Company In-Depth

16 January 2007 | 44 pages

Hindalco Industries (HALC.BO)

Initiating at Sell: Price Downturn Looms

- **Target price at Rs174** — Given that aluminum prices are falling and copper TC/RC margins are tumbling, we expect a 24% drop in Hindalco's FY08 EPS and a 600bp fall in ROE. The stock does not appear cheap versus global and Indian majors. Our target price is based on a sum-of-the-parts approach of 8x FY08E P/E (Rs162) and the value of Hindalco's investment in associates.

- **Aluminum prices to soften in FY08E** — The aluminum division will benefit from buoyant international prices in FY07, with prices up 28% yoy (US$2,598/t). However, we expect a surplus in 2007 and a price decline of 12% yoy in FY08. This, along with an appreciating rupee, would lower the EBIT margin in FY08.

- **Difficult times ahead for copper smelters** — Treatment and refining charges (TC/RCs) perked up in FY07 and are expected to average US27c/lb, versus US18c/lb in FY06. But based on a shortage of concentrate, we expect copper TC/RCs to fall to US15c/lb in FY08 and FY09. A forecast 42% jump in volumes will only partially stem the EBIT decline.

- **Strong correlation with LME aluminum prices** — Despite having two key products, Hindalco's share price has a strong correlation with spot aluminum prices on the LME. Since FY04, copper has contributed 45-60% of sales but less than 26% of EBIT. Even though the stock has underperformed the Sensex by 36% over the past 12 months, we do not see any upside price triggers.

- **Key upside risks** — (1) Commodity prices and TC/RC margins surpassing our forecasts; (2) depreciation of the rupee versus our forecast of an appreciation; and (3) acquisition of copper mines at reasonable valuations.

See page 41 for Analyst Certification and important disclosures.

Sell/Medium Risk	3M
Price (16 Jan 07)	Rs169.95
Target price	Rs174.00
Expected share price return	2.4%
Expected dividend yield	1.8%
Expected total return	**4.1%**
Market Cap	Rs197,018M
	US$4,456M

Price Performance (RIC: HALC.BO, BB: HNDL IN)

Figure 1. Statistical Abstract (Standalone)

Year to 31 Mar	Net Profit (Rs M)	EPS (Rs)	EPS growth (%)	P/E (x)	EPS cons (Rs)	P/E cons (x)	EV/EBITDA (x)	ROE (%)
FY05A	13,294	14.4	59	7.9	13.8	8.2	4.4	17
FY06A	16,556	17.7	23	7.4	16.9	7.8	4.7	17
FY07E	24,099	24.0	35	7.1	25.8	6.6	4.0	18
FY08E	19,557	18.2	-24	9.4	20.2	8.5	5.0	12
FY09E	19,541	16.9	-8	10.1	18.8	9.1	5.8	11

Note: EPS calculated on average shares outstanding, adjusted for call monies received in FY06 rights issue.

Source: Company Reports, DataStream and Citigroup Investment Research estimates

Pradeep Mahtani[1**]
+91-22-6631-9882
pradeep.mahtani@citigroup.com

Raashi Chopra[1**]
raashi.chopra@citigroup.com

Fiscal year end 31-Mar	2005	2006	2007E	2008E	2009E
Valuation Ratios					
P/E adjusted (x)	11.9	9.8	8.2	10.1	10.1
EV/EBITDA adjusted (x)	7.7	7.2	4.8	5.4	5.5
P/BV (x)	2.1	1.7	1.3	1.2	1.1
Dividend yield (%)	1.2	1.3	1.8	1.5	1.5
Per Share Data (Rs)					
EPS adjusted	14.33	17.30	20.79	16.87	16.86
EPS reported	14.33	17.30	20.79	16.87	16.86
BVPS	82.63	97.46	126.18	138.30	152.30
DPS	2.00	2.20	3.00	2.50	2.50
Profit & Loss (RsM)					
Net sales	95,233	113,965	178,729	202,971	186,085
Operating expenses	-74,400	-90,642	-143,189	-173,663	-156,799
EBIT	**20,832**	**23,323**	**35,540**	**29,308**	**29,286**
Net interest expense	-1,700	-2,252	-2,300	-2,700	-2,700
Non-operating/exceptionals	0	0	0	0	0
Pre-tax profit	**19,133**	**21,071**	**33,240**	**26,608**	**26,586**
Tax	-5,748	-4,501	-9,141	-7,051	-7,045
Extraord./Min.Int./Pref.div.	-91	-14	0	0	0
Reported net income	**13,294**	**16,556**	**24,099**	**19,557**	**19,541**
Adjusted earnings	13,294	16,556	24,099	19,557	19,541
Adjusted EBITDA	25,465	28,490	41,733	35,269	35,647
Growth Rates (%)					
Sales	53.4	19.7	56.8	13.6	-8.3
EBIT adjusted	46.4	12.0	52.4	-17.5	-0.1
EBITDA adjusted	46.3	11.9	46.5	-15.5	1.1
EPS adjusted	57.9	20.8	20.1	-18.8	-0.1
Cash Flow (RsM)					
Operating cash flow	**17,609**	**7,101**	**28,833**	**25,808**	**27,070**
Depreciation/amortization	4,633	5,167	6,193	5,962	6,361
Net working capital	-6,258	-17,434	-3,479	2,386	744
Investing cash flow	**-19,840**	**-13,519**	**-22,604**	**-31,758**	**-36,853**
Capital expenditure	-11,205	-11,554	-25,086	-34,130	-39,154
Acquisitions/disposals	-24,744	-4,109	-500	-500	-500
Financing cash flow	**3,961**	**11,582**	**5,176**	**1,018**	**-756**
Borrowings	12,354	11,034	-5,000	-5,000	5,000
Dividends paid	-1,725	-2,116	-2,472	-3,437	-3,057
Change in cash	**1,731**	**5,163**	**11,405**	**-4,932**	**-10,539**
Balance Sheet (RsM)					
Total assets	**151,145**	**188,958**	**230,636**	**257,129**	**274,226**
Cash & cash equivalent	4,010	9,173	20,577	15,646	5,107
Accounts receivable	7,874	12,484	17,786	18,203	16,651
Net fixed assets	69,265	76,157	95,050	123,219	156,012
Total liabilities	**74,479**	**92,895**	**98,963**	**96,800**	**97,661**
Accounts payable	14,574	19,745	27,017	31,859	26,745
Total Debt	38,000	49,034	44,034	39,034	44,034
Shareholders' funds	**76,666**	**96,063**	**131,673**	**160,328**	**176,565**
Profitability/Solvency Ratios (%)					
EBITDA margin adjusted	26.7	25.0	23.4	17.4	19.2
ROE adjusted	18.3	19.2	21.2	13.4	11.6
ROIC adjusted	18.5	17.9	20.5	14.6	12.2
Net debt to equity	44.3	41.5	17.8	14.6	22.0
Total debt to capital	33.1	33.8	25.1	19.6	20.0

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Investment thesis

A diversified metals conglomerate

Hindalco has two main businesses. It is an integrated low-cost aluminum producer (58% of FY06 sales) with a strong domestic presence, especially in sheet products. It has ambitious expansion plans to quadruple its alumina and triple its aluminum capacity in 4-5 years. Its recently expanded copper smelter is ramping up utilization, which should allow volumes to grow 42% yoy in FY08 and reduce average costs. The copper division also benefits from some in-house availability of copper concentrate from its mines in Australia.

Both aluminum and copper have a robust outlook for FY07E. However, the trend changes in FY08E, when we expect a downturn for both metals. In aluminum we expect a 12% yoy decline in prices, to US$2,287/t, based on our international price forecasts. In copper, TC/RC margin is expected to average US15c/lb in FY08, versus around US27c/lb in FY07. A combination of both these is expected to result in a 22% yoy decline in consolidated earnings in FY08. In the past the stock has displayed a strong correlation with aluminum price movements, and therefore the expected decline in international prices should adversely impact the stock. Additionally, the stock does not appear cheap against both its past trading range and international majors. The stock has largely traded between 7x and 9x over the past 5 years (after the acquisition of the copper division). Our target price of Rs174 is based on (1) a P/E of 8x FY08E (Rs162), the mid-point of this trading range, and (2) the discounted value of its holdings in associate companies. We initiate coverage with a Sell/Medium Risk (3M) rating on the stock.

Aluminum

Smelter expansion – volume growth and cost cutting

The key driver for the EBITDA growth in the aluminum division in FY07E is prices. There is also some benefit from a small increase in volumes and lower costs due to more modern aluminum smelting capacity being commissioned in Hirakud (from 65,000 tpa to 145,000 tpa in 2 stages by 4Q FY08), along with an increase in captive power capacity (from 168MW to 368MW). Its integrated operations (good quality bauxite, low-cost power), especially after the modernization process is complete, will keep it well within the lowest cost quartile globally.

Alumina – prices have come off

Alumina spot prices have come off from a high of US$628/t in March to US$200-220/t

In addition to aluminum, Hindalco also sells its surplus alumina (the intermediate product in the process of manufacturing aluminum). The expansion at its Muri plant (West Bengal) from 110,000 tpa to 450,000 tpa (taking overall alumina capacity to 1.5mn tpa) is likely to be completed in 1Q FY08. Although alumina production volumes are expected to be flat in FY07, we expect 17% yoy growth in FY08. However, pricing is not expected to work in Hindalco's favor as alumina spot prices have come off from a high of US$628/t in March to US$200-220/t. In our forecasts we have assumed that average standard alumina prices would be US$482/t, US$216/t and US$240/t in FY07, FY08 and FY09, respectively. However, average prices would be higher for Hindalco as it also sells around 150,000 tonnes of special alumina at higher realizations.

Value-added products is a focus area

Hindalco's value-added capacity to rise to 64% of primary metal capacity

Hindalco is a leader in the domestic market with a market share of about 33% for primary aluminum, 60-65% for sheet/foil products and 20% in the fragmented extruded product market. The focus on increasing the revenue share from value-added products continues. The acquisition of 30,000 tpa of rolled capacity and 14,400 tpa of conductor rod capacity from Pennar Aluminium based in Mouda near Nagpur (in Maharashtra) in 4Q FY06 takes the effective rolled capacity to 200,000 tpa. This acquisition takes Hindalco's value-added capacity to 64% of primary metal capacity.

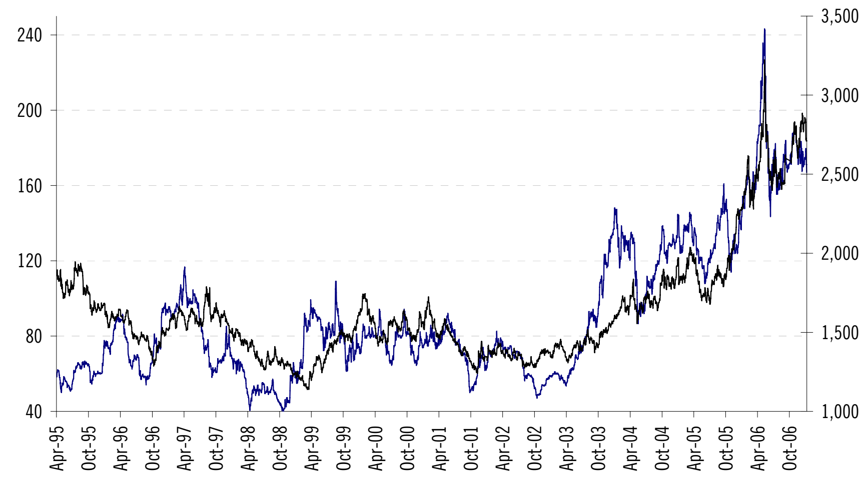
Domestic prices follow international trends

We estimate that aluminum prices will come off in FY08 to an average of US$2,287/t

Domestic producers have tended to price primary aluminum prices based on the landed cost of imported aluminum. After hitting a multi-year high of US$3,187/t in May 2006, primary aluminum prices on the LME have largely ranged between US$2,400/t and US$2,800/t. We expect FY07 to be a good year for aluminum, and forecast an average price of US$2,598/t in FY07. However, we estimate that prices will come off in FY08 to an average of US$2,287/t. We also forecast that the rupee will appreciate versus the US dollar (from Rs45.3/US$1 in FY07E to Rs43.2/US$1 in FY08E). Based on the above outlook, we expect a decline in the EBIT margin for aluminum in FY08.

