UBS

UBS Investment Research

Hindalco Industries

Emerging aluminium major

■ Emerging global major with forward and backward linkages

Hindalco is an integrated aluminium player with significant downstream and upstream expansion plans in place. The company has backward linkages to raw materials and forward linkages in developed markets with downstream assets from Novelis, the worlds' leading aluminium rolled producer.

■ Least cost producer

Hindalco has backward linkages to high-quality bauxite and thermal coal deposits, along with low-cost fabrication and manpower that enable its operations to be at the top quartiles of aluminium cash cost tables. Brownfield and greenfield expansions should help bring the cost of metal production down further.

■ Earnings volatile in the interim

In the near term, we believe Novelis will continue to be a drag on overall profitability as the price ceiling contracts progressively fall from over 20% of volume in 2006 to c.5% of volume in FY09E. We have used UBS commodity price assumptions for our company analysis; these assume that aluminium prices should average US$2,677 over FY08E and a higher US$3,031 in FY09E before falling to US$2,515 in FY10E.

■ Valuation: Buy rating; 12-month price target raised to Rs240

At the present market price, Hindalco's share price is at an 11% discount to core business value alone. Our price target of Rs240, previously Rs230, is based on a sum of the parts valuation of the core business, ABML, an NPV of losses from price ceiling contracts, Novelis' core business value and Hindalco's treasury investments. We assume coverage of Hindalco with a Buy rating.

Highlights (Rsm)	03/06	03/07	03/08E	03/09E	03/10E
Revenues	121,197	193,161	654,654	718,261	620,321
EBIT (UBS)	20,490	35,660	21,996	42,463	29,044
Net Income (UBS)	15,773	26,865	8,371	20,116	10,402
EPS (UBS, Rs)	16.00	25.75	7.22	17.36	8.97
Net DPS (UBS, Rs)	2.93	2.40	1.95	2.27	1.51

Profitability & Valuation	5-yr hist av.	03/07	03/08E	03/09E	03/10E
EBIT margin %	19.5	18.5	3.4	5.9	4.7
ROIC (EBIT) %	18.7	28.6	8.6	10.7	7.1
EV/EBITDA (core) x	5.5	4.9	11.3	7.6	9.5
PE (UBS) x	8.0	6.7	26.1	10.9	21.0
Net dividend yield %	2.2	1.4	1.0	1.2	0.8

Source: Company accounts, Thomson Financial, UBS estimates. (UBS) valuations are stated before goodwill, exceptionals and other special items.
Valuations: based on an average share price that year, (E): based on a share price of Rs188.65 on 07 Nov 2007 23:39 GMT

Sunita Sachdev
Analyst
Sunita.Sachdev@ubs.com
+91-22-2286 2059

Sandeep Bhatia
Business/Country Head
sandeep-za.bhatia@ubs.com
+91-22-2286 2032

Global Equity Research

India

Non-Ferrous Metals

12-month rating	Buy *
	Unchanged
12m price target	Rs240.00/US$6.11
	Prior:Rs230.00/US$5.85
Price	Rs188.65/US$4.80

RIC: HALC.BO BBG: HNDL IN

8 November 2007

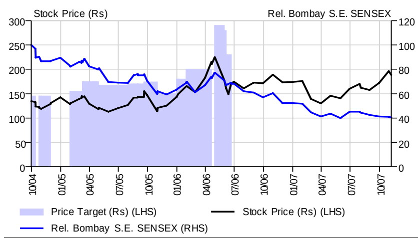
Trading data (local/US$)	
52-wk range	Rs197.95-126.90/US$5.03-2.87
Market cap.	Rs175bn/US$4.45bn
Shares o/s	928m (ORD)
Free float	51%
Avg. daily volume ('000)	1,249
Avg. daily value (Rsm)	214.5

Balance sheet data 03/08E	
Shareholders' equity	Rs147bn
P/BV (UBS)	1.5x
Net Cash (debt)	(Rs304bn)

Forecast returns	
Forecast price appreciation	+27.2%
Forecast dividend yield	1.0%
Forecast stock return	+28.2%
Market return assumption	12.4%
Forecast excess return	+15.8%

EPS (UBS, Rs)	03/08E			03/07
	From	To	Cons.	Actual
Q1E	-	-	-	-
Q2E	-	-	-	-
Q3E	-	-	-	-
Q4E	-	-	-	-
03/08E	28.69	7.22	-	
03/09E	-	17.36	-	

Performance (Rs)



Source: UBS

www.ubs.com/investmentresearch

Aluminium business

Table 1: Aluminium tonnages and revenues

Sales (tonnes)	FY07	FY08E	FY09E	FY10E
Alumina	299,762	470,584	478,354	451,744
Aluminium	137,975	153,954	173,244	194,804
Rods	69,067	69,552	69,552	69,552
Rolled	170,467	180,295	180,295	180,295
Extruded	38,480	41,550	41,550	41,550
Foils	25,366	25,850	25,850	25,850
Wheels (pcs.)	188,772	180,000	180,000	180,000
Sales (Rsm)				
Alumina	7,317	8,142	8,444	7,164
Aluminium	17,227	17,632	21,452	20,289
Rods	9,150	8,444	9,129	7,679
Rolled	25,462	25,605	26,790	22,909
Extruded	6,135	6,186	6,585	5,539
Foils	5,430	5,033	5,441	4,577
Wheels (pcs.)	403	360	360	360
Net sales	71,124	71,403	78,202	68,517

Source: Company data, UBS estimates

The aluminium business is adding brownfield capacity through FY08E

Hindalco has augmented its Hirakud smelter and captive power capacities from 65,000tpa to 100,000tpa and power by adding incremental 67.5MW in H1FY08. We expect another 43,000tpa argumentation in smelting capacity and another 100MW power capacity to be completed by end-FY08E, taking the Hirakud smelter to 143,000tpa.

Capacity at the Muri refinery has been expanded from 110,000tpa to 450,000tpa, effectively making Hindalco long alumina despite the Hirakud expansion. We estimate Hindalco's capital expenditure in FY08 at Rs19.5bn for both locations.

This should enable 18.9% volume growth in the alumina business between FY07-09E and a 10.8% volume growth in the primary aluminium business (ex Novelis) in FY07-FY09E.

Renukoot operates at the least cost quartile for aluminium

Hindalco's Renukoot and Hirakud smelters are backwardly linked and operate at US$1,069-1,349 cash cost (according to Brookhunt), which places Renukoot in the least cost quartile within the aluminium cost curve. The Hirakud smelter is in the process of changing its technology from the old Söderberg technology to the new Pre-bake pots. This should bring down the cost at Hirkud to the US$1,000-1,050 level. This brownfield expansion should produce high operating efficiencies and are key drivers for Hindalco's profitability.

