



INDIAN INSTITUTE OF MANAGEMENT  
AHMEDABAD • INDIA



## Comparison of Privatization Processes of Telecom Services in India and Brazil

**Rekha Jain**

**W.P. No. 2011-10-03**

October 2011

The main objective of the working paper series of the IIMA is to help faculty members, research staff and doctoral students to speedily share their research findings with professional colleagues and test their research findings at the pre-publication stage. IIMA is committed to maintain academic freedom. The opinion(s), view(s) and conclusion(s) expressed in the working paper are those of the authors and not that of IIMA.



**INDIAN INSTITUTE OF MANAGEMENT  
AHMEDABAD-380 015  
INDIA**

## Comparison of Privatization Processes of Telecom Services in India and Brazil

**Rekha Jain**

Executive Chair, IIMA-Idea Telecom Centre of Excellence  
Professor, Indian Institute of Management, Ahmedabad, Gujarat, India-380015  
rekha@iimahd.ernet.in

### Abstract

*Apart from being BRIC countries, what India and Brazil have in common is a large service sector that contributes significantly to the GDP. The service sector contributed 66% to the Brazilian GDP and 59% to the Indian GDP in 2010. Telecommunication services are a significant part of it in both the countries. This paper compares the regulatory processes of privatization of telecom services in these countries and the consequences of these on the telecom firms broadly and on the sector as a whole. Indian companies, facing harsh competition and having refined their business models to compete in this environment acquired the necessary expertise to foray abroad, opportunistically building their businesses. The highly competitive regulatory policies in India, led to the emergence of innovative business models and creation of large domestic companies both in services and infrastructure segment and consequently acquiring the necessary expertise to foray abroad. Brazilian regulatory policies focused on financially sound business and were open to investment by operators in other countries. Facing difficult domestic situation, the operators from Europe saw the Brazilian market as a growth opportunity.*

*The paper concludes that although both in Brazil and India, the objective of the telecom regulatory policies was to bring in privatization and competition, the variations in models followed by the two countries had led to sectoral outcomes that are very different. Brazilian telecom sector had shown higher penetration, both for telecom services in general and broadband in particular but domestic companies, other than one, which too was recently partially acquired by Portugal Telecom, have not emerged. Phased and controlled FDI in India combined with the hyper competitive scenario has led to the emergence of Indian telecom firms that have become significant global players.*



Work done as a visiting scholar to Fundação Dom Cabral

## Comparison of Privatization Processes of Telecom Services in India and Brazil<sup>1</sup>

**Rekha Jain<sup>2</sup>**

Although Brazil and India differ widely in their economic indicators, there are some interesting dimensions on which these could be compared. In 2010, while Brazil had the seventh largest GDP at \$2.05 trillion on a nominal basis, India ranked tenth at a GDP of nearly \$1.5 trillion. On a PPP basis, India ranked fourth with a GDP of \$4.1 trillion while Brazil ranked eighth with a GDP of \$ 2.17 trillion. However, given the vast population differences, India's GDP per capita at 2010 prices was \$1382 and for Brazil it was \$12423. Of late, the economies of these two countries have been growing at significant pace, despite the global recession, although India has shown consistently higher growth rates.

Besides being a part of BRIC, what India and Brazil have in common is a large service sector that contributes significantly to the GDP. For 2010, the service sector in Brazil contributed nearly 66% to the GDP, while in India the sector contributed nearly 59% to the GDP, a quarter of total employment, and one-third of country's total exports, besides accounting for a higher share in foreign direct investment (FDI). Telecommunication services are a significant part of it in both countries. Exhibit 1 provides the relevant data for both countries for the last three years.

The objective of this paper is to compare the regulatory processes of privatization of telecom services in these countries and the consequences of these on the telecom firms broadly and on the sector as a whole.

### **Key Regulatory Process in India**

Like several other countries in the world, Indian telecom sector had undergone significant

---

<sup>1</sup> Support provided by Flávia de Magalhães Alvim, Assistant Professor, Fundação Dom Cabral and Jayshree Jaiswal, Business Research Analyst, IIMA-Idea Telecom Centre of Excellence is gratefully acknowledged.