Strong correlation with LME aluminum prices

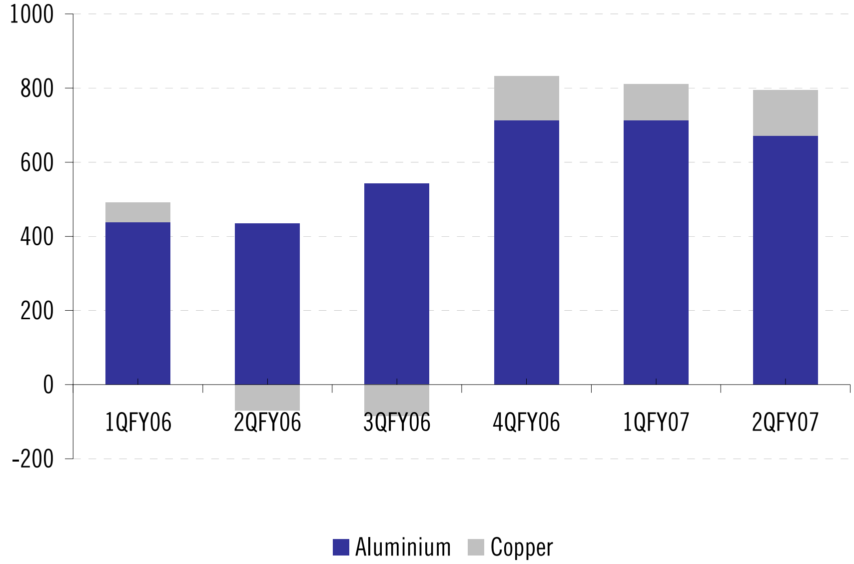
Figure 2. Hindalco Stock Price (Rs) vs. Aluminum Spot LME (US$/t)



Source: DataStream, Company Reports and Citigroup Investment Research

In the chart above, we have plotted Hindalco's share price with the movement in spot aluminum prices on the LME since April 1995. It shows that at most times, there is a strong correlation between Hindalco's share price and the movement of aluminum prices on the LME. Although Hindalco has two main divisions, copper profitability has been under pressure (as explained below) and has been a disproportionately lower contributor to Hindalco's EBIT.

Figure 3. PBIT Trends for Hindalco's Two Major Divisions (Rs Millions)



Source: Company Reports

Copper – not pulling its weight

Copper EBIT in 1H FY07 was still disproportionately low at 12-15% of Hindalco's EBIT, versus around 60% of net sales

The copper division was acquired in FY03 and accounted for 52% of net sales and 37% of EBIT in that year. Since FY04, although copper's proportion to net sales has been in the range of 45% to 60%, the division's proportion to Hindalco's total EBIT has been declining — from 26% of EBIT to almost zero in FY06, but has picked up somewhat in 1H FY07. The division's performance was adversely impacted until FY06 due to a combination of lower TC/RC margins, a reduction in duty rates, a production shortfall and backwardation charges. The performance in the case of copper has improved in the past two quarters, but the EBIT in 1H FY07 was still disproportionately low at 12-15% of Hindalco's EBIT versus around 60% of net sales.

Copper

Expansion benefits to come through

The copper smelter based in Dahej, in Gujarat expanded capacity by 100% to 500,000 tpa in late FY06. A combination of various production problems and backwardation charges led to only marginal profits in FY06. These have largely been sorted out and we expect a substantial 34% yoy jump in volumes in FY07, to 281,000 tonnes, and a further 42% yoy rise in FY08. The increase in utilization should help bring down average production costs in the coming quarters.

Captive jetty in Gujarat and mines in Australia

Another advantage for Hindalco is its captive jetty (owned by a subsidiary) which has a cargo handling capacity of 3m tpa and can handle large vessels of up to 70,000 DWT. The company also has two mines in Australia, which should help meet 15-20% of its copper concentrate requirements when the new mine ramps up fully. It is on the look out for more such mines.

Lower costs partly compensate for declining trends in margins

Based on current trends, the outlook for TC/RCs is not positive for FY08E

The copper smelter profitability is largely dependent on trends in copper TC/RCs (treatment and refining charges) rather than those in international copper prices. FY07E should be a good year for the copper division due to the substantial improvement in TC/RCs (largely aided by higher copper prices) to an average of about US27c/lb in FY07E from US18c/lb in FY06. However, based on current trends the outlook is not so positive for FY08E. Spot prices have already fallen to a range of about US11-13c/lb, and we forecast an average of US$15c/lb in both FY08 and FY09. While lower TC/RCs would mean lower profits, Hindalco would be able to compensate this fall to some extent by higher volumes and lower average costs YoY.

Valuations appear stretched

Based on the factors detailed in the previous section, we expect FY07 to be a year in which Hindalco reports strong consolidated profit growth of 64% yoy. However, this trend is expected to reverse as we expect profits to fall 19% in FY08 and remain flat in FY09. Taking into account the rights issue pares down EPS growth to 53% in FY07E, and a 22% yoy decline in FY08E. At the current price, the stock trades at an FY08 P/E of 9.5x (consolidated 8.5x) and EV/EBITDA of 5.1x.

We use P/E as our preferred valuation metric for Hindalco, to which we add the value of its investment in associate companies

We use P/E as our preferred valuation metric for Hindalco, to which we add the value of its investment in associate companies. We use P/E because stocks such as Hindalco are largely driven by commodity price tends, which translate into earnings momentum. Additionally, we use EV/EBITDA and peer comparison with international majors.

P/E

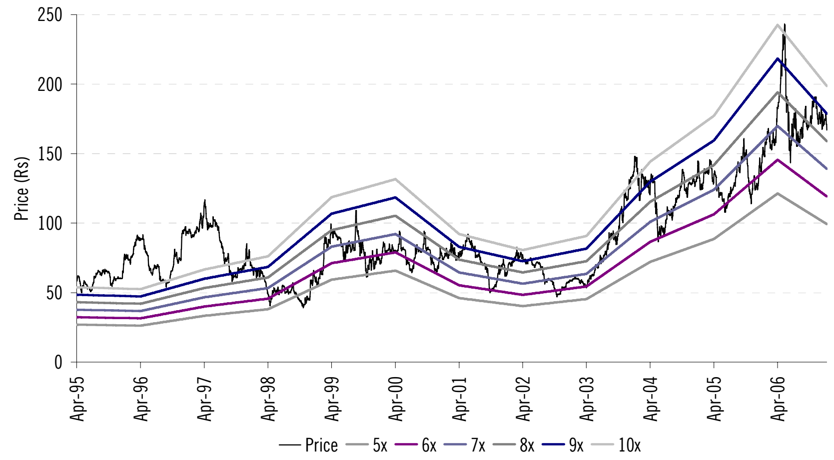
The P/E band chart for Hindalco indicates that since April 1998 the stock has traded in a wide P/E range of 5x to 10x depending on the company's profitability, largely driven by aluminum prices. Factors that adversely impacted the stock and drove it to the bottom end of its valuation range include concerns on the commodity outlook, production problems and disruption in coal supply. A positive outlook on aluminum generally led to stronger EPS growth and valuations moving up to the top of the P/E range.

The steady increase in international aluminum prices since October 2002 has led to a steady appreciation in Hindalco's share price and a gradual rerating of the stock, which now trades between a P/E range of 7x and 9x. Based on our outlook for falling international prices in aluminum and a substantial decline in copper TC/RCs, we expect the stock to continue to trade in the middle of this range: (1) This appears justified given its business mix and limited upside risk to earnings; and (2) the stock does not appear cheap compared with its Indian and international peers.

Our target price is based on: (1) a P/E of 8x for FY08E (Rs162); and (2) a 25% discount to investment value

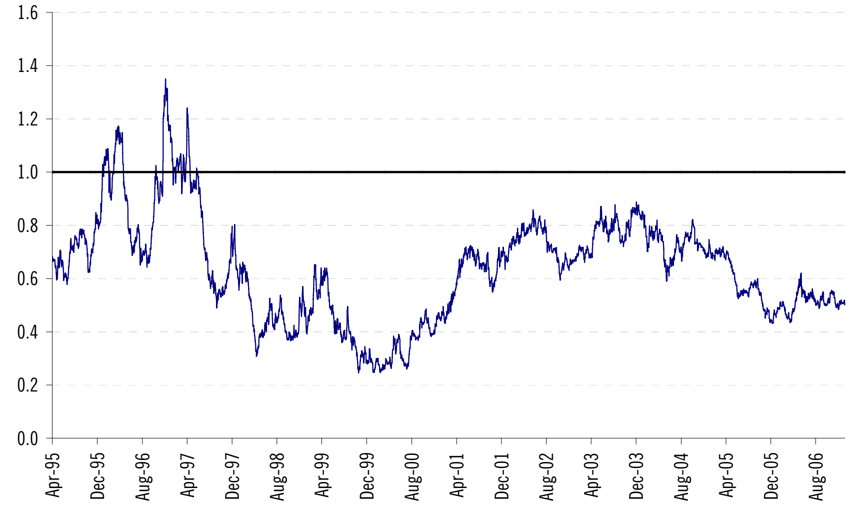
Our target price of Rs174 is arrived at by: (1) applying a P/E of 8x for FY08E (Rs162); and (2) adding the value of its investment holding in associate companies and discounting it by 25% to account for the risk that it may not be spun off and to account for a possible delay in listing.

Figure 4. Hindalco's P/E Band Chart — Earnings Largely Driven by Aluminum



Source: Company reports, DataStream and Citigroup Investment Research

Figure 5. Hindalco's Premium/Discount Relative to Sensex P/E



Source: Company Reports, DataStream and Citigroup Investment Research

Comparison with global majors

At our target price of Rs174, Hindalco would trade at a discount of about 20% to global peers on a P/E basis and in line with global peers such as Alcan and Alcoa on an EV/EBITDA basis for CY07E.

Figure 6. Global Valuation Comparisons

	RIC Code	Rating	Price (LC)	US$m	PE 2006e	PE 2007e	PE 2008e	EV/EBITDA 2006e	EV/EBITDA 2007e	EV/EBITDA 2008e
ALCOA Inc	AA.N	2 M	30.79	26,698	10.8	10.0	11.9	5.9	5.3	5.9
Alcan Inc	AL.N	2 H	49.88	18,288	9.4	9.9	10.6	6.0	5.7	5.7
Alumina Ltd	AWC.AX	2 M	6.38	5,831	14.4	11.6	12.1	11.0	8.8	9.0
Chalco	2600.HK	3 L	7.24	10,816	6.0	8.2	20.0	4.7	5.7	10.3
Nalco	NALU.BO	3 M	211.85	3,080	6.1	8.3	8.7	2.6	3.4	3.7
Hindalco	HALC.BO	3 M	172.50	4,513	7.2	9.5	10.2	4.0	5.1	5.9

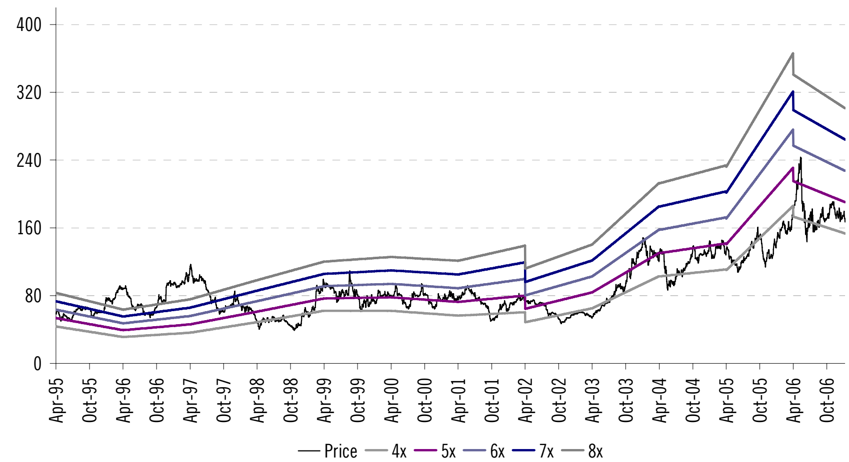
Source: Powered by dataCentral, Citigroup Investment Research. Prices are as of Jan 15.

For Nalco and Hindalco, 2006e refers to March FY07 and similarly for 2007e and 2008e.

EV/EBITDA

Another useful valuation measure for Hindalco is EV/EBITDA. In the past seven years the stock has traded in an EV/EBITDA band of 4x to 6x. Based on our outlook for the two commodities, we believe that Hindalco will trade in the middle of this range. At our target price of Rs174 the stock would trade at 5.1x FY08E EV/EBITDA.

Figure 7. Hindalco's EV/EBITDA Band Chart



Source: Company reports, DataStream and Citigroup Investment Research

Risks

The possible upside risks to our target price include:

Higher commodity prices

As in the case of most commodity producers, Hindalco's profits and share price are impacted by trends in commodity prices, especially in the case of aluminum. The impact is lower for alumina, as alumina constitutes only 3-4% of Hindalco's sales, whereas for Nalco alumina constitutes 25-30% of sales. Copper price movements have a very small impact on Hindalco's profits as TC/RC margins are more relevant. Our earnings forecasts are based on the price assumptions set by our global commodities team. However, as the international aluminum price or copper TC/RC could exceed these forecasts, we give below Hindalco's earnings sensitivity based on higher (and lower) assumptions.

