

MARKET STRUCTURE AND TARIFF DETERMINATION IN THE CELLULAR INDUSTRY IN INDIA

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CERTIFICATE

This is to certify that the dissertation entitled "**MARKET STRUCTURE AND TARIFF DETERMINATION IN THE CELLULAR INDUSTRY IN INDIA**" submitted by me in partial fulfillment of the requirement for the award of **MASTER OF PHILOSOPHY** is my original work and has not been previously submitted for any other degree of this university or any other university.

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We recommend that this dissertation be placed before the examiner for evaluation.

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CHAPTER 1

INTRODUCTION

Telecommunication has always been regarded as the key to the rapid growth of a modern economy as well as the social development of the country. According to a World Bank study, 1 per cent increase in the teledensity (number of telephone connections per 100 population) leads to a 3 per cent increase in growth of GDP¹. The Government of India also realised the importance of a world-class telecommunication network and anticipated that it would be a major contributor to GDP in future. The Tenth Five Year Plan states “Telecommunication is a critical part of infrastructure and one that is becoming increasingly important, given the trend of globalisation and the shift to knowledge base economy.Telecommunication has also become extremely important for a wide range of rural activities and this importance will only increase as the process of diversification of the rural economic opportunity gains momentum”.

The telecommunication network of a nation enhances opportunities in a number of ways, such as by increasing the information available; improving the speed of making and implementing decisions; by saving resources that would have otherwise been spent on transportation and storage and enabling more efficient ways of providing various

¹ www.coai.com “History of Cellular Services in India

services. A number of constraints that limit production due to inadequate infrastructure are released due to the presence of a telecommunication network, as through telecommunication, a person or resource is virtually present at more than one place at a time. Thus the multiplier effect of investment in the telecommunication sector is much more as it has both direct and indirect effects on the overall production. Thus, a society with lesser telecommunication facilities is more likely to be out competed, as the modern technological advances in the sector has brought about a virtual 'death of distance'.

Recent developments in the telecommunication sector, especially in mobile and internet operations have further enhanced the effect of telecommunication on economic growth. In India, with its rapid growth, cellular mobile telephony has been emerging as a significant complement to basic telephony for providing telecommunication services. Now, teledensity is being considered in terms of a combination of basic and cellular mobile lines. While it is widely recognized that India is a country with low teledensity, it has a large number of Direct Exchange Lines (DELs). India's fixed network, which had about 21.5 million telephone lines in 1998 that increased to about 32.4 million in 2000 (*source: ITU*), was the seventh largest in the world in that year in terms of the number of connections. However the teledensity although improving over time, is very very low at 3.2 only. This is low even when compared with the other developing countries of the world.

To improve the present situation of low teledensity, a high growth rate of telephone connections were needed. Since in the present world, cellular telephony complements the

basic service, equal importance is being given to this sector worldwide. Likewise the Indian government, in an attempt to improve the situation and to keep up with the new and fast developing technologies in telecommunication, introduced the cellular service in the country in the year 1994. It was realised that the private sector will play a major role in this respect, as private capital was needed to augment government capital for the huge investment needed for setting up the modern infrastructure. So the government in the early 90's decided to issue licenses to private companies for providing cellular mobile services in India.

1.1 History of Cellular Telephony in India

The growth of cellular telephony in India dates back to the year 1992, when the government decided to open the cellular service to private operators. As the government of the day realised that the telecommunication sector needs heavy investment for setting up of a modern telecommunication infrastructure and it is not possible for the government to organise public funding for the sector on such a massive scale to achieve the desired objective of Universal Service Obligation (USO), it took a major step in opening up of the telecommunication sector for private investments to bridge the vast resource gap. For the above purpose licenses were awarded to private basic as well as cellular service providers for providing telecommunication services in the different circles of the country.

With mobile services being introduced along with the introduction of two telecommunication policies namely National Telecommunication Policy (NTP) 1994 and

National Telecommunication Policy (NTP) 1999, the last decade of the 20th century has been a period of major changes for the Indian telecommunication sector, specially for cellular telephony. Apart from providing the framework for opening up of the telecommunication sector, the NTPs of 1994 and 1999 clearly specified conditions in the form of Universal Service Obligation. There was a clear change in the policy objective of the government, which started treating telecommunication service as a necessity that should be available to all and not a luxury item.

