

## Company Focus

1 October 2007 | 14 pages

# Sterlite Industries (India) (STRL.BO)

[Site visit](#)

## Site Visits: Key Takeaways – Things on the Move

- Sites visited** — We visited the facilities of Sterlite Industries and the Vedanta group last week. The sites visited include the Tuticorin copper smelter, Balco's Korba smelter, Lanjigarh Alumina Refinery, Jharsuguda Aluminium Smelter, the zinc smelter at Chanderiya and the Rampura-Agucha Mines.
- Expansion plans** — HZL is increasing its zinc capacity by 63% to 669,000 tpa by FY09 and its ore production capacity to ~5m tpa by Dec 2007. A 1.4m tpa alumina refinery is being set up at Lanjigarh and a 500,000 tpa aluminium smelter at Jharsuguda. Sterlite is undertaking feasibility studies to enhance capacity by 650,000 tpa at Balco and 200,000-250,000 tpa at HZL in the long term. In addition, the company sees debottlenecking potential in all its plants.
- Cost savings** — The company is setting up captive power plants with each of its planned expansions, with the coal linkages in/expected to be in place. Management hopes to get coal blocks for Balco's power plants. At Lanjigarh, the aim is to produce low-cost alumina (and supply to Balco) using high-quality bauxite. Sterlite expects lower production costs at HZL and its copper smelter.
- FY08 developments** — The company expects 3 important developments this fiscal: (1) acquisition of its residual 29.5% stake in HZL, (2) acquisition of the government's 49% stake in Balco, (3) permission to mine bauxite at Lanjigarh.
- Reiterate Buy (1M)** — We came away from the trip quite positive on the planned projects, operating abilities and cost-saving initiatives.

<b>Buy/Medium Risk</b>	<b>1M</b>
Price (01 Oct 07)	Rs745.00
Target price	Rs949.00
Expected share price return	27.4%
Expected dividend yield	0.6%
<b>Expected total return</b>	<b>28.0%</b>
Market Cap	Rs527,976M US\$13,313M

### Price Performance (RIC: STRL.BO, BB: STLT IN)



Figure 1. Sterlite Industries (India) – Statistical Abstract

YE 31 Mar	Net Profit*	EPS	EPS growth	P/E	EV/EBITDA	ROE
	(Rs m)	(Rs)	(%)	(x)	(x)	(%)
FY05	6,517	11.9	-8%	63.3	38.7	15%
FY06	16,781	30.0	153%	25.0	16.2	28%
FY07	44,841	80.3	167%	9.4	6.4	45%
FY08E	48,229	68.1	-15%	11.0	7.2	22%
FY09E	67,233	94.9	39%	7.9	5.1	24%
FY10E	47,381	66.9	-30%	11.2	6.8	14%

Source: Company Reports and Citi Investment Research estimates. Prices as on 1 Oct 2007. \*Net profit is profit attributable to shareholders.

See Appendix A-1 for Analyst Certification and important disclosures.

### Pradeep Mahtani<sup>1</sup>

+91-22-6631-9882  
pradeep.mahtani@citi.com

### Raashi Chopra<sup>1</sup>

raashi.chopra@citi.com

Citi Investment Research is a division of Citigroup Global Markets Inc. (the "Firm"), which does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the Firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision. Non-US research analysts who have prepared this report are not registered/qualified as research analysts with the NYSE and/or NASD. Such research analysts may not be associated persons of the member organization and therefore may not be subject to the NYSE Rule 472 and NASD Rule 2711 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

<sup>1</sup>Citigroup Global Markets India Private Limited

Fiscal year end 31-Mar	2006	2007	2008E	2009E	2010E
<b>Valuation Ratios</b>					
P/E adjusted (x)	24.8	9.3	10.9	7.9	11.1
EV/EBITDA adjusted (x)	14.3	5.7	5.9	5.2	6.8
P/BV (x)	6.9	4.2	2.4	1.9	1.6
Dividend yield (%)	0.2	0.5	0.6	0.6	0.6
<b>Per Share Data (Rs)</b>					
EPS adjusted	30.05	80.29	68.07	94.89	66.88
EPS reported	30.05	80.29	68.07	94.89	66.88
BVPS	108.38	178.72	309.41	401.79	478.17
DPS	1.25	4.00	4.25	4.40	4.50
<b>Profit &amp; Loss (RsM)</b>					
Net sales	131,272	243,868	266,556	294,850	248,798
Operating expenses	-96,300	-150,501	-180,347	-199,134	-181,392
<b>EBIT</b>	<b>34,972</b>	<b>93,367</b>	<b>86,208</b>	<b>95,717</b>	<b>67,406</b>
Net interest expense	-2,353	-3,791	-3,447	-4,624	-4,618
Non-operating/exceptionals	-101	-198	0	0	0
<b>Pre-tax profit</b>	<b>32,518</b>	<b>89,378</b>	<b>82,762</b>	<b>91,093</b>	<b>62,788</b>
Tax	-10,165	-24,118	-20,243	-21,463	-14,451
Extraord./Min.Int./Pref.div.	-5,572	-20,420	-14,289	-2,398	-955
<b>Reported net income</b>	<b>16,781</b>	<b>44,841</b>	<b>48,229</b>	<b>67,233</b>	<b>47,381</b>
Adjusted earnings	16,781	44,841	48,229	67,233	47,381
Adjusted EBITDA	40,241	101,406	94,701	104,629	76,307
<b>Growth Rates (%)</b>					
Sales	81.0	85.8	9.3	10.6	-15.6
EBIT adjusted	127.5	167.0	-7.7	11.0	-29.6
EBITDA adjusted	119.3	152.0	-6.6	10.5	-27.1
EPS adjusted	153.1	167.2	-15.2	39.4	-29.5
<b>Cash Flow (RsM)</b>					
<b>Operating cash flow</b>	<b>22,086</b>	<b>56,490</b>	<b>66,341</b>	<b>75,067</b>	<b>58,209</b>
Depreciation/amortization	5,269	8,039	8,493	8,912	8,902
Net working capital	-8,339	-18,647	4,336	-3,390	4,220
<b>Investing cash flow</b>	<b>-16,172</b>	<b>-43,070</b>	<b>-118,603</b>	<b>-47,131</b>	<b>-17,246</b>
Capital expenditure	-13,506	-23,796	-24,707	-34,044	-25,468
Acquisitions/disposals	-6,009	-26,091	-99,836	-20,000	0
<b>Financing cash flow</b>	<b>-3,103</b>	<b>-13,438</b>	<b>90,181</b>	<b>22,169</b>	<b>-8,833</b>
Borrowings	-320	217	13,238	30,387	-500
Dividends paid	-732	-4,441	-132	-3,595	-3,716
<b>Change in cash</b>	<b>2,811</b>	<b>-19</b>	<b>37,920</b>	<b>50,105</b>	<b>32,130</b>
<b>Balance Sheet (RsM)</b>					
<b>Total assets</b>	<b>170,976</b>	<b>239,990</b>	<b>385,908</b>	<b>495,084</b>	<b>554,251</b>
Cash & cash equivalent	11,153	11,134	49,055	99,159	131,289
Accounts receivable	13,475	16,521	19,266	22,981	20,473
Net fixed assets	85,497	97,176	118,641	171,067	202,315
<b>Total liabilities</b>	<b>93,279</b>	<b>103,916</b>	<b>122,787</b>	<b>158,644</b>	<b>158,323</b>
Accounts payable	13,917	9,078	17,780	19,536	18,395
Total Debt	51,653	46,103	59,342	89,729	89,229
<b>Shareholders' funds</b>	<b>77,696</b>	<b>136,074</b>	<b>263,121</b>	<b>336,439</b>	<b>395,928</b>
<b>Profitability/Solvency Ratios (%)</b>					
EBITDA margin adjusted	30.7	41.6	35.5	35.5	30.7
ROE adjusted	32.3	55.9	30.2	26.7	15.2
ROIC adjusted	23.9	51.1	32.7	26.8	16.6
Net debt to equity	52.1	25.7	3.9	-2.8	-10.6
Total debt to capital	39.9	25.3	18.4	21.1	18.4