Figure 8. Sensitivity of FY08 Profits at Different Aluminum Price Levels

Aluminium LME (US$/tonne)	2,100	2,200	2287*	2,400	2,500
Net sales (Rs bn)	199.1	201.2	203	205.3	207.3
EBITDA (Rs bn)	31.4	33.5	35.3	37.6	39.6
EBITDA %	16%	17%	17%	18%	19%
PAT (Rs bn)	16.7	18.2	19.6	21.3	22.8
EPS (Rs)-standalone	15.6	17.0	18.2	19.8	21.2
EPS (Rs)-consolidated	17.5	18.9	20.2	21.7	23.1

Source: Company Reports, Citigroup Investment Research. * Base case

Figure 9. Sensitivity of FY08E Profits at Different Copper TC/RC Levels

TcRc (USc/lb)	12	15*	18	21	24
Net sales (Rs bn)	203.0	203.0	203.0	203.0	203.0
EBITDA (Rs bn)	34.1	35.3	36.4	37.6	38.8
EBITDA %	17%	17%	18%	19%	19%
PAT (Rs bn)	18.7	19.6	20.4	21.3	22.1
EPS (Rs)-standalone	17.4	18.2	19.0	19.8	20.6
EPS (Rs)-consolidated	19.4	20.2	21.0	21.8	22.6

Source: Company Reports and Citigroup Investment Research. * Base case

Trends in US$ exchange rates

Another key factor for companies involved in international commodities such as aluminum and copper is the exchange rate. This is because domestic prices are based on international price trends. Additionally, export earnings are also expressed in rupee terms. We have used average Rs/US$ exchange rates of Rs45.3, Rs43.2 and Rs42 for FY07, FY08 and FY09. We expect an appreciation in the rupee versus the dollar. If the rupee depreciates versus the dollar, it would be positive for Hindalco. We give below the sensitivity of Hindalco's earnings to different exchange rates.

Figure 10. Sensitivity of FY08E Profits to Changes in Exchange Rates (Rs/US$)

Exchange Rate (Rs/US$)	41.0	42.0	43.2*	44.0	45.0
Net sales (Rs bn)	194.1	198.1	203.0	206.2	210.2
EBITDA (Rs bn)	31.9	33.4	35.3	36.5	38.1
EBITDA %	16%	17%	17%	18%	18%
PAT (Rs bn)	17.1	18.2	19.6	20.5	21.6
EPS (Rs)-standalone	15.9	17.0	18.2	19.1	20.1
EPS (Rs)-consolidated	17.8	18.9	20.2	21.0	22.1

Source: Company Reports and Citigroup Investment Research * Base case

Financial summary

Figure 11. Operating Data

YE March 31	FY05	FY06	FY07E	FY08E	FY09E
Capacity (tonnes)					
Alumina	1,145,000	1,145,000	1,145,000	1,485,000	1,485,000
Aluminium ingots	410,000	410,000	460,000	506,000	506,000
Rolled products	170,000	200,000	200,000	200,000	200,000
Extruded products	21,700	27,700	27,700	27,700	27,700
Conductor redraw rods	50,000	64,400	64,400	64,400	64,400
Foil	33,000	33,000	33,000	33,000	33,000
Wheel (pcs)	300,000	300,000	300,000	300,000	300,000
Copper Cathodes	250,000	500,000	500,000	500,000	500,000
Continuous Cast Copper Rods	97,200	97,200	97,200	97,200	97,200
Production (tonnes)					
Alumina	1,159,664	1,203,383	1,203,383	1,400,000	1,485,000
Aluminium ingots	409,068	429,140	435,000	460,750	506,000
Rolled products	175,734	190,581	210,581	221,110	232,166
Extruded products	28,551	32,328	37,828	38,828	39,828
Conductor redraw rods	62,392	67,730	69,230	71,230	73,230
Foil	26,177	26,184	28,279	29,975	31,774
Wheel (pcs)	107,279	194,079	220,000	233,200	247,192
Copper Cathodes	217,138	210,228	280,787	400,000	450,000
Continuous Cast Copper Rods	88,298	88,687	92,340	97,200	97,200
Sulphuric Acid	663,316	639,414	878,985	1,234,783	1,389,130
Phosphoric Acid	133,735	95,420	103,852	135,000	157,500
DAP	286,264	218,199	230,782	300,000	350,000
Gold	5.2	6.7	6.8	9.1	10.5
Silver	36.6	35.1	37.1	52.1	55.5
Sales (tonnes)					
Alumina	322,828	388,646	355,133	501,538	498,300
Aluminium ingots	158,518	146,785	118,847	131,157	162,446
Rolled products	144,158	151,568	179,474	188,137	197,214
Extruded products	28,453	32,181	37,828	38,828	39,828
Conductor redraw rods	62,841	67,895	69,230	71,230	73,230
Foil	26,004	26,003	28,279	29,975	31,774
Wheel (pcs)	111,045	199,403	220,000	233,200	247,192
Copper Cathodes	126,452	127,061	188,447	302,800	352,800
Continuous Cast Copper Rods	87,924	88,331	92,340	97,200	97,200
Sulphuric Acid	268,592	294,740	567,430	829,783	916,630
DAP	302,436	217,176	230,782	300,000	350,000
Gold	5.3	6.7	6.8	9.1	10.5
Silver	34.9	36.0	37.1	52.1	55.5
Average Exchange Rate (Rs/US$)	44.93	44.27	45.3	43.2	42
Average Aluminium LME (US$/tonne)	1,782	2,030	2,598	2,287	2,260
Aluminium Freight/Premium (US$/tonne)	70	70	70	70	70
Aluminium import duty (%)	15.0%	10.0%	7.5%	7.5%	7.5%
Avg domestic aluminium price (Rs/tonne)	92,783	98,638	122,038	105,039	100,927
Copper TcRc (cents/lb)	8.74	18.10	27.50	15.00	15.00

Source: Company Reports and Citigroup Investment Research estimates

Figure 12. Profit and Loss Statement, FY05-09E (Rs in Millions)

YE March 31	FY05	FY06	FY07E	FY08E	FY09E
P & L (Rs mn)					
Sales breakdown					
Hydrate and alumina	5,696	8,007	7,755	6,522	6,661
Aluminium ingots	14,375	14,480	14,504	13,777	16,395
Rolled products	16,380	18,603	26,928	25,030	25,426
Extruded products	3,379	4,102	5,940	5,437	5,414
Conductor redraw rods	5,908	7,045	9,054	8,123	8,050
Foil	4,543	4,847	5,996	5,846	6,067
Wheels	198	374	433	468	506
Other aluminium products	1,207	1,464	1,504	1,564	1,626
Copper Cathodes	17,966	24,422	61,243	86,749	72,837
Continuous Cast Copper Rods	14,774	17,795	31,756	30,563	22,140
Sulphuric Acid	434	472	497	762	884
DAP	4,182	3,188	3,658	4,946	6,001
Gold and silver	3,557	4,918	6,739	9,975	11,064
Other Copper Products	396	1,092	1,092	1,146	1,204
Export Incentives	1,852	2,744	1,216	1,642	1,380
Miscellaneous Receipts	387	413	413	422	430
Net sales	**95,233**	**113,965**	**178,729**	**202,971**	**186,085**
Operating expenses	72,468	87,914	139,977	170,574	153,239
Operating profit	22,765	26,051	38,752	32,397	32,846
Other income	2,700	2,439	2,981	2,872	2,801
EBITDA	**25,465**	**28,490**	**41,733**	**35,269**	**35,647**
EBITDA margin %	**27%**	**25%**	**23%**	**17%**	**19%**
Depreciation	4,633	5,167	6,193	5,962	6,361
% of avg gross block	6.0%	5.4%	5.1%	5.2%	5.2%
PBIT	**20,832**	**23,323**	**35,540**	**29,308**	**29,286**
Interest	1,700	2,252	2,300	2,700	2,700
PBT	**19,133**	**21,071**	**33,240**	**26,608**	**26,586**
Total Tax	5,748	4,501	9,141	7,051	7,045
Eff.tax rate %	30%	21%	28%	27%	27%
PAT	**13,385**	**16,570**	**24,099**	**19,557**	**19,541**
Extraordinary items	91	14	0	0	0
Net profit	**13,294**	**16,556**	**24,099**	**19,557**	**19,541**

Note: EPS calculated on average shares outstanding, adjusted for call monies received in FY06 rights issue.

Source: Company Reports and Citigroup Investment Research

Figure 13. Balance Sheet, FY05-09E (Rs in Millions)

YE March 31	FY05	FY06	FY07E	FY08E	FY09E
Balance Sheet (Rs mn)					
Fixed Assets	**69,265**	**76,157**	**95,050**	**123,219**	**156,012**
Gross Block	87,728	104,183	110,166	119,126	125,523
Acc.Depreciation	-31,693	-36,355	-42,547	-48,509	-54,870
Net Block	56,035	67,828	67,618	70,617	70,653
CWIP	13,230	8,329	27,432	52,602	85,359
Investments	**37,021**	**39,713**	**40,213**	**40,713**	**41,213**
Current Assets	**44,764**	**73,027**	**95,313**	**93,137**	**76,941**
Stocks + WIP	23,745	40,951	45,949	47,288	42,184
Sundry debtors	7,874	12,484	17,786	18,203	16,651
Loans, advances & deposits	9,136	10,420	11,000	12,000	13,000
Cash, bank	4,010	9,173	20,577	15,646	5,107
Current Liabilities and provisions	**25,182**	**31,527**	**42,428**	**44,734**	**40,063**
Trade creditors	14,574	19,745	27,017	31,859	26,745
Taxation	6,117	6,440	8,975	6,519	6,514
Proposed dividends	2,116	2,472	3,437	3,057	3,304
Other creditors	2,375	2,870	3,000	3,300	3,500
Misc Expenditure	**94**	**60**	**60**	**60**	**60**
Overall Capital employed	**125,963**	**157,430**	**188,207**	**212,395**	**234,163**
Shareholders Funds	**76,666**	**96,063**	**131,673**	**160,328**	**176,565**
Share capital	928	986	10,435	11,593	11,593
Preference capital	0	0	0	0	0
Reserves & surplus	75,738	95,077	121,238	148,735	164,972
Revaluation reserves	0	0	0	0	0
Intangible assets	0	0	0	0	0
Deferred tax liability	**11,297**	**12,334**	**12,500**	**13,032**	**13,564**
Total debt	**38,000**	**49,034**	**44,034**	**39,034**	**44,034**
Secured Loans	29,523	28,480	23,480	18,480	23,480
Unsecured Loans	8,477	20,554	20,554	20,554	20,554
Cash credit	0	0	0	0	0
Total sources of Funds	**125,963**	**157,430**	**188,207**	**212,395**	**234,163**

Source: Company Reports and Citigroup Investment Research estimates

Figure 14. Cash Flow Statement, Stock Metrics and Ratios

YE March 31	FY05	FY06	FY07E	FY08E	FY09E
Cash flow statement (Rs mn)					
PBIT	20,832	23,323	35,540	29,308	29,286
Depreciation	4,633	5,167	6,193	5,962	6,361
Other income	-2,700	-2,439	-2,981	-2,872	-2,801
Changes in working capital	-6,258	-17,434	-3,479	2,386	744
Taxes paid	632	-3,019	-6,440	-8,975	-6,519
Others	471	1,503	0	0	0
Net cash from operations	**17,609**	**7,101**	**28,833**	**25,808**	**27,070**
Purchase of Fixed Assets	-11,205	-11,554	-25,086	-34,130	-39,154
Purchase of investments	-11,226	-2,692	-500	-500	-500
Interest /Dividend received	2,700	2,439	2,981	2,872	2,801
Others	-109	-1,713	0	0	0
Net cash used in investment activities	**-19,840**	**-13,519**	**-22,604**	**-31,758**	**-36,853**
Issue of share capital	3	5,557	14,948	12,155	0
Proceeds from borrowings	12,354	11,034	-5,000	-5,000	5,000
Interest paid	-1,700	-2,252	-2,300	-2,700	-2,700
Dividend paid	-1,725	-2,116	-2,472	-3,437	-3,057
Others	-4,971	-642	0	0	0
Net cash from financing activities	**3,961**	**11,582**	**5,176**	**1,018**	**-756**
Net cash flow	**1,731**	**5,163**	**11,405**	**-4,932**	**-10,539**
Opening cash balance	2,279	4,010	9,173	20,577	15,646
Closing cash balance	4,010	9,173	20,577	15,646	5,107
Stock Metrics					
No. of shares (mn)	928	935	1,005	1,072	1,159
Book value per share (Rs)	82.6	102.7	131.0	149.5	152.3
EPS (Rs)	14.4	17.7	24.0	18.2	16.9
CFPS (Rs)	19.4	23.2	30.1	23.8	22.3
Net Debt/EBITDA (x)	0.3	0.4	-0.1	-0.2	0.3
Total debt/Tangible net worth (x)	0.5	0.5	0.3	0.2	0.2
Net debt/equity (x)	0.1	0.1	0.0	0.0	0.1
ROE (%)	17%	17%	18%	12%	11%
RoCE (%)	17%	15%	19%	14%	13%
Total dividend (Rs mn)	2,120	2,472	3,437	3,057	3,304
DPS (Rs)	2.0	2.2	3.0	2.5	2.5
Dividend payout (%)	14%	12%	13%	14%	15%
Ratios					
Current ratio	1.8	2.3	2.2	2.1	1.9
Interest coverage	12.3	10.4	15.5	10.9	10.8
PBIT/sales	21.9	20.5	19.9	14.4	15.7
Sales/total assets	0.8	0.7	0.9	1.0	0.8
Days in inventory	129	181	125	105	105
Days receivable	27	37	33	30	30
Debtors turnover	13	10	11	12	12
Days payable	79	80	75	72	68

