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## **ROLE OF GOVERNMENT AS REGULATOR IN CREATING FLEXIBILITY AND COMPETITION IN TELECOM INDUSTRY OF INDIA: A POLICY PERSPECTIVE**

**Manoj K. Sharma\* and Pramod K. Jain\*\***

### **ABSTRACT**

*Globalization and Liberalization are the major factors in catalyzing the dynamics of national policy making of any nation. These two factors are also responsible for creating pressures on the enhancing innovations in product and services leading to competitiveness in any sector of economy.*

*Globalization brings with it a whole set of international and cross-border regulatory issues, and a requirement for multilateral regulatory forums. For example, IT-enabled services, international financial services, and e-commerce entail the transfer of data across borders, and these activities raise the issue inter alia of privacy. (ITU-2007)*

*This paper examines how the timely and appropriate government regulation enhances the flexibility and competitiveness in telecom sector in India. This paper reviews the nature of regulation in current globalization scenario and its impact on competition leading to better performance and describes the strategies adopted by Indian Government as Telecom regulator to built competition by creating freedom of choice (Flexibility) for both Industry players (Telecom operators) and the customers using their services.*

*This paper concludes by reemphasizing on the need of proactive role of government as a regulator, in creating flexibilities to cope up the pressures on enhancing the competitiveness in the highly paced environment of globalization and liberalization. Further this paper gives an indicative roadmap for other developing countries that what kinds of Telecom Policy/Regulation is needed in the current international scenario of globalization and change of technology to achieve competitiveness through flexibility route while not compromising the fundamentals of quality and price of product and services in telecom services.*

**Keywords:** *Flexibility, Competitiveness, Globalization, Liberalization, Telecom Policy, Regulator*

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### **1. Introduction**

Globalization and Liberalisation are the major factors in enhancing the dynamic of national policy making of any nation. These two factors are also responsible for creating pressures on the enhancing innovations in product and services leading to competitiveness in any sector of economy and creating more competing organization for market share in their industry sector.

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\* Director General (Honorary), Global Institute of Flexible Systems Management Delhi  
Email: dg@giftsociety.org, sharmaportal@gmail.com

\*\* Professor, Department of Management Studies, Indian Institute of Technology Delhi  
Email: pkjain@iitd.dms.ac.in

Globalization with reference to telecom sector also brings many international and cross-border regulatory issues, and a requirement for multilateral regulatory forums. For example, IT-enabled services, international financial services, and e-commerce entail the transfer of data across borders, and these activities raise the issue *inter alia* of privacy (ITU-2007) The sheer volume of data transfer is itself a challenge but the OECD (<http://www.oecd.org> ) notes two additional risks related to first secondary uses of personal data; and secondly information security breaches.

In 1983 the ITU established the independent Commission for Worldwide Telecommunication Development, also known as Maitland Commission, to recommend ways in which the expansion of the telecommunications across the world could be stimulated. In 1984, the Commission, after studying the earlier works by ITU, OECD, the World Bank and other international agencies, published “*Missing Link*”, which embodied its conclusions and recommendations. The Commission’s study of the role of telecommunication persuaded its members that “telecommunications can increase the efficiency of economy, commercial and administrative activities, improve the effectiveness of social and emergency services and distribute the social, cultural and economic benefits of the process of development more equitable throughout a community and a nation “(ITU, 1984).

The visible paradigm shift in digital economy took shape in the following format given below table:

Table No: 1A

From	To
Industrial society; Centralized control or regulation, from regulators or monopolies in telecom; Significant market powers of incumbents, conglomerates & MNCs	Information society with a knowledge-driven digital economy; Deregulated or privatized telecom; & Industry-led self-regulation & power of individual users’ fingertips over convergence of ICT, especially in the advent of Internet; Share the markets with micro, small & medium-sized entrepreneurs esp. in the era of e-Business or e-Commerce; and Almost ‘instant global village’ connected by various technologies and services

Source: Dr. Eun-Ju Kim, ITU (2001)

The argument forwarded by Rugman (2006) “Globalization is a myth. As currently understood, it does not exist. Far from taking place in a single global market, most business activity by large international firms takes place within regional blocks. Government regulations, transportation costs and cultural differences divide the world into the triad of North America, Europe, and Asia-Pacific - an extension of the three large economic hubs at its core: the United States, the European Union and Japan. Within these blocks rival multinational enterprises compete for regional market share and so contribute to economic efficiency” (Rugman, 2006), but in my opinion this is very true for the industries covered in Rugman’s paper but in telecom sector being service industry in nature, it does not discriminate the various sector of economy but its serves all the sectors of economy in similar manner as the services provided by telecom sector to various categories of customers those who need these telecom services because of faster mode and cost effective of communication arising due to business process fulfillment and long distance separation of organizations separated around the globe i.e. demand driven. So the globalization in whatever formats it occur in any country it does not alter the configuration of telecom service delivery and always enhances the growth of telecom sector as it becomes the common denominator for all the industrial sector’s growth enabler.

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Within the Asia Pacific region, various voice usage patterns exist among consumers of voice communication services. Generally, there has been a preference shown for mobile communication over fixed-line communication, and as a result, customers have been shifting their subscriptions and usage. Also, in certain regions, particularly where price is an issue, a preference for the use of mobile data services over voice calling has become apparent. This increasing demand for mobile communication services can be attributed to the flexibility and mobility that is characteristic of these technologies as well as the value-added services that have become incorporated into the offerings of mobile providers.

The main theme of this paper is that flexibility need not be only considered only in processes but throughout the enterprise in people, processes and technology in various forms of flexibilities. Based on the framework presented in this paper, we convey that flexibility incorporation is required for enhancing competitiveness.

### **1.1 The Need of Liberalization or Competition**

- To provide customers with more choices of technologies & services (Flexibility/Freedom of choice) with quality and affordable prices (Flexibility in pricing), but not necessary lower prices
- To formulate effective competition policies to ensure that the benefits of liberalization or deregulation and market-based reforms flow through to both industries & consumers
- The industry trend demonstrates faster and more growth of data (esp., Internet) and mobile services, both areas which have tended to be more open up to competition, than that of basic fixed voice services

### **1.2 The Need of Regulation**

The telecom sector has witnessed many changes related to technology, market conditions of telecom sector and the role of Government as regulator has really played a dominant role in protection of both side of demand (consumers/users of services) and supply ( Companies and its related players who create telecom infrastructure/software/hardware and content developers) of telecom sector. The telecom sector is typically depicted in terms of Technology/Market/Regulation.

The need of regulation of the telecommunication industry sector is very much required as this sector touches the life of individual, business and government in similar fashion and it is now omnipresent in all walks of life and telecom services are extending almost towards becoming an essential service in the life of people and hence in order to protect the interest of all some regulation is inevitable.

Regulatory intervention is required for a variety of reasons. Typically, regulators must authorize or license new operators. They must often remove barriers to market entry by new operators by providing them the level playing field. They must observe interconnection of new entrants with incumbent operators. Regulatory intervention should be in sync with high cost areas or low income subscribers of telecom services.

The objectives of telecommunications regulation vary from country to country and Governments in most countries continue to see telecommunications as an essential public service. Even after telecommunications networks are no longer run by them, governments normally retain a regulatory role to ensure that telecommunications services are supplied keeping the public interest their citizens and business interest of the operators.

The new technologies played a dominant impact on the format of regulation i.e convergence

of technologies led Regulations & Institutions to accommodate these (converged technologies computing, telecommunications & broadcasting) & services ( Internet, IP telephony, CATV), further the convergence which is facilitated by the transition from analogue to digital, voice to data, narrowband to broadband, circuit switched to packet switched, one way to interactive, scarcity to abundance, and the accompanying digitalization of all content. Convergence allows both previously separate industries and entirely new sectors to compete in the same newly expanded market space. There are already numerous examples of markets offering IPTV and Mobile television. In this new converged market space, technology allows, and customers can expect, the seamless provision from multiple sources on a single device of all of electronic communications for one supplier competing with many other suppliers This single new market space could be the business of a single entity or of multiple entities working in collaboration. This transition has radical consequences for existing business models, platforms, content, and devices, together with the regulatory environments that support investment in and consumption of them. This is illustrated below in table 1 B:

Table 1.B: Convergence & the New Market Space

Company	Old Market Core Business	New Market Space
A	Print	On-line multimedia services
B	Audio-visual	
C	Voice	
D	e-commerce	
E	Search engine	
F	Utility service	
G	Game station	
Many Others	Digital content or delivery	

The answer on why regulate telecommunication is very aptly addressed by world bank: “The last decade of the 20th Century saw unprecedented changes in the global telecommunications industry. Numerous state-owned telecommunications operators were privatized, and a wave of pro-competitive and deregulatory telecommunications policies swept the world. New market-based approaches to the supply of telecommunications services were introduced in scores of countries. This liberalization of telecommunications markets was motivated by various factors, including:

- Increasing evidence that more liberalized telecommunications markets were growing and innovating faster and serving customers better
- The need to attract private sector capital to expand and upgrade telecommunications networks, and to introduce new services
- Growth of the Internet, which caused data traffic to overtake voice traffic in many countries, and led to the introduction of many new service providers
- Growth of mobile and other wireless services, which provided alternatives to fixed networks and introduced new service providers to telecommunications markets
- Development of international trade in telecommunications services, which are increasingly provided by transnational and global service providers “ (World Bank, 2000)

### 1.3 Convergence

Convergence has raised new challenges for competition authorities since it is expected to

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generate pressures for consolidation. We have already witnessed numerous mergers and acquisitions among players in the new market space. In some instances, acquirers have emerged from non-traditional sectors. The following categories of convergence became apparent:

- **Convergence of Operators** – mergers, acquisition, joint-ventures, or investment among telecommunications operators or manufacturers used as a strategy for entering new markets or maintaining market share within an existing market, e.g., in Japan, Softbank acquired Vodafone Japan gaining access to the mobile telephony market;
- **Convergence of Services** – the development of business strategies that either involve the incorporation of one service within another or the simple offering of one service with another, e.g., mobile Internet included with mobile telephony or triple play (package offering cable TV, Internet, and fixed-line telephony for a single price)
- **Convergence of Technology** – the incorporation of one technology into another, e.g., incorporating broadcasting technology into mobile phones to allow for mobile TV
- **Convergence of Markets** – services that were once non-competing become competing or when operators who were once non-competing become competitors due to substitutability of the service, e.g., broadcasters in the telecommunications market and telecommunication operators in the broadcast market
- **Convergence of Regulation** – the alteration of regulatory schemes or regulatory bodies such that they are have power over areas of technology which were previously dealt with individually (typically a reaction to one of the other forms of convergence), e.g., the proposed merger of OFTA and the Broadcasting Division of the Television and Entertainment Licensing Authority to create the Office of the Communications Authority (OFCA).

Each of these categories of convergence does not appear in isolation. They are often found together and the appearance of one can cause the appearance of another. For example, the convergence of technology is often the catalyst for the convergence of markets. In the case of mobile TV, 3G mobile technology allows for the provision of video to a mobile handset. The response of mobile telephony providers has been to create content or to license content from content providers, essentially putting these telephony providers in the broadcast market. Table: 1.C provides a Breakdown of the attitudes towards convergence in the Asia Pacific region.

