



# **Impact of Technological Innovation on Regulatory Reforms: Case Study of Indian Telecom Sector**

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***Disclaimer:***

This document represents part of the author's study programme while at the Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

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## List of Acronyms

AGR	Adjusted Gross Revenue
BSNL	Bharat Sanchar Nigam Limited
BSOs	Basic Service Operators
CAGR	Compounded Annual Growth Rate
CDMA	Code Division Multiple Access
CII	Confederation of Indian Industry
CMSPs	Cellular Mobile Service Providers
COAI	Cellular Operators' Association of India
CPP	Calling Party Pays
DoT	Department of Telecommunications
FDMA	Frequency Division Multiple Access
FSP	Fixed Service Provider
GDP	Gross Domestic Product
GSM	Global System for Mobile communication
ILD	International Long Distance
ITU	International Telecommunication Union
MTNL	Mahanagar Telephone Nigam Limited
NLD	National Long Distance
NTP	National Telecom Policy
OECD	Organisation for Economic Co-operation and Development
PDC	Personal Digital Cellular
PSU	Public Sector Unit
SDCA	Short Distance Charging Area
SMS	Short Message Service
TDMA	Time Division Multiple Access
TDSAT	Telecom Disputes Settlement and Appellate Tribunal
TRAI	Telecom Regulatory Authority of India
USA	United States of America
UN	United Nations
USOF	Universal Service Obligation Fund
VSNL	Videsh Sanchar Nigam Limited
WLL	Wireless in Local Loop
WLL(M)	Wireless in Local Loop (Limited Mobility)

## Abstract

During last two decades, Indian Telecom Sector has seen a major transformation from government monopoly regime to competitive environment. Subscriber base has grown manifold and India telecom sector become second largest in the world. All this could be possible because of evolving positive regulatory environment which helped in increasing the competition and reducing the tariff to enable common people to reap the benefit of mobile service.

Since the start of liberalization process, telecom regulatory regime in India has evolved from restrictive service specific to technology neutral unified access licensing regime. Under this regime, all service providers are allowed to provide both basic as well mobile service without putting any restriction on the choice of technology unlike the initial situation of separate license for separate service and that too with the condition to use a particular technology.

This research paper explores the factors responsible behind this evolution of telecom regulatory regime in India. It also studies about the role of technological innovations as well as various actors of the sector in this evolution process.

**Keywords:** Regulation, Regulatory Capture, Innovation, Game theory, WLL, Limited mobility, Unified Access licensing



# Chapter 1

## Introduction

Telecommunication has always been considered an important tool for socio economic development of any country. Various studies show that internet and mobile service has a positive impact on the GDP growth of a country (Department of Telecommunications 2016a). Due to various initiatives taken by the Government, Telecom Sector in India has also seen a remarkable growth and reached to the position of second largest network of the world, just behind China (ibid.). Present Indian telecom sector can be characterised as highly competitive with the presence of many private service providers and two public sector undertakings namely Mahanagar Telephone Nigam Limited (MTNL) and Bharat Sanchar Nigam Limited (BSNL), who are competing to provide various telecom services to their subscribers. Due to combined efforts of all service providers, subscriber base of Indian telecom network has crossed the figure of one billion during the quarter of April-June'2015 (TRAI 2015).

### 1.1. Present Status of Indian Telecom Network

Status of Indian telecom network as on 31<sup>st</sup> March'16 is shown in Table 1.1. It shows that present Indian telecom market is dominated by private operators (holding around 90% market share) and mainly comprising of mobile subscribers (more than 97%). Tele-density<sup>1</sup> has also reached to a remarkable level of 83.36. On the issue of affordability, Sridhar (2011: 86) has observed that "India's mobile services are one of the cheapest in the world". Such growth of Indian telecom sector could be possible only with the participation of private service providers. The situation was entirely different before opening up of the telecom market for private operators in 1990s. In 1994, India was having a tele-density of merely 1.044 comprising only fixed telephones and that too served only by public sector. Figure 1.1 shows the growth pattern of Indian telecom network during last 25 years. It shows that tele-density in India remained well below 5 till 2001 and thereafter it observed an exponential growth rate and reached to the level of 76.6 in 2014 (World Bank 2016).

### 1.2. Liberalisation of Indian Telecom Sector

Liberalisation of Indian Telecom Sector started with the announcement of National Telecom Policy 1994 which allowed entry of private operators into basic as well as cellular mobile service. Whole country was divided into several telecom circles for the purpose of granting license and every operator had to obtain separate license for providing different services like basic or cellular service for each of the license area. Initially, it was decided to keep the market structure as duopoly and accordingly two private operators were granted licenses to provide

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<sup>1</sup> Tele-density is defined as number of telephones per 100 populations.

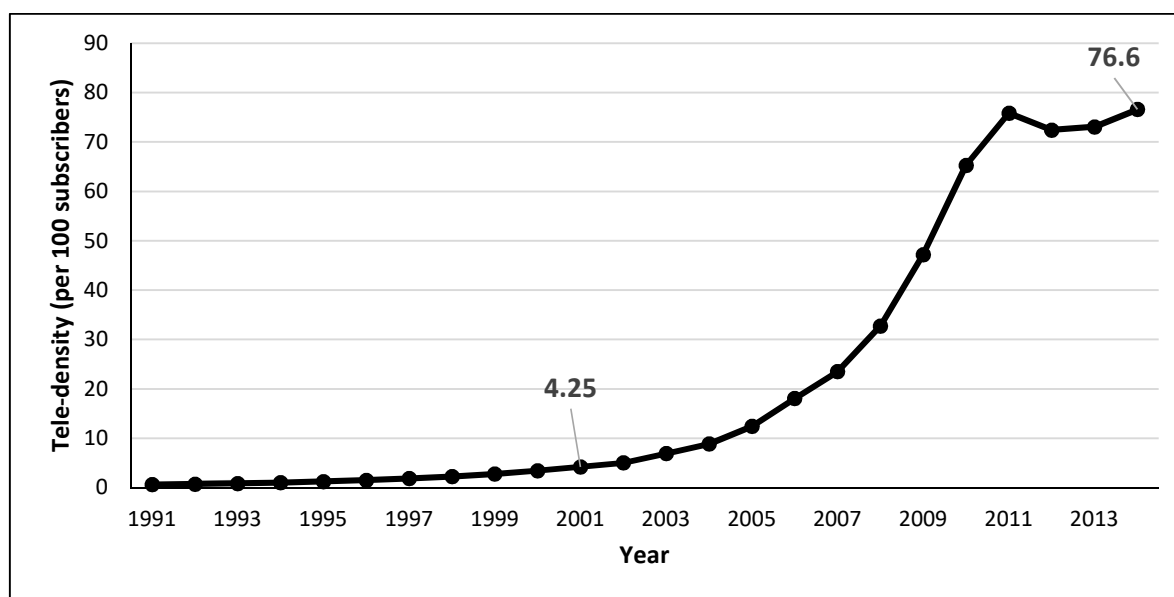
cellular mobile service in each of the telecom circle whereas only one private operator was granted license to provide basic telecom service in addition to incumbent public sector undertaking. Further, cellular mobile service providers were also allowed to use only GSM technology for providing mobile services.

Table 1.1: Status of Indian Telecom Network as on 31st March'16

S. No.	Parameter	Mobile	Fixed	Total
1.	Total Subscribers (Millions)	1,033.63 <sup>2</sup>	25.22	1,058.86
2.	Urban subscribers (Millions)	588.79	20.9	609.69
3.	Rural subscribers (Millions)	444.84	4.32	449.17
4.	Tele-density	81.38	1.99	83.36
5.	Urban Tele-density	148.73	5.28	154.01
6.	Rural Tele-density	50.88	0.49	51.37
7.	Market share of Private Operators (%)	91.3	27.58	89.78
8.	Market share of PSU Operators (%)	8.7	72.42	10.22

Source: (TRAI 2016)

Figure 1.1: Growth of Indian Telecom network during last 25 years



Source: (World Bank 2016)

Despite liberalization, growth of telecom sector initially remained limited. Rollout of cellular mobile networks could not extend beyond the boundaries of metros or major cities and its

<sup>2</sup>Out of total, GSM subscribers are 989.54 million and CDMA subscribers are 44.09 million

high tariff kept it out of the reach of the common people. Performance of basic operators was even worse as only two out of six operators could commence the services by 1999 and that too in a limited way. Private operators cited 'less revenue realization' as the main reason for slow growth. Availability of affordable local loop or last mile connectivity i.e. connectivity between exchange and customer's premises was cited as another reason for slow growth of the basic service. In India, local loop was primarily provided by laying underground cables which is very difficult, time consuming and expensive specially in congested areas.

Considering all these factors, Government reviewed the existing telecom policy and in order to give a boost to the growth of the telecom sector, announced new National Telecom Policy in 1999 incorporating many favorable provisions like substantial reduction in annual license fee obligation for private operators, allowing basic service operators to use 'Wireless in Local Loop (WLL)' technology to provide last mile connectivity, allowing private sector participation in other telecom services etc. This policy also envisaged for increasing competition by allowing entry of more operators in the telecom market (Department of Telecommunications 1999).

The policy did not allow the basic service operators to provide mobility using WLL technology although the technology was capable to do so. However, subsequent to demand of basic service operators and on recommendation of Telecom regulator i.e. TRAI, they were allowed to provide mobility using WLL but restricting to local area only. However, using certain loopholes in the existing policy, some BSOs provided all-India roaming facility to their subscribers similar to being provided by cellular mobile service provider. Although this action of BSOs extended the availability of mobile services to common people at very cheap and affordable price but simultaneously it leads to dispute between cellular and basic operators which finally turned into a long legal battle. This dispute could be resolved only when Government on recommendation of telecom regulator announced convergence of licenses of basic and cellular service into a unified license.

This change in licensing regime from service specific to technology neutral had a wide ranging impact on the whole telecom sector of India.

### **1.3. Research Problem**

During the initial period of liberalization of telecom sector, India adopted service specific licensing regime which was subsequently replaced by unified licensing regime in order to resolve the dispute between BSOs and CMSPs on the issue of WLL limited mobility. Under unified licensing regime, every private operator is free to provide any service using any technology. Establishment of unified licensing regime has helped Indian telecom sector to achieve a new dimension of growth by providing a litigation free regulatory environment.

It is very interesting to study about the factors responsible for this change in order to understand the evolution of telecom regulation in India. Questions like, whether this migration was a part of long term perspective of policy makers or an outcome of dispute

resolution mechanism, need to be answered. If it is an outcome of resolution, then what are the factors responsible behind this change? What are the role of technological innovations/developments in this change? What is the role of various actors in this migration? And finally, what is the impact of new licensing regime on Indian telecom sector?

Therefore, in order to answer these questions, my research is focussed on the question 'How technological innovations impacted the Indian telecom regulatory reforms?'. This research will be helpful in identifying and understanding the dynamics of various actors which have affected the evolution of telecom policy and regulatory framework in India.

#### **1.4. Research Questions**

My research is focusing on following main question:

**'How technological innovations impacted the Indian telecom regulatory reforms?'**

Further my research is also focusing on following sub-questions in order to support the main research question:

- a. What is the contribution of WLL technology in evolution of Indian telecom regulation?
- b. What is the role of various actors in the process of regulatory change from service specific to technology neutral unified license regime in India?
- c. What is the impact of unified licensing regime on Indian telecom sector?

#### **1.5. Research Objectives**

Service based division of telecommunication is becoming redundant due to advancement of technologies. With the use of innovative technologies, service providers are now able to provide even those services, which are covered under the license agreement of another service provider. In such scenarios, some services are losing its relevance even before becoming popular like Radio Paging, which could not take off in India due to launch of SMS service by cellular mobile service provider. In such situations, service providers are not able to recover their cost of investment as the service lost its relevance even before reaching to break-even point and results into dispute or litigation (TRAI 2003b: 11).

Telecom regulation plays a critical role in managing the affairs of the market. It should be dynamic enough to accommodate the technological innovations. If it restricts the innovation, then service providers try to find out the loopholes in existing licensing regime to bypass these restrictions. Accordingly, objective of this research paper is to understand the impact of technological innovation on telecom services and its regulation policy.

## **1.6. Research Methodology**

The study is aimed to understand the impact of technological innovations on evolution of telecom regulation. The study is exploratory in nature and based on both quantitative and qualitative methods. For qualitative analysis purpose, I have taken various policy related documents available on public domain. These includes various consultation papers issued by TRAI to seek the views of stakeholders before formulating any policy, views of stakeholders received in response to the consultation papers and the recommendations of TRAI to licensor for making final decision. I have also explored various judgements pronounced by TDSAT and Supreme Court of India on various occasions during the process. Various telecom policies announced by the Government of India and the acts, vide which telecom regulator was established, have also been examined during the research. Various literatures and articles written by epistemic community, news articles have also been used to get an insight of the regulatory reform process. I have undertaken stakeholder analysis to understand the role of various actors in the process.

For quantitative analysis, I have used secondary data related to the performance of telecom sector from various websites like Word bank, Department of Telecommunications, TRAI etc. and analyzed them to get an idea about the impact of various regulatory reforms on the Indian telecom sector.