Source: Company Reports and Citigroup Investment Research estimates

Competitive positioning and strategy

Aluminum division outlook

Figure 15. Hindalco's Aluminum Assets and Production Flow Chart

		Input/output ratio	West region	Central and east region
	Bauxite Mines	Bauxite 5.6 tonnes	Chandgad, Mahrashtra Durgmanwadi, Mahrashtra	Lohardaga, Jharkhand
400kWh/ton	Alumina Refinery	Alumina 2 tonnes	Belgaum, Karnataka (350,000tpa)	Muri, Bihar (110,000 tpa) Renukoot, UP (700,000 tpa)
Power Plants				Hirakud, Orissa (168MW) Hirakud Co-gen, Orissa (41MW) Renusagar, UP (742MW) Renukoot Co-gen, UP (164MW)
15,840kWh/tonne	Aluminum Smelter	Metal 1 tonne	Alupuram, Kerala (15,000 tpa)	Hirakud, Orissa (65,000 tpa) Renukoot, UP (360,000 tpa)
960 kWh/ton		Sheets	Taloja, Mah (45,000 tpa) Mouda, Mah (30,000 tpa)	Belur, WB (45,000 tpa sheet) Renusagar, UP (80,000 tpa sheet)
1.000 kWh/ton	Fabrication Plants	Foils	Kalwa, Mah (6,000 tpa) Silvassa (5,000 tpa foil, 300,000 wheels)	
960 kWh/ton		Extrusions	Alupuram, Ker (8,000 tpa extrusion)	Renusagar, UP (20,000 extrusions)
60 kWh/ton		Rods	Alupuram, Ker (10,000 rods) Mouda, Mah (14,400 tpa rods)	Renusagar, UP (40,000 tpa rods)

Source: Company Reports and Citigroup Investment Research

Low-cost aluminum producer

Hindalco is self-sufficient in most of the major inputs used in aluminum production

Hindalco's largest smelter at Renukoot in Uttar Pradesh is in the lowest cost quartile globally. The low cost is because Hindalco is self-sufficient in most of the major inputs used in aluminum production, such as power and bauxite. Hindalco expects bauxite deposits to last about 22 years at Muri and Belgaum, and around 43 years at Renukoot. Hindalco is an efficient producer of power with a production cost of Rs1.2/kwh (US2.7c/kwh) versus grid power cost of Rs3.5/kwh (US77c/Kwh). Hindalco also benefits from its own coal mines at Hirakud in Orissa since FY06. As a result coal is about 30% cheaper at Hirakud compared with the landed cost at Renukoot. Hindalco is surplus in alumina, which it sells in both the domestic and international markets. Key raw materials such as caustic soda and aluminum fluoride are sourced from joint-venture companies. In order to increase its self-sufficiency in raw materials, Hindalco is setting up a 5,300 tpa captive aluminum fluoride plant at Dahej (in Gujarat) to convert a by-product (fluosilicic acid) at the copper plant into aluminum fluoride, used in the aluminum manufacturing process.

Strong domestic market presence

Nalco has a market share of around 33% in primary aluminum and an even more overwhelming 60-65% in value-added products such as sheets

Hindalco has the largest aluminum smelter capacity in India. This gives it a market share of around 33% in primary aluminum and an even more overwhelming share of 60-65% in value-added products such as sheets. Selling value-added products is beneficial to the bottom line, as products such as extrusions, sheets and foils sell at premiums ranging from Rs28,000/t to as high as Rs90,000/t, compared with primary aluminum prices. Prices of value-added products are generally less volatile versus prices of basic aluminum products. Value-added products accounted for 49% of sales volumes and 56% of revenues in FY06. The focus on increasing the revenue share from value-added products continues. The acquisition of 30,000 tpa of sheet capacity and 14,400 tpa of conductor rod capacity from Pennar Aluminium based in Mouda near Nagpur (in Maharashtra) in 4QFY06 will take the effective sheet capacity to 200,000 tpa. These acquisitions take Hindalco's value-added capacity to 64% of primary metal capacity.

Ongoing expansions to cut costs further

More modern capacity at Hirakud, along with captive power

Hindalco is in the process of expanding its aluminum capacity at Hirakud (Orissa) from 65,000 tpa to 145,000 tpa in two stages. The expansion will include conversion of the old Soderberg technology to the more efficient pre-bake and also a transfer of the idle capacity at Belgaum (30,000 tpa), which has been inoperative for the past several years due to high power costs. The capex of Rs10.4bn includes the cost of the smelter, power plant and coal mine development. The first phase of the expansion by 35,000 tpa to 100,000 tpa is expected to be completed by Dec 2006. The balance expansion to 145,000 tpa is expected to be completed by Dec 2007. Along with the smelter expansion, the captive power capacity at Hirakud is being increased to 368MW from the current 168MW in two phases of 100MW each, by December 2006 and December 2007. The modern technology, along with the captive coal that is already being used at Hirakud, will help bring down production costs at the smelter there. Once the expansion is completed in December 2007, the Hirakud smelter will account for 29% of capacity and reduce average production costs.

Muri alumina expansion

In addition to aluminum, Hindalco is also planning to expand its alumina refinery in Muri (in West Bengal) by 340,000 tpa to reach 450,000 tpa by 1Q FY08 at a cost of Rs8bn. In addition to the alumina refinery, the capex includes the cost of a co-generation power plant. The use of technology from Alcan is expected to bring down the alumina cash production cost substantially.

Belgaum alumina expansion

A slightly longer-term plan is to expand alumina capacity at Belgaum from 350,000 tpa to 650,000 tpa. The estimated capex of Rs8.4bn includes the cost of the refinery and related infrastructure. The key objective of the expansion is to reduce cash cost of production. Hindalco has received environmental clearances and is waiting for mining leases in Maharashtra so that it can go ahead with project implementation.

Major expansions to triple aluminum capacities in five years

Hindalco has substantial capex plans over the next five years, which if successfully completed would result in a fourfold expansion in alumina capacity and a threefold expansion in aluminum capacity. The company has raised about Rs22 bn through equity (final call by 4Q FY08) and about Rs65bn through debt to meet the capex requirements, which involves spending of around Rs300bn.

Figure 16. Hindalco's Planned Expansions

Plant	Location	Capacity ('000 tpa)	Completion date
Alumina current		**1,145**	
Muri	W. Bengal	340	Apr-07
Belgaum	Karnataka	300	NA
Utkal	Orissa	825	Jan-10
Aditya	Orissa	1,500	2010
Alumina after expansion		**4,110**	
Aluminium current		**425**	
Hirakud	Orissa	35	Dec-06
Hirakud	Orissa	46	Dec-07
Aditya	Orissa	325	2010
Mahan	MP	325	2011
Latehar	Jharkhand	325	2011
Aluminium after expansion		**1,481**	
Thermal power		**987**	
Hirakud	Orissa	100	Dec-06
Hirakud	Orissa	100	Dec-07
Aditya	Orissa	750	2010
Mahan	MP	750	2011
Latehar	Jharkhand	750	2011
Power after expansion		**3,437**	

Source: Company Reports and Citigroup Investment Research

Utkal Alumina

Utkal Alumina is a project to set up a 1.5m tpa alumina plant in Orissa. Hindalco has a 55% share in the JV with Alcan, its partner in this project, and hence will be entitled to 825,000 tpa of alumina. Around 70% of the land acquisition is completed; some of the houses to existing landowners have been handed over. Basic infrastructure work has commenced, and the technology agreement is expected to be signed soon. The detailed engineering for the project is being done by UHDE. Hindalco expects to complete this project in 36 months, by January 2010.

Aditya Alumina & Aluminium

Aditya Alumina & Aluminium is a project to set up a greenfield plant in Orissa including 1.5m tpa of alumina, 325,000 tpa of aluminum capacity and 750 MW of captive power. The total capex on this project is Rs110bn. Land acquisition is in progress, and approval from the ministry has been received for the smelter and power plant. A rehabilitation plan has been submitted for approval. The expected completion date for the project is 2010.

Mahan Aluminium project

Hindalco plans to set up a 325,000 tpa aluminum plant along with 750MW of power in Madhya Pradesh. The plant will be located in the Sidhi district, near Bargawan, and is about 50km from the existing power plant at Renusagar. A captive coal mine of 3.5m tpa has been allotted, which will be mined by a 50:50 JV between Hindalco and Essar, named Mahan Coal Co Ltd. The capex on the plant is Rs77bn and the completion is likely by 2011.

Jharkhand Aluminium project

The company also plans to set up a 325,000 tpa aluminum plant along with 750MW of captive power in Latehar, Jharkhand. The government of Jharkhand has forwarded a recommendation to the Ministry of Coal for the allotment of a coal block to Hindalco. Hindalco has already finalized the project site and will soon file applications for the infrastructure required for the project. The capex required is Rs78bn, and the plant is expected to be completed by 2011.

Copper division outlook

Expansion to reduce costs

Hindalco acquired its copper smelter from its associate company, Indo Gulf, with effect from 1 April 2002. The original capacity of the smelter, which uses technology from Outokumpo (Finland), was 100,000 tpa, which was expanded to 180,000 tpa. Subsequently a second smelter was set up with a capacity of 70,000 tpa using technology supplied by Ausmelt (Australia). The third smelter of 250,000 tpa was commissioned in FY06 using technology from Mitsubishi Materials, Japan. The refinery is also located at Dahej, Gujarat and uses technology from Mount ISA, Australia, which is of the most commonly used processes for refining copper. Once the new plant stabilizes and Hindalco manages to reach full production levels of its overall capacity, it estimates that there would be a substantial reduction in cash production costs.

Captive mines in Australia

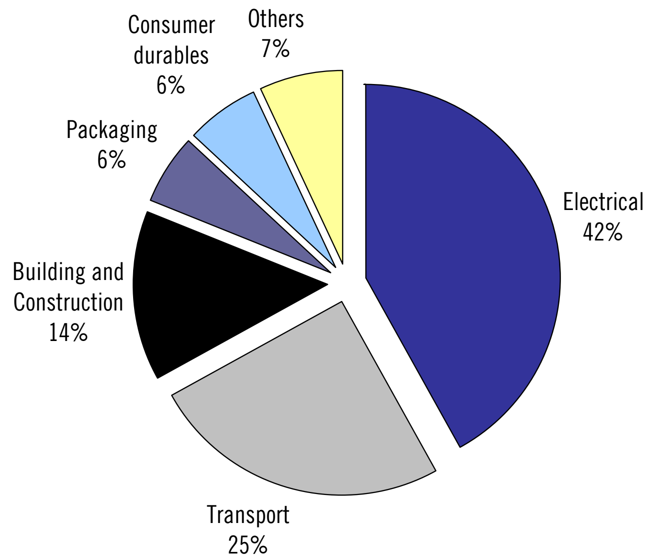
Hindalco has two copper mines in Australia owned by its 51% subsidiary, Birla Mineral Resources Ltd (BMRL), which has been recently listed on the Australian stock exchange. BMRL owns 100% of Birla Nifty Pty Ltd and Birla Mount Gordon Pty Ltd which had 34.6mn tonnes and 2.3 mn tonnes respectively of estimated proven and probable copper ore reserves. These together meet an estimated 15-20% of Hindalco's concentrate requirements. The copper sulphide project at Birla Nifty is still at a developmental stage and efforts to extract copper ore may not be successful. However, Hindalco believes that once production begins: (1) this will be among the largest underground mines to be commissioned in this decade; and (2) the project would have been completed quite quickly (36 months) despite an acute skill shortage in Western Australia, and at a competitive capital cost globally despite the remoteness of the location.

Domestic demand-supply outlook

Positive demand trends

India consumed around 1m tonnes of aluminum in FY06. Consumption growth in the period FY00 to FY04 grew at a CAGR of 5%. However, in the past couple of years the growth rate has accelerated. Domestic consumption grew by 13% yoy in FY05 and by a substantially higher rate of 23% yoy in FY06. The key drivers for this strong growth was buoyant growth of about 20-25% yoy from the largest consuming sectors such as electrical, automobiles and construction, which collectively account for around 75-80% of domestic aluminum consumption. Going forward, we expect these three sectors to report relatively stronger growth and expect overall consumption to grow by 9-10% pa over the next few years.

Figure 17. Aluminum Consumption Pattern in India



Source: Citigroup Investment Research

Large capacities only expected after FY10

On the supply side, there has been a jump in capacity by 27% yoy in FY06, mainly due to the smelter capacity increase by Bharat Aluminium. This is the key reason for the production growth of 12-13% yoy in FY06 and FY07. Most of the other capacity expansion plans are at various stages of progress and are most likely to be commissioned only in FY10 and beyond. Of these the first to be completed is Nalco whose 115,000 tpa smelter capacity along with power and alumina is expected to be completed in December 2008. Completion of some of the capacities being planned by Hindalco and others is dependent on speedy allocation of mines and environmental approvals.

