probability
- Bear Case: 15-20% probability
- Bull Case: 0-10% probability

Exhibit 13
Base, Bear and Bull Case Scenarios for Nickel



Source: Reuters, e = Morgan Stanley Research estimates

Exhibit 14
Base, Bear and Bull Case Scenarios for Zinc



Source: Reuters, e = Morgan Stanley Research estimates

Exhibit 15

Commodity Price Forecasts – BULL CASE, Nov 2008

Base Metals:

Period	Aluminium Bull US$/lb	Aluminium Base US$/lb	Aluminium Diff %	Nickel Bull US$/lb	Nickel Base US$/lb	Nickel Diff %	Copper Bull US$/lb	Copper Base US$/lb	Copper Diff %	Zinc Bull US$/lb	Zinc Base US$/lb	Zinc Diff %
2008e	1.18	1.23	*-4%*	9.50	10.15	*-6%*	3.17	3.38	*-6%*	0.85	0.90	*-5%*
2009e	1.20	0.95	*26%*	13.60	5.50	*147%*	3.25	1.95	*67%*	1.40	0.65	*115%*
2010e	1.35	1.20	*13%*	15.00	7.50	*100%*	3.90	2.90	*34%*	1.80	0.95	*89%*
2011e	1.65	1.40	*18%*	17.00	9.00	*89%*	4.50	3.75	*20%*	2.00	1.25	*60%*
2012e	1.65	1.50	*10%*	17.00	9.00	*89%*	4.75	4.00	*19%*	2.00	1.25	*60%*
2013e	1.50	1.40	*7%*	14.00	8.50	*65%*	4.00	3.50	*14%*	1.75	1.10	*59%*
2014e	1.40	1.25	*12%*	12.00	8.00	*50%*	3.25	3.00	*8%*	1.40	0.95	*47%*
LT	1.30	1.15	*13%*	9.00	8.00	*13%*	2.25	2.00	*13%*	0.95	0.80	*19%*

Precious Metals:

Period	Gold Bull US$/oz	Gold Base US$/oz	Gold Diff %	Platinum Bull US$/oz	Platinum Base US$/oz	Platinum Diff %	Palladium Bull US$/oz	Palladium Base US$/oz	Palladium Diff %	Rhodium Bull US$/oz	Rhodium Base US$/oz	Rhodium Diff %
2008e	855	900	*-5%*	1,575	1,670	*-6%*	348	360	*-3%*	6,582	7,000	*-6%*
2009e	870	750	*16%*	1,725	950	*82%*	395	190	*108%*	7,675	2,500	*207%*
2010e	1,000	825	*21%*	2,000	1,400	*43%*	440	270	*63%*	8,750	3,500	*150%*
2011e	1,100	850	*29%*	2,250	1,800	*25%*	500	360	*39%*	9,500	4,700	*102%*
2012e	1,100	800	*38%*	2,250	1,900	*18%*	500	380	*32%*	9,500	5,000	*90%*
2013e	1,000	750	*33%*	2,000	1,850	*8%*	450	370	*22%*	7,500	4,500	*67%*
2014e	900	700	*29%*	1,900	1,800	*6%*	400	360	*11%*	6,000	4,500	*33%*
LT	800	700	*14%*	1,800	1,800	*0%*	380	350	*9%*	4,500	4,500	*0%*

Bulks:

Period	Iron Ore (Lump) Bull US$/t	Iron Ore (Lump) Base US$/t	Iron Ore (Lump) Diff %	Iron Ore (Lump) YoY % chg	Iron Ore (Fines) Bull US$/t	Iron Ore (Fines) Base US$/t	Iron Ore (Fines) Diff %	Iron Ore (Fines) YoY % chg	Alumina (contract) Bull US$/t	Alumina (contract) Base US$/t	Alumina (contract) Diff %	Linkage to LME
2008e	118.24	118.24	*0%*	*80%*	92.64	92.64	*0%*	*80%*	326	340	*-4%*	*12.5%*
2009e	124.15	82.77	*50%*	*5%*	97.27	64.85	*50%*	*5%*	331	331	*0%*	*12.5%*
2010e	136.56	82.77	*65%*	*10%*	107.00	64.85	*65%*	*10%*	378	378	*0%*	*12.7%*
2011e	136.56	99.32	*38%*	*0%*	107.00	77.82	*38%*	*0%*	462	462	*0%*	*12.7%*
2012e	136.56	104.28	*31%*	*0%*	107.00	81.71	*31%*	*0%*	462	462	*0%*	*12.7%*
2013e	129.73	104.28	*24%*	*-5%*	101.65	81.71	*24%*	*-5%*	420	392	*7%*	*12.7%*
2014e	123.25	104.28	*18%*	*-5%*	96.57	81.71	*18%*	*-5%*	392	350	*12%*	*12.7%*
LT	102.11	89.34	*14%*		80.00	70.00	*14%*		358	317	*13%*	*12.5%*

Period	Hard Coking Coal Bull US$/t	Hard Coking Coal Base US$/t	Hard Coking Coal Diff %	Thermal Coal Bull US$/t	Thermal Coal Base US$/t	Thermal Coal Diff %	PCI Coal Bull US$/t	PCI Coal Base US$/t	PCI Coal Diff %	Semi Soft Coal Bull US$/t	Semi Soft Coal Base US$/t	Semi Soft Coal Diff %
2008e	300.0	300.0	*0%*	125.00	125.00	*0%*	260.00	260.00	*0%*	240.00	245.00	*-2%*
2009e	325.0	250.0	*30%*	150.00	110.00	*36%*	290.00	150.00	*93%*	270.00	130.00	*108%*
2010e	350.0	270.0	*30%*	180.00	125.00	*44%*	295.00	170.00	*74%*	280.00	150.00	*87%*
2011e	350.0	275.0	*27%*	200.00	150.00	*33%*	290.00	200.00	*45%*	280.00	180.00	*56%*
2012e	325.0	250.0	*30%*	180.00	140.00	*29%*	280.00	180.00	*56%*	270.00	160.00	*69%*
2013e	275.0	220.0	*25%*	160.00	120.00	*33%*	210.00	155.00	*35%*	200.00	140.00	*43%*
2014e	225.0	190.0	*18%*	140.00	100.00	*40%*	160.00	135.00	*19%*	150.00	115.00	*30%*
LT	175.0	140.0	*25%*	100.00	80.00	*25%*	130.00	100.00	*30%*	120.00	90.00	*33%*

Source: Morgan Stanley Research estimates

COPPER

Price Forecasts Substantially Downgraded

- Price forecast for 2009 downgraded by 39% to US$1.95/lb. Demand growth has slowed dramatically although substantial production problems are keeping the market close to balance.
- LME stocks have risen in the past two weeks, but most metal has been delivered into Rotterdam potentially from just one party, so may not be fully representative of the market. Meanwhile, Shanghai stocks have been falling.
- Chinese consumption has slowed but infrastructure demand for power is still strong; we estimate Chinese demand growth of 6% in 2009, global growth of just 1%.
- Price forecast for 2010 of US$2.90/lb reflects expected 132kt market deficit and stocks-consumption ratio by year-end at a record low 1.2 weeks.