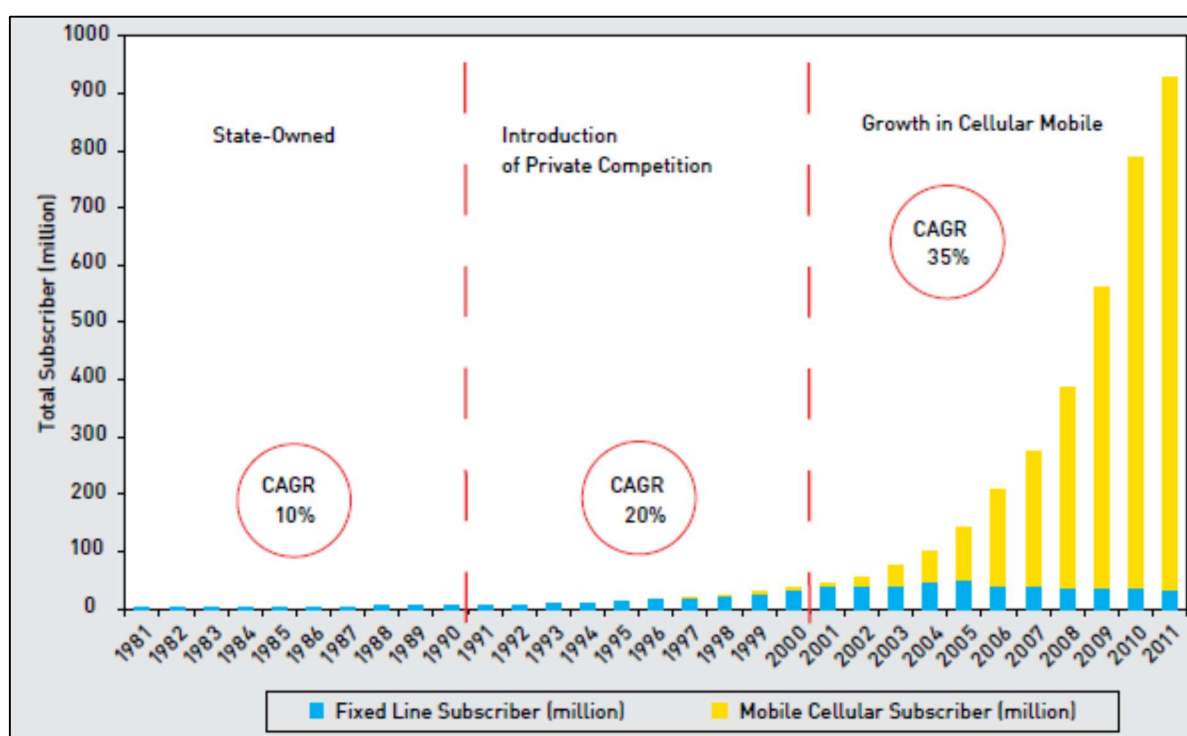
## **1.7. Relevance and Justification**

Growth of Telecommunication sector has played an important role in the development of the Indian Economy. The share of telecommunication service in GDP has increased from 0.96% in 2000-01 to 3.78% in 2009-10 (TRAI 2012). Figure 1.2 depicts the growth of India telecom subscribers during different periods. During 1980s, when Indian telephone sector was controlled by state owned entities, it observed compounded annual growth rate (CAGR) of 9%. During 1990s, after entry of private operators in the telecom sector, it observed a higher CAGR of 22% but during the period 2001 to 2011 its recorded highest CAGR of 35% primarily due to the high growth of mobile subscribers (TRAI 2012).

Positive and evolving regulatory framework has increased the participation of the private operators which resulted into high growth of mobile subscribers. Although mobile subscribers have recorded high growth rate but still development of telecommunication facility in rural areas and penetration of internet service in the country is far below the expectation.

The research will help in understanding the various dynamics operating behind the evolution of telecom policy and regulatory framework in India. The research will help to find the factors responsible for high growth rate of mobile service so that similar approach could be adopted for increasing the rural tele-density and internet penetration.

Figure 1.2: Different phases of growth of Indian Telephone Subscribers



Source: (TRAI 2012)

## 1.8. Scope and Limitations

The scope of research is limited to the first decade of the liberalization of Indian Telecom Sector starting from 1992 and till the migration to unified licensing regime in 2003.

The most important limitation of this research paper is that it is primarily based on the review of secondary data, government policy documents, court judgements, newspaper articles and other literatures. Being a secondary data based research, it may be possible that I may not be able to capture the actual dynamics working behind the regulatory reforms.

Being a Government sponsored candidate, subsequent to completion of my full time study period I reported back for my duty on 2<sup>nd</sup> September 2016. Therefore, during the period of Research paper writing (September to November 2016), I had to manage my official duties as well as research paper writing.

My past association with Bharat Sanchar Nigam Limited as Deputy General Manager may lead to some personal bias towards certain initiatives and policies which may influence the findings. I have tried my best efforts to reach to an unbiased conclusion.

## 1.9. Structure of the Research Paper

The Research Paper have six chapters as detailed below:

The **Chapter-1** is the introductory chapter which includes the present status of Indian telecom network, brief background about liberalisation process, research problem, research questions, research objective, research methodology and scope and limitations of the research. The **Chapter-2** explains various theories and concepts relevant to the research including literature review. **Chapter-3** is explaining various key organisations of Indian Telecom Sector responsible for evolution of telecom policies and regulatory framework. **Chapter-4** describes the evolution process of Unified Access Licensing Regime. **Chapter-5** is dealing with the analysis and discussion about the impact of various factors on the evolution of regulatory framework to unified access licensing regime. Finally, **Chapter-6** is related to the conclusion of the research paper.

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## **Chapter 2**

### **Theory and Concepts**

#### **2.1. Concepts**

##### **2.1.1. Regulation**

In past, telecommunications service in most of the countries has been provided by the monopoly public sector due to its consideration as a natural monopoly because of economies of scale and scope (Smith and Staple 1994: x). However, recently this responsibility has been shifted from state to private markets. Private markets can take any shape including competitive, highly oligopolistic or even monopolistic but in every case state regulation is a key requirement to protect consumers from the abuse of monopoly power of a private service provider or its dominant position in oligopolistic market. Due to shift in State's focus from service provisioning to regulation of market for economic and social welfare, Majone, has described it as "rise of the 'regulatory state'", whereas Jackson and Price mentioned it, "'invisible hand' of the market being supplemented by the 'visible hand' of regulators" (Cook 2004: 3).

State Regulation helps in maximising economic welfare by reducing the effect of market failures which normally occurs due to information asymmetry existing in the market or by virtue of being a natural monopoly sector. However, considering the risk associated with the misuse of state regulation, competitive market is preferred over regulated market for social welfare. Epistemic community has also recommended for adoption of regulation temporarily till the market become competitive. Cook (2004: 3) also observed that creating an effective regulation is a difficult and time taking process.

An independent regulator is normally established to provide a non-discriminatory treatment to all the players operating in the liberalised market. The UN Task Force has observed that "[t]he introduction and strengthening of independent, neutral sector regulation has helped to reinforce investor confidence and market performance, while enhancing consumer benefits" (InfoDev and ITU 2016). However, in order to meet its objectives, regulator need to be impartial, objective, non-partisan and independent from the political influence as well as regulated industry. These attributes can be enhanced by defining the clear responsibilities of regulator, ministry and country's other regulatory agencies. On the other hand, some check and balances are also required to ensure that regulator works within its legally defined authority. An accountable, transparent and predictable regulator has a high credibility and low regulatory risks (ibid.)

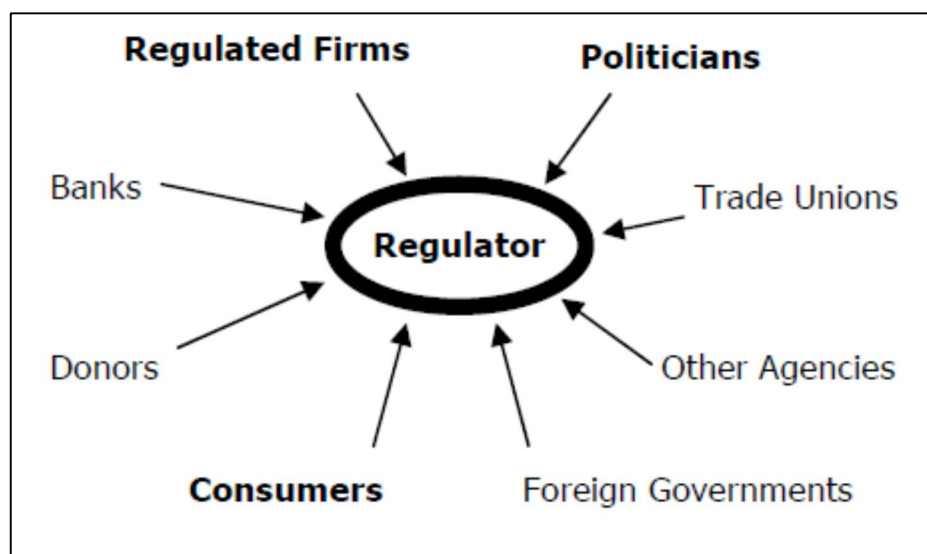


Regulatory reform is a process to keep the regulation responsive to surrounding economic, social and technical conditions. Deregulation, privatisation or increasing or decreasing level of government control are all various forms of regulatory reforms. The purpose of regulatory reform is to reduce the costs, enhance the efficiency and stimulate the innovation without compromising its objectives (OECD 2016).

### 2.1.2. Regulatory Capture

Regulation normally suffers from the risk of Regulatory capture, which is defined by Dal Bó (2006: 203) as a “process through which regulated monopolies end up manipulating the state agencies that are supposed to control them”. Unlike public interest theories of regulation, Stigler’s capture theory states that objective of regulation is to serve private interest rather than public interest by protecting the regulated firm from competitive pressure (Boehm 2007). However, capture theory does not consider the presence of other interest groups, who are also exerting counter pressure to protect their interests (refer figure 2.1). Interest group theories of regulation takes these factors into consideration and explains that defending interest is an expensive activity and due to free-riding problem of organising groups, smaller and already organised groups are in a better position to protect their interests in comparison to larger and diffused groups such as consumers. Despite all these differences, corruption, which is defined by Boehm (2007: 12) as “abuse of entrusted powers for private gains”, has been recognised as the main reason behind the regulatory capture. Out of all types of corruption, Boehm has identified legislative corruption and high-level bureaucratic corruption as the main cause behind the capture. Apart from monetary corruption, it can also be in non-monetary forms like status, power or future employment in the industry known as “Revolving door” phenomenon. Apart from corruption, asymmetric information between regulator and regulated firm is also another cause of capture (ibid.).

Figure 2.1: Regulator between different interests



Source: (Boehm 2007: 6)

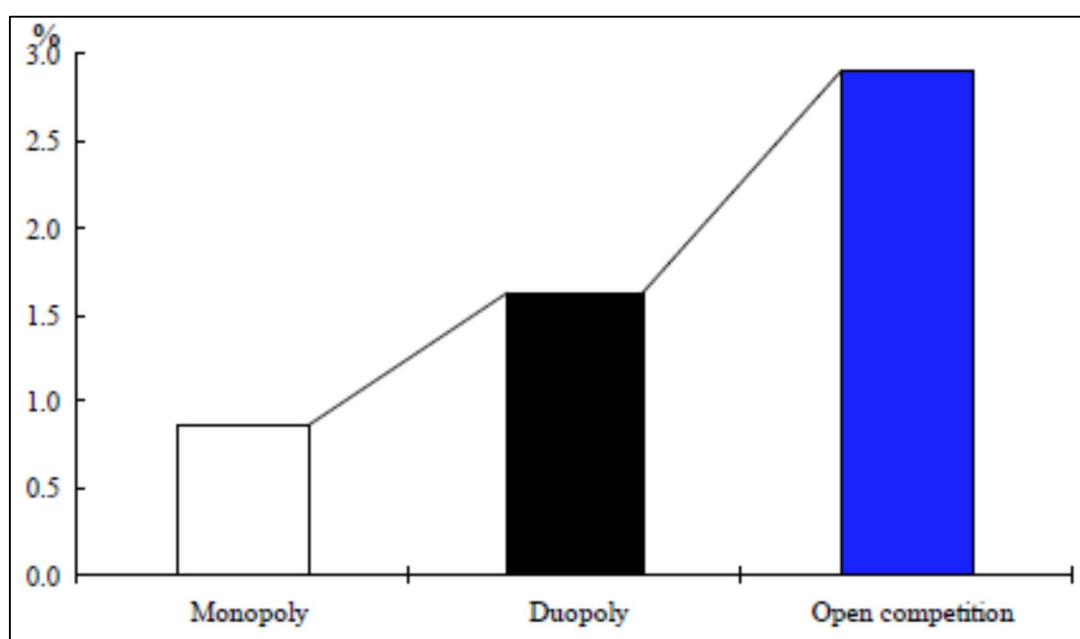
Regulatory capture can be categorised into ex-ante or ex-post capture based on the timings of the capture (Boehm 2007). Ex-ante capture targets the policy making process whereas ex-post capture aims to manipulate or modify the existing policy (ibid.).

Boehm (2007) observed that corruption provides special incentive to an individual firm on the cost of other competing firms, whereas lobbying provide a legitimate way for group of firms to protect their interest in a democracy. He further observed that corruption need to controlled by following anti-corruption measures whereas lobbying need to be regulated in a transparent way (ibid.).

### 2.1.3. Regulation and Innovation

According to Mulgan and Albury (2003: 3), “Successful innovation is the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in outcomes efficiency, effectiveness or quality”. Regulation plays a great role in promoting as well as obstructing innovation. On one hand regulation helps in creating suitable environment for research and innovation, while on other hand they can also obstruct the innovation by creating certain barriers of uncertainty and cost of development process (OECD 2016). OECD observed that regulatory regime of a country also affects the diffusion of technology. As shown in figure 2.2, monthly growth of mobile subscribers increases with change in regulatory regime from monopoly to duopoly to open competition (ibid.).

Figure 2.2: Monthly growth of mobile subscribers per 1000 populations in OCED countries during 1994



Source: (OECD 2016)

Similarly, technological innovation also affects the regulation. Certain technical changes render some regulation redundant or obsolete. Technological developments also blur the boundaries between different services which increases the necessity of converged or unified regulation (OECD 2016). Accordingly, regulatory system need to be modified either to support or obstruct the technological developments. Regulation also need to ensure that law enforcing techniques are evolutionary with technology so that society can be easily protected from the abuse of these developments (InfoDev and ITU 2016).