Figure 18. India Domestic Aluminum Consumption ('000 tonnes)

Year ended 31 March	2003	2004	2005	2006	2007E	2008E	2009E	2010E
Capacity								
Hindalco (incl Indal)	367	410	410	410	460	506	506	506
Nalco	288	288	345	345	345	345	345	460
Balco	110	110	110	355	355	355	355	355
Malco	40	40	40	40	40	40	40	40
Total Capacity	**805**	**848**	**905**	**1,150**	**1,200**	**1,246**	**1,246**	**1,361**
Production								
Hindalco (incl Indal)	318	393	409	429	435	461	506	506
Nalco	245	298	338	359	360	365	375	456
Balco	95	97	100	174	288	316	338	355
Malco	31	33	36	40	40	40	40	40
Total Production	**689**	**821**	**883**	**1,002**	**1,123**	**1,182**	**1,259**	**1,357**
% change	7%	19%	8%	13%	12%	5%	7%	8%
% utilization	86%	97%	98%	87%	94%	95%	101%	100%
Imports	125	100	125	170	200	200	200	200
Exports	175	230	227	208	273	237	211	197
Domestic Consumption	**639**	**691**	**781**	**964**	**1,050**	**1,145**	**1,248**	**1,360**
% change	5%	8%	13%	23%	9%	9%	9%	9%

Source: Citigroup Investment Research estimates

Global Outlook – Copper

(Extracted from *Standing by Our Call,* 18 November 2006)

Alan Heap
+61-2-8225-4853
alan.heap@citigroup.com

Surplus ahead

Our supply demand analysis points to a modest surplus in 2007, increasing in subsequent years. But by 2010 we expect a deficit.

Previously we also showed a deficit across the whole forecast period.

The key variables in the forecast are:

- Chinese demand — consumer restocking drives a recovery in 2007E. But a further steady decline in IOU slows demand growth in subsequent years.
- US demand — Recovers in the second half of 2007E from the late 2006 slowdown, and then reverts to trend.
- Fewer disruptions to mine supply in 2007E and in subsequent years. Also, in the out years of our forecast, additional mine supply may come from new projects which are still at an early planning stage.

Demand – US & China are key markets

China

China's offtake slowed sharply in 2006. Sales by the State Reserve Bureau (SRB) have clouded the true picture, but consumer de-stocking and substitution have been important depressing influences.

SRB sales – a confusing factor

Estimating apparent consumption in 2006 is complicated by sales from the government-controlled SRB. The sales are to cover short positions that came due in late 2005.

We estimate that during the first three quarters, the SRB sold about 450kt of metal. Of this, 75kt was exported to LME warehouses mainly in Korea; 200kt was delivered to the SFE, and 170kt auctioned in the domestic market. Of the domestic sales, a proportion was sub LME and SFE grade, and therefore sold at a discount. This material competes with scrap and has contributed to excess scrap supply and depressed scrap prices.

The 450kt of SRB sales depress apparent consumption estimates by the same amount. SRB sales have declined in recent months, and have probably now ended.

Destocking – is it over?

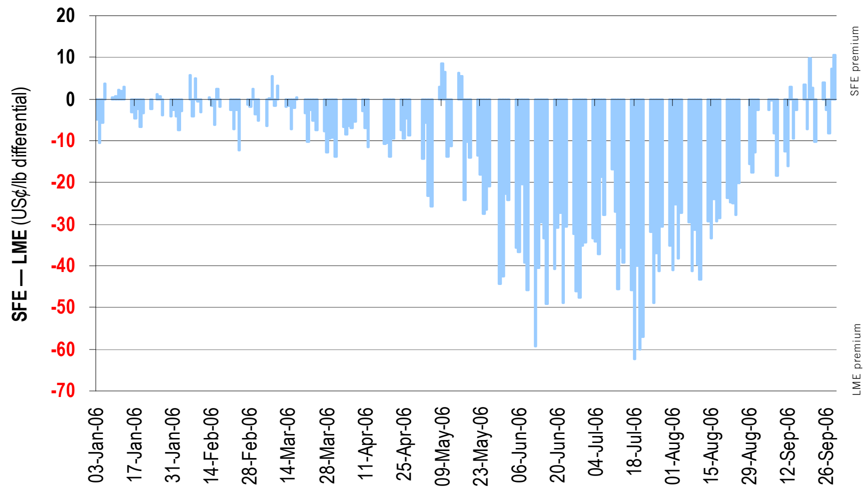
Even after taking account of SRB sales, however, apparent consumption was sharply weaker in 2006. There have been two main causes: consumer destocking and substitution.

China's fabricators have drawn down stocks to minimize their exposure to price volatility. Some fabricators have reduced their stocks by up to half. Others have been forced to close, unable to match high and volatile cathode costs against product prices.

Nevertheless, at some point, consumers will have to return to the market. A premium of the SFE price to the LME might indicate that consumers are buying again. However, this could also be caused by an end to SRB selling.

The SFE price has returned to a premium to LME, arguably signaling an end to consumer destocking

Figure 19. Copper SFE-LME Differential



Source: SFE, LME and Citigroup Investment Research.

Further, SFE stocks have increased recently, indicating that consumer offtake is not yet recovering.

Substitution

Potentially, substitution is a most bearish development in the copper market, but estimating its scale, rate of change and reversibility are challenging.

In May 2006, we estimated that 250kt of demand had been lost. Since then, the estimate has increased and it is likely to increase further, perhaps to 1Mt.

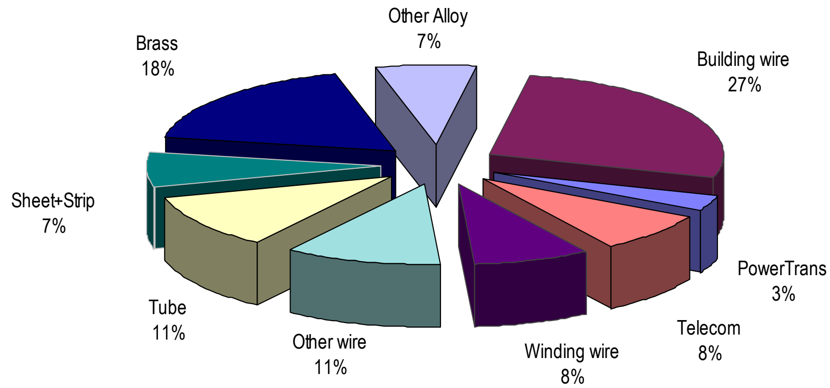
Substitution has been more evident in China than other markets.

It is important to consider two types of substitution and reduced unit use — reversible and irreversible.

Reversible substitution is most evident in wire markets, e.g. winding wire for electric motors and underground power cable. The main substitute is aluminium and the process will reverse when copper prices decline.

Global wire markets, which are vulnerable to substitution, account for around 11% of demand.

Figure 20. Global Copper Demand, by End-Product



Source: CRU

In tube markets, however, the processes of substitution and reduced unit use are likely to prove irreversible. In plumbing applications, copper tube is being replaced by PVC and PEX (cross-linked polyethylene). In air conditioners, thinner walled and narrow bore fluted tube is being used.

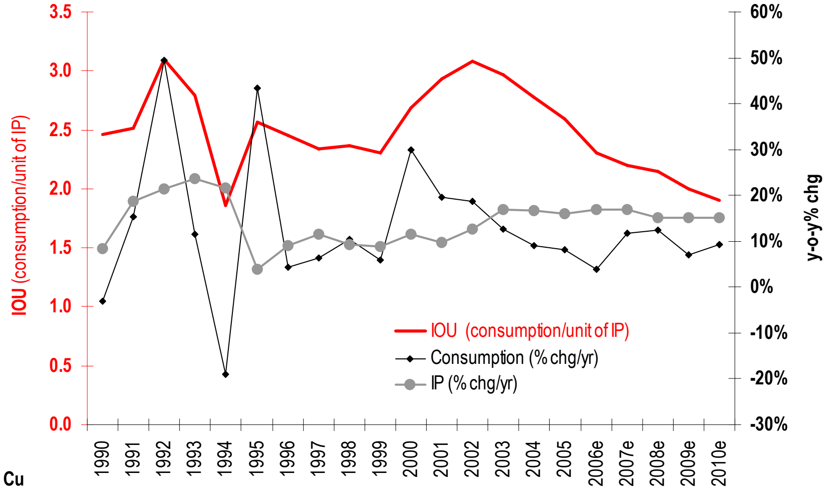
Globally tube markets account for around 11% of demand.

The full and long-term implications of substitution and reduced unit use are difficult to discern. Much will depend on how long high prices are sustained and how tight the market becomes. However, it could be that the extent of permanent damage to the market is greater than we assume.

Substitution pressures are expected to persist in 2007, contributing to further declines in intensity of use in China. Even so, consumption should rebound to nearly 10% growth.

IOU declines due to substitution & the changing composition of growth

Figure 21. Copper Intensity-of-Use in China



Source: WBMS, Citigroup Investment Research

US

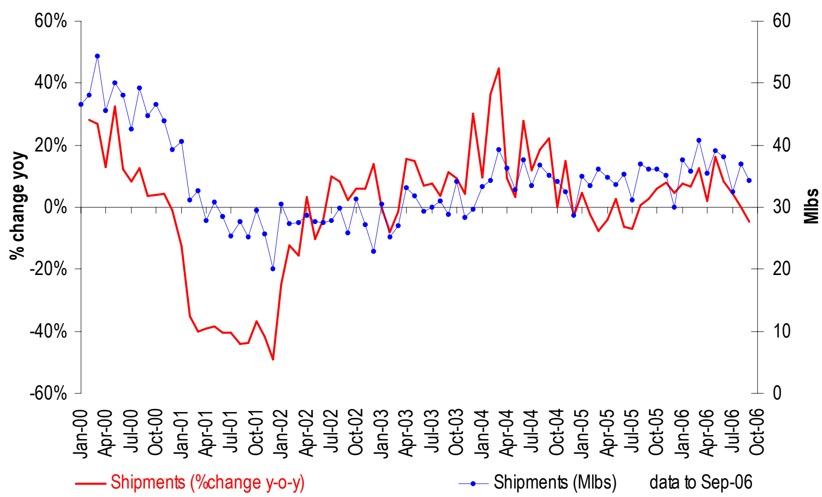
A current primary issue for US copper demand is the impact of a housing slowdown, together with a weakness in automobile markets.

Early demand indicators have been pointing to weakness in demand since August. More recently, inventories in US LME warehouses have also begun to rise, causing more widespread market concerns.

Our macro view is that although the housing sector has some months of reduced activity ahead, it will not be a prolonged slowdown. Furthermore, it will not spread into a broader-based breakdown in consumer sentiment.

Shipments have slowed sharply

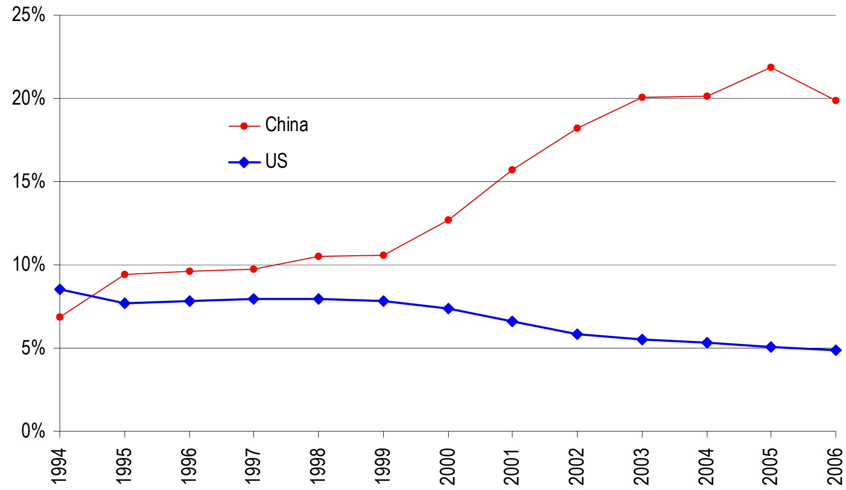
Figure 22. US Copper & Brass Service Centre Shipments



Source: Copper and Brass Service Center Assn

In 2000, China and US construction industries were about the same size, as sources of demand

Figure 23. China and US Construction, as Contributors to Global Demand



Source: WBMS

What if the US slowdown is deeper and more prolonged?

Based on potential risks to our central economic forecast, we have constructed two scenarios for the US economy:

1. Weaker growth

A softening in the US economy as further slowing in the housing sector weighs on consumer confidence. This environment also carries adverse implications for China, as US consumer demand for China's imports declines.

2. Stagflation

A combination of weaker growth and higher interest rates is the most bearish outlook for commodities.

The economic assumption embedded in the scenarios and the implications for commodity prices are shown below.