For further data queries on Citigroup's full coverage universe please contact CIR Data Services Asia Pacific at CitiResearchDataServices@citigroup.com or +852-2501-2791



## Takeways from the Site Visits

We visited the facilities of Sterlite Industries (India) Ltd and the Vedanta group in the week of Sep24-28, 2007. The sites visited include the copper smelter at Tuticorin, Balco's aluminium smelter at Korba, Lanjigarh Alumina Refinery and Jharsuguda Aluminium Smelter (both 29.5% held by Sterlite), the zinc smelter at Chanderiya and the Rampura-Agucha Mine. In addition to the plant visits, there were presentations made by the management at each of the locations. In this note, we list down our key-takeways from the site visits and the presentations.

The management presentation made before we embarked on our trip indicated that the company expects 3 important developments to take place by the end of FY08:

- **Acquisition of Sterlite's residual 29.5% stake in Hindustan Zinc:** The company has started discussions with the government and expects the process to be completed by December 2007.
- **Acquisition of the government's 49% stake in Balco:** The out-of-court mediation has started and Sterlite is hopeful of a resolution by the end of FY08, though at a premium to the initially offered price of Rs11bn.
- **Bauxite mining at Lanjigarh:** The permission to mine bauxite at Lanjigarh is now believed to be in the final stages. The environment ministry has cleared the process and the company hopes to get the final approval by October 2007.

## Sterlite's copper business

Our first stop on this trip was a visit to the Tuticorin copper smelter and refinery on the 24<sup>th</sup> of September, 2007. This is conveniently located 17 kms from Tuticorin seaport as all copper concentrate requirements are imported. The plant has been recently designated as an EOU, allowing Sterlite to lower its effective tax rate.

- **Debottlenecking:** Sterlite completed the process of debottlenecking and increasing its capacity from 300,000 tpa to 400,000 tpa of cathodes in FY07 with an investment of US\$24mn. This was done by reducing the cycle time of operations and increasing labor efficiency. There is scope to debottleneck further; however, no plans have been formalized yet.

Figure 2. Copper capacity snapshot as of March 31, 2007

Facility	Copper Smelter (tpa)	Copper Refinery (tpa)	Copper Rods (tpa)	Sulphuric Acid (tpa)	Phosphoric Acid (tpa)	Captive Power (MW)
Tuticorin (TN)	400,000	205,000	90,000	1,300,000	180,000	46.5+11.2
Silvassa	-	195,000	150,000	-	-	-
<b>Total</b>	<b>400,000</b>	<b>400,000</b>	<b>240,000</b>	<b>1,300,000</b>	<b>180,000</b>	<b>58</b>

Source: Company Reports

- **TC/RC margins falling:** In a tight concentrate market, management expects its TC/RCs in FY08 to be between 16-17USc/lb.

**Figure 3. TC/RC margins (USc/lb)**

	FY03	FY04	FY05	FY06	FY07	FY08E
TC/RC margins (USC/lb)	13.8	8.9	8.6	23.1	31.1	16.0-17.0

Source: Company Reports

- **Sourcing of copper concentrate:** In FY07, Sterlite sourced about 67% of its concentrate requirements through long-term contracts, 24% through spot and the balance from its mines in Australia (remaining life is ~5 years). The company hopes to increase the portion of ore sourced through long-term contracts in the future to about 75%.
- **Net cost of production:** According to Brook Hunt data, the Tuticorin smelter was in the lowest cost quartile of all copper smelting operations worldwide, and Sterlite's Tuticorin and Silvassa refineries had the third and fifth lowest cost of production, respectively, compared to all copper refining operations globally. The net cost of production was 6.1USc/lb in FY06 and FY07. Sterlite hopes to achieve a net production cost of less than 5.5USc/lb in FY08.

**Figure 4. Net cost of production (USc/lb)**

	FY03	FY04	FY05	FY06	FY07	FY08E
Net cost of production (USC/lb)	9.1	7.9	7.05	6.1	6.1	<5.5

Source: Company Reports

- **Byproducts:** Byproduct sales (phosphoric acid, sulphuric acid, anode slimes) accounted for about 11% of Sterlite's stand-alone gross revenues in FY07, but a rise in the prices of sulphur globally should benefit Sterlite's earnings from its byproducts in FY08E. Sulphur prices have gone up to as high as US\$240/t from about US\$50-60/t in a period of about 4 months on buoyant demand globally.
- **Carbon credits:** In the presentation at Tuticorin, Sterlite indicated that 6 potential Clean Development Mechanism projects have been identified, and the company has started the journey to avail carbon credits in 2008.