## 2.2. Game Theory

According to Turocy and Stengel (2001: 4), Game theory is a mathematical tool to study “conflict and cooperation” among interdependent agents by analysing their strategic choices. Cooperative game theory studies the impact of cooperation among different players whereas non-cooperative game theory studies about the strategic choices of the players. Game theory assumes that rational players always choose an action which gives most preferred output based on the expected action of the opponent (ibid.).

### Prisoner’s Dilemma

Prisoner’s Dilemma is a classic example of strategic choices available with two prisoners, who are interrogated independently about the true culprit. Each prisoner has two choices: remain silent or cooperate with the police by becoming an eyewitness of the crime. Table 2.1 is a representation of this game in strategic form, where rows, columns and numbers in cells represent the strategies of Prisoner-I, Prisoner-II and payoff of both Prisoners (lower left for Prisoner-I and upper right for Prisoner-II) for each combination of strategies respectively (ibid.).

Table 2.1: Prisoner’s Dilemma

I \ II		
	Remain Silent	Cooperate the police
Remain Silent	2, 2	0, 3
Cooperate the Police	3, 0	1, 1

In this game, if Prisoner-I and Prisoner-II both decided to remain silent, then police will not be able to establish the actual charges against both of them and they may be sentenced for normal imprisonment say one year for some other established minor charges like keeping

arms (payoff has been taken as two for each of them). If Prisoner-I remain silent and Prisoner-II cooperate with the police by becoming an eyewitness, then prisoner-II may be rewarded by giving no sentence while Prisoner-I may be sentenced for maximum imprisonment say eight years (which means maximum payoff for Prisoner-II and minimum payoff for Prisoner-I). The situation will be just reverse in case Prisoner-II remain silent and Prisoner-I cooperate with the police by becoming an eyewitness. However, if both the Prisoners cooperate with the police by becoming eyewitnesses, then both of them may be sentenced for imprisonment of lower period say three years (payoff has been taken as one for each of them) (ibid.).

Taking a decision about the best strategy is the major dilemma of both the prisoners. However, they will try to maximise their individual payoff by choosing such strategy which gives best payoff irrespective of the decision of other prisoner. In present situation, cooperating police by becoming an eyewitness seems a better choice in comparison to remaining silent. Accordingly, both prisoners may individually choose to become eyewitness and end up with an imprisonment of three years whereas their ideal choice should be to remain silent and get an imprisonment of one year (ibid.).

### **2.3. Stakeholder Analysis**

Dearden et al. (2002: 2.1) have described stakeholder analysis as a tool “to identify the interests of different groups and find[ing] ways of harnessing the support of those in favour of the activity, while managing the risks posed by stakeholders who are against it”. The analysis primarily comprises two components: identification of stakeholders along with their interest; and their importance and influence on the activity. Stakeholder can be any person or group, who has an interest in the rollout of the activity and can be classified into three categories: key, primary and secondary stakeholders. Key stakeholders are very influential and important actors for the activity. Primary stakeholders are those who are affected by the outcome of the activity whereas secondary stakeholder are those who have some interest or role in the activity (ibid.). Accordingly, stakeholder analysis of all actors involved in the process of regulatory change has been carried out to understand their role in the process.

### **2.4. Literature Review**

Gupta and Jain (2016: 339) observed that “diffusion of CDMA technology has been more rapid than that of GSM. CDMA service providers touched the 50-million-subscriber mark after four years of CDMA launch, whereas GSM operators needed more than 10 years to reach this target”. They found following main reasons behind the rapid growth of CDMA technology:

- People were already acquainted with mobile services due to existence of GSM technology.
- CDMA operators’ first priority was to cover the so far uncovered areas.

- CDMA operators provided mobile handsets at very cheap and affordable price which helped in removing the entry barrier (ibid.).

Gupta and Jain (2016: 340) also observed that “despite product and service innovations and faster diffusion, the market share of the CDMA service has not yet exceeded that of GSM” due to “first-mover advantage” enjoyed by GSM technology.

While talking about benefits of auctions over other methods, Chowdhury and Datta (2009: 289) observed that auctions also have problems like “winner’s curse, where the winner bids an exorbitant amount but the deal finally fails to pay off” and “post contract opportunism where after winning the [bid], the winner may refuse to pay the committed amount”.

Bourreau and Doğan (2001: 168) has characterised the Telecommunication as the most dynamic industry among all the sectors, which are having separate regulation, due to its “high speed of innovation”. Competition in the sector increases with the innovation of new services by telecom operators. Although regulation is mainly used to maximise the growth of the market to achieve the lower costs of the services but it also need to be dynamic enough to follow the quick change in market otherwise it will not be able to achieve its objectives (ibid.).

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## **Chapter 3**

### **Organisational Framework**

This section describes key organisations of Indian Telecom Sector responsible for evolution of telecom policies and regulatory framework.

#### **3.1. Department of Telecommunications**

Department of Telecommunications (DoT), under the Ministry of Communications, is the nodal agency responsible for the development of the telecommunication industry in India. Its main tasks are:

- formulating policies for the development of the telecom sector,
- awarding telecom licenses,
- spectrum management,
- administration of the universal service obligation fund (USOF) created for supporting the provision of village public telephones and rural exchange lines.

#### **3.2. Telecom Regulatory Authority of India**

In the emerging multi-operator scenario, where private operators were competing with the government owned entities, it was felt necessary to separate the regulatory function of the government from the service providing function. Accordingly, in 1997, Parliament of India enacted 'Telecom Regulatory Authority of India Act 1997' for constitution of an independent and quasi-judicial regulator in telecom sector namely Telecom Regulatory Authority of India (TRAI) to regulate the telecommunication services and to protect the interests of service providers and consumers (Government of India 1997). As per the act, the authority shall consist of a chairperson and two to six members. A judge of supreme court or chief justice of a high court was eligible for appointment to the post of chairperson and person having special knowledge or professional experience in telecommunication, industry, finance, accountancy, law, management or consumer affairs was eligible for appointment to the post of a member. Appointments were for a fixed period of five years with the restriction of upper age limit of sixty-five years for members. They were not allowed to undertake any commercial employment within a period of two years of the vacation of post except state or central government employment. Authority has to take its decisions by majority of votes of the members present in the discussion (ibid.).

Government assigned following major functions to TRAI, while retaining the function of licensor:

- recommending need and timing for introduction of new service provider and terms and conditions of their licence,
- ensuring compliance of terms and conditions of licence by the service provider and recommending revocation of licence in case of non-compliance,
- ensuring growth of the telecom sector by facilitating competition and promoting efficiency,
- protecting the interest of the subscribers,
- monitoring the quality of service provided by the service providers,
- settlement of disputes between service providers and facilitating inter-connection and revenue sharing agreements between them (ibid.).

However, over a period of time many disputes arose regarding clarification about power and functions of the TRAI, which created a necessity for restructuring and strengthening of TRAI and accordingly Government of India (2000) amended certain provisions of TRAI Act 1997 by issuing amendment on 24<sup>th</sup> January 2000. After this amendment, a clear distinction has been made in the recommendatory and regulatory functions of the TRAI. Now it is statutorily mandatory for the Government to seek the recommendations of TRAI in respect of the licensing matters though the recommendation is still not binding upon the Government. In case, Government finds that recommendations cannot be accepted then it shall refer the matter back to TRAI for reconsideration and after receipt of further recommendation, Government is free to take any decision (ibid.).

Composition of TRAI has also been amended vide this act and it shall now consist of a Chairperson, and not more than two whole time and two part-time Members. The person earlier eligible for appointment as Member can now be appointed as Chairperson also. Terms of appointment of both were also reduced to a period of three years or till their attaining the age of sixty-five years, whichever is earlier. They also allowed to take any commercial employment after a period of one year of the vacation of post (ibid.).

On 9<sup>th</sup> January 2004, TRAI was also assigned the responsibility to regulate the broadcasting and cable sector in addition to telecom sector (Department of Telecommunications 2016c).

### **3.2.1. TRAI's Consultation process**

Consultation process is a best way to involve citizens and regulated firms in the decision making process of the regulator. It not only increases the legitimacy of the regulator but also helps in collecting the feedback of stakeholders on various policy matters. Once the feedback of stakeholders is incorporated in a policy decision, chances for its success becomes maximum. Consultation process can be formal or informal in nature.

TRAI has adopted a formal consultation process for seeking feedback of stakeholders. For this purpose, TRAI prepares a consultation paper, which includes all information on the matter under consideration along with the specific points on which feedback of stakeholders are invited and put it on its website. TRAI also publishes a short notice in leading newspapers to intimate the stakeholders about the consultation paper.

In some cases, TRAI also conducts public meetings at different places to discuss the issues. Sometimes, TRAI also seek opinion of experts of the subject by inviting them for discussion. After receiving inputs from various stakeholders, TRAI compile them and place the compiled responses on their websites for information of the public. Based on the feedback of stakeholders, TRAI also finalise its recommendations after evaluating pros and cons of each alternatives and submit its detailed recommendations to the Government. Placing every information on website gives an indication of transparent process. Sometime, when issue under consideration is too complex, TRAI issues a pre-consultation paper for seeking inputs from stakeholders for preparing the consultation paper.

### **3.3. Telecom Disputes Settlement and Appellate Tribunal**

TRAI's adjudicatory powers have also been replaced by establishment of a separate dispute redressal body, known as the 'Telecom Disputes Settlement and Appellate Tribunal', to adjudicate any dispute between a licensor and a licensee, between two or more service providers, between a service provider and a group of consumers, and to hear and dispose of appeals against any direction, decision or order of TRAI. The Appellate Tribunal have a chairperson and not more than two members. A judge of supreme court or chief justice of a high court is eligible for appointment to the post of chairperson and secretary level officer or person having special knowledge in the field of technology, telecommunication, industry, commerce or administration is eligible for appointment to the post of member. There appointment is made by Government in consultation with the Chief Justice of India for a maximum term of three years (Government of India 2000).

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## **Chapter 4**

### **Evolution of Unified Access Licensing Regime**

This chapter describes the sequence of events which led to migration to service neutral unified access licensing regime from service specific licensing regime in Indian telecom sector.

#### **4.1. Historical Background**

Journey of growth of Indian Telecommunications sector is very long and filled with many ups and downs. It started in 1851, when first telegraph line was laid in India under British rule mainly for the purpose of maintaining law and order (Subramanian 2008: 3). In 1947, when India got independence, its telecom network was very small comprising 86,000 subscribers with negligible tele-density of 0.025. After Independence, the Government of India decided to retain the telecom sector under the exclusive domain of the state and followed the colonial legacy of Indian Telegraph Act 1885. Under state monopoly, its growth remained restricted mainly due to limited availability of funds and also due to consideration of telephones as luxury rather than an essential service (ibid.).

In 1985, Department of Telecommunications (DoT) was created under the Ministry of Communications by separating it from Postal system with the aim to provide focus on enhancing the quality of telecommunication services in India (Athreya 1996: 4). One year later, in 1986, two corporate entities were established: Mahanagar Telephone Nigam Limited (MTNL) for providing local telephone services in the metropolitan areas of Delhi and Mumbai and Videsh Sanchar Nigam Limited (VSNL) for providing exclusive international telecommunication services. In 1989, Telecom Board (now known as Telecom Commission) was set up as a policy making body within the DoT to speed up the decision making process about the telecom sector (ibid.).

#### **4.2. Opening up of Cellular mobile sector for private operators**

According to Sridhar (2011: 23), “realizing that the development of world-class telecommunication infrastructure was the key to rapid economic growth and social change in the country, India embarked on the process of liberalization of the telecommunications sector in the early 1990s”. During the initial phase of liberalisation, private operators were allowed to provide only ‘value added services’ such as radio paging and cellular mobile service. In 1992, bids were invited for selection of two private operators for providing cellular mobile service in each of the four metropolitan cities (Delhi, Mumbai, Kolkata, and Chennai) using ‘Global Systems for Mobile Communication (GSM)’ technology. On completion of bidding process, licences were awarded to two private operators for each of the four metro cities in November

1994 and first cellular mobile service was started from Kolkata on 31<sup>st</sup> July 1995 (Sridhar 2011, Department of Telecommunications 2016b).

Government of India announced National Telecom Policy (NTP) in May 1994 which reaffirmed that “[p]rivate investment and association of the private sector would be needed in a big way to bridge the resource gap” (Department of Telecommunications 1994). This policy also allowed the private operators to provide basic telephone service. To continue with the process of liberalisation, during the period of 1995 to 1998, thirty-four more licences were awarded to fourteen private operators for providing cellular mobile service in eighteen Telecom Circles<sup>3</sup> restricting two operators in each of the Telecom Circle (Department of Telecommunications 2016b).

As per licence terms and conditions, these private operators were to pay a fixed amount, as agreed during bidding process, as an annual licence fees. Sridhar (2011) observed that successful operators quoted very high amount for annual license fees in order to acquire the licence but subsequently realised that the actual revenue is far less than the projected revenue and found themselves as victims of “winner’s curse” problem. Apart from low revenue potential, high annual licence fees also caused huge losses to the private operators. They were not able to fulfil their obligation towards licence fees and their liability towards licence fee reached to the level of Rs 3,779.45 Crores<sup>4</sup> by the end of May 1999 (Comptroller and Auditor General of India 2005). Government also recognised that private participation has not resulted into satisfactory performance and lack of financial resources due to poor revenue potential is the main reason behind this performance (Department of Telecommunications 1999). In order to give relief to private operators, Government announced adoption of revenue sharing regime in new National Telecom Policy 1999, under which service providers were required to pay a certain percentage of their adjusted gross revenue (AGR) as an annual licence fees apart from one-time entry fees but in turn they have to leave their duopoly status and face more competition in the market by entry of new operators. All existing cellular operators were migrated to new regime of revenue sharing w. e. f. 1<sup>st</sup> August’1999 considering their outstanding dues towards licence fees up to 31<sup>st</sup> July’1999 as a payment towards one-time entry fee. Subsequently, Government prescribed the annual licence fee as 12 per cent, 10 per cent and 8 per cent of AGR for category A, B and C Telecom Circles respectively (Sridhar 2011). Details of licence fees commitment of cellular operators as per bid, entry fees paid for

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<sup>3</sup> Whole country is divided into twenty-three Telecom Circles (including four Metro) for the purpose of granting cellular mobile licence and most of the Telecom Circles are coterminous with a state boundary, except a few smaller states are clubbed into one Telecom Circle like six north eastern states (Arunachal Pradesh, Manipur, Mizoram, Meghalaya, Nagaland and Tripura) and Uttar Pradesh, being a very large state, is split into two Telecom Circles. These Telecom Circles are categorised as A, B and C based on the expected revenue potential with category C being the lowest revenue potential telecom circle.