Figure 24. Price Scenario Analyses — Considering Two Bearish Cases

Categories	Units	Central case			US slowdown case			Stagflation case		
		2006E	2007E	2008E	2006E	2007E	2008E	2006E	2007E	2008E
IP										
World	%/yr	5.0%	4.2%	3.5%	4.5%			4.5%		
US	%/yr	4.8%	4.2%	3.8%	4.8%	2%	2%	4.8%	-2%	-2%
China	%/yr	17.0%	16.8%	15.0%	15.0%	12%	12%	15.0%	8%	8%
copper										
surplus/deficit	kt	1	59	46		250	460		350	580
stock:consumption ratio	kt/weeks	1.6	1.7	1.7		2.3	3.5		2.4	3.9
price	US¢/lb	287	225	130	287	175	130	287	110	110

Source: Citigroup Investment Research estimates

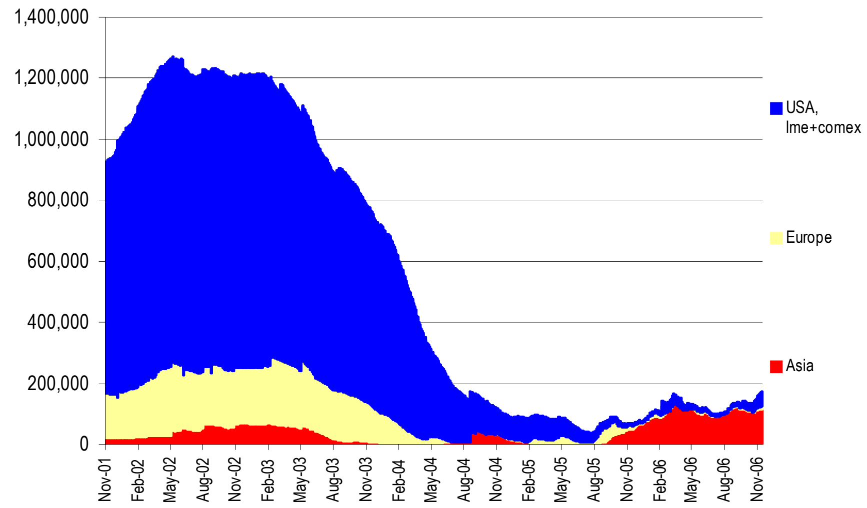
It is notable that the signs of economic weakness in the US, and now signs of softening demand, have not triggered a sell-off by speculators and investors.

Inventory increases – the market is worried

The recent softening in demand has been reflected in an increase in reported stocks.

Most exchange (LME) stocks are located in Asia

Figure 25. LME + Comex Stocks – Copper (Tonnes)



Source: Reuters

- LME stocks have increased from 93kt in June to 144kt.
- COMEX stocks have increased from 7kt in June to 25kt.
- SFE stocks have increased sharply.

However, the increases are only partly representative of softness in demand.

1. The increases in LME stocks in Asia are of copper delivered by the SRB against their short position.

2. The increases in US LME warehouses and COMEX stocks reflect a weakening in US demand.

3. The increases in SFE stocks indicate that restocking by China's consumers is still not occurring.

Mine supply — disruptions lower

Mine production losses have increased further in 2006, partly due to increased strike activity. Unforeseen disruptions have reduced our forecast production by 7%.

In 2007, we expect strike losses to be less than those of 2006, because unions appear to be settling new labor contracts without strike action in the wake of the settlement at Escondida. We have reduced the disruption allowance to 5%. (i.e. a "normal" disruption level is around 3% of capacity).

For the out years of our forecast, limited scheduled increases will push the market into deficit. However, if more projects are committed in the next few years, this will contribute to a continuing surplus.

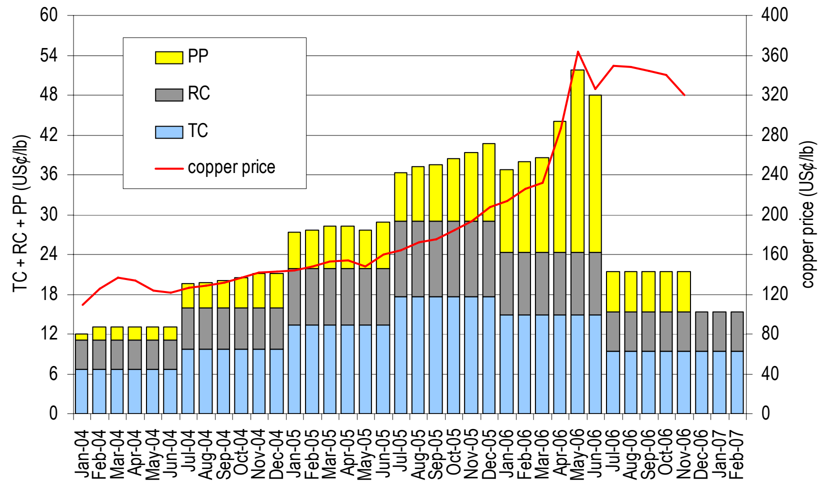
Concentrate markets – smelter terms under extreme pressure

Persisting tightness in the concentrate market is expected to put TC/RCs under continuing pressure.

Recent half-year benchmark contracts were settled at US$60/t, 6¢/lb — with price participation reduced to a maximum of 6¢/lb. At current copper prices, this reduces TC/RC and PP from US48¢/lb to 21¢ (Winners & Losers on Copper Price Participation, October 2006).

Post PP blues: Looks like 2007 will be a grim year for copper smelters

Figure 26. Copper Treatment & Refining Charges +/- Price Participation



Source: Citigroup Investment Research.

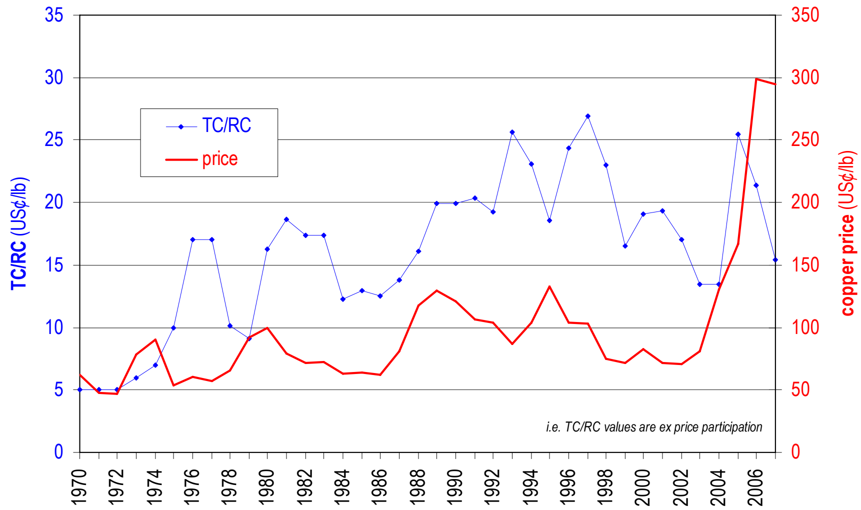
Negotiations of calendar year contracts are under way and will result in further pressure on smelters. Settlements between BHP Billiton and China's smelters and LS-Nikko Metals in Korea, have been agreed at US$60/t and 6¢/lb (equivalent to 5¢/lb combined) with no price participation.

The LS-Nikko settlement is particularly notable; as it is a member of the Pan Pacific consortium, it is likely to form the Japanese benchmark.

These agreements take TC/RCs to their lowest since the mid-1980s.

TC/RCs are reverting to mid1980s levels

Figure 27. Annual Copper TC/RCs



Source: Citigroup Investment Research.

In addition a number of 10-year price-sharing contracts (75% to the miner, 25% to the smelter) expire in coming months and these are expected to be renewed as a TC/RC structure — this would make the smelters' life even more miserable.

Pricing outlook

Our expectations are for slower global demand growth in 2007 than in our previous forecast. As a consequence, we now expect a modest surplus in 2007, a larger surplus in 2008 and a return to deficit in 2010.

We also expect continued weakness in prices to prevail through late 2006 and into the first half of 2007, as US demand softens further. Beyond this, a recovery in US demand will allow prices to recover. We also forecast stronger consumer offtake in China to further support prices.

Risks

Key sources of positive risk are stronger than expected recovery in demand, especially in China, and greater than expected supply disruptions. Downside risks centre on the global economic environment and the potential for withdrawal of investment funds supporting markets.

Global Outlook: Alumina & Aluminum

Aluminum smelter capacity constraints

Sentiment toward the aluminum complex has deteriorated in recent months, driven by increased alumina production and easier power availability in China, allowing increased aluminum production contributing to an aluminum surplus.

We are not so bearish. The global alumina market is expected to move into large surplus in 2007. But the global aluminum market remains tight, driven by smelter capacity constraints and strong demand growth. Despite that, however, aluminum inventories do not approach the acutely tight conditions which are already present in copper and nickel.

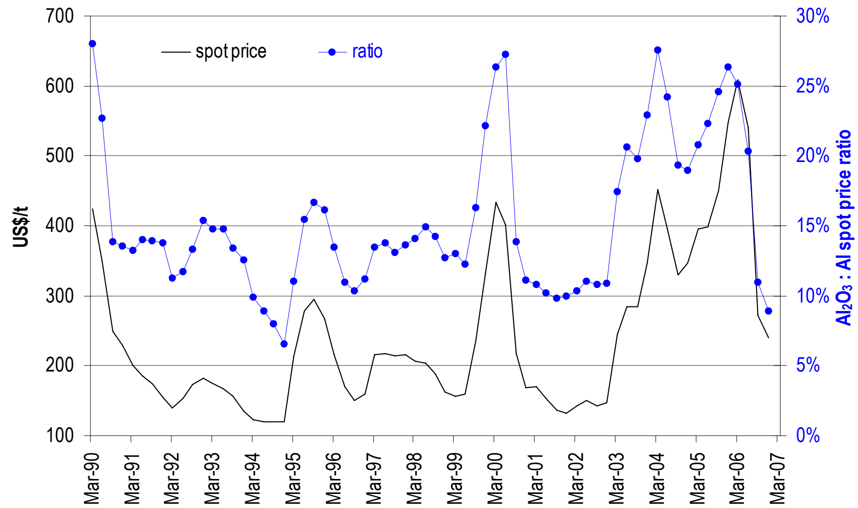
Alumina

Spot price meltdown

The alumina spot price has collapsed in response to increasing supply from China.

Spot prices have collapsed and the spot alumina:aluminium ratio has fallen to 10%

Figure 28. Alumina Spot Price

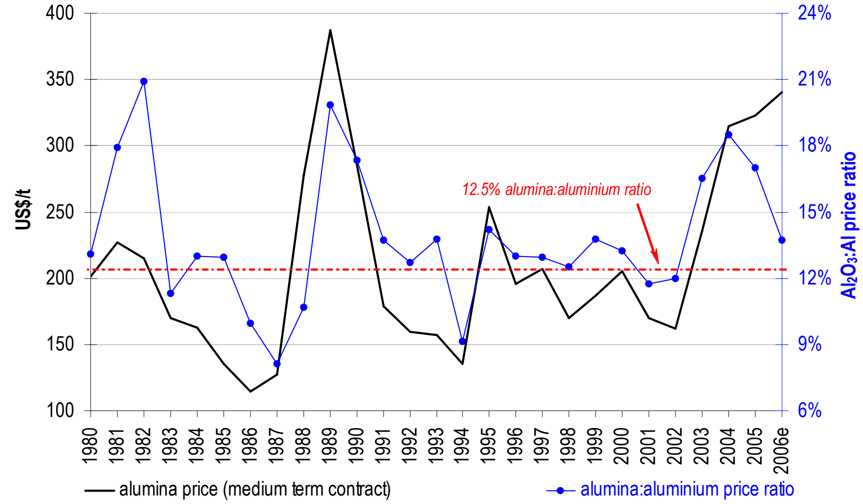


Source: CRU, Press Reports

The outlook for contract prices is also uncertain. However, the linkage rate for medium-term contracts has fallen below the critical 12.5% only twice since 1980 — during the mid-1980s and the early 1990s — both periods of extreme depression in the aluminum market.

We believe it is unlikely therefore that this critical level will be breached in the current environment.

Figure 29. Alumina Price — Medium-Term Contract



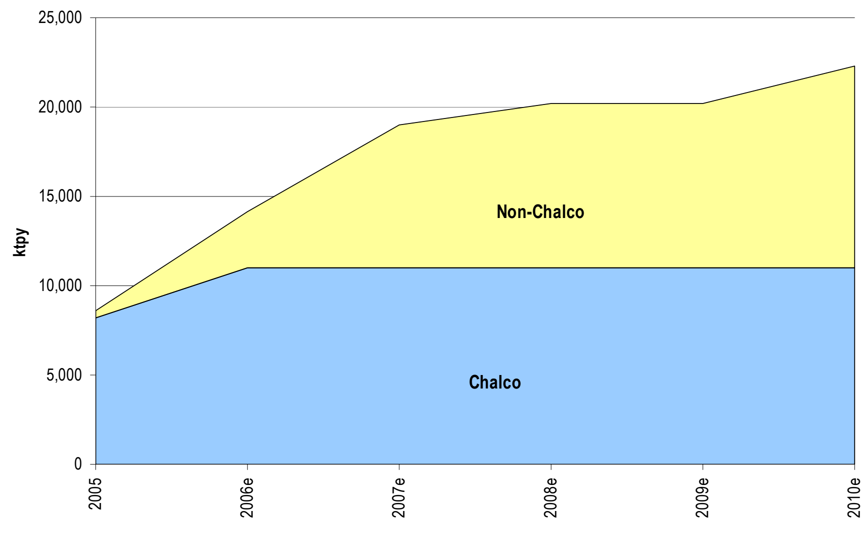
Source: CRU

China's capacity growth

Capacity is scheduled to reach 20Mt by 2008, up from 8.6Mt in 2005. By 2010 half of Chinese refinery capacity will be outside the Chalco group. This is despite postponement of a number of projects following the collapse in prices.