<sup>2</sup> I would like to thank Fundação Dom Cabral (FDC) for financially supporting my visit that made the study possible. I am also thankful to Dean, Wagner Furtado Veloso, Processo Administração, FDC; Maria Elizabeth Fernandes, Gerente Coordenadora do Nucleo Técnico, FDC and Professor Aldemir Drummond, Professor, FDC for facilitating my trip and stay.

reforms over nearly last three decades. From service provision from a state owned monopoly of Department of Telecom (DOT) under the Ministry of Communications and IT, MTNL (for service provision in Mumbai and Delhi) and VSNL (international services) until the early 1990s, by 2010 competition and private players had been introduced in all segments of the services such as fixed, National Long Distance (NLD), International Long Distance, mobile, etc. Corporatization of DOT into BSNL in 2000, privatization of state owned incumbents and introduction of competition through private players had led to both public and private players. In 1992, two mobile private operators per service area and one fixed line private operator had been licensed through auctions. The cellular operators were required to use the GSM standard in the 900 MHz band. The services were licensed on the basis of service areas called ‘circles’ that were administrative units of DOT and later those of BSNL. These were usually co-terminus with state boundaries. Participation was limited to companies registered in India. For the first round of licensing, foreign participation was mandatory but limited to a maximum of 49% equity. It was thought that Indian companies by themselves may not have the technical expertise and access to capital required for setting up networks. Given the assessment of growth potential, most of the large global telecom operators partnered with Indian bidders. But the extremely high bids and the subsequent not-so-conducive regulatory and policy environment led to several of them leaving the country.

The Telecom Regulatory Authority of India (TRAI), was set up in 1997 and the Telecom Dispute Settlement and Appellate Tribunal (TDSAT), a quasi-judicial body that adjudicated and settled disputes between service providers or licensor and licensee and reviewed appeals against TRAI directions was set up in 2000.

### *Evolution of Wireless Services*

Subsequent to winning the 2G bids, private operators claimed they had bid too high and could not provide services in a commercially viable way. The government then came out with a National Telecom Policy, 1999 (NTP 99) that allowed the operators to convert their license fee in to a one time entry fee (which was much lower than the license fee) and an annual revenue share for the duration of the license. As a part of NTP 99, and the “migration” package, the existing bidders agreed to have potentially any number of operators. The government introduced

the state owned operators, BSNL and MTNL as the third mobile operator in each circle in the 900 MHz band. Subsequently, in 2001, the DOT auctioned licenses for the fourth mobile operator, with the GSM standard in the 1800 MHz band. Some of the operators, after acquiring fixed line licenses (whose entry fee was much lower), used the CDMA based Wireless in the Local Loop (WLL) services to provide “limited” mobility services. After several legal hurdles and protracted regulatory and political interventions, CDMA operators were allowed to provide mobile services, after paying the license fee paid by the fourth cellular operators.

Subsequently, TRAI came out with the Unified Access Service License (UASL) regime, under which operators could provide either mobile or fixed line service using the same license. Calling Party Pays regime was also implemented for all operators. These regulatory changes led to the rapid uptake of mobile services, as due to competition, prices of services fell significantly. Moreover, since the Indian economy had been growing at between 6-9% during these years, the services became affordable for a large numbers of Indians.

The shift to UASL resulted in 5-6 operators per circle. The allocated spectrum was far below the international norms. As subscriber numbers grew exponentially, operators clamored for more spectrum allocations. However, DOT claimed that there was shortage of spectrum for commercial applications as various government departments (mainly the defence services) had previously been allocated the spectrum in bands where commercial mobile services could now be provided.

In order to prioritize spectrum allocation amongst competing bidders, DOT came up with a Subscriber Linked Criteria that allocated spectrum based on number of subscribers of the operator in the respective service areas. By January 2008, it had greatly tightened the allocation basis for subscriber linked criteria for existing operators. The subscriber linked criteria was not used anywhere else in the world as operators elsewhere were given fixed amounts of spectrum. In January 2008, DOT announced that additional players could get UASL licenses and start-up spectrum (minimum amount of spectrum required to start services) would be given based on availability. This led to a rush for UASL licenses. In several “circles”, where spectrum was available, the number of operators reached between 12-14. In other circles, the new operators acquired licenses but could not start services.

Despite these regulatory hurdles, the mobile services continued to grow as was the global trend. Over time the foreign equity limits were raised to 74%. Exhibit 2 gives the data on revenues from different services for the years (2003-10).

There had been a lot of debate regarding allocation of 3G licenses. DOT had gone through several changes on the criteria and mode of allocation and 3G auctions had been delayed several times. 3G auctions were completed in May 2010. Each service area had 3-4 operators (depending upon amount of spectrum available). Subsequently, two private players were allocated Broadband Wireless Access (BWA) spectrum.

### ***Competitive Scenario***

There were six large players, Bharti Airtel, BSNL, Idea Cellular Limited (ICL), Reliance Infocomm (now Reliance Communications), Tata Teleservices and Vodafone Essar, who had a pan India or almost pan India presence. Some relatively smaller players (who had operations in a few circles only) were also active. Several of them and some new players acquired licenses in January 2008 as a part of DOT's new guidelines for licensing.