## Bharat Aluminium Company (Balco)

Day 2 (25<sup>th</sup> September, 2007) was at Balco, where the new aluminium smelter (Korba II-245,000 tpa) has been fully ramped up. The focus will now be on cost savings through technology improvements and likely approval of coal blocks. Longer-term plans on which feasibility studies are being conducted are to take aluminium capacity to 1m tpa and to set up additional captive power of more than 1,200 MW.

The company sees huge opportunity in aluminium, given India's huge bauxite reserves (fifth largest in the world) and the fact that the Indian aluminium smelters have a production cost of ~US\$1000/t, among the lowest in the world.

## Volume growth

Figure 5. Balco Capacity Snapshot –March 07

Facility	Alumina (tpa)	Aluminium (tpa)	Captive Power (MW)
Korba 1	200,000	110,000	270
Korba 2	-	245,000	540
<b>Total</b>	<b>200,000</b>	<b>355,000</b>	<b>810</b>

Source: Company Reports

- Volumes expected in FY08:** Korba II, which was commissioned in FY06, with a capacity of 245,000 tpa is now fully ramped up. In FY08, the company expects to produce about 350,000-360,000 tpa of aluminium, of which ~260,000-265,000 is likely to come from Korba II. Balco has already produced 89,000 (62,000 tonnes from Korba II) tonnes of aluminium in 1QFY08. The company sees further debottlenecking potential by upgrading current and increasing efficiency.
- Long-term plans:** In the long run, Balco has plans to take capacity to about 1m tpa by setting up an additional 650,000 tpa of smelter capacity. The MOU has been signed for the same, and the company is currently undertaking feasibility studies. In addition, Balco has also announced a feasibility study to examine the setting up of a 1,200MW coal-based power plant.

## Continued emphasis on cost savings

- Cost of production:** The unit cost of production (excl alumina) fell from US\$885 in FY06 to US\$740 in FY07 (US\$737 in 4QFY07). The company hopes to bring this down to below US\$700 in FY08 and to around US\$600-650/t by FY09-FY10.
- Alumina sourcing:** Balco's own alumina capacity is not sufficient to meet the requirements of its Korba II smelter. Alumina for this smelter is currently sourced from external suppliers. Balco hopes to source alumina on a regular basis from Vedanta's Lanjigarh refinery (29.5% subsidiary of Sterlite) from the third quarter of the current fiscal, leading to a fall in costs.
- Coal availability:** Balco has signed a 5-year contract in August 2006 with a subsidiary of Coal India to meet about 70% of its coal requirements, the remaining being purchased from the open market. Their current coal cost is about Rs0.75 per unit of power. Balco is in the process of being allotted coal mines. The Coal Ministry has approved coal blocks for Balco and the mines should be allocated in the next couple of months. The process to start mining is likely to take about 3 years after allocation and should help bring down the coal costs by about 20-25%.
- Conversion of Korba I to pre-baked technology:** Balco's older smelter uses Vertical Stud Soderberg (VSS) technology to produce aluminium from alumina, and the new smelter uses pre-baked technology from Guiyang Aluminium Magnesium Design and Research Institute (GAMI), China. Balco is in talks to convert Korba I from VSS to pre-baked technology. The entire process of conversion should take about a year and the process should start no later than 12-14 months from now. This should help reduce cost of production to fall below current levels of US\$1100/t (net of alumina).

## Vedanta Alumina

Sterlite owns a 29.5% minority interest in Vedanta Alumina Limited (Vedanta Alumina). The balance 70.5% stake is held by Sterlite's parent company, Vedanta Resources plc.

The visit to Vedanta Alumina underscored the progress made at both Lanjigarh (Alumina plant), which we visited on Wednesday, 26<sup>th</sup> September, 2007, and at Jharsuguda (Aluminium smelter), which we visited the next day. Lanjigarh is not yet easy to reach, but the key highlight was that the company expects to get approval to mine bauxite by October 2007 and help ramp up the plant by mid 2008, which should also substantially reduce costs. Right now bauxite travels 450kms through poor quality roads from Korba to Lanjigarh, a trip that can take around 3 days one way. In Jharsuguda, our key takeaway was the good progress being made on the smelter and that both phases are coming 4-6 months ahead of schedule.

## Lanjigarh Alumina

Vedanta Alumina is setting up a 1.4m tpa alumina refinery at Lanjigarh, Orissa. The company has chosen this site due to abundant availability of bauxite, easy access to power, logistical advantages and ease of land acquisition.

**Figure 6. Operation Review – Present Status**  
(tonnes per day)

Parameters	Design	Achieved
Maximum Bauxite Grinding	5,400	4,883
Maximum Alumina Production	2,000	1,560

Source: Company Reports

- **Alumina production:** Vedanta Alumina has commenced commercial production of its first stream of 700,000 tpa. The production of alumina commenced in August 2007, and the company has produced 32,000 tonnes till date. The company expects to achieve production of about 450,000-500,000 tpa in FY08.

The production of its second stream of 700,000tpa is expected to start by the end of October 2007 and be ramped by mid 2008.

- **Bauxite deposits:** There are more than 600m tonnes of bauxite deposits in a radius of 30-80kms from the refinery. The company had earlier entered into an MOU with the government of Orissa for the latter to grant access to 150 million tonnes of bauxite. The company expects to get mining approval for the Lanjigarh deposits of ~78 million tonnes by October 2007.
- **Bauxite currently sourced from Balco:** As Vedanta Alumina awaits clearance to mine bauxite, it sources its current bauxite requirements from Balco. The alumina produced using the bauxite is supplied to Balco. Lanjigarh is located about 450kms from Balco's Korba facility. The bauxite is transported via road and each round trip takes about 6 days (the same truck that transports bauxite one-way carries alumina on the way back).
- **Captive power:** 90MW of captive power (3\*30 MW) has been commissioned, together with back-up from the grid and diesel generators. Currently only one unit of 30MW is being used as only the first stream of 0.7m has started commercial production. Coal linkages have been secured to meet the needs of the captive power plants.

- **Low-cost producer:** The high-quality bauxite (alumina content of 44%) and the use of the latest technology should make it among the lowest cost producers of alumina (cost expected to be less than US\$130/tonne).

## Jharsuguda

Vedanta Alumina is also setting up a greenfield 500,000 tpa aluminium smelter in two phases of 250,000 tpa each, in Jharsuguda, Orissa, together with an associated 1,215MW captive power plants (nine units of 135MW each). The capex for this project is Rs90.5bn (US\$2.1 bn).

