Outlook #04.2006

India Wireless Operator and Handset manufacturer Outlook 2006 – 2010

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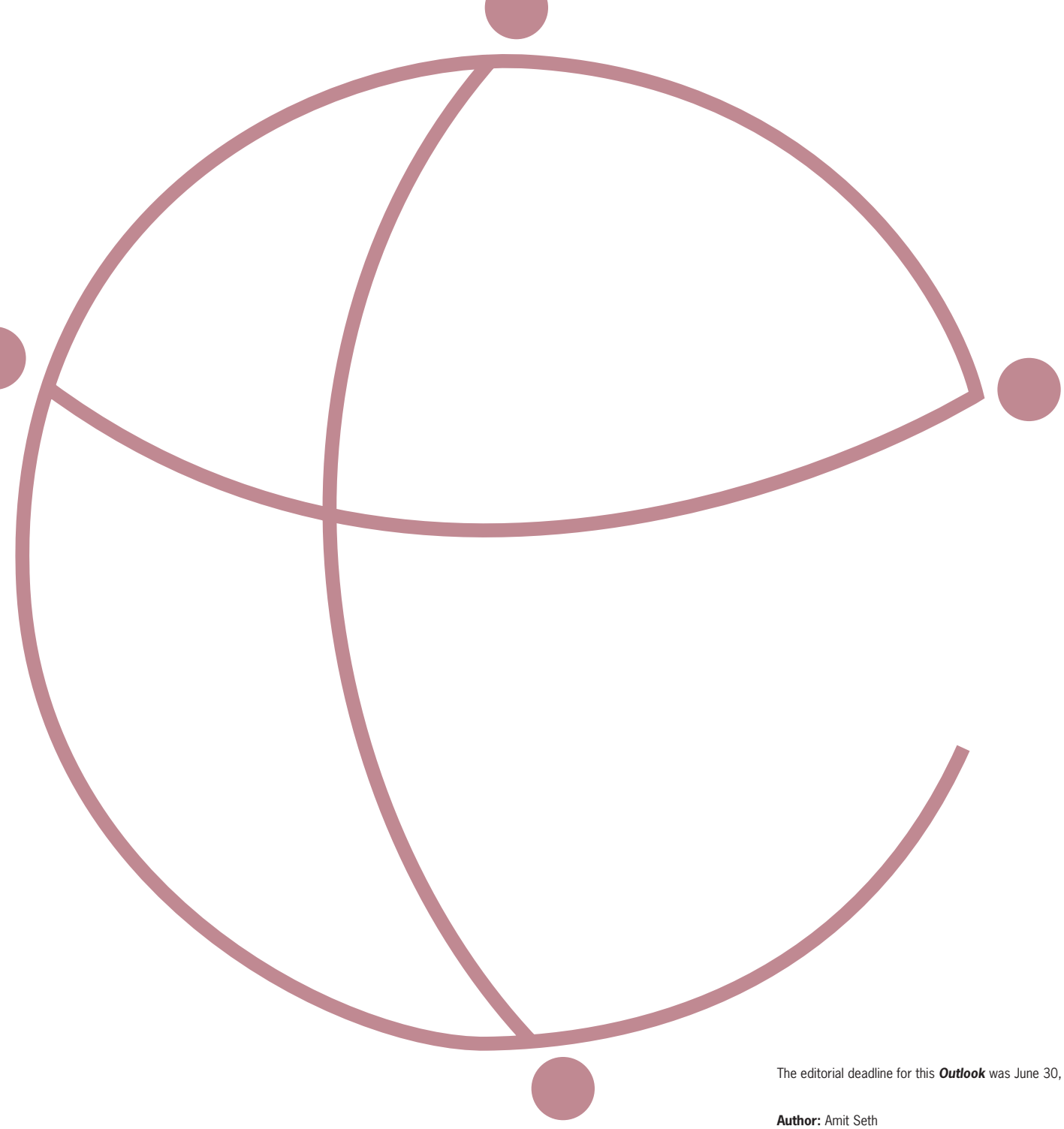

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Installed Base

Installed Base: 79.9 Million
Prepaid Installed Base: 61.6 Million
Postpaid Installed Base: 18.63 Million
Data Users: 34.1 Million

ARPU

Service Revenue: $ 7.3 Billion
Monthly ARPU: $ 7.66
Monthly ARPU (Voice): $ 6.51
Monthly ARPU (Data): $ 1.15

Handset Sales by Technology

GSM Handset Sales: 21.9 Million
CDMA Handset Sales: 10.1 Million

Carrier Market Shares (by Installed Base)

Bharti Televentures Ltd: 21.6%
Reliance Infocomm: 20.0%
BSNL: 19.0%
Hutchinson Group: 14,9%
Idea Communications: 9.1%
BPL Group: 4.3%
Spice Communications: 2.2%
Tata Teleservices/Hughes: 3.2%
MTNL: 2.2%
Others: 3.5%

Source: IEMR

Table 1: Market Forecasts: 2006 - 2010

IEMR FORECAST

	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*CAGR, 2005 - 2010*
Population (Millions)	1,088	1,102	1,115	1,129	1,142	1,156	1.2%
Total Installed Base (Thousands)	75,000	103,204	129,958	153,137	171,580	184,922	19.8%
Penetration Rate %	6.9%	9.4%	11.7%	13.6%	15.0%	16.0%	18.3%
Total Monthly ARPU (USD)	7.66	6.67	5.92	5.4	5.02	4.75	-9.1%
Total Service Revenue (USD Mill)	7,354	9,717	11,513	12,877	13,912	14,698	14.9%
Data Users (Thousands)	32,625	45,644	58,592	70,653	81,305	90,287	22.6%
Monthly ARPU on Data per Data User (USD)	1.14	1.17	1.29	1.29	1.27	1.27	2.2%
Total Handset Sales (Thousands)	32,000	44,027	55,440	65,328	73,196	78,888	19.8%
Handset Sales by Technology (Thousands)							
GSM Handset Sales	15,203	17,170	17,054	15,813	13,028	14,295	-1.2%
GPRS Handset Sales	6,692	13,504	18,903	21,285	18,691	16,490	19.8%
WCDMA Handset Sales		178	1,084	5,479	13,870	23,148	237.7%
CDMA 2000 1xRTT	9,922	12,001	15,103	17,060	19,741	15,395	9.2%
CDMA 1xEV-DO	183	1,174	3,296	5,693	7,865	9,559	120.6%

Source: IEMR

1. Executive Summary

India Wireless Market: Strategic Outlook

For the 2005 – 2010 period, we forecast India's installed base will grow by a Compound Annual Growth Rate (CAGR) of 19.8%, the fastest growing of the Asia-Pacific markets we cover. Given that net new adds are in the range of 2.5 - 3 million per month, we recently revised our forecast, and now predict that India's installed base will reach 185 million by 2010. With a 150% growth rate over the next four years, India is a very hot market indeed, and the world's second-largest mobile market opportunity, as many people have been waiting years for a phone.

We expect the major operators will continue to fight tooth-and-nail for subscriber adds. India's operator space is fiercely competitive, with cutthroat price competition among the major operators. We also expect the pace of mergers and acquisitions (M&A) to accelerate during the forecast period. The business culture in India, however, may not allow for mergers between some of the larger operators like Reliance and Tata, which are operating subsidiaries of larger industrial conglomerates. Therefore, M&A activity is likely going to be limited to foreign operators acquiring minority stakes in existing players or larger players acquiring smaller, regional operators.

Rural India Key to Demand Growth

Local Indian operators, particularly Reliance and regional players, are undertaking significant investments in telecommunications infrastructure in India's semi-urban and rural areas. According to the Telecom Regulatory Authority of India (TRAI), plans proposed by various operators suggest that by the end of 2006, network coverage will capture approximately 350,000 of India's 607,000 villages, a rural population base of approximately 450 million people. While we are skeptical about the magnitude of these numbers and timelines, we are convinced about the economics of rural demand. Of 138 million households in rural India, 19% have a television. At current prepaid rates, we think these households can easily afford cellular services. Therefore, in our view, coverage, rather than affordability, is the key constraint in reaching 30 – 40 million subscribers in rural India (20% of rural households).

Distribution Channels Are Becoming Increasingly Sophisticated

The second important development underway in India is the liberalization of its retail sector and the evolution of unique distribution channels that are more suitable to Indian sensibilities. Current distribution channels are limited to cities, where operator and manufacturer retail outlets mostly sell the handsets. In some cities, independent public call offices, internet kiosks, and electronics stores are now also beginning to sell handsets. This limited distribution channel is about to get a boost with both multinational and local retail chains establishing retail operations throughout major urban centers. These retail chains will likely want to sell handsets as part of their offering, and we anticipate marketing of handsets will be a top priority for these outlets. At the lower end of the market, on a recent visit to India, we observed that small merchants are buying handsets and prepaid time, and then renting both the handsets and prepaid time to multiple clients. This distribution channel will be important, in order to reach low-end subscribers in both rural and urban India.

Operators in India will continue to face a number of key challenges. These include:

Network Congestion and Interconnectivity:

Recent studies by the TRAI have shown significant network congestion due to interconnectivity issues between operators. In some cases, 40% of calls between private operators and state-owned BSNL are dropped. Reasons for this include long lead times of existing interconnect agreements, delays by operators (especially BSNL) in providing interconnection, and lack of direct interconnectivity between private operator networks. With BSNL controlling 79% of fixed line market share in India, it is imperative to solve these network congestion and interconnectivity problems. To complicate matters, a number of legal battles are affecting service quality and operator purchase decisions from vendors.

Commoditized Voice Services:

2005 saw an explosion of price competition among operators in India. We think this trend will continue during the forecast period, with smaller operators being the main victims, while larger operators continue to bleed cash. Monthly ARPU in India is the lowest in the Asia-Pacific markets we cover, and, at a CAGR of 9.1%, we predict that monthly ARPU in India will decline the fastest in the Asia-Pacific during our forecast period. With post-paid tariff charges declining to Re 1 per minute under certain plans, voice service in India is already commoditized. Experience in other markets indicates the profitable operators will be those who can differentiate their offering to middle- and high-end consumers and provide converged network services. We expect Bharti and Hutchison to maintain their brand image as premium service providers for middle- and high-end consumers in India.

Reduced Operator Profitability:

Indian operators are spending a significant amount of cash attracting subscribers and maintaining networks. According to the TRAI, operating expenditures (OPEX) per subscriber per month in India stood at $4.18 in 2004, 1.7x OPEX in China. As a result, returns on invested capital in India are 7% - 10%, compared to 20% - 25% in China. These reduced profitability levels are not going to change anytime soon for operators that have gambled on expanding into semi-urban and rural areas, especially Reliance and BSNL. For others, such as Bharti and Hutchison, that have branded themselves as premium service providers, price competition will likely erode their subscriber base and have a negative effect on profitability during the forecast period.

Data and Convergence to Drive Operator Revenue, But Subscriber Net Adds Will Still be Voice-Driven:

With increasing popularity of mobile phones, education and per capita incomes in urban areas, we expect value added services (VAS) will become popular in India, with total data revenue at $ 1.6 billion in 2010 (a CAGR of 21.1%). Data revenue is expected to account for 10.6% of operator revenue by 2010. Over the next four years, we are going to see the big Indian operators, particularly Bharti, BSNL, Hutchison-Essar, and Reliance, follow converged business models. The rapid evolution to Next Generation Networks will require expansion of the existing optical fiber network, although, according to the Cellular Operators Association of India (COAI), service providers in interior areas have already laid out 670,000 kilometers of optical fiber network. With this network, India's mobile space is set to evolve to digital switching and transmission, VOIP, and broadband. Beyond 2010, we anticipate the premium operators will differentiate themselves by offering "triple play" services in urban centers, in order to gain captive

markets among India's growing middle- and high-end consumers. Despite this network build, voice will determine subscriber adds, and the gestation period for profiting from "triple play" offerings is going to be long in India. Therefore, we think that operators that have speculated on convergence will likely see eroding profitability in the short- to medium-term.

IEMR's Brand Image Survey Results: Operators

The objective of our 2005-06 Brand Image Survey was to provide our clients with information on the specific strengths and weaknesses of both their own and their competitors' brands (See Annex A for details). We covered five markets in the Asia-Pacific, with an installed base of 675 million subscribers. As such, this survey represents the largest multi-country survey of its kind in Asia. In February 2006, we undertook a survey of 500 Indian mobile users with coverage in five cities in India: Delhi, Mumbai, Calcutta, Chennai, and Bangalore. Broad results of this survey for Indian operators are as follows:

• Reliance Infocomm and Tata Teleservices enjoy significant positive brand equity in the Indian market, well above what their market share levels would justify. Of respondents surveyed, 51% identified Reliance and 29% identified Tata brands as offering wireless services, compared to their market share levels of 20% and 3.2%, respectively. We think this positive brand equity is because both firms have a powerful brand presence in the Indian mindset, and are able to leverage this to create awareness among mobile consumers. In particular, Reliance's popularity can be attributed to its massive marketing campaigns and promotional schemes offered at the launch of its services. Reliance's cost effective mobile services and VAS were new to the Indian market, and generated a lot of interest in the brand.

• Operators with significant foreign ownership, including Hutchison-Essar (investments by Hutchison) and Bharti (investments by SingTel), have also developed positive share of mind among Indian consumers. Of Indian consumers, 31% were aware of the Airtel brand (Bharti's brand in India), while 34% were aware of the "Hutch" brand. Our visit to India showed that advertising has played an important role in creating brand awareness for both Hutchison-Essar and Bharti. Television, radio, billboards, and malls in India's major urban centers are flooded with Airtel and Hutch advertisements.

• State-owned Bharat Sanchar Nigam Ltd. (BSNL) and Mahanagar Telephone Nigam Ltd. (MTNL) also have a strong "share of mind". MTNL's large share of mind, 42.4%, is likely because our sample included Mumbai and Delhi - the only two cities where MTNL has fixed line operations. Consumers appear to be signing up for BSNL because of the perception its services are available everywhere, even during inter-city railway journeys. BSNL has been quick to catch up with the mobile revolution in India and utilize its state-owned monopoly status and infrastructure to gain customers.

IEMR's Brand Image Survey Results: Manufacturers

Samsung and LGE Have a Unique Opportunity to Break Nokia's Lead in India:

In terms of brand awareness, our survey clearly shows that Nokia, Samsung, and LG Electronics (LGE) have the largest "share of mind" among Indian consumers. Samsung and Nokia are neck-and-neck in terms of share of mind of consumers in India. Of respondents, 63% identified Samsung and 60% identified Nokia as a handset brand unaided. We think Samsung's and LG Electronics' brand recognition in the handset domain is because of their long-term presence and marketing of consumer electronics and other products in India.

This finding is significant for Samsung and LGE, indicating that while Nokia may have large actual market shares in India, the Indian consumer is aware of these Korean brands. We think, Samsung and LG Electronics have the opportunity to leverage their brand image in other electronics segments to strengthen their marketing and distribution networks in India, and cross-sell handsets using these existing distribution networks. With the establishment of handset manufacturing facilities in India, we think both Samsung and LG Electronics are gearing up to meet Nokia head-on.

Price is not the only factor affecting market shares in India:

It is not going to be easy to displace Nokia from its perch in the Indian market. Our survey shows that price is not the only factor. Of the seven features of handsets we designed for our survey, Nokia clearly dominates in six. 45.8% of respondents associated Nokia with "cool", 46.8% with "creative", 54.8% with "reliable", 58.4% with "technically advanced", 49.2% with "good service", and 35.8% with "good value". Price is the one area where Nokia does not come out on top. Only 26.6% of respondents associated Nokia with "cheap". By contrast, 38% of respondents considered Samsung "cheap". This is likely because, despite Samsung's stated objective of focusing on middle- and high-end consumers, in India, available handsets from Samsung have tended to be entry-level handsets. Figure 7b is a price-point analysis of available handsets in India. As shown, Nokia dominates the market in all three price bands while Samsung (and LG Electronics) handsets have been targeted more toward the entry-level market.

Low-Income Consumers are More Brand Loyal Than High-Income Consumers:

An interesting finding of our survey was that high-income consumers may not have high brand loyalty in India, while low-income consumers are more brand loyal. We think this may be because advertisements and brand association have a greater impact on low-income consumers. Low-income consumers may also be more risk averse, and want to reduce the chance of dissatisfaction associated with trying a new brand. Again, this stems from price perceptions of low-income versus high-income households. Only 20.4% of respondents with household annual incomes under Rs. 60,000 ($ 1,360) associated Nokia with the word "cheap", compared to 33.3% of respondents with household annual incomes over Rs. 250,000 ($5,700). This trend was reversed for almost every other manufacturer, with more low-income and less high-income respondents associating manufacturers other than Nokia with the word "cheap". Again, this indicates to us that brand qualities other than price matter to low-income consumers, and manufacturers should stress factors such as 'cool', 'technically advanced', etc. to create brand loyalty among this pool of subscribers.

Other Manufacturers Need To Act Quickly To Enter The Handset Race In India:

Our Brand Image Survey shows that other brands, such as Motorola, Sony Ericsson, Siemens, Ningbo Bird, and Huawei, are virtually absent from the Indian urban market. In particular, Sony Ericsson and Siemens achieved low ratings on all seven categories we designed, while Motorola fares minutely better. These manufacturers will need to take a serious look at how they approach the Indian market, if they want to capitalize on the second-largest market opportunity in the handset domain.

2. Forecasts of India's Wireless Sector, 2006-2010

2.1. Headline Market Forecasts

2.1.1. Installed Base, Monthly ARPU, and Service Revenue

We expect India's installed base to grow at a CAGR of 19.8%, reaching 184.9 million by 2010 (see Table 1). As in many other developing countries, prepaid subscribers account for a large share of India's installed base (77.1% in 2005). We estimate prepaid subscribers will grow at 21.3%, as Indian operators continue to compete with each other on voice services. Prepaid mobiles are extremely popular in India's urban centers, primarily because it allows consumers the ability to control their cell phone expenses, making it popular with the emerging the middle-class and students. Some operators even offer free roaming for prepaid users.