Among the large players, scale and scope of operations varied considerably. Some of them were a part of larger Indian industrial conglomerates, (ICL, Reliance and Tata Teleservices), while some others were a part of larger global telecom companies (Vodafone Essar), or were public operators (BSNL, MTNL) and yet others like Bharti had begun their operations in telecom. Over time, although Bharti had diversified into insurance and other services, a large part of its revenue came from telecom services. While players like Bharti provided a whole range of telecom services including, fixed, NLD, ILD, satellite etc, others like Vodafone concentrated on mobile voice and data. Exhibit 3 gives the details of the large operators in terms of their scope of operations, subscriber bases and revenues.

### ***Impact on Availability and Businesses***

Regulatory changes, economic growth in the country and technological changes made telecom services more affordable over a period of time. Driven by availability of mobile services, (as was the global trend), the teledensity (phones per hundred persons) which was 18.3% as of

March 31, 2007, had increased to 66.6% by March 31, 2011. Broadband penetration was low as it was also driven by ability to pay for broadband connection services whose costs were perceived as high as well as ownership of PCs which was extremely low. This had reached 1.7% by March 31, 2011 up from 0.2% on March 31, 2007 (Exhibit 4).

The high growth potential (expected subscribers to be one billion by 2015) attracted private companies despite the extreme competition, uncertain regulation and the lower ability of Indian citizens to pay and hence lower revenue potential. Consequently, private companies responded by coming up with innovative business models and diversification strategies. For example, Bharti outsourced its entire network operations on a long term contract to Ericsson, Alcatel-Lucent etc. It has also outsourced its entire IT operations to IBM Global Services Division. This allowed it to convert the capex required for expansion into an opex, thus requiring smaller amounts of capital for growth. By linking the payments to revenue sharing, it made the vendors share the market risk. Additionally, this type of arrangement allowed it to hedge the technology risk arising out of making the right choices and obsolescence. Reduction of capex led to a more attractive balance sheet, allowing it to get higher valuations. Structuring the outsourcing contract, which was the first of a kind for any telecom company anywhere in the world, was a very complex process. Given that Bharti, a relatively smaller Indian company had to sell an innovative idea to global corporations and was successfully able to do so, shows that these corporations saw value in this business opportunity and possible growth paths for themselves in emerging economies. Subsequently, a majority of large Indian telecom companies adopted similar business models vouching for the value of this approach. While there were some initial internal issues such as arrangements for employees who were hired for the IT function by the telecom company, the companies were able to make offers to them that the employees found better than the initial conditions thus facilitating adoption.

Another innovation in the Indian telecom sector was the development of infrastructure as a separate business. Recognizing that service provision and laying infrastructure were two separate kinds of business, several Indian telecom companies separated their operations along these lines and spun out the infrastructure divisions into separate legal entities that provided infrastructure services to their own parent as well as to third parties. Three of the largest operators also

combined to form a JV where they put a majority of their existing towers as a separate business and the company so formed “Indus Towers” became the largest tower company. Vodafone Essar and Bharti Group each held 42 per cent stake in the company and Idea Group has the remaining 16 per cent stake. The company, which has operations in 16 out of the 22 telecom circles, owned more than 110,000 towers. In comparison to the US market where around 60% of the towers were provided by independent companies, around 28% were operator owned towers shared by other operators and the remaining 12% were exclusively used by wireless operators for their own use, in India around 80-90% of the towers were owned by operators. This implies that there was a strong potential for this market to grow. Indus Towers had become the globally largest tower company with a portfolio of nearly 1,50,000 towers compared with American Tower Company portfolio of 38,000 towers.

The growth of tower business has been driven by decreasing ARPUs as after saturation in high paying customer base, operators acquired customers with lower propensity to pay and consequent erosion of revenue base and profitability. Secondly, the relatively higher minutes of usage in the Indian market led to higher intensity of usage/per tower necessitating increasing the tower numbers, and in the scenario of high competition, sharing tower reduced cost.

The third aspect of the Indian telecom sector was the venturing abroad of Indian telecom firms. Tata Communications emerged as the top global wholesale voice services and in global submarine cable capacity after it acquired Teleglobe and TGN in 2006. Tata Communications had forayed in the African market through its subsidiary: Neotel in South Africa. Reliance Infocomm (now renamed Reliance Communications) acquired Fibre Optic Link Around the Globe (FLAG), in 2002 and renamed it as Reliance Globalcom. This acquisition led to availability of huge global assets allowing it to provide global managed solutions. Reliance, like Bharti also attempted to acquire MTN, a South African Telecom company, but due to cross border and other issues, the acquisition did not come through for either operator. But the events showed a propensity for Indian operators to seek business opportunities outside India as well. Bharti has acquired 3G license Sri Lanka, and also operates in Seychelles. It shot in the limelight with its acquisition of Zain Telecom’s majority African business. Zain was a key operator in Africa and the Middle East. This acquisition led Bharti to becoming the third largest telecom



network operator and the fifth largest integrated player globally. Valued at \$10.2 billion, in March 2010, it was recognized as the “largest ever cross border deal in emerging markets”.