The government at the time of introducing cellular services in the country took a landmark decision to introduce the GSM² standard, leapfrogging obsolete technologies. In order to ensure fair and balanced regulation of investments for the private investors in the sector, the government also established an independent regulator, namely the Telecom Regulatory Authority of India (TRAI), on 25th March 1996.

Cellular Mobile Service (CMS) was introduced for the first time in India on a commercial basis in the four metro cities in 1994, which was followed by opening of 20 circles (generally coterminous with state boundaries) to private CMS providers in 1995-96. In the initial proposal for the license the main terms and conditions that were laid down was that the license was for a period of 10 years, which was renewable for 5 years. Each bidder was required to have a subscriber base of 1,00,000 and a minimum of 3 years of experience of operating a mobile network as on January 1, 1995. Since the mobile services were new at that time in the country, it was evident that no Indian company had

² GSM: Global System of Communication was instituted in 1987 to promote and expedite the adoption and development of the GSM standard for digital wireless communication.

the required experience of 3 years as a result of which an equity alliance with a foreign company was inevitable. Thus a foreign company whose experience was equal or more than the prescribed experience as laid down in the guidelines was required to have a foreign equity of not less than 10 per cent and not more than 49 per cent in the Indian company which applies for the license. Bidders were also required to conform to the GSM standard.

Initially two licenses were issued in each of the metro and non-metro circles. With the provision that the public sector basic service provider could be permitted as a third licensee. Although subsequently four private CMSPs have been issued licenses, for the metro and 18 other circles, they are yet to start their operations. So as on July 2002 there were 8 Cellular Mobile Service Providers (CMSP) in the four metros along with government owned MTNL in Delhi and Mumbai and 34 CMSPs in 18 circles. In the case of West Bengal and Assam circles there was only one CMSP, while bids were not received in the first round of bidding for the two circles of Andaman and Nicobar Islands and Jammu & Kashmir.

The eight private operators who were initially issued licenses to operate cellular mobile services in the 4 metro cities on 29th November 1994 were Bharti Cellular Limited and Sterling Cellular Limited in Delhi, BPL Mobile Communications Limited and Hutchison Max Telecom Limited in Mumbai, Modi Telstra and Usha Martin Telekom in Calcutta and RPG Cellular and SkyCell Communication in Chennai.

On 3rd November 1997, the government owned Mahanagar Telephone Nigam Limited (MTNL), which was the basic telecommunication service provider in the two metro cities of Delhi and Mumbai, announced its plan to launch cellular mobile services in the two metros. Although faced with some initial opposition from the private cellular operators represented by the Cellular Operators Association of India (COAI), MTNL successfully started its cellular service in the two metro cities as the third operator. Introduction of the third operator in these two circles has ushered in an era of healthy competition and has brought down tariffs considerably in the recent past. The third operator license for the other two metros, that is Calcutta and Chennai and for the remaining 20 circles were reserved for the government owned Bharat Sanchar Nigam Limited (BSNL).

On 5th January 2001, 4th cellular operators license guidelines for the metros as well as for the 20 circles were announced by the Department of Telecommunication (DoT). The process of bidding started on 29th June 2001 and the winners for the 4th cellular license were announced on the 31st July 2001.

In the aftermath of mergers these developments and consequent to some mergers and takeovers, the cellular industry in India in the four metro cities had the following form in July 2002:

Table 1.1
Cellular Operator of Four Metro Cities

<i>City</i>	<i>Operator 1</i>	<i>Operator 2</i>	<i>Operator 3</i>	<i>Operator 4</i>
Delhi	Bharti	Hutchison Essar	MTNL	BATATA
Mumbai	BPL	Hutchison Max	MTNL	Bharti
Calcutta	Bharti	UMTL	BSNL	Reliance
Chennai	RPG	Bharti	BSBL	B.S. & Services

Source: Compiled from different sources

The fourth operators, however, were yet are expected to start their service in the metros.

Apart from the four metro circles, the different telecom circles in India are divided into three categories: "A", "B" and "C", on the basis of their perceived business potential.

States falling in these categories are as follows:

Table 1.2
Different Categories of Telecommunication Circles in India

<i>Category A</i>	<i>Category B</i>	<i>Category C</i>
Maharashtra	Kerala	Himachal Pradesh
Gujarat	Punjab	Bihar
Andhra Pradesh	Haryana	Orissa
Karnataka	Uttar Pradesh (West)	Assam
Tamil Nadu	Uttar Pradesh (East)	North East
	Rajasthan	
	Madhya Pradesh	
	West Bengal	

Tenders for the above 20 circles were invited for the first time on 16th January 1995, after licenses were awarded to the metro circles. A High Powered Committee was formed for the purpose of selection of service providers. The evaluation was made on the basis of financial strength, experience of the foreign partner, proposed tariff structure etc.