- **Capacity likely to come ahead of schedule:** The first phase of smelter capacity is expected to be completed by June 2009 and the second phase by late 2010, although the management is working to bring both ahead of their stated schedule.

The first phase of 675MW of power (135x5) is likely to be completed by April 2009 (with the first 135MW coming in June 2008) and the balance 540MW of power is expected to be commissioned by mid 2010.

- **Project status:** The package ordering and engineering for the smelter and captive power plant are almost complete. The construction of both the smelter and the power plant are in progress and are about 40% complete.
- **Amperage:** The smelter will start using current at 320kA. This can be increased to 350kA. Upgrading the current could add about 10% (50,000 tpa) to production.
- **Cost of production:** The Jharsuguda smelter is using the same technology and expertise as that of Korba II (Balco's new smelter). Based on that, the company expects to achieve the same cost of production as Korba II (US\$600-650/t, net of alumina) in the long run.

## Hindustan Zinc

On Day 4, we also visited HZL's largest zinc smelter at Chanderiya in Rajasthan. The new 170,000 tpa zinc smelter is a replica of the old one and is on track to be completed about 3-4months ahead of schedule, taking capacity to 581,000 tpa (up by 41%) by December 2007 and adding to volumes at a period when zinc prices are expected to be buoyant.

**Figure 7. HZL's capacity snapshot as of March 31, 2007.**

Facility	Zinc (tpa)	Lead (tpa)	Silver (tpa)	Sulphuric Acid (tpa)	Captive Power (MW)
Chanderiya (Rajasthan)	275,000	85,000	74	465,000	154
Debari (Rajasthan)	80,000	-	-	131,200	29+6*
Vizag (Andhra Pradesh)	56,000	-	-	90,996	-
<b>Total</b>	<b>411,000</b>	<b>85,000</b>	<b>74</b>	<b>687,196</b>	<b>189</b>

Source: Company Report. \*6MW of power at Zawar Mines

**Figure 8. HZL's expansion plans**

Location	Planned expansion	Completion Date
Chanderiya - Zinc	170,000 tpa	Dec 2007
Chanderiya - Power	80 MW	
Chanderiya – Zinc (debottlenecking)	80,000 tpa	Mid 2008
Debari – Zinc (debottlenecking)	8,000 tpa	
Zawar - Power	80 MW	
Windpower (Guj, Kar, Mah)	38.4 MW	Completed FY08
	110.4 MW	

Source: Company Reports

**Figure 9. HZL's Expected Total Capacities by FY09**

Facility	Zinc (tpa)	Lead (tpa)	Silver (tpa)	Sulphuric Acid (tpa)	Captive Power (MW)
Chanderiya (Rajasthan)	525,000	85,000	74	465,000	234
Debari (Rajasthan)	88,000	-	-	131,200	29+6+80*
Vizag (Andhra Pradesh)	56,000	-	-	90,996	-
<b>Total</b>	<b>669,000</b>	<b>85,000</b>	<b>74</b>	<b>687,196</b>	<b>349</b>

Source: Company Reports. \*86 MW of power at Zawar Mine

- **Capacity by FY09:** All the expansion plans are well on track. Once the ongoing expansions are completed by 1Q FY09, HZL's overall zinc smelting capacity will become 669,000 tpa (up 63% from the current 411,000 tpa), and the power capacities will rise by 85% to 349MW.
- **Project implementation status:** The first hydrometallurgical zinc smelter (170,000 tpa) was completed over a period of 22 months (usually takes about 27-30 months). The company hopes to complete the new 170,000 tpa smelter at Chanderiya in a period of less than 20 months, based on the experience of the first phase.
- **Long-term expansion plans:** In addition, the company has the potential to add about 200,000-250,000 tpa of smelter capacity to take its total zinc and lead capacity to around 1m tpa. However, no plans for this additional capacity have been formalized yet.
- **Coal availability:** The company sources about 60% of its coal requirements from Indonesia, and the balance is met indigenously.
- **Cost of production:** The current cost of production of zinc is ~US\$639/t. The company hopes to achieve a long-term cost of US\$500/t (excluding royalties), which would make it one of the lowest-cost producers globally.
- **CER credit:** HZL's 9.4MW Waste Heat Recovery based power plant at Chanderiya got the United Nation's stamp of registration and has thus qualified for CER registration.



- **Wind power:** HZL set up 38.4MW of wind power in Gujarat in March 2007. Another 110.4MW is being commissioned in phases in Gujarat, Karnataka and Maharashtra and should be completed by the end of FY08.

## HZL's Mines

Figure 10. Mining Operations -Current Status

Mine	Total Proven and Probable Reserves			Ore production capacity m tpa
	Qty m tons	Zinc Grade (%)	Lead Grade (%)	
Rampur Agucha	60.7	13.0	2.0	3.75
Zawar	6.7	3.9	2.1	1.2
Rajpura Dariba	6.8	6.3	1.5	0.9
Sindesar Khurd	2.5	5.3	2.2	0.3

Source: Company Reports

## Rampura Agucha Mine

Our visit to HZL's Rampura Agucha Zinc-Lead Mine, located ~350 kms from the picturesque city of Udaipur in Rajasthan was a trip highlight. Rampura Agucha mine is the third-largest lead-zinc mine in the world and has one of the lowest costs with a low stripping ratio and high grade mineralogy.

We visited the mine on 28<sup>th</sup> September 2007 and the beneficiation plant that is used to convert the ore to concentrate. The mine appears to have significant potential, and HZL can increase the ore production capacity further, both open cast and underground, by undertaking feasibility studies.

The company reported continuous increase in the budget commitment towards exploration activities around all its mines. The budget commitment for FY08 is Rs285m. At HZL, the exploration efforts should bear fruit and allow the company to soon announce an increase in the level of zinc ore reserves.

- **Expansion plans:** The current mine life of the Rampura Agucha mine is around 14 years. The ore production capacity is being increased from 3.75m tpa to ~5m tpa by December 2007(site works commenced in December 2006). Further, the company has undertaken feasibility studies to start underground production as well.
- **Stripping ratio:** The overall stripping ratio is 1:4.69, among the lowest globally.
- **Lead and Zinc recovery:** There has been a rising trend in lead and zinc recovery from the Rampura Agucha Mine.