Table: 1.C

	Government Strategy	Operator Strategy	Consumer Demand
Hong Kong	<ul style="list-style-type: none"> <li>• Maximization of open competition;</li> <li>• All markets fully liberalized;</li> <li>• No barriers to convergence.</li> </ul>	<ul style="list-style-type: none"> <li>• Exclusivity of content (the walled-garden approach) to attract customers and differentiate operators;</li> <li>• Value-added services;</li> <li>• Bundling.</li> </ul>	<ul style="list-style-type: none"> <li>• Highly sophisticated consumers;</li> <li>• Willing to adopt new technologies.</li> </ul>
South Korea	<ul style="list-style-type: none"> <li>• Broadband Converged Network (BCN), executed in three phases, to be completed in 2010;</li> <li>• First mover in the creation of infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• Operators positioned to provide more than voice services as total solutions providers;</li> <li>• Pilot project for IPTV allowed by KBC and MIC.</li> </ul>	<ul style="list-style-type: none"> <li>• Very technology savvy;</li> <li>• Willing to adopt new technologies.</li> </ul>

<b>Japan</b>	<ul style="list-style-type: none"> <li>The u-Japan program which is move towards the convergence of communication and broadcasting and consumer electronics into a single network.</li> </ul>	<ul style="list-style-type: none"> <li>Expand market power or move into new markets by merging with or acquiring another operator(s).</li> </ul>	<ul style="list-style-type: none"> <li>Technology savvy;</li> <li>Willing to adopt new technologies.</li> </ul>
<b>Australia</b>	<ul style="list-style-type: none"> <li>Slow regulatory reaction;</li> <li>Attempting to apply existing regulatory framework and only making changes as deemed necessary;</li> <li>Emphasis on industry self-regulation.</li> </ul>	<ul style="list-style-type: none"> <li>Access to Telstra's fixed network is key;</li> <li>Value-added services.</li> </ul>	<ul style="list-style-type: none"> <li>Willing to adopt new technologies if they are cost effective.</li> </ul>
<b>China</b>	<ul style="list-style-type: none"> <li>State-controlled competition;</li> <li>Government is fighting the push towards convergence in broadcast and telecommunications;</li> <li>Convergence between telecommunications and broadcast is banned.</li> </ul>	<ul style="list-style-type: none"> <li>Competition based on service, no exclusivity of content;</li> <li>Partnerships are forming to allow telecommunications operators in broadcast and broadcast operators in telecommunications.</li> </ul>	<ul style="list-style-type: none"> <li>High demand for cost-effective services;</li> <li>Huge market potential;</li> <li>Willingness to leapfrog technologies indicates a high interest in converged services.</li> </ul>

Convergence brings with it many advantages for consumers and providers, but it also brings with it difficulties, particularly in market regulation. For example, convergence of operators includes the convergence of manufacturers. A possible result of this is vertical and horizontal integration within the market and the concentration of market power. This could cause major antitrust concerns as horizontal and vertical monopolies may result. This will also raise the question of whether a natural monopoly will and should exist in the new market of converged services. Antitrust issues are only one of the challenging regulatory issues convergence has raised as regulators attempt to maintain quality and affordability as well as meet community standards for responsibility and accountability while nurturing the markets for these new services.

## 2. Literature Review

The high growth of telecommunication sector has been mainly because of the well established notion that there is positive high degree of correlation between telecommunication and national development and secondly the felt need of telecommunication technology for holistic growth of the humanity. Beginning in 1960s, published papers of economists categorically cited a relationship between telephone density and GDP (Mowlana & Wilson, 1990). Three important studies have been most influential in this regard. The International Telecommunication Union (ITU) in collaboration with the organization of Economic Co-operation and Development (OECD) produced the first set of studies in the late 1970s. The result of the studies, later summarized in *Telecommunications for Development*, focused on the role of telecommunications in the process of development and especially in the development of the rural areas of the world's poor countries (Jipp, 1963). In 1983 the ITU established the independent Commission for Worldwide Telecommunication Development, also known as Maitland Commission, to recommend ways in which the expansion of the telecommunications across the world could be stimulated. In 1984,

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the Commission, after studying the earlier works by ITU, OECD, the World Bank and other international agencies, published “*Missing Link*”, which embodied its conclusions and recommendations. The Commission’s study of the role of telecommunication persuaded its members that “telecommunications can increase the efficiency of economy, commercial and administrative activities, improve the effectiveness of social and emergency services and distribute the social, cultural and economic benefits of the process of development more equitable throughout a community and a nation (ITU, 1984). It is, however, far too evident that both organizational capabilities and market environment shape business strategy and performance, and vice versa (Henderson and Mitchell, 1997).

### **2.1 Flexibility**

In Webster’s Dictionary, “flexible” is defined as “a ready capability to adapt to new, different or changing requirements.” Because of the multitude of choices available to customers, today, flexibility is a key factor in business success. Not surprisingly then, it is suggested that the organizations should offer solutions for isolating, extending and modifying the business rules that drive the processes within digital value chain (Porter, 2001, D’souza, and Williams, 2000). Consequently, much research has demonstrated the importance of flexibility for firms to prosper in turbulent environments (Dreyer & Gronhaug, 2004). Flexibility within a business context is a rather complex concept to define as it incorporates several dimensions (Shi & Daniels, 2003; Dryer). Traditionally, flexibility tended to focus on the ability of firms to adjust their manufacturing volumes to varying market demand. However, more recently, the concept of flexibility has been extended to incorporate the ability of firms to develop new products, enter new markets and industries (Dreyer & Gronhaug, 2004).

#### **2.1.1 Organizational Flexibility**

Becoming flexible is becoming imperative for survival. There are several dimensions to becoming a flexible organization including the following: creating a responsive internal environment that can quickly react to any change in the marketplace, planned or unforeseen, a threat or an opportunity. Second, an organization should have variable cost structures to manage costs in proportion to growth of the organization or change in demand. Third, an organization needs to be focused on what is profitable and core to the enterprise’s success. Finally, the organization needs to have a resilient infrastructure that is available around the world and round the clock (Phan, 2001). Flexible organizations mandate that business processes are integrated end-to-end, enabling it to respond with flexibility and speed to any customer demand, market opportunity or external threat (Shi and Daniels, 2003, Sethi and Sethi, 1990). As organizations use real-time information to accelerate an increasing number of business processes, flexibility and adaptability become fundamental requirements for supporting today’s—and tomorrow’s—business imperatives (Davidson, 1999).

#### **2.1.2 Flexible Workforce**

The organization chart of a traditional enterprise had long been defined as a shrinking pyramid with the CEO at the top. The 21st century organization will look like the Web; horizontal, a mesh that connects partners, employees, external contractors, suppliers, and customers in various forms of collaborations. The players will grow more and more independent. Tomorrow’s corporations will be virtual, defined not by their location but by their ability to acquire knowledge, organize information, and organize independent contractors and suppliers worldwide. To keep ahead of the steep new-product curve, it will be crucial for organizations to attract and retain the best thinkers. Companies will need to build a deep reservoir of talent - employees and free agents - to succeed in this new era (Amor, 1999, Aalst, 2000). Companies should be flexible

enough to employ customer- focused people at every level of the organization and build processes that are simple to execute and flexible enough to change with changing times.

### 2.1.3 Organzation Flexibility

The need for organization flexibility to accommodate a changing world is well understood. Today's high-velocity and competitive markets apply added pressure to adapt rapidly and perform at high levels. Organization is essentially a systemized whole consisting of interdependent and coordinated parts. Flexibility, however, centers on modification or adaptation. The more systemized and interdependent a group of humans is, the more difficult the change process. Thus, flexible organizations typically have been thought of as having less top down control and more than an individual empowerment.

Finally, many present day theorists speak of the importance of possessing the dynamic resources and abilities necessary for rapid and effective action in business activities and decision-making. These action-oriented or kinetic capabilities are presented as essential complements to positional competitive advantages, a view that puts even further demands on the organization. Thus, organizational approaches are cornerstones or kinetic capabilities, and are likely to be of primary importance for certain positional advantages, such as relationships with stakeholders. The flexibility in collaboration also refers to organizational flexibility as Strategic alliances are more likely to involve competitors (Duysters, Kok & Vaandrager, 2000). and Lorange (2002) suggest that the role of inter-organizational cooperation grows in the future due to three broad reasons: regulatory factors, changes in the business and economic environment, and changes in industry practice and strategy. Companies must have flexibility in their alliance strategies to allow them to form quickly and effectively virtual supply chains that may transcend industry and national boundaries overcoming regulatory hurdles. Also, intermediaries need to renew organizational skills, resources and functional competencies to sustain the advantages that they build (Tece, Pisano & Shuen, 1997).

Flexibility in forming strategic alliances must address issues such as:

- The nature of collaboration – As the nature of competition becomes increasingly based on rapidly reconfigurable value chains (Rayport and Jaworski 2001),
- Mechanisms of quality assurance – Digital intermediaries, which assure quality for the company's products and services, should be considered strategic partners because they can play a critical role in building brand image and enhancing customer satisfaction and loyalty.

The capacity of forming collaboration and alliances maintaining a strong brand image is possible only when companies can afford to be flexible in strategies related to the above issues.

### 2.1.4 Technical Flexibility

Technical flexibility refers to freedom of choice organization possess in terms of technology platforms available. Once the enabling technologies are flexible enough to quickly adapt to a changing market environment, it is important to create flexibility in core processes of technology related business processes. Many studies in the past have shown that organizations can use technology as a resource to gain competitive advantage (Clemons & Row, 1991; Parsons, 1983). Technology, which is the primary force behind the emergence of the new economy, has become not only a means of production but also a main component of service, relationship building, collaboration, and co-existence. In this context, the importance of flexibility in technology cannot be overemphasized. Byrd and Turner (2001) identify several dimensions of technological flexibility such as data transparency, compatibility, application functionality, connectivity, technical skills,

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boundary skills, functional skills, and technology management. They also observe that flexibility in technology as measured by integration, modularity, and IT personnel flexibility is positively correlated to an organization's innovativeness, mass customization, market position, and difficulty to duplicate. Malhotra (2001) identifies technology flexibility as the ability to cope with the integration of new e-Business applications with the existing brick-and-mortar infrastructures. Such integration entails flawless fusion of enterprise resource planning, supply chain management, and customer relationship management, which is not possible without having integration standards, network capacity, data storage capacity, and processing power. Gronhaug (1999) links technological flexibility with product and services flexibility by using the open-system metaphor (Katz & Kahn, 1966) in which organizations are viewed as input-throughput-output systems. Flexibility in formulating and executing a technology strategy, which is critical to achieving a sustained competitive advantage for firms in the new market environment, must address such issues as: impact of technological change within the organization, impact of technological change on the market, technological changes can exert a huge impact on the market by directly affecting the size and nature of customers, partners/suppliers competitors, and products. In order to provide the flexibility, scalability and reliability required of mobile telephony services companies need to create a flexible e-business infrastructure. This infrastructure should consist of open interfaces that allow new applications and services to easily connect. The flexible e-business infrastructure should include; universal connectivity through the use of open standards, and integration with internal and external services. Universal connectivity through the use of open standards implies that companies must allow customers, business partners, suppliers, and influencers to have access to systems and applications with a variety of access devices available. Having interoperability to allow sharing or communicating with mixed technologies across and beyond the enterprise is an important success factor and technology infrastructure should have capability to integrate internal and external services seamlessly. By integrating business applications and data among customers, suppliers, partners and employees, companies can achieve a more effective and efficient e-business model. Enabling integration is accomplished by using open standards-based infrastructure elements in conjunction with an integration, which allows existing application functionality to be integrated with the new application logic (Shi and Daniels, 2003).