<sup>4</sup> One Crore= Ten Million

migration to revenue sharing regime and entry fees quoted by fourth cellular operator is given in Table 4.1.

Table 4.1: Reduction in licence fees commitment of cellular operators subsequent to migration to revenue sharing regime

S No.	Telecom Circle	Category	Number of operators at the time of migration	Average Licence fees quoted in bid (in Rs Crore)	Average entry fees paid on migration to revenue sharing (in Rs Crore)	Entry Fees quoted by fourth operator (in Rs Crore)
1	Andhra Pradesh	A	2	1001	284.755	103.01
2	Gujarat	A	2	1794	510.365	109.01
3	Karnataka	A	2	1393	385.37	206.83
4	Maharashtra	A	2	1657.5	471.565	189
5	Tamil Nadu	A	2	836	141.455	79
6	Haryana	B	2	240	68.49	21.46
7	Kerala	B	2	517	147.53	40.54
8	Madhya Pradesh	B	2	5.1	14.56	17.45
9	Punjab	B	2	1266	423.755	151.75
10	Rajasthan	B	2	382	108.665	32.25
11	Uttar Pradesh (W)	B	1	422	115.92	30.55
12	Uttar Pradesh (E)	B	1	812	138.25	45.25
13	West Bengal including Andaman and Nicobar Islands	B	1	42	12.24	-
14	Assam	C	1	1	0.38	-
15	Bihar	C	1	273	89.5	-
16	Himachal Pradesh	C	2	15	4.27	1.1
17	North East	C	2	2	1.21	-
18	Orissa	C	1	178	58.49	-
19	Jammu & Kashmir <sup>5</sup>	C	-	-	-	-
20	Delhi	Metro	2	-	84.545	170.7
21	Mumbai	Metro	2	-	86.095	203.66
22	Chennai	Metro	2	-	21.27	154
23	Kolkatta	Metro	2	-	28.65	78.01

Source: (Sridhar 2011: 79, TRAI 2003b)

<sup>5</sup> In Jammu & Kashmir Telecom circle, cellular service started in August 2003, and private operators entered the market only in October 2004.

It shows that licence fees commitment of cellular operators has reduced substantially subsequent to migration to revenue sharing regime. Similarly, license fee obligation of fourth cellular operator reduced further in all Telecom Circles except Metro Cities.

Though NTP 1999 envisaged for unlimited competition in the cellular market, but Government decided to restrict the number of cellular operators to four due to limited availability of radio spectrum. Accordingly, in 2001, MTNL/ BSNL were awarded licence as third operator to provide cellular mobile services. Licences for fourth operator were issued in August'2001 after following the bidding process (Sridhar 2011).

### **4.3. Opening up of Basic Telecom sector for private operators**

Basic or fixed telecom service has always been considered as a 'natural monopoly' service mainly because of high fixed and sunk cost of local loop or last mile connectivity. In India, local loop has been provided primarily by laying underground cables which is very time consuming, expensive and difficult specially in congested areas. Before opening up of the sector for private players, DoT was solely responsible for providing the basic telecom service in whole country except metropolitan areas of Delhi and Mumbai where MTNL was providing the service. At the time of announcement of NTP 1994, DoT/ MTNL were not able to meet the demands of the people as 2.5 million subscribers were waiting for telephone connections as against total working connection of 8 million (Department of Telecommunications 1994). In order to meet the demands of the people, Government announced opening up of Basic Telecom Service for private operators in NTP 1994 as a duopoly market, where private operator has to compete with the incumbent public operator to provide basic telecom service. However, they were still not allowed to provide more lucrative long distance services like national long distance (NLD) and international long distance (ILD). As per policy, every operator had to obtain different licence for providing different services. For the purpose of granting licences for basic telecom service, whole country was divided into twenty-one<sup>6</sup> telecom circles unlike twenty-three telecom circles for cellular mobile licence. Although there was long waiting list of subscribers who wanted telephones but huge cost of setting up of fixed telecom network and government controlled pricing policy deterred the private operators to participate in the process. Initially, licences could be given only for six telecom circles leaving fifteen telecom circles without any new entrants for increasing competition. Licence fees paid by these six operators is shown in Table 4.2. Out of these six operators, only two could commence services by 1999 (Department of Telecommunications 1999, Sridhar 2011: 36-40).

Growth of basic telecom service primarily depends on the availability of cost effective local loop or last mile connectivity and basic service providers were finding it very difficult to lay

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<sup>6</sup> Three metro cities (Chennai, Mumbai and Kolkatta), which were considered separate telecom circle for cellular mobile service, have been considered a part of their respective states and Andaman & Nicobar Island has been considered a separate telecom circle for the purpose of basic telecom service licence. Telecom Circles have also categorised as A, B and C like cellular mobile licence.

the underground cables for last mile connectivity specially in congested areas. To address this problem, new telecom policy announced by Government in 1999 allowed basic service operator (BSO) to adopt Wireless in Local Loop (WLL) technology for providing fast and cost effective last mile connectivity apart from allowing them to migrate to revenue sharing regime similar to cellular operators (ibid.).

Table 4.2: Details of Licence fees paid by Basic Service Providers

S No	Operator	Telecom Circle	Category	First Year Licence Fee (in Rs Crore)	Total Licence Fee (payable over 15 years) (in Rs Crore)	Entry fees paid for migration to revenue sharing regime (in Rs Crore)
1	Tata Tele-Services	AP	A	120.5	4,200.00	161.47
2	Reliance Telecom	Gujarat	A	97.04	3,396.00	179.09
3	Hughes Ispat	Maharashtra	A	397.4	13,909.00	532.55
4	Bharti	MP	B	19.2	654.5	35.33
5	Essar Commvision	Punjab	B	131.24	4,593.40	177.59
6	Shyam Telcelink	Rajasthan	B	10	1,110.00	29.29

Source: (Sridhar 2011: 38, TRAI 2003b)

NTP 1999 also provided that the amount of entry fees, percentage of revenue share and criteria for selection of new operators will be decided on the basis of recommendations of TRAI. Accordingly, DoT sought the recommendation of TRAI on 23<sup>rd</sup> April'1999. TRAI submitted its recommendations to DoT on 31<sup>st</sup> August'2000 after seeking inputs from all stakeholders viz., Service Providers, Consumers and Consumers' Organizations, Financial Institutions and Banks, Policy Makers and Research Institutions by issuing a consultation paper on 12<sup>th</sup> June'2000 (TRAI 2000a). However, on 9<sup>th</sup> October'2000, DoT referred the matter back to TRAI for seeking certain clarifications. On 31<sup>st</sup> October'2000, TRAI submitted its clarifications on all the matters except the matter of offering of WLL mobile service by the basic service operators because this issue was not a part of the original recommendations of the TRAI and TRAI needed some time to seek the inputs of all stakeholders after following its usual process of consultation before giving any recommendations as the issue was very critical and had a long term impact on basic as well as mobile services (TRAI 2010).

Meanwhile, as per the recommendations of TRAI, Government decided to open up the basic telecom services without putting any restrictions on the number of operators and accordingly

bids were invited for second round of licensing in 2001 under revenue sharing regime. Details of prescribed entry fees, percentage of revenue share and successful bidders is mentioned in Table 4.3.

Table 4.3: Prescribed Licence fees for second round of bidding for basic telecom service and successful bidders

S No	Telecom Circles	Category	Entry fee (in Rs Crore)	Percentage of Revenue as Annual Licence Fee	Successful bidder (s)
1	Andhra Pradesh	A	35	12	Reliance
2	Delhi	A	50	12	TTSL, Reliance
3	Gujarat	A	40	12	TTSL
4	Karnataka	A	35	12	TTSL, Reliance, Bharti Telnet
5	Maharashtra (including Mumbai and Goa)	A	115	12	Reliance
6	Tamil Nadu (including Chennai)	A	50	12	TTSL, Reliance, Bharti Telnet
7	Haryana	B	10	10	Reliance, Bharti Telnet
8	Kerala	B	20	10	Reliance
9	Madhya Pradesh (including Chhattisgarh)	B	20	10	Reliance
10	Punjab	B	20	10	Reliance
11	Rajasthan	B	20	10	Reliance
12	Uttar Pradesh (East)	B	15	10	Reliance
13	Uttar Pradesh (West) (including Uttaranchal)	B	15	10	Reliance
14	West Bengal (including Kolkata)	B	25	10	Reliance
15	Andaman and Nicobar	C	1	8	Reliance
16	Assam	C	5	8	-
17	Bihar (including Jharkhand)	C	10	8	Reliance
18	Himachal Pradesh	C	2	8	Reliance
19	Jammu and Kashmir	C	2	8	-
20	North East	C	2	8	-
21	Orissa	C	5	8	Reliance

Source: (Sridhar 2011: 40, TRAI 2003b)

## **Differences between WLL and GSM technology**

WLL or 'Wireless in Local Loop' provides wireless link for fixed subscriber as last mile connectivity i.e. connectivity between customer and telephone exchange. There are mainly three types of wireless access technology for providing wireless link:

- i. Frequency Division Multiple Access (FDMA)- It uses different frequency to provide access to different users.
- ii. Time Division Multiple Access (TDMA)- It allows different users to access a common frequency on different time slots.
- iii. Code Division Multiple Access (CDMA)- It allows different users to access same frequency all times but using different randomly generated code for each users.

GSM is a mobile standard originated in Europe in 1990 and based on TDMA. It became popular all over the worlds except U.S.A. where CDMA was more popular. CDMA was developed by Qualcomm Inc. and it became an international standard in 1995.

### **4.4. Allowing Basic Service Operators to provide limited mobility using WLL**

NTP 1999 allowed basic service operators to adopt any technology for extending 'last mile' connectivity including WLL for which frequency spectrum would be made available on payment of additional one time fees over and above the basic service licence fees.

Considering the fact that the WLL technology has the capability to provide mobility, BSOs started demanding for allowing them to provide mobility to its fixed subscribers using WLL. Telecom Commission also recommended for providing mobility using WLL but only in limited local area i.e. Short distance charging area<sup>7</sup> (SDCA). For restricting the roaming of WLL subscribers to other areas, Telecom Commission suggested for using numbering plan of local area and not allocating frequency band reserved for GSM technology to BSOs. However, Government favoured to allow full mobility within the boundaries of a Telecom Circle in order "to ensure competition and deregulation of the cellular sector keeping pace with the trends in National Long Distance, International Long Distance, Basic Service sector of Telecommunications" (TRAI 2000b: 5). Before taking any final decision, DoT referred the matter to TRAI on 9<sup>th</sup> October'2000 seeking its recommendations on the issue of allowing mobility to WLL subscribers.

TRAI (2000b) mentioned that Wireless in Local Loop (WLL) is a faster alternative to the underground cable for providing last mile connectivity as laying underground cable is very expensive, difficult and time consuming specially in congested areas. TRAI also mentioned that though basic service providers have allowed to use WLL for extending last mile connectivity

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<sup>7</sup> SDCA is defined as the area which can be served by a local exchange and mostly coterminous with *Tehsils*. At present there are 2645 SDCAs in India.

but as per license conditions they are not allowed to provide mobility and once mobility is allowed on WLL then there will be no distinction between the fixed and mobile service being provided by different operators using different technologies i.e. WLL and GSM respectively. With this background information, TRAI (2000b: 2) circulated a consultation paper on 3<sup>rd</sup> November'2000 seeking views of all stakeholders on the issues, "whether mobility should be provided to WLL subscribers and if so, what should be the extent of this mobility and what will be its impact on various Licensing and Regulatory issues".

In response to this consultation paper, TRAI received useful inputs from various stakeholders, which can be segregated into two categories: one supporting mobility in WLL and another opposing it.

### **Arguments supporting mobility in WLL**

- Cellular mobile telephones are very useful for the society but common people has not been able to reap its benefit due to high price. Allowing mobility in WLL will extend these benefits to common people at affordable price though in limited sense.
- Instead of denying the benefits of alternative and cheap facility to subscribers on the ground of non-compliance with existing policy, efforts should be made to realign the policy so that such benefits could be extended to common people.
- WLL mobile handsets are available at a cheaper price in comparison to WLL fixed phone (TRAI 2001).

### **Arguments opposing mobility in WLL**

- Cellular mobile service operators opposed the WLL with limited mobility as they found it a 'back door' entry for BSOs to access the cellular market.
- CMSOs also feared that they are going to lose their market because BSOs will be able to provide a comparable mobile service and that too at lower price due to cross subsidisation from other remunerative services.
- CMSOs also argued that permitting mobility in WLL will violate the terms and conditions of their licence. BSOs should obtain cellular mobile licence before offering such facility to their subscribers.
- Limited availability of spectrum could result into poor service quality due to high demand which may lead to customer dissatisfaction (Ibid.).

TRAI (2001) examined both categories of arguments and observed that both services cannot be treated as comparable because they are offering different extent of mobility. On one side, GSM subscribers are provided with the facility of seamless national and international roaming whereas such facility is not available for CDMA subscribers. Regarding claim of CMSOs about violation of licence terms and conditions, TRAI observed that subsequent to migration to new revenue sharing regime under NTP 1999, they had accepted the condition of opening up of



market for new operators and hence there is no violation of licence terms and conditions. After considering views of all stakeholders, TRAI (2001: 2) observed that “circle-wise mobility sought by the BSOs cannot be permitted on the WLL platform as it will pose a number of techno-economic and regulatory problems” and recommended that “WLL mobility is not the same as that of Cellular Mobile Services and that the disturbance expected to be created in the level playing field by the BSOs introducing this service can be evened out by making necessary policy changes, permitting WLL with mobility within the local area i.e. Short Distance Charging Area (SDCA) will be in the best interests of the consumer and the telecom services in the country”. In order to provide level playing field between BSOs and CMSOs, TRAI recommended various suggestions like rationalising the annual licence fees for CMSOs and BSOs, increasing the number of interconnection points for CMSOs, allowing CMSOs to provide fixed telephone service based on GSM technology, allowing them to retain similar share of long distance calls as retained by BSOs etc. (ibid.).