### **Brazil Telecom Sector**

Reforms of the telecom sector were facilitated by the Constitutional Amendment 8 that allowed for privatization through licensing. A new general Telecommunications Law (GLT) created the norms for licensing and a regulatory framework was adopted in 1997 with the creation of Anatel, the regulatory agency.

As a consequence, fixed telephony was privatized in 1998. Prior to privatization, the Telebrás state monopoly, owned 54 subsidiaries, one in almost each state, and Embratel, the long distance and international carrier. Telebras was restructured prior to its sale and was broken into four fixed telephony companies: Telesp, Tele Centro Sul, Telemar (now Oi), and one long-distance, national, and international incumbent—Embratel. The regional companies could offer intra-region long distance services. Later the fixed line companies were acquired by a variety of consortia, with Telefonica, Portugal Telecom, Telecom Italia and MCI playing a dominant role. Opening of the mobile segment occurred before the privatization of Telebras. Eight mobile companies were carved out of Telebras and operated in the A band (Mattos and Coutinho, 2005: Marsical and Rivera, 2005).

Anatel also came up with the concept of “mirror companies” that were granted licenses in the same service areas, thus creating a duopoly. In order to level the ground for competition, mirror companies did not have universal service and quality obligations. These were Intelig, for long distance; GVT, which competed in the area of Brasil Telecom; and Vésper, to compete with Telefônica and Telemar. For the second round of privatization, mobile telephony was divided into ten regions and private operators bid for B-Band (850MHz) in 1996 in each of these regions in order to allow competition with the sector’s ten incumbents. In order to ensure adequate number of new operators each of the ten licence areas, were divided into two groups: those that were more economically viable and those that were not. Each of the bidders could buy only one company in each of the two groups. The rules also precluded any change in the control of the companies before five years of commercial operation, in order to allow regional competition to

be established. Subsequently, new mobile operators for bands C, D, and E, were introduced in 2000 and 2001. Since the B band operators were aware that new operators would be introduced soon in the market, they were aggressive about pricing and roll outs (Mattos and Coutinho (2005); Marsical and Rivera (2005); Maciel, Whalley and Meer, (2005), Afonso and Valente (2008)).

Anatel's objective was to create the regulatory framework for competition to develop, which it did through several licensing processes and bidding conditions. The new players were granted greater freedom in operation while the incumbents had universal and quality of service obligations and other restrictions on operations. The asymmetrical regulatory framework of incumbents vis-à-vis newer players was designed to create a level playing by supporting the latter, as they did not have the networks or customers of the former. It spurred the incumbents into investing in digital technology and backbones. 3G licenses were auctioned in 2008 and service provision had started.

### ***Impacts on Availability and Businesses***

As was the case in most parts of the world, the mobile segment had been a major driver of teledensity from 64.2% in 2007 to 112.5% by February 2011. Broadband penetration was low in comparison to developed countries, but had grown from 4.1% in 2007 to 7.3% in 20-11 (Exhibit 5). Both these numbers were much higher than for India.

Privatization in the sector led to the entry of foreign players from Europe (Telefonica, Telecom Portugal), Mexico (Telmex) and America (BellSouth). Telefonica at that time faced difficult situations in its home market. The poor level of telecom in Spain in 1996, prospects of facing opening of the sector to the European Common Market had led the Spanish government to take steps to strengthen Telefonica, the then state carrier, by a variety of measures including exclusivity of operations for specified time period, cheap credit, pricing etc. Privatization of Telefonica started by the Socialist Party was completed, with the proviso of the Golden Share that gave the government veto power in certain decisions until 2007, among others. On the other hand, Telmex had been sold as an integrated player, as a part of the privatization and the reform process, to a consortium of French, American and Mexican financial conglomerate. Supported

by regulatory policies and its business strategies, Telmex became the dominant player in its home market (Marsical and Rivera (2005)).