#### *2.1.5 Operations Flexibility*

For consistent customer service, applications, customer data must be integrated with different databases and applications (Oliver, 2001). The integration of applications, processes and data creates a single view of the customer, prevents discrepancies in customer data, and ensures consistent service of the customer, no matter the channel. In addition, any employee who interacts with customers, no matter where they are in the organization, can access any customer information necessary in order to provide superior service (Papazoglou, et al, 2000).

#### *2.1.6 Strategic Flexibility*

Strategic Flexibility or non-routine steering capacity refers to capabilities related to the goals of the organization or the environment. This most radical type of flexibility is much more qualitative and involves changes in the nature of organizational activities. Strategic flexibility is necessary when the organization faces unfamiliar change that has far-reaching consequences and needs to respond quickly.

#### *2.1.7 Marketing Flexibility*

Companies must be flexible in their product offerings because one standard cannot meet the different needs, tastes, and expectations of an increasingly segmented and global customer

base. Flexibility, in this context refers to the ability of a company to meet this challenge within the overall framework of its business strategy. The capacity and speed of product innovation is an attribute of such flexibility.

### 2.1.8 Financial Flexibility

The concept of flexibility has basically developed in the context of manufacturing systems and organizational systems. As regards financial management systems, the need and *raison d'etre* of flexibility has drawn increased attention of professionals only in the recent years. New concept in this area real options and their interaction with the financial flexibility of the firm have been reviewed by Trigeorgis (1993). Kaulatilaka (1993) has presented new methods for determining the value of flexibility in project selection and concluded in a case that the value of flexibility exceeds the value of incremental/additional cost. In the concept of financial management Gupta (1983) has aptly underlined the significance of flexibility. The balance sheet can be used primarily for assessing the vulnerability of an enterprise in terms of the strength and flexibility of its financial frame which can be best thought as a kind of constraint ring surrounding the enterprise.

Flexibility in financial management refers to liberation of the financial management from the clutches of the strict normative framework for providing freedom of choice to financial managers. Financial Flexibility can be defined as “exercise of the freedom of choice within the framework of government’s monetary and fiscal policies, capital market regulation, investor’s risk returns preferences and corporate strategy, evolving financial processes with versatility, adaptiveness and transparency for better resonance with business environment”.(Jain and Sushil, 2000).

The investment decisions will be governed by the growth strategy adopted by the organization and matching of the project with corporate strategies and core competencies. This is further compounded by the inter-play of “financial flexibility” in terms of capital availability, sources of finances and the cost of capital.

Flexibility in capital structure process is concerned with exercise of the freedom of choice to dynamically interplay among the various sources of financial, providers of fund(individual and institutional investors from the country and abroad) and various financial instruments, keeping in the view the conditions prevalent in financial markets, government regulations in vogue and firm’s own financial profile.

Flexibility in dividend decisions, being open to various policy options as well as different modes of implementation, provides leverage to the decision-maker in terms of speed of adjustment, taking care of extreme financial position of the firm and the liquidity crisis. This will prove to be more ‘investor friendly’ and thereby contribute towards price enhancement of the share, eventually furthering the value of the firm.

### 2.2 Competitiveness

Firms operating in today’s economy are experiencing increased pressures due to several factors including a rapidly changing business environment, shorter product life cycles, increasingly demanding and less loyal customers with rapidly evolving preferences, and fiercer competition (Dreyer & Gronhaug, 2004). These trends are motivated by an increasingly global economy, deregulation in many industries, and fast developments in information technologies that enable new business models and novel forms of collaboration and competition. This is especially the case for firms that operate within an online environment (such as Mobile Telephony) which is characterized by lower switching costs, lower barriers to entry, more substitution threats, quickly changing regulations and increased competition due to lower differentiation and increased geographic reach (Porter, 2001).

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'Competitiveness' originated from the Latin word, *competer*, which means involvement in a business rivalry for markets. In business parlance, the term can be simply as the ability to compete. Competitiveness is a complex, multidimensional and relative concept. It is linked to a large number of interdependent variables, thus, making it difficult to sense and define it. Defining and measuring competitiveness is itself a research challenge. So is measuring competitiveness, it is being relative concept without bearing any direct relationship with economic performance indicators. Competitiveness has been dealt with by coining two separate but related concepts viz., comparative advantage and competitive advantage. Competitiveness advantage corresponds to the notion of firm specific assets and describes the proprietary elements of the firm that determines what activities it should undertake and what distinguishes it from its competitors. The real difference between these two terms in existing literature seems to lie in their levels of analysis. While the literature on comparative advantage deals with the issue of competitiveness of nations and their industries, writers on competitive advantage are more concerned with firm level.

The competitiveness has been getting importance in the USA toward the later half of the 20<sup>th</sup> Century. Declining competitiveness of USA in the early 1980s can be attributed to macroeconomic factors. The firm level behavior is strongly influenced by macro economic factors. For example, short-term profit orientation of US firms in this era resulted into high cost of capital due to low private saving. The rising competitiveness of Japan in international trade was inter-linked with macro-economic factors, such as long- run productivity growth, higher savings and investment rates, governments emphasis on quantity and quality of education and investment in public infrastructure (Baumol and McLennan, 1985). Some authors (Vernon, 1966; Krugman, 1983, 1986; Porter, 1990) have argued that while factor advantages were important in the 18<sup>th</sup> and 19<sup>th</sup> centuries, economies of scale, technological change, comparable factor endowments, cheaper transportation costs and inflow of foreign capital and other factors have pushed firms towards factor exploiting advantages of multiple nations, thus leading to the emergence of a large number of multinational firms. Some writers (Borras et al., 1983; Tyson, 1988, 1992) have given prominence to the role of the government. It is noteworthy to see that in NICs (newly industrialized countries), governments have nurtured infant industries and shaped competitiveness of firms in these industries to gradually enter the global market and gain prominence. The market promotion policy of the government has been focused on those industries that have spill over effect over entire economy because of 'linkage externality' (Krugman, 1987) and on which the future competitive success of various industries depend (Tyson, 1988).

Competitiveness is also defined as the accumulation of competitiveness of firms operating in nation's boundary cutting across industries or group of industries (Chesnais, 1986 in Papadakis, 1994). Researchers have conceptualized firm level competitiveness as competitive position of a firm vis-à-vis its competitors in international markets. This is determined by three sets of interrelated factors, namely delivered costs. Product characteristics and users' perception about the match between a product/ service and their needs, which has been measured by factors like cost and quality of product/services, speed of delivery, brand image, etc. or a composite factor. Porter argues that the role played by comparative factor advantage are there but there exist competitive industries in many countries not endowed with comparative advantage in the relevant factors (Porter, 1990). Classic example of this argument is Japan. Some writers (Hays and Wheelright, 1983) attribute the competitiveness problem and challenges of US to micro (firm level) developments, such as lower emphasis on manufacturing and operations, product and process innovation, short-term orientation of corporate managers and less emphasis on technology development.

### 2.3 Regulation

In a few short decades, radical changes in technology, market institutions, and regulatory and competition policy have transformed telecommunications markets. Telecommunications service traditionally meant “voice communication”, however, the term now encompasses audio (voice), data (fax and email), and video (graphics and multimedia). It is common to refer to these forms of electronic communication as the “triple play” when made available from a single provider. With these changes, the phenomenon of “convergence” has emerged as both the principal offspring and driver of the technology-market-policy triad. Convergence is bringing together previously disparate communication services, content, and consumer market segments.

This phenomenon raises questions about the future of communications and, in particular, about that of voice communication particularly (1) what place will voice communication have in the converged world of electronic communication? and (2) how will regulation and competition policy shape the environment in which voice communication services will be provided and consumed?

#### 2.3.1 Technology Issues to Guide Regulatory Policy

**Market and Regulatory Implications for Voice Provision over Broadband:** It is important to rate the role of markets and regulatory policy in shaping the environment for broadband deployment. Several important aspects of that role are:

**Competing broadband platforms:** Broadband capability comes in several dimensions, namely, architecture, bandwidth/speed, and scale. Although DSL and cable modem (both wireline technologies) are dominant currently, future broadband services (of which various forms of voice communication will be an integral part) will likely be migrated to all-fibre or wireless systems.<sup>1</sup>

**Inter-operability and standards:** Even as parallel standards are likely in the future evolution of broadband (and, within it, voice communication), markets and, more specifically, consumers and policymakers will demand greater interoperability among systems. It is unlikely that convergence and integration will drive the world to a single standard or system. However, it is also unlikely that consumers will be unable to communicate with one another or fail to reach the content they desire solely because of divergent systems or standards. Standards setting institutions at the ITU and national governments or regional blocs will likely ensure that, at a minimum, inter-operability is feasible.<sup>2</sup>

**Future broadband access networks:** Markets and regulators will also have to grapple with the consequences of a complete transition to IP-based service provision. As triple-play services

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1. In 2001, an OECD Working Group noted that the anticipated hand-off from DSL to all-fibre technology may be slowed by the development of “very high bit rate” DSL (“VDSL”) systems that could reach access speeds of up to 60 Mbps. Also, DSL variants will continue to interest most end users (despite downstream access speeds) as long as FTTH and similar services remain relatively expensive. See OECD (2001), p. 20. In Japan, the solution has been to allow shared (community) use of all-fibre connections through splitters located close to end users. While this solution sacrifices access speed, the connections themselves are more affordable.

2. In Section 4.3, we discuss the role of standards-setting in creating an enabling environment, and whether standards should be imandated by policy or determined by market forces. For now, we note that, in telecommunications, inter-operability within a particular platform (such as wireless) is logically similar to interconnection; even if a GSM phone cannot access the CDMA network vice versa, interconnection between the networks makes calling between them possible and has the same effect, from the end user’s perspective, as inter-operability.

are increasingly transmitted over the public Internet (IP network) and then into last-mile access networks on their way to end users, the need for higher-bandwidth access networks will become crucial. Importantly, whatever the bandwidth requirement of voice (plain or enhanced) communication, the ultimate choice of access network will depend on the extent to which the market and operators believe that the demand for bandwidth-intensive video and multimedia services (e.g., IPTV) will drive demand.<sup>3</sup>

**Scalability of broadband:** For broadband to realise its market potential, deployments must be possible at different scales. Unlike narrowband PSTN, the easy scalability of broadband (IP-based) technology make it well suited for deployment in areas with fragmented or low demand.<sup>4</sup> Such scaled deployment implies that almost any entity can establish a broadband network by constructing an access network (whether wireline or wireless) and then connecting it to the backbone IP network. Thus, municipal or town authorities, companies, universities, and research laboratories can build broadband networks and interconnect either directly or through the IP network. To ensure that sufficient demand develops for broadband services, regulators must facilitate aggregation of demand to levels that can be served efficiently.<sup>5</sup>

### **2.3.2 Regulatory Principles under Convergence**

As convergence progresses and new broadband technological options become available, regulators and policymakers need to re-examine their role in shaping the future of electronic communication. It is likely that most forms of communication will occur in two- or multi-sided markets.<sup>6</sup> That prospect presents several options for the efficient recovery of the costs associated with building converged or next-generation networks. Regulators must avoid enacting policy — intentionally or otherwise — that create disincentives to invest for both incumbent operators and entrants, or favour the adoption of particular technologies or provision of particular services. Thus, technology and service-neutrality must be the hallmark of enlightened regulation.<sup>7</sup> Indeed, we propose that the very cornerstone of any enabling future regulatory environment for electronic communication should be dynamic efficiency. This principle marks a significant departure from generations of regulatory policies (particularly for *ex ante* regulation) that are based instead on the principle of static allocative efficiency.