Copper Price Profile Now Effectively "V-Shaped"

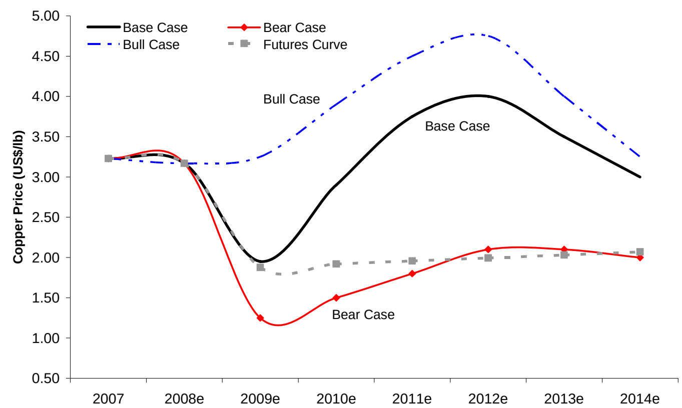
US$/lb	New	Old	Chg (%)
2008e	3.17	3.38	-6%
2009e	1.95	3.20	-39%
2010e	2.90	3.80	-24%
2011e	3.75	3.70	1%
2012e	4.00	3.20	25%
2013e	3.50	2.60	35%
2014e	3.00	2.25	33%
LT	**2.00**	**2.00**	**0%**

Source: Morgan Stanley Research estimates

Key Cost Data Points

- Current marginal cost of Western mine production after adjusting for the sharp fall in diesel prices and sulphuric acid prices estimated at $1.70-1.80/lb (Source: Brook Hunt and CRU).
- Current average cost of Western mine production after adjusting for sharp fall in by-product credits estimated at $1.10/lb (Source: Brook Hunt and CRU).
- Current average cost of Chinese smelter production is about $2.80-3.00/lb, while the marginal cost is approximately $3.50/lb (Source: Antaike, CBI China).

Base, Bear and Bull Case Profiles vs Futures Curve

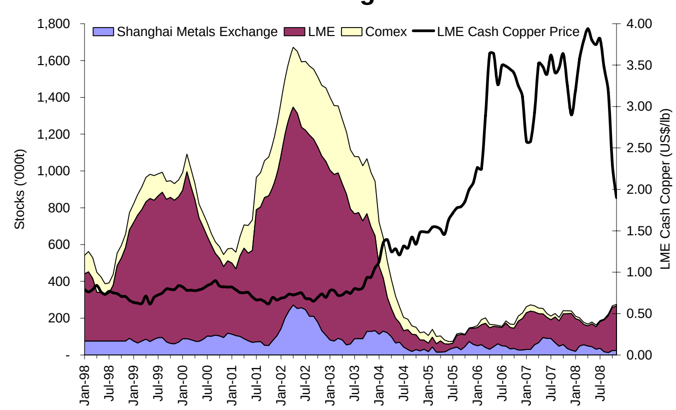


Source: CRU, Morgan Stanley Research estimates

Production Cutbacks or Deferrals/Cancellations

- Chinese smelter officials indicated this week that 2Mt out of China's 4.6Mt of refined copper capacity is reducing output – we estimate the cuts would total at least 750kt on an annualized basis.
- Escondida production will be at least 200-250kt lower than budgeted over the period 3Q'08 to 3Q'09 due to lower grades and a major SAG mill failure.
- Codelco announced a number of cuts across almost all of its operations, including 10% from the main Codelco Norte division – at least 100-150kt annualized.
- Freeport announced a 90kt cut in its US production for both 2009 and 2010.
- First Quantum closed its 50kt Bwana Mkubwa mine.