In a recent visit to India, we observed an interesting phenomenon of multi-client prepaid handsets. Small merchants in urban centers are buying handsets and prepaid airtime in bulk and re-selling these to groups of individuals who are unable to afford the handset and/or rental fees and service charges. This flexibility offered by prepaid services will continue to ensure the largest growth in both rural and urban centers occurs among prepaid subscribers. Our forecast for postpaid service growth, however, is not shabby. At 14% CAGR over the 2005 – 2010 period, postpaid subscriber growth in India is the highest among the Asia-Pacific markets we cover. Again, price is an important factor, with some operators offering free roaming, incoming, and same-network calls. Effectively, on some rate plans, customers are finding it cheaper to own a mobile device than wait years for a landline or make a call at a Public Call Office (PCO).

What is interesting about the economics of the India market is that despite these very high growth rates, in 2010, the penetration rate for mobile telephony will be only 16%, only half of China's current penetration levels. For this reason, we remain convinced about the long-term growth prospects of the Indian market beyond 2010.

Table 1: Headline Market Forecasts: India, 2005 - 2010

IEMR FORECAST	2005	2006	2007	2008	2009	2010	CAGR 05 - 10
Total Installed Base (Thousands)	75,000	103,204	129,958	153,137	171,580	184,922	19.8%
Penetration Rate %	6.9%	9.4%	11.7%	14.3%	15.0%	16.0%	18.3%
Pre-Paid Installed Base (Thousands)	57,825	81,739	106,983	137,944	146,970	151,885	21.3%
Post-Paid Installed Base (Thousands)	17,175	21,465	22,975	22,923	24,610	33,037	14.0%
Total Monthly ARPU ($)	7.66	6.67	5.92	5.40	5.02	4.75	-9.1%
Total Service Revenue ($ Millions)	7,354	9,717	11,513	12,877	13,912	14,698	14.9%

Source: IEMR

In our India forecast, the implicit assumption is that the major operators will continue to engage in price wars to lure middle- and low-income consumers. We expect total monthly ARPU to decline by -9.1% CAGR between 2005 and 2010. Both operators and handset vendors have already started customizing their services to meet this price-sensitive demand. As shown in Tables 2, 3, and 4, a sampling of prepaid and postpaid rate plans of various operators suggests India's service charges are among the lowest

in the world, with local call charges ranging between 1 - 5¢ per minute. Moreover, retail prices for entry-level handsets by all the major vendors are also very attractive for low-income consumers, with some new handsets in the sub $50 range.

Table 2: Selected Postpaid rate plans of Indian Operators, February 2006

Operator/Plan	Activation Charges/ Security Deposit	Rental	Local Call Charges (per minute)		
			Same Network	Other Network	To Landline
Airtel Ecstasy 99	$6.77/$6.78	$2.24	$0.054	$0.054	$0.054
Airtel Talkmore150	$5.66/$11.32	$3.40	$0.017	$0.017	$0.027
Airtel One 150	$9.08/-	$3.40	$0.023	$0.045	$0.045
Hutch FV 699			$0.011	$0.027	$0.027
Hutch Talk 199		$4.51	$0.007	$0.017	$0.027
Hutch Talk 999		$22.63	$0.011	$0.011	$0.024
Reliance Joy 99		$2.24	$0.034	$0.050	$0.050
Reliance Joy 499	$4.53/$22.65	$11.30	$0.009	$0.023	$0.023
BSNL Cell One 225	$4.53/$22.65	$5.10	$0.020	$0.020	$0.027
BSNL Cell One 525	$2.24	$5.10	$0.009	$0.009	$0.027
Tata Indicom Do More 123	$2.24	$2.79	$0.000	$0.023	$0.045
Tata Indicom Do More 999	$6.77/$22.65		$0.023	$0.023	$0.045
BPL Wireless One	$11.32/$11.32	$3.69	$0.027	$0.027	$0.027
BPL 699	$5.66/$11.32	$15.83	$0.011	$0.011	$0.022
BPL Wirefree 999		$22.63	$0.023	$0.023	$0.023

Source: IEMR

Table3: Selected Prepaid rate plans of Indian Operators, February 2006

Operator/Plan	Local Call (per minute) Charges		Extras
	cellular device	fixed line	
Airtel (most jurisdictions)	$0.023	$0.045	Activate national roaming at Rs.49 and International roaming at Rs.99
Hutch (most jurisdictions)	$0.017-$0.045	$0.045	For Rs. 25/month make Hutch-Hutch STD calls @ Re.1
BSNL	$0.020	$0.027	Rs. 50 free talk time for initiating service
Reliance	$0.022	$0.041	Call anywhere in the country @ Re. 1/minute
BPL (most jurisdictions)	$0.041	$0.041	

Source: IEMR

Table 4: Selected retail prices for Entry-level Handsets, February 2006

Model	Retail Price
Airtel One Touch E157	$49.83
BenQ M100	$66.82
Bird S190	$76.81
Bird S299	$67.93
Huawei Gem	$45.28
Lexus 222B	$62.29
LG B2050	$88.11
LG G1600	$90.37
LG RD2430	$45.30
Motorola C138	$46.43
Motorola C118	$47.45
Motorola V171	$83.81
Nokia 2300	$73.61
Nokia 1100	$59.34
Nokia 2112	$63.42
Samsung Boss	$47.57
Samsung N710	$72.46
Samsung N700	$67.93
Sony Ericsson T290i	$74.63

Source: IEMR

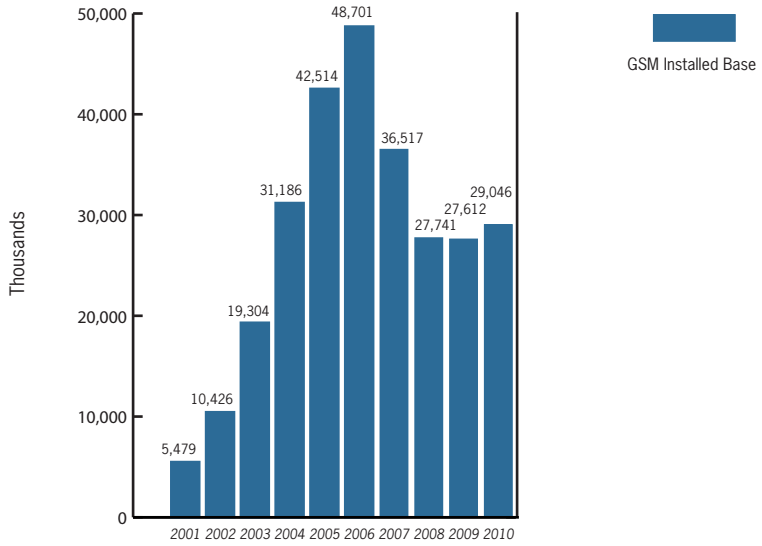
2.2. Technology Forecasts

2.1.1. GSM Migration Path

GSM:

As of January 31, 2006, there were 62 million GSM migration path subscribers in India, accounting for 77.5% of the market. We estimate 42.5 million of these subscribers had basic GSM. On average, 1.5 million - 2 million subscribers are added to India's GSM subscriber base every month. Currently, of 13 licensed mobile operators by TRAI, nine are GSM operators: Reliance Group, Bharti Group, BSNL, Hutchison Group, IDEA Group, BPL Group, Spice Group, Aircel Group, Tata Teleservices and MTNL. We expect GSM subscribers in India to peak in 2006 at about 48.7 million, and forecast that it will decline at a CAGR of -7.3% between 2005 and 2010 (see Figure 1). This is largely because operators in India have already announced major investments in their GPRS and EDGE networks, following the GSM/GPRS/EDGE/WCDMA technology track.

Figure 1: GSM Installed Base 2001 - 2010

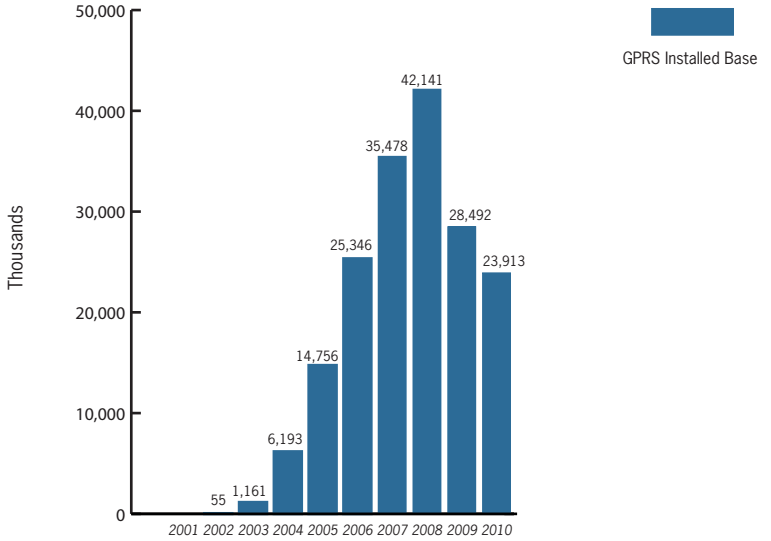


Source: IEMR

GPRS:

In India, BPL Mobile was the first operator in the country, the second in Asia, and the fifth in the world to introduce GPRS in 2001. With faster access to the Internet, WAP and multimedia messaging, BPL Mobile has built a brand for itself in the premium market with its GPRS offering, although other operators have not been far behind. Currently, Nokia is expanding Bharti's GSM/GPRS/EDGE networks in five circles - Mumbai, Maharashtra, Goa, Gujarat, and Bihar - which will take three years to implement. As well, in 2005, BSNL announced an expansion of its GSM/GPRS network (with Nortel) for about $500 million. Given the expansion plans by two of the largest operators in India, our forecast model shows the GPRS installed base will expand by a CAGR of +10.1% between 2005 - 2010, although in the next two to three years, the number of subscribers using basic GPRS will more than triple to 42.1 million by 2008 (See Figure 2). Thereafter, as WCDMA network rollouts begin to come on stream, we expect the GPRS installed base to decline. Our forecasted high rate of growth for GPRS in the 2006 – 2008 period is also based on our view that the wireless content market in India has matured significantly and operators will be using their GSM/GPRS networks to deliver this content.

Figure 2: India GPRS Installed Base 2001-2010



Source: IEMR

EDGE:

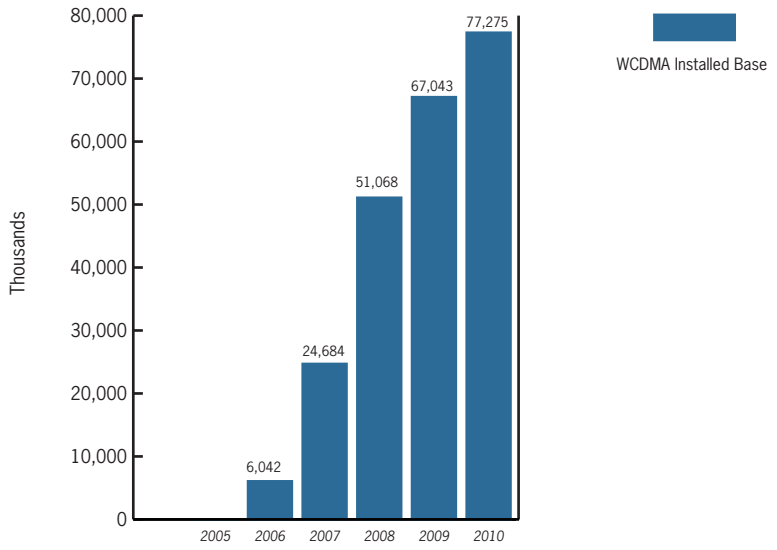
In India, the issue with EDGE is the imminent approval of 3G licenses in 2006, which will see WCDMA network rollouts in 2006-07. Therefore, most operators have decided not to spend a huge amount of money on EDGE upgrades. Some, however, have speculated that investing in EDGE will allow them first-mover advantage by capturing premium clients in India's urban centers. Airtel, Hutch, and IDEA Cellular launched EDGE services in 2004, and all three are currently providing their subscribers with streaming videos and other internet-based multimedia services.

Currently, there is a debate among operators regarding the proposed spectrum allocation of the 1900 MHz band by the TRAI. Objections by GSM operators center on the claim there is a risk of interference between future WCDMA and CDMA networks. The Indian Ministry of Communications and Information Technology is said to be indecisive in taking a decision on the allocation of IMT-2000 band for 3G services. CDMA lobbyists, led by Reliance Infocomm, are interested in 1900 MHz (UP PCS band), which GSM operators oppose because they fear it may block the GSM migration to 3G WCDMA.

WCDMA:

As in other markets, the controversy around spectrum allocation of the 1900 MHz band is a non-starter in India. Consequently, once network installations begin in the 2006-2008 period, we expect WCDMA to expand at a CAGR of 89.1% between 2006 and 2010 (see Figure 3). Like China, India's entry into WCDMA will likely make GSM competitive in the market with CDMA. Therefore, we expect lower tariff rates on both voice and data. Further, like the markets of most developing countries, voice, not data, is the greatest potential for WCDMA in India. With four to five times higher voice capacity than present 2G networks, operators are going to see the greatest subscriber adds in basic voice services, while at the same time migrating their data-centric customers to WCDMA networks.

Figure 3: India WCDMA Installed Base 2005-2010



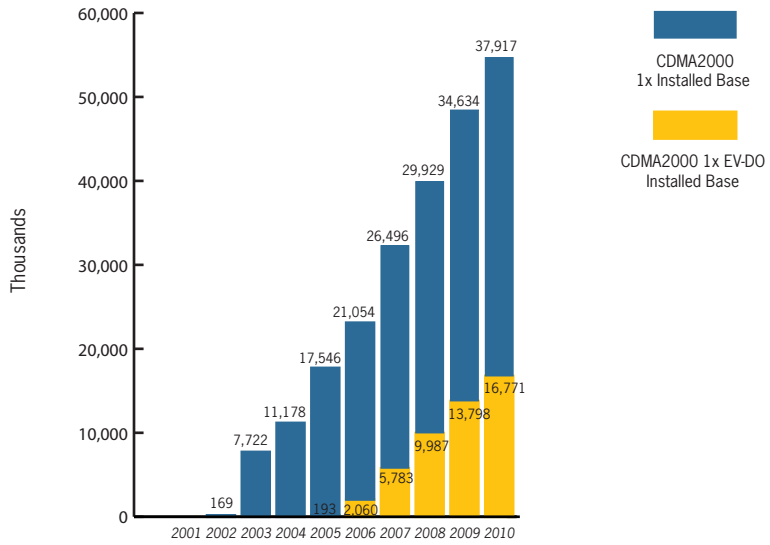
Source: IEMR

2.2.2. CDMA Migration Path

As of January 31 2006, there were 17.9 million subscribers on various CDMA networks across India. There are six CDMA operators in India, with Reliance Infocomm leading the market. Other CDMA operators include BSNL, Tata Teleservices, MTNL, Shyam Telelink, and HFCL Infocom. We forecast that CDMA operators will be able to expand their subscriber base faster than GSM operators. Our forecast model for CDMA has CDMA 2000 1xRTT expanding in India at a CAGR of 16.7% and CDMA 2000 1xEV-DO expanding at a CAGR of 147% for the 2005 – 2010 period (see Figure 4). In 2010, we expect CDMA 2000 subscribers to reach 37.9 million, and EV-DO subscribers to reach 16.8 million.

This higher forecast for CDMA is despite the fact CDMA operators lack the same spectrum as GSM operators, restricting their ability to provide international roaming, which is becoming an increasingly important market for premium clients in India's urban centers. Subscriber economics in markets like India, however, is about price, not roaming. TRAI publishes regular breakdowns of subscribers, revenue analysis, and usage patterns for GSM and CDMA operators. Our review of this analysis shows that CDMA operators have a number of key price advantages over their GSM counterparts. At Rs. 244, monthly blended ARPU for CDMA operators is 35% lower than for GSM operators. Further, revenue realization for CDMA operators was Re. 0.52 per minute of usage, one-half the revenue realization figures for GSM operators. For these reasons, we expect subscriber growth trends to continue for CDMA operators, given the fact that the next evolution to EV-DO is upwardly compatible with existing networks and the cost of network build is relatively small, compared to the WCDMA network builds that will be undertaken by the leading GSM operators.

Figure 4: India CDMA Installed Base 2001 - 2010



Source: IEMR

2.2.3. Other Technologies

There had been significant growth in the Indian wireless market in the last seven years, with technology changes from analog systems to digital cellular technologies, such as GSM and CDMA. While it is now clear that GSM will dominate urban India, real subscriber growth, in both semi-urban and rural markets, will occur only if operators enter the rural space. Here, the PHS market is viewed quite seriously by the Ministry of Communications, especially in the area of applying PHS to Wireless in Local Loop (WLL). India has over 600,000 villages, of which 24,000 villages, mostly in border regions, still lack the infrastructure needed to connect them to the rest of the country. Some 200,000 villages have never seen an analog telephone, and the Ministry of Communication thinks PHS may be the solution to rural India's communications problems.

Personal Handyphone System (PHS):

PHS is ideal for semi-urban and rural populations where there are pockets of high population density and demand for cheap voice and data services. Recent sociological studies of India show that population mobility in rural areas is fairly low, with individuals living within a 5-10 kilometre radius of where they work. This makes PHS especially applicable to rural areas in India.