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3 For an illuminating discussion, see Hatfield et al. (2005), pp. 53-54. The authors also characterise the network of the future in the following terms: [T]he trend is towards an architecture where all applications — audio/voice, data, image, and multimedia — are conveyed to an all-digital, packet-switched, broadband, low-latency network of networks that uses common open standards and protocols (i.e., the IP suite). Using the modularity and layering associated with modern communications protocols, this network, in turn, will increasingly rely on fiber-optic transmission facilities for the needed bandwidth and on wireless technologies to extend the network to allow users to communicate anywhere, anytime, in any mode or combination of modes. In this architecture, traditional voice conversations will become just another digitized, compressed, and packeted bit stream along with data, image and video traffic and with the intelligence or service logic defining the equivalent of traditional voice services being distributed throughout the network and not necessarily controlled by traditional telephone carriers. Id., p. 56.

4 See ITU (2006a), Chapter 3: “Understanding Broadband Technologies”, p. 27.

5 The European Union clearly sees this as a priority for overcoming the digital rural-urban divide and facilitating universal access. See Commission of the European Communities (2006).

6 See Borreau and Sonnac (2006).

7 This may be easier said than done. As explained in Section 4.3, policies — particularly those that mandate specific technological or service standards — can often conflict with the general principle that policymakers should not attempt to pick winners.

The global diffusion of mobile telephony epitomises the co-existence — sometimes aided by regulatory policy — of competing standards. The most popular standard, the Global System for Mobile Communications (“GSM”), offers digital voice calling quality, inexpensive text messaging, and common encryption over different frequency bands.<sup>8</sup> GSM is an open standard that allows considerable interoperability.<sup>9</sup> GSM is best positioned for international roaming and, according to the GSM Association, has over two billion subscribers (or 80 percent of mobile phone users) globally.<sup>10</sup> Additionally, GSM — a 2G standard — has introduced packet data capabilities, including General Packet Radio Service (“GPRS”) and Enhanced Data Rates for GSM Evolution (“EDGE”). The successor to GSM or, more precisely, the air interface to the 3G mobile technology Universal Mobile Telecommunications System (“UMTS”), is Wideband Code Division Multiple Access (“W-CDMA”), pioneered by the Japanese mobile operator NTT DoCoMo.

To summarise, competition among mobile telephony standards, which initially concerned how universally voice communication capability was being provided, has now shifted to data and multimedia communications. That networks based on new standards may not be fully backward compatible with legacy voice networks has not hindered deployment of more data-oriented (and IP-based) networks. The ability to make voice calls from anywhere to anywhere will remain important to mobile communications. However, interconnection, rather than true interoperability or emergence of a single universal standard, is likely to remain the basis for serving voice calling needs. Significantly, the intersection of mobile and broadband technology has brought to the fore WiMax and HSDPA as potential alternatives to traditional last-mile access networks, such as the PSTN, DSL, or cable.<sup>11</sup>

**2.3.3 Market and Regulatory Issues in Voice Provision over Mobile Networks:** Apart from the competition among alternative mobile telephony technological standards, several regulatory policy issues are likely to require attention around the world. Below, we identify and discuss several such issues.

**2.3.4 Spectrum Allocation and Management:** Recent technological advances in wireless communications have important implications for markets and regulatory policy. These advances have made the movement of voice, data, and video transmissions at high speeds more reliable and secure. Also, the range of devices (including the mobile telephone handset) that can use wireless means for all forms of electronic communication is becoming more diverse.

### **2.3.5 Mobile Termination Charge**

Another problem in mobile voice communication markets is determining the appropriate mobile termination charge (“MTC”), particularly when assessed on calls from fixed-line networks that terminate on mobile networks.<sup>12</sup> A related issue is whether the compensation regime that applies to the MTC should be Calling Party Pays (“CPP”) or Receiving Party Pays (“RPP”). CPP, the

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8 “GSM” meant Groupe Speciale Mobile in the 1980s.

9 In 2004-05, 42 percent of the global GSM subscriber base was from Europe, 38 percent from Asia-Pacific, and only 11 percent from the Americas. See ITU (2006a), Chapter 1: “Market and Regulatory Trends in the ICT Sector”, Figure 1.9, p. 8.

10 See GSM World (2006a).

11 Mauritius and Macedonia, with populations of 1.2 million and 2 million, respectively, both launched plans to use technologies that conform to the WiMax standard to provide universal broadband wireless access. See ITU (2006a), Chapter 1: “Market and Regulatory Trends in the ICT Sector”, Box 1.1, p. 7.

12 See Gans et al. (2005) for a summary. The higher the MTC, the more expensive is cross-network calling. How that greater burden is, or should be, shared between the caller and called party is unresolved.

most common regime, is a cost-causative form of pricing that attempts to recover the cost of terminating a cross-network call from the caller and the network — fixed-line or mobile — to which the caller belongs. CPP is credited with having stimulated mobile voice communication and rapidly increasing national mobile telephony penetration rates. In contrast, the less common RPP regime requires that the termination cost be recovered instead from the called party (“receiver”) and the receiver’s network. It is widely believed that placing the cost onus of a call from another network on the receiver encourages mobile subscribers from sharing their phone numbers and suppresses calling from fixed-line or even other mobile networks.<sup>13</sup>

### 3. Trends in Regulation and Policy

The trends in regulation and deregulation have been of the trigger to change and adopt various measures. The following is the list of issue related to such trends:

- Protect public interests from anti-competitive behaviors of industries and growing cyber-crimes.
- Face convergence of ICTs in not mere technologies & services but also legislation & institutions.
- Undertake sector reform or reengineering through liberalization or privatization
- Ensure fair competition or competition safeguard
- Aware of digital divide in ICT infrastructure & applications not only between countries but also within the country.
- Increasing concerns over private anti-competitive practices led by liberalization or privatization
- Some 80 countries (inc. 50 developing ones) adopted competition policy including laws & other measures to promote competition in the national economy through dealing with price fixing, cartel arrangements, abuses of a dominant position or monopolization, mergers that limit competition
- Developing a multilateral framework on competition & e-commerce policy within the WTO is under the review.

The privacy laws, cyber law, dispute settlement over domain names; and Certificate Authority began to be introduced in the advent of Internet & e-commerce

*Regulatory trends for spectrum management:* In the current situation, the general approach of spectrum regulators remains one of “Command & Control”, where changing uses of spectrum is a deliberative process involving study and opportunities for public comment. However, we can recognize some trends towards a more flexible approach.

#### 3.2 Legal trends

- Establish new telecom or ICT legislation;

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<sup>13</sup> Not being non-cost-causative, RPP fails a fundamental requirement of efficient pricing. Nevertheless, it is most frequently justified by the argument that the termination cost of a call should, at least in part, be recovered from the receiver as long as, by voluntarily engaging in the call, he or she receives some benefit. Moreover, in practical terms, mobile networks in RPP countries may have successfully offset the disincentive to mobile subscribers to receive calls from other networks by offering “bucket” price plans and “free” night/weekend calling windows. However, those who view voice communication as essentially generating “two-sided benefits”, i.e., benefits to both the caller and the receiver, sharing the cost of termination rather than assigning that cost entirely to the caller (as in a CPP regime) generates greater social welfare. See Hermalin and Katz (2002, 2003).

- Modify the existing telecom laws or regulations;
- Harmonize or improve legal environments & frameworks to reflect convergence & its implications in advent of the Internet: e.g.,
  - o Data protection/privacy, intellectual property rights;
  - o Security (e.g., authentication, digital signatures etc.);
  - o Harmful & illegal content (e.g., child pornography etc.);
  - o Domain names & their standardization;
  - o Jurisdiction & cross-border issues;
  - o Cyber crime (e.g., virus, fraud) etc.

**3.3 Global Trends on Legislative Reform**

- Over 150 countries have introduced new telecom legislation or modified existing regulations to Introduce competition, establish regulatory authority, & privatize the incumbent: &/or Accommodate convergence of ICT
- Further changes are anticipated to fit the new realities of convergence
- Legislation on interconnection

The table 3.A provide recently revised ICT legislation in Asia.

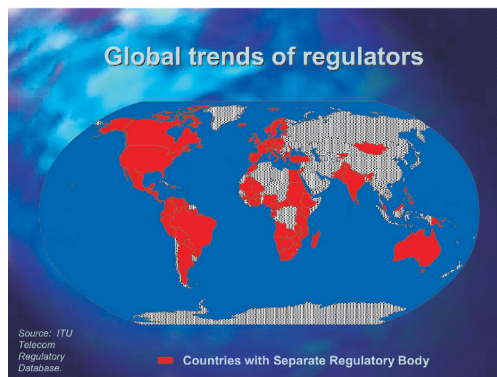
Table: 3.A

Countries	Years	Laws
India	1999	Telecommunications Policy
	2000	Information Technology Act
China	1997/8	Regulations
Hong Kong	2000	Telecommunications Ordinance (Rev) Broadcasting Ordinance (Rev)
Malaysia	1998	Communications & Multimedia Act Communications & Multimedia Commission Act
Singapore	1998	Electronic Transactions Act
	1999	Telecom Act
Thailand	1999	Corporatization Law
	Pending	Frequency Bill

{Source: ITU, Asia-Pacific Telecommunication Indicators, 2000}

The following diagram 3.B gives the global trend of regulatory bodies:

DIAGRAM: 3.B



### **3.4. Regulatory Trends in India**

As mentioned above, India made commitments under the under the General Agreement on Trade in Services (GATS) to review further opening up of national long distance service in the year 1999. This commitment was reinforced by the NTP 1999, which declared that the market for domestic long-distance (DLD) should be opened up to competition by January 2000. This, however, has yet to occur. The NTP 1999 requested the TRAI to make recommendations to the government in this regard. The TRAI released its discussion paper in September 1999 and announced its recommendations in December 1999<sup>17</sup>. The Telecom Commission has not yet announced the government's definitive policy but this is expected by April 2000. The main elements of the TRAI's recommendation on DLD competition are as follows:

- Creation of a multi-player environment
- Competition limited to facilities-based players
- Entry fee of a one-time Rs 5 billion, with Rs 1 billion in cash and the rest as bank guarantee ensuring roll-out
- Revenue sharing scheme of 5 per cent
- A phased network rollout plan with obligatory coverage of 15-100 per cent of the total long distance charging areas in the first 2-7 years
- Equal access and interconnection to be provided immediately Thus far, the DoT/DTS has agreed to the separation of accounts proposed by the TRAI in order to set up a distinct long-distance operator. However, it has objected to both the open competition and the recommended level of revenue sharing, set at 5 per cent of the licensee's revenue, which it considers sub-optimal. It is not eager to pay license fees equal to that of private long-distance operators. It argues that India's telecommunications policy does not require the payment of license fees for basic fixed telecommunications.
- Another important regulatory development relates to the government's policy on Internet Service Providers. The policy stated that ISPs should be allowed to operate their own international gateways, and thus be able to lease either satellite transponder or submarine cable capacity for connection to the Internet backbones in other countries. Although the ISP policy was released in 1998, it is only as recently as February 2000 that private ISPs have been given official clearance for setting up International Gateways.