In the cellular market, four major operators and their brands have emerged: Vivo (Telefonica), Oi (Domestic Brazilian companies +Portugal Telecom), Claro (Telmex), and TIM (Telecom Italia). Exhibit 6 gives the data on the current operations, revenues and operational details of major operators in Brazil as of June 2011. These operators have played a key role in the Brazilian telecom market: both in the fixed and cellular markets. Supported by the financing available in their domestic and other countries, these players could bid aggressively and use the proximity of culture to their domestic markets to acquire and effectively manage operations in Brazil. Their operations in Brazil were a part of a larger strategy of expansion in Latin American markets. The synergies of operations across various countries in Latin America and their domestic markets have further strengthened these operators. Further, the Brazilian government's perspective was that to attract foreign capital, it would need to make the sector attractive through exclusivity periods and attractive pricing policies, which it did. Over time, driven by the strong growth rates in Brazil and stagnant markets in their home countries, Telecom Portugal and Telecom Italia have also emerged as significant players.

After ten years of this privatization process, the Brazilian government was concerned about the lack of domestic companies that could compete with existing foreign players. It therefore facilitated the acquisition of Brasil Telecom, a domestically held company by Telemar/Oi, another domestically held company, by changing the existing regulation and legal framework which did not allow merger of two telecom companies operating fixed lines in two different regions. The government was concerned that if this was not facilitated, either of the two companies could be taken over by the existing foreign firms. The Social and Economic National Development Bank provided the financial resources for the merger (Szapiro, 2008). Consequently, Oi is the largest landline telephone company in Brazil and the second largest telco in Latin America, behind Mexican América Móvil (part of Telmex), considering both lines in service and revenues. In January 2011, it was partly (22.38%) acquired by Portugal Telecom as a part of its continued strategy to invest in Brazil's growing mobile and Internet markets. Portugal Telecom earlier had investments in VIVO, along with Telefonica, which it had withdrawn to

invest in Oi. Along with equity stakes, Portugal Telecom acquired substantive governance control.

While foreign operators like Telefonica, Portugal Telecom, Telecom Italia and Telmex have invested in both the fixed and mobile segments, foreign operators in India have largely focused on the booming mobile market (Although Bharti Airtel, was an integrated player, nearly 84% of its revenues came from mobile services). Given the high fixed penetration and the consequent potential for broadband penetration through DSL and its variants, the investments of foreign operators in Brazil may turn out to be beneficial. While there is growing saturation in mobile markets, the emergence of smartphones, has spawned bandwidth intensive applications, leading to the need to have high bandwidth infrastructure. Companies that have such infrastructure are likely to do well in the future.

Subsequent to the introduction of various players, there was consolidation through mergers and acquisition. As of June 2011, four large telecommunications conglomerates emerged, operating in various sectors of the domestic market and encompassing the groups controlled by Telefônica, Telmex, Oi, and Telecom Italia. Coexisting on the market with these five groups were other small and independent competitors such as CTBC and GVT.

### **Comparing the Experience of Players in the Two Countries**

From the above, it is clear that Indian companies, facing harsh competition and having refined their business models to compete in this environment acquired the necessary expertise to foray abroad, opportunistically building their businesses. The highly competitive regulatory policies in India, led to the emergence of innovative business models. Operating in India, characterized by lower GDP/capita, operators had to devise extremely efficient operations and find out ways of doing business that were potentially profitable. This approach led to creation of new business opportunities such as tower business.

A comparison of the EBITDA margins of key operators in both countries for 2009 and 2010 (Exhibit 7) shows that Indian operators had higher efficiency of operations. The lower relative EBITDA margins for Indian operators in 2011 relative to 2010, indicate the money spent on

auctions and roll out for 3G. No 3G services had been rolled out for private operators as at the time of writing.

While the Brazilian regulatory policies allowed financially sound businesses, such as Telefonica, Telecom Italia, Telmex to operate, government ensured that asymmetrical regulation would lead to investments in those parts of the network that are not commercially viable. This allowed the citizens access to technology and benefits of the spread of network. However, the extremely deep pockets of foreign operators created by preferential regulations in the home markets did not allow the emergence of Brazilian companies. The pan Latin American strategies of these operators further consolidated their operations.

In both countries, FDI in the sector have been driven by saturated markets and recession in home countries. In India, the initial rounds of FDI (in 1994-98) were driven by American, British and some European companies. However, the slower pace of reform and the DOT com burst led to the withdrawal of such capital. In the second round of FDI, majority of it is from Asian operators (NTT, Singtel, Telekom Malaysia) looking for growth opportunities.

Although the initial objective of regulation in Brazil was to create a competitive market, it resulted in a market with a few large players, most of which were “national champions” in their home countries, in contrast to the Indian situation where a large number of domestic players emerged, only a few of which had substantial FDI equity (Aircel).

The Brazilian policy in particular and the Latin American policy in general of attracting foreign investments created strong European players in Brazil and Latin America. The Indian policy of initially restricting foreign investments to less than 49% allowed Indian companies to develop their business acumen in the sector. While this may have restricted access to foreign capital for growth for Indian companies, the growing size of the Indian market led to most equipment vendors giving very attractive terms to Indian players, thus partly mitigating this constraint.