On the basis of the recommendations of TRAI, DoT issued guidelines on 25th January, 2001 stating that

Basic Service Operator shall be allowed to provide mobility to its subscriber with Wireless Access Systems limited within the local area i.e., Short Distance Charging Area (SDCA) in which the subscriber is registered. While deploying such systems, the operator has to follow numbering plan of that SDCA and it should not be possible to authenticate and work with the subscriber terminal equipment in SDCAs other than in which it is registered. The system shall also be so engineered so as to ensure that hand over of subscriber does not take place from one SDCA to another SDCA while communicating (TDSAT 2003: 52).

#### **4.5. Entry of M/s Reliance Infocomm as Basic Service Operator**

In second round of bidding for basic telecom services, M/s Reliance Infocomm obtained licences for 17 Telecom Circle on 20<sup>th</sup> July'2001 in addition to existing one licence for Gujarat Telecom Circle. By this time, DoT had also issued the guidelines for allowing Basic service operators to provide limited mobility to its subscribers using WLL. Reliance announced launch of its nationwide limited mobility service using CDMA technology on the 70<sup>th</sup> birthday of late Shri Dhirubhai Ambani, founding chairman of the Reliance Group i.e. 28<sup>th</sup> December' 2002 with very low and ambitious tariff (Rediff.com 2002).

Reliance Infocomm offered three attractive schemes to its subscribers to fulfil the vision of its founding chairman “to provide the latest telecommunication facilities to every Indian at the price of a postcard” (Varghese 2006: 4). One of them was 'Dhirubhai Ambani Pioneer' offer under which subscribers had to pay one-time fee of Rs. 3,000/- and monthly charge of Rs. 600/- for three years in order to get a free digital mobile phone along with various other unique facilities like unlimited free incoming calls, charging on the basis of 15 seconds pulse

rate instead of one minute, monthly free outgoing calls for 400 minute etc. (Rediff.com 2002). Comparison between 'Dhirubhai Ambani Pioneer' offer and other existing cellular mobile offers is given in Table 4.4.

Table 4.4: Comparison between 'Dhirubhai Ambani Pioneer' offer and other existing cellular mobile offers

Dhirubhai Ambani Pioneer Offer	Existing GSM mobile offers
Free Digital mobile phone bundled with service	Handsets to be purchased separately. Minimum cost of purchase Rs. 7500/-.
Unlimited free incoming calls	Incoming calls chargeable
15 second pulse billing	One-minute pulse billing
Long distance calls to any Reliance phone charged at Rs 0.4 per minute	Long distance calls charged at Rs. 9 per minute onwards.
Free value added services like voice mail, call wait, call hold, call divert, CLIP, conferencing, SMS.	All value added services charged separately
Existing GSM handset can be exchanged for equivalent long distance time value	No such handset exchange scheme
Monthly rental of Rs 600/- which includes 400 minutes of free outgoing calls.	Rentals starting from Rs 350/-, but no free outgoing calls
Initially free Internet through Mobile	No provision for connecting to the Internet

Source: (Rediff.com 2002, Varghese 2006)

Entry of Reliance into the telecom market has enabled the common people to use mobile phone at very cheap and affordable price. High cost of mobile handsets has always been a barrier for new subscribers to adopt mobile services. Providing handsets through this bundling scheme has helped in reducing this entry barrier. After great success of 'Dhirubhai Ambani Pioneer' offer, Reliance launched another scheme 'Monsoon Hungama Scheme', which also helped in reducing the entry barrier further by offering mobile handsets at a nominal price of Rs 501/- only (Varghese 2006).

Apart from providing attractive and affordable schemes, Reliance provided all-India roaming facility to its CDMA subscribers in violation of licence norms of limited mobility taking the help of certain loopholes in the existing licensing regime. Licence restricted the use of same handset in area other than where it is registered apart from forbidding roaming. However, Reliance allowed the use of same handsets all over the India using various indigenous techniques like call forwarding, multiple registration scheme and over the air activation of subscriber terminal outside one's SDCA by pressing certain numbers like \*444N (Rediff.com 2003a, Rediff.com 2003b). DoT observed that the roaming service provided by Reliance Infocomm is in gross violation of the license condition and issued a notice to discontinue the service (ibid.).

#### **4.6. Objection of Cellular mobile service providers on WLL mobility issue**

Cellular mobile service providers were already against the policy of allowing limited mobility on WLL and issuance of guidelines by DoT in this regard on 25<sup>th</sup> January, 2001 ignited the fire further. CMSPs through its association i.e. COAI (Cellular Operators' Association of India) challenged DoT's guidelines in TDSAT on various grounds including that these guidelines are against the provisions of the NTP 1999. On 15<sup>th</sup> March, 2002 TDSAT dismissed the petition stating that "granting limited mobility in WLL was a matter of policy of the Central Government on which Tribunal could not adjudicate" (TRAI 2003a: 4).

COAI challenged the TDSAT judgement in the Supreme Court of India on 11<sup>th</sup> April 2002. Supreme Court of India (2002) in its judgement dated 17<sup>th</sup> December 2002 mentioned that TDSAT has wide jurisdiction over the matter but "failed to assign sufficient or cogent reasons in support of its findings" and remitted back the matter to TDSAT for reconsideration.

Accordingly, TDSAT reconsidered the matter and after hearing the arguments of all parties, dismissed the petition of COAI on 8th August 2003, stating that,

We have seen no illegality or arbitrariness in either the procedures followed or the final decision taken by the Government to permit the Basic Service Operators to provide Limited Mobility Services as a value added service within the ambit of their licence. We also hold that allowing WLL with limited mobility in the basic service stream does not go against the spirit of NTP 1999 (TDSAT 2003).

TDSAT (2003) while acknowledging that "entry of Basic Service Operators with Limited Mobility services has affected the Cellular Mobile Service Providers in an area where competition hitherto was limited" recommended that an additional entry fees should be imposed on BSOs for providing limited mobility service. TDSAT (2003) also noted that limited mobility service is beneficial for whole nation by stating that:

We hold that WLL service with limited mobility will go a long way in increasing tele-density of the country and making available cheaper and affordable service and benefits accruing from evolving technology which are in conformity with the objectives of NTP 1999. Therefore, allowing WLL service with limited mobility would be in best interest of the telecom sector and consumers at large in the country. As long as WLL(M) service is provided as a value added service under a FSP licence, the existing distinctions between fully mobile Cellular Mobile Service and Limited Mobile Service being provided by WLL(M) service providers would have to be maintained.

Based on above judgement, DoT sought the recommendations of TRAI on 18<sup>th</sup> August 2003 for imposing additional entry fee on BSOs for providing limited mobility service using WLL. TRAI (2003e) observed that initially no additional entry fee was recommended for WLL mobility because they found that keeping low market price will be beneficial for overall growth

of the telecom industry due to increase in consumer demand. However, after TDSAT's judgement and based on views of stakeholders, TRAI (2003e) recommended following principles for imposing additional entry fees on 27<sup>th</sup> October 2003:

- The difference between entry fees paid by fourth cellular operator and new BSO has been taken as basis for calculating additional entry fees for providing WLL mobility.
- No additional entry fees will be charged in those Telecom Circle where no fourth cellular operator has participated in the bid.
- No additional entry fee is payable by old BSOs as they have already paid high entry fees.
- No additional entry fees will be charged in those Telecom Circle where BSOs have paid higher entry fee than the fourth cellular operator.
- Accordingly, TRAI recommended an additional entry fee of Rs. 69.75 Crores in Delhi, Rs. 55.81 Crores in Tamil Nadu (including Chennai), Rs. 44.8 Crores in Maharashtra (including Mumbai), Rs. 19.03 Crores in Punjab, Rs. 3.6 Crores in Karnataka, Rs. 28.07 Crores in West Bengal (including Kokatta) and NIL in remaining Telecom Circles for new BSOs for providing WLL mobility service (ibid.).

#### **4.7. Migration to Unified Access Licencing Regime**

Permitting WLL mobility had wide ranging impact on Indian Telecom Sector. On one hand, mobile telephone reached to the common people due to affordable price whereas on other hand CMSPs and BSOs entered into legal battle which caused an adverse effect on the growth of the telecom sector. When the issue could not be resolved for long time, TRAI took it as an opportunity for migrating the existing service specific licensing regime to unified licencing regime as per international trend. Many countries had either already adopted unified licensing regime or in the process of adopting the same. During this period, technological developments were also blurring the boundaries between different telecom services due to which telecom operators were able to provide services reserved for other operators could using their existing infrastructure. Therefore, it was necessitated to review the existing regulatory frameworks and adoption of new regime which supports technological developments instead of obstructing them. Under unified licensing regime, every operator is free to provide both basic as well as mobile service using any technology. Accordingly, TRAI (2003c) issued a consultation paper on 16<sup>th</sup> July 2003, inviting views of all stakeholders on main question "Should there be a unified license for basic and cellular mobile service in India?" and several other related questions.

#### **Comments of Stakeholders**

TRAI (2003d) received comments from forty-six stakeholders and most of them except COAI and Hutch (a CMSP) supported the idea of unified licensing regime. COAI and Hutch opposed the unified licensing regime on the basis of following arguments:

- Present policy and licensing regime does not permit unified licensing.
- Licensor cannot amend the terms and conditions of the licence unilaterally.
- As per international practice, unified licensing means a single licence for all telecom services whereas TRAI has proposed to unify only fixed and mobile service.
- COAI apprehended that main reason behind this consultation process is “to legitimise WLL(M) as a full cellular mobile service”.
- Consultation paper is silent on possible negative impact of unified licensing regime on consumers, service providers and telecom sector as a whole. It is also silent about proposed measures to avoid such impact (ibid.).

### **TRAI’s response on comments of stakeholders**

TRAI (2003b) invited views of all stakeholders on unified licence for basic and cellular service restricting the consultation process to only access network because in TRAI’s opinion, unification of access service could be helpful in the growth of tele-density which is the most crucial issue of the moment. On the suggestion of increasing the scope of unified licence to include other services such as national long distance, international long distance, internet service etc., TRAI mentioned that unified licensing for all services are not included in initial proposal because clubbing all services at once could be a very complex and time consuming process due to following reasons:

- These services are provided on national level unlike basic and cellular services being provided at Telecom Circle level.
- NLD and ILD services have recently been opened for private participation (ibid.).

On the opposition of COAI, TRAI (2003b) mentioned that licensor has the right to amend the terms and conditions of licence at any time in the national security, public interest, consumer interest or for proper conduct of telecom services. Apart from that, while migrating to revenue sharing regime cellular operators had accepted the condition for operating in unrestricted competitive environment, which is as stated below:

The Licensee shall forego the right of operating in the regime of limited number of operators after 01.08.1999 and shall operate in a multipoly regime, that is to say that the Licensor may issue additional licenses for the Service without any limit in the Service Area where the Licensee Company is providing Cellular Mobile Telephone Service (TRAI 2003b: 11).

On the issue of benefits to consumers and operators, TRAI mentioned that unified licensing will provide a litigation free environment which will helps in faster growth of the telecom sector (ibid.).

TRAI (2003b: 11), while observing that telecom sector has seen a tremendous growth subsequent to entry of WLL operators, mentioned that “Formulation of telecom regulatory

environment and strategy has to be based on the single priority of the moment, viz. increasing the availability of phone connections at affordable costs and tariffs and ensuring fast roll out of services”.

### TRAI’s Recommendations on Unified Licensing Regime

After considering various suggestions of stakeholders and keeping in view the interests of consumers and telecom sector as a whole, TRAI (2003b) recommended that country should migrate to unified licensing regime for all services. However, initially unified access licence for basic and cellular mobile service may be implemented in each telecom circle and subsequently process may be initiated for adoption of unified licence for all services in all geographical areas (ibid.).

TRAI (2003b) also recommended that entry fees paid by fourth cellular operators may be fixed an entry fees for migration to unified access licensing regime. Entry fees paid by BSOs would be adjusted while migrating. However, no additional fee is payable by BSOs in those circles where no fourth cellular operator is available (ibid.).

TRAI (2003b) also acknowledged that M/s Reliance Infocomm, despite having a licence as BSO, provided mobile service like cellular mobile service without putting any restriction on mobility using multiple registration/ call forwarding facility under the pretext that calls terminates at the time of moving from one SDCA to another. TRAI found it a violation of the terms and conditions of the BSO licence and proposed to impose a penal interest w. e. f. the date of signing its licence agreement till the date of migration to unified access licensing regime by considering that Reliance was providing cellular mobile service since beginning (ibid.). Entry fee recommended by TRAI for BSOs to be paid for migration to unified access licensing regime is mentioned in Table 4.5.