#### **3.4.1 Current Status Regulation**

The Indian government has also been setting new policy targets, in an effort to modernize the telecommunications sector. The policy also aims to create a modern and efficient telecommunications infrastructure taking account the convergence of electronics, telecom, IT and media. It commits to a strong and independent regulator and proposes new targets for telecommunications network development. In response to the TRAI's recommendations dated August 29, 2007, DoT announced changes in the telecom policy. The key highlights of the new policy are as follows:

- Removal of cap on the number of access providers in any service area
- Permission to existing UASL operators to provide wireless services using alternate technology
- Implementation of new subscriber norms for allocation of spectrum

## **4. A Case of Indian Telecom Mobile Service Provider**

### **4.1 Industry Review**

**4.1.1 Low Initial Demand for Mobile Services:** Mobile telecom services were introduced in India in late 1995 and were marked by low demand and high tariffs, due to large licence fee commitments and capital expenditure requirements of service providers. In March 1998, there were merely 0.88 million mobile subscribers in the country, over half of these being from Delhi and Mumbai.

**'NTP 1999' dialled in accelerated growth from 1999 to 2003:** The National Telecom Policy, 1999, revolutionised the industry by allowing a shift from a fixed licence fee regime to a revenue share regime, thereby attracting more players to the market. Consequently, the mobile services industry began to look up and added 0.7 million customers to its base in 1999-00. The growth accelerated in 2000-01 with an additional 1.7 million subscribers. In 2001-02, net additions of the industry increased to 2.9 million and further to 6.7 million in 2002-03.

In 2002-03, BSNL launched its services as the third operator across many circles, followed by fourth operators. This, along with the consequent decline in tariffs accelerated growth, with the total number of mobile subscribers now going up to 13.8 million in March 2003.

The year 2003-04 witnessed phenomenal growth in the industry with an addition of over 20 million subscribers. This can be attributed to the Calling Party Pays (CPP) regime implemented in May 2003, which made incoming calls free and the launch of services by Reliance Infocomm. While the CPP regime brought more low-usage customers into the mobile telephony fold, Reliance Infocomm lowered entry barriers for mobile services with schemes such as 'Monsoon Hungama'

In 2004-05, the mobile industry witnessed an addition of 21.4 million customers which was lower than the net additions in 2003-04. This was because Reliance Infocomm disconnected around 1 million subscribers after checks for credit-worthiness and customer verification. Moreover, there were no significant growth triggers during this year. However, 2004-05 turned out to be momentous because by the end of the year, the total mobile subscriber base reached 56.97 million, which outnumbered the total fixed subscriber base. The ratio of fixed to mobile subscribers dropped down from 0.7 times in 2004-05 to 0.4 times in 2005-06.

In 2005-06, the total telecom subscriber base increased by 43.6 million to reach 140.4 million. The mobile subscriber base went up by 43.5 million subscribers whereas fixed services added 0.13 million subscribers during the year. The launch of a 2-year incoming-free scheme by Tata Teleservices and the introduction of lifetime validity scheme triggered growth, thereby pushing net additions to cross the 4 million mark.

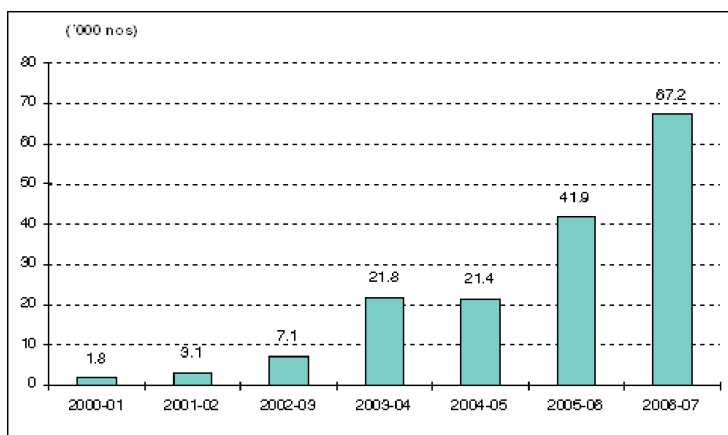
In 2006-07, the total telecom subscriber base went-up by 66.5 million and reached 206.8 million. In June 2006, the government introduced a policy wherein fixed wireless subscribers were included in the mobile segment and fixed wire-line subscribers would alone constitute the fixed telephony segment. As a result, the total wireless segment (mobile plus fixed wireless) went up by 67.2 million subscribers reaching 166.05 million in March 2007 and again soared up by 19.08 million to reach 185.13 million in June 2007. Fixed wire-line continued the past year's trend and declined by 0.8 million to reach 40.8 million, as of March 2007. In 2006-07, the average monthly wireless subscriber net addition was 5.7 million.

Table 4.A: All-India Mobile Subscriber Base

(million)	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Subscribers	3.6	6.7	13.8	35.6	57.0	98.8	166.1
Net additions	1.8	3.1	7.1	21.8	21.4	41.9	67.2
Growth rate (per cent)	92.0	87.4	105.8	157.9	60.1	73.5	68.0
Source: CRISIL Research, AUSPI and COAI							

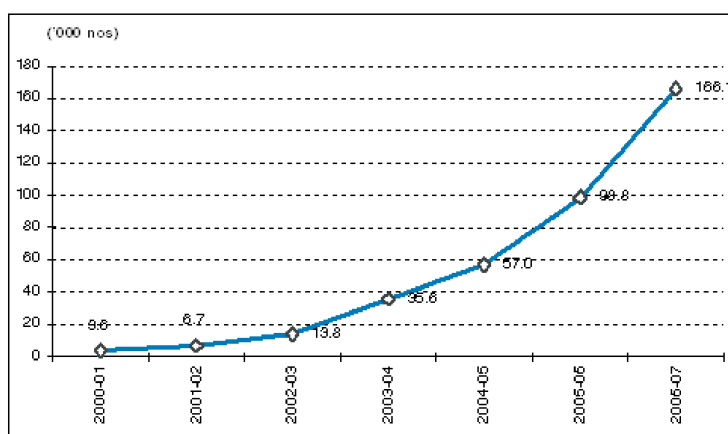
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Figure 4.B: Yearly net additions



Source: CRISIL Research, AUSPI and COAI

Figure 4.C: All-India Mobile Subscribers - Trend



Mobile phone subscribers are classified into pre-paid and post-paid subscribers. While post-paid subscribers pay for usage of services at the end of the billing period, pre-paid subscribers pay a fixed amount in advance for which they get corresponding talk-time valid for a certain period.

Between 1999-2000 and 2003-04, the number of post-paid subscribers as a proportion of total GSM subscriber base witnessed a secular decline. In 2004-05, the number of post-paid subscribers increased for the first time which is believed to be a result of the aggressive cut in rentals on post-paid services by many operators. This was reflected in the sharp decline in post-paid ARPU in 2004-05. In 2005-06, the share of post-paid subscribers went down again to 13 per cent but picked up in 2006-07 to reach 16 per cent.

On the other hand, the share of pre-paid subscribers climbed up from 81 per cent in 2005-06 to 87 per cent in 2006-07. The upward trend of subscribers in the pre-paid segment was an outcome of the re-launch of lifetime-validity pre-paid scheme by various mobile network operators, available at a minimum charge of Rs 495 as against Rs 999 introduced last year.

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Over the last 5 years, while the number of post-paid subscribers expanded at a CAGR of 43 per cent, the pre-paid segment grew at a CAGR of 94 per cent.

Table 4.D: Break-up of GSM Subscriber Base

		2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Post-paid	million	1.9	2.6	3.6	6.5	10.8	13.1	15.8
Pre-paid	million	1.7	3.8	9.1	19.6	30.2	56.0	105.6
<b>Total GSM subscriber base</b>	<b>million</b>	<b>3.6</b>	<b>6.4</b>	<b>12.7</b>	<b>26.2</b>	<b>41.0</b>	<b>69.2</b>	<b>121.4</b>
Proportion of pre-paid and post-paid								
-Post-paid	per cent	53	41	28	25	26	19	13
-Pre-paid	per cent	47	59	72	75	74	81	87
<b>Source: CRISIL Research, TRAI and COAI</b>								

Table 4.E: Break-up of CDMA Subscriber Base

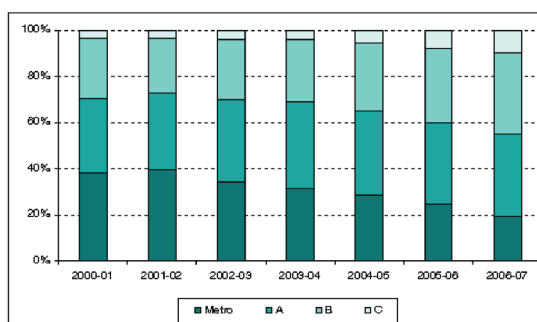
		2005-06	2006-07
Post-paid	million	6.2	5.4
Pre-paid	million	23.4	39.3
<b>Total CDMA subscriber base</b>	<b>million</b>	<b>29.6</b>	<b>44.6</b>
Proportion of pre-paid and post-paid			
-Post-paid	per cent	21	12
-Pre-paid	per cent	79	88
<b>Source: CRISIL Research, TRAI and AUSPI</b>			

## 4.2 Circle-wise Trend

### 4.2.1 Subscriber Base by Category of Circle

Table 4.F: Total Mobile Subscribers in each Circle

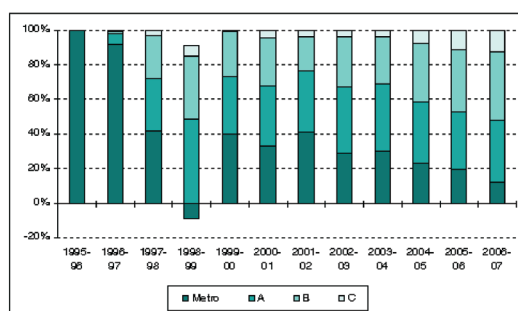
(nos)	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Metro	1,362,592	2,567,757	4,534,179	10,955,311	15,777,962	23,672,901	31,664,806
A	1,166,791	2,174,658	4,743,382	12,985,565	20,220,757	33,947,327	57,727,447
B	932,685	1,517,620	3,491,876	9,362,414	16,440,452	31,193,489	57,545,602
C	116,040	227,573	508,632	1,317,867	2,905,805	7,447,715	15,556,893
<b>Total mobile</b>	<b>3,578,108</b>	<b>6,487,608</b>	<b>13,278,069</b>	<b>34,621,157</b>	<b>55,344,976</b>	<b>96,261,432</b>	<b>162,494,748</b>
Note: BSNL CDMA numbers are not included from 2000-1-01 to 2005-06 due to non availability of its circle-wise break-up							
<b>Source: AUSPI, COAI and CRISIL Research</b>							



Source: CRISIL Research, AUSPI and COAI

Figure 4.H: Mobile Subscriber Base

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Source: CRISIL Research, TRAI, AUSPI and COAI

Figure 4.G: Proportion of Net Additions by Mobile Operators

Mobile phone services were initially launched in the metros, which accounted for almost the entire mobile subscriber base and thus the net additions in the first 2 years of operation. Among the metros, Delhi and Mumbai accounted for a substantial portion of the net additions.