Warehouse Stocks Are Rising But Still Low



Source: Reuters, DataStream, Morgan Stanley Research

Exhibit 16

Global Copper Supply/Demand Balance, 2004-2012e

'000 t	2004	2005e	2006e	2007	2008e	2009e	2010e	2011e	2012e	CAGR
Production										
North America	2,223	2,192	2,133	2,153	2,110	2,170	2,250	2,355	2,425	
% change yoy	*7.2*	*-1.4*	*-2.7*	*0.9*	*-2.0*	*2.8*	*3.7*	*4.7*	*3.0*	***1.0***
South and Central America	3,591	3,568	3,526	3,593	3,693	3,743	3,893	4,143	4,393	
% change yoy	*-0.7*	*-0.6*	*-1.2*	*1.9*	*2.8*	*1.4*	*4.0*	*6.4*	*6.0*	***0.9***
Western Europe	1,826	1,831	1,877	1,850	1,900	1,900	1,925	1,960	2,000	
% change yoy	*0.3*	*0.3*	*2.5*	*-1.4*	*2.7*	*0.0*	*1.3*	*1.8*	*2.0*	***0.7***
East and Central Europe	686	708	714	695	700	720	770	850	925	
% change yoy	*6.9*	*3.2*	*0.8*	*-2.7*	*0.7*	*2.9*	*6.9*	*10.4*	*8.8*	***2.3***
CIS	1,454	1,458	1,469	1,449	1,370	1,375	1,425	1,475	1,525	
% change yoy	*7.0*	*0.3*	*0.8*	*-1.4*	*-5.5*	*0.4*	*3.6*	*3.5*	*3.4*	***0.6***
Japan	1,380	1,395	1,532	1,577	1,590	1,590	1,610	1,630	1,630	
% change yoy	*-3.5*	*1.1*	*9.8*	*2.9*	*0.8*	*0.0*	*1.3*	*1.2*	*0.0*	***1.5***
China / Mongolia	2,199	2,600	3,080	3,490	3,839	4,031	4,313	4,572	4,846	
% change yoy	*19.8*	*18.2*	*18.5*	*13.3*	*10.0*	*5.0*	*7.0*	*6.0*	*6.0*	***11.3***
Other Asia	1,578	1,842	2,036	2,189	2,190	2,190	2,250	2,300	2,450	
% change yoy	*1.5*	*16.7*	*10.5*	*7.5*	*0.0*	*0.0*	*2.7*	*2.2*	*6.5*	***4.7***
Australasia	504	461	430	443	485	500	520	550	580	
% change yoy	*3.1*	*-8.5*	*-6.7*	*3.0*	*9.5*	*3.1*	*4.0*	*5.8*	*5.5*	***0.8***
Africa	516	511	566	639	720	780	880	980	1,130	
% change yoy	*10.5*	*-1.0*	*10.8*	*12.9*	*12.7*	*8.3*	*12.8*	*11.4*	*15.3*	***8.2***
Total Potential Production	15,957	16,566	17,363	18,078	18,597	18,999	19,836	20,815	21,904	
% change yoy	*4.4*	*3.8*	*4.8*	*4.1*	*2.9*	*2.2*	*4.4*	*4.9*	*5.2*	***3.3***
less 3% disruption allowance	0	*0*	*0*	*0*	*-558*	*-570*	*-595*	*-624*	*-657*	
Total World Production	**15,957**	**16,566**	**17,363**	**18,078**	**18,039**	**18,429**	**19,241**	**20,190**	**21,247**	
	4.4%	*3.8%*	*4.8%*	*4.1%*	*-0.2%*	*2.2%*	*4.4%*	*4.9%*	*5.2%*	***2.9%***
World ex-China	**13,758**	**13,966**	**14,283**	**14,588**	**14,200**	**14,398**	**14,928**	**15,619**	**16,401**	
	2.3%	*1.5%*	*2.3%*	*2.1%*	*-2.7%*	*1.4%*	*3.7%*	*4.6%*	*5.0%*	***1.3%***
Consumption										
North America	3,118	2,979	2,737	2,689	2,528	2,442	2,496	2,532	2,543	
% change yoy	*9.4*	*-4.5*	*-8.1*	*-1.8*	*-6.0*	*-3.4*	*2.2*	*1.4*	*0.4*	***-2.5***
South and Central America	526	518	535	524	534	545	572	601	631	
% change yoy	*8.7*	*-1.5*	*3.3*	*-2.1*	*2.0*	*2.0*	*5.0*	*5.0*	*5.0*	***2.3***
Western Europe	3,797	3,565	3,923	3,661	3,441	3,321	3,421	3,489	3,559	
% change yoy	*2.2*	*-6.1*	*10.0*	*-6.7*	*-6.0*	*-3.5*	*3.0*	*2.0*	*2.0*	***-0.8***
East and Central Europe	377	410	451	483	507	507	533	559	587	
% change yoy	*6.9*	*8.8*	*10.0*	*7.1*	*5.0*	*0.0*	*5.0*	*5.0*	*5.0*	***5.7***
CIS	664	696	759	768	799	815	855	898	934	
% change yoy	*29.9*	*4.8*	*9.0*	*1.2*	*4.0*	*2.0*	*5.0*	*5.0*	*4.0*	***4.4***
Japan	1,279	1,256	1,307	1,268	1,204	1,162	1,185	1,197	1,197	
% change yoy	*6.4*	*-1.8*	*4.1*	*-3.0*	*-5.0*	*-3.5*	*2.0*	*1.0*	*0.0*	***-0.8***
China	3,565	3,815	3,967	4,675	5,026	5,327	5,860	6,329	6,835	
% change yoy	*18.0*	*7.0*	*4.0*	*17.8*	*7.5*	*6.0*	*10.0*	*8.0*	*8.0*	***8.5***
Other Asia	3,342	3,355	3,398	3,491	3,596	3,668	3,888	4,082	4,245	
% change yoy	*10.6*	*0.4*	*1.3*	*2.7*	*3.0*	*2.0*	*6.0*	*5.0*	*4.0*	***3.0***
Australasia	168	155	143	147	147	143	146	149	152	
% change yoy	*-8.8*	*-7.7*	*-7.7*	*2.5*	*0.0*	*-2.5*	*2.0*	*2.0*	*2.0*	***-1.3***
Africa	207	234	242	276	345	373	417	459	505	
% change yoy	*20.3*	*13.0*	*3.4*	*14.0*	*25.0*	*8.0*	*12.0*	*10.0*	*10.0*	***11.8***
Total World Demand	**17,043**	**16,983**	**17,462**	**17,981**	**18,127**	**18,302**	**19,373**	**20,295**	**21,188**	
	9.8%	*-0.4%*	*2.8%*	*3.0%*	*0.8%*	*1.0%*	*5.8%*	*4.8%*	*4.4%*	***2.8%***
World ex-China	**13,478**	**13,168**	**13,495**	**13,306**	**13,101**	**12,975**	**13,513**	**13,966**	**14,353**	
	7.9%	*-2.3%*	*2.5%*	*-1.4%*	*-1.5%*	*-1.0%*	*4.1%*	*3.4%*	*2.8%*	***1.0%***
Surplus/(deficit)	**-1086**	**-417**	**-99**	**97**	**-88**	**127**	**-132**	**-104**	**59**	
Total Reported Stocks	469	468	560	547	459	586	454	350	409	
Stocks-consumption ratio (weeks)	**1.4**	**1.4**	**1.7**	**1.6**	**1.3**	**1.7**	**1.2**	**0.9**	**1.0**	

Source: CRU, Brook Hunt,, Morgan Stanley Research, e = Morgan Stanley Research estimates

ALUMINIUM

Price Forecast Cut Sharply for 2009

- Price forecast for 2009 downgraded by 21% to US$0.95/lb, about 10% above the average smelting cost.

- Chinese demand growth has slowed very sharply, from 35-40% in 2007 to just 8.2% for the first eight months of this year (adjusted for inventory movements), and just 1.8% year-on-year in August. Antaike forecast Chinese demand growth of about 9% in 2009, based on a GDP factor of about 1.2 times in a downturn, which is based on a strong recovery in 2H'09.

- Price forecast for 2011 reflects expected 133kt market deficit, rising to a 365kt shortfall for 2012, based on our numbers.