Table 4.5: Entry Fees payable by BSOs for migration to Unified Licensing Regime

S. No.	Circle	Date of signing of license agreements	Entry Fee Paid by BSO (in Rs Crores)	Entry Fee paid by 4th Cellular Operator (in Rs Crores)	Difference between entry fees of BSOs & CMSOs (in Rs Crores)
1	<b>Operator: Reliance</b>				
	Rajasthan	20.7.2001	20	32.25	12.25
	UP(East)	20.7.2001	15	45.25	30.25
	Gujarat	18.3.1997	179.09	109.01	0
	Maharashtra including Mumbai	20.7.2001	115	189+203.66= 392.66	277.66
	Karnataka	20.7.2001	35	206.83	171.83
	Punjab	20.7.2001	20	151.75	131.75

	AP	20.7.2001	35	103.01	68.01
	Haryana	20.7.2001	10	21.46	11.46
	Kerala	20.7.2001	20	40.54	20.54
	UP(West)	20.7.2001	15	30.55	15.55
	West Bengal including Kolkatta	20.7.2001	25	0+78.01=78.01	53.01
	MP	20.7.2001	20	17.45	0
	Bihar	20.7.2001	10	-	0
	Himachal Pradesh	20.7.2001	2	1.1	0
	Orissa	20.7.2001	5	-	0
	Tamil Nadu including Chennai	26.9.2001	50	79+154=233	183
	Delhi	20.7.2001	50	170.7	120.7
	A&N	20.7.2001	1	-	0
	<b>Total</b>				<b>1096</b>
	<b>Penal Interest</b>				<b>485</b>
	<b>Gross Total</b>				<b>1581</b>
2	<b>Operator: Tata</b>				
	Gujarat	31.8.2001	40	109.01	69.01
	Maharashtra including Mumbai	31.8.2001	533	189+203.66=392.66	0
	Karnataka	31.8.2001	35	206.83	171.83
	AP	4.11.1997	161.47	103.01	0
	Tamil Nadu including Chennai	31.8.2001	50	79+154=233	183
	Delhi	31.8.2001	50	170.7	120.7
	<b>Total</b>				<b>545</b>
3	<b>Operator: Bharti</b>				
	Karnataka	29.10.2001	35	206.83	171.83
	Haryana	8.10.2001	10	21.46	11.46
	MP	28.2.1997	35.33	17.45	0
	Tamil Nadu including Chennai	29.10.2001	50	79+154=233	183
	Delhi	29.10.2001	50	170.7	120.7
	<b>Total</b>				<b>487</b>
4	<b>Operator: Shyam</b>				
	Rajasthan	4.3.1998	29.29	32.25	2.96
5	<b>Operator: HFCL</b>				
	Punjab	7.11.1997	177.59	151.75	0

Source: (TRAJ 2003b)

## **Guidelines for migration to Unified Access Services Licence**

Government accepted the recommendations of TRAI and guidelines for migration to Unified Access Services Licence were issued on 11<sup>th</sup> November 2003, which are as follows:

- i. Existing basic and cellular service providers shall have the option to continue under present licensing regime or migrate to new Unified Access Services Licence (UASL) in existing service area.
- ii. On migration to UASL, licence fee, service area, rollout obligations and performance bank guarantee will be same as for fourth cellular operator.
- iii. Migrated service providers are free to use any technology to provide wireless or basic service. CMSPs are also free to offer limited mobility within SDCA.
- iv. They are also free to use existing allocated spectrum.
- v. No additional entry fee shall be charged from CMSPs for migration to UASL. However, BSOs shall pay the entry fee as mentioned in Table 4.5 (Department of Telecommunications 2003).

With the issue of these guidelines for UASL, the dispute and legal battle between BSOs and CMSPs over limited mobility issue came to an end.

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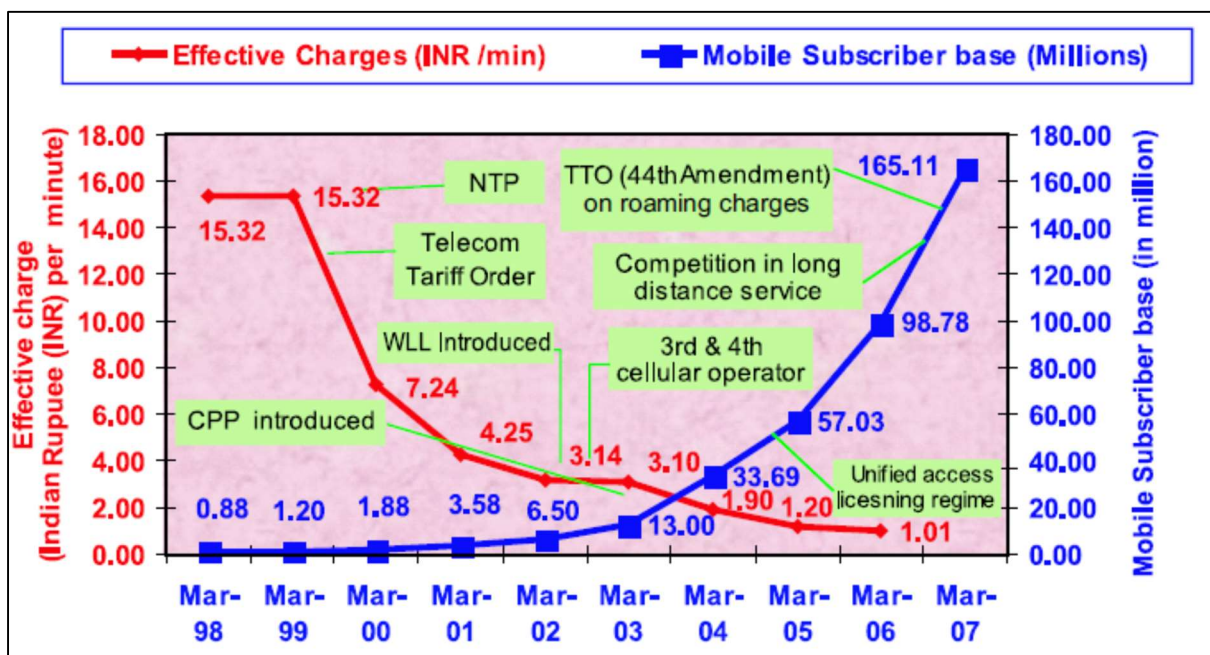


## Chapter 5

### Analysis and Discussion

During last two decades, Indian Telecom Sector has seen a major transformation from government monopoly regime to competitive environment where private service providers are competing with public sector undertakings like MTNL and BSNL. During this period, telecom sector has recorded a tremendous growth as its subscriber base has crossed the remarkable figure of one billion and its tele-density increased from 1.044 to 83.36. Liberalization of the telecom sector along with evolving telecom policies and positive regulatory framework has helped the sector in achieving the exceptionally high growth rate. Figure 1.1 and 1.2 shows that growth remained restricted till 2001 and only thereafter registered a high growth rate.

Figure 5.1: Impact of various regulatory reforms on the growth of Indian Telecom sector



Source: (TRAI 2007a)

Impact of various regulatory reforms on the growth of the Indian telecom sector is presented in figure 5.1. It shows that announcement of NTP 1999 has resulted into substantial reduction in call charges but introduction of WLL can be seen as a major policy decision which boosted the growth of mobile subscribers. This policy decision finally resulted into change in regulatory regime from service specific to unified access licensing regime for basic and mobile service. Under new licensing regime, operators were free to choose any technology unlike the initial period of liberalisation when they were restricted to use only GSM technology to provide cellular mobile service and apart from that it was no longer required to obtain two separate licences for providing basic and mobile service as unified access licence allowed them to

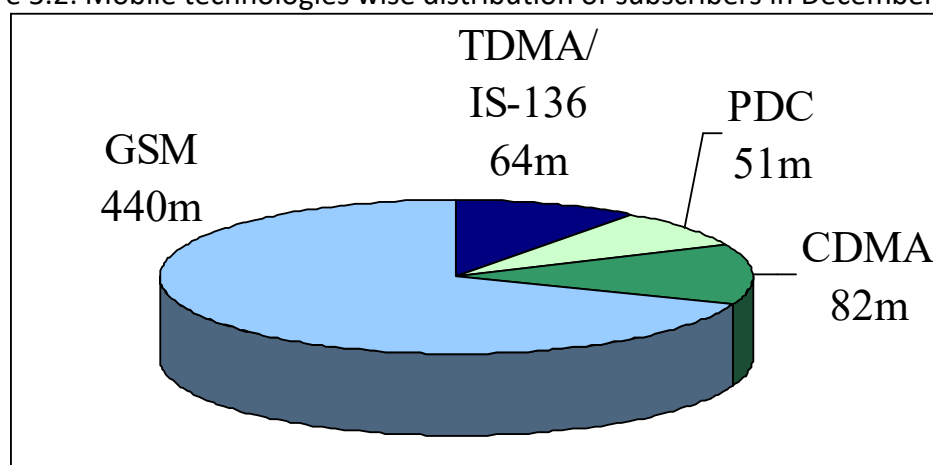
provide both services under single licence. This change in regulatory regime helped in creating the litigation free environment by removing the disputes between various operators and apart from extending the mobile services to common people at very affordable price.

## 5.1. Role of various actors in the process of change of regulatory regime

### 5.1.1. Department of Telecommunications

Department of Telecommunications (DoT), being the nodal agency responsible for the development of the telecommunication industry in India, embarked on the process of liberalisation of the telecom sector in 1990s by allowing the entry of private operators in cellular mobile services. Private operators were restricted to use GSM technology for providing cellular mobile service because it was the most preferred 2G digital mobile technology in the world at that time. Figure 5.2 shows that in December'2000, out of 637 million worldwide mobile subscribers, 440 million (almost 70%) were using GSM technology (ITU. n.d.).

Figure 5.2: Mobile technologies wise distribution of subscribers in December'2000



Source: (ITU. n.d.)

Subsequent to announcement of NTP 1994, DoT's policy making process was criticised because it allowed the entry of private operators in basic service only leaving more lucrative and revenue generating long distance services for public sector. Subramanian (2008: 38) stated that "The policy gave the lion's share of the nation's telecommunications development to the DoT and its corporations. It allowed only a supplementary role for the private enterprises.", whereas Gupta (2002: 2) observed that "DOT's bureaucrats, fearing competition, used their licensing and regulatory powers and distorted the policy in their favour".

Growth of tele-density remained very poor during the initial period of liberalization as it recorded a marginal increase from the level of 1.04 to 2.77 during the period 1994 to 1999 (refer table 5.1). Even this marginal growth cannot be attributed to the liberalization process as contribution of private operators was merely 7% and that too mainly due to growth of

mobile subscribers and not because of fixed subscribers which constitutes less than 0.5% (refer table 5.2 for service provider wise telecom subscribers).

Table 5.1: Growth of Tele-density during the period of 1991 to 2000 (Per 100 population)

Year	Fixed or Basic telephone	Mobile cellular telephone	Total
1991	0.66	0.00	0.66
1992	0.75	0.00	0.75
1993	0.87	0.00	0.87
1994	1.04	0.00	<b>1.04</b>
1995	1.25	0.01	1.26
1996	1.49	0.03	1.53
1997	1.80	0.09	1.89
1998	2.14	0.12	2.26
1999	2.59	0.18	<b>2.77</b>
2000	3.11	0.34	3.46

Source: (World Bank 2016)

Table 5.2: Service provider wise telecom subscribers as on 31<sup>st</sup> March 2000 (In Millions)

S No	Service Providers	Mobile	Fixed
1	BSNL	0	22.48
2	MTNL	0	4.03
	<b>Sub-total (Public operators)</b>	<b>0</b>	<b>26.51</b>
3	Bharti	0.36	0.09
4	Tata/ Hughes	0	0.05
5	Reliance	0.07	0
6	Hutch	0.45	0
7	Idea	0.16	0
8	BPL Group	0.34	0
9	Others	0.21	0
10	Spice	0.17	0
11	Escotel	0.14	0
12	Hexacomm	0.02	0
13	HFCL	0	0
14	Shyam	0	0
	<b>Sub-total (Private operators)</b>	<b>1.9</b>	<b>0.14</b>
	<b>Gross Total</b>	<b>1.90</b>	<b>26.65</b>

Source: (TRAI 2004)

On realization about the poor performance of privatization, DoT announced several measures in NTP 1999 to boost the confidence of private players which includes separating the service providing role of DoT from licensing and policy making role by establishing a separate corporate entity so that level playing field could be provided to all operators and strengthening of telecom regulator to ensure fair competition. Apart from that it also announced reducing the license fee obligation by allowing operators to migrate to revenue sharing regime and allowing BSOs to use WLL technology to provide fast and affordable last mile connectivity. After this decision, DoT realized that continuing restriction of using GSM technology will be an unfair policy for CMSPs as BSOs has allowed to use any technology for WLL. In order to remove this discrimination, DoT finally allowed the CMSPs to use any digital technology. But despite removing of this restrictions, operators, who entered subsequently into cellular market, chose GSM as a technology for providing cellular mobile services mainly due to its worldwide popularity. Allowing CDMA technology to BSOs subsequently proved to be a major step for change in regulatory regime from service specific to unified access licensing regime.

Later on, DoT separated its service providing role from licensing and policy making role by creating separate Government owned corporate entity i.e. BSNL. Simultaneously, telecom regulator was also strengthened by clearly defining its functions and a separate dispute resolution authority i.e. TDSAT was created. These measures helped in increasing the participation of private players by boosting their confidence in the evolving positive regulatory environment in India.

DoT supported the limited mobility issue by stating that “[their] approach is to encourage new technology, competition for the good of the common man and if CDMA become an affordable valid technology, the same should be taken advantage of for public good and the march of technology should not be stopped” (TDSAT 2003: 21). On the issue of inconsistency of limited mobility with existing telecom policy, DoT cleared its intention by stating that “[p]olicy document should not be construed as an instrument to freeze development in a fast changing scenario, particularly in a sunrise area like telecommunication and the Policy makers never intended it to be so” (TDSAT 2003: 16).

### **5.1.2. M/s Reliance Infocomm**

Reliance Industries is a largest private sector corporation in India having presence in various sectors like Petroleum, Petrochemicals, Engineering, Finance etc. It established Reliance Infocomm in 2000 with a vision to provide telecom service to every Indian at cheap price. However, before entering into market, it studied the status of Indian telecom market and profit margins of existing players and observed that actual revenue realizations of mobile operators were falling short of projections due to which they were not able to arrange funds for new projects. Presence of sister concern i.e. Reliance Telecom Limited in seven telecom circles as cellular mobile service provider has helped in reducing the ‘information asymmetry’

by providing insider's information. Till now, high revenue targets were forcing mobile operators to keep the call charges at high level but despite this they were not able to earn sufficient revenue due to lower penetration of mobile services. In turn, lower penetration was further restricting mobile operators from reducing the call charges. This vicious circle of high call charges and lower penetration of mobile services was causing adverse impact on the growth of Indian telecom sector.