Table 2: Brook hunt's aluminium cost tables for aluminium smelters in India

Rank	Name	Country	Production (kt/a)	% Lower	Centile	Average Delivered Alumina Cost (US$/t)	Other Raw Materials Cost (US$/t)	Total Energy Cost (US$/t)	Labour Cost (US$/t)	Total Other Costs (US$/t)	Cash Cost (C1) (US$/t)
13	Renukoot	India	334	16.8	1.2	426	118	393	45	88	1,069
16	Angul	India	316	20.9	1.2	314	129	410	63	168	1,084
66	Hirakud	India	65	60.5	0.2	430	155	555	98	111	1,349
127	Korba (S)	India	99	91.4	0.4	585	226	570	131	135	1,647
108	Mettur Dam	India	33	84.5	0.1	408	204	685	98	133	1,528

Source: Brookhunt

Greenfield projects gathering momentum

Table 3: Capacity in the aluminium segment

Capacity (tonnes)	FY07	FY08E	FY09E	FY10E	FY11E	FY12E	FY13E	FY14E	FY15E
Alumina	1,160,000	1,500,000	1,500,000	1,500,000	3,000,000	4,500,000	4,500,000	4,500,000	4,500,000
Aluminium	461,000	496,000	539,000	539,000	718,000	1,255,000	1,613,000	1,613,000	1,613,000

Source: Company data, UBS estimates

In our opinion, Hindalco now has the necessary government approvals in place to actively gather momentum around its greenfield projects. This should help maintain Hindalco's leadership position in the domestic market.

Utkal Alumina: a much-delayed project due to the change in the joint venture associates. However, Hindalco has purchased Alcan's 45% stake in the JV, effectively making it a 100% subsidiary.

Utkal Alumina will be a 1.5 Mtpa alumina facility—expected commissioning in FY11

Utkal Alumina will have a rated capacity of 1.5 Mtpa and expects to be commissioned around March 2010. Along with the refinery, the company intends to set up a 90MW integrated power plant (IPP). The project has also received clearance to mine 100 MT of captive bauxite ore and Hindalco expects to get allotted another 50MT of bauxite ore in the vicinity.

Aditya Aluminium: this project includes a 1.5Mtpa alumina refinery, along with a 90MW IPP for the refinery and a 325,000tpa aluminium smelter with a 750MW IPP. Hindalco has been allotted coal blocks (15% stake) along with Mahanadi Coalfields Ltd (70%) and Neyvelli Lignite (15% stake) in the Talabira I and II. They will be jointly developed for captive consumption. Bauxite mining rights have been received, and the ore body is estimated at 200MT of high quality bauxite ore.

Aditya Aluminium—1.5 Mtpa alumina refinery and a 325ktpa aluminium smelter—expected commissioning in FY12

Hindalco expects Aditya Aluminium's aluminium smelter to come on stream by April 2011, and its alumina refinery to start commissioning from October 2011.

Table 4: Summary of brownfield and greenfield expansions

Items	Unit	From	To	Expected Completion/Status
Brownfield				
Alumina refining				
Muri	MT	110,000	450,000	Q4FY08
Hirakud Smelter	MT	100,000	143,000	Q4FY08
Hirakud Power	MW	268	368	Q4FY08
Greenfield				
Utkal Alumina Refinery	MT	-	1,500,000	Allotted bauxite blocks FY11
Aditya Aluminium				
Alumina Refinery	MT	-	1,500,000	Allotted bauxite blocks -FY12
Aluminium Smelter	MT	-	325,000	Awaiting govt. approval -FY12
Power	MW	-	750	Allotted coal blocks (15% stake)
Mahan				
Aluminium Smelter	MT	-	325,000	Allotted bauxite blocks -FY12
Power	MW	-	750	Formed 50: 50 JV with Essar Power for coal mining
Lathehar				
Aluminium Smelter	MT	-	325,000	Awaiting govt. approval -FY13
Power	MW	-	750	Coal block expected to be allotted soon.

Source: Company data

Mahan project: Hindalco's second greenfield aluminium smelter will be located at Mahan. Hindalco was allocated a coal block along with the Essar group. Coal for the IPP will be mined through this joint venture, called Mahan Coal Company Ltd. Hindalco will set up another 325,000ktpa aluminium smelter with a 750MW captive power plant.

This project is expected to be commissioned from October 2011 (mid FY12).

Mahan & Lathehar—both 325ktpa aluminium smelters—expected to be commissioned in FY12E and FY13E, respectively.

Lathehar project (Madhya Pradesh): Hindalco's third aluminium smelter has 325,000ktpa and a 750MW IPP, and is close to the allotted coal mine in the area. The development of the coal mine is in the final stages and various environmental clearances are under way. Hindalco expects this project to start commissioning from April 2012.

Hindalco expects both the Aditya and the Mahan projects to be allocated SEZ status, which would entitle them to tax concessions.

We estimate Hindalco will need to spend Rs318bn (US$8.2bn) for these greenfield expansions.

Copper business

Table 5: Summary of copper business tonnage, revenues

Sales (tonnes)	FY07	FY08E	FY09E	FY10E
- Copper rods	109,700	136,080	136,080	136,080
Of this, exports	65,000	40,824	40,824	40,824
- Copper cathodes	181,093	213,920	263,920	263,920
Of this, exports	210,000	149,744	184,744	184,744
- Total domestic sales	15,793	159,432	174,432	174,432
- Sulphuric Acid	559,033	584,500	584,500	584,500
- DAP/ NPK	220,935	140,000	140,000	140,000
- Gold	10.5	12.6	14.4	14.4
- Silver	48.7	58.7	67.1	67.1
Sales (Rsm)				
- Copper rods	35,603	45,897	35,389	25,159
- Copper cathodes	57,357	68,335	64,740	45,690
- Sulphuric Acid	484	964	585	585
- DAP/ NPK	3,481	1,960	2,240	2,240
- Gold	9,438	11,587	13,585	11,342
- Silver	893	1,063	1,260	1,028
Total	107,256	129,806	117,798	86,043

Source: Company data, UBS estimates

The copper business is facing operational issues as well as an unfavourable TCRC environment

The custom smelting copper business has had a disappointing performance due to the weak treatment cost refining cost (TCRC) market and cut in duty protection. Operational factors have compounded the situation, with the business with Copper-II smelters not performing optimally due to refractory lining problems. Hindalco took an impairment charge on account of Copper-II in Q2FY07.

The Copper-III smelter was commissioned in July 2005 and should drive volumes from FY08-09E.

However, given our weaker outlook on copper TCRC and Hindalco's non-integrated operations, we expect copper EBITDA to grow 11% in FY08E over FY07 levels.

ABML (Aditya Birla Minerals Ltd)

UBS covers ABML

Hindalco's 51%-owned subsidiary in Australia—Aditya Birla Minerals Ltd (ABML)—supplies c. 20-22% of Hindalco's copper requirement. ABML is covered by our mining team in Australia, and we have used their price target to value Hindalco's stake in the subsidiary.

Stand-alone Hindalco financials

Profit & loss

Stand-alone Hindalco financials for clarity

Hindalco's stand-alone operations capture the aluminium and copper businesses. We expect the operations to grow revenues 13% in FY08E. Thereafter, revenues should decline 2% and 21% in FY09E and FY10E, respectively. EBITDA margins should expand from 17% in FY08E to 19% in FY09E.

Table 6: Hindalco's profit & loss statement

Particulars (Rs m)	FY07	FY08E	FY09E	FY10E
Gross Revenues	199,201	225,440	220,035	174,248
Excise duty	16,071	17,363	17,707	14,592
Net Revenue	183,130	208,076	202,328	159,656
EBITDA	40,150	35,492	38,719	24,825
EBITDA Margin (%)	22%	17%	19%	16%
EBIT	33,769	28,410	30,902	16,632
EBIT margin (%)	18%	14%	15%	10%
PBT (pre exceptional)	35,046	29,909	33,738	19,674
Provision for tax	9,403	8,375	9,447	5,509
PAT	25,643	21,535	24,291	14,165

Source: UBS estimates

Novelis

Novelis is the world's leading purchaser of aluminium

Novelis is the worlds' leading aluminium rolled producer. In FY07, revenue was US$11.3bn, and total aluminium rolled shipments were 3,113ktpa. Novelis has operations on four continents in 37 facilities in over 12 countries. Novelis ranks as the top supplier in Europe, Asia Pacific and South America in rolled aluminium products. In North America, Alcoa remains the top supplier, followed by Novelis.