New Aluminium Price Profile

US$/lb	New	Old	Chg (%)
2008e	1.18	1.23	-4%
2009e	0.95	1.20	-21%
2010e	1.20	1.30	-8%
2011e	1.40	1.40	0%
2012e	1.50	1.25	20%
2013e	1.40	1.20	17%
2014e	1.25	1.15	9%
LT	**1.15**	**1.15**	**0%**

Source: Morgan Stanley Research estimates

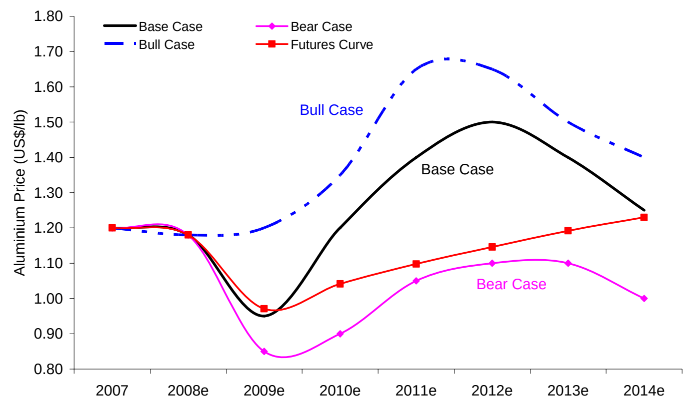
Key Cost Data Points

- Current marginal cost of Western smelter production after adjusting for lower alumina prices and declining power prices (where linked to LME prices) estimated at $1.10-1.15/lb (Source: Brook Hunt and CRU).

- Current average cost of Western smelter production after adjusting for falling alumina and power costs estimated at $0.85-0.88/lb (Source: Brook Hunt and CRU).

- Antaike has estimated the average cost of production in China at RMB 15,100/t ($1.00/lb), while Chalco estimated RMB14,300/t ($0.95/lb). Antaike suggested that marginal costs in China may be as high as RMB18,000-19,000/t ($1.20-1.26/lb).

Base, Bear and Bull Case Profiles vs Futures Curve



Source: CRU, Brook Hunt, Morgan Stanley Research estimates

Production Cutbacks or Deferrals/Cancellations

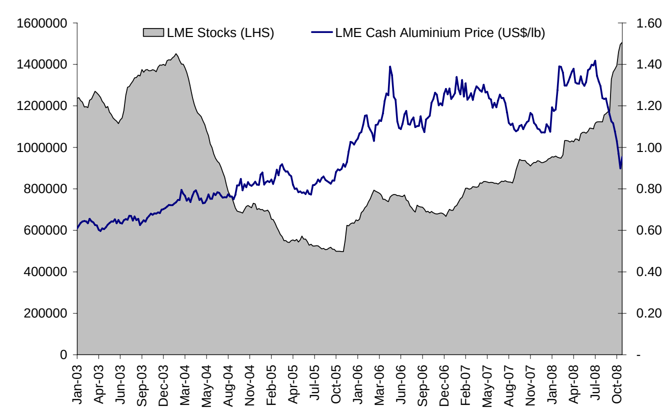
- Aluminium production has already been cut in China, with CBI reporting that last week 2.2Mt of capacity was shut-in with a further 700kt-1Mt of potential cuts to come. This compares with production in 2007 of 12.3Mt and total capacity of close to 15Mt, based on our numbers.

- However, recent news reports from China suggest that the aluminium industry is lobbying the government to reverse the current 15% export tax and reintroduce a 15% tax rebate instead. If the government was to 'bail-out' the industry in the short term it would be very negative for prices, in our view.

- Alcoa announced the closure of the three remaining potlines (150ktpa) at its Rockdale smelter, due to high cost power supplies and overall market conditions.

- Vale announced that its Valesul smelter would operate at 40% of its 95kt capacity, effectively a 55kt cut.