Figure 11. Zinc and Lead Recovery

	2002	2003	2004	2005	2006	2007
Lead Recovery (%)	54.04	54.69	58.50	59.01	59.62	60.39
Zinc Recovery (%)	89.80	89.80	90.38	90.98	91.20	92.00

Source: Company Reports

## Sterlite Industries (India)

### Company description

Sterlite is a non-ferrous metals major with a presence in aluminium, zinc and copper. Sterlite is a custom copper smelter (capacity 400,000 tpa) for which the key profit driver is treatment and refining charges (TC/RCs). According to Brook Hunt, Sterlite is in the lowest-cost quartile of all copper smelting operations worldwide. Sterlite's aluminium revenues and profits comes from its 51% ownership of Bharat Aluminium Co (Balco), Balco's smelter capacity of 345,000 tpa has access to 810MW power, which is the most important cost component in the aluminium manufacturing process. Sterlite's zinc and lead revenues come from its 64.9% holding in Hindustan Zinc Ltd (HZL), an integrated zinc producer with a 60% domestic share. It is among the lowest-cost producers in the world largely due to the low cost of mining ore at the Rampura Agucha mine which meets about 90% of its requirement. HZL is expanding its zinc capacity by 63% to 669,000 tpa by 1Q FY09, accompanied by expansion in captive power capacity by 83% to 346MW. Sterlite is in the process of buying out the minority government stake in both HZL (29.5%) and Balco (49%).

### Investment strategy

We rate Sterlite shares Buy / Medium Risk (1M). Zinc (Hindustan Zinc) is the biggest contributor to Sterlite's EBITDA (70% of total) and should continue to benefit from robust pricing and strong volume growth. Sterlite is expected to soon raise its holding in HZL to 94.4% and hence can be considered as an alternate investment vehicle for investors looking to participate in the zinc story. Sterlite is also 4x more liquid than HZL. In the aluminium business (Balco), lower costs and some volume growth should help compensate for lower domestic prices in FY08. Sterlite's shareholding in Balco is also expected to soon reach 100%. Copper has a difficult outlook due to the lower TC/RC margins expected in FY08-FY09 vs. FY07. We expect Sterlite's attributable net income to rise 39% yoy in FY09E due to higher profits in zinc and aluminium and the completion of the minority stake acquisition of Hindustan Zinc (29.5%) and Balco (49%) from the government during FY08.

### Valuation

Since April 2006, the stock has been substantially re-rated to a P/E range of 6-8x due to the positive trends in all its three major businesses. We expect this re-rating process to continue based on our robust outlook for zinc and steady profits in aluminium, with triggers coming from progress in acquiring the balance minority stakes from HZL and Balco. Our target price of Rs949 is arrived at by applying a P/E of 10x to FY09E earnings. This appears justified as Sterlite's earnings are substantially driven by zinc's robust outlook, and the sector re-rating following recent M&A activity. The stock has also crossed its 4-year average EV/EBITDA of 3.7x in the last few months, largely driven by zinc and lead prices. Based on our zinc outlook, we expect the EV/EBITDA upside to continue. At our target price, the stock would trade at an EV/EBITDA of 6.6x.

We also examine the value for Sterlite using sum-of-the-parts by applying P/E

ratios of 6x to 10x for FY09E for its various businesses. We also add to this value the book value of investments in Sterlite Energy at the end of FY09E. This method gives a value of Rs904 per share.

## **Risks**

We rate Sterlite shares as Medium Risk based on our quantitative risk rating system, which tracks 260-day historical share price volatility. Risk factors that could prevent the shares from reaching our target price include: (1) Any delays in completion of Hindustan Zinc minority stake acquisition; (2) Any delays in acquisition of Balco minority stake; (3) Weaker-than-expected commodity prices or TC/RC margins; (4) Delays in expansion plans for zinc and power; (5) Substantial dependence on the Rampura Agucha mines in case of zinc; (6) Trends in exchange rates.

# Appendix A-1

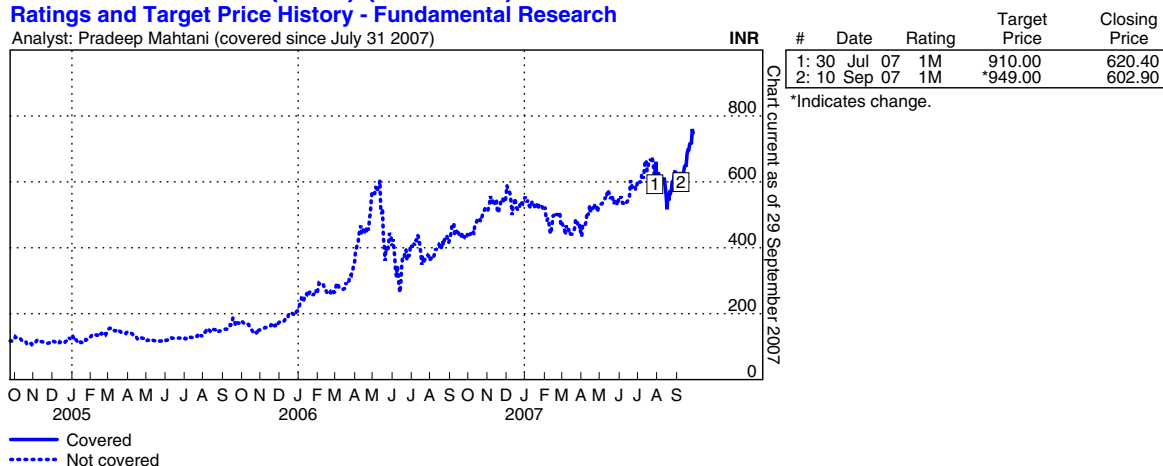
## Analyst Certification

Each research analyst(s), strategist(s) or research associate(s) responsible for the preparation and content of this research report hereby certifies that, with respect to each issuer or security that the research analyst, strategist or research associate covers in this research report, all of the views expressed in this research report accurately reflect their personal views about those issuer(s) or securities. Each research analyst(s) strategist(s) or research associate(s) also certify that no part of their compensation was, is, or will be, directly or indirectly, related to the specific recommendation(s) or view(s) expressed by that research analyst, strategist or research associate in this research report.