Novelis has a strong competitive position in the rolled products business, given its global presence. Its leadership position in most geographies, long customer relationships, leading market position in segments and leading position in technology are some of its competitive advantages.

Table 7: Novelis' segment-wise market dominance

End-use market	End-use applications	Approximate market share
		Within end-use markets
Construction and Industrial	Construction	57%
	Electrical Machinery	22%
	Consumption Durables	18%
	Lithographic sheet	3%
Bevarage / Food Cans	Beverage cans	92%
	Food cans	5%
	Bottle caps	3%
Foil Products	Coverter foil	43%
	Household foil	32%
	Container foil	25%
Transportation	Automotive	39%
	Truck, Bus, Trailer	30%
	Aerospace	10%
	Marine / Rail / Other	21%

Source: Novelis

Novelis is also the worlds' largest purchaser of aluminium and a leading recycler. Novelis has long-term arrangements for metal contracts that enable it to source in a flexible and low cost manner. Novelis also recycles up to 800ktpa of aluminium annually, which accounts for c.30% of its rolled products production and helps manage costs.

Price ceiling contracts have been a drag on Novelis' profitability

Around 2004-05, Novelis entered long-term purchase agreements in ceiling price contracts wherein sales contracts provided a ceiling over which metal prices cannot be contractually passed through to its customers. This exposed Novelis to raw material price fluctuations. These sales contracts accounted for c.20% of total annual sales in 2006.

Table 8: Quantifications of losses from price ceiling contracts

Particulars	FY06	FY07	FY08E	FY09E	FY10E
Realisation of price ceiling contract sales	81,700	82,175	74,100	72,200	70,300
% premium to LME	-6%	-29%	-29%	-37%	-24%
Realisation of others	128,216	155,902	143,551	158,963	128,368
% premium to LME	47.0%	35.4%	37.5%	38.0%	38.0%
EBITDA loss on account of contract sales	28,830	45,902	22,041	14,036	-
NPV	(21,608)				

Source: UBS estimates

Management has guided that these price ceiling contracts will account for c.10% of total sales in 2007 and go down further to c.5% of sales in 2008. There will be no price ceiling contracts into FY10E, which prepares the stage for operational recovery for the company over FY10-FY11E.

We have estimated the year-wise EBITDA loss on account of fixed price contract sales. We estimate the NPV of these negative cash flows at Rs21.6bn.

Legacy debt worsened financial performance

Novelis' performance was also impacted by a large debt burden. As part of the Alcan spin-off, Novelis raised debt of US$2.9bn (adjusted for working capital), creating a new spun-off entity with a debt to EBITDA (trailing) ratio of c.5x in 2004. The company was focused on reducing debt.

However, from 2005 the aluminium cycle turned bullish, with prices increasing c.60% over 2004-07 worsening operating performance.

Hindalco, along with Novelis, now enjoys a higher degree of earnings stability

The acquisition has bought about two important changes for Hindalco:

1. Historically, Hindalco has been an integrated aluminium producer with limited downstream capability (Hindalco converts c.55% of its primary aluminium production). Downstream products witness lower volatility in prices and hence impart a degree of stability to earnings. Novelis' revenues, which are essentially pass-through of aluminium prices along with a conversion premium, have brought in some insulation to the swings of the commodity cycle, consistent with the overall strategy of adding value-added products in the revenue mix.

2. The acquisition also brings to Hindalco high-end technology, a presence in the developed markets with strong customer relationships and a globally diversified manufacturing base. The technology leap that Hindalco has achieved would under normal circumstances be very difficult to replicate in capability and scale, in our view.

Hindalco purchased Novelis at an enterprise value of US$6bn (c.33% below its replacement cost). It included US$3.5bn paid to shareholders (US$22.07 per share) and US$2.4 in existing debt. The equity infusion from Hindalco of US$450m was leveraged to cUS$3.1bn, making it a significantly levered transaction.

We have not built in any synergy benefits from the acquisition

We have not built in any meaningful synergy benefits that can accrue from this takeover. Hindalco has started making inroads into key areas of Novelis' management, where it believes Novelis can add value, eg smelting professionals and taxation experts. Overall, Hindalco has retained existing management and has not yet provided any quantifiable guidance to cost savings or improvements.

Table 9: Novelis income statement

Particulars	FY07	FY08E	FY09E	FY10E	FY11E
Net revenue (Rs m)	439,420	433,537	500,284	443,451	628,396
% premium to LME		38%	38%	38%	38%
COGS	416,454	413,744	460,870	406,203	557,701
% of net sales	94.8%	95.4%	92.1%	91.6%	88.7%
SG&A	18,035	17,341	20,011	17,738	25,136
% of net sales	4.1%	4.0%	4.0%	4.0%	4.0%
R&D	1,687	1,517	1,626	1,552	1,885
% of net sales	0.38%	0.35%	0.33%	0.35%	0.30%
EBITDA	3,244	934	17,777	17,958	43,675
EBITDA margin	0.7%	0.2%	3.6%	4.0%	7.0%
Depreciation and Amortization	10,077	10,032	9,744	9,464	9,191
Impairment	346	346	346	346	346
% of assets	11.5%	11.5%	11.5%	11.5%	11.5%
EBIT	(7,180)	(9,444)	7,687	8,149	34,137
EBIT margin	-2%	-2%	2%	2%	5%
Other income/ (loss)	(562)	(281)	(141)	250	255
Net interest expense	8,996	11,588	16,500	16,965	17,215
PBT	(16,738)	(21,313)	(8,953)	(8,567)	17,178
Provision for tax	(4,282)	(6,394)	(2,686)	(2,570)	5,153
Effective tax rate	26%	30%	30%	30%	30%
PAT	(12,456)	(14,919)	(6,267)	(5,997)	12,024

Source: Company releases, UBS estimates

1. We assume the price ceiling contracts will account for 10% of volumes in FY08E, and 5% of volumes in FY09E. We estimate the average price of these contracts at US$1,900/tonne.

2. Overall, we assume non-price ceiling contracts will generate a 38% premium to LME prices

3. Novelis has been purchasing aluminium at a c.12-13% discount to average LME price (on an average). This is includes recycled raw material. Hence we have assumed a constant discount to LME for the purchase of raw materials.

4. Novelis operates in over 12 geographies, making taxation computation complex. We have assumed a 30% effective tax rate for the company.

Consolidated financials

Table 10: Metal price assumptions

Particulars	FY04	FY05	FY06	FY07	FY08E	FY09E	FY10E
Alumina (US$/tn)	255	312	399	385	341	366	337
Aluminium (US$/tn)	1,495	1,780	2,029	2,663	2,677	3,031	2,514
Copper TCRC (c/lb)	11	12	21	20	15	14	15

Source: UBS estimates

We use UBS commodity price assumptions in our company analysis. We have assumed cost inflation in the metal price forecasts is evident from the rise in our long-term forecasts, based on pricing over the cost of production and the possible risk of a cost push from rising energy costs. However, post FY09, our long-term pricing formula comes into play. It uses the lowest cost-based incentive prices.