Like in the metros, a single round of bidding process was followed whereby the winner of each of the circles were awarded the license and the second highest bidder was to match the bid of the highest bidder in order to get the license. It was also decided that in case no bidder matches the first bidder, then the license would be re-auctioned.

The final 65 bids, which were received in the month of June for 20 circles, were mostly concentrated in the lucrative Category "A" circles, while few of the circles in Category "B" and "C" were unable to attract the bidders. This led the government to subsequently put a cap of three circles per company in Category "A" and Category "B" for the grant of cellular licenses. On 12th December 1995, DoT issued 33 licenses to 13 companies to operate cellular services in 18 telecommunication circles except Jammu & Kashmir and Andaman & Nicobar Islands.

After few years of commencement of services by the private Cellular Mobile Service Providers (CMPS), the New Telecom Policy (NTP) was announced in the year 1999, which had analysed the performance of the CMSPs. The analysis revealed that heavy capital expenditure of some of the CMSPs due to wrong assessment of the market and over provision of capacity, slower revenue growth due to low subscriber base, high operational cost and many other problems like long time taken to obtain the license and unresolved issues of interconnectivity, added up to a situation where more and more private operators were becoming unviable for providing cellular services.

In October 1998, the government of India in order to improve the viability for the private service provider extended the license period of the circle from 10 years to 15 years. Followed by this the New Telecom policy (NTP) 1999 was announced in March 1999, where the government took the landmark decision of moving to a revenue sharing regime from the existing license fee regime for the cellular services, in addition to the entry fee for the new entrant. The license period was also increased from 15 years to 20 years for the circles as well as for the metros. Thus from July 1999 the government permitted the existing circle and metro operators to migrate to the revenue sharing regime as per NTP 99.

The NTP 99 also recognised the importance of increased competition in order to bring “affordable and effective” communication services to the user. Thus the government decided to increase the number of licenses for cellular services from two to four for each telecommunication circle. As stated earlier, the position of the third operator was reserved for the government owned BSNL and MTNL (for Delhi and Mumbai). The bidding process for the fourth cellular operator started on 29th June 2001. After the completion of the bidding process it was seen that the response from the private operators was mixed, but overall, it was not very encouraging for the government. Four so called “non-lucrative” circles (Bengal, Orissa, Bihar and Andaman & Nicobar Island) failed to attract any bids. The final situation that emerged at the end of the bidding process for the different circles is summarised in the following table:

Table 1.3
Cellular Operator of Different Circles of India

	<i>Circle</i>	<i>Operator 1</i>	<i>Operator 2</i>	<i>Operator 3</i>	<i>Operator 4</i>
<i>"A" Circle</i>	Maharashtra	BPL	BATATA	BSNL	Bharti
	Gujarat	Fascel	BATATA	BSNL	Bharti
	Andhra Pradesh	BATATA	Bharti	BSNL	B.S.& Services
	Karnataka	Bharti	Spice Comm	BSNL	B.S.& Services
	Tamil Nadu	BPL	Aircel	BSNL	Bharti
<i>"B" Circle</i>	Kerala	Escotel	BPL	BSNL	Bharti
	Punjab	Spice Comm	-	BSNL	Escorts Tel
	Haryana	Escotel	ADL	BSNL	Bharti
	U.P. (W)	Escotel	-	BSNL	Bharti
	U.P. (E)	ADL	Koshika	BSNL	Escorts Tel
	Rajasthan	ADL	Hexacom	BSNL	Escorts Tel
	Madhya Pradesh	RPG	Reliance	BSNL	Bharti
	West Bengal	Reliance	Vacant	BSNL	Escotel
<i>"C" Circle</i>	Himachal Pradesh	Bharti	Reliance	BSNL	Vacant
	Bihar	-	Reliance	BSNL	Vacant
	Orissa	-	Reliance	BSNL	Vacant
	Assam	Reliance	Vacant	BSNL	Vacant
	North East	Reliance	-	BSNL	Vacant

Source: Compiled from different sources

Note: The names of the companies have been shortened and in some case same name has been used for companies of related groups