However, this scenario changed after the launch of services in non-metro circles; the share of metros in the total subscriber addition came down from 92 per cent in 1996-97 to 42 per cent in 1997-98. Category-A circles accounted for 30 per cent of the net additions, category-B for 25 per cent and category-C for 3 per cent in 1997-98. This trend continued up to 2001-02. Metros continued to lead the net additions followed by category-A circles. Thus, metros continued to enjoy the largest market share in terms of the total outstanding subscriber base at the end of 2001-02.

The year 2002-03 witnessed a change in trend, and category A and B circles surged forward in net additions. Category-A circles led the growth, accounting for around 37.8 per cent and 38.6 per cent of the total net additions in 2002-03 and 2003-04 respectively. While metros and category-B circles accounted for around 29 per cent of the total net additions at the end of 2002-03, category-A circles surpassed the metro circles with a subscriber base of around 4.6 million. Whereas, in 2003-04, metros continued to grow at 30.1 per cent, category-B circles experienced a decline in net additions at 27.5 per cent.

In 2004-05, category-A circles accounted for the highest proportion of net additions of 34.9 per cent while the share of metro circles fell quite steeply to 23.3 per cent. The share of category-C circles, on the other hand, jumped appreciably from around 4 per cent in the past few years to 7.7 per cent. In terms of total subscriber base, category A continued to be the highest with a market share of 36.5 per cent. Category B ranked second with a market share of 29.7 per cent at 16.4 subscribers. The metros slipped to the third position where its market share stood at 28.5 per cent accounting for 15.7 million subscribers.

In 2005-06, category B circle accounted for the highest proportion of total net additions with 36.1 per cent of the total net additions, followed by category A circle at 33.5 per cent. Category C saw a jump in total net additions, contributing 11.1 per cent as against 7.7 per cent in 2004-05.

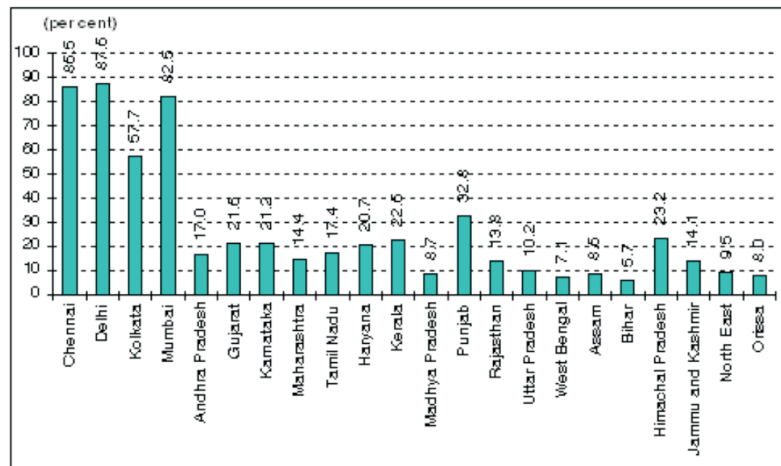
In 2006-07 category-B circles maintained the ace position accounting for net additions of 39.8 per cent, followed by category-A with a share of 35.9 per cent. However, category-C circle overtook metros in terms of share of net additions, standing at 12.2 per cent. Metros continued the downward trend and reached 12.1 per cent.

In 2006-07, category A and B circles stood at almost the same level of around 35.5 per

cent in terms of total subscriber market share. Metros followed both, placed at 19.5 per cent. Category C circle had a market share of 9.6 per cent.

### 4.3 Mobile Penetration by States

Mobile teledensity, commonly referred to as mobile penetration can be defined as the number of mobile phones in use for every 100 individuals living within an area. By March 2007, there were 166.05 million mobile subscribers in India, corresponding to a teledensity of around 15.8 per cent.



Note: BSNL CDMA numbers have been excluded

Source: CRISIL Research, AUSPI and COAI

Figure 4.1: Mobile Service Penetration in India as of March 2007

In India, mobile teledensity varies significantly between different circles. Delhi has the highest teledensity, followed by Chennai, while Bihar and West Bengal circles rank the lowest. Broadly, the relative teledensity in different circles corresponds to per capita GDP in a particular circle. States with higher per capita GDP have a higher penetration and vice-versa.

### 4.4 Subscribers by Technology

GSM being the most widespread technology worldwide, mobile services in India were initially provided on GSM and all mobile licensees had to base their services on this technology.

The basic service operators were permitted to provide limited mobility services based on CDMA technology only in 2001. However, limited mobility services were more or less in competition with full-fledged mobile services. This led to disputes between mobile network operators and basic service operators hampering investments and growth of the sector. Subsequently, TRAI introduced Unified Access Service License (UASL) in November 2003 wherein a UASL licensee was permitted to provide access services based on any technology. Furthermore, the basic service operator was provided the option of converting to UASL by paying the requisite fees. Pursuant to this, all basic service operators providing limited mobility services converted to UASL and presently provide mobile services based on CDMA technology.

The GSM mobile subscriber base increased significantly at a CAGR of 79.9 per cent from 3.6 million in March 2001 to around 121.4 million in March 2007, accounting for around 73.1 per cent of the total mobile subscriber base in India.

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Though CDMA operators were late entrants in the mobile services market, the share of CDMA subscribers (including WLL-F subscribers) in the total mobile subscriber base increased from a meagre 0.03 per cent in March 2001 to 26.9 per cent in March 2007. This was brought about by aggressive schemes launched by Reliance Communications and Tata Teleservice s.

**Table 4.J: Technology-wise Mobile Subscriber Base in India**

Technology		2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	CAGR
GSM	nos.	3,577,095	6,430,814	12,687,637	26,154,405	41,025,940	69,193,321	121,431,166	79.9
CDMA <sup>1</sup>	nos.	1,013	272,970	1,106,432	9,425,752	15,947,036	29,640,636	44,619,845	494.3
<b>Total</b>	<b>nos.</b>	<b>3,578,108</b>	<b>6,703,784</b>	<b>13,794,069</b>	<b>35,580,157</b>	<b>56,972,976</b>	<b>98,833,957</b>	<b>166,051,011</b>	<b>89.6</b>
GSM	per cent	100.0	95.9	92.0	73.5	72.0	70.0	73.1	-
CDMA <sup>1</sup>	per cent	0.03	4.1	8.0	26.5	28.0	30.0	26.9	-
<sup>1</sup> CDMA includes WLL-F subscribers									
CAGR is calculated for 2000-01 to 2006-07.									
<b>Source: CRISIL Rsearch, AUSPI and COAI</b>									

#### 4.5 All-India ARPU

Over the last 6 years, the blended (weighted average of pre-paid and post-paid) ARPU has declined at an annual rate of 19.7 per cent per annum from Rs 1,113 per month in 2000-01 to Rs 298 per month in 2006-07. This can be attributed to the reduction in local and long-distance tariffs, implementation of CPP regime and an increase in the number of pre-paid subscribers. The average revenue per user (ARPU) of post-paid subscribers is more than twice that of pre-paid subscribers. While the post-paid ARPU has declined by 13.9 per cent per annum, the prepaid ARPU has dropped by an annual rate of 13.5 per cent per annum, during 2000-01 to 2006-07.

**Table 4.K: All-India ARPU of GSM Operators**

Rs	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Post-paid	1,501	1,335	1,176	1,056	672	628	613
Pre-paid	597	484	346	288	302	298	250
Blended	1,113	884	634	469	398	366	298
<b>Source: COAI and TRAI</b>							

Minutes of Use (MOU): The blended (weighted average of pre-paid and post-paid) minutes of use has increased by a CAGR of 26.9 per cent from 223 minutes in 2000-01 to 933 minutes in 2006-07. Pre-paid MOU grew at a higher CAGR of 24.3 per cent between 2000-01 and 2006-07 to reach 390 minutes. On the other hand, post-paid MOU increased at a CAGR of 21.7 per cent to 1,013 minutes in 2006-07, during the same period It can be observed that post-implementation of calling party pays regime in May 2003 a significant rise was registered in the blended MOU in 2003-04.

**Table 4.L: All-India Minutes of use (MOU) of Mobile Services**

MOU/subscriber/month	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Post-paid	312	363	460	590	560	652	1,013
Prepaid	106	89	99	208	286	321	390
Blended	223	218	225	302	357	400	933
<b>Source: CRISIL Research, AUSPI, COAI and TRAI</b>							

**4.6 Industry Structure:** Traditionally, services in the telecommunication sector — local as well as national and international long distance — were monopolised by state-owned organizations. Though BSNL and MTNL both provided fixed (basic) services, domestic long-distance services were taken care of by BSNL while VSNL catered to international long-distance services. As the need for developing the telecom sector to promote economic growth was felt and given the government's financial constraints to meet the sector's resource requirements, the central government threw open the doors to private players. Although the mobile services segment had private player participation from the advent itself, other services were opened up subsequently.

### 5. Mobile Services

In 1994, the government initiated the process of opening up the telecommunications industry by inviting bids from private operators to provide cellular services in the four metropolitan cities. The cellular industry was initially envisaged as a duopoly and thus the government invited bids for two licences for each of the circles. Metro cellular licences were issued in November 1994, with operations commencing in August 1995. Modi Telstra (now Spice Communications) launched the first cellular service in India in August 1995 in Kolkata.

The process of launching mobile services in the non-metro circles began in 1994-95. In January 1995, the government invited tenders from private operators to provide cellular services in 18 circles, excluding the four metropolitan areas. Based on their revenue-generating potential, the circles were classified into three categories: A, B and C, with Category-A circle having the highest revenue potential. The government issued 34 licences for 18 service areas to 14 companies during 1995-1998. Though licences were initially granted for 10 years, the government subsequently extended the license period from 10 years to 15 years in October 1998 for non-metro circles.

Two licences were issued in each of the metros and most of the non-metro circles. However, in the case of West Bengal and Assam, one license was issued as only one bid was received. No bids were received for Jammu & Kashmir.

Although both metro and non-metro circle licences were awarded on the basis of tenders, the terms of both these tenders and licences were different in certain respects. The most important differences were in the selection criteria and the licence fee structure. Effective June 2006, the government included fixed wireless services in the wireless segment. Therefore, the wireless segment would now comprise GSM, CDMA and fixed wireless services.