LME Stocks Have Risen Sharply in past Six Months



Source: DataStream, Morgan Stanley Research

Exhibit 17

Global Aluminum Supply/Demand Balance, 2006-2012e

'000 t (%)	2006	2007	2008e	2009e	2010e	2011e	2012e	CAGR
Production								
North America	5,333	5,643	5,675	5,525	5,525	5,525	5,525	0.6
	-0.9%	*5.8*	*0.6*	*-2.6*	*0.0*	*0.0*	*0.0*	
Latin America	2,493	2,559	2,600	2,600	2,800	3,100	3,250	4.5
	4.3%	*2.6*	*1.6*	*0.0*	*7.7*	*10.7*	*4.8*	
Western Europe	4,174	4,321	4,600	4,475	4,425	4,400	4,375	0.8
	-3.9%	*3.5*	*6.5*	*-2.7*	*-1.1*	*-0.6*	*-0.6*	
Eastern Europe	947	949	950	950	950	1,000	1,050	1.7
	-2.1%	*0.2*	*0.1*	*0.0*	*0.0*	*5.3*	*5.0*	
CIS	4,177	4,421	4,714	4,814	4,964	5,164	5,464	4.6
	2.5%	*5.8*	*6.6*	*2.1*	*3.1*	*4.0*	*5.8*	
China	9,349	12,588	13,658	14,614	16,614	19,114	21,814	15.2
	19.8%	*34.6*	*8.5*	*7.0*	*13.7*	*15.0*	*14.1*	
Asia (ex-China)	1,687	1,794	1,800	1,900	2,100	2,250	2,200	4.5
	10.6%	*6.3*	*0.3*	*5.6*	*10.5*	*7.1*	*-2.2*	
Middle East	1,643	1,743	1,908	2,160	2,820	3,420	4,020	16.1
	11.5%	*6.1*	*9.5*	*13.2*	*30.6*	*21.3*	*17.5*	
Australasia	2,274	2,317	2,300	2,300	2,300	2,300	2,450	1.3
	1.0%	*1.9*	*-0.7*	*0.0*	*0.0*	*0.0*	*6.5*	
Africa	1,865	1,815	1,700	1,700	1,750	1,850	1,950	0.7
	6.4%	*-2.7*	*-6.3*	*0.0*	*2.9*	*5.7*	*5.4*	*-2.7*
Total World Production	33,942	38,150	39,905	40,838	44,130	48,206	52,192	7.4
	6.2%	*12.4*	*4.6*	*2.3*	*8.1*	*9.2*	*8.3*	
World ex-China	24,593	25,562	26,247	26,224	27,516	29,092	30,378	3.6
	1.8%	*3.9*	*2.7*	*-0.1*	*4.9*	*5.7*	*4.4*	
Consumption								
North America	7,195	6,662	6,196	6,027	6,458	6,809	7,139	-0.1
	0.5%	*-7.4*	*-7.0*	*-2.7*	*7.1*	*5.4*	*4.8*	
of which US	6,172	5,746	5,296	5,137	5,496	5,771	6,060	-0.3
	-0.4%	*-6.9*	*-7.8*	*-3.0*	*7.0*	*5.0*	*5.0*	
N America ex-US	1,023	916	900	890	961	1,038	1,080	0.9
	6.5%	*-10.5*	*-1.7*	*-1.1*	*8.0*	*8.0*	*4.0*	
South & Central America	1,245	1,286	1,400	1,500	1,600	1,700	1,850	6.8
	5.1%	*3.3*	*8.9*	*7.1*	*6.7*	*6.3*	*8.8*	
Europe	7,887	8,221	7,925	7,706	8,108	8,347	9,100	2.4
	4.2%	*4.2*	*-3.6*	*-2.8*	*5.2*	*3.0*	*9.0*	
of which Western Europe	6,992	7,245	6,900	6,650	6,983	7,122	7,265	0.6
	4.4%	*3.6*	*-4.8*	*-3.6*	*5.0*	*2.0*	*2.0*	
of which Eastern Europe	895	976	1,025	1,056	1,125	1,225	1,250	5.7
	2.5%	*9.1*	*5.0*	*3.0*	*6.6*	*8.9*	*2.0*	
CIS	916	1,015	1,066	1,098	1,153	1,233	1,320	6.3
	9.0%	*10.8*	*5.0*	*3.0*	*5.0*	*7.0*	*7.0*	
Asia	16,267	19,938	21,220	22,475	25,790	29,237	32,100	12.0
	13.6%	*22.6*	*6.4*	*5.9*	*14.7*	*13.4*	*9.8*	
of which China	8,790	12,300	13,407	14,547	17,456	20,511	23,075	17.5
	22.7%	*39.9*	*9.0*	*8.5*	*20.0*	*17.5*	*12.5*	
of which Japan	2,479	2,414	2,380	2,332	2,402	2,498	2,548	0.5
	2.9%	*-2.6*	*-1.4*	*-2.0*	*3.0*	*4.0*	*2.0*	
Asia ex-Jap/China	4,998	5,224	5,433	5,596	5,932	6,228	6,477	4.4
	5.2%	*4.5*	*4.0*	*3.0*	*6.0*	*5.0*	*4.0*	
Australasia	354	386	400	400	420	441	463	4.6
	-1.1%	*9.0*	*3.6*	*0.0*	*5.0*	*5.0*	*5.0*	
Africa	472	502	522	535	557	570	585	3.6
	15.1%	*6.4*	*4.0*	*2.5*	*4.0*	*2.5*	*2.5*	
Total World Demand	34,336	38,010	38,728	39,740	44,084	48,339	52,557	7.4
	7.8%	*10.7*	*1.9*	*2.6*	*10.9*	*9.7*	*8.7*	
World ex-China	25,546	25,710	25,321	25,194	26,628	27,828	29,483	2.4
	3.5%	*0.6*	*-1.5*	*-0.5*	*5.7*	*4.5*	*5.9*	
Surplus/(deficit) ex China	-953	-148	926	1,030	888	1,264	896	
Surplus/(deficit)	**-394**	**140**	**1,177**	**1,098**	**46**	**-133**	**-365**	

Source: CRU, Brook Hunt, Morgan Stanley Research, e = Morgan Stanley Research estimates

NICKEL

Nickel Market in Substantial Surplus

- Price forecast for 2009 downgraded by 35% to US$5.50/lb, as we now expect market surpluses of 45kt and 54kt for 2008 and 2009 respectively.
- This is despite CRU's estimate of 135kt of refined production losses/cuts in 2008 (10% of global primary production), and Vale's announcement of a delayed start-up for the tier 1 Goro and Onca Puma projects, which combined are set to add 120kt of new capacity.
- Incentive prices for the complex HPAL nickel laterite projects are also at about US$8/lb, on our estimates, so we believe prices need to rally sharply to prevent further delays or postponements of new projects.

Key Cost Data Points

- Current marginal cost of Western production after adjusting for lower diesel and acid prices is estimated at $6.00-6.50/lb (Source: Brook Hunt and CRU).
- Current average cost of Western production after adjustments is estimated at $3.50-4.00/lb (Source: Brook Hunt and CRU).
- Marginal cost for EAF nickel pig iron production in China is estimated at about $8/lb, and BOF nickel pig iron is estimated at about US$10-12/lb (Source: CRU, Xstrata). Nickel pig iron prices have fallen 50% in the past month and Reuters reported this week that 95% of producers have now closed (about 90kt capacity).

Outlook Dependent on Stainless Restocking

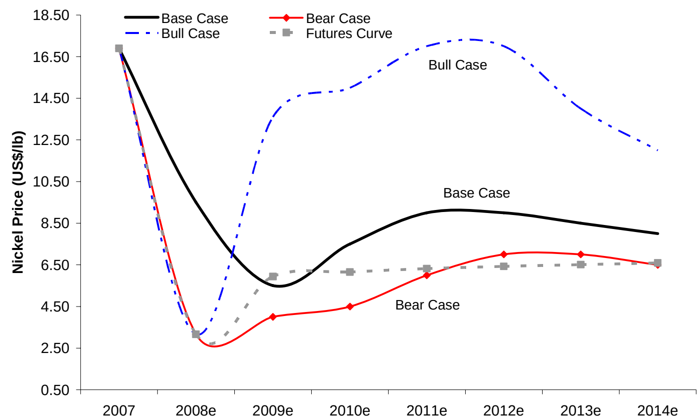
- The outlook for nickel is largely dependent on the timing of the restocking cycle in stainless steel. Stainless inventories are at 10-20 year lows and the destocking cycle is already longer than usual at 15-18 months; we anticipate that the restocking cycle should start within the next 6-9 months, which should drive prices substantially higher.
- The sharp fall in nickel prices should also boost the austenitic ratio, as the high-nickel content (austenitic) steels are now more attractive again relative to ferritic and duplex steels. Having fallen to just above 50% last year from the long-term average of 70-75%, we believe the austenitic ratio should recover back to at least the 70% level in 2H'08.