Most private operators are skeptical of PHS because of the largely redundant nature of the technology, limited roaming capabilities, and interconnectivity issues with existing networks. Still, operators such as MTNL did venture into PHS in 2005, targeting small businesses in Delhi and Mumbai by offering a tariff of Rs. 1.40 for three minutes, with a returnable deposit of Rs. 10,000 for handsets. This triggered a price war with other operators. Although MTNL's service was limited to two to three kilometres from base stations and only available in Delhi and Mumbai, we think private operators in India were made aware that the state-owned MTNL and BSNL would cut tariffs aggressively and enter the PHS space. However, in the absence of any significant announcement on PHS-related infrastructure investments by private operators, we maintain our forecast that PHS is likely going to be limited to the state-owned operators.

TDMA:

Tata Teleservices is the main TDMA operator in India. The company began TDMA-based fixed wireless operations in October 1998 in Maharashtra state, and expanded its TDMA-based voice and data services in rural and semi-urban areas in August 2003, after successfully testing the technology in small towns in Tamil Nadu. States covered by Tata Teleservices currently include Andhra Pradesh, Maharashtra, Tamil Nadu, and Gujarat. Current handset manufacturers in India are Crompton Greaves, HFCL and Shyam Technologies. Despite TDMA's many advantages in a market like India, we do not think this technology will fly, primarily because most major operators are focused on either GSM or CDMA technologies.

2.3. India Voice and Data Services Forecasts, 2006 – 2010

2.3.1. Voice and Data Services Installed Base, Monthly ARPU, and Service Revenue

The economics of mobile markets like India's are driven by subscriber growth and usage of basic voice services. Given the competition on tariff charges, many operators are relying on other sources of revenue to increase their top-line numbers. For GSM operators, rental revenues from handsets and processing fees accounted for 32% of total revenues, while voice only accounted for 53%. Voice revenues, as a share of total revenues for CDMA operators, were slightly higher at 59%. Our forecast model for voice services calls for share of voice revenues to decline to 53% of total revenue by 2010.

While Value Added Services (VAS) is an upcoming market opportunity in India, especially with the maturing of content, our view is that data revenue will be mainly driven by basic SMS revenue. Our forecast model calls for data revenues to rise from their current levels of about 8% of total revenues, to about 11% by 2010. For GSM operators, SMS currently accounts for 5.4% of total revenue and about 4% for CDMA operators. In 2005, Indians sent 24.9 billion SMS messages, approximately 38 SMS messages per subscriber per month on GSM networks, and 12 SMS messages per subscriber per month on CDMA networks.

In India, the major opportunity for SMS messages lies not in English or Hindi, but in local dialects. The SMS market is leading to vernacular text messaging, with low-cost SMS likely to spill over first to semi-urban and then to rural India. Consequently, manufacturers have already begun to design handsets capable of supporting local dialects. As we see in Table 5, the Korean manufacturers, Samsung especially, have taken the lead in providing low-cost handsets capable of sending SMS messages in local dialects. Handset prices for these SMS capable handsets, in our view, are still quite high, and will have to drop to the sub- $50 range, in order for significant take-up of SMS in rural and semi-urban areas.

Table 5: Handsets Available With Local Language SMS Capability

Model	Retail Price	Languages Supported
Samsung C230	$115.50	Hindi, Marathi, Tamil, Bengali, Punjabi, Kannada, Gujarati
Samsung N700	$67.93	Hindi, Marathi, Tamil, Bengali, Punjabi (menu only multi-language dictionary also available)
LG RD 2340	$56.63	Hindi
LG RD 2430	$45.30	Hindi
LG AD6335	$169.85	Hindi

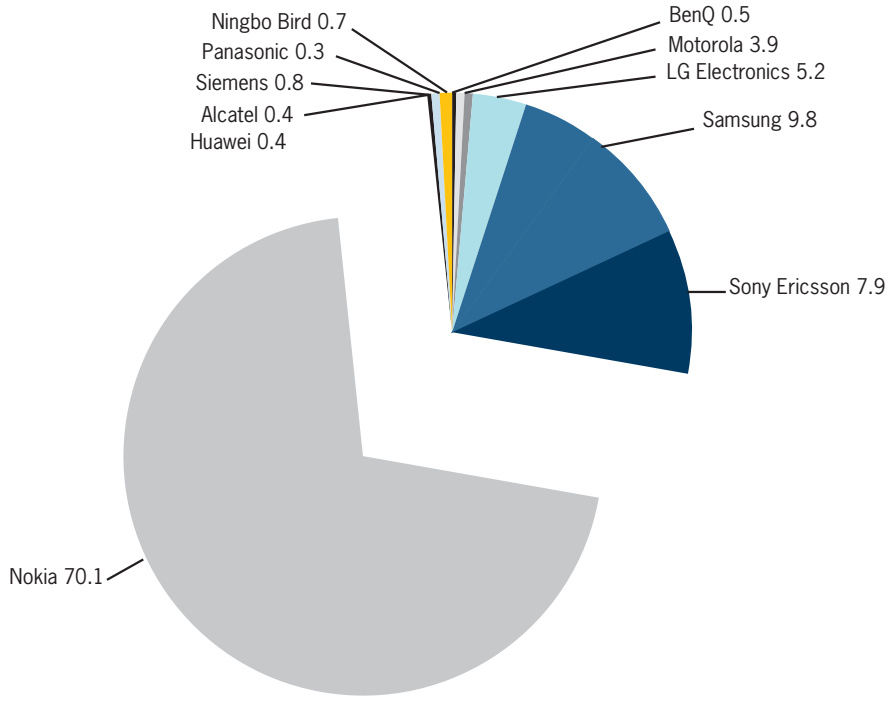
Source: IEMR

3. India Handset Vendor Market Forecasts and Strategies

3.1. Handset Vendor Market Shares and Forecasts

Nokia is the undisputed leader in the Indian GSM market, although our brand image survey suggests that Korean rivals Samsung and LG Electronics have the opportunity to close Nokia's lead. We estimate that 70.1% of GSM phones sold in India were Nokia-branded phones. Samsung came in second, with 9.8% market share, followed by Sony Ericsson at 7.9%. The overall market shares of other players, in terms of units sold, were LG Electronics at 5.2%, Motorola at 3.9%, and BenQ, Ningbo Bird, Siemens, Alcatel, Huawei, and Panasonic all under 1% (see Figure 5).

Figure 5: Percentage of Handset Vendor Market Shares in 12 Indian Cities (GSM market), January 2006

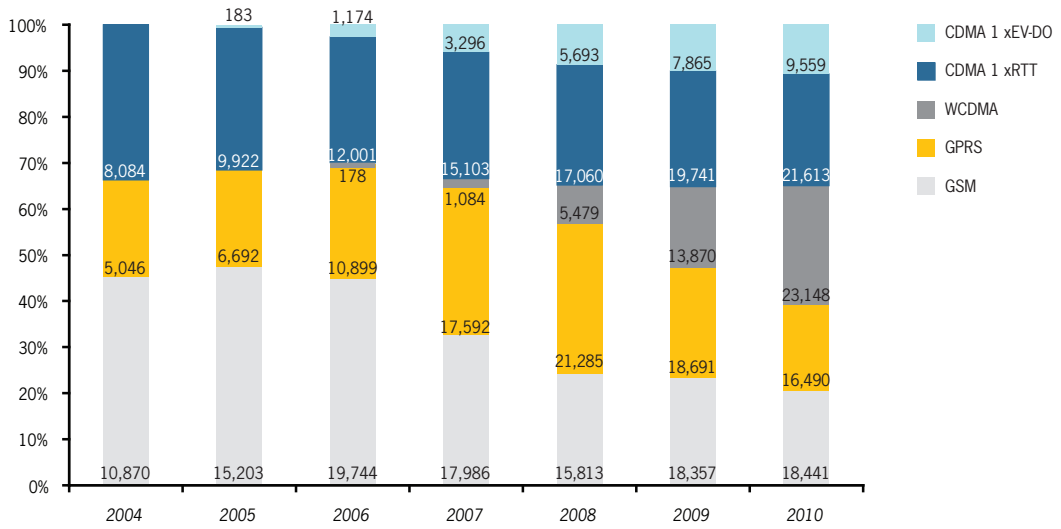


Source: IEMR

We have recently increased our forecast for handset sales in India, and now expect 2006 handset sales (in the legal market) to be 44 million units, rising at a CAGR of 19.8% for the 2005 – 2010 period. By 2010, we expect 79 million handsets to be sold annually in the Indian market, with the largest increases occurring in the WCDMA and CDMA 1xEV-DO segments (see Figure 6).

While we do not have estimates of handsets sold in the "grey" market, our sources tell us over 60% of the handsets are sold in the grey market, with a mobile handset replacement cycle of two to three years. The difference in price between the original handset and the grey market is at least 25% - 35%, due to high level of duties like customs, sales tax and octroi paid by the vendors selling in the legal market.

Figure 6: India Handset Sales Forecasts, 2005 – 2010



Source: IEMR

3.2. Results from IEMR's 2005-2006 Brand Image Survey

Nokia's leadership in the Indian market has led its competitors to focus on ways to break its stranglehold there. Given the economics of India's potential in the medium- and long-term, it will be a key battleground for all of the global players. In February 2006, we undertook a survey of 500 Indian mobile users with coverage in five cities in India: Delhi, Mumbai, Calcutta, Chennai, and Bangalore. The objective of our 2005-06 Brand Image Survey is to provide clients with information on the specific strengths and weaknesses of both their own and their competitors' brands (See Annex A for details). Broad strategic implications of our survey for handset manufacturers are as follows:

Samsung and LGE have Opportunity to break Nokia's lead in India:

In terms of brand awareness, our survey clearly shows that Nokia, Samsung, and LG Electronics have the largest "share of mind" among Indian consumers. Samsung and Nokia are neck-and-neck in terms of share of mind of consumers in India. Of respondents, 63% identified Samsung and 60% identified Nokia as a handset brand unaided. We think Samsung's and LGE's brand recognition, despite their low market share, in the handset domain is due to their long-term presence and marketing of consumer electronics and other products in India.

This finding is significant for Samsung and LG Electronics, indicating that while Nokia may have large actual market shares in India, the Indian consumer is aware of these Korean brands. We think Samsung and LG Electronics have the opportunity to leverage their brand image in other electronics segments to strengthen their marketing and distribution networks in India, and cross-sell handsets using these existing distribution networks.

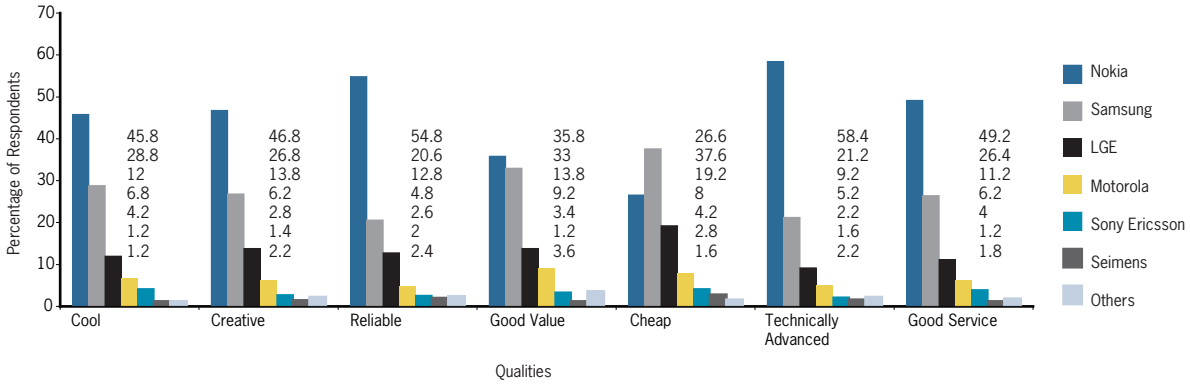
We also think that both Samsung and LG Electronics are gearing up to meet Nokia head on in India. Samsung has established a handset manufacturing facility at Manesar in Gurgaon (Haryana state close to New Delhi). LG Electronics has also announced plans to establish a GSM handset manufacturing plant in Ranjangaon near Pune. Both plants would have the capacity to produce 20 million handsets annually. Nokia has also established a plant at Sri Perumbudur near Chennai (in Tamil Nadu state). All three manufacturers intend to use their plants to move around the 16% tariff rate currently applied on imported handsets. Like Nokia, Samsung and LG Electronics will also leverage their facilities to market "Made in India" handsets, which has worked successfully for Nokia in the past.

Price is not the only factor affecting manufacturer market shares in India:

It is not going to be easy to displace Nokia from its perch in the Indian market. Our survey shows that price is not the only factor. Of the seven features of handsets we designed for our survey, Nokia clearly dominates in six. 45.8% of respondents associated Nokia with "cool", 46.8% with "creative", 54.8% with "reliable", 58.4% with "technically advanced", 49.2% with "good service", and 35.8% with "good value". Price is the one area where Nokia does not come out on top. Only 26.6% of respondents associated Nokia with "cheap". By contrast, 38% of respondents considered Samsung "cheap". This is likely because, despite Samsung's stated objective of focusing on middle- and high-end consumers, in India, available handsets from Samsung have tended to be entry-level handsets. Figure 7b is a price-point analysis of available handsets in India.

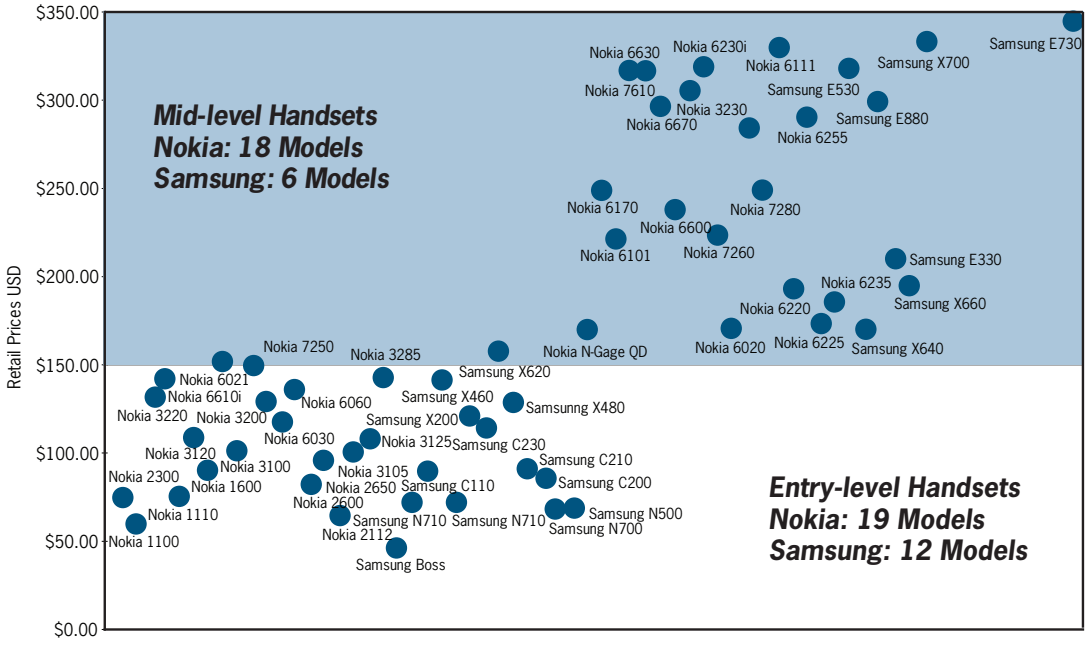
As shown, Nokia dominates the market in all three price bands (the high-price band is not shown in this figure) while Samsung's handsets have been targeted more toward the entry-level market. The association between Samsung and "cheap" may be hurting rather than helping its brand. The lesson for manufacturers in India is, therefore, to target all three price bands but throw marketing dollars behind handsets in the mid-level and high price bands. This will likely decouple a manufacturer's brand image with words such as "cheap", which appear to hurt, rather than help, vendors like Samsung.

Figure 7a: Mobile Manufacturers Comparatve Brand Image



Source: IEMR

Figure 7b: Nokia vs. Samsung Entry and Mid-Level Handsets



Source: IEMR

An interesting finding of our survey was that high-income consumers may not have high brand loyalty in India, while low-income consumers may be brand loyal. We think this may be because advertisements and brand association have more affect on low-income

Low-Income Consumers May Be More Brand Loyal Than High-Income Consumers:

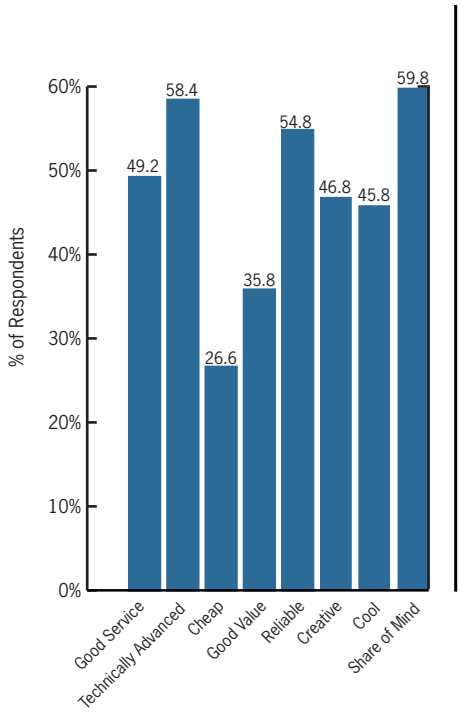
consumers. Low-income consumers may also be more risk averse, and want to reduce the chance of dissatisfaction associated with trying a new brand. Again, this stems from price perceptions of low-income versus high-income households. Only 20.4% of respondents with household annual incomes under Rs. 60,000 ($ 1,360) associated Nokia with the word "cheap", compared to 33.3% of respondents with household annual incomes over Rs. 250,000 ($5,700). This trend was reversed for almost every other manufacturer, with more low-income and less high-income respondents associating them with the word "cheap". Again, what this indicates that brand perceptions matter to low-income consumers, and manufacturers should stress factors other than price to create brand loyalty among this pool of subscribers.