The Brazilian policy’s emphasis on privatization, even though the largest players after privatization were initially state owned incumbents in Europe, led to no “national champions”. The Indian policy has led to the coexistence of a government owned corporate incumbents (BSNL and MTNL) with private players. The preferential treatment meted out to state owned

incumbents created problems and delayed growth on some aspects. The incumbents have been given preferential treatment in respect of award of spectrum, both for 2G and 3G, while private operators had to wait until sufficient spectrum could be refarmed before start of services. The incumbents were awarded 3G spectrum prior to the bidding for it and were to pay the market determined prices in the subsequent auction. The rationale for this preferential treatment was that incumbents operate in commercially non-viable areas as a part of their mandate and hence must be compensated. This was despite the fact that the Universal Service Obligation Fund, administered by the DOT to which all telecom services providers pay 5% of their revenues had been operational since 2002. BSNL was also getting maintenance and operational expenditure for large part of its rural operations through USOF. Over time, the incumbents were not doing well as the competitive markets required agility and market orientation, which the ministerial oversight and bureaucratic processes did not allow. Political pressures and employee unions created a difficult environment for privatization of the incumbent. Given the loss of valuations over time as reflected in the declining revenues of the incumbents, it would be difficult to privatize these companies through a public IPO at high financial values. This is despite the fact that a recent IPO of a government owned company, Coal India Limited saw record high prices.

Relative to India, the benefits of 3G were available to a much larger segment of the population in Brazil. Since broadband services also contribute to economic growth, later start of 3G services in India would have implications for India's economic growth. In contrast, the Indian 3G auctions were delayed due to the government's inability to make spectrum available through refarming for 3G services. 3G services had yet to take off.

## **Conclusions**

Although in both Brazil and India, the objective of the telecom regulatory policies was to bring in privatization and competition, the variations in models followed by the two countries had led to sectoral outcomes that are very different. Brazilian telecom sector had shown higher penetration, both for telecom services in general and broadband in particular but a part of it could be due to the higher propensity to pay (higher GDP/capita in relation to India).

Phased and controlled FDI in India combined with the hyper competitive scenario has led to the emergence of Indian telecom firms that have become significant global players. New business segments such as Tower businesses have emerged. Such businesses have leveraged on their size in India to attain global dimensions. New business models have contributed to the dynamism in the sector.

The Brazilian policy of supporting foreign investments and the European operators' cultural proximity to Latin America led to a dominance of European operators on one hand and that of Telmex on the other. The strategies of these operators were influenced by domestic environment in their home environments, namely Europe and Mexico and their pan Latin American growth prospects. The consequent consolidation in the Brazilian market and the scale of operations in Europe and Latin America have created operators with global ambitions. Proactive policy support for new technologies such as 3G has given Brazilian operators an edge.

**References:**

1. Cesar Mattos & Paulo Coutinho, (2005). “The Brazilian model of telecommunications reform”, *Telecommunications Policy*, 29, 449–466.
2. Judith Mariscal & Eugenio Rivera, (2005). “New trends in the Latin American telecommunications market: Telefonica & Telmex”, *Telecommunications Policy*, 29, 757–777.
3. Marcos Maciel, Jason Whalley & Robert van der Meer, (2005). “Foreign Investment and Consolidation in the Brazilian Mobile Telecommunications Market”, *Info*, 8(3), 60-77.
4. Carlos A. Afonso & Jonas Valente, (2008). “Open Spectrum for Development Brazil Case Study”, *Association for Progressive Communications (APC)*, November 2010.
5. Marina Szapiro, (2008). “Improving the productive and technological capabilities in the telecommunications industry: policy lessons from the restructuring process of Brazil and Spain”, Paper presented for *The VI Globelics Conference*, September 22-24, 2008, Mexico City.



**Exhibit 1: Economic Indicators for India and Brazil for the Years 2008-11.**

<b>India</b>	<b>Nominal GDP (\$ billions)</b>	<b>GDP PPP (\$ billions)</b>	<b>GDP per capita- current prices</b>	<b>GDP growth rate (%)</b>	<b>Agriculture (%)</b>	<b>Industry (%)</b>	<b>Service (%)</b>
2008-09	1214	3297	1061	6.8	15.7	28.1	56.2
2009-10	1381	3680	1030	10.4	14.6	28.1	57.3
2010-11	1645	4060	1382	8.2	17.0	28.0	59.0

Source: en.wikipedia.org/wiki/BRIC accessed on August 28, 2011.