Profit & loss

Table 11: Profit & loss account

Particulars Rs m	FY03	FY04	FY05	FY06	FY07	FY08E	FY09E	FY10E
Revenues	64,009	82,233	101,053	121,197	193,161	654,654	718,261	620,321
Cost of goods sold	(26,967)	(32,874)	(40,623)	(58,071)	(108,980)	(434,797)	(460,031)	(368,077)
Gross profit	37,043	49,359	60,430	63,125	84,181	219,857	258,229	252,244
SGA	(25,733)	(34,944)	(42,450)	(42,636)	(48,520)	(197,861)	(215,766)	(223,201)
EBIT	11,310	14,415	17,981	20,490	35,660	21,996	42,463	29,044
Income from associates	-	-	-	-	-	-	-	-
Other investment income	2,407	2,795	2,779	2,805	4,090	4,575	6,029	6,499
Pension	-	-	-	-	-	-	-	-
Abnormal items (pre-tax)	(1,613)	(10)	(131)	23	-	-	-	-
Interest	(1,902)	(2,346)	(2,159)	(3,014)	(3,134)	(15,223)	(19,963)	(20,131)
Profit before taxes	10,202	14,854	18,470	20,304	36,616	11,348	28,530	15,412
Taxes	(3,497)	(4,880)	(5,512)	(4,402)	(9,585)	(2,531)	(7,510)	(3,800)
Profit after tax	6,704	9,975	12,958	15,902	27,031	8,817	21,020	11,613
Minorities	(48)	(40)	(110)	(106)	(166)	(445)	(904)	(1,211)
Net income	6,657	9,935	12,848	15,796	26,865	8,371	20,116	10,402
Revenue growth		28%	23%	20%	59%	239%	10%	-14%
EBIT margin	18%	18%	18%	17%	18%	3%	6%	5%
EBIT growth		27%	25%	14%	74%	-38%	93%	-32%
Net profit growth		49%	29%	23%	70%	-69%	140%	-48%

Source: Company, UBS estimates

In FY08E we have factored in flattish pricing for aluminium and lower TCRC margins over FY07. In FY09 our aluminium pricing estimates are up 13%, driven by higher demand. In FY09E we also will see volume growth as the expanded Renukoot facility will get commissioned towards the end-FY08E. We estimate aluminium revenue growth of 22% in FY09.

We expect Hindalco's copper revenue to decline 23% in FY09 over FY08, as we anticipate the TCRC environment for custom smelters to worsen. We expect Hindalco's net profit to grow 2.4x in FY09 over FY08.

Table 12: Cash flow statement

Particulars Rs m	FY03	FY04	FY05	FY06	FY07	FY08E	FY09E	FY10E
EBIT	11,310	14,415	17,981	20,490	35,660	21,996	42,463	29,044
Depreciation	3,711	5,140	6,325	7,915	7,793	18,635	19,319	19,676
Change in working cap	(7,449)	(258)	2,834	(12,319)	(3,035)	(7,374)	(16,697)	1,389
Other operating	(1,661)	(50)	(241)	(83)	(166)	(445)	(904)	(1,211)
Operating cash flow	5,911	19,248	26,899	16,002	40,252	32,812	44,182	48,898
Interest	505	450	620	(208)	956	(10,648)	(13,934)	(13,631)
Taxes paid	782	(3,186)	(6,122)	(3,463)	(10,152)	(10,955)	(8,256)	(5,213)
Capex	(23,448)	(13,830)	(13,891)	(19,940)	(22,377)	(113,683)	(33,257)	(21,933)
Free cash flow	(16,250)	2,681	7,506	(7,609)	8,679	(102,474)	(11,265)	8,121
Net acquisitions / disposals	-	-	-	-	-	-	-	-
Dividends (common)	(1,408)	(1,728)	(2,131)	(2,486)	(2,044)	(1,659)	(1,926)	(1,286)
Dividends (preferred)	-	-	-	-	-	-	-	-
Share issues / buybacks	(271)	358	(4,570)	3,898	10,056	11,058	(0)	0
Other	(1,581)	(6,213)	(10,977)	(1,592)	(38,504)	(136,749)	1,993	2,181
Cash flow (inc)/dec in net debt	(19,511)	(4,902)	(10,172)	(7,789)	(21,812)	(229,824)	(11,199)	9,016

Source: Company, UBS estimates

Price target derivation

Given the capital-intensive nature of the business, we believe EV/EBITDA is a relevant valuation metric for non-ferrous businesses. It captures the strength of leverage and is the metric that is used globally to value metal stocks.

The aluminium business has been valued using the global average EBITDA multiple for aluminium stocks, with a 20% target premium multiple assigned. The aluminium business contributes 82% of company EBITDA. We use a target EBITDA multiple of 7.8x to value the aluminium business.

We value the copper business at a target EBITDA multiple of 6.1x (20% premium to the average EBITDA multiple for copper stocks). Hindalco is a custom smelter, and copper prices are generally a pass through, with revenues typically derived from the TCRC rates earned. The copper business contributes 18% of stand-alone EBITDA.

We have set this 20% premium to global average EBITDA multiples due to:

1. Backward linkages in place—certainty to the greenfield operations;

2. Strong demand growth in the aluminium sector—Hindalco is the aluminium major in India; and

3. Low cash cost of production.

We estimate the value of the core business is therefore Rs271 per share of Hindalco.

ABML—We value Hindalco's listed 51% Australian subsidiary at a target price less a 20% holding company discount. We value it at Rs16 per share of Hindalco.

The market value of quoted investments accounts for c.Rs35 per share of Hindalco. Hindalco also owns 1.6m shares in treasury stock; we have valued the same at Rs0.3 per share of the company.

To calculate the value of Novelis, we have used its adjusted EBITDA in FY09E. The entire debt on acquisition has been serviced at Novelis' end, and hence the value of Novelis' core business per share of Hindalco accounts for (Rs63) per share. We have estimated the loss from the price ceiling contracts over FY08E-10E. The NPV of these losses has been estimated at (Rs19) per share. This calculation does not include the US$450m equity investment by Hindalco for Novelis.

We estimate the acquisition on net at (Rs97.4) per share of Hindalco.

We achieve the sum of the parts price target of Hindalco of Rs240 per share.

Table 13: Price target derivation

Particulars	Stake (%)	EBITDA (FY09)	EV / EBITDA (x)	EV (Rs m)	Net debt (Rs m)	Equity Value (Rs m)	Net Equity Value (Rs m)	Value / Share (Rs)
Core business	100%	38,719	7.5	288,844	(25,202)	314,046	314,046	271
Value of shareholding in ABML (20% holding co. discount)	51%					44,975	18,350	16
Mkt Val of quoted treasury investments	100%					40,187	40,187	35
Mkt value of treasury investment in HINDALCO	100%					321	321	0.3
Novelis (Post acquisition debt as well, calculated on adjusted EBITDA level)	100%	31,813	5.5	173,697	246,482	(72,786)	(72,786)	(63)
NPV of loss making can contract	100%			(21,608)	0	(21,608)	(21,608)	(19)
Total								240