#### 5.1 Selection Criteria

While in non-metro circles, the bidder with the highest quoted license fee got selected, the selection of operators in metros was based on the lowest rental proposed to be charged from subscribers (with licence fee and call charges as given parameters). The evaluated value of lowest rental was determined at Rs 156 per month. Apart from the proposed rental, the bidders in metros were evaluated on their experience, financial strength and committed rollout. The selected operators were as under:

Table 5.A: Metro-wise Select Operators

Metros	Operator 1	Operator 2
Mumbai	BPL Telecom	Maxtouch
Delhi	Bharti Cellular	Sterling
Kolkata	Usha Martin	Modi Telstra
Chennai	SkyCell	RPG Cellular
Source: CRISIL Research		

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As mentioned earlier, in non-metro circles, licences were issued on basis of the highest quoted licence fee, and other selected bidders were directed to match the licence fee quoted by the highest bidder. In those cases where the licence could not be awarded to the highest bidder owing to the restriction on the number of circles which could be allotted to a single bidder, the licence fee bid by such a bidder became a benchmark for award of the licence.

The selected bidders and the licence fees quoted by them for the non-metro circles were as follows:

Table 5.B: Selected bidders (1st and 2nd operators) in non-metro circles

Circle	Name of operator	Total fees quoted	Licence fee
		for 10 years (Rs million)	accepted (Rs million)
<b>Category - A circles</b>			
Andhra Pradesh	J.T.Mobile	1,001	1,001
	Tata Cellular	858	1,001
Gujarat	Birla AT&T	1,794	1,794
	Fascel	1,229	1,794
Karnataka	Modicom	1,393	1,393
	J.T.Mobile	1,320	1,393
Maharashtra	Birla AT&T	1,658	1,658
	BPL Cellular	1,463	1,658
Tamil Nadu	BPL Cellular	836	836
	Srinivas Cellocom	450	836
<b>Category - B circles</b>			
Haryana	Aircel Digilink	240.0	240.0
	Escotel	245.9	240.0
Kerala	BPL Cellular	517.0	517.0
	Escotel	384.8	517.0
Madhya Pradesh	RPG Cellcom	51.0	51.0
	Reliance Telecom	5.6	51.0
Punjab	Modicom	1,266.0	1,266.0
	J.T.Mobile	914.5	1,266.0
Rajasthan	Aircel Digilink	210.0	382.0
	Hexacom	161.0	382.0
	Modicom	382.0	Not eligible
Uttar Pradesh (East)	Koshika Telecom	210.9	210.9
	Aircel Digilink	210.0	210.9
Uttar Pradesh (West)	Escotel	406.2	406.2
	Koshika Telecom	258.2	406.2
West Bengal	Reliance Telecom	42.0	42.0
<b>Category - C circles</b>			
Assam	Reliance Telecom	1.3	1.3
Bihar	Koshika Telecom	136.5	136.5
	Reliance Telecom	2.6	136.5
Himachal Pradesh	Bharti Telenet	15.0	15.0
	Reliance Telecom	1.3	15.0
Jammu and Kashmir	No bids received		
Northeast	Hexacom	1.9	1.9
	Reliance Telecom	1.3	1.9
Orissa	Koshika Telecom	89.2	89.2
	Reliance Telecom	2.6	89.2
<b>Source: CRISIL Research</b>			

### 5.2 Licensing Fee Structure

In metro circles, licence fee for the first 3 years was a fixed amount. From the fourth year, the fee was Rs 6,023 per annum per subscriber; subject to a minimum varying between Rs 60 million and Rs 180 million for different circles. For calculating the licence fee from the fourth year, the number of subscribers at the end of each month was to be added for all months of the year and then divided by the number of completed months.

Table 5.C : Minimum Licence fee Schedule for Metros

(Rs million)	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4th to 6th Year	7 <sup>th</sup> Year onwards
	(Fixed)	(Fixed)	(Fixed)	- Minimum (for each year)	(for each year)
Mumbai	30	60	120	180	240
Delhi	20	40	80	120	160
Kolkata	15	30	60	90	120
Chennai	10	20	40	60	80
Source: CRISIL Research					

For the non-metro circles, the bidders were required to quote the total licence fee to be paid in yearly instalments for the 10-year licence period. The annual payout had to be such that the instalment for the sixth to tenth year equalled 1.2 times the amount payable for the first 5 years. Thus, the total licence fee was 11 times the payment due for the first year.

### 5.3 The Impact of National Telecom Policy on the Industry

In March 1999, government announced the National Telecom Policy (NTP) which brought about a revolution in the cellular industry. The salient features of the NTP '99 were:

- Fixed-line and cellular service providers could migrate from a fixed licence-fee regime to a revenue sharing arrangement.
- Third cellular operator licence to be issued to BSNL and MTNL in the service areas where they were offering fixed-line services.
- Entry of an additional private cellular operator in all the circles.
- Extension of licence period to 20 years for metros and non-metro circles (extendable by additional periods of 10 years thereafter).

### 5.4 Migration from Fixed Licence-fee Regime to Revenue-sharing Regime (Flexibility to Operators)

In July 1999, private telecommunication operators were offered the option to change the basis of licence fee payment from a fixed amount to a share of revenues. However, these concessions were subject to operators accepting a set of conditions which included:

- The existing cellular operators had to clear all their outstanding dues by January 2000 (effective August 1999).
- The new licence agreement would not have the clause relating to exclusiveness of the licence. This meant more operators could be provided licences in future to offer cellular services.

All private telecommunication operators accepted the terms of migration to a revenue-sharing arrangement effective August 01, 1999 and the licence fee paid till July 1999 by the existing cellular operators was treated as entry fee. The provisional licence fee for all categories of circles was fixed at 15 per cent of gross revenue, according to the licence agreement with the

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Department of Telecommunication (DoT).

In September 2001, the DoT changed the licence fee payable by the existing or future cellular service providers with retrospective effect from January 26, 2001 to 12 per cent of AGR (adjusted gross revenue) for metropolitan areas and category-A circles and for categories B and C, it was at 10 and 8 per cent respectively.

### 5.5 Third and Fourth Cellular Licences

The government allotted third cellular operator's license for Mumbai and Delhi to MTNL, and for the rest of India to BSNL. While MTNL commenced cellular services in Delhi and Mumbai during February 2001, BSNL started operating in Kolkata, Tamil Nadu and Bihar in July 2002. For the remaining circles it introduced cellular services in November 2002.

The government issued licences for cellular services corresponding to the fourth operators' slot in October 2001. Licences were issued to the Bharti Group in eight circles, Escotel in four, Hutchison Essar in three and Reliance (through Reliable Internet) and Idea Cellular in one circle each. The entry fee for the fourth cellular licence in the four metros and 13 circles aggregated Rs 16.33 billion. The highest quoted fee was Rs 2,060 million for Karnataka. Almost all operators holding the fourth cellular licence commenced services during 2002-03.

### 5.6 Limited Mobility Services

Circle	Operator	Licence fees (Rs million)
<b>Metros</b>		
Chennai	Hutchison Essar South	1,540.0
Delhi	Birla AT & T	1,707.0
Kolkata	Reliance	780.1
Mumbai	Bharti Cellular	2,036.6
<b>Category - A circles</b>		
Andhra Pradesh	Hutchison Essar South	1,030.0
Gujarat	Bharti Cellular	1,090.0
Karnataka	Hutchison Essar South	2,060.0
Maharashtra	Bharti Cellular	1,890.0
Tamil Nadu	Bharti Cellular	790.0
<b>Category - B circles</b>		
Haryana	Bharti Cellular	215.0
Kerala	Bharti Cellular	405.0
Madhya Pradesh	Bharti Cellular	174.5
Punjab	Escorts Telecommunications	1,517.5
Rajasthan	Escorts Telecommunications	322.5
Uttar Pradesh (East)	Escorts Telecommunications	452.5
Uttar Pradesh (West)	Bharti Cellular	305.5
West Bengal	-	No bids
<b>Category - C circles</b>		
Assam	-	No bids
Bihar	-	No bids
Himachal Pradesh	Escorts Telecommunications	11.0
Jammu and Kashmir		
North East	-	No bids
Orissa	-	No bids
Source: CRISIL Research		

The technology used by limited-mobility service providers is the CDMA-based wireless in local loop (WLL) platform. Limited mobility is a facility offered by basic service operators whereby a fixed line telephone connection can be used like a cellular service within a short distance calling area (SDCA) with the help of a handset similar to a mobile handset. As compared with full-fledged cellular services, limited mobility has lesser features and does not provide roaming facility which allows subscribers to access the network in other areas.

It was only after a long tussle between basic service operators and cellular service providers that the Telecom Dispute Settlement Appellate Tribunal gave a green signal to the introduction of limited mobility service by basic service companies. The Department of Telecommunication included WLL services in the wireless segment effective June 2006.

### **5.7 Unified Access Licensing Regime (Flexibility to Operator)**

Limited mobility services were in direct competition with full-fledged mobile services, on account of two reasons: first, only a small proportion of the mobile subscribers used roaming services and second, one of the operators used techniques such as call forwarding and multiple registration, which effectively resulted in the subscriber getting roaming facility.

As the licence fee paid by the limited mobility providers (the basic service operators) was substantially lower than that of the cellular providers, they could price their services at lower price. This led to litigation between the full-fledged cellular service providers and the basic service providers. The disputes resulted in the operators, particularly the GSM operators, holding back their investment plans and growth of the industry suffered.

The government, however, brought an end to this conflict in November 2003 by introducing the Unified Access Service Licence (UASL) wherein licensees could access services based on any technology. The guidelines of the UASL state that in order to migrate to UASL in any circle, a basic operator would have to pay an amount equivalent to the difference between the entry fees paid by fourth cellular operators and him. On the other hand, cellular licensees were not required to pay any additional amount to migrate to UASL. Reliance Communications and Tata Teleservices migrated to UASL soon after UASL was implemented by paying the prescribed entry fee of Rs 15.42 billion and Rs 5.45 billion respectively to the government and began offering full-fledged mobile services to their subscribers.

#### **5.7.1 Fixed/Basic Services**

In June 2006, the DoT excluded the fixed wireless segment from the purview of the fixed segment which now included only fixed wire-line services.

Until 1995, basic services were a state monopoly, with MTNL providing fixed-line services in Delhi and Mumbai and the rest of India being looked after by BSNL. In June 1995, the process of deregulating fixed-line telephony services in India was initiated, with the first round of bidding being held for 21 telecom circles — each telecom circle roughly corresponds to a state of the Indian Union. Two further rounds of bidding were completed in January and April 1996, respectively resulting in private fixed-line telephony operators being licensed in six circles. The response from the private sector to the auctions was way below expectations, as the licence fee payable was quite high, which implied a long payback period.

The NTP '99 envisaged the opening up of basic telephone services to unrestricted competition. Taking cue, the government decided to switch from fixed licence-fee regime to a revenue-sharing arrangement linked to operators' gross annual revenue. As a result, the fixed-line telephone services segment was opened up to unrestricted competition in January 2001. Any operator who met the eligibility requirements (discussed in the policy chapter) and paid the requisite entry fee could register and commence operations.

#### **5.7.2 National Long Distance (NLD)**

With BSNL being the sole player, NLD services were largely monopolised by the state. Once again, the government on the heels of NTP'99 opened up the sector to competition with no restriction on the number of players, effective August 2000.

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In 2002-03, Bharti Airtel Ltd slashed NLD prices and the sector witnessed cut-throat competition, which further intensified in 2005-06 with the introduction of one-India plan. One-India plan enabled the caller to make calls anywhere in the country at Rs 1 per minute. Furthermore, MTNL dropped its intra-network fixed-line call charges between Delhi and Mumbai to Rs 1.20 for a 3-minute call, effective June, 2006.