Other Manufacturers Need To Act Quickly To Enter The Handset Race In India:

Our Brand Image Survey shows that other brands, such as Motorola, Sony Ericsson, Siemans, Bird, and Huawei, are virtually absent from the Indian urban market. In particular, Sony Ericsson and Siemans achieved less than 5% on all seven categories we designed, while Motorola fares minutely better. These manufacturers will need to take a serious look at how they approach the Indian market, if they want to capitalize on the second-largest market opportunity in the handset domain. The lessons for these "residual" manufacturers are clear: provide a diversified offering across price bands; throw marketing dollars toward mid-level and high-end handsets, which will create aspirational brand loyalty among low-income households; and focus on other features, rather than price, in branding handsets

3.3. Vendor Strategies in India

3.3.1. Nokia in India



2005 Market Share: 70.1%

2005 Handset Models on offer/Average Price:
45/$255.20
No. of entry-level handsets/Average Price:
19/$108.27
No. of mid-level handsets/Average Price:
18/$251.29
No. of high-end level handsets/Average Price
8/$612.97

Source: IEMR Brand Image Survey

Nokia Strategic Outlook in India:

Nokia is the clear market leader in India. As highlighted below, it has a number of strengths going forward, including positive brand image across income groups and a diversified device offering. Its recent successes in the managed services area has also resulted in a high degree of integration between Nokia and key operators, which will undoubtedly result in larger handset sales for Nokia in the medium-term. Nokia is expected to meet this demand for handset devices and network equipment through its new manufacturing facility near Chennai in Tamil Nadu state.

Despite these strengths, we think there is an opportunity for other manufacturers to break Nokia's hold on the Indian market. In particular, Samsung and LG Electronics have an advantage in that they have a positive brand image and can leverage their distribution networks in other consumer electronics categories, to cross-sell and sell-through the distribution chain. Having said that, Nokia's emphasis on all price bands (for devices) and integration with operators (for networks) will be difficult to challenge. Samsung and LG Electronics are not known for their managed services offering, and this may very well be their Achilles' heel in confronting Nokia for market share in India.

Nokia Operational Summary:

Emphasis Shifting owards Managed Services

In the last two years, Nokia has announced several large transactions with operators in India to provide everything from network equipment and expansion, to network management, maintenance, and quality assurance services. These transactions include:

- A $141 million project to expand BSNL's GSM/EDGE and GPRS networks in north India. This project includes core and radio network equipment and an extensive range of managed services for the states of Jammu & Kashmir, Haryana, Uttaranchal, Uttar Pradesh (both east and west circles), Himachal Pradesh, and Rajasthan.

- A three-year, $275 million contract with Bharti Televentures to build and manage networks in five circles:, Mumbai, Maharashtra, Goa and Gujarat, Bihar and Orissa.

- A $24 million network expansion of IDEA Cellular's GPRS network.

- An estimated $350 million managed services contract with Hutchison-Essar under which Nokia would run Hutchison-Essar's network operations for five years in nine circles: Gujarat, Karnataka, Andhra Pradesh, Chennai, Uttar Pradesh (East and West), Rajasthan, Haryana and West Bengal. This contract may also lead to Nokia getting another deal to run Hutchison-Essar's networks in seven other circles.

This emphasis on managed services will no doubt lead to further integration between Nokia and operators in other segments of the wireless domain. An example of this came in the November 2005 announcement by IDEA Cellular that it had chosen Nokia to enhance IDEA's mobile packet core network capabilities, making IDEA the first operator to charge differentially for its data services offered to both prepaid and post-paid subscribers. This strategy of offering managed services will clearly be an advantage for Nokia over its key rivals, particularly Samsung and LG Electronics, who do not have strong network roll-out and management capabilities.

Nokia's emphasis on managed services and network equipment manufacturing may also be designed to meet a possible Government of India requirement that vendors wanting to sell to state-owned operators need to have manufacturing facilities in India. BSNL and MTNL are expected to invest 900 billion rupees ($20.3 billion) over the next five years, to purchase equipment and expand their networks. This will be an estimated 85% of the total investment in this sector.

"Made in India" Handsets:

Part of Nokia's India strategy appears to be manufacturing handsets in India and using India as a base for exporting Nokia-branded handsets to Southeast Asia and the Middle East. Nokia recently celebrated the inauguration of its manufacturing facility at Sri Perumbudur, near Chennai in Tamil Nadu state. The Sri Perumbudur facility also houses Nokia's Global Networks Solutions Centre, which manufactures network equipment. This makes Nokia the first equipment vendor to manufacture both mobile devices and network infrastructure equipment in India, and is a clear recognition of the growth potential of the Indian market for both devices and networks.

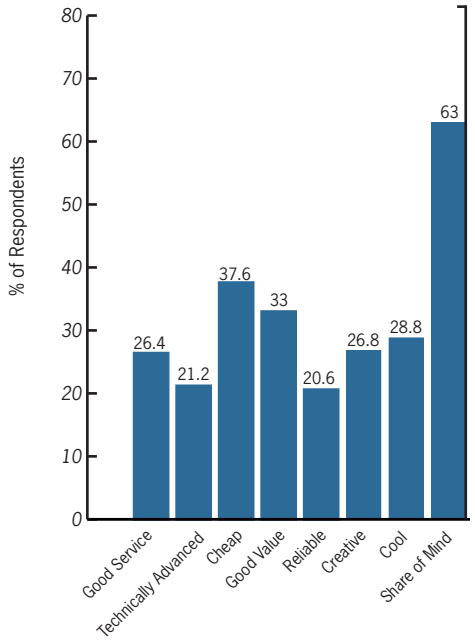
Brand Image Survey Results and Analysis:

Our Brand Image Survey shows why Nokia is at the top of the Indian market, as 59.8% of respondents identified Nokia as a handset manufacturer unaided. Out of the seven features of handsets we designed for our survey, Nokia dominates in six, where 45.8%

of respondents associated Nokia with "cool", 46.8% with "creative", 54.8% with "reliable", 58.4% with "technically advanced", 49.2% with "good service", and 35.8% with "good value".

Analysis of Nokia's data shows why Nokia has been so successful in India. Only 26.6% of respondents associated Nokia with "cheap", despite the fact Nokia had more entry-level handsets than any other manufacturer in the Indian market in 2005. It also dominated the mid-level and high-end market segment. Nokia's brand strategy in India has clearly been to brand its handsets as a lifestyle product, while touching all price bands. With 45 models on offer in the Indian market, Nokia has created an aspirational image for its handsets across income groups. Our brand image survey shows that as many low-income consumers associate Nokia with "good value" (37%) as high-income consumers (36%).

3.3.2. Samsung in India



2005 Market Share: 9.8%

2005 Handset Models on offer/Average Price:
22/$199.94
No. of entry-level handsets/Average Price:
12/$99.26
No. of mid-level handsets/Average Price:
6/$253.66
No. of high-end level handsets/Average Price
4/$383.33

Source: IEMR Brand Image Survey

Samsung Strategic Outlook in India:

We see a number of strategic weaknesses that may affect Samsung's position in the Indian market. First, despite its emphasis on mid- and high-end handsets, Samsung only had six mid-level and four high-end handsets available in India in 2005, compared to Nokia's 18 mid-level and eight high-level handsets. Therefore, Samsung lacked diversity of offering, which will need to change significantly if Samsung wants to make a dent into Nokia's market share in the handset domain.

Second, Samsung's average handset price in India was $199.94, 21.6% lower than Nokia's. As our Brand Image Survey shows, this is not necessarily a good thing from a brand image perspective, and has caused Samsung's brand to be associated with the word "cheap" across income groups. In many ways, Samsung is caught in a low-brand-equity – low-price-point cycle, where its low, effective prices are the cause of its low market share, rather than a solution. It appears Samsung's reputation as a manufacturer

of inexpensive products continues to stick, despite its recent slick marketing efforts. Our Brand Image Survey shows that Samsung still has a marketing job on its hands to brand its handsets as a premium brand, which could mean raising prices on mid-level and high-end devices to create aspirational desire among low- and lower-middle income consumers.

Samsung is also not well known for either its systems integration capability or its ability to provide network and managed services. Its significant competitors - Nokia, Sony-Ericsson, and Motorola - possess this capability, and are making significant in-roads into the Indian operator space. As we have seen elsewhere in the world, network and managed services contracts are usually precursors to handset sales, since they open lines of communication and strengthen relationships between vendors and operators.

Samsung has two key strengths in the Indian market. First, Samsung has a high "share of mind" among Indian consumers (see below), likely because of its strong presence in other consumer electronics segments. Currently, Samsung is not exploiting this channel much in selling through to the consumer. We see this as an area of strength for Samsung, as it can leverage its existing distribution network in other consumer electronics categories to cross-sell and sell-through to the consumer. Samsung's other clear advantage is its leadership in the colour display and photo-snapping handset niche. With more than half of India's billion-plus population below age 25, the market is ripe for Samsung's stated objective of focus. We think Samsung's vertical integration in various handset domains - displays, cameras, LEDs, flash memory, CCD camera modules, image processing LSIs and ICs - places it in an ideal spot to meet demand from the youth segment of the Indian market.

Samsung Operational Summary:

Samsung Follows "Made in India" Trend Set by Nokia:

In March 2006, Samsung announced its manufacturing plant in Manesar, Gurgaon, was fully operational. This facility is expected to start production at one million handsets, reaching 20 million handsets in 2010. Mass production started at the end of Q1 2006. Samsung's production strategy is to start with mid-level phones, and expand production capacity to meet demand in both India and the Middle East. Local production will also help in responding faster to Indian consumer tastes. Therefore, we expect, Samsung to come out with a larger variety of handsets that cater to the needs of the local market.

Focus on Colour and Camera Phones: :

Samsung continues to focus on the colour and camera segments of the market, in order to expand its market share. It also plans to launch several music and camera phones by the end of 2006. Samsung has been a main supplier to the leading CDMA operator in India - Reliance Infocomm - supplying basic and entry-level handsets. Our sources tell us Samsung and Reliance are collaborating to launch high-end CDMA phones for the Indian market.

After-Sales Service Seen as Important:

Recent statements by Samsung India management suggest after-sales service is a key differentiator for Samsung, and that the company has a widespread network of over 200 service and 25 collection centers in India. Samsung also has nine mobile service plazas that allow consumers to get service onsite, interact with product specialists, and experience the entire range of their products on display.

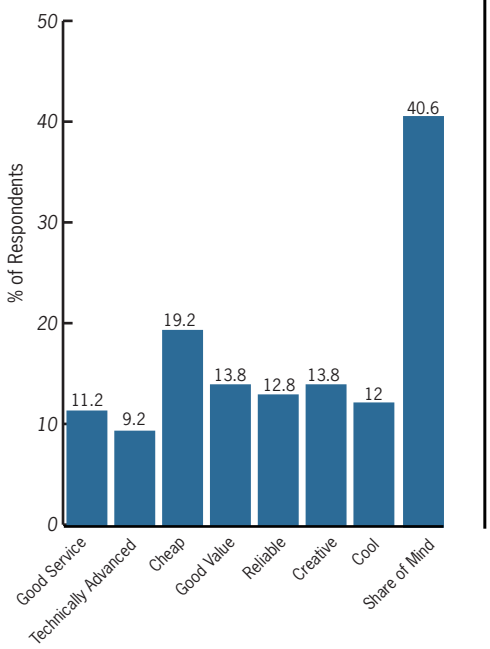
Our Brand Image Survey shows that, of the global handset players, Samsung probably

has the best chance of catching up with Nokia in the Indian market. More respondents in our survey (63%) identified Samsung as a handset manufacturer unaided, than Nokia (59.8%). We think this is because of Samsung's leadership position in other consumer electronics segments. After Nokia, Samsung has the strongest brand presence in six of the seven categories we designed, with 28.8% of respondents identified Samsung with the "cool", 26.8% with "creative", 20.6% "reliable", 33% with "good value", 21.2% with "technically advanced", and 26.4% with "good service". We think these are strong brand equity figures, given Samsung had only 9.8% market share in the Indian market.

Clues as to why Samsung has not been as successful in the recent past in the Indian market can be gathered from low-income respondents, as 36.9% identified Samsung with "cheap", compared to 24.1% for Nokia. This was a surprise to us, especially given Samsung's emphasis on marketing its brand as a sophisticated "lifestyle" product at the global level. Analysis of Samsung's offering in India, however, shows why low-income mobile users identified Samsung with "cheap". More than half of Samsung's handset offerings in India (12 out of 22) were in the entry-level price band, with an average price per handset of $99.26, 8.3% lower than Nokia's average price per handset for entry-level devices at $108.27. In other categories, Samsung's offering was thin and cheaper than Nokia's. Samsung had only six handsets in the mid-level band, with average prices only slightly above Nokia's, and only four handsets on offer in the high-end band, with average prices 37.5% lower than Nokia's. As well, Nokia had 45 model devices on offer in the Indian market.

An income breakdown of Samsung's brand image shows that low-income households were just as likely to suggest Samsung's brand was "cheap" as high-income households. We think this is a problem not only for Samsung, but also for other vendors whose marketing strategies emphasize "lifestyle" but who do not appear to be convincing either the high-end market, which they are targeting, or the low-end market, where they will see the fastest growth. We think offering handsets that are priced too low and lack diversity has a lot to do with this conundrum faced by players such as Samsung in emerging markets.

3.3.3. LG Electronics in India



2005 Market Share: 5.2%

2005 Handset Models on offer/Average Price:
20/$138.03
No. of entry-level handsets/Average Price:
13/$104.05
No. of mid-level handsets/Average Price:
7/$201.13
No. of high-end level handsets/Average Price
0/$0

Source: IEMR Brand Image Survey

LG Electronics Strategic Outlook in India:

We think LG Electronics may need to tweak its India strategy, in order to gain market share from the likes of Nokia and Samsung. LG Electronics has clearly been emphasizing the entry- and mid-level market with 20 handsets on offer in the Indian market - 13 entry-level and 7 mid-level handsets. Average prices for LGE's offering were 31% below Samsung and 45.9% below Nokia.

We think this low price offering should have helped LGE gain significant market share in India. This has clearly not been the case. As in the case of Samsung, we think lower prices for LGE handsets has resulted in LGE's brand being associated with the word "cheap" across income groups. As a result, LG Electronics may be caught in a low-brand-equity – low-price-point cycle, where its low effective prices are the cause of its low market share rather than a solution.

Other weaknesses that LG Electronics must tackle include the lack of significant presence in the managed services or networks domain. While an opportunity exists for LG Electronics to leverage its distribution network in other electronics segments in order to push higher-margin handsets, it has a steep hill to climb to brand its handsets and fully optimize its distribution network. LGE may also find it difficult to clinch deals with operators to supply significant volumes of handsets, given that Nokia and Sony Ericsson have already established relationships with some of the larger operators in the Indian market.

LG Electronics Operational Summary:

LG Follows "Made in India" trend set by Nokia:

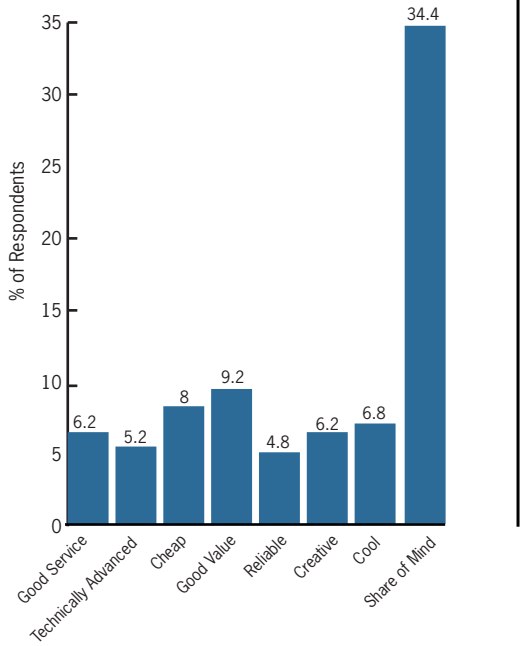
LG Electronics India has announced plans to put up a GSM handset manufacturing plant in Ranjangaon near Pune, as part of plans to produce 20 million GSM handsets in India by 2010. The facility is part of LGE's plans to make India its global export hub. LG Electronics will invest $35 million in manufacturing of mobile phones at this facility, and plans to manufacture 35,000 - 40,000 handsets in 2006.

Brand Image Survey Results and Analysis:

As in the case of Samsung, we think LG Electronics needs to fine-tune rather than make wholesale changes to its marketing and technology strategy in India. Our brand image survey found that 49.6% of respondents identified LG Electronics as a handset manufacturer unaided. We think this is significant and positive for LG Electronics. We also think that relative to its market share, LG Electronics has a strong brand presence in six of the seven categories we designed, with 12% of respondents identifying LG Electronics with "cool", 13.8% with "creative", 12.8% "reliable", 13.8% with "good value", 9.2% with "technically advanced", and 11.2% with "good service".

At the same time, 19.2% of respondents associated LG Electronics handsets with "cheap". Lower-income and lower middle-income households (18.4% - 21.2%) were more likely to view LG Electronics handsets to be cheap than high-income households (13.9%). Thus, the lesson for LG Electronics is to further brand its handsets as lifestyle products, which should cause lower-income households to view LGE handsets as aspirational products rather than "cheap" products - a strategy successfully used by Nokia in India.