Nickel Price Profile Significantly Flattened

US$/lb	New	Old	Chg (%)
2008e	9.50	10.15	-6%
2009e	5.50	8.50	-35%
2010e	7.50	9.00	-17%
2011e	9.00	8.00	13%
2012e	9.00	7.50	20%
2013e	8.50	8.00	0%
2014e	8.00	8.00	0%
LT	**8.00**	**8.00**	**0%**

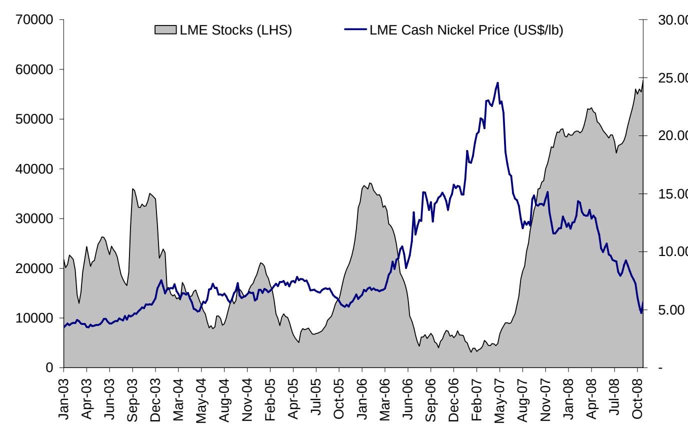
Source: Morgan Stanley Research estimates

Base, Bear and Bull Case Profiles vs Futures Curve



Source: CRU, Brook Hunt, Morgan Stanley Research estimates

LME Stocks at Highest Level for 10 Years



Source: DataStream, Morgan Stanley Research

Exhibit 18

Global Nickel Supply/Demand Balance, 2005-2012e

'000 t (%)	2005	2006e	2007e	2008e	2009e	2010e	2011e	2012e	CAGR
Production									
North America	179	210	218	222	230	254	262	275	
	4.3%	*17.8*	*3.8*	*1.5*	*3.8*	*10.4*	*3.1*	*5.1*	*4.7*
Latin America	203	197	202	188	197	258	309	349	
	2.0%	*-3.0*	*2.6*	*-7.2*	*5.1*	*30.9*	*19.6*	*13.0*	*11.5*
Europe	24	25	33	42	54	69	80	81	
	3.3%	*4.0*	*33.6*	*24.7*	*28.9*	*28.3*	*16.9*	*1.1*	*19.5*
Russia	265	269	266	263	275	285	293	296	
	0.7%	*1.5*	*-1.4*	*-0.8*	*4.4*	*3.5*	*2.8*	*1.1*	*2.2*
Other East	20	28	30	32	31	31	29	29	
	36.3%	*40.6*	*6.0*	*4.9*	*-1.7*	*-1.2*	*-5.2*	*1.1*	*-0.5*
China	56	59	62	63	64	67	68	69	
	-8.3%	*6.8*	*4.8*	*1.9*	*1.5*	*4.2*	*1.1*	*1.1*	*2.0*
Indonesia	133	149	178	175	171	166	172	184	
	-0.6%	*12.0*	*19.7*	*-2.1*	*-2.3*	*-2.5*	*3.3*	*6.8*	*0.6*
Philippines	27	60	89	73	67	61	41	36	
	62.9%	*123.4*	*48.8*	*-18.2*	*-8.4*	*-8.8*	*-31.8*	*-12.2*	*-16.4*
Africa	70	70	67	72	73	81	87	102	
	4.6%	*0.1*	*-4.8*	*7.5*	*1.7*	*11.9*	*7.1*	*17.1*	*8.9*
Australia	174	160	167	204	237	261	249	244	
	-10.6%	*-7.8*	*4.0*	*22.1*	*16.5*	*10.2*	*-4.6*	*-2.2*	*7.9*
New Caledonia	104	93	119	108	115	125	152	169	
	-5.6%	*-10.7*	*28.1*	*-9.0*	*5.9*	*9.5*	*21.1*	*11.1*	*7.3*
Total Potential Prod'n	**1,254**	**1,314**	**1,403**	**1,411**	**1,450**	**1,582**	**1,664**	**1,753**	
less disrupt'n allowance	0	-7	-28	-29	-65	-80	-82	-85	
Total Finished Prod'n	**1,254**	**1,314**	**1,403**	**1,411**	**1,450**	**1,582**	**1,664**	**1,753**	
	0.0%	***4.8***	***6.7***	***0.6***	***2.8***	***9.1***	***5.1***	***5.3***	***4.6***
Consumption									
USA	139	146	143	140	135	145	150	155	
	-0.2%	*5.2*	*-2.3*	*-2.1*	*-3.6*	*7.4*	*3.4*	*3.3*	*1.6*
Other America	37	38	36	37	43	45	42	43	
	-0.2%	*2.7*	*-4.9*	*2.7*	*16.2*	*4.7*	*-6.7*	*2.4*	*3.6*
Europe	416	457	404	408	405	440	470	485	
	-3.3%	*9.8*	*-11.6*	*1.0*	*-0.7*	*8.6*	*6.8*	*3.2*	*3.7*
CIS	31	33	34	35	38	40	43	45	
	1.6%	*6.9*	*5.3*	*1.6*	*8.6*	*4.2*	*8.6*	*4.7*	*5.5*
China	190	260	331	368	400	480	545	580	
	21.9%	*36.8*	*27.4*	*11.1*	*8.7*	*20.0*	*13.5*	*6.4*	*11.9*
Japan	164	176	164	157	155	161	165	167	
	-9.4%	*7.1*	*-6.7*	*-4.4*	*-1.3*	*3.9*	*2.5*	*1.2*	*0.3*
Other Asia	227	237	188	182	180	210	227	235	
	-3.4%	*4.5*	*-20.6*	*-3.2*	*-1.1*	*16.7*	*8.1*	*3.5*	*4.6*
Australasia	32	42	34	36	37	50	43	45	
	-29.7%	*31.3*	*-18.6*	*5.1*	*2.8*	*35.7*	*-14.5*	*4.9*	*5.6*
Africa	32	3	3	3	3	3	3	3	
	-29.7%	*-90.9*	*-6.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Total World Demand	**1,239**	**1,392**	**1,338**	**1,366**	**1,396**	**1,574**	**1,688**	**1,758**	
	-1.4%	**12.4**	**-3.9**	**2.1**	**2.2**	**12.7**	**7.3**	**4.2**	**5.6**
Surplus/(deficit)	**15**	**-77**	**65**	**45**	**54**	**9**	**-24**	**-5**	