## IMPORTANT DISCLOSURES

### Sterlite Industries (India) (STRL.BO) Ratings and Target Price History - Fundamental Research

Analyst: Pradeep Mahtani (covered since July 31 2007)



Pradeep Mahtani holds a long position in the shares of Sterlite Industries (India).

Citigroup Global Markets Inc. or its affiliates has received compensation for investment banking services provided within the past 12 months from Sterlite Industries (India).

Citigroup Global Markets Inc. or its affiliates expects to receive or intends to seek, within the next three months, compensation for investment banking services from Sterlite Industries (India).

Citigroup Global Markets Inc. or an affiliate received compensation for products and services other than investment banking services from Sterlite Industries (India) in the past 12 months.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following company(ies) as investment banking client(s): Sterlite Industries (India).

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following company(ies) as clients, and the services provided were non-investment-banking, securities-related: Sterlite Industries (India).

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following company(ies) as clients, and the services provided were non-investment-banking, non-securities-related: Sterlite Industries (India).

Analysts' compensation is determined based upon activities and services intended to benefit the investor clients of Citigroup Global Markets Inc. and its affiliates ("the Firm"). Like all Firm employees, analysts receive compensation that is impacted by overall firm profitability, which includes revenues from, among other business units, the Private Client Division, Institutional Sales and Trading, and Investment Banking.

For important disclosures (including copies of historical disclosures) regarding the companies that are the subject of this Citi Investment Research product ("the Product"), please contact Citi Investment Research, 388 Greenwich Street, 29th Floor, New York, NY, 10013, Attention: Legal/Compliance. In addition, the same important disclosures, with the exception of the Valuation and Risk assessments and historical disclosures, are contained on the Firm's disclosure website at [www.citigroupgeo.com](http://www.citigroupgeo.com). Private Client Division clients should refer to [www.smithbarney.com/research](http://www.smithbarney.com/research). Valuation and Risk assessments can be found in the text of the most recent research note/report regarding the subject company. Historical disclosures (for up to the past three years) will be provided upon request.

### Citi Investment Research Ratings Distribution

Data current as of 30 September 2007

	Buy	Hold	Sell
Citi Investment Research Global Fundamental Coverage (3358)	50%	38%	12%
% of companies in each rating category that are investment banking clients	53%	55%	42%

### Guide to Fundamental Research Investment Ratings:

Citi Investment Research's stock recommendations include a risk rating and an investment rating.

Risk ratings, which take into account both price volatility and fundamental criteria, are: Low (L), Medium (M), High (H), and Speculative (S).

**Investment ratings** are a function of Citi Investment Research's expectation of total return (forecast price appreciation and dividend yield within the next 12 months) and risk rating.

For securities in emerging markets (Asia Pacific, Emerging Europe/Middle East/Africa, and Latin America), investment ratings are: Buy (1) (expected total return of 15% or more for Low-Risk stocks, 20% or more for Medium-Risk stocks, 30% or more for High-Risk stocks, and 40% or more for Speculative stocks); Hold (2) (5%-15% for Low-Risk stocks, 10%-20% for Medium-Risk stocks, 15%-30% for High-Risk stocks, and 20%-40% for Speculative stocks); and Sell (3) (5% or less for Low-Risk stocks, 10% or less for Medium-Risk stocks, 15% or less for High-Risk stocks, and 20% or less for Speculative stocks).

Investment ratings are determined by the ranges described above at the time of initiation of coverage, a change in investment and/or risk rating, or a change in target price (subject to limited management discretion). At other times, the expected total returns may fall outside of these ranges because of market price movements and/or other short-term volatility or trading patterns. Such interim deviations from specified ranges will be permitted but will become subject to review by Research Management. Your decision to buy or sell a security should be based upon your personal investment objectives and should be made only after evaluating the stock's expected performance and risk.

---

#### Guide to Corporate Bond Research Credit Opinions and Investment Ratings:

Citi Investment Research's corporate bond research issuer publications include a fundamental credit opinion of Improving, Stable or Deteriorating and a complementary risk rating of Low (L), Medium (M), High (H) or Speculative (S) regarding the credit risk of the company featured in the report. The fundamental credit opinion reflects the CIR analyst's opinion of the direction of credit fundamentals of the issuer without respect to securities market vagaries. The fundamental credit opinion is not geared to, but should be viewed in the context of debt ratings issued by major public debt ratings companies such as Moody's Investors Service, Standard and Poor's, and Fitch Ratings. CBR risk ratings are approximately equivalent to the following matrix: Low Risk Triple A to Low Double A; Low to Medium Risk High Single A through High Triple B; Medium to High Risk Mid Triple B through High Double B; High to Speculative Risk Mid Double B and Below. The risk rating element illustrates the analyst's opinion of the relative likelihood of loss of principal when a fixed income security issued by a company is held to maturity, based upon both fundamental and market risk factors. Certain reports published by Citi Investment Research will also include investment ratings on specific issues of companies under coverage which have been assigned fundamental credit opinions and risk ratings. Investment ratings are a function of Citi Investment Research's expectations for total return, relative return (to publicly available Citigroup bond indices performance), and risk rating. These investment ratings are: Buy/Overweight the bond is expected to outperform the relevant Citigroup bond market sector index (Broad Investment Grade, High Yield Market or Emerging Market), performances of which are updated monthly and can be viewed at <http://sd.ny.smb.com/> using the "Indexes" tab; Hold/Neutral Weight the bond is expected to perform in line with the relevant Citigroup bond market sector index; or Sell/Underweight the bond is expected to underperform the relevant sector of the Citigroup indexes.

---

## OTHER DISCLOSURES

The subject company's share price set out on the front page of this Product is quoted as at 01 October 2007 04:15 PM on the issuer's primary market.

For securities recommended in the Product in which the Firm is not a market maker, the Firm is a liquidity provider in the issuers' financial instruments and may act as principal in connection with such transactions. The Firm is a regular issuer of traded financial instruments linked to securities that may have been recommended in the Product. The Firm regularly trades in the securities of the subject company(ies) discussed in the Product. The Firm may engage in securities transactions in a manner inconsistent with the Product and, with respect to securities covered by the Product, will buy or sell from customers on a principal basis.