3.3.4. Motorola in India



2005 Market Share: 3.9%

2005 Handset Models on offer/Average Price:
9/$179.30
No. of entry-level handsets/Average Price:
5/$89.90
No. of mid-level handsets/Average Price:
3/$229.52
No. of high-end level handsets/Average Price
1/$475.65

Source: IEMR Brand Image Survey

Motorola has been late in recognizing the potential of the India market and consequently

Motorola Strategic Outlook in India:

has a lot of catching up to do to capture market share there. Announcements made by Motorola in 2005 and 2006 have given shape to Motorola's India strategy, although the extent to which its India strategy will be successful, given competition from Nokia and Sony Ericsson, is yet to be seen. Broadly, this strategy appears to be based on three principles– begin rebuilding relationships with Indian operators; establish India as a manufacturing and software center for network equipment and devices; and target entry-level handset models to capture market share in semi-urban and rural markets.

In August 2005, Motorola's worldwide CEO, Mr Ed Zander, visited India and announced a series of initiatives to help drive the company's growth in India. In November 2005, Motorola announced the appointment of Mr. Firdose A. Vandrevala as the head of its India operations. The fact that Mr. Vandrevala was earlier the Chairman of Tata Teleservices and spent 33 years with the Tata Group in different capacities may be an asset or liability for Motorola. On the asset side of the ledger, Mr. Vandrevala is well respected in the industry and should help Motorola establish stronger relationships with operators in India. On the other hand, the fact that Mr. Vandrevala was Chairman of a major operator and spent his entire career within one of India's largest industrial conglomerates may be a liability for Motorola, as competitor operators may not want to disclose sensitive operational information to a supplier whose management team was formerly at a competitor operator.

Motorola also appears to be strengthening its manufacturing presence in India. Motorola recently announced that it would add another 1,000 employees in India in 2006, primarily in its research and development unit in Bangalore. This would take Motorola's headcount in India to 4,000– several times larger than either Nokia's or Sony Ericsson's headcount in the country. While Motorola has been in India since at least 1987, most of its operations were export-oriented units and focused on software development. Motorola is now using these units to cater to domestic market demand in India. In our view, Motorola's manufacturing strategy is robust. If leveraged effectively, we think that Motorola will be able to break into both the devices and networks domain in India and give Nokia and Sony Ericsson some serious competition in that market.

Motorola Operational Summary:

Motorola has distinct Manufacturing and Software Development Advantage in India

Motorola has had a long manufacturing and software development presence in India. Motorola first entered India in 1986 through a joint venture to manufacture modems with Blue Star (now India's largest Central air conditioning and commercial refrigeration company). In 1991, Motorola set up its first software center in Bangalore. In 1994 expanded this facility and set up a pager manufacturing unit in Bangalore. Given that the pager market did not take off in India, Motorola shifted strategy to manufacture and design cellular hardware and software products at its Bangalore facilities. According to Motorola, India is now one of Motorola's leading R&D and software development hubs. Motorola says that 40% of software in all Motorola handsets are developed in India; about 17 new handset models shipped by Motorola last year, including the RAZR, contained features/software out of it India R&D unit; and new models like the PEBL and SLVR are also based on R&D efforts of its India unit.

By year end-2006, Motorola is expected to have over 4,000 employees in its India

operations. This would make Motorola the largest foreign telecommunications equipment manufacturer and services provider in India. We think that Motorola's management will leverage this strong presence to go after contracts with India's private and state-owned operators. They will also leverage this capability to produce "Made for India" handsets that better meet consumer demands there.

Motorola's device strategy in India appears to be firmly rooted in the entry-level market segment. Motorola won both tenders for GSMA's emerging market handset project due to its attractive pricing (sub-$40 and sub-$30) and focus on after-sales support and local service. To support this strategy, Motorola announced in November 2005 that it had established a strategic alliance with Bharti Teletech Ltd. to extend Motorola's distribution network across India. Bharti Teletech manufactures and distributes various telephone equipment and devices under its Beetel brand and has more than 11,000 points of sale across India.

This strategy is no doubt an effort by Motorola to break into an important growth area of the Indian marketplace. However, as we show below, our Brand Image Survey results for other handset manufacturers suggests that Motorola needs to be careful about how it positions its brand both among low-income and high-income consumers since price is not the only factor affecting brand perceptions or buying decision in the Indian marketplace. Other factor include product diversity, and Motorola did not have this in the Indian marketplace. In 2005, Motorola had nine devices in play in India (compared to Nokia's 45 or Samsung's 22) with an average price of $179.30. This was 30% lower than Nokia's average handset price. In the entry-level market, Motorola had in play the C650 (priced at $131.37), V220 ($140.43), C138 ($46.43), C118 ($47.45), and the V171 ($83.81).

Brand Image Survey Results and Analysis:
Our 2005-06 Brand Image Survey shows that Motorola is in a reasonable position to capitalize on its existing brand image in India to gain market share. 34.4% of respondents identified Motorola as a handset manufacturer unaided, which was well above the firm's 3.9% market share in 2005. Relative to its market share, Motorola also has a strong brand presence all seven categories we designed. 6.8% of respondents identified Motorola with the "cool", 6.2% with "creative", 4.8% with "reliable", 9.2% with "good value", 8% with "cheap", 5.2% with "technically advanced", and 6.2% with "good service". We think that these are strong brand equity figures given that Motorola only had a 3.9% market share in the Indian market.

However, results of our Brand Image Survey for other manufacturers tell us that Motorola needs to be very careful about how it begins to brand itself in the Indian market. Here, Samsung's experience is quite instructive for Motorola. In our Brand Image Survey, we found that 37.6% of respondents identified Samsung with "cheap" compared to 26.6% for Nokia. A look at Samsung's offering in India shows just why mobile users identified Samsung with "cheap". More than half of Samsung's handset offering in India (12 out of 22) was in the entry-level price band with the average price per handset of $99.26. This average price was 8.3% lower than Nokia's average price per handset for entry-

level devices ($108.27). In other categories as well, Samsung's offering was thin and cheaper than Nokia's offering. Samsung had only 6 handsets in the mid-level band with average prices only slightly above Nokia's and only 4 handsets on offer in the high-end band with average prices 37.5% lower than Nokia's in this price band.

Motorola's position is no different than Samsung's. Its MOTO4YOU brand campaign launched in India in March 2006 appears to target the mid-level and high-end consumer market, but its offering in India is decidedly entry-level and weak. Nine handsets do not make for a diversified offering and five of these handsets are in the low end of the market. Average prices for Motorola's handsets are 30% lower than Nokia's average handset prices and in the entry-level market Motorola's average handset prices are 17% lower. Despite these low prices focused on entry-level handsets, Motorola has not been able to gain significant market share in the devices domain in India.

An income breakdown of Motorola's brand image shows that Motorola could actually raise prices and brand its devices as lifestyle products. Lower-income households (3.9% of households) were less likely to view Motorola handsets to be cheap compared to high-income households (8.3%). The lesson for Motorola here is not to reduce prices even further but to brand its handsets as lifestyle products. This should cause lower-income households to view Motorola handsets as aspirational products that they will acquire as income levels rise in India.

4. India Mobile Operator Outlook

4.1. Industry Strategic Scenario

4.1.1. Supply Chain ManagementWill Be Key To Operator Growth:

The Indian market is adding 2.5 – 3 million subscribers per month, which works out to about 83,000 – 100,000 subscribers per day! A successful operator in India has the difficult task of ensuring its supply chains are able to deliver products into the hands of consumers in a market known for its poor infrastructure and a culture that does not place a premium on service at the point of sale.

Order, Deliver, Distribute, Activate, Repair. This simple sequence of steps has caused many vendors and operators significant hurdles in the last few years in India. It is well known that, compared to supply chain management systems established in other industries and emerging markets in India, the mobile handset industry misses the mark. Industry insiders have highlighted the following areas difficulty for vendors and carriers:

- The inability to collaboratively plan between the vendor and carrier;
- The inability to manage expectations when volumes are in the millions;
- Questionable product quality and business processes;
- Poor market forecasting;
- Poor culture of customer service and after-sales support; and
- Lack of experience in supply chain management.

BSNL's Massive Tender Will Create Opportunities for Supply Chain Service Providers:

Regarding supply chain management, a point of note is BSNL's massive $4.5 billion tender to add more than 45 million GSM lines over three years. We think this will create a number of supply chain opportunities in the Indian market. To meet BSNL's competitive threat, private operators are likely to upgrade their own supply chains, which will create opportunities for everyone from logistics firms, after-sales service providers, systems integrators, technology vendors, and marketing firms.

Distribution Networks Will Expand to Include Formal and Informal Retail Outlets:

Another important development underway is the liberalization of India's retail sector, and the evolution of unique distribution channels more suitable to the needs of low-income consumers. Currently, distribution channels are limited to cities, where operator and manufacturer retail outlets mostly sell handsets. In some cities, independent public call offices, internet kiosks, and electronics stores are beginning to sell handsets. With both multinational and local retail chains setting up retail operations throughout major urban centers, this limited distribution channel is going to get a boost. These retail chains will likely want to sell handsets as part of their offering, and we expect the marketing of handsets to be a top priority for these outlets.

At the lower end of the market, on a recent visit to India, we observed that small merchants are buying handsets and prepaid time, and then renting both the handsets and prepaid time to multiple clients. This distribution channel is important in order to reach lower-end subscribers in both rural and urban markets in India. It creates a logistical nightmare for vendors and operators, however, and those who are able to

deal with these issues effectively will come out on top.

The operators who have been successful so far in supply chain management are those who have brought their overseas experiences to the Indian market. On a recent visit to India, it took three days for our analyst to have a cell phone activated in Delhi with Tata Teleservices. All the domestic Indian operators, especially state-owned BSNL and MTNL, are known to be unable to deliver and activate handsets into the hands of their customers in a timely manner. On the other hand, Bharti (with investments from SingTel) and Hutchison-Essar (with investments from 3 Hutchison) have been able manage supply chains and meet client expectations. Our 2005-06 Brand Image Survey shows that Indian mobile users consistently identify Bharti and Hutchison-Essar with "good service".

4.1.2. Interconnectivity Problems Hurting Smaller Private Operators:

The Telecom Regulatory Authority of India (TRAI) regularly publishes quality of service performance indicators to measure network performance, customer helpline metrics, and responses to billing complaints. While operator performance has improved substantially since these statistics first began being published, a major problem facing smaller private operators is interconnection.

Recent studies by the TRAI have shown significant network congestion due to interconnectivity issues between operators. In some cases, 40% of calls between private operators and state-owned BSNL are dropped. Reasons for this include long lead times of existing interconnect agreements, delays by operators - especially BSNL - in providing interconnection, and lack of direct interconnectivity between private operator networks. With BSNL controlling 79% of the fixed-line and 20% of the mobile market share in India, it is imperative for all private operators to solve these network congestion and interconnectivity problems.

The impact on smaller operators is particularly significant, as they rely on interconnectivity as the foundation for offering quality service to a smaller customer base. Rather than resolve interconnectivity issues, larger operators have opted for the legal route. For example, BSNL has challenged TRAI's lead-time regulations for interconnection, and Reliance Infocom and Tata Teleservices have been engaged in a pitched legal battle on interconnectivity. These and other legal battles are affecting not only service quality, but also operator purchase decisions from vendors.

4.1.3. Mergers and Acquisitions Likely During the Forecast Period:

India's operator space is fiercely competitive, with cutthroat price competition among major operators. A successful operator in India has the difficult task of both ensuring its service levels are satisfactory for a high-growth market and competing with 12 other carriers. These factors, combined with inexperience in supply chain management and legal battles over interconnectivity, make India a tough market for small operators. For these reasons, we expect a number of mergers and acquisitions to take place during the forecast period, with smaller operators looking to exit the market. We think two types of acquisitions are most likely:

• First, we expect other foreign operators and finance companies to begin acquiring stakes or outright ownership of smaller operators. Some deals in 2005 and 2006 included:

• On March 10, 2006 Telekom Malaysia acquired a 49% stake in Spice Communications Private Limited (Spice) of India for a consideration of $178.85 million. As of December 2005, Spice had 1.63 million subscribers.

• Malaysia's Maxis Communications, in partnership with Chennai-based Reddy family, took a 74% equity interest in Aircel for $1.08 billion. This deal was announced in December 2005, at which time Aircel had 2.28 million subscribers.

• In July 2005, news surfaced of talks between SK Telecom, South Korea's top mobile carrier, and Tata Teleservices Ltd. for a $597 million consideration toward a 33% stake in Tata Teleservices. On March 9 2006, Temasek Holdings (the investment arm of the Government of Singapore) announced the acquisition of 9.9% equity stake in Tata Teleservices through its wholly-owned subsidiary, Aranda Investments (Mauritius). Details of the deal were not disclosed, but it is speculated to be around $300 million. Close on the heels of this transaction, Tata Teleservices also offloaded a 7% stake to a Chennai-based private investor - a transaction said to be valued at $265 million.

• Second, we also expect the larger operators to begin acquiring control of smaller operators and some ownership concentration within larger operators. The biggest deal was the Hutchison-Essar/BPL Mobile merger announced in July 2005, worth $1.15 billion. We are told that management within Hutchison-Essar is likely to increase its stake by buying out other investors. Given Hutchison's moves, we think it is only a matter of time before Bharti and Reliance enter the fray. The most likely targets would be Spice and Shyam Telelink, although the deals may not be as lucrative as the Hutch-BPL merger.

One final note on the nature of M&A activity in the Indian telecom industry. There are a number of so-called goliaths in the Indian mobile telecom space. Many domestic Indian operators - Reliance Infocom, IDEA Cellular, BPL Group, and Tata Teleservices - are part of larger industrial conglomerates that have a history of acquiring smaller competitors as part of their growth strategy. These conglomerates are also fiercely competitive with each other, and do not have a history of joint ventures or strategic alliances. The one exception is IDEA Cellular, which is itself a joint venture between the Birla Group, AT&T and the Tata group. Given this history, we think a merger between Reliance and Tata or Reliance and IDEA is only an outside possibility.

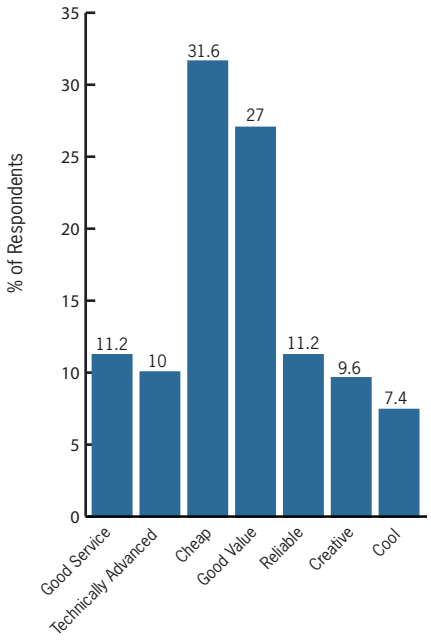
4.1.4. Reduced Operator Profitability:

Indian operators are spending a significant amount of cash attracting subscribers and maintaining networks. According to the TRAI, Operating Expenditures (OPEX) per subscriber per month in India stood at $4.18 in 2004, 1.7x OPEX in China. As a result, returns on invested capital in India are 7% - 10%, compared to 20% - 25% in China. These reduced profitability levels are not going to change anytime soon for operators who have gambled on expanding into semi-urban and rural areas, especially Reliance

and BSNL. For others, such as Bharti and Hutchison, who have branded themselves as premium service providers, price competition will likely erode their subscriber base and have a negative effect on profitability during the forecast period.

4.2. Mobile Operator Competition Analysis

4.2.1. Bharat Sanchar Nigam Ltd. (BSNL)



Financial Metrics

Liquidity Ratios
Current Ratio (Group): 1.67
Quick Ratio (Group): 1.52
Inventory Turnover (days): n/a

Debt Ratios
Asset Coverage (per 1000 Rs): n/a
Cash Flow/Total Debt Outstanding : 81%

Profitability Ratios
Operating Profit Margin : 46.9%
Net Profit Margin: 27.8%
Pre-Tax Return on Assets: 7.5%
Pre-Tax Return on Equity: n/a
Debt- Adjusted Dupont ROE: n/a

Total Subscribers Base: 14.83 Million
Net Subscriber Growth, 2004 - 2005: 66.6%

ARPU per month (Blended): $8.30
Data Services as a & of ARPU: n/a
Post-Paid Churn per Month: n/a

Source: IEMR All figures are for year ended March 31, 2005

Management Background:

BSNL is India's largest fixed-line operator and second largest mobile operator, with 14.83 million subscribers as of December 2005. It is also India's largest public sector firm, with 345,822 employees. The BSNL Board consists of a Managing Director and five full-time Directors: Human Resource Development (HRD), Planning & New Services, Operations, Finance, and Commercial & Marketing. There are five other Directors in the full Board of BSNL.

Mr. A.K. Sinha is BSNL's Chairman Managing Director (CMD). Mr. Sinha has wide experience in installation and commissioning of various switching systems, and also worked as General Manager (Development) in MTNL Corporate Office, as well as MTNL Delhi Telephones. One other key individual is Mr. S. D. Saxena, who is currently the Director of Finance at BSNL. Mr. Saxena's name came up repeatedly in our conversations with industry insiders. Mr. Saxena was involved in the global depository receipt (GDR) issue of MTNL in London 1997. This GDR was viewed as one of the best issues brought out by an Indian company in the United Kingdom. He was also a member of Rakesh Mohan Infrastructure Committee - an influential committee that has shaped the thrust of the Indian government's infrastructure policies in the last 2-3 years.