"-" Means slots for which service providers are not operating for some reason

1.2 Conclusion

From the above discussion of the history of the cellular telephony in India, it is evident that the sector, has undergone a major transition from the day of its inception in 1994. Following a series of mergers and acquisitions of CMSPs and changes in policies, the cellular telephony has reached the present stage of development. All these factors have directly or indirectly influenced the tariff setup of the cellular services over time. The introduction of cellular mobile service (Dolphin) by the government owned MTNL

triggered a price war among the existing players, lowering the airtime rates and also helping in creating an environment of healthy competition. The cumulative effect of all the factors led to the increase in number of mobile connection in India from about 3,39,031 connections in March 1997 to about 57,25,213 in January 2002, with Delhi crossing 1 million mobile connections early this year (*Source: COAI*). Under these circumstances it would be interesting to review the licensing pattern that has been followed for the cellular telephony, the policies at different points of time and how the cumulative effect of all these factors have influenced the market structure of and tariff determination in the cellular industry in India. The role played by the regulatory authority, that is the Telecom Regulatory Authority of India (TRAI) from time to time with respect to pricing of cellular services would also be interesting to investigate in this case.

CHAPTER 2

LICENSE STRUCTURE OF CELLULAR TELEPHONY IN INDIA

The Indian telegraph, which was started in the year 1856 by the British government, was a state monopoly during its initial years. In 1882 telephone services were licensed to be provided by the private companies in few cities, but they were taken over by the state in 1943. In the post independence era, India continued with the colonial legacy of the Indian Telegraph Act (ITA), 1885 which placed telecommunication in the exclusive domain of the state. Till 1985, the Department of Post and Telegraph (DPT) had the exclusive mandate to regulate and offer telecommunication services.

In an attempt to improve the provision of telecommunication services in India, the government initiated sectoral reforms in telecommunications during the Seventh Five Year Plan in the year 1985. The DPT was split into a new wholly owned government of India undertaking- the Department of Telecommunication (DOT) as operator, regulator and licensor of all telecommunication services in India. Further in 1986, a new government of India owned corporate entity, Mahanagar Telephone Nigam Limited (MTNL) was formed for providing basic services in the two metro cities of Delhi and Mumbai. Similarly the overseas communication services were to be provided by another government of India owned body, namely Videsh Sanchar Nigam Limited (VSNL).

In October 1999, the DOT was split, whereby a new Department of Telecommunication Services (DTS) was formed for provision of telecommunication services, while DOT retained its mandate as policy maker and licensor. In October 2000, DTS was corporatised into a new wholly owned GoI entity- Bharat Sanchar Nigam Limited (BSNL), which took over the erstwhile operating functions of DTS.

Before the liberalisation in 1991, telecommunication services were regarded more as a public utility rather than an instrument of economic and global competitiveness. Under the state monopoly network expansion occurred at a very sluggish rate, with an ever increasing waiting list of subscribers who had to wait as long as 42 months to get a telephone connection. This was because of the limited resource that was allocated to the sector, which was spread thin as the government under the universal service obligation has to also provide telephone connection to rural and remote areas as too, which were otherwise non-lucrative. Because of all these factors the fixed line teledensity (telephone lines per 100 persons) in India was as low as 2.7 (as on March 31, 2000), which is very low even when compared with the teledensity of the other developing countries. The figure for teledensity in the rural area, where the majority of the population resides, was only a meager 0.6.

Soon the government realised the importance of the telecommunication sector for the overall growth of the economy, as it was realised that information and communication technology (ICT) would be the architect of the modern world. But setting up of a world

class telecommunication network meant heavy investment and organising public funding for the sector on a massive scale, which was not feasible for the government. Prior to the liberalisation during the 90's, progressive liberalisation of the equipment sector had removed a crucial bottleneck in the supply of equipment to the DOT. Therefore to generate resources needed for the heavy investment in the sector, the government of India liberalized the sector for private participation in July 1992, when it invited technical bids for the cellular mobile services for the first time in the country for the four metro cities of Delhi, Mumbai, Kolkata and Chennai.

2.1 License Structure for the Cellular Telephony in India

2.1.1 License for the Metro Cities

Before the introduction of the cellular services in the metro cities for the first time in India in the year 1994, the request for proposal (RFP) were released in July, 1992. In the initial proposal for the license the main terms and conditions that were laid down was that the license was for a period of 10 years, which was renewable for 5 years. Each bidder was required to have a subscriber base of 1,00,000 and a minimum of 3 years of experience of operating a mobile network as on January 1, 1995. Since the mobile services were being introduced for the first time in the country, it was evident that no Indian company had the required experience of 3 years, as a result of which an equity alliance with a foreign company was inevitable. Thus a foreign company whose experience was equal or more than the required experience as laid down in the guideline was required to have a foreign equity of not less than 10 % and not more than 49 % in the

Indian company which applies for the license. Bidders were also required to conform to GSM standard.