Source: CRU, Brook Hunt, e = Morgan Stanley Research estimates

ZINC

Spot Prices Now Trading Below Average Costs

- Price forecast for 2009 downgraded by 24% to US$0.65/lb, as we now expect market surpluses of 294kt and 236kt in 2008 and 2009 respectively. However, we now expect market deficits of 89kt in 2010 and 166kt in 2011, reducing stocks back to 3.0 weeks' consumption by year-end 2011, hence our forecast of prices averaging US$1.25/lb in both 2011 and 2012.
- There have been a number of mine production cuts announced in 3Q, totaling about 200-250kt of annual output. CRU estimate that a cumulative 1.8Mt of zinc mine supply is set to be removed in the 2009-13 period (total annual mine production is currently about 12Mt).

Key Cost Data Points

- Current marginal cost of Western production after adjusting for lower diesel and acid prices, but also lower by-product credits from lead and silver, is estimated at $0.80-0.85/lb (Source: Brook Hunt and CRU).
- Current average cost of Western production after adjustments is estimated at $0.55-0.60/lb (Source: Brook Hunt and CRU).
- Current average cost of Chinese smelter production is about $0.75-0.80/lb, while marginal cost is approximately $0.95-1.00/lb (Source: Antaike, CBI China).

Chinese Concentrate Import Requirement Much Higher than Expected

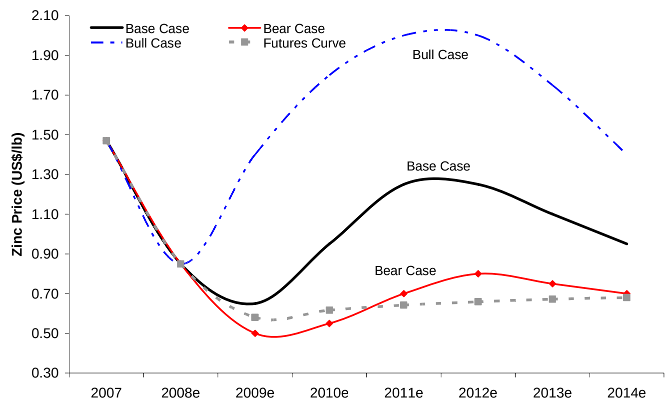
- Based on a poll by CBI China (of 33 smelters representing the majority of domestic capacity), one-third of Chinese zinc smelters have very low concentrate stocks. One smelter has shut and further closures are expected. The same poll by CBI on the outlook for prices gave the following results: 85% of smelters thought the price would continue to fall (although it has rallied 20% since the poll!), 15% were unclear but thought prices would be flat at best, and 0% thought prices would rise.
- The key data from our meeting with CBI was China's very large increase in zinc concentrate import requirements (+250% in 2007, see chart opposite). As zinc mines are closed in exporting countries (particularly Australia and Canada) the concentrate market will quickly go into deficit once demand recovers, and hence the Chinese will need to import refined zinc instead. This would be very positive for prices, in our view.

Zinc Price Profile Now Significantly "V-Shaped"

US$/lb	New	Old	Chg (%)
2008e	0.85	0.90	-5%
2009e	0.65	0.85	-24%
2010e	0.95	1.00	-5%
2011e	1.25	1.05	19%
2012e	1.25	1.00	25%
2013e	1.10	0.90	22%
2014e	0.95	0.80	19%
LT	**0.80**	**0.80**	**0%**

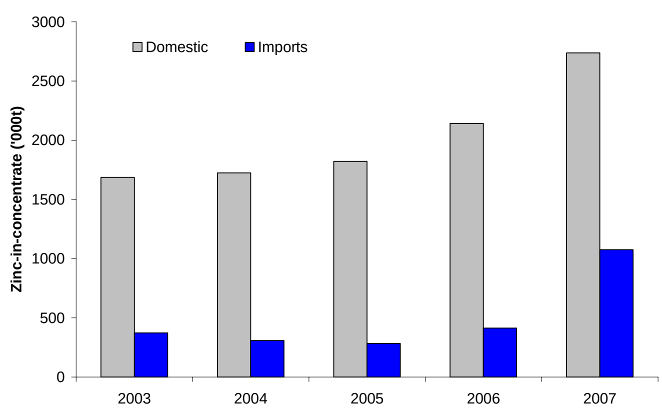
Source: Morgan Stanley Research estimates