Source: UBS estimates

Hindalco Industries

Income statement (Rsm)	03/03	03/04	03/05	03/06	03/07	03/08E	% ch	03/09E	% ch	03/10E	% ch
Revenues	64,009	82,233	101,053	121,197	193,161	654,654	*238.9*	718,261	*9.7*	620,321	*-13.6*
Operating expenses (ex depn)	(48,988)	(62,677)	(76,748)	(92,792)	(149,708)	(614,023)	*310.1*	(656,478)	*6.9*	(571,602)	*-12.9*
EBITDA (UBS)	15,021	19,555	24,306	28,404	43,453	40,631	*-6.5*	61,783	*52.1*	48,719	*-21.1*
Depreciation	(3,711)	(5,140)	(6,325)	(7,915)	(7,793)	(18,635)	*139.1*	(19,319)	*3.7*	(19,676)	*1.8*
Operating income (EBIT, UBS)	11,310	14,415	17,981	20,490	35,660	21,996	*-38.3*	42,463	*93.1*	29,044	*-31.6*
Other income & associates	2,407	2,795	2,779	2,805	4,090	4,575	*11.8*	6,029	*31.8*	6,499	*7.8*
Net interest	(1,902)	(2,346)	(2,159)	(3,014)	(3,134)	(15,223)	*385.7*	(19,963)	*31.1*	(20,131)	*0.8*
Abnormal items (pre-tax)	(1,613)	(10)	(131)	23	0	0	-	0	-	0	-
Profit before tax	10,202	14,854	18,470	20,304	36,616	11,348	*-69.0*	28,530	*151.4*	15,412	*-46.0*
Tax	(3,497)	(4,880)	(5,512)	(4,402)	(9,585)	(2,531)	*-73.6*	(7,510)	*196.7*	(3,800)	*-49.4*
Profit after tax	6,704	9,975	12,958	15,902	27,031	8,817	*-67.4*	21,020	*138.4*	11,613	*-44.8*
Abnormal items (post-tax)	0	0	0	0	0	0	-	0	-	0	-
Minorities / pref dividends	(48)	(40)	(110)	(106)	(166)	(445)	*167.6*	(904)	*103.0*	(1,211)	*33.9*
Net income (local GAAP)	6,657	9,935	12,848	15,796	26,865	8,371	*-68.8*	20,116	*140.3*	10,402	*-48.3*
Net Income (UBS)	8,270	9,945	12,978	15,773	26,865	8,371	*-68.8*	20,116	*140.3*	10,402	*-48.3*
Tax rate (%)	*34*	*33*	*30*	*22*	*26*	*22*	*-14.8*	*26*	*18.0*	*25*	*-6.3*
Pre-abnormal tax rate (%)	*30*	*33*	*30*	*22*	*26*	*22*	*-14.8*	*26*	*18.0*	*25*	*-6.3*

Per share (Rs)	03/03	03/04	03/05	03/06	03/07	03/08E	% ch	03/09E	% ch	03/10E	% ch
EPS (local GAAP)	8.15	10.74	13.85	16.03	25.75	7.22	*-72.0*	17.36	*140.3*	8.97	*-48.3*
EPS (UBS)	10.12	10.75	13.99	16.00	25.75	7.22	*-72.0*	17.36	*140.3*	8.97	*-48.3*
Net DPS	1.68	2.06	2.50	2.93	2.40	1.95	*-18.7*	2.27	*16.1*	1.51	*-33.3*
Cash EPS	14.66	16.31	20.81	24.03	33.22	23.30	*-29.9*	34.03	*46.0*	25.95	*-23.7*
BVPS	75.21	75.71	82.09	94.73	123.87	126.83	*2.4*	142.52	*12.4*	150.39	*5.5*

Balance sheet (Rsm)	03/03	03/04	03/05	03/06	03/07	03/08E	% ch	03/09E	% ch	03/10E	% ch
Net tangible fixed assets	70,598	79,288	86,854	98,834	112,565	206,415	*83.4*	219,154	*6.2*	220,212	*0.5*
Net intangible fixed assets	0	0	0	0	0	138,300	-	138,300	*0.0*	138,300	*0.0*
Net working capital (incl. other assets)	19,514	19,654	16,880	29,247	32,327	39,732	*22.9*	56,429	*42.0*	55,040	*-2.5*
Other liabilities	(10,182)	(11,758)	(11,207)	(12,195)	(11,672)	(3,280)	*-71.9*	(2,533)	*-22.8*	(1,120)	*-55.8*
Operating invested capital	79,931	87,184	92,526	115,887	133,220	381,167	*186.1*	411,350	*7.9*	412,432	*0.3*
Investments	11,868	18,656	29,559	31,632	78,748	85,365	*8.4*	85,365	*0.0*	85,365	*0.0*
Total capital employed	91,798	105,840	122,085	147,519	211,968	466,532	*120.1*	496,715	*6.5*	497,797	*0.2*
Shareholders' equity	61,449	70,014	76,161	93,369	129,222	146,993	*13.8*	165,182	*12.4*	174,298	*5.5*
Minority interests	357	932	858	1,295	8,567	15,537	*81.4*	16,331	*5.1*	17,314	*6.0*
Total equity	61,807	70,946	77,019	94,664	137,789	162,530	*18.0*	181,514	*11.7*	191,612	*5.6*
Net debt / (cash)	29,992	34,894	45,066	52,855	74,178	304,002	*309.8*	315,201	*3.7*	306,185	*-2.9*
Debt deemed provisions	0	0	0	0	0	0	-	0	-	0	-
Total capital employed	91,798	105,840	122,085	147,519	211,968	466,532	*120.1*	496,715	*6.5*	497,797	*0.2*

Cash flow (Rsm)	03/03	03/04	03/05	03/06	03/07	03/08E	% ch	03/09E	% ch	03/10E	% ch
Operating income (EBIT, UBS)	11,310	14,415	17,981	20,490	35,660	21,996	*-38.3*	42,463	*93.1*	29,044	*-31.6*
Depreciation	3,711	5,140	6,325	7,915	7,793	18,635	*139.1*	19,319	*3.7*	19,676	*1.8*
Net change in working capital	(7,449)	(258)	2,834	(12,319)	(3,035)	(7,374)	*143.0*	(16,697)	*126.4*	1,389	-
Other (operating)	0	0	0	0	0	0	-	0	-	0	-
Operating cash flow	7,572	19,297	27,140	16,085	40,418	33,257	*-17.7*	45,086	*35.6*	50,108	*11.1*
Net interest received / (paid)	505	450	620	(208)	956	(10,648)	-	(13,934)	*30.9*	(13,631)	*-2.2*
Dividends paid	(1,408)	(1,728)	(2,131)	(2,486)	(2,044)	(1,659)	*-18.8*	(1,926)	*16.1*	(1,286)	*-33.3*
Tax paid	782	(3,186)	(6,122)	(3,463)	(10,152)	(10,955)	*7.9*	(8,256)	*-24.6*	(5,213)	*-36.9*
Capital expenditure	(23,448)	(13,830)	(13,891)	(19,940)	(22,377)	(113,683)	*408.0*	(33,257)	*-70.7*	(21,933)	*-34.1*
Net (acquisitions) / disposals	0	0	0	0	0	0	-	0	-	0	-
Other	(1,093)	(6,213)	(10,977)	(1,636)	(39,844)	(137,947)	*246.2*	794	-	982	*23.7*
Share issues	(759)	358	(4,570)	3,898	10,545	11,058	*4.9*	0	-	0	-
Cash flow (inc)/dec in net debt	(19,511)	(4,902)	(10,172)	(7,833)	(22,664)	(231,022)	*919.3*	(12,397)	*-94.6*	7,817	-
FX / non cash items	(488)	0	0	45	1,341	1,198	*-10.6*	1,198	*0.0*	1,198	*0.0*
Balance sheet (inc)/dec in net debt	(19,999)	(4,902)	(10,172)	(7,789)	(21,324)	(229,824)	*977.8*	(11,199)	*-95.1*	9,016	-
Core EBITDA	15,021	19,555	24,306	28,404	43,453	40,631	*-6.5*	61,783	*52.1*	48,719	*-21.1*
Maintenance capital expenditure	0	0	0	0	0	0	-	0	-	0	-
Maintenance net working capital	0	0	0	0	0	0	-	0	-	0	-
Operating free cash flow, pre-tax	15,021	19,555	24,306	28,404	43,453	40,631	*-6.5*	61,783	*52.1*	48,719	*-21.1*

Source: Company accounts, UBS estimates. (UBS) valuations are stated before goodwill, exceptionals and other special items. Note: For some companies, the data represents an extract of the full company accounts.