Operational Summary:

BSNL experienced a phenomenal 2005, with a 67% growth in its subscriber base. For 2005, we estimate BSNL's Blended ARPU to be about $8.30 per month, on the lower end for even Indian operators, and expect BSNL's ARPU numbers to decline even further in 2006. In early 2006, BSNL's One India Plan led to a significant ramping up

of competition in India's wireless space. Media reports indicate BSNL will likely attract 250,000 subscribers in March, although the breakdown between fixed and mobile services is not clear. The One India Plan, which charges subscribers only 2¢ per minute for calls anywhere in India on other networks, has led other operators to announce similar plans. One of our analysts was in India when the Plan was announced, and it received wide media coverage and buzz. What was interesting to observe BSNL's ability to leverage its dominant position in the fixed-line segment to win subscribers in the mobile segment. While other operators have followed suit, it is clear BSNL is now top-of-mind among subscribers when it comes to service charges.

Particulars			
1. Initial One-Time Payments			
a) Registration Amount		$11.29	
b)Activation Charges in Rs.		$4.52	
2. Monthly Fixed Charges		$6.75	
3. Call Charges Per Minute in Rs.	***To Mobile***		***To Fixed WLL***
i) Intra Circle Calls			
Own Network	1c		2c
Other Network	2c		2c
ii) Inter Circle (Own & Other Network)	2c		2c
iii) ISD Charges Per Minute in Rs. with 60 second pulse			
a) USA, Canada and UK		16c	
b) Europe (other than UK) Singapore, Thailand, Malaysia, Indonesia and Hong Kong		22c	
c) Rest of World		27c	

Source: BSNL

Financial Summary:

As noted above, the financial and operational reporting at BSNL is probably the worst of all the Asian operators we track. As of March 31, 2005, BSNL's cellular revenue was $905.5 million and operating profit margins were 46.9%. BSNL has reasonable current and quick ratios compared to other Indian and Asian operators. In terms of asset coverage, while we were not able to calculate BSNL asset coverage, its Cash Flow: Total Debt Outstanding ratio was 81%, which is in the high-end of the various carriers we track.

Strategic Outlook:

Massive Mobile Tender Has Little Downside Risk for BSNL:

Because of its public sector pedigree, BSNL's corporate structure and practices are rather bureaucratic and cumbersome. Their financial and operational reporting is probably the worst of all the Asian operators we track. None of the core board members have private sector experience, and BSNL's board largely consists of career bureaucrats.

Given this context, management floated the biggest ever tender in India's history in March 2006. This three-year, $4.5 billion, 45.5 million GSM lines contract is expected to be made public on May 10th and has attracted bids from 18 companies, including Siemens, Nortel, Nokia, Motorola, Huawei, Sun Micro Systems, and HP. The target of a

network capacity of 45.5 million requires the company to add 41,500 subscribers per day for three years - a pace and target not reached by any other mobile operator in the world, not even DoCoMo at the height of its imode success.

While BSNL's ambitious plan should not be taken for granted by other operators, history and BSNL's internal culture are not on its side. Within six months of launching its mobile services in late 2002, BSNL added 2.4 million subscribers until its board decided to halt further network capacity expansion. Having said that, the downside risks of a BSNL failure to expand its subscriber base at the targeted rate are not significant. Given that BSNL is a government-owned enterprise, there are very little financial markets implications for other private operators. Also, BSNL's Board will likely change in 2008-09, as a matter of regular policy.

Should BSNL succeed, it will be propelled into the ranks of one of the largest wireless telecom operators in the world. Under this scenario, we can see the wireless arm of BSNL spin off as an independent entity. The Indian government may also instill management with greater private sector experience in this new entity. If the experience of other government-owned operators in Asia is any indicator, BSNL may also begin acquiring telecom assets in the region.

2005-06 Brand Image Survey Results:

Relative to the leading private operators, BSNL's brand strength is weak, and is most associated with the words "cheap" and "good value". Of mobile users surveyed, 31.6% identified BSNL with the word "cheap" and 27% with "good value". On all the other brand strength indicators, BSNL came out significantly below its market share. Only 7 - 11% of mobile users identified BSNL with words such as "cool", "creative", "reliable", "good service", or "technically advanced".

While 27% of respondents did associate BSNL with "good value" (above its market share), it should be noted most customers we interviewed may have experiences with BSNL's fixed line division, which is notorious for its bureaucracy and which has 79% of the fixed-line market. Thus, a 27% rating on "good value" does not seem that high for such a ubiquitous brand across India.

Another issue which may be negatively affecting BSNL is the perception it is a state-owned monopoly and controls the largest network in India. In conversations with industry insiders, the view was that consumers choose to stay with BSNL because of poor quality of interconnectivity with private networks. Customers would rather stick with BSNL than risk poor interconnectivity, higher charges, and multiple bills. A customer relationship strategy that forces consumers to stay, not because they receive value, but because they have to is, in our view, not a sound basis for building a strong brand image. We think this factor is reflected in the brand image figures we found for BSNL.

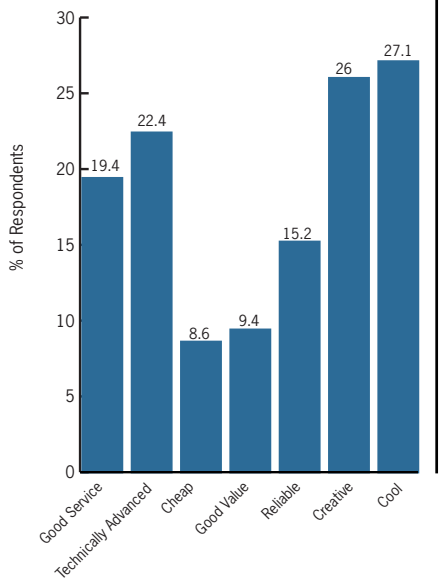
Risks:

The biggest risk for BSNL is the implications of its massive tender of 45 million GSM lines on its operations. While we think BSNL has the financial capacity to withstand any downside financial risks resulting from a failure in its investment plans, we also

think it will need to upgrade its existing systems and deploy ultra-modern supply chain management platforms to ensure customer satisfaction. Without it, we expect BSNL's brand to suffer tremendously, as subscribers move to other operators.

Another risk to BSNL's operations is the impact of its One India Plan. Should this plan be successful, it will be tough for BSNL to raise prices in the future. Since BSNL is most associated with the word "cheap", our research indicates low-income consumers will likely "graduate" to other operators, rather than stick with a service provider they view as being "cheap". In other words, a subscriber growth strategy based solely on price will likely hurt, rather than help BSNL's profitability in the medium- to long-term.

4.2.2. Bharti Tele-Ventures, Ltd.



Financial Metrics

Liquidity Ratios
Current Ratio (Group): 0.51
Quick Ratio (Group): 0.50
Inventory Turnover (days): 3.6

Debt Ratios
Asset Coverage (per 1000 Rs): 2,659
Cash Flow/Total Debt Outstanding
: 62.08%

Profitability Ratios
Operating Profit Margin : 23.9%
Net Profit Margin: 23.6%
Pre-Tax Return on Assets: 10.1%
Pre-Tax Return on Equity: 23.8%
Debt- Adjusted Dupont ROE: 9.8%

Total Subscribers Base: 16.33 Million
Net Subscriber Growth, 2004 - 2005: 66.2%

ARPU per month (Blended): $10.50
Data Services as a & of ARPU: 9.7%
Post-Paid Churn per Month: 4.2%

Source: IEMR All figures are for quarter ended 31st December 2005

Management Background:

At the head of Bharti Tele-Ventures is Sunil Bharti Mittal, Chairman and Managing Director. Unlike other IT executives, who have succeeded by specializing in one industry, Mr. Mittal is an intrepid entrepreneur, with business interests in everything from telecom to bicycles, to fruits, to airports. Institutional Investor magazine rated Mr. Mittal as the Best CEO, Telecommunications, Asia in 2005. Asia Money also awarded Bharti Tele-Ventures the Best Managed Company award in the large capacity category for 2005. Supporting Mr. Mittal is his younger brother, Rajan Bharti Mittal, Joint Managing Director; Manoj Kohli, President of the Mobility Group; and Akhil Gupta, Joint Managing Director and Chief Financial Officer. Bharti's Board also consists of SingTel's senior management.

Bharti's management is very highly regarded within the industry, and has demonstrated an ability to stay ahead of the pack in India's tough wireless market by emphasizing brand image, and offering a wide range of value-added services. Going forward, we think management is fully capable rising to the challenges faced in the Indian market, although we expect Bharti's management will limit itself to expansion in India's urban centers, among the more affluent income groups.

Operational Summary:

Bharti is the only private telecom company to have an all India footprint, with mobile operations in all 23 telecom circles of India. Partly because of its brand image and quality service, Bharti experienced a strong 2005, emerging as the leading mobile operator in India. Its subscriber base grew by 66.2%, to 16.327 million subscribers as of December 31, 2005 and a market share of 21.5%.

Like all operators in India, Bharti's prepaid customers account for a large fraction of its

subscriber base, and this ratio has been going up in the last two to three years. Pre-paid subscribers accounted for 79.7% of Bharti's total subscriber base and 93.2% of its net subscriber adds, for the quarter ended December 31st, 2005. Bharti's Prepaid churn was 5.5%, down significantly from 8.5% in December 2004, while post-paid churn rates remained fairly stable at around 4.2%. Bharti's blended ARPU declined by 9% (y-o-y), and stood at $10.50 as of December 31, 2005. Bharti's non-voice revenue makes up 9.7% of its total mobile revenue.

It is interesting to note that most analysts deem India to be a price-sensitive market. Our range of research suggests otherwise, and Bharti's subscriber growth numbers are a case in point. Compared to BSNL, Bharti's ARPUs are 26.5% higher; yet, Bharti has been able to attract and retain its customers.

Financial Summary:

Unlike other family-run Indian conglomerates, the Bharti Group has shown a willingness to allow foreign investments and foreign operating procedures, strategies, and management to filter through its corporate structure. This is largely because SingTel, and now Vodafone, has been a long-time investor in the firm. In May 2005, SingTel increased its stake in Bharti Telecom (the holding company for Bharti Tele-Ventures) for an aggregate cash consideration of $252 million. SingTel now has a 30.6% stake in Bharti Tele-Ventures. In October-November 2005, Vodafone acquired a 10% economic interest in Bharti for a cash and convertible debenture consideration of $1.5 billion.

For the nine months ended December 31, 2005, Bharti's Total Revenues and EBITDA were $1,836 million and $686 million, respectively. Net profit was US$ 351 million, up 52% from a year earlier. Our analysis of Bharti's financial statements shows the firm has some short-term financial challenges. With a Current and Quick ratio of 0.5, we can see why the firm has been accepting cash injections from overseas investors. Having said that, Bharti is growing fast enough to meet its short-term debt obligations, as indicated by its low inventory turnover figure. Bharti also has a comfortable overall debt situation relative to other Asian telecom players, with a Cash Flow: Total Debt Outstanding ration of 62.1%.

Strategic Outlook:

Bharti's Marketing Strategy May Result in Brand Dilution:

06 Brand Image Survey (see below), Bharti has developed a reputation as a premium provider of wireless mobility services in India. We think it has superior management and brand, and its partnership with overseas investors will help further solidify its hold, especially in India's cities. The company announced plans to roll out its GSM network, increasing its presence to over 4,500 towns and locations in India, up from 3,200 in September 2005.

One strategic issue Bharti will face in the short-term is to define its customer base and decide how it wants to compete with the likes of Reliance and BSNL for the low-income market segment. So far, Bharti's target customers have been up-market professionals, entrepreneurs, and the country's elite. In our view, in the past, Bharti has run a brilliant marketing strategy, but its current marketing focus risks diluting the AirTel brand.

In the 1990's, Bharti took out full and half-page ads in newspapers and magazines, answering questions like "what is roaming?", "what is coverage area?" and "how to make international calls?". To complement this strategy, Bharti was the first operator to establish its own customer centers, called Airtel Connects, where customers could pay their bills, apply for new connections, and touch and feel new handset models. This add campaign and retail presence resonated with Indian customers who were still learning about wireless mobility, and identified Bharti with innovation and new learning experiences.

Bharti changed its marketing strategy quickly in 1999, on the heels of the New Telecom Policy. Its management rightly predicted there would be a quick race to the bottom in terms of price, and a rush to attract low-income consumers. Consequently, Bharti's marketing strategy began to focus on low-income consumers. The focus was on a product-driven communication strategy that showcased new offerings like AirTel's Magic prepaid card and an emotional communication message with liberal use of youth in its messaging. Bharti's current campaign continues this strategy, and Bharti now has an extensive add campaign in regional languages, with a clear focus on low-income prepaid customers. The strategic question is whether this marketing strategy will continue to work for Bharti. All the operators, particularly Reliance, Tata, and Hutchison-Essar, also have slick marketing campaigns with a similar focus on low-income consumers. Given a much more crowded space, customers may not be able to distinguish the AirTel brand from other, more recognizable brands, such as Reliance or Tata.

Vodafone and SingTel Relationship Unclear:

With Vodafone acquiring a 10% economic stake in Bharti, many analysts have asked the question of how this relationship will play out within the organization. In the short-term, we do not see any downside risks. Like SingTel, we think Vodafone is likely to take a passive approach, leaving management to lead the way at Bharti. Should the Mittal family and other shareholders wish to sell part or all of their stakes, however, it could get ugly very quickly. Both SingTel and Vodafone are aggressive operators, and SingTel can be expected to match and exceed any Vodafone offer, since Bharti is so important to its overall business strategy in the region.

The real issue in this battle is what will happen to senior management, should the Mittal family sell. We think neither SingTel nor Vodafone will attempt to instill their own management, given the accomplishments of Mr. Mittal and his existing management team. In addition, India's telecom policy requires key board members and executive management of Indian telecom operators to be Indian citizens. It will be difficult for either Vodafone or SingTel to find management to match the experience of Mr. Mittal and his senior management team.

2005-06 Brand Image Survey Results:

In our view, AirTel has the most recognizable brand in the Indian operator space, with 30.8% of our respondents able to identify it as a mobile brand unaided. While this is lower than many of its competitors, examination of the various brand strength indicators shows AirTel has a much stronger brand than its competitors do. Of respondents, 27.4% identified AirTel with "cool", 26% with "creative", and 22% with "technically advanced". Only 8.6% of respondents identified AirTel with "cheap". Also, 80% of respondents who

were AirTel customers said they would remain with AirTel if they got an offer to switch to a competitor.

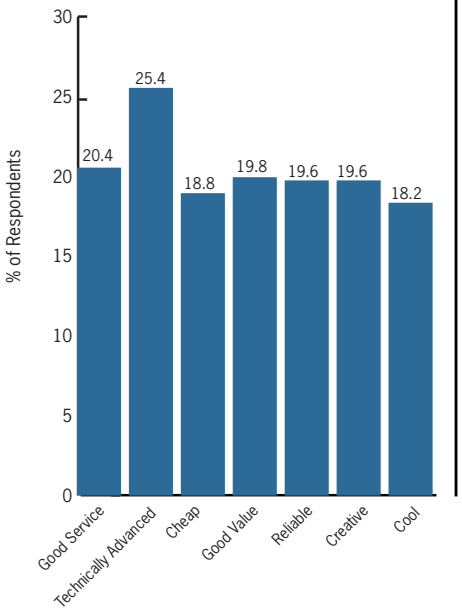
In our view, these are solid brand equity numbers, which Bharti can continue to capitalize on as it competes in an increasingly crowded space. Between 2004 and 2005, it has increased its market share from 20.5% to 21.5% of the market. Driving some of this growth are experiences of AirTel customers. Some of our other research suggests AirTel customers are quite satisfied with almost all aspects of Bharti's offering.

Risks:

A continuous risk facing a market leader like Bharti, is what it needs to do in order to meet the challenge of its competitors. Firms such as Reliance, Hutchison-Essar, BSNL, and Tata also have a strong brand presence, and some are competing on price as well as quality. While we think Bharti's offering is superior, one interesting finding in our Brand Image Survey was that only 9.4% of respondents identified Bharti with "good value". In other emerging markets, we generally see a strong negative correlation between how consumers view a word like "cheap" (a negative quality) compared to a word like "good value" (a positive quality). In India, the two are positively correlated, suggesting price may be an important factor in this market.

Bharti clearly faces a conundrum: how to maintain market share when its competitors are offering lower prices, a wide variety of handsets, and slick marketing plans? We think the answer to this question will be for Bharti to accept lower market share and move up the value chain to focus on premium customers.

4.2.3.
Hutchison-Essar Ltd.



Financial Metrics
Revenue: $1.29 Billion
Hutch

Liquidity Ratios
Current Ratio (Group): 1.02
Quick Ratio (Group): n/a
Inventory Turnover (days): n/a

Debt Ratios
Asset Coverage (per 1000 Rs): n/a
Cash Flow/Total Debt Outstanding : n/a

Profitability Ratios
Operating Profit Margin : 24.4%
Net Profit Margin: n/a
Pre-Tax Return on Assets: 11.9%
Pre-Tax Return on Equity: n/a
Debt- Adjusted Dupont ROE: n/a

Total Subscribers Base: 14.30 Million
Net Subscriber Growth, 2004 - 2005: 59.4%

ARPU per month (Blended): $11.36
ARPU per month (Pre-Paid): $6.89
ARPU per month (Post-Paid): $25.67
Data Services as a & of ARPU: n/a
Post-Paid Churn per Month: 5.7%

Source: IEMR All figures are for quarter ended 31st December 2005

Management Background:

At the head of Hutchison-Essar is Mr. Asim Ghosh, Managing Director, an icon of India's wireless telecommunications industry. Over the years, Mr. Ghosh has developed the Hutch brand into one of the strongest pure-play mobile brands in India's tough wireless telecommunications space. He has done this by focusing on premium clients, service quality, and keeping Hutch's marketing message simple and elegant. Over the years, Hutchison-Essar has been named the "Most Respected Telecom Company", the "Best Mobile Service in the Country", and the "Most Creative and Most Effective Advertiser of the Year".