<b>Brazil</b>	<b>Nominal GDP (\$ billions)</b>	<b>GDP PPP (\$ billions)</b>	<b>GDP per capita- current prices</b>	<b>GDP growth rate (%)</b>	<b>Agriculture (%)</b>	<b>Industry (%)</b>	<b>Service (%)</b>
2008-09	1653	2170	10200	-0.6	6.1	25.4	68.5
2009-10	1593	2290	11767	7.5	5.8	26.8	67.4
2010-11	2089	2030	12423	4.5	6.0	28.0	66.0

Source: en.wikipedia.org/wiki/BRIC accessed on August 28, 2011.

**Exhibit 2: Revenue from Indian Operators from Different Services for the Years 2003 -10**

Category	Revenue (R\$ millions)							
	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
Fixed line	930	1190	1170	1230	1090	960	890	680
Cellular	310	510	1300	1290	2020	2760	3370	3480
NLD	220	180	320	330	260	350	520	590
ILD	180	160	260	260	410	410	540	630
Broadband	50	60	60	60	70	190	270	320
<b>TOTAL</b>	<b>170</b>	<b>210</b>	<b>240</b>	<b>3190</b>	<b>3880</b>	<b>4700</b>	<b>5600</b>	<b>5740</b>

Source: Compiled from various Edition of Voice and Data

**Exhibit 3: Details of the Large Operators in terms of their Scope of Operations, Subscriber Bases and Revenues.**

Sl. No.	Operators	Highlights
1	Bharti Airtel	Bharti Airtel Limited commonly known as Airtel, is an Indian telecommunications company that operates in 19 countries across South Asia, Africa and the Channel Islands. It is headquartered in New Delhi, India. It operates a GSM network in all countries, providing 2G or 3G services depending upon the country of operation. Airtel is the fifth largest telecom operator in the world with over 207.8 million subscribers across 19 countries at the end of 2010. It is the largest cellular service provider in India, with over 169.18 million subscribers as of June 2011. The company offers mobile voice & data services, fixed line, high speed broadband, IPTV, DTH, turnkey telecom solutions for enterprises and national & international long distance services to carriers.
2	Vodafone	Vodafone Essar, formerly Hutchison Essar, is a cellular operator in India that covers 23 telecom circles in India. It is based in Mumbai. Vodafone Group agreed terms for the buy-out of its partner Essar from its Indian mobile phone business in 2011. It is the second largest mobile phone operator in terms of revenue behind Bharti Airtel, and third largest in terms of customers. Vodafone had about 134.5 million customers as of February 2011.
3	Reliance Communications	Reliance Communications Limited (commonly called RCOM) is a major Indian telecommunication company headquartered in Navi Mumbai, India. It is the 16th largest operator in the world with more than 128 million subscribers. RCOM is the flagship company of the Reliance Anil Dhirubhai Ambani Group. Reliance Communications corporate clientele includes 2,100 Indian and multinational corporations, and over 800 global, regional and domestic carriers.
4	Idea Cellular	Idea Cellular, usually referred to as Idea, is a wireless telephony company operating in all the 22 telecom circles in India based in Mumbai. The company has also been the first to offer flexible tariff plans for prepaid customers. It also offers GPRS services in urban areas. It had about 134.5 million customers as of February 2011 30.38 million

Source: [www.airtel.in](http://www.airtel.in), [www.vodafone.in](http://www.vodafone.in), [www.rcom.co.in](http://www.rcom.co.in), [www.ideacellular.com](http://www.ideacellular.com) as accessed on August 28, 2011.

Sl. No.	Service Provider (Year of Incorporation)	Area for which licensed with No.	UASL Service Licensed
1	BSNL/MTNL	All India (23)	
2	Bharti (1995)	All India (22)	All India except North East
3	Reliance Communications (2004) and Reliance Telecom (2004)	All India (except Assam & North East) (21) Kolkata, Madhya Pradesh, West Bengal, Himchal Pradesh, Bihar, Orissa, Assam & North East (8)	All India except North East and Assam Madhya Pradesh, West Bengal, Himachal Pradesh, Bihar, Orissa, Assam and North East
4	Vodafone (1992)	All India (23)	All India
5	Tata Teleservices (1989)	All India (23)	All India
6	IDEA (1995)	All India (22)	Mumbai, Chennai & Tamil Nadu, Kolkata, Karnataka, Punjab, West Bengal, Bihar, Orissa, Assam, North East and Jammu & Kashmir

Source: DoT ([www.dot.gov.in](http://www.dot.gov.in)), accessed on August 28, 2011.