By 2010, half of China's refinery capacity will be outside Chalco's group

Figure 30. China's Alumina Refinery Capacity



Source: CRU and Citigroup Investment Research

But China's new capacity is only marginally economic

The cash operating costs of the new capacity are estimated as follows:

- Using tri-hydrate bauxite imported from Indonesia US$200-250/t. Of this bauxite costs account for around 50%.
- Using domestic bauxite US$180-200.

But the prices of caustic and power are falling, so perhaps the new plants will remain cash positive at spot alumina prices as low as US$180/t. Also, capacity which is integrated will be cross-subsidized from the smelter.

Although the operating costs of Chinese smelters are not low, capital costs are. Capex costs of low-pressure capacity are believed to be US$500-600/t; high-pressure plants US$600-850. Current estimates of western costs are US$800-1000/t for brownfield, low temperature capacity.

Refineries outside China – also under pressure

High-cost refineries elsewhere in the world that are also exposed to spot alumina prices are now feeling the pinch. Ormet announced the closure of the Burnside USA plant (500ktpy). Point Comfort is another possible closure candidate.

Our projections of large surpluses from 2008 imply further closures and cancellations of projects.

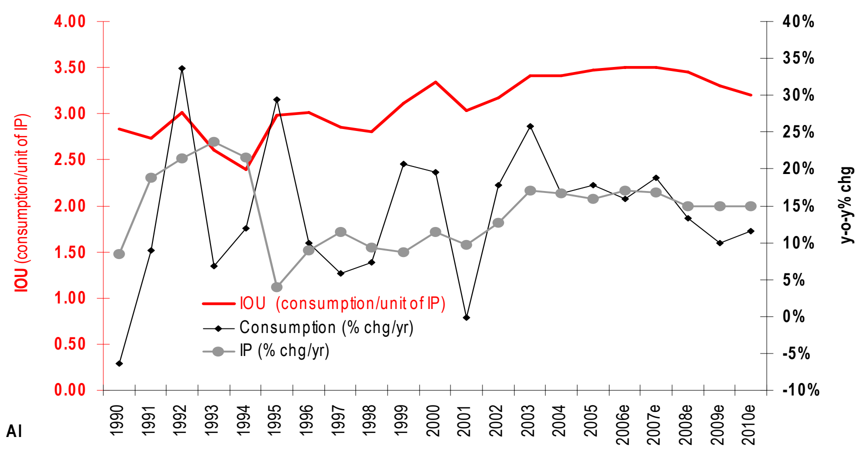
Aluminum

China

The outlook for aluminum hinges on developments in China, just as in alumina. Demand there is growing at around 20% a year. Aluminum demand is a beneficiary of substitution of copper, and overhead power transmission systems are an important source of growth.

Aluminum IOU will slow only modestly, compared with copper

Figure 31. China's Aluminum Consumption



Source: CRU and Citigroup Investment Research

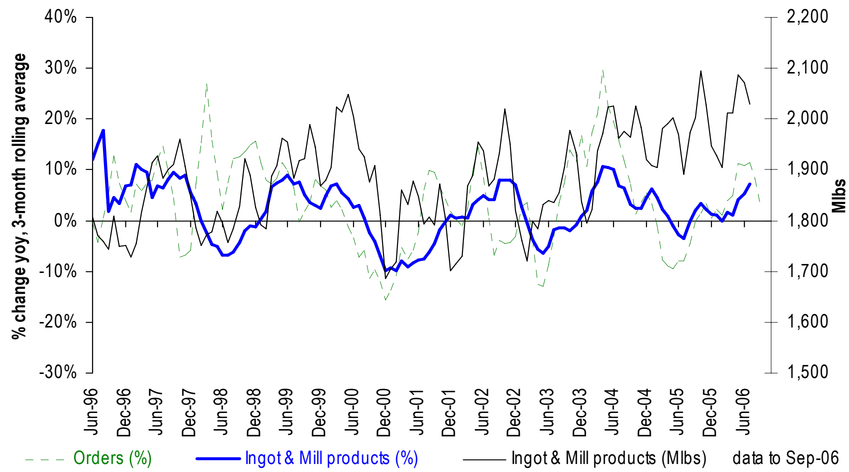
China's aluminum production is increasing, but our forecasts do not point to China becoming a sustained exporter.

US

In the US, the first signs of softening in demand are appearing in the data. Weakness in orders and shipments reflects a slowdown in housing and autos.

Orders and shipments have dipped – as housing and auto demand falls

Figure 32. US Aluminum Orders & Shipments



Source: Aluminium Assn.

But we expect the US economic slowdown to be short-lived, and not to spread into a broader-based weakness in consumer confidence. Therefore, weakness in aluminum demand may last 3-6 months, not a prolonged slowdown.

In the auto sector, automobile production is slowing, but truck and trailer demand remains good.

Smelter production

Globally the aluminum market will be smelter capacity-constrained, despite restarts.

In China, capacity is increasing, but as this will be matched by demand growth there, we do not expect China to become a sustained exporter.

In Europe, closures are still set to predominate, but even here some scheduled closures have been postponed.

In the US, however, the combination of high prices, lower alumina prices and easier power tariffs could allow the restart of up to 1.2Mtpy of idled capacity, which would be more than sufficient to cause a surplus.

Figure 33. Alumina & Aluminium Summary

WORLD Al_2O_3 & Al Supply-Demand Balance				Current Al Price:	US¢/lb		125.2
kt	2004	2005	2006e	2007e	2008e	2009e	2010e
Alumina							
Production Capacity	67,463	70,977	80,928	88,133	94,198	97,348	98,398
Capacity utilization (%)	93%	94%	95%	94%	94%	94%	94%
Production	62,534	66,482	72,155	79,459	85,696	90,027	92,001
Consumption Met Grade	58,347	61,156	64,843	70,098	73,676	77,132	80,964
Consumption Non-Met Grade	5,232	5,721	6,290	6,337	6,440	6,472	6,472
Consumption Total	63,579	66,877	71,133	76,435	80,116	83,604	87,436
Surplus/Deficit	**-1,045**	**-395**	**1,022**	**3,024**	**5,579**	**6,423**	**4,565**
Estimated Stocks	6,658	6,263	7,285	10,308	15,888	22,311	26,876
Aluminium							
Smelter Capacity ktpy	34,323	36,669	38,906	40,100	41,153	43,006	45,334
Refined Production	29,922	32,002	33,253	35,948	37,783	39,555	41,520
Capacity Utilization (%)	91%	90%	88%	91%	93%	94%	94%
Supply Incr (%)	6.9%	7.0%	3.9%	8.1%	5.1%	4.7%	5.0%
Consumption/Demand	29,865	31,607	33,638	35,766	37,831	39,673	41,833
Consumption Incr. (%)	8.3%	5.8%	6.4%	6.3%	5.8%	4.9%	5.4%
Surplus	56	395	-385	182	-49	-118	-313
Stocks	3,033	3,011	2,626	2,808	2,759	2,641	2,328
Stock Change	**-639**	**-22**	**-385**	**182**	**-49**	**-118**	**-313**
Stocks (weeks)	5.3	5.0	4.1	4.1	3.8	3.5	2.9
Price (US¢/lb)	77	86	116	108	100	110	90

CHINA - Supply Demand Balance							
kt	2004	2005	2006e	2007e	2008e	2009e	2010e
Alumina Prodn	7,024	8,510	13,088	16,572	19,600	20,203	21,254
Capacity Utiln. (%)	99.8%	108.7%	115.0%	100.0%	100.0%	100.0%	100.0%
Alumina Demand	13,378	15,612	18,352	20,640	21,057	22,977	24,512
Alumina Imports	6,015	7,001	6,301	4,067	1,457	2,774	3,258
Alumina Import Requirement	6,354	7,102	5,263	4,067	1,457	2,774	3,258
Apparent Stock Change	-339	-101	1,037				
Aluminium Smelter Capacity	8,959	10,392	11,988	12,294	12,479	13,051	14,185
Aluminium Smelter Prodn	6,689	7,806	9,176	10,320	10,529	11,489	12,256
Smelter Utilizn (%)	86%	81%	82%	85%	85%	90%	90%
Aluminium Consumption	6,043	7,119	8,257	9,812	11,122	12,235	13,643
Aluminium Consumption (%/yr)	16.7%	17.8%	16.0%	18.8%	13.4%	10.0%	11.5%
Aluminium Surplus/Deficit	646	687	919	508	-594	-746	-1,387
Aluminium Exports to West	1,259	1,295	1,110				
Aluminium Imports from West	445	304	217				
Aluminium Net Exports	814	991	893				

Source: WBMS, CRU, LME, Citigroup Investment Research

Consumption Forecast by Country

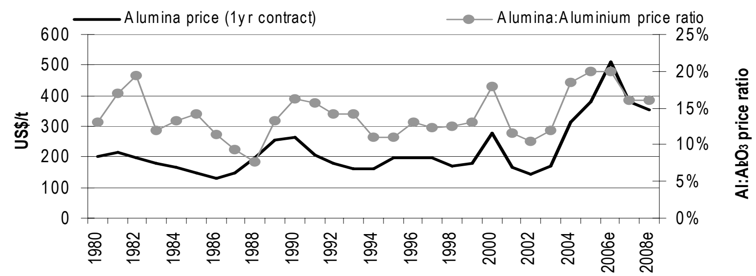
(% ch yoy)	2004	2005	2006e	2007e	2008e	2009e	2010e
World	8.3%	5.8%	6.4%	6.3%	5.8%	4.9%	5.4%
USA	2.3%	5.4%	2.5%	1.5%	3.3%	2.5%	2.5%
Japan	3.7%	-1.8%	0.8%	-2.0%	0.0%	0.0%	0.0%
Europe	3.1%	-1.3%	1.9%	2.0%	2.0%	2.0%	2.0%
China	16.7%	17.8%	16.0%	18.8%	13.4%	10.0%	11.5%
Korea	13.9%	7.4%	-2.2%	5.0%	5.0%	5.0%	5.0%

Source: WBMS; CRU; Citigroup Investment Research

Key points

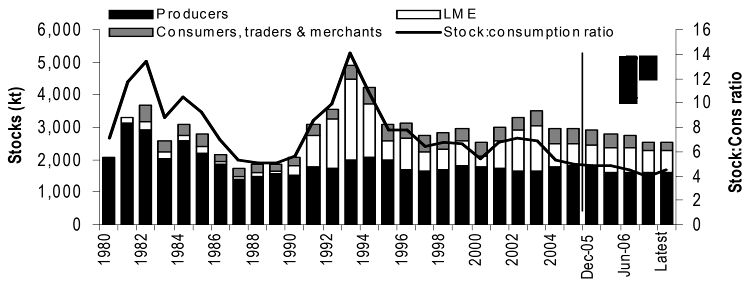
- China's growing alumina production has caused the spot price to collapse
- The global alumina market will move into surplus in 2007
- deficits post-2007 reflect smelter capacity constraints

Alumina Price & the Al:Al_2O_3 price ratio



Source: WBMS; LME; Citigroup Investment Research

World Primary Stocks



Source: WBMS; LME; Citigroup Investment Research

Figure 34. Copper Summary

WORLD COPPER Supply Demand Balance — Current Price: US¢/lb 315.9

kt	2004	2005	2006e	2007e	2008e	2009e	2010e
Mine Production (Concentrates)	11,999	12,279	12,284	12,944	13,841	14,668	15,161
Concentrate Stock	169	151	150	100	50	0	0
Concentrate Stock Change	56	-18	-1	-50	-50	-50	0
remains strong	11,944	12,297	12,285	12,994	13,891	14,718	15,161
Secondary Supply etc. (incl losses)	292	449	1,058	940	1,013	758	932
Smelter Capacity	15,243	16,142	17,106	17,638	18,629	19,107	19,389
Smelter Production	12,236	12,746	13,343	13,934	14,903	15,477	16,093
Smelter Utilization (%)	80.3%	79.0%	78.0%	79.0%	80.0%	81.0%	83.0%
Mine Production (Electrowon)	2,713	2,760	3,063	3,457	3,731	3,860	3,685
High Grade Scrap	904	1,060	1,150	1,000	1,000	1,000	1,000
Mine Production (Total)	14,712	15,039	15,347	16,401	17,572	18,528	18,846
Refined Production (Total)	15,853	16,566	17,556	18,391	19,634	20,337	20,778
% Change	4.0%	4.5%	6.0%	4.8%	6.8%	3.6%	2.2%
Consumption	16,726	16,668	17,615	18,296	19,350	20,114	20,965
Consumption (%)	8.9%	-0.3%	5.7%	3.9%	5.8%	3.9%	4.2%
Surplus	-873	-102	-59	95	284	223	-187
Stock Change	**-693**	**19**	**-59**	**95**	**284**	**223**	**-187**
Stocks	519	537	478	573	857	1,080	893
Stock:Consumption Ratio (wks)	1.6	1.7	1.4	1.6	2.3	2.8	2.2
Price (US¢/lb)	130	167	306	295	250	150	250