Securities recommended, offered, or sold by the Firm: (i) are not insured by the Federal Deposit Insurance Corporation; (ii) are not deposits or other obligations of any insured depository institution (including Citibank); and (iii) are subject to investment risks, including the possible loss of the principal amount invested. Although information has been obtained from and is based upon sources that the Firm believes to be reliable, we do not guarantee its accuracy and it may be incomplete and condensed. Note, however, that the Firm has taken all reasonable steps to determine the accuracy and completeness of the disclosures made in the Important Disclosures section of the Product. The Firm's research department has received assistance from the subject company(ies) referred to in this Product including, but not limited to, discussions with management of the subject company(ies). Firm policy prohibits research analysts from sending draft research to subject companies. However, it should be presumed that the author of the Product has had discussions with the subject company to ensure factual accuracy prior to publication. All opinions, projections and estimates constitute the judgment of the author as of the date of the Product and these, plus any other information contained in the Product, are subject to change without notice. Prices and availability of financial instruments also are subject to change without notice. Notwithstanding other departments within the Firm advising the companies discussed in this Product, information obtained in such role is not used in the preparation of the Product. Although Citi Investment Research does not set a predetermined frequency for publication, if the Product is a fundamental research report, it is the intention of Citi Investment Research to provide research coverage of the/those issuer(s) mentioned therein, including in response to news affecting this issuer, subject to applicable quiet periods and capacity constraints. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security. Any decision to purchase securities mentioned in the Product must take into account existing public information on such security or any registered prospectus.

Investing in non-U.S. securities, including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of the U.S. Securities and Exchange Commission. There may be limited information available on foreign securities. Foreign companies are generally not subject to uniform audit and reporting standards, practices and requirements comparable to those in the U.S. Securities of some foreign companies may be less liquid and their prices more volatile than securities of comparable U.S. companies. In addition, exchange rate movements may have an adverse effect on the value of an investment in a foreign stock and its corresponding dividend payment for U.S. investors. Net dividends to ADR investors are estimated, using withholding tax rates conventions, deemed accurate, but investors are urged to consult their tax advisor for exact dividend computations. Investors who have received the Product from the Firm may be prohibited in certain states or other jurisdictions from purchasing securities mentioned in the Product from the Firm. Please ask your Financial Consultant for additional details. Citigroup Global Markets Inc. takes responsibility for the Product in the United States. Any orders by US investors resulting from the information contained in the Product may be placed only through Citigroup Global Markets Inc.

The Citigroup legal entity that takes responsibility for the production of the Product is the legal entity which the first named author is employed by. The Product is made available in Australia to wholesale clients through Citigroup Global Markets Australia Pty Ltd. (ABN 64 003 114 832 and AFSL No. 240992) and to retail clients through Citi Smith Barney Pty Ltd. (ABN 19 009 145 555 and AFSL No. 240813), Participants of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in Australia to Private Banking wholesale clients through Citigroup Pty Limited (ABN 88 004 325 080 and AFSL 238098). Citigroup Pty Limited provides all financial product advice to Australian Private Banking wholesale clients through bankers and relationship managers. If there is any doubt about the suitability of investments held in Citigroup Private Bank accounts, investors should contact the Citigroup Private Bank in Australia. Citigroup companies may compensate affiliates and their representatives for providing products and services to clients. The Product is made available in Brazil by Citigroup Global Markets Brasil - CCTVM SA, which is regulated by CVM - Comissão de Valores Mobiliários, BACEN - Brazilian Central Bank, APIMEC - Associação Associação dos Analistas e Profissionais de Investimento do Mercado de Capitais and ANBID - Associação Nacional dos Bancos de Investimento. Av. Paulista, 1111 - 11º andar - CEP. 01311920 - São Paulo - SP. If the Product is being made available in certain provinces of Canada by Citigroup Global Markets (Canada) Inc. ("CGM Canada"), CGM Canada has approved the Product. Citigroup