Given recent corporate tensions between HTIL and the Essar Group, many analysts have questioned the future of Hutch's senior management and their willingness to stay on. In our view, HTIL has much at stake in Hutchison-Essar, and will consolidate its stake in the joint venture entity. Should this happen, Mr. Ghosh and the rest of Hutchison's senior management will continue to stay on in his current capacity, since he has both the confidence and support of HTIL's senior management.

Operational Summary:

Hutchison-Essar is the holding company for the cellular operations of the joint venture between India's Essar Group and Hutchison Telecommunications International Limited (HTIL), a subsidiary of Hong Kong-based Hutchison Whampoa. Hutch established its presence in India in 1994, by acquiring the cellular license for Mumbai. It now has operations in 16 circles, that cover 89% of India's mobile subscriber base and 72% of India's population.

Hutch had a strong 2005, and by most accounts is the industry leader in India. Its subscriber base (ex-BPL) increased by 59.4%, to reach 11.4 million subscribers as of

December 31, 2005. Hutch's prepaid subscriber base increased by a staggering 76.7%, to reach 8.878 million customers. At the end of 2005, 77.8% of Hutch's customer base was in the prepaid segment, up from 70.2% at the end of 2004. Postpaid subscribers rose by 18.7% to 2.535 million subscribers. While Hutch's blended ARPU declined by 11% in 2005, at $11.36 it's ARPU is the highest in India - 8% higher than industry leader, Bharti. Further, while Hutch's churn rates appear to be slightly higher than Bharti's, Hutch's numbers are more believable. Hutch's prepaid churn rates are calculated as the average number of disconnections (net of reconnection and internal migration between networks) divided by the weighted average number of "activated customers". Bharti and other operators in India measure churn as the number of disconnections per gross customer adds rather than gross "activated customers", which is a more robust measure of churn.

In 2005 and early 2006, three key changes/deals have signaled to us a more aggressive operational strategy by Hutchison-Essar. First, Hutchison-Essar consolidated operations of five regional carriers, formerly known collectively as Hutch India, into a single company. We think this was an effort to consolidate marketing and sales functions, to more aggressively pursue regional growth opportunities. Second, in July 2005, Hutchison-Essar announced its takeover of BPL Mobile, a deal valued at $1.15 billion. BPL Mobile provided wireless service in three areas of India: Kerala, Maharashtra, and Tamil Nadu. Within months, Hutch has successfully completed a significant level of integration, including a complete re-branding of BPL's operations, supply chain integration, and training of sales and marketing professionals. By all accounts, the Hutch-BPL merger is probably the most successful merger in Indian telecom history, given the speed at which integration has occurred. Third, in January 2006, Nokia was selected by Hutchison-Essar for a five-year managed services contract that would see 600 Hutch staff transferred to Nokia. The deal is significant on two counts. First, it covers nine of Hutch's 16 circles: Gujarat, Karnataka, Andhra Pradesh, Chennai, Uttar Pradesh (East and West), Rajasthan, Haryana, and West Bengal. Services being outsourced include network planning, project management, configuration and optimization, network operations and maintenance, and the administration of third-party vendor contract management. Second, the Nokia deal signals a willingness by senior management to outsource network management and focus more on marketing and sales.

Financial Summary:

Hutchison-Essar accounted for 41% of HTIL's turnover and 108.9% of its operating profits, making it the most important telecom asset of the Hutchison Whompoa group. Turnover increased 40.9% to $1.29 billion and EBITDA increased 47.1% to $417.5 million. As mentioned above, this growth has largely been in the prepaid segment, driven by accelerated investment in coverage, together with the introduction of new tariff plans and realignment of existing plans. Operating profits rose by 81.5% to reach $314.7 million in 2005. According to HTIL, the increase in operating profits mainly reflects the improved performance in the Uttar Pradesh (East), Rajasthan, Haryana, and Karnataka service areas. HTIL intends to invest between $1.1 – 1.3 billion in India in 2006, to double the size of its network.

Strategic Outlook:

Focus on Premium Market to Continue:

Hutchison-Essar's network roll-out and branding strategy has traditionally focused on premium markets in India, both in a geographic and demographic sense. Unlike competitors such as Reliance and Tata, it did not start of with a nation-wide footprint, focusing instead on large Indian cities and moving on to smaller cities and less lucrative circles. This was done partly to focus on high purchasing power markets within India, and considered prudent financial management by Asim Ghosh.

Within these high-growth urban markets, Hutch's focus was on the high-income consumer market. While the company has entered selective price wars with some of its competitors, in our view, Hutch's marketing focus was on positioning its brand on quality, reliability, and good value. Its marketing message (the boy and his dog) was simple and elegant for the Indian market.

2004 and 2005 were important years for Hutch in the Indian market. In early 2004, most analysts were predicting the entry of integrated and aggressive players like Reliance and BSNL to result in a loss of market share for players like Hutch. Contrary to expectations, Hutch demonstrated it can organically grow as fast as its competitors, while at the same time capturing a large share of the premium urban market and maintaining its ARPUs above the competition. We think Hutch will continue to create a niche for itself as a pure-play mobile services provider in India, rather than be lured into a low-price spiral.

Hutch Likely to Become a Full-Service Operator:

Unlike some of its competitors, Hutch is a non-integrated player, and does not offer fixed line, long distance, or broadband services. We think this focus on mobile communications has allowed Hutch to effectively target the largest and fastest growing market in the telecommunications space; however, we think it is becoming increasingly difficult for Hutch to keep market share of the premium market based solely on its mobility plank. Reliance Infocomm already has 60,000 km of fibre optic laid out across the country, and plans to connect 1.7 million buildings over the next few years by providing enterprise broadband; 7% of Bharti's turnover already comes from its enterprise, broadband and data businesses. Players such as Reliance, Bharti, and Tata have been able to lure some key enterprise clients away from Hutch. Further, like other developed markets, premium consumers in Indian cities are demanding a one-stop service provider. Should Hutch decide to become a full service operator, we think it is going to invest in building its own network rather than renting network space from its competitors. The history of litigation in the Indian telecommunications industry is long, and we do not think entering fixed line or broadband services is just a matter of "renting" space from other operators.

2005-06 Brand Image Survey Results:

Hutchison has very strong brand equity in the Indian market. Of respondents, 34.4% were able to identify Hutch as a mobile brand unaided, which was larger than the market leader - Bharti Tele-Ventures. A look at the various brand strength indicators shows that Hutch has a solid reputation across the board, with 18.2% of respondents identifying Hutch with "cool", 19.6% with "creative", 19.6% with "reliable", 19.8% with "good value", and 25.4% with "technically advanced".

One aspect of these numbers that was surprising to us was that Hutch did not excel in any specific area. This fact points to a strong and loyal customer base that is satisfied with its existing services, as is indicated by the fact 85% of respondents who were Hutch customers said they would stay with Hutch if they got an offer to switch. Hutch's numbers in our Brand Image Survey, however, also point to a lack of any "edge" over some of its important competitors. Hutch's brand strength numbers are not far off from its market share figures, indicating the firm may not have the brand strength to continue to experience the type of subscriber growth figures it has seen in the recent past.

Risks:

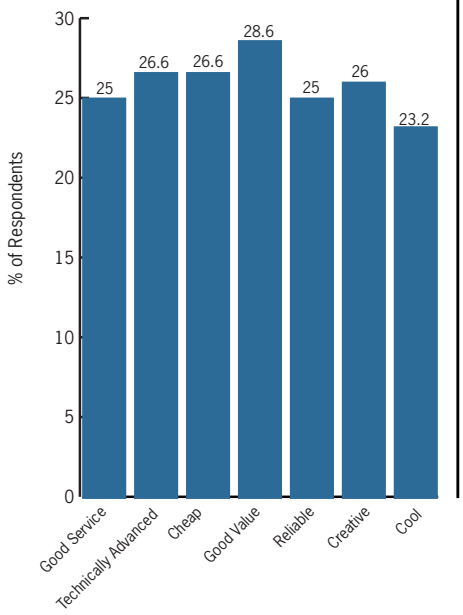
Lack of Love Means Trouble for Hutch's Operations:

There has been a lot of speculation lately over the implications of the most recent spat between HTIL and Ruia-owned Essar Teleholdings. HTIL and the Essar Group have been at loggerheads since HTIL's parent, Hutchison Whampoa, sold a 19.3% stake in HTIL to Egypt's Orascom for $1.3 billion, which gave Orascom an indirect stake of 9.6% and a right to a seat on the 11-member board of Hutchison-Essar. It should be noted that HTIL owns 42% of Hutchison-Essar directly, Ruia-owned Essar Teleholdings owns 33%, Hinduja Group owns 5% and Telecom Investment India (TII) owns 19.5%. TII, in turn, is owned by HTIL (37%), Analjit Singh (39%), and Asim Ghosh (24%). Currently, Hutchison has five representatives on the board (including Orascom's), Essar has three, Hinduja Group has one, and Telecom Investment India (TII) has two.

The recent disputes apparently stem from the Essar Group's move to approach the government of India against HTIL's stake sale to Orascom. The group alleged the change, without the consent of its Indian partners, Ruias, could pose a threat to national security. In our opinion, the real cause of the dispute is the dilution of the Essar Group's shareholding expected after Hutch's IPO.

The on-going battles between HTIL and Essar Group cannot be good for Hutch's operations. Already, Hutch's IPO, scheduled for early 2005, has been delayed indefinitely. This delay in raising money through the IPO will impact Hutch-Essar's network rollout plans. It also creates a lot of uncertainty about the direction management may want to take in competing with some aggressive players in the Indian market. Some board directors may speculate that key strategic decisions, such as the focus on mobility and the premium market, may place Hutch at a competitive disadvantage in India. Since TII is partly owned by HTIL and Mr. Ghosh, the Essar Group directors may also feel that top management has the interest of the senior equity holder HTIL in mind, rather than building long-term value for all equity holders. These types of issues at the Board level always affect operations negatively. As a result, we think Hutch's senior management will likely be slower to respond to market realities and may delay strategic competitive decisions until Board disputes are resolved. We think Hutchison-Essar is important enough to both HTIL and the Essar Group that IPO-related issues will be settled within the next year.

4.2.4. Reliance Infocomm Limited



Financial Metrics

Revenue: $1.514 Billion

Reliance

Liquidity Ratios

Current Ratio (Group): n/a
Quick Ratio (Group): n/a
Inventory Turnover (days): n/a

Debt Ratios

Asset Coverage (per 1000 Rs): 3,500
Cash Flow/Total Debt Outstanding
: 88.9%

Profitability Ratios

Operating Profit Margin : n/a
Net Profit Margin: n/a
Pre-Tax Return on Assets: n/a
Pre-Tax Return on Equity: n/a
Debt- Adjusted Dupont ROE: n/a

Total Subscribers Base: 14.30 Million
Net Subscriber Growth, 2004 - 2005: +31.2%

ARPU per month (Blended): $8.43
Data Services as a & of ARPU: 6%
Post-Paid Churn per Month: 2.2%

Source: IEMR All figures are for quarter ended 31st December 2005

Management Background:

Unlike the other leading wireless telecom operators in India, Reliance Infocomm Limited (RIC) has experienced significant management churn in the last year, primarily due to the feud between the Ambani brothers. The company's Board of Directors is now reconstituted, with the resignations of five directors: Anand Jain, Manoj Modi, Bharat Goenka, Y.P. Trivedi, and M.P. Modi. Mr. Mukesh Ambani also resigned as Chairman. Going forward, we think these resignations were necessary to move RIC forward with a clean slate and allow Mr. Anil Ambani, the new Chairman, to make the type of changes needed to rebrand Reliance into an integrated telecommunications outfit.

We also think management changes made by Mr. Anil Ambani are generally positive. Mr. Ambani has chosen to keep management with domain experience and has brought in new talent from competitors and suppliers that should see RIC grow its subscriber base and brand. So far, appointments indicate to us that RIC is likely to move toward a managed services business model in the wireless domain, while trying to grow its broadband and fixed line subscribers. There will also be a greater emphasis on re-branding RIC. Key management at RIC now includes:

• Mr. Bhagwan D. Khurana, Group President: Mr. Khurana is a 30-year veteran of the telecom industry, and has largely been responsible for RIC's fibre optic networking project. Although implicated in the Access Deficit Charge scandal, Mr. Khurana's continued presence at RIC shows the confidence that Mr. Anil Ambani has in his ability to lead RIC as an integrated telecom operator.

• Mr Prakash C. Bajpai, President: Former President & CEO of Hughes Telecom, Mr. Bajpai joined Reliance Infocomm in April 2002, and is now driving RIC's broadband business. Mr Bajpai's background is in electronics engineering, and he has worked

at IBM, Phillips, Tata Telecom, and AT&T. As President & CEO at Hughes Telecom, Mr Bajpai is largely credited with building India's first integrated broadband network in Maharashtra & Goa.

• Mr. Rajeev Batra, Vice President - IT & Technology: Mr. Batra was formerly Chief Architect (Corporate IT & Technology) for Bharti Televentures' India operations. His responsibilities included leading Bharti's efforts to outsource network management and back-office operations. Mr. Batra is credited with leading Bharti's efforts in the managed services domain and was a member of the team negotiating managed services contracts Bharti signed with IBM, Nortel, and Nokia in 2004-2005. We think Mr. Batra's appointment is an indication that RIC will likely outsource core network management and customer care functions and focus its attention on retail/enterprise subscriber growth.

• Mr. Debabrata Chowdhury, Vice President– Technology Development: Mr. Chowdhury was formerly the Chief Technology Officer (Enterprise Services) at Bharti Tele-ventures Ltd. We think he brings a wealth of experience in the lucrative enterprise market, and his appointment is an indication that RIC will be placing greater emphasis on service quality, which is crucial to this market. Prior to Bharti, Mr. Chowdhury worked in the United States for Hughes Network Systems, Inc., Network Equipment Technologies, Inc., Telenova, and Nortel.

• Mr. Sanjay Behl, Head of Branding: Mr. Behl comes to Reliance Infocomm from Nokia, where he was Head of Marketing for its India operations. At Nokia, Mr. Behl was responsible for product portfolio management, brand communication, retail and web marketing, and media management. Mr. Behl also has considerable experience in marketing consumer products, with over 10 years of experience with Hindustan Lever Ltd., including two years with Unilever's global brand team. Mr. Behl is credited with managing Nokia's brand in India, and growing it to become one of the most recognized brands in the country.

• Ms. Nalini Gupta: Complementing Mr. Behl will be Ms. Nalini Gupta, Marketing Advisor to the Chairman at RIC. Ms. Gupta was formerly the Chief Marketing Officer at Bharti's Enterprise Services division, with responsibilities for voice and data products management. Ms. Gupta has extensive experience in telecom marketing, having worked at AT&T, Pacific Bell and Bellcore (now Telecordia).

Other key individuals staying on at Reliance include Mr. Mahesh Prasad, President, Applications, and Mr. Arun Sur, who heads the Networks division.

Operational Summary:

Since its entry into the wireless market in December 2002, RIC has seen explosive growth of its subscriber base. As of December 31, 2005, the company had 14.68 million subscribers, for a net subscriber growth of 31.2% for 2004-05. We estimate RIC has an additional 15% (or 2.2 million) WLL subscribers. According to the firm's latest offer documents, RIC's customer churn rate for 3Q 2005-06 was 2.2%, compared to Bharti's 4.2% and Hutch's 5.7%. We think Reliance's figures include WLL and broadband subscribers, however, and there may also be definitional differences between operators,

with Hutch reporting the most believable churn figures.

We note that RIC's subscriber growth figures were lower than the other leading operators - Bharti, BSNL, and Hutch. We think this is likely a reflection of management's inability to move on key business decisions in 2005. There is also a broad perception that the Reliance brand is cheap, as reflected in our 2005 - 06 Brand Image Survey (see below). In terms of ARPU, RIC posted gross ARPUs of $8.43 for the March 2006 quarter, which was 15% lower than Bharti's figure for the same quarter, and represented a sequential decline of 8.5%. We estimate RIC's minutes of usage (MOU) per subscriber per month were 532 minutes, compared to 431 minutes for Bharti.

From our recent visit to India and anecdotal analysis of RIC's marketing campaign and data offering, we believe Reliance is going to place a major emphasis on data. In our view, RIC has perhaps the widest array of data services, including cricket score updates, video streaming, cinema, ringtones, gaming, and airline/railway ticketing. While exact figures are not published by RIC, we estimate data revenue makes up about 6% of total revenue, lower than the 9.7% posted by Bharti. Our sources tell us RIC is experiencing significant growth in data users, to the order of 25% - 30% for 1H 2006. At this rate, we expect gross data users to surpass the 7.5 million mark by July 2006.

Financial Summary:

RIC does not provide much detail in its financial statements, and we think its reporting standards are only slightly better than BSNL's. For the nine months ended December 31, 2005, RIC posted sales of $1.514 billion, 10.8% higher than the corresponding period in 2004. EBITDA margin was 15.7%. It was not possible for us to confirm RIC's liquidity and debt measures, but we estimate the firm's Cash Flow/Total Debt Outstanding Ratio to be 88%. Based on correlations for other operators in the region, we estimate RIC's Asset Coverage at Rs. 3,500, with which we are very comfortable.

Strategic Outlook:

2005-06 Brand Image Survey Results:

We think RIC has a strong brand position in the Indian market, and should be able to capitalize on these going forward. Of respondents, 51% were able to identify Reliance as a mobile brand unaided, which was larger than any other company, including Bharti and BSNL. This strong brand recognition may be due to a number of factors, such as the Reliance name itself, and the negative publicity surrounding the dispute between the Ambani brothers.