A High Powered Committee was formed for the purpose of selection of service providers. The evaluation was made on the basis of financial strength, experience of the foreign partner, proposed tariff structure etc. The bidding in the metros was for the lowest rental to be charged by the private service providers from their subscribers. After the bidding the evaluated value of the lowest rental was determined to be Rs. 156 per month.

In the open tender for the award of metro license, the license fee for the first 3 years was fixed, while the fee for the subsequent years was settled initially at Rs 5,000 per subscriber per annum, which was later revised to Rs 6,023 per subscriber per annum. The increase was based on the fact that the per unit call rate was increased from Rs 1.10 to Rs 1.40 afterwards. It was also decided that for the purpose of calculating the license for 4th year onwards, the number of subscribers at the end of each month were to be added for all months and divided by the number of completed months.

The selection was made by the High Powered Committee from the list of technically qualified companies and the first licenses were awarded on 29th November 1994, to Bharti Cellular and Sterling in Delhi, BPL Telecom and MaxTouch in Mumbai, Usha Martin and Modi Telstra in Calcutta and SkyCell and RPG Cellular in Chennai. The license fee structure that these companies in the different metros were supposed to pay are tabulated as follows:

Table 2.1
License Fee Schedule for Metro Operator

<i>Service Area</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Years 4-6 (pa)</i>	<i>Year 7 onwards (pa)</i>
Delhi	20	40	80	120	160
Mumbai	30	60	120	180	240
Calcutta	15	30	60	90	120
Chennai	10	20	40	60	80

Source: Telecom Regulatory Authority of India (TRAI)

2.1.2 License for the Circles

After licenses were awarded in the metros, the request for proposals (RFP) for the subsequent bidding for cellular licenses in the circles was released on 16th January 1995.

The few of the important entry guidelines for the circles were as follows:

- The bidder has to be an Indian company
- Total foreign equity in the bidding company should not exceed 49 % of total equity and should be more than 10 %
- The company must have an operating experience of 1,00,000 lines and at least 3 years experience of cellular operations
- A company can bid for as many circles as desired
- The non-exclusive license issued to the company will be for a period of 10 years (later in 1998 it was increased to 15 years), provided BSNL/MTNL were free to provide cellular service also
- Cellular Mobile Services has to fully conform to GSM standards

- Tariff ceiling was fixed at Rs 156 as monthly rental, Rs 3,000 as security deposits and Rs 1,200 as the installation charges
- Access charges were to be levied by BSNL or its nominee for local, STD and ISD calls
- No free airtime to be given in airtime
- On selection, letter of acceptance has to be submitted along with financial and performance bank guarantees

As per the above guidelines the companies were supposed to submit their bids within March 31, 1995, which was later extended to June 7, 1995. The highest bidders in each circle won the first license in each circle, while the second highest bidders were to match the highest bidders if they wanted to receive the second license. In case the second bidder declined to match the amount of the highest bidder, then the right of the second license fell to the third highest bidder who has to match the amount of the highest bidder in order to receive the license. If no bidder matches the highest bidder then the second license will be re-auctioned.

A total of 65 bids were received for 20 circles, which also included bids from over 30 international consortia. The final financial bids were opened in August 1995. However most of these 65 bids were mostly concentrated in a few regions mostly on Category "A" and Category "B", while most of the circles in the Category "C" and few of the circles in Category "B" were unable to attract the bidders. Wealthier circles of Haryana, Kerala, Punjab and Rajasthan received as many as 5 bids each, whereas some of the circles in

Category “B” & “C” hardly received one or two bids, while Andaman & Nicobar Islands and Jammu & Kashmir of Category “C” did not receive any bid at all. In view of the above skewed distribution of bids in favour of the Category A circles, after the winners had been announced, DOT placed an upper limit on the number of Category A and B circles to be awarded to any one bidder at three, although the DOT had allowed consortia to win an unlimited number of licenses initially. DOT used the provision of the tender document that it had the authority to reject any tender under the licensing authority granted to it.