Reliance noticed that existing mobile operators has got established in the market by charging high call rates from small segment of subscribers. Now it will be difficult to follow same strategy because most of the high paying capacity subscribers have already joined with some operators and attracting these subscribers will be very difficult due to limitation of change in mobile number. In contrast to this, profit can also be maximized by providing mobile services to masses by keeping call charges at low level. Choice of Reliance among these two contrasting strategies could be explained using game theory. To keep it simple, let us assume that there is only one existing mobile operator (say A) in the market. Reliance and operator 'A' both have the option to earn the profit by serving small population with high call charges or by serving large population with low call charges. However, both the operators have dilemma about their best strategy in order to maximize their interest just similar to "Prisoner's Dilemma". Payoff matrix for all combinations of strategies of both the operators is presented in table 5.3.

If both of the operators decides their strategy after mutual consultation, then keeping high call charges will be best strategy for them. But since they will try to maximize their individual interest at the cost of other so their best strategy is to keep the charges low. Accordingly, Reliance decided to keep the call charges at low level so that profit can be maximized by serving maximum population and this strategy helped Reliance to acquire majority market share within one year of the launch of the service. Table 5.4 and figure 5.3 supports this argument by showing that Reliance recorded a highest growth in terms of mobile subscribers during the period from March'2003 to December'2003 and reached to the level of first position with 6.24 million subscriber base whereas Bharti, which was standing at first position with 3.07 million subscriber base, slide down to second position with subscriber base of 5.5 million during this period.

Varghese (2006:1) observed that Reliance "stimulated telecommunication growth in India by challenging many of the conventional practices in product design, sales, advertising and pricing". In order to maximize its profits, Reliance adopted many "innovative strategies", some of them are as mentioned below:

- Instead of participating in the bid for mobile services in 2001, Reliance decided to bid for basic service due to its low license fee in comparison to mobile service,
- Reliance purchased bulk quantities of mobile handsets at low cost in order to provide them to its subscribers at very cheap price,

Table 5.3: Payoff matrix for Reliance and Operator 'A'

Reliance \ A	High call charges	Low call charges
High call charges	'A' being an established operator will continue to hold the majority shares and Reliance will also be able to get established in the market over a period of time but 'A' will have a first-mover advantage. Telecom sector will continue to grow at nominal rate.	Apart from attracting new subscribers, 'A' will be able to retain the existing subscribers which will create problem for Reliance in getting established in the market despite its high growth rate.
Low call charges	Apart from attracting new subscribers, low call charge of Reliance will provide an incentive to existing subscribers of 'A' for joining Reliance's services. Over a period of time, Reliance will acquire majority share of market. Telecom sector will observe a high growth rate.	'A' being an established operator will continue to hold the majority shares whereas Reliance's performance will depend on the difference between the call charges offered by both the operators. This may also initiate a price war between both the operators which will reduce their profit margins. Telecom sector will observe an exceptionally high growth rate.

Source: By author

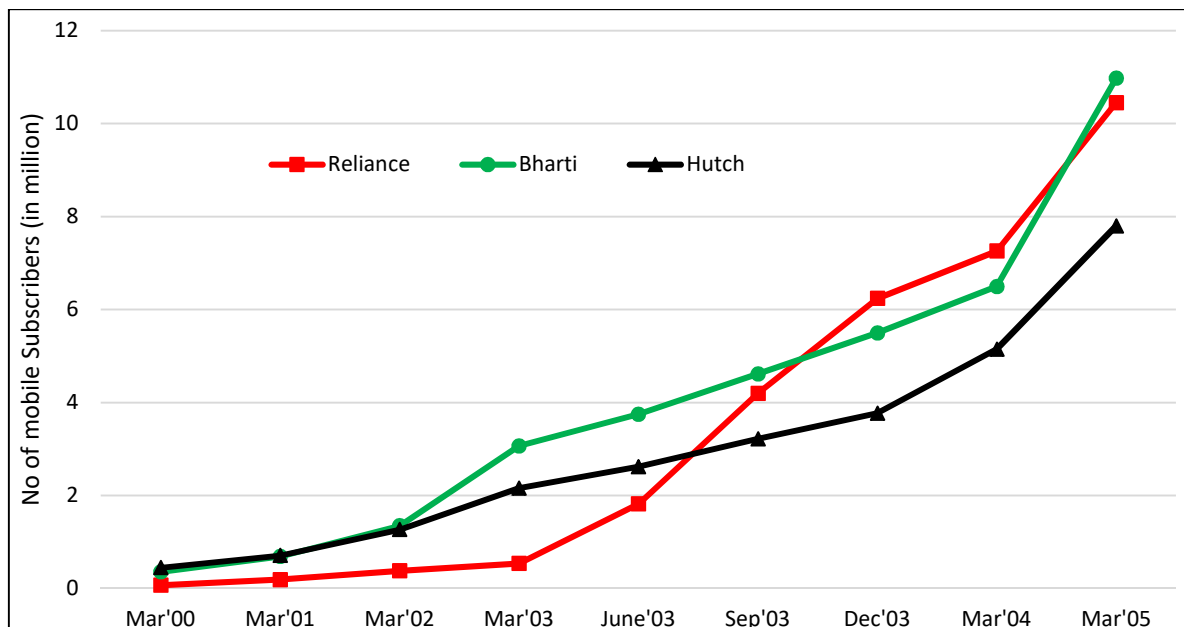
Table 5.4: Mobile Subscribers base of different operators during the period March'2000 to March'2005 (In Millions)

Operator	Mar' 00	Mar' 01	Mar' 02	Mar' 03	June' 03	Sep' 03	Dec' 03	Mar' 04	Mar' 05
Reliance	0.07	0.19	0.38	<b>0.54</b>	1.82	4.2	<b>6.24</b>	7.26	10.45
Bharti	0.36	0.69	1.35	<b>3.07</b>	3.75	4.62	<b>5.5</b>	6.5	10.98
BSNL	0	0	0.04	2.29	3.19	4.04	4.94	5.53	9.9
Hutch	0.45	0.71	1.27	2.16	2.62	3.22	3.77	5.15	7.8
MTNL	0	0.02	0.22	0.35	0.29	0.31	0.42	0.46	1.08
BPL	0.34	0.64	0.9	1.13	1.17	1.31	1.54	1.88	2.58
Tata	0	0	0.05	0.16	0.2	0.4	0.56	0.63	1.09
Others	0.68	1.33	2.33	3.3	4.28	4.93	5.47	6.28	8.34
Total	1.9	3.58	6.54	13	17.32	23.03	28.44	33.69	52.22

Source: (TRAI 2004, Varghese 2006)

- When Indian telecom industry was just thinking about introduction of ‘Calling Party Pays’ (CPP), Reliance took an initiative and offered all incoming calls free of charge.
- Reliance decided to harness the announcement of DoT, which allowed basic operators to use WLL technology, by using CDMA technology to provide limited mobile service to its subscriber at very cheap price,
- In order to attract general public towards its service, Reliance took a bold decision to allow all India roaming facility to its CDMA subscribers despite such facility was prohibited under existing license terms and conditions. It offered mobility beyond SDCA by adopting various innovative techniques like call forwarding, multiple registration, over the air activation of subscriber terminal etc., on the pretext that call gets disconnected whenever subscriber moves from one SDCA to another.

Figure 5.3: Growth of Reliance's mobile subscribers (In million)



Source: (TRAI 2004, Varghese 2006), chart by author

This breaking rule action of Reliance could be seen in the context “when an entrepreneur is prevented from doing something by a rule imposed by some authority” (Brenkert 2009: 7). Brenkert (2009: 2) defined the entrepreneur as a person who “must break the rules, not accept conventional wisdom, but take advantage of the various opportunities that one identifies or can create”. In such context, when an entrepreneur found that some rules are obstructing good projects, but despite his request to allow to relax or break those rules he never gets the permission on one or another pretext. In such situation, he might prefer to break the rules rather than seeking permission and subsequently demands for forgiveness, which is though not guaranteed but seems to be easier than getting permission. It is all likelihood that authority may forgive him even without imposing any penalty if the project results into grand success (ibid.).

Accordingly, present context could be explained by arguing that the existing regulatory regime did not allow BSOs to provide full mobility using CDMA technology despite the technology was capable to do so. However, Reliance was of the view that cheap mobile service could be extended to the general public using CDMA technology for which existing rules are either to be relaxed or broken. However, finding it difficult to get the permission to relax or break the rules, Reliance opted to go ahead by breaking the rule. The success of the project, which enabled high growth rate of telecom sector, forced the Government to forgive the rule breaking act of Reliance by imposing a nominal penalty and apart from that existing regulatory regime was also modified to enable the Reliance and other BSOs/ CMSPs to provide mobile service as well as basic service using any technology under unified license.

### **5.1.3. Cellular mobile service providers**

CMSPs were the worst affected actors of these two decisions: allowing BSOs to provide limited mobility in WLL and change in regulatory regime to unified access licensing regime. They have entered into the market by paying hefty amount of license fee whereas these decisions allowed BSOs to enter into the cellular market by paying a nominal license fee for basic service. They also argued that BSOs are providing mobile services at cheaper price due to cross subsidization from other lucrative service like long distance service, whereas they are not able to match the prices due to high interconnection charges. CMSPs were feared that all these factors will erode their market share.

Apart from above objections, CMSPs also opposed the move of Reliance to provide all-India roaming facility to their CDMA subscribers in violation of license condition. They challenged the decisions of DoT in TDSAT but TDSAT rejected their appeal. Unhappy with the judgement of TDSAT, they filed an appeal in the Supreme Court of India on 29<sup>th</sup> October 2003 (Business Standard 2003).

### **5.1.4. Telecom Regulatory Authority of India**

At every stage, TRAI played a constructive role by providing recommendations to licensor after following a transparent consultation process with all stakeholders. Before finalising its recommendations on the issue of allowing limited mobility to BSOs, TRAI invited views of different stakeholders through consultation process and after considering various inputs, it observed that benefit of technological innovation cannot be denied to the public on the pretext that it will disturb the level playing field between CMSPs and BSOs. Considering the benefit likely to be extended to the society and telecom sector as a whole, TRAI recommended allowing limited mobility in WLL but restricting it to local area so that the services provided by BSOs and CMSPs do not become substitutable (TRAI 2000b).

Allowing limited mobility in WLL has helped in increasing the monthly net addition of subscribers from around 0.3 million in May 2002 to almost 2.26 million subscribers in May 2003 (refer table 5.5). Apart from increasing the growth, it also helped in reducing the tariff



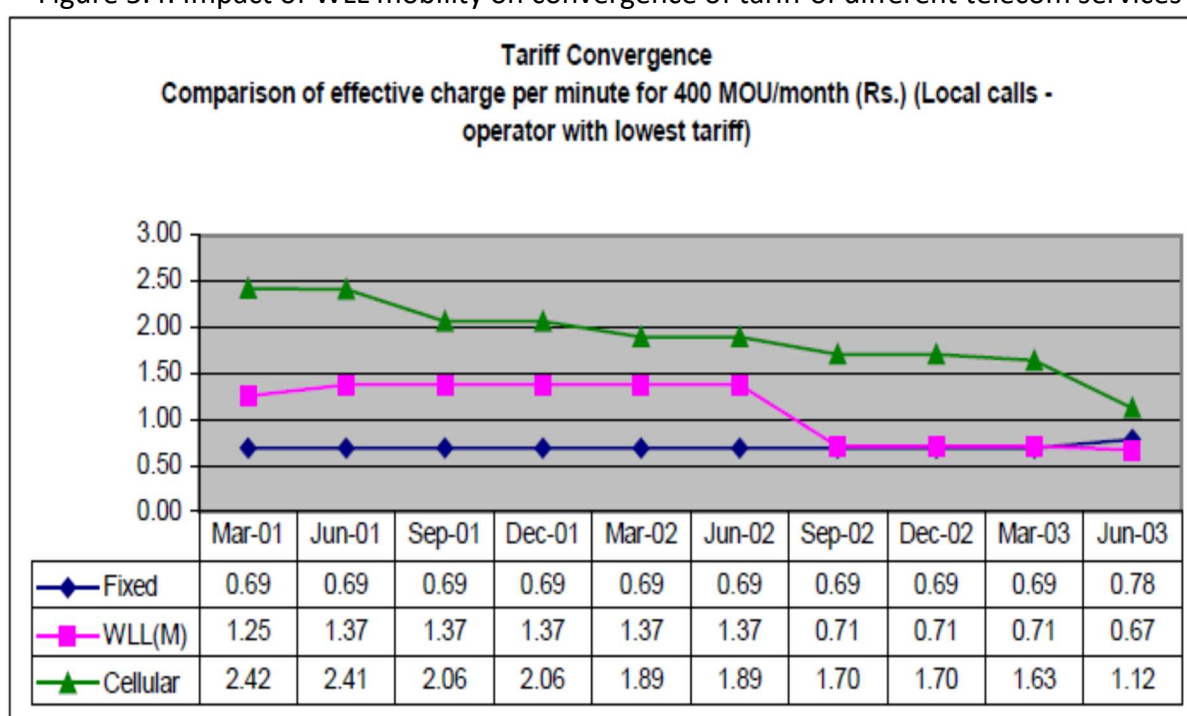
by more than 50%. As shown in Figure 5.4, tariff for both the mobile and WLL mobility service start decreasing and finally converged with the tariff of basic service.