CHINA - Supply Demand Balance

kt	2004	2005	2006e	2007e	2008e	2009e	2010e
Mine Production	742	651	678	705	733	762	793
Refined Production	2,199	2,583	2,919	2,893	3,400	3,800	0
Consumption	3,364	3,639	3,781	4,129	4,748	5,079	5,549
Consumption (%/yr)	9.1%	8.2%	3.9%	9.2%	15.0%	7.0%	9.2%
Conc+Scrap Surplus/Deficit	-1,457	-1,932	-2,241	-2,188	-2,667	-3,038	793
Metal Surplus/Deficit	-1,165	-1,056	-862	-1,236	-1,348	-1,279	-5,549
East West Trade - China Imports							
Concentrates	652	1,094	949				
Blister	48	52	35				
Metal	888	866	504				
Scrap etc.	1,034	975	1,615				
Cu units Import Demand	2,622	2,988	3,104				

Source: WBMS, LME, CRU, Citigroup Investment Research

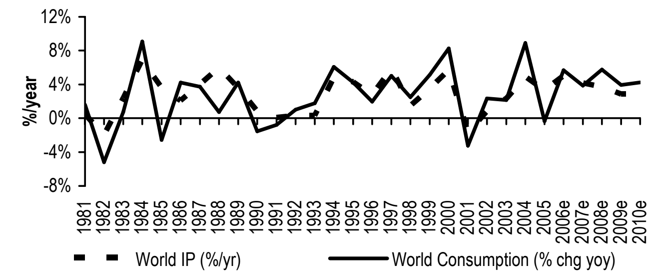
Key points

- Slower demand growth and fewer supply disruptions produce a small surplus in 2007

- Substitution is emerging as an important structural threat

- US demand is slowing, particulalrly housing, but is expected to recover in 2007

World - Consumption & IP



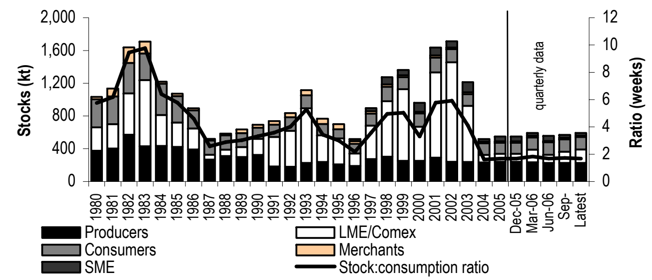
Source: Datastream; Citigroup Investment Research

Consumption Forecast by Country

(% ch yoy)	2004	2005	2006e	2007e	2008e	2009e	2010e
World	8.9%	-0.3%	5.7%	3.9%	5.8%	3.9%	4.2%
USA	5.2%	-5.8%	2.0%	0.0%	3.2%	2.3%	
Japan	6.3%	-3.9%	0.5%	2.6%	2.5%	2.8%	
Europe	6.0%	-6.7%	15.0%	2.0%	2.0%	2.0%	
China	9.1%	8.2%	3.9%	9.2%	15.0%	7.0%	9.2%
Korea	4.3%	-9.3%	-2.0%	3.0%	5.0%	5.0%	

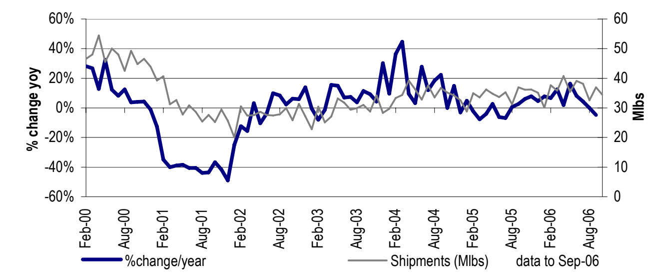
Source: WBMS; Citigroup Investment Research

World Stocks



Source: WBMS; LME; Citigroup Investment Research

Copper and Copper Alloys Service Centre Shipments - USA



Source: Copper & Brass Service Center Association

Paul Chanin
+65 6432 1153

Quant view: Attractive

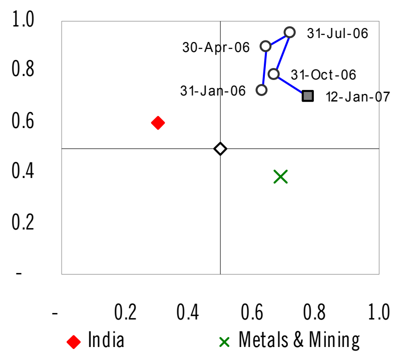
Relatively cheap valuations and strong momentum put Hindalco in the Attractive quadrant of our value/momentum map. Trading at 11x trailing EPS with moderate trend earnings of 20%, the stock looks relatively cheap. On the momentum front, price momentum has been declining since April 2006. Earnings estimate revisions, which have historically been volatile, stay positive for the fourth month and offsets negative long-term price momentum.

The stock currently ranks better than the Indian market and the Metals & Mining sector on both valuations and momentum. Risk analysis indicates a positive exposure to growth, small-cap outperformance when Asian interest rates fall and both regional and local equity markets rise.

Rader Screen Quadrant Definitions

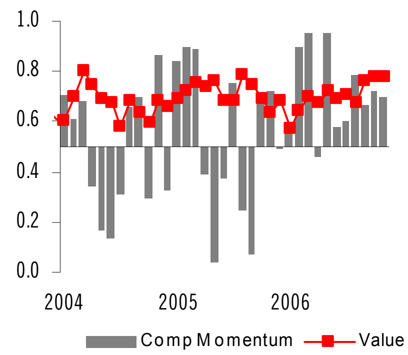
Glamor *Poor relative value but superior relative momentum*	**Attractive** *Superior relative value and superior relative momentum*
Unattractive *Poor relative value and poor relative momentum*	**Contrarian** *Superior relative value but poor relative momentum*

Figure 35. Radar Quadrant Chart History



Source: Citigroup Investment Research

Figure 36. Radar Valuation Momentum Ranks



Source: Citigroup Investment Research

Figure 37. Radar Model Inputs

IBES EPS (Actual and Estimates)

FY(-2)	8.56	Implied Trend Growth % (3+2)	20.4
FY(-1)	13.03	Trailing PE (x)	10.7
FY0	16.02	Implied Cost of Debt (%)	5.61
FY1	22.87	StdMktCap	(0.08)
FY2	20.07		

Source: Worldscope, I/B/E/S

Figure 38. Macro Sensitivity

Region	1.78	Commodity ex Oil	0.69
Local Market	1.33	Rising Oil Prices	0.01
Sector	0.77	Rising Asian IR's	(0.44)
Growth Outperforms Value	0.64	Rising EM Yields	(0.09)
SmallCaps Outperform LargeCaps	0.65	Stronger US$ (vs Asia)	2.22
Widening US Credit Spreads	0.03	Weaker ¥ (vs US$)	0.25

Source: Citigroup Investment Research

Hindalco Industries

Company description

Hindalco is a low-cost integrated aluminum producer (455,000 tpa) with access to captive power and bauxite. It also operates India's largest copper smelter (500,000 tpa). The aluminum division accounted for 52% of FY06 sales and 99% of EBIT. In aluminum, Hindalco has a strong domestic market share; and after its acquisition of Indian Aluminium from Alcan, it now has a dominant 60-65% market share in sheet products. Hindalco's 1:4 rights issue of Rs22.2 bn (US$500m) in FY06 will part finance quadrupling of its alumina capacity (currently 1.1m tpa) and tripling of its aluminum capacity (capacity 455,000 tpa) in the next 4-5 years. Hindalco's copper smelter was acquired from associate company, Indo Gulf in 2002. The smelter had an original capacity of 100,000 tpa but has just been expanded to 500,000 tpa. Hindalco has a domestic market share of 35-40% in copper. Hindalco owns some copper mines, which meet 15-20% of its requirement when fully ramped up.

Investment thesis

We rate Hindalco as Sell/Medium Risk (3M) with a target price of Rs174. The key reason for our Sell rating is the downside we expect in FY08-09 for copper and aluminum. In copper, TC/RC margins averaged US37c/lb in 1H FY07, largely benefiting from higher copper prices and price participation. But these are already trending down (spot TC/RC is US11-13c/lb) and are expected to average US15c/lb in FY08 and FY09 due to a shortage of copper concentrates. For a copper smelter like Hindalco, profits are determined largely by TC/RCs rather than copper prices. For aluminum, we expect average prices to decline 12% yoy in FY08 to US$2,287/t and remain around that level in FY09. Hindalco's share price has generally moved in line with international aluminum prices, and based on the trends forecast by us, we expect the stock to trade in a narrow band over the next year, and is unlikely to outperform the BSE-30 Index.

Valuation

Our target price of Rs174 is based on: (1) 8x FY08E earnings (Rs162); and (2) the value of Hindalco’s investment holding in associate companies, which is discounted by 25%. We use P/E because stocks such as Hindalco are largely driven by commodity price tends, which translate into earnings momentum. The steady increase in international aluminum prices since October 2002 has led to a steady appreciation in Hindalco's share price and a gradual rerating of the stock, which now largely trades between P/Es of 7x and 9x. Based on our outlook of falling international prices in aluminum and substantial declines in copper TC/RCs, we expect the stock to continue to trade in the middle of this range: (1) This appears justified given its business mix and limited upside risk to earnings based on our sensitivity analysis. (2) The stock does not appear cheap compared with its Indian and international peers. Another useful valuation measure for Hindalco is EV/EBITDA. In the past seven years the stock has traded in an EV/EBITDA band of 4-6x. Based on our outlook for the two commodities, we believe that Hindalco will trade in the middle of this range. At our target price of Rs174 the stock would trade at 5.1x FY08E EV/EBITDA, and at a discount of 13-18% to global peers on P/E and in line with peers such as Alcan and Alcoa on EV/EBITDA for CY07E.

Risks

We rate Hindalco as Medium Risk based on our quantitative risk-rating system, which tracks 260-day historical share price volatility. Possible upside risks to our target price include: (1) commodity prices (aluminum and alumina) surpassing our forecasts; (2) copper TC/RC margins exceeding our forecasts; (3) depreciation in the rupee versus our forecast of an appreciating rupee in FY08 and FY09; and (4) acquisition of copper mines at reasonable valuations. Possible downside risks to our target price include: (1) Reduction in import duties from 7.5% for aluminum and a reduction in the differential duty of 5.5% for copper (between copper ore and cathode); (2) delays in the implementation of ongoing expansions of alumina (at Muri, West Bengal), aluminum and power (at Hirakud in Orissa); (3) Shutdowns at the copper smelter due to technical factors; and (4) power disruption at the aluminum plants resulting in a forced shutdown.

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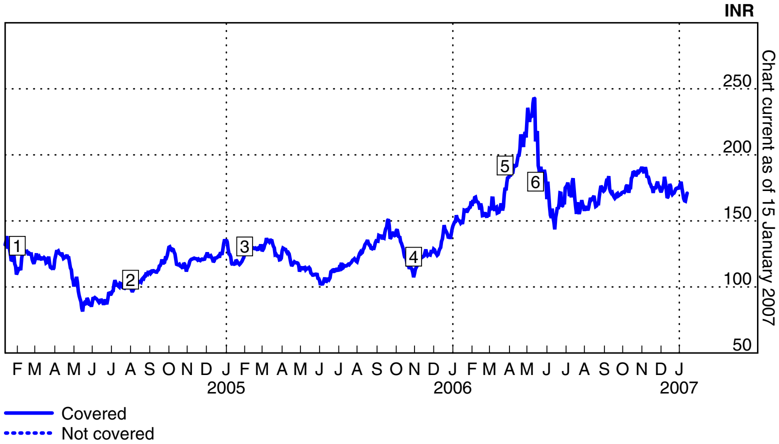
IMPORTANT DISCLOSURES

Hindalco Industries Ltd (HALC.BO)
Ratings and Target Price History - Fundamental Research



#	Date	Rating	Target Price	Closing Price
1:	2 Feb 04	1L	*150.71	NA
2:	2 Aug 04	1L	*139.42	100.36
3:	1 Feb 05	1L	*150.14	125.24
4:	30 Oct 05	1L	*146.75	107.33
5:	26 Mar 06	1L	*196.00	175.15
6:	14 May 06	1L	*278.00	210.15

*Indicates change.

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