After the selection of the eligible bidder, the Letter of Intent (LoI) was issued to the companies in October 1995. The successful companies, which were awarded the license in the different circles and the amount of license fee paid by each, are given in the following table:

Table 2.2
Winners of Licenses in the Different Circles and the License Fee Committed

<i>Circle</i>	<i>Name of the Operator</i>	<i>Effective date of License</i>	<i>Total levy quoted for 10 years</i>	<i>PV of the quoted Levy</i>	<i>License fee accepted</i>	<i>PV of the License fee</i>
Andhra Pradesh	JT Mobiles	12.12.95	10010	5028	10010	5028
	Tata Cellular	19.12.95	8580	4309	10010	5028
Gujarat	Birla AT & T	12.12.95	17941	9011	17941	9011
	Fascel	19.12.95	12293	6174	17941	9011
Karnataka	Modicom	04.04.96	13930	6997	13930	6997
	JT Mobiles	15.02.96	13200	6630	13930	6997

Table 2.2 (Continued...)

<i>Circle</i>	<i>Name of the Operator</i>	<i>Effective date of License</i>	<i>Total levy quoted for 10 years</i>	<i>PV of the quoted Levy</i>	<i>License fee accepted</i>	<i>PV of the License fee</i>
Maharashtra	Birla AT & T	12.12.95	16577	8326	16577	8326
	BPL Cellular	19.12.95	14630	7348	16577	8326
Tamil Nadu	BPL Cellular	12.12.95	8360	4199	8360	4199
Category "A"- Total			120021	56669	133636	67120
Haryana	Aircel Digilink	12.12.95	2400	1347	2400	1347
	Escotel	12.12.95	2459	1235	2400	1347
Kerala	BPL Cellular	12.12.95	5170	2597	5170	2597
	Escotel	12.12.95	3848	1933	5170	2597
Madhya Pradesh	RPG Cellcom	12.12.95	510	256	510	256
	Reliance Telecom	12.12.95	56	28	510	256
Punjab	Modicom	04.04.96	12660	6359	12660	6359
	JT Mobiles	12.12.95	9145	4593	12660	6359
Rajasthan	Hexacom	22.04.96	1610	993	3820	1919
	Aircel Digilink	12.12.95	2100	1179	3820	1919
UP (East)	Koshika Telecom	12.12.95	2109	1460	2109	1460
	Aircel Digilink	12.12.95	2100	1179	2109	1460
UP (West)	Escotel	12.12.95	4062	2040	4062	2040
	Koshika Telecom	12.12.95	2582	1788	4062	2040
West Bengal	Reliance Telecom	12.12.95	420	213	420	213
Category "B" Total			51231	27197	61882	32167
Assam	Reliance Telecom	12.12.95	13	7	13	7
Bihar	Koshika Telecom	23.08.96	1365	945	1365	945
	Reliance Telecom	12.12.95	26	13	1365	945
Himachal Pradesh	Bharti Telenet	12.12.95	150	81	150	81
	Reliance Telecom	12.12.95	13	7	150	81
Orissa	Koshika Telecom	12.12.95	892	618	892	618
	Reliance Telecom	12.12.95	26	13	892	618

Table 2.2 (Continued...)

<i>Circle</i>	<i>Name of the Operator</i>	<i>Effective date of License</i>	<i>Total levy quoted for 10 years</i>	<i>PV of the quoted Levy</i>	<i>License fee accepted</i>	<i>PV of the License fee</i>
North East	Hexacom	12.12.95	19	13	19	13
	Reliance Telecom	12.12.95	13	7	19	13
Category "C"- Total			2519	1704	4865	3321
Total			173770	85570	200383	102609

Source: Department of Telecommunication (DOT)

Note: Present Values (PV) are calculated at 16 per cent rate for a period of 10 years

In case of Rajasthan Circle, the accepted License Fee is equal to what the first bidder has bid for but as it has opted out the second and the third bidder has matched that bid to get the License.

The guidelines issued by the DOT for the cellular operators license for the circles had no ex-ante caps on the number of circles in each of three categories to be awarded to a single bidder. But ex post facto the DOT modified this and had put a cap of three circles per category for a single bidder. But many companies were successful in pursuing aggressive bidding strategies as these bidders were interested in suitable blocks of licenses instead of a single license. For example Reliance Telecom had the maximum concentration of license in terms of the number of states. It won licenses for 13 states by winning 6 circles including West Bengal circle, which includes Sikkim and the North East comprising of 6 states. Apart from Reliance Telecom, other companies that won more than one license were Koshika, which won 4 licenses and BPL Cellar, J