Table 5.5: Monthly addition of mobile subscribers (In Million)

Year	April	May	June	July	August	September	Total in 6 months (Apr-Sept)
2002	0.28	<b>0.29</b>	0.35	0.36	0.49	0.37	2.14
2003	0.64	<b>2.26</b>	1.42	2.28	1.81	1.88	10.29

Source: (TRAI 2003b: 3)

Figure 5.4: Impact of WLL mobility on convergence of tariff of different telecom services



Source: (TRAI 2003b: 3)

COAI were not accepting the decision of DoT to allow BSO to provide limited mobility in WLL and accordingly challenged the decision in TDSAT. Although TDSAT rejected their appeal but still they were not in favor of the decision and subsequently challenged the judgement in Supreme Court of India. This prolonged legal battle was proving detrimental to the growth of the telecom sector. In order to create a litigation free environment in Indian telecom sector, TRAI took it as an opportunity for migration to technology neutral unified licensing access regime. TRAI's move was primarily guided by two factors:

- TRAI (2003b) observed that technological developments are blurring the distinction between mobile and fixed services due to which it is becoming difficult to regulate the telecom sector through traditional service specific regulating regime. Regulatory

provision to restrict the WLL mobility to SDCA level also proved to be ineffective as service providers developed their own methods to bypass the restriction (ibid.).

- During this period, a trend was emerging at international level to move away from service specific licensing towards converged licensing regime. Many countries have either already migrated to the converged licensing regime or in the process of doing so. Australia has already adopted 'no licensing regime' whereas Singapore and Malaysia has unified licensing framework. In Europe, European Parliament and Council has directed its members to provide a single regulatory framework for all services. After setting up of new regulator, requirement of licence has been abolished in UK (ibid.).

Considering that apart from resolving the dispute between BSOs and CMSPs, such move will take the Indian telecom sector to a new height of growth, TRAI invited the opinions of various stakeholders through consultation paper on the issue of migration to unified access licensing regime.

Despite objections registered by COAI against the unified licensing regime, TRAI recommended for migration to unified licensing regime considering the interest of telecom subscribers and telecom sector as a whole.

Regulator has always been prone to regulatory capture by the regulated firms for their private gains. It is observed by epistemic community that corruption is the main cause behind the regulatory capture. Klitgaard (Boehm 2007: 16), while expressing corruption as "Corruption = Monopoly + Discretion – Accountability" stated that discretion cannot be avoided as it is necessary for the effective regulation, however, transparency and accountability are two others factors to control the corruption. Accordingly, necessary safeguards have taken to reduce the risk of 'regulatory capture' in case of Indian telecom regulator. Like, TRAI has adopted an open and transparent consultation process to incorporate the views to all stakeholders in its decision making process. Necessary provisions have been made to make the TRAI accountable to the Parliament of India through Ministry of Communications. If it is found that Chairperson or Member of TRAI is abusing his position, then Government has the power to terminate him. TRAI's chairperson and members have been restricted to take a commercial employment within one year of vacation of the post in order to control the 'revolving door' problem.

#### **5.1.5. Telecom Disputes Settlement and Appellate Tribunal**

Though TDSAT was initially hesitant to take a decision on the appeal of COAI against DoT's decision of allowing limited mobility on WLL. However subsequent to direction of Supreme Court of India, it realised its power and finally gave a verdict dismissing the appeal of COAI and justifying the decision of TRAI and DoT.

TDSAT (2003: 11) supported the recommendations of TRAI by stating that “[v]iewing the concept of WLL(M) from a developmental approach rather than a restrictive regulatory approach can play a positive and promotive role in meeting the needs of the market”.

Supporting the views of Government on limited mobility issue, TDSAT (2003: 28) observed that “There indeed was a shift in approach on the part of the Government towards WLL service but it cannot be termed as arbitrary or unreasonable in view of the fact that it has gone through various stages of consideration with the intention that fruits of evolving technology should not be denied to the consumer which gives him one more option, particularly when this is also conducive for increasing tele-density and making service available at a more affordable tariff”. On the issue of inconsistency of limited mobility with existing telecom policy, TDSAT (2003: 18) supported DoT’s view by stating that having no specific mention in policy document cannot be construed that it is prohibited under the policy, and if it so then “no technological improvements or innovations which do not find express mention in the policy document can ever be introduced without again changing the policy formally”.

As a final note, TDSAT (2003: 50) observed that “we are of the view that increasing tele-density of the country is an object which must be pursued with zeal and vigour. Nothing should be allowed to stand in the way of pursuing this object”.

#### **5.1.6. Consumers**

Although consumers were the most beneficial actors of this change of regulatory regime as it reduced the tariff to an affordable level due to which even the poorest people of the country could be able to enjoy the benefit of the mobile service. But despite such benefits, it is difficult to see any contribution of consumers in the whole process. Even they did not bother to submit comments to the consultation papers issued by TRAI on various issues which are directly impacting them.

On this behaviour, it can be argued that to pursue their interests, consumers need to be organised into group. But due to problem of free-riding and being expensive activity, it is difficult to organise them. Apart from that that they have diverse interests like rich and poor people have different interest, so it is difficult to organise them into one group.

### **5.2. Stakeholder Analysis**

A stakeholder analysis has been carried out to understand the interest and influence of various stakeholders in the process of migration to the unified access licensing regime. Apart from identification of various stakeholders, their interest and impact on the process have also been identified and mentioned in table 5.6. Further, they have also been categorised into key, primary and secondary stakeholders as per the definition given in section 2.3.

Table 5.6: Stakeholder Analysis Table

S. No.	Stakeholders	Type	Interest of Stakeholder	Impact
1	DoT	Key	Increasing the growth of telecom sector in India	Positive
2	TRAI	Key	Regulating the telecommunication services and protecting the interests of service providers and consumers.	Positive
3	Reliance Infocomm	Key	Capturing major share of telecom sector.	Positive
4	TDSAT	Key	Ensuring a non-discriminatory regulatory regime.	Positive
5	Supreme Court of India	Key	Ensuring that justice is being provided to one and all.	Neutral
6	Politicians	Key	Finding a solution which is beneficial for all actors.	Positive
7	Consumers	Primary	Getting telecom services at affordable price.	Positive
8	CMSP	Primary	Obstructing the “back-door” entry of BSOs into mobile market.	Negative
9	Other BSOs	Primary	Getting access to mobile market.	Positive
10	Telecom Manufacturers	Primary	Increase growth of Indian telecom sector will also lead to increase in sell of their equipment.	Positive
11	Consumer Groups	Secondary	Protecting the interests of consumers.	Positive
12	BSNL/ MTNL	Secondary	Customer will get a competitive service due to increase in competition.	Positive
13	CII	Secondary	Development of enabling environment for the industry.	Positive
14	Banks	Secondary	Litigation free environment will lead to increase their business.	Positive
15	Media	Secondary	Transparent and fair process has been followed in decision making.	Positive

Source: By author

### Stakeholder Influence and Importance Matrix

Based on the stakeholder analysis table and influence/ importance of each stakeholder on the migration process, stakeholder influence and importance matrix has been prepared as per figure 5.5.

Figure 5.5: Stakeholder Influence and Importance Matrix



Source: By author

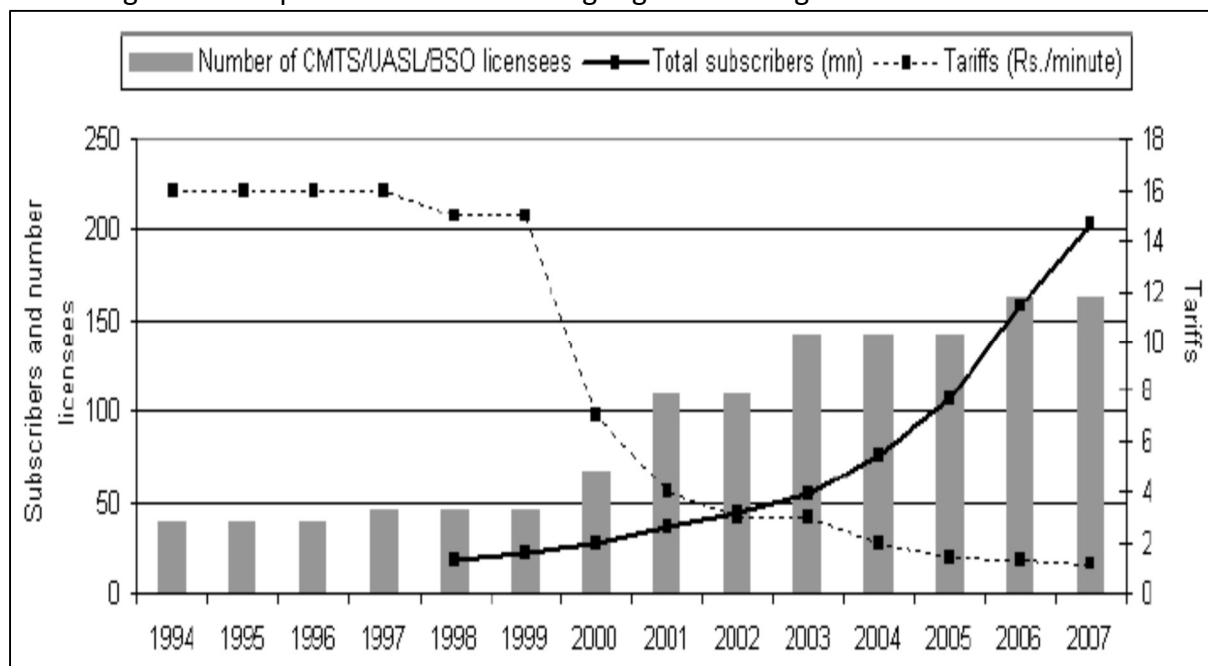
### 5.3. Impact of Unified Licensing Regime on Indian Telecom Sector

Subsequent to issue of guidelines for Unified Access Services Licence, all existing Basic and Cellular operators were given an option for migration to UASL and henceforth entry of new operators were allowed only under UASL. Subsequently, Government awarded 173 new licences under UASL regime between the period 2004 to 2008. As on 31st March 2008, there

were total 281 licensees out of which 2 were basic licensees; 39 CMTS licensees and 240 UAS licensees (Department of Telecommunications 2016b)

Figure 5.6 shows that subsequent to migration to unified licensing regime, telecom market become more competitive with the entry of many more service providers, which resulted into reduction in tariff and exponential growth in telecom subscribers.

Figure 5.6: Impact of Unified Licensing regime on the growth of telecom sector



Source: (TRAI 2007b: 12)

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## **Chapter 6**

### **Conclusion**

During last two decades, Indian Telecom Sector has seen a major transformation from government monopoly regime to competitive environment. Subscriber base has grown manifold and India telecom sector become second largest in the world. All this could be possible because of evolving positive regulatory environment which helped in increasing the competition and reducing the tariff to enable common people to reap the benefit of mobile service. But neither the growth of telecom subscriber nor the regulatory environment was remained static during the whole period of liberalization.

Liberalisation of Indian telecom started with the restrictive entry of private operators in few services and that too with the conditional adoption of a particular technology. Although, over a period of time, entry of private operators was allowed into all services, but still they need to obtain separate license for providing separate service. This restrictive regulatory regime was creating a barrier in the growth of the Indian telecom sector. On the other hand, technological developments were blurring the distinction between different services. Service providers were now able to provide several services which were earlier reserved for other service provider. It was also becoming difficult to regulate the sector through traditional regulatory regime as service providers were adopting various measures to bypass the regulatory restrictions to provide the prohibitive services. All such issues leading to increase in litigation between service providers as well as between service provider and licensor.

Considering the fact that regulation need to be evolving in accordance to surrounding economic, social and technical conditions (OECD 2016), Government of India decided to change the regulatory regime to unified access licensing regime. Under this regime, all service providers were allowed to provide both basic as well mobile service without putting any restriction on the choice of technology. Accordingly, this paper tried to study the impact of technological innovations on evolution of regulatory regime by taking the case of impact of WLL mobility on change in regulatory regime of Indian telecom sector from service specific to technology neutral unified licensing regime.

#### **6.1. Research Findings**

The research was focussed on the main research question i.e. how technological innovations impacted the Indian telecom regulatory reforms? It is observed that until announcement of NTP 1999, all service providers were restricted to adopt specified technology to provide a particular service. BSOs were finding it difficult to provide last mile connectivity to their subscribers through conventional method of laying underground cable. In order to reap the benefit of recent technological developments, they were allowed to use WLL technology to

provide last mile connectivity. As the technology was capable to provide full fledged mobility service, BSOs were subsequently allowed to provide mobility service using WLL but to discriminate it from cellular mobile service, it was restricted to provide the mobility in limited area only. This decision while providing a solution to the problem of BSOs created dispute between BSOs and CMSPs because technological developments in the form of WLL has blurred the difference between the basic and mobile service. Since regulation has incorporated an artificial restriction of limited mobility, BSO bypassed this regulatory restriction to provide the full mobility to their subscribers by finding loopholes in the existing regulation. This rule breaking behavior further widened the dispute between different players working in telecom sector. Continuation of dispute over a long period created an uncertainty in the regulatory regime of telecom sector which proved to be detrimental to the growth of telecom sector. In order to resolve the dispute, Government decided to migrate to technology neutral unified licensing regime, under which operators are free to provide basic as well as mobile service using any technology of their choice. This migration while resolving the dispute between CMSPs and BSOs also helped in attaining new heights of the growth of Indian telecom sector.

This case study shows that technological development like WLL technology had a wide impact on the evolution of Indian telecom regulation from service specific licensing regime to unified licensing regime.

## **6.2. Looking Ahead**

Recently, another company of Reliance Industries under the leadership of Sh. Mukesh Ambani with the trade name of 'Reliance Jio' has entered into the Indian telecom market. It has offered unlimited voice and data services to its subscriber free of cost for first three months. Sridhar and Prasad (2016) observed that "second coming of Mukesh Ambani will be as disruptive as Reliance's first foray in 2001" and "this could be an important differentiator in the years ahead". Reliance Jio initially acquired the not-so-widely used spectrum at very low price to provide 4G LTE service and now it is providing voice service using the latest technology of 'Voice over LTE (VoLTE)' which is a superior service than the traditional voice service provided by other 2G and 3G service providers (ibid.). It seems that present move of Reliance Jio may bring some other drastic changes in the Indian telecom sector.

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