Global Equity Research

India

Non-Ferrous Metals

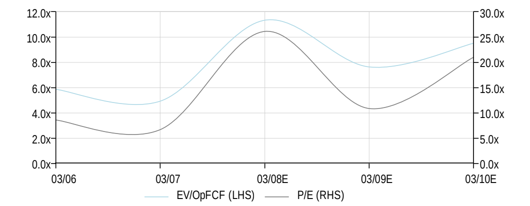
12-month rating	Buy *
12m price target	Rs240.00

Hindalco Industries

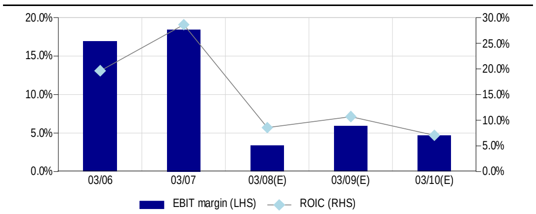
Company profile

Hindalco is the largest non-ferrous metal producer in India and is focused on the production of aluminium and copper. It produces 345,000tpa of integrated aluminium and 660,000tpa of alumina. Its downstream products include rolled, aluminium foil, wire rods and alloy wheels. Hindalco plans to expand its copper smelter production from 180,000 to 250,000tpa. It recently acquired two copper mines, which could meet up to one-third of its concentrate requirements. Hindalco's 97%-owned subsidiary Indal produces 110,000tpa of aluminium and 401,000tpa of alumina/alumina hydrate.

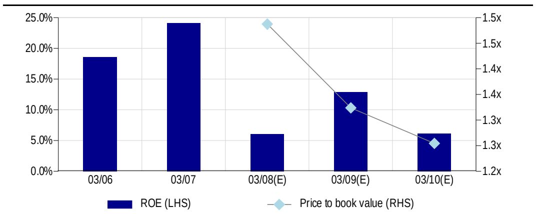
Value (EV/OpFCF & P/E)



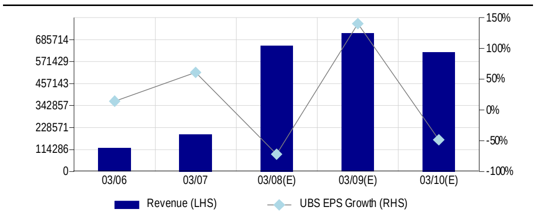
Profitability



ROE v Price to book value



Growth (UBS EPS)



* Exception to core rating bands; See page17

Valuation (x)	5Yr Avg	03/06	03/07	03/08E	03/09E	03/10E
P/E (local GAAP)	8.3	8.6	6.7	26.1	10.9	21.0
P/E (UBS)	8.0	8.6	6.7	26.1	10.9	21.0
P/CEPS	5.5	5.7	5.2	8.1	5.5	7.3
Net dividend yield (%)	2.2	2.1	1.4	1.0	1.2	0.8
P/BV	1.2	1.4	1.4	1.5	1.3	1.3
EV/revenue (core)	1.4	1.4	1.1	0.7	0.7	0.7
EV/EBITDA (core)	5.5	5.9	4.9	11.3	7.6	9.5
EV/EBIT (core)	7.4	8.1	6.0	20.9	11.1	15.9
EV/OpFCF (core)	5.5	5.9	4.9	11.3	7.6	9.5
EV/op. invested capital	1.4	1.6	1.7	1.8	1.2	1.1

Enterprise value (Rsm)	03/06	03/07	03/08E	03/09E	03/10E
Average market cap	127,244	159,983	175,020	175,020	175,020
+ minority interests	0	0	0	0	0
+ average net debt (cash)	52,855	74,178	304,002	315,201	306,185
+ pension obligations and other	0	0	0	0	0
- non-core asset value	(13,490)	(20,239)	(18,817)	(18,865)	(18,434)
Core enterprise value	166,609	213,923	460,206	471,356	462,772

Growth (%)	5Yr Avg	03/06	03/07	03/08E	03/09E	03/10E
Revenue	35.8	19.9	59.4	NM	9.7	-13.6
EBITDA (UBS)	24.0	16.9	53.0	-6.5	52.1	-21.1
EBIT (UBS)	20.2	14.0	74.0	-38.3	93.1	-31.6
EPS (UBS)	12.0	14.4	60.9	-72.0	140.3	-48.3
Cash EPS	16.4	15.5	38.2	-29.9	46.0	-23.7
Net DPS	21.3	16.9	-17.9	-18.7	16.1	-33.3
BVPS	5.3	15.4	30.8	2.4	12.4	5.5

Margins (%)	5Yr Avg	03/06	03/07	03/08E	03/09E	03/10E
EBITDA / revenue	25.7	23.4	22.5	6.2	8.6	7.9
EBIT / revenue	19.5	16.9	18.5	3.4	5.9	4.7
Net profit (UBS) / revenue	14.4	13.0	13.9	1.3	2.8	1.7

Return on capital (%)	5Yr Avg	03/06	03/07	03/08E	03/09E	03/10E
EBIT ROIC (UBS)	18.7	19.7	28.6	8.6	10.7	7.1
ROIC post tax	-	15.4	21.1	6.6	7.9	5.3
Net ROE	15.7	18.6	24.1	6.1	12.9	6.1

Coverage ratios (x)	5Yr Avg	03/06	03/07	03/08E	03/09E	03/10E
EBIT / net interest	9.4	7.7	12.7	1.7	2.4	1.8
Dividend cover (UBS EPS)	6.0	5.5	10.7	3.7	7.6	5.9
Div. payout ratio (%, UBS EPS)	17.0	18.3	9.3	27.1	13.1	16.9
Net debt / EBITDA	1.7	1.9	1.7	7.5	5.1	6.3

Efficiency ratios (x)	5Yr Avg	03/06	03/07	03/08E	03/09E	03/10E
Revenue / op. invested capital	1.0	1.2	1.6	2.5	1.8	1.5
Revenue / fixed assets	1.1	1.3	1.8	2.9	2.0	1.7
Revenue / net working capital	4.7	5.3	6.3	18.2	14.9	11.1

Investment ratios (x)	5Yr Avg	03/06	03/07	03/08E	03/09E	03/10E
OpFCF / EBIT	1.3	1.4	1.2	1.8	1.5	1.7
Capex / revenue (%)	22.2	16.5	11.6	17.4	4.6	3.5
Capex / depreciation	3.6	2.5	2.9	6.1	1.7	1.1

Capital structure (%)	5Yr Avg	03/06	03/07	03/08E	03/09E	03/10E
Net debt / total equity	48.2	56.6	57.4	NM	NM	NM
Net debt / (net debt + equity)	32.5	36.1	36.5	67.4	65.6	63.7
Net debt (core) / EV	31.5	31.7	34.7	66.1	66.9	66.2

Source: Company accounts, UBS estimates. (UBS) valuations are stated before goodwill, exceptionals and other special items.
Valuations: based on an average share price that year, (E): based on a share price of Rs188.65 on 07 Nov 2007 23:39 GMT Market cap(E) may include forecast share issues/buybacks.