Sl. No	Operator	Total Revenue (R\$ millions)						
		03-04	04-05	05-06	06-07	07-08	08-09	09-10
1	Bharti Airtel	120	190	400	640	950	1330	1400
2	BSNL	1220	1310	1440	1440	1270	1260	1090
3	Vodafone	100	160	240	380	550	730	840
4	Reliance Communications	90	150	390	520	670	820	800
5	Idea Cellular	50	90	140	210	310	430	490
6	Tata Group	-	-	-	500	510	380	640

Source: Compiled from various Edition of Voice and Data

**Exhibit 4: Broadband Penetration and Teledensity for India for the Years 2007-11.**

<b>Year (as on March 31<sup>st</sup>)</b>	<b>Broadband Penetration (%)</b>	<b>Teledensity (%)</b>
2007	0.2	18.3
2008	0.3	26.1
2009	0.7	36.9
2010	0.9	47.8
2011	1.7	66.6

Source: TRAI ([www.traai.gov.in](http://www.traai.gov.in)) accessed on August 28, 2011.

**Exhibit 5: Broadband Penetration and Tele-density for Brazil for the Years 2007-11.**

<b>Year (%)</b>	<b>Broadband Penetration (%)</b>	<b>Teledensity (%)</b>
2007	4.1	64.2
2008	5.3	79.2
2009	5.9	90.5
2010	6.7	104.7
2011	7.3	112.5

Source: [www.teleco.com.br](http://www.teleco.com.br) accessed on August 28, 2011

### Exhibit 6: Data on the Current Operations, Revenues and Operational Details of Major Operators in Brazil as of June 2011

Sl. No	Operator	Highlights
1	TIM	TIM Participações S.A is a holding that acts in the whole national territory through its subsidiaries, TIM Celular SA and Intelig Telecomunicações Ltda. The company is controlled by Telecom Italia. TIM Brazil (Telecom Italia Group) is the third Brazilian Mobile operator offering national cellular coverage and serving more than 18.3 million lines. It also offers national and international distance services in the entire Brazil.
2	Claro	Claro is the largest mobile phone network in the Americas. It is part of the Mexican telecom group América Móvil which is one of the four largest mobile phone network operators in the world, with more than 200 million customers. It serves clients in Argentina, Brazil, Chile, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Puerto Rico and Uruguay.
3	Vivo	Vivo is the largest mobile phone service provider in Brazil and in South America with over 60 million users. It originated from the merger of several Brazilian mobile phone operations under a joint-venture owned equally by Portugal Telecom(PT) and Spain's Telefónica; however, Telefónica is now its owner, after having bought PT's shares in July 2010.
4	Oi	Oi is the wholly owned PCS subsidiary of fixed line operator Telemar Norte Leste. Launched in July 26, 2002 “Oi” was the first operator to use the GSM network in Brazil. Oi's concession covers 16 states: Rio de Janeiro, Minas Gerais, Espírito Santo, Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe, Amapá, Amazonas, Pará e Roraima.

Source: [www.tim.com.br](http://www.tim.com.br), [www.claro.com.br](http://www.claro.com.br), [www.vivo.com.br](http://www.vivo.com.br), [www.oi.com.br](http://www.oi.com.br) accessed on August 28, 2011

Sl. No	Operator	Total Revenue (R\$ millions)			
		2007	2008	2009	2010
1	TIM	17215	18321	18079	20319
2	Claro	-	15074	14361	14895
3	Vivo	19576	22212	23068	25717
4	Oi	-	10037	12666	14666

Source: www.teleco.com.br accessed on August 28, 2011.

**Exhibit 7: A Comparison of the EBITDA Margins of Key Operators in Both Countries for the Year 2009 and 2010**

	2009	2010	2011		2009	2010
Bharti Airtel			TIM			
EBITDA Margin (%)	41.4	40.3	33.7	EBITDA Margin (%)	25.8	29.0
EBITDA (R\$ millions)	3216	3539	4207	EBITDA (R\$ millions)	3541	4194
Reliance Cellular			Oi			
EBITDA Margin (%)	40.5	35.3	39.3	EBITDA Margin (%)	24.3	33.8
EBITDA (R\$ millions)	1954	1642	1907	EBITDA (R\$ millions)	2211	3537
Idea Cellular			Nextel			
EBITDA Margin (%)	27.8	27.4	24.5	EBITDA Margin (%)	27.4	31.0
EBITDA (R\$ millions)	596	726	796	EBITDA (R\$ millions)	475	777
Vodafone			Vivo			
EBITDA Margin (%)	24.0	25.9	25.6	EBITDA Margin (%)	31.4	32.2
EBITDA (R\$ millions)	944	1271	1551	EBITDA (R\$ millions)	5224	5832

Source: www.airtel.in, www.rcom.co.in, www.ideacellular.com, www.vodafone.in, www.teleco.com.br accessed on August 28, 2011