Examination of the various brand strength indicators shows the negative publicity is not a factor for consumers. Of respondents, 23.2% identified Reliance with "cool" (even larger than Hutch's 18.2%), 26% with "creative"(on par with Bharti), 25% with "reliable" (far exceeding both Hutch and Bharti), 28.6% with "good value" (again reflecting RIC's emphasis on innovative pricing), and 26.6% with "technically advanced" (again on par with both Bharti and Hutch).

Reliance Likely to Change its Branding Strategy:

Given these branding results and the management changes, we think the company is going to move aggressively to increase its ARPUs with an emphasis on driving revenues in the data and enterprise services segments. RIC will also go through a rebranding exercise, which will likely see it emphasize premium services rather than entry-level

offerings.

What all of this means for Reliance's pricing strategy is a bit unclear at this stage. We note that Reliance has always emphasized price as its key differentiator. For example, its launch of mobile services in December 2002 came with the introductory "Dirubhai Ambani Pioneer" offer. Under this offer, consumers were given a mobile phone, unlimited free incoming calls, billing at 15-seconds pulse rate for a one-time fee of Rs. 3,000 ($66) and a monthly charge of Rs. 600 ($13). This offer's other characteristics challenged - indeed upset - many norms in the Indian wireless telecom space, and resulted in a lot of buzz around RIC's services. In July 2003, Reliance followed up with its "Monsoon Hungama" offer which lowered the initial payment to Rs. 500 ($11) and a monthly charge as low as Rs. 450 ($11). By all measures, Monsoon Hungama was quite a success for Reliance, with over one million subscribers signing up within the first 10 days of the offer.

In January 2006, Reliance came up with two more low-pricing plans. Under its 1 India tariff plan, Reliance WLL customers are able to make calls to any phone anywhere in India for Re 1/minute (2¢). Before this offering, fixed phone rates varied between Rs 1.80 - 2.40/minute (4.09¢ -5.46¢). The tariff for local and intra-circle calls to Reliance phones was even lower, at Rs. 0.4/minute (less than 1¢). The 1 India scheme has a monthly rental of Rs 499 ($11.35). Reliance also started its "Life-Time Free Incoming" plan. Under this plan, for a one-time payment of Rs 2,999 ($68), Reliance customers get life-time incoming free on their WLL phones. We expect both these plans to boost Reliance's subscriber base significantly. Our anecdotal experience in February 2006 suggests Reliance's WLL service is getting a lot of attention among consumers in India.

These rock bottom prices have not been without their downsides. In 2003-04, RIC provisioned 16% of service revenues toward bad debts. These were among the highest in the industry and are an indication of RIC's customer base - low income consumers

Risks:
Does Ownership Matter to Operational Performance?

One issue we think may impact RIC's operations is its expected consolidation with other sister companies of the Anil Dhirubai Ambani Group (ADAG). RIC is an operating company of Reliance Communication Ventures Limited (RCVL). In March 2006, RCVL's board approved a proposal to amalgamate the group companies - Reliance Infocomm Ltd, Reliance Business Management Pvt Ltd, Ambani Enterprises Pvt Ltd, Panther Consultants Pvt Ltd, Reliance Communication Solutions Pvt Ltd, Reliance Communications Technologies Ltd, Reliance Software Solutions Pvt Ltd and Formax Commercial Pvt Ltd. Once this process is complete, Mr. Anil Ambani will own a majority share of 63% in the reconstituted company; he currently owns around 40%.

Many investors have been put off by this move for different reasons. From an operational point of view, we think the move will create an even stronger private-sector integrated telecom operator in India, with a significant presence in the wireless, fixed, and broadband markets. The impact on BSNL will be the most significant; however, pure play wireless providers, such as Hutch, and, to a certain extent, Bharti, will also

be negatively affected in the long run.

Ongoing Legal Claims: Reliance has been very aggressive in defending its market position in the courts and pushing the legal envelope. The access deficit charge issue is only one of several legal issues looming over Reliance. Altogether, Reliance management has listed over $200 million in legal claims of various types pending against it in the courts. While we do not think this will have a material impact on RIC's operations (RIC has already made deposits for the largest cases), we do think it has created a position for itself that is confrontational toward the regulator – a poor strategy in a regulated industry like telecommunications.

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Annex A: Methodology for IEMR's 2005 - 06 Brand Image and Wireless Strategy Surveys

Brand Image Survey Methodology:

Between November 2005 and February 2006, IEMR undertook its 2005 - 06 Brand Image Survey in five of Asia's largest wireless markets: Japan, China, Korea, India, and Indonesia. Together, these economies have an installed base of over 675 million subscribers, and represent perhaps the most important markets for operators, handset manufacturers, and vendors in the wireless space today.

The objective of our 2005 - 06 Brand Image Survey was to provide our clients with intelligence on the specific strengths and weaknesses of both their own and their competitors' brands in these five Asian markets. In order to achieve these objectives, we undertook a random sample survey of 2,459 individuals. All interviews were conducted over the telephone in local languages/dialects. As such, this IEMR 2005 - 06 Brand Image Survey represents the largest multi-country survey of its kind in Asia. Table A1 below presents a summary of sample sizes, response rates, and significance levels of overall results in each of these markets.

Table A1: Sample sizes and Significance Levels in the 2005-06 Brand Image Survey

Market	Date of Survey	Sample Size	Response Rate, %	Significance Level
Japan	Nov. 15 - 20, 2005	408	35.6%	± 5% 19 times out of 20
China	Jan. 25 - 26, 2006	651	25.2%	± 4% 19 times out of 20
Beijing		202		
Shanghai		232		
Guangzhou		217		
Korea	Jan. 29 - 30, 2006	500	32.1%	± 5% 19 times out of 20
Indonesia	Jan. 31 - Feb. 2, 2006	400	40%	± 5% 19 times out of 20
Jakarta		191		
Surabaya		72		
Bandung		74		
Medan		40		
Palembang		23		
India	Feb. 19 - 21, 2006	500	32%	± 5% 19 times out of 20
Delhi		209		
Mumbai		91		
Calcutta		93		
Chennai		59		
Bangalore		48		

Source: IEMR

Clients should note two important caveats when interpreting results of the Survey:

1. While the national-level results are valid at the significance levels indicated above, the levels of error are much higher at the city level. Therefore, we urge clients to interpret the city-level results with caution. At all levels, we have made every effort to present the statistical significance levels of our results.

2. Because the survey was a telephone survey, we had to limit its implementation to cities within these five markets. While there are no statistical issues here, we feel that brand recognition and strength in suburban or rural areas of these economies, particularly China, Indonesia, and India, would look very different. Therefore, we caution clients that the results of this survey are applicable only to urban populations in these economies.

The generally high response rates on our survey was a direct result of both the short length of the survey and the relatively closed-ended questions we asked respondents. Survey interview times varied between 3 – 10 minutes. We used the evocative word association technique to measure the strength of brands. For handset manufacturers, the interview protocol was as follows:

Question 1: Please name every handset manufacturer brand you can think of?
[**Interviewer:** Repeat back to the respondent all brands identified]

Question 2: Can you think of any others?
[**Interviewer:** If they can identify others, repeat back entire list, including new names. Repeat Question 2 until respondent replies "no"]

Question 3: I am now going to say a series of words, and, after each word, I would like you to say the name of the first Handset Manufacturer that comes to mind. There are no wrong answers.

"Cool", "Creative", "Reliable", "Good Value", "Cheap", "Technically Advanced", "Good Service".

For wireless operators, the interview protocol was as follows:

Question 1: Please name every cellular service provider brand you can think of?
[**Interviewer:** Repeat back to the respondent all brands identified]

Question 2: Can you think of any others?
[**Interviewer:** If they can identify others, repeat back entire list, including new names. Repeat Question 2 until respondent replies "no"]

Question 3: I am now going to say a series of words, and, after each word, I would like you to say the name of the first cellular service provider that comes to mind. There are no wrong answers.

"Cool", "Creative", "Reliable", "Good Value", "Cheap", "Technically Advanced", "Good Service".

Asking respondents to volunteer the names of every firm in a specific domain (Questions 1 and 2) provides a particularly good indicator of whether consumers recognize specific brand names. Aggregating these answers across the sample provides a measure of "Share of Mind", i.e., the percentage of respondents who actually recalled any particular brand.

Question 3 then asks consumers to associate particular qualities with their recalled brands. These seven qualities – "Cool", "Creative", "Reliable", "Good Value", "Cheap", "Technically Advanced", "Good Service"– are important to different demographics, and the weight attached to each will vary in different economies. For example, "cool" and "creative" are more important decision factors for younger individuals (relative to older individuals), while "cheap" is more important in price-sensitive markets like China and India (relative to a market like Japan).

These correlations are important, since they provide the thrust areas for marketing, pricing and engineering efforts by our client organizations. We provide these country and region-wide correlation metrics on a company and country basis in our various CONSUMEREADY™ publications.

Wireless Strategy Survey Methodology:

Given the competitive nature of the Japanese handset manufacturing domain and Japan's leadership position in this space, we also undertook a strategy survey of suppliers and channel partners of Japanese handset manufacturers and operators. A structured questionnaire was mailed/faxed/emailed to executives at over 100 suppliers and channel partners. We received 21 completed surveys.

The questionnaire asked respondents to rate various characteristics of handset manufacturers and operators. We would classify these characteristics into two broad areas: 1) technology innovation; and 2) business strategy. On technology innovation, channel partners were asked to rate manufacturers on five indicators that we thought would adequately capture technology innovation in the handset domain. These were:

1. The quality of manufacturers' IP portfolios in the handset domain
2. The quality of engineering in existing handsets
3. The quality of design of existing handsets
4. The quality & innovativeness of existing platforms, and
5. The ability to integrate R&D, design, and manufacturing functions.

Respondents were asked to provide their rating on a scale of 1-7 with 1 being "not innovative at all" and 7 being "very innovative".

For business strategy, channel partners were asked to rate manufacturers and operators on five indicators that we thought would adequately capture various elements of strategy in this area. In this case, 1 = "not competitive at all" and 7 = "very competitive". For manufacturers, these characteristics were:

1. Intellectual Property Licensing Practices
2. Price Strategy
3. Platform Capabilities
4. Marketing Strategy, and
5. Systems Integration Strategy.

For operators, these were:

1. Management Strength
2. Price Strategy
3. Content Strategy
4. Branding and Marketing Strategy, and
5. Financial Strength.

Two notes of caution when interpreting the results of our Strategy Survey:

1. While all of the respondents were very knowledgeable about the wireless space in Japan, we think that any given respondent would not have had enough specific information or knowledge to judge *all* 15 characteristics of *every* handset manufacturer and/or operator in Japan. Respondents, therefore, may have ranked firms appearing at the top of the questionnaire more positively than those appearing at the bottom or may have applied the same ranking to several firms to reduce their time commitment for this questionnaire.

2. In an effort to keep the questionnaire length to a minimum, we asked individuals to rate firms on a scale of 1-7 for characteristics such as "intellectual property licensing practices" or "platform capabilities" or "price strategy". In all instances, the interpretation of these words was left to the respondent. While this interpretation can be better controlled for in an interview setting, our experience shows that even in interviews, interpretations of what is meant can be affected by the respondent's or the interviewer's own biases. Nonetheless, in the case of our questionnaire (as in any questionnaire), different respondents may have opposite opinions on what business strategy is or is not "competitive" or "innovative". For example, it is possible a respondent may think that a price strategy where a manufacturer drastically *reduces* prices was "very competitive" while another may think that a price strategy in which another manufacturer *raises* prices was "very competitive". While we think these interpretive anomalies are usually averaged out, clients are advised to use caution when interpreting results.

Annex B: Financial Metrics Methodology

We use nine standardized indicators to analyze the financial status of handset manufacturers and operators in the wireless space. These span three areas: liquidity, debt, and profitability. The indicators we use are calculated as follows:

Brand Image Survey Methodology:

Liquidity

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Ratio} = \frac{\text{Current Assets - Inventories}}{\text{Current Liabilities}}$$

$$\text{Inventory Turnover} = \frac{365}{\text{(Cost of Goods Sold/Inventory)}}$$

Debt

$$\text{Asset Coverage} = \frac{\text{Total Assets - Deferred Charges - Intangible Assets - [Current Liabilities - (short-term debt + Current Portion of long-term Debt)]}}{\text{Total Debt Outstanding/ Currency Unit 1,000}}$$

$$\text{Cash Flow : Debt Outstanding} = \frac{\text{Net earnings (before extraordinary items) - equity income + minority interest in earnings of subsidiaries + deferred income taxes + depreciation + Deductions not Paid in Cash}}{\text{Total Debt Outstanding}} \%$$

Profitability

$$\text{Operating Profit Margin} = \frac{\text{Net Sales - Cost of Goods Sold}}{\text{Net Sales}}$$

$$\text{Net Profit Margin} = \frac{\text{Net Earnings (before extraordinary items) - equity income + minority interests}}{\text{Net Sales}} \%$$

$$\text{Pre-Tax ROA} = \frac{\text{Net Earnings (before extraordinary items) + income taxes + total interest charges}}{\text{Total Assets}} \%$$

$$\text{Pre-Tax ROE} = \frac{\text{Net Earnings (before extraordinary items) + income taxes + total interest charges}}{\text{Value of Common Shares Outstanding + Contributed Surplus/Paid-In Capital + Retained Earnings + Other Adjustments (e.g., Foreign Exchange)}} \%$$

Rather than use "rules of thumb" to judge each of the above measures, we developed normalized indices to rank overall financial strength. For manufacturers, this was the Handset Manufacturer Financial Index (HMFI); for Wireless Operators, we developed the Wireless Operator Financial Index (WOFI). The methodology for calculating HMFI and WOFI was fairly simple:

1. We calculated the average of the liquidity (except inventory turnover), Debt (except Cash Flow: Total Debt Outstanding), and profitability measures separately;
2. We then normalized each of these measures to the minimum in the peer group to get an index number for each of these measures (minimum = 100);
3. The average of the three indices was then used to calculate a "blended index" which was again normalized to the minimum in the peer group.

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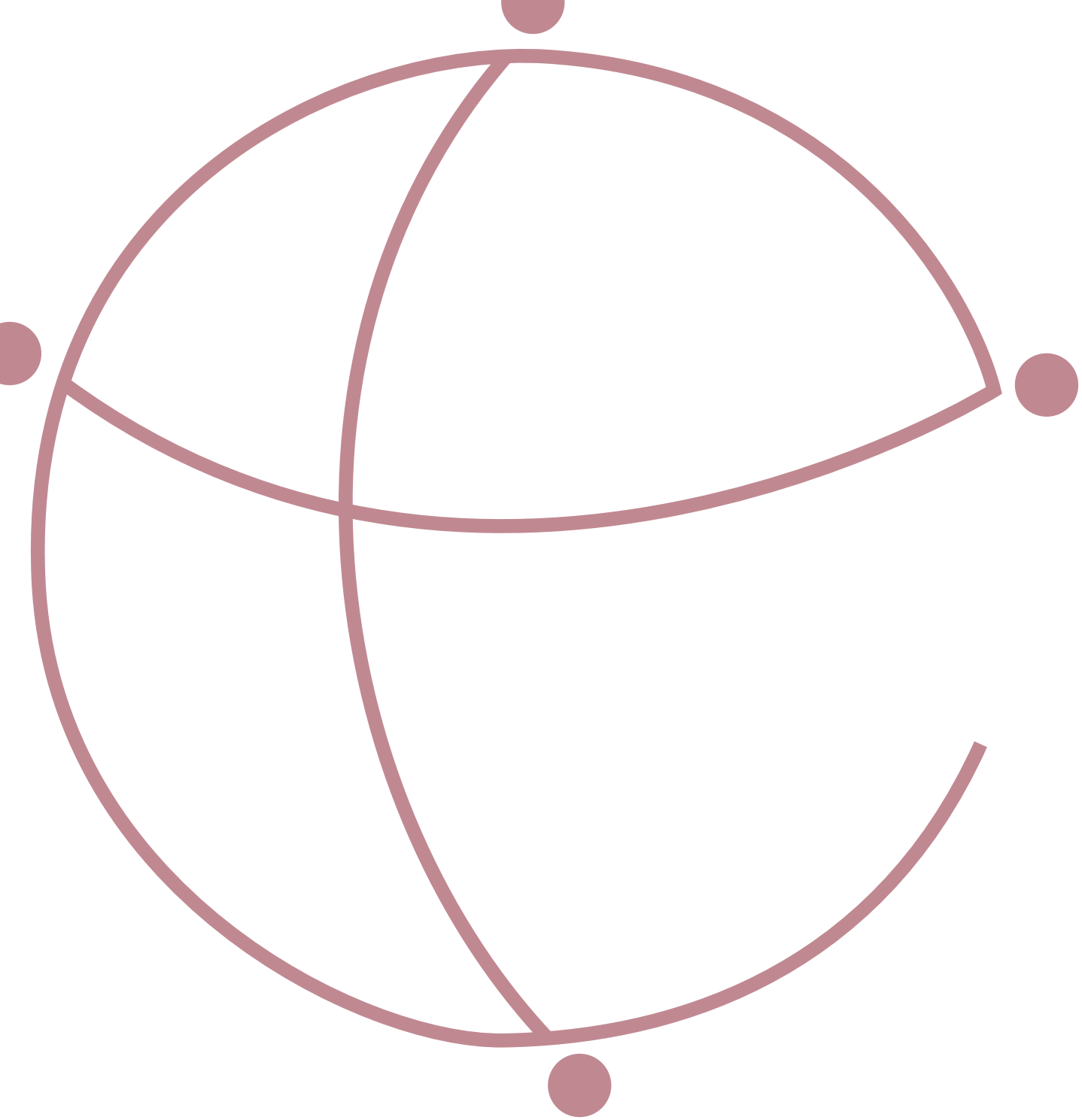

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