Sunita Sachdev
Analyst
Sunita.Sachdev@ubs.com
+91-22-2286 2059

Sandeep Bhatia
Business/Country Head
sandeep-za.bhatia@ubs.com
+91-22-2286 2032

■ Hindalco Industries

Hindalco is the largest non-ferrous metal producer in India and is focused on the production of aluminium and copper. It produces 345,000tpa of integrated aluminium and 660,000tpa of alumina. Its downstream products include rolled, aluminium foil, wire rods and alloy wheels. Hindalco plans to expand its copper smelter production from 180,000 to 250,000tpa. It recently acquired two copper mines, which could meet up to one-third of its concentrate requirements. Hindalco's 97%-owned subsidiary Indal produces 110,000tpa of aluminium and 401,000tpa of alumina/alumina hydrate.

■ Statement of Risk

A sharp fall in global prices for aluminium, which in turn, is linked to the recovery of the global economy, as well as continuing strong Chinese imports, is the key risk factor for Indian aluminium companies, in our view.

■ Analyst Certification

Each research analyst primarily responsible for the content of this research report, in whole or in part, certifies that with respect to each security or issuer that the analyst covered in this report: (1) all of the views expressed accurately reflect his or her personal views about those securities or issuers; and (2) no part of his or her compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by that research analyst in the research report.

Required Disclosures

This report has been prepared by UBS Securities India Private Ltd, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS.

For information on the ways in which UBS manages conflicts and maintains independence of its research product; historical performance information; and certain additional disclosures concerning UBS research recommendations, please visit www.ubs.com/disclosures.

UBS Investment Research: Global Equity Rating Allocations

UBS 12-Month Rating	Rating Category	Coverage[1]	IB Services[2]
Buy	**Buy**	55%	40%
Neutral	**Hold/Neutral**	36%	35%
Sell	**Sell**	9%	22%
UBS Short-Term Rating	**Rating Category**	**Coverage[3]**	**IB Services[4]**
Buy	**Buy**	0%	29%
Sell	**Sell**	0%	0%

1:Percentage of companies under coverage globally within the 12-month rating category.
2:Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.
3:Percentage of companies under coverage globally within the Short-Term rating category.
4:Percentage of companies within the Short-Term rating category for which investment banking (IB) services were provided within the past 12 months.

Source: UBS. Rating allocations are as of 30 September 2007.

UBS Investment Research: Global Equity Rating Definitions

UBS 12-Month Rating	Definition
Buy	FSR is > 6% above the MRA.
Neutral	FSR is between -6% and 6% of the MRA.
Sell	FSR is > 6% below the MRA.
UBS Short-Term Rating	**Definition**
Buy	Buy: Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.
Sell	Sell: Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.

KEY DEFINITIONS

Forecast Stock Return (FSR) is defined as expected percentage price appreciation plus gross dividend yield over the next 12 months.
Market Return Assumption (MRA) is defined as the one-year local market interest rate plus 5% (a proxy for, and not a forecast of, the equity risk premium).
Under Review (UR) Stocks may be flagged as UR by the analyst, indicating that the stock's price target and/or rating are subject to possible change in the near term, usually in response to an event that may affect the investment case or valuation.
Short-Term Ratings reflect the expected near-term (up to three months) performance of the stock and do not reflect any change in the fundamental view or investment case.

EXCEPTIONS AND SPECIAL CASES

US Closed-End Fund ratings and definitions are: Buy: Higher stability of principal and higher stability of dividends; Neutral: Potential loss of principal, stability of dividend; Reduce: High potential for loss of principal and dividend risk.
UK and European Investment Fund ratings and definitions are: Buy: Positive on factors such as structure, management, performance record, discount; Neutral: Neutral on factors such as structure, management, performance record, discount; Reduce: Negative on factors such as structure, management, performance record, discount.
Core Banding Exceptions (CBE): Exceptions to the standard +/-6% bands may be granted by the Investment Review Committee (IRC). Factors considered by the IRC include the stock's volatility and the credit spread of the respective company's debt. As a result, stocks deemed to be very high or low risk may be subject to higher or lower bands as they relate to the rating. When such exceptions apply, they will be identified in the Companies Mentioned or Company Disclosure table in the relevant research piece.

Company Disclosures

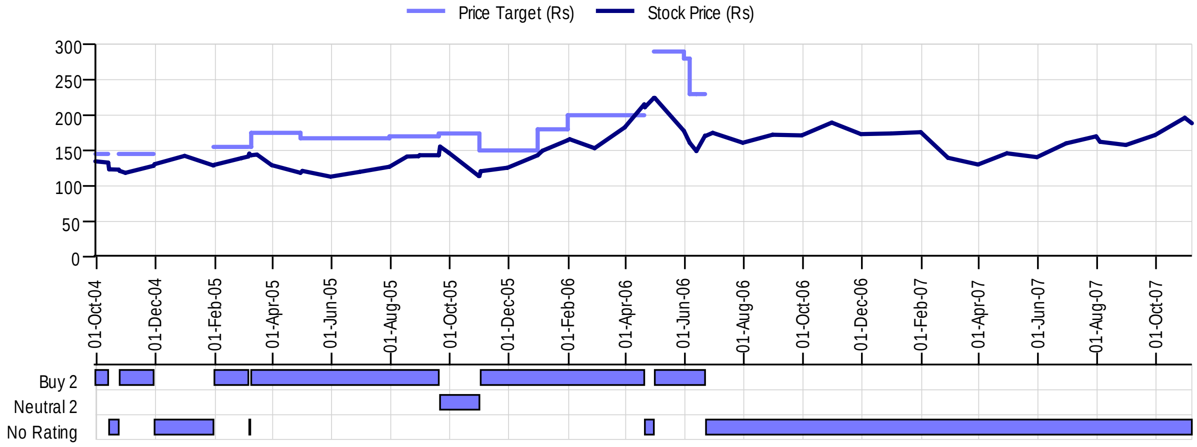
Company Name	Reuters	12-mo rating	Short-term rating	Price	Price date
Hindalco Industries[4, 6, 20]	HALC.BO	Not Rated	N/A	Rs188.65	07 Nov 2007

Source: UBS. All prices as of local market close.
Ratings in this table are the most current published ratings prior to this report. They may be more recent than the stock pricing date

4. Within the past 12 months, UBS AG, its affiliates or subsidiaries has received compensation for investment banking services from this company/entity.
6. This company/entity is, or within the past 12 months has been, a client of UBS Securities LLC, and investment banking services are being, or have been, provided.
20. Because UBS believes this security presents significantly higher-than-normal risk, its rating is deemed Buy if the FSR exceeds the MRA by 10% (compared with 6% under the normal rating system).

Unless otherwise indicated, please refer to the Valuation and Risk sections within the body of this report.