Base, Bear and Bull Case Profiles vs Futures Curve



Source: CRU, Brook Hunt, Morgan Stanley Research estimates

Chinese Domestic Production vs Imports of Zinc-in-Concentrates



Source: CBI China, Antaike, Morgan Stanley Research

Exhibit 19

Global Zinc Supply/Demand Balance, 2005-2011e

(kt)	2005	2006	2007	2008e	2009e	2010e	2011e
Production							
N America	1,411	1,380	1,397	1,431	1,434	1,446	1,457
% change yoy	*-5.9*	*-2.2*	*1.2*	*2.4*	*0.2*	*0.8*	*0.8*
S&C America	472	490	474	505	573	652	703
% change yoy	*-4.8*	*3.8*	*-3.4*	*6.7*	*13.4*	*13.8*	*7.8*
Australia	457	463	498	508	500	510	512
% change yoy	*-3.5*	*1.3*	*7.6*	*2.0*	*-1.5*	*1.9*	*0.5*
W Europe	2,047	1,953	1,938	1,956	1,898	1,886	1,865
% change yoy	*-5.8*	*-4.6*	*-0.8*	*0.9*	*-3.0*	*-0.6*	*-1.1*
NC Asia	1,754	1,851	1,929	2,120	2,147	2,242	2,381
% change yoy	*1.2*	*5.5*	*4.2*	*9.9*	*1.3*	*4.4*	*6.2*
Africa	268	254	286	280	280	280	280
% change yoy	*5.2*	*-5.2*	*12.6*	*-2.1*	*0.0*	*0.0*	*0.0*
W World	6,409	6,391	6,522	6,799	6,832	7,016	7,198
% change yoy	*-3.3*	*-0.3*	*2.0*	*4.3*	*0.5*	*2.7*	*2.6*
C&E Europe	279	226	301	326	327	350	380
% change yoy	*-10.3*	*-19.0*	*33.2*	*8.4*	*0.4*	*7.0*	*8.4*
CIS	598	653	685	708	696	743	849
% change yoy	*1.7*	*9.2*	*4.9*	*3.4*	*-1.8*	*6.7*	*14.3*
China	2,875	3,295	3,713	3,900	4,000	4,100	4,250
% change yoy	*7.9*	*14.6*	*12.7*	*5.0*	*2.6*	*2.5*	*3.7*
North Korea	44	40	45	50	50	50	50
% change yoy	*0.0*	*-9.1*	*12.5*	*11.1*	*0.0*	*0.0*	*0.0*
Total Former E. Bloc	3,796	4,226	4,744	4,985	5,073	5,243	5,529
% change yoy	*5.2*	*11.3*	*12.3*	*5.1*	*1.8*	*3.3*	*5.5*
Total World Production	**10,205**	**10,617**	**11,266**	**11,784**	**11,906**	**12,259**	**12,727**
% change yoy	*-0.3*	*4.0*	*6.1*	*4.6*	*1.0*	*3.0*	*3.8*
World ex-China	**7,330**	**7,322**	**7,553**	**7,884**	**7,906**	**8,159**	**8,477**
% change yoy	*-3.2*	*-0.1*	*3.2*	*4.4*	*0.3*	*3.2*	*3.9*
Consumption							
NC Asia	2,777	2,776	2,690	2,735	2,754	2,877	2,965
% change yoy	*1.2*	*0.0*	*-3.1*	*1.7*	*0.7*	*4.5*	*3.1*
China	2,900	3,300	3,575	3,861	4,093	4,502	4,862
% change yoy	*17.2*	*13.8*	*8.3*	*8.0*	*6.0*	*10.0*	*8.0*
Other	50	54	93	100	106	116	124
% change yoy	*0.0*	*8.0*	*72.2*	*8.0*	*6.0*	*9.0*	*7.0*
W Europe	2,233	2,261	2,281	2,223	2,157	2,222	2,271
% change yoy	*-2.4*	*1.2*	*0.9*	*-2.5*	*-3.0*	*3.0*	*2.2*
C&E Europe	213	200	246	248	253	258	261
% change yoy	*1.9*	*-6.1*	*23.0*	*1.0*	*2.0*	*2.0*	*1.0*
N America	1,525	1,495	1,430	1,342	1,308	1,356	1,374
% change yoy	*-8.4*	*-2.0*	*-4.3*	*-6.2*	*-2.5*	*3.7*	*1.3*
S&C America	442	445	450	457	470	481	492
% change yoy	*0.7*	*0.7*	*1.1*	*1.6*	*2.8*	*2.3*	*2.3*
CIS	285	294	303	308	313	318	323
% change yoy	*1.1*	*3.2*	*3.2*	*1.5*	*1.7*	*1.5*	*1.5*
Africa	188	202	209	212	214	217	219
% change yoy	*0.0*	*7.4*	*3.5*	*1.6*	*1.0*	*1.0*	*1.0*
W World	7,165	7,179	7,060	6,970	6,902	7,152	7,321
% change yoy	*-2.2*	*0.2*	*-1.7*	*-1.3*	*-1.0*	*3.6*	*2.4*
Former E. Bloc ‡	3,450	3,850	4,219	4,520	4,768	5,196	5,572
% change yoy	*14.3*	*11.6*	*9.6*	*7.1*	*5.5*	*9.0*	*7.2*
Total World Demand	**10,615**	**11,029**	**11,279**	**11,490**	**11,670**	**12,348**	**12,893**
% change yoy	*2.6*	*3.9*	*2.3*	*1.9*	*1.6*	*5.8*	*4.4*
World ex-China	**7,715**	**7,729**	**7,704**	**7,629**	**7,577**	**7,846**	**8,030**
% change yoy	*-1.9*	*0.2*	*-0.3*	*-1.0*	*-0.7*	*3.5*	*2.4*
US Stockpile Sales	30	40	8	0	0	0	0
World Balance	**(380)**	**(372)**	**(5)**	**294**	**236**	**(89)**	**(166)**
Western world stocks	810	473	468	762	997	908	742
Weeks of consumption	4.0	2.2	2.2	3.4	4.4	3.8	3.0

Source: CRU, Morgan Stanley Research, e = Morgan Stanley Research estimates

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(as of October 31, 2008)

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	Coverage Universe		Investment Banking Clients (IBC)		
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category
Overweight/Buy	**869**	**39%**	**275**	**42%**	**32%**
Equal-weight/Hold	**983**	**44%**	**286**	**44%**	**28%**
Underweight/Sell	**403**	**18%**	**89**	**14%**	**22%**
Total	**2,255**		**650**		

Data include common stock and ADRs currently assigned ratings. An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations. Investment Banking Clients are companies from whom Morgan Stanley or an affiliate received investment banking compensation in the last 12 months.

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Overweight (O). The stock's total return is expected to exceed the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.
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Industry Coverage:Metals & Mining

Company (Ticker)	Rating (as of)	Price (11/04/2008)
Wiktor Bielski		
Anglo Platinum Limited (AMSJ.J)	E (02/01/2008)	ZAc44,490
BHP Billiton (BLT.L)	++	1,158p
Implats Limited (IMPJ.J)	++	ZAc10,900
Norilsk Nickel (GMKN.RTS)	O (03/08/2006)	US$97.5
Rio Tinto Plc (RIO.L)	++	3,135p
Dmitriy Kolomytsyn, CFA		
Raspadskaya (RASP.RTS)	O (09/08/2008)	US$2.1
Ephrem Ravi		
Anglo American (AAL.L)	E (10/16/2007)	1,667p
Antofagasta (ANTO.L)	U (10/16/2007)	416p
Aquarius Platinum Limited (AQP.L)	E (06/09/2008)	158p
Kazakhmys (KAZ.L)	O (03/06/2007)	397p
Lonmin Plc (LMI.L)	U (06/09/2008)	1,273p
Vedanta (VED.L)	O (06/09/2008)	1,000p
Xstrata PLC (XTA.L)	O (02/13/2008)	1,304p

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