Currently, apart from the incumbent BSNL, Bharti Airtel Ltd, Reliance Communications Ltd and VSNL provide NLD services. While BSNL, Bharti Airtel Ltd and Reliance Communications Ltd have an extensive pan-Indian optic fibre cable (OFC) network, VSNL has laid fibre cables to connect the key cities.

In 2006-07, NLD licenses were issued to more domestic and international companies. Domestic licensees include: Power Grid Corporation of India Limited, Shippingstop dot com (India) Pvt Ltd, HCL Infinet Ltd, Hughes Communications, Tulip IT Services Ltd, i2i Enterprise Ltd, MTNL, RailTel Corporation of India and Oil India Limited, Tata Teleservices, Spice Telecom, Hutchison-Essar (now Vodafone-Essar), Sify Communications, Idea Cellular, and Dishnet wireless. International operators include: AT&T Global Network Services India Pvt Ltd and British Telecom.

### **5.7.3 International Long Distance (ILD)**

The only ILD license in India until April 2002 was held by state-owned Videsh Sanchar Nigam Limited (VSNL). Though NTP'99 envisaged the opening up of ILD services to private operators by 2004, the government went ahead with the proposals in April 2002 itself. This ended VSNL's monopoly and the sector opened up to competition with no restriction on the number of operators. Data Access, Reliance Communications and Bharti Airtel erstwhile Bharti Televentures applied and were issued licences shortly after the government issued detailed guidelines and licence conditions in January 2002. While Data Access and Bharti commenced ILD operations in July 2002, Reliance Communications embarked on this service in late 2003. BSNL and MTNL also obtained ILD licences.

In November 2005, the government eased licence fee norms for the ILD segment and reduced entry fees from Rs 250 million to Rs 25 million. Moreover, it also slashed the revenue share from 15 per cent of aggregate gross revenue (AGR) to 6 per cent of AGR.

India being a lucrative license market for ILD services, has been sought by domestic and global players alike. In April 2007, international telecom major AT&T Global Network Services India launched its ILD services in the country and plans to offer international voice and data services to multinational enterprises in India. Other companies to have bagged ILD licences include Tulip IT Service Ltd, Cable and Wireless Ltd, Spice Telecom, British Telecom and Sify Communications Ltd.

### **5.8 Tariff Structure**

As mentioned earlier, the minimum subscription cost is a combination of cost of handsets and the monthly charge paid by subscribers to use the service. The average monthly outflow incurred by a subscriber, that is, average revenue per user, is a combination of per minute tariff paid and the total minutes used by the subscriber in a month. Over the last few years, the per minute tariff charged by the subscriber has fallen drastically due to economies of scale achieved by operators owing to rising subscriber base, continuously declining cost of capital equipments and intense competition in the market place.

#### **5.8.1 Changing Tariff Structure**

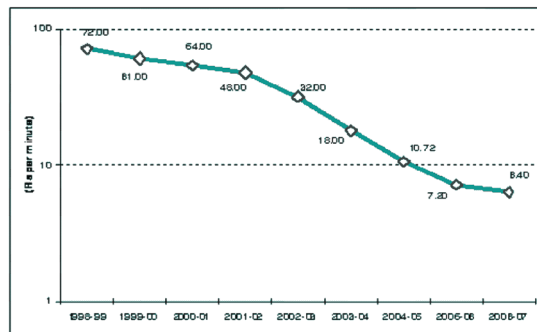
Tariff differentiation amongst different technologies has also been eliminated by way of unification

of access licenses. Players charge the same rate for calls to any mobile under most of their schemes. However, to differentiate the service and to increase the subscriber base, telecom operators offer lower tariffs for on-net calls (calls originating from and terminating on their own networks). On-net calls are as cheap as Rs 0.10 per minute for some operators. Though these schemes are available to high-end postpaid service, prepaid subscribers can also avail these services by paying a fixed monthly rental as prescribed by operator.

### 5.8.2 Long Distance Tariffs to Continue Declining

Over the last 7 years, national and international long distance tariffs have declined by over 90 per cent. This rapid reduction was driven by the entry of private players into these sectors, decrease in cross-subsidisation of access services from long distance services and advancements in technology that have lowered the cost of carrying telecom traffic over the years.

The drivers for reduction in long distance tariff is reduction in access deficit charge (The per minute international long distance (ILD) tariff (on the US route) has declined from Rs 72 in 1998-99 to Rs 6.40 in 2006-07 per minute. The average per minute ILD tariff, however, stood at Rs 4.35 during 2006-07) , carriage charge competition and falling cost of carrying telecom traffic. Another major factor leading to a cut in average tariff is the bundled services offered by integrated telecom operators, wherein the minute tariff charged for national and international calls is considerably lower than the average tariff available on a standalone basis. Lower tariffs are typically available on high end post paid plans. Long distance calls are more frequently made by corporate and high end post paid consumers, whose per call charges are lower due to bundled services, as compared with prepaid subscribers, who are charged the higher standard rates. As a result, the average long distance tariff is lower than the tariff available to prepaid subscribers



Source: CRISIL Research (2008)

Figure 5.E: International Long Distance Tariffs (on the US route)

## 6. Proposed Conceptual Framework for the Study

The proposed framework for the regulation of telecom sector of India based on flexibilities provided to organization by regulators of India enhance competitiveness i.e. the framework proposes that the resultant flexibility affects the overall competitiveness of the organization manifested in four perspectives of the organization as shown in Figure 6.A.

The important variables in the conceptual framework are as follows:

### 6.1 External Flexibilities

This relates to external dimension of the strategy that ensures the ability of an organization to

grow despite insecurity and turbulence and capitalize on emerging opportunities while maintaining a focus on existing customer, market and suppliers. This type of flexibility also originate from regulatory mechanism from the regulators and government departments of the country dealing with the industry segment. This flexibility is also affected by International scenario / Global regional scenario/ Own country scenario in terms of technology available, integration of international regulators and global service provider in mobile telecommunication sector.

### 6.2 Internal Flexibilities

These flexibilities are related to the internal dimension of the strategy. The creative, innovative, capabilities for quickly recombining and redeploying resources and competencies. Internal flexibility of the organizations ensures not only the different organizational sub-units and linkages continue to work together efficiently even while the organization renews itself for the new operations, market or customer. The following are the internal flexibilities taken up in the proposed framework.

- Strategic Flexibility
- Organizational Flexibility
- Technical Flexibility
- Marketing Flexibility
- Operations Flexibility
- Financial Flexibility

### 6.3 Competitiveness Perspectives of the Organization (Kaplan and Norton, 1993; 1996)

- Financial Perspective
- Internal Business Perspective
- Innovation and Learning Perspective
- Customer Perspective

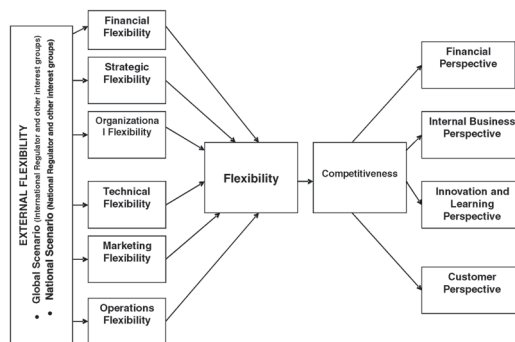


Figure 6.A: Conceptual Framework for Flexibility and Competitiveness

## 7. Conclusions

The transition from monopoly to competition in telecommunications is well underway in the vast majority of countries and largely completed in many countries. The transition has proved beneficially transformational and has set in motion further dynamic changes that are delivering a vastly expanded set of global opportunities in electronic communications. These opportunities are again positively transformational and are covered in the term convergence. But in order to

participate in and maximize the benefits of convergence, a new regulatory framework has to be put into place in India. The new regulatory framework must address the legacy of the earlier transition period while supporting investments in the new period and facilitating new investments in the new market space. Clearly a level playing field would be most advantageous that is, an integration of existing regulatory frameworks into a single framework that is coherent across the entire electronic communications market space.

The convergence further call for convergence of regulators and policy makers in India as it happened in Thailand, i.e. (a) The Science & Technology Ministry for information technology; (b) The Transport & Communications Ministry for telephone and other basic telecoms infrastructure; (c) The Commerce Ministry for e-commerce converged for the purpose of telecommunication. Therefore the convergence whether through technology, business models, or regulation is the future growth roadmap for India. This type of policy change can be categorized as flexibility in terms of organizational flexibility of government of India.

Simple offerings of voice services will no longer be able to provide the revenue needed to operate in the emerging competitive environment as revenue and usage of these will continue to decline. However, people will always want some form of voice service, and they will look to those service providers who offer them additional value in the form of value added services or cost-effective packages. This demand will drive service providers to find and incorporate those additional services or packages that will address the desires of the consumers, but at the same time, the service provider will continually pursue ways to reduce its supply costs and maximize revenue.

Mobile number portability (MNP) is a facility given by operators where a subscriber can move from one service provider to another without changing the number allocated to the subscriber. Thus, under MNP, a subscriber will have the option of retaining the same phone number issued by the old operator even with the new operator.

Telecom regulator TRAI of India has already recommended the implementation of nationwide mobile number portability by June 2009 in a phased manner and has requested DoT to select an operator for providing and operating MNP solutions. The move is likely to push operators to provide quality services to retain their subscribers. TRAI has forwarded the Draft Request For Proposal (RFP) to the Department of Telecom for the selection of an operator which would be licensed for providing and operating mobile number portability solutions in the country. "The Mobile Number Portability Clearing House Administrator (MCHA) should be licensed through a competitive bidding process," TRAI said in a statement.

However, the move is opposed by the existing GSM operators who had demanded that the number portability should be implemented across the services - mobile and fixed line both.

MNP is expected to lead to shifting of subscribers from one operator to other in large scale and lead to flexibility to subscriber, provided by the regulator, to opt for cost effective and better quality of telecom service provider. This will lead to competition among service providers to hold their customers.

To achieve the successful implementation of MNP, operators should consider carrying out a comprehensive cost-benefit analysis to ascertain whether the implementation of the technology would prove to be profitable for the operator. Cost aspects such as the up-gradation of existing networks, software modifications and assessment of effective call routing mechanism are some of the areas where operators need to focus their attention. Operators have the option of providing MNP through a centralised or distributed database of ported numbers. Here the role of regulators become difficult to manage the balance of interest of customer and telecom service providers.

This proposed framework is a comprehensive framework for telecom industry catering to regulators of telecom services providers where the regulator can create appropriate interventions to manage competition among operators without sacrificing the interest of customers. This framework suggests that by creating appropriate flexibilities, the regulator can enhance competitiveness of service providers in all the four perspectives given in the proposed framework.

The framework is not intended to be prescriptive about how the various processes are carried out, how a regulator of telecom service provider is to be organized or how the tasks are identified in any single regulator related to mobile telecom service provider.

The one of the strengths of this proposed framework is that it can be adopted at enterprise level also by allowing a service provider to enhance their competitive positioning by capturing the opportunities provided by the regulator's flexibility in terms of entry of players or internal business process permitted by their respective regulator.

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