Hindalco Industries (Rs)



Source: UBS; as of 07 Nov 2007

Note: On August 4, 2007 UBS revised its rating system. (See 'UBS Investment Research: Global Equity Rating Definitions' table for details). From September 9, 2006 through August 3, 2007 the UBS ratings and their definitions were: Buy 1 = FSR is > 6% above the MRA, higher degree of predictability; Buy 2 = FSR is > 6% above the MRA, lower degree of predictability; Neutral 1 = FSR is between -6% and 6% of the MRA, higher degree of predictability; Neutral 2 = FSR is between -6% and 6% of the MRA, lower degree of predictability; Reduce 1 = FSR is > 6% below the MRA, higher degree of predictability; Reduce 2 = FSR is > 6% below the MRA, lower degree of predictability. The predictability level indicates an analyst's conviction in the FSR. A predictability level of '1' means that the analyst's estimate of FSR is in the middle of a narrower, or smaller, range of possibilities. A predictability level of '2' means that the analyst's estimate of FSR is in the middle of a broader, or larger, range of possibilities. From October 13, 2003 through September 8, 2006 the percentage band criteria used in the rating system was 10%.

Additional Prices: Aditya Birla Minerals Limited, A$3.30 (07 Nov 2007); Source: UBS. All prices as of local market close.

Global Disclaimer

This report has been prepared by UBS Securities India Private Ltd, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS. In certain countries, UBS AG is referred to as UBS SA.

This report is for distribution only under such circumstances as may be permitted by applicable law. It has no regard to the specific investment objectives, financial situation or particular needs of any specific recipient and does not constitute a representation that any investment strategy is suitable or appropriate to a recipient's individual circumstances or otherwise constitute a personal recommendation. It is published solely for informational purposes, it does not constitute an advertisement and is not to be construed as a solicitation or an offer to buy or sell any securities or related financial instruments in any jurisdiction. No representation or warranty, either express or implied, is provided in relation to the accuracy, completeness or reliability of the information contained herein, except with respect to information concerning UBS AG, its subsidiaries and affiliates, nor is it intended to be a complete statement or summary of the securities, markets or developments referred to in the report. UBS does not undertake that investors will obtain profits, nor will it share with investors any investment profits nor accept any liability for any investment losses. Investments involve risks and investors should exercise prudence in making their investment decisions. The report should not be regarded by recipients as a substitute for the exercise of their own judgement. Any opinions expressed in this report are subject to change without notice and may differ or be contrary to opinions expressed by other business areas or groups of UBS as a result of using different assumptions and criteria. Research will initiate, update and cease coverage solely at the discretion of UBS Investment Bank Research Management. The analysis contained herein is based on numerous assumptions. Different assumptions could result in materially different results. The analyst(s) responsible for the preparation of this report may interact with trading desk personnel, sales personnel and other constituencies for the purpose of gathering, synthesizing and interpreting market information. UBS is under no obligation to update or keep current the information contained herein. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS, into other areas, units, groups or affiliates of UBS. The compensation of the analyst who prepared this report is determined exclusively by research management and senior management (not including investment banking). Analyst compensation is not based on investment banking revenues, however, compensation may relate to the revenues of UBS Investment Bank as a whole, of which investment banking, sales and trading are a part.

The securities described herein may not be eligible for sale in all jurisdictions or to certain categories of investors. Options, derivative products and futures are not suitable for all investors, and trading in these instruments is considered risky. Mortgage and asset-backed securities may involve a high degree of risk and may be highly volatile in response to fluctuations in interest rates and other market conditions. Past performance is not necessarily indicative of future results. Foreign currency rates of exchange may adversely affect the value, price or income of any security or related instrument mentioned in this report. For investment advice, trade execution or other enquiries, clients should contact their local sales representative. Neither UBS nor any of its affiliates, nor any of UBS' or any of its affiliates, directors, employees or agents accepts any liability for any loss or damage arising out of the use of all or any part of this report. Additional information will be made available upon request.

For financial instruments admitted to trading on an EU regulated market: UBS AG, its affiliates or subsidiaries (excluding UBS Securities LLC and/or UBS Capital Markets LP) acts as a market maker or liquidity provider (in accordance with the interpretation of these terms in the UK) in the financial instruments of the issuer save that where the activity of liquidity provider is carried out in accordance with the definition given to it by the laws and regulations of any other EU jurisdictions, such information is separately disclosed in this research report.

United Kingdom and the rest of Europe: Except as otherwise specified herein, this material is communicated by UBS Limited, a subsidiary of UBS AG, to persons who are market counterparties or intermediate customers (as detailed in the FSA Rules) and is only available to such persons. The information contained herein does not apply to, and should not be relied upon by, private customers. UBS Limited is authorised and regulated by the Financial Services Authority. France: Prepared by UBS Limited and distributed by UBS Limited and UBS Securities France SA. UBS Securities France S.A. is regulated by the Autorité des Marchés Financiers (AMF). Where an analyst of UBS Securities France S.A. has contributed to this report, the report is also deemed to have been prepared by UBS Securities France S.A. Germany: Prepared by UBS Limited and distributed by UBS Limited and UBS Deutschland AG. UBS Deutschland AG is regulated by the Bundesanstalt fur Finanzdienstleistungsaufsicht (BaFin). Spain: Prepared by UBS Limited and distributed by UBS Limited and UBS Securities España SV, SA. UBS Securities España SV, SA is regulated by the Comisión Nacional del Mercado de Valores (CNMV). Turkey: Prepared by UBS Menkul Degerler AS on behalf of and distributed by UBS Limited. Russia: Prepared and distributed by the Moscow Representative Office of UBS Cyprus Moscow Limited. Switzerland: Distributed by UBS AG to persons who are institutional investors only. Italy: Prepared by UBS Limited and distributed by UBS Limited and UBS Italia Sim S.p.A.. UBS Italia Sim S.p.A. is regulated by the Bank of Italy and by the Commissione Nazionale per le Società e la Borsa (CONSOB). Where an analyst of UBS Italia Sim S.p.A. has contributed to this report, the report is also deemed to have been prepared by UBS Italia Sim S.p.A.. South Africa: UBS South Africa (Pty) Limited (Registration No. 1995/011140/07) is a member of the JSE Limited, the South African Futures Exchange and the Bond Exchange of South Africa. UBS South Africa (Pty) Limited is an authorised Financial Services Provider. Details of its postal and physical address and a list of its directors are available on request or may be accessed at http:www.ubs.co.za. United States: Distributed to US persons by either UBS Securities LLC or by UBS Financial Services Inc., subsidiaries of UBS AG; or by a group, subsidiary or affiliate of UBS AG that is not registered as a US broker-dealer (a **'non-US affiliate'**), to major US institutional investors only. UBS Securities LLC or UBS Financial Services Inc. accepts responsibility for the content of a report prepared by another non-US affiliate when distributed to US persons by UBS Securities LLC or UBS Financial Services Inc. All transactions by a US person in the securities mentioned in this report must be effected through UBS Securities LLC or UBS Financial Services Inc., and not through a non-US affiliate. Canada: Distributed by UBS Securities Canada Inc., a subsidiary of UBS AG and a member of the principal Canadian stock exchanges & CIPF. A statement of its financial condition and a list of its directors and senior officers will be provided upon request. Hong Kong: Distributed by UBS Securities Asia Limited. Singapore: Distributed by UBS Securities Pte. Ltd or UBS AG, Singapore Branch. Japan: Distributed by UBS Securities Japan Ltd to institutional investors only. Australia: Distributed by UBS AG (Holder of Australian Financial Services Licence No. 231087) and UBS Securities Australia Ltd (Holder of Australian Financial Services Licence No. 231098) only to 'Wholesale' clients as defined by s761G of the Corporations Act 2001. New Zealand: Distributed by UBS New Zealand Ltd. China: Distributed by UBS Securities Co. Limited.

The disclosures contained in research reports produced by UBS Limited shall be governed by and construed in accordance with English law.

UBS