Place, 123 Front Street West, Suite 1100, Toronto, Ontario M5J 2M3. The Product may not be distributed to private clients in Germany. The Product is distributed in Germany by Citigroup Global Markets Deutschland AG & Co. KGaA, which is regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin). Frankfurt am Main, Reuterweg 16, 60323 Frankfurt am Main. If the Product is made available in Hong Kong by, or on behalf of, Citigroup Global Markets Asia Ltd., it is attributable to Citigroup Global Markets Asia Ltd., Citibank Tower, Citibank Plaza, 3 Garden Road, Hong Kong. Citigroup Global Markets Asia Ltd. is regulated by Hong Kong Securities and Futures Commission. If the Product is made available in Hong Kong by The Citigroup Private Bank to its clients, it is attributable to Citibank N.A., Citibank Tower, Citibank Plaza, 3 Garden Road, Hong Kong. The Citigroup Private Bank and Citibank N.A. is regulated by the Hong Kong Monetary Authority. The Product is made available in India by Citigroup Global Markets India Private Limited, which is regulated by Securities and Exchange Board of India. Bakhtawar, Nariman Point, Mumbai 400-021. The Product is made available in Indonesia through PT Citigroup Securities Indonesia. 5/F, Citibank Tower, Bapindo Plaza, Jl. Jend. Sudirman Kav. 54-55, Jakarta 12190. Neither this Product nor any copy hereof may be distributed in Indonesia or to any Indonesian citizens wherever they are domiciled or to Indonesian residents except in compliance with applicable capital market laws and regulations. This Product is not an offer of securities in Indonesia. The securities referred to in this Product have not been registered with the Capital Market and Financial Institutions Supervisory Agency (BAPEPAM-LK) pursuant to relevant capital market laws and regulations, and may not be offered or sold within the territory of the Republic of Indonesia or to Indonesian citizens through a public offering or in circumstances which constitute an offer within the meaning of the Indonesian capital market laws and regulations. If the Product was prepared by Citi Investment Research and distributed in Japan by Nikko Citigroup Limited ("NCL"), it is being so distributed under license. If the Product was prepared by NCL and distributed by Nikko Cordial Securities Inc., Citigroup Global Markets Inc., or Monex, Inc. it is being so distributed under license. NCL is regulated by Financial Services Agency, Securities and Exchange Surveillance Commission, Japan Securities Dealers Association, Tokyo Stock Exchange and Osaka Securities Exchange. Shin-Marunouchi Building, 1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100-6520 Japan. In the event that an error is found in an NCL research report, a revised version will be posted on Citi Investment Research's Global Equities Online (GEO) website. If you have questions regarding GEO, please call (81 3) 5574-4860 for help. The Product is made available in Korea by Citigroup Global Markets Korea Securities Ltd., which is regulated by Financial Supervisory Commission and the Financial Supervisory Service. Hungkuk Life Insurance Building, 226 Shinmunno 1-GA, Jongno-Gu, Seoul, 110-061. The Product is made available in Malaysia by Citigroup Global Markets Malaysia Sdn Bhd, which is regulated by Malaysia Securities Commission. Menara Citibank, 165 Jalan Ampang, Kuala Lumpur, 50450. The Product is made available in Mexico by Acciones y Valores Banamex, S.A. De C. V., Casa de Bolsa, which is regulated by Comision Nacional Bancaria y de Valores. Reforma 398, Col. Juarez, 06600 Mexico, D.F. In New Zealand the Product is made available through Citigroup Global Markets New Zealand Ltd., a Participant of the New Zealand Exchange Limited and regulated by the New Zealand Securities Commission. Level 19, Mobile on the Park, 157 lambton Quay, Wellington. The Product is made available in Poland by Dom Maklerski Banku Handlowego SA an indirect subsidiary of Citigroup Inc., which is regulated by Komisja Papierów Wartościowych i Gield. Bank Handlowy w Warszawie S.A. ul. Senatorska 16, 00-923 Warszawa. The Product is made available in the Russian Federation through ZAO Citibank, which is licensed to carry out banking activities in the Russian Federation in accordance with the general banking license issued by the Central Bank of the Russian Federation and brokerage activities in accordance with the license issued by the Federal Service for Financial Markets. Neither the Product nor any information contained in the Product shall be considered as advertising the securities mentioned in this report within the territory of the Russian Federation or outside the Russian Federation. The Product does not constitute an appraisal within the meaning of the Federal Law of the Russian Federation of 29 July 1998 No. 135-FZ (as amended) On Appraisal Activities in the Russian Federation. 8-10 Gashka Street, 125047 Moscow. The Product is made available in Singapore through Citigroup Global Markets Singapore Pte. Ltd., a Capital Markets Services Licence holder, and regulated by Monetary Authority of Singapore. 1 Temasek Avenue, #39-02 Millenia Tower, Singapore 039192. The Product is made available by The Citigroup Private Bank in Singapore through Citibank, N.A., Singapore branch, a licensed bank in Singapore that is regulated by Monetary Authority of Singapore. Citigroup Global Markets (Pty) Ltd. is incorporated in the Republic of South Africa (company registration number 2000/025866/07) and its registered office is at 145 West Street, Sandton, 2196, Saxonwold. Citigroup Global Markets (Pty) Ltd. is regulated by JSE Securities Exchange South Africa, South African Reserve Bank and the Financial Services Board. The investments and services contained herein are not available to private customers in South Africa. The Product is made available in Taiwan through Citigroup Global Markets Inc. (Taipei Branch), which is regulated by Securities & Futures Bureau. No portion of the report may be reproduced or quoted in Taiwan by the press or any other person. No. 8 Manhattan Building, Hsin Yi Road, Section 5, Taipei 100, Taiwan. The Product is made available in Thailand through Citicorp Securities (Thailand) Ltd., which is regulated by the Securities and Exchange Commission of Thailand. 18/F, 22/F and 29/F, 82 North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand. The Product is made available in United Kingdom by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. This material may relate to investments or services of a person outside of the UK or to other matters which are not regulated by the FSA and further details as to where this may be the case are available upon request in respect of this material. Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB. The Product is made available in United States by Citigroup Global Markets Inc, which is regulated by NASD, NYSE and the US Securities and Exchange Commission. 388 Greenwich Street, New York, NY 10013. Unless specified to the contrary, within EU Member States, the Product is made available by Citigroup Global Markets Limited, which is regulated by Financial Services Authority. Many European regulators require that a firm must establish, implement and make available a policy for managing conflicts of interest arising as a result of publication or distribution of investment research. The policy applicable to Citi Investment Research's Products can be found at [www.citigroupgeo.com](http://www.citigroupgeo.com). Compensation of equity research analysts is determined by equity research management and Citigroup's senior management and is not linked to specific transactions or recommendations. The Product may have been distributed simultaneously, in multiple formats, to the Firm's worldwide institutional and retail customers. The Product is not to be construed as providing investment services in any jurisdiction where the provision of such services would be illegal. Subject to the nature and contents of the Product, the investments described therein are subject to fluctuations in price and/or value and investors may get back less than originally invested. Certain high-volatility investments can be subject to sudden and large falls in value that could equal or exceed the amount invested. Certain investments contained in the Product may have tax implications for private customers whereby levels and basis of taxation may be subject to change. If in doubt, investors should seek advice from a tax adviser. The Product does not purport to identify the nature of the specific market or other risks associated with a particular transaction. Advice in the Product is general and should not be construed as personal advice given it has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Accordingly, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to their objectives, financial situation and needs. Prior to acquiring any financial product, it is the client's responsibility to obtain the relevant offer document for the product and consider it before making a decision as to whether to purchase the product.

This Product is not intended for distribution in Poland. Any receipt or review of the Product in Poland is not authorized by the Firm.

© 2007 Citigroup Global Markets Inc. (© Nikko Citigroup Limited, if this Product was prepared by it). Citi Investment Research is a division and service mark of Citigroup Global Markets Inc. and its affiliates and is used and registered throughout the world. Citigroup and the Umbrella Device are trademarks and service marks of Citigroup or its affiliates and are used and registered throughout the world. Nikko is a registered trademark of Nikko Cordial Corporation. All rights reserved. Any unauthorized use, duplication, redistribution or disclosure is prohibited by law and will result in prosecution. The information contained in the Product is intended solely for the recipient and may not be further distributed by the recipient. The Firm accepts no liability whatsoever for the actions of third parties. The Product may provide the addresses of, or contain hyperlinks to, websites. Except to the extent to which the Product refers to website material of the Firm, the Firm has not reviewed the linked site. Equally, except to the extent to which the Product refers to website material of the Firm, the Firm takes no responsibility for, and makes no representations or warranties whatsoever as to, the data and information contained therein. Such address or hyperlink (including addresses or hyperlinks to website material of the Firm) is provided solely for your convenience and information and the content of the linked site does not in anyway form part of this document. Accessing such website or following such link through the Product or the website of the Firm shall be at your own risk and the Firm shall have no liability arising out of, or in connection with, any such referenced website.

ADDITIONAL INFORMATION IS AVAILABLE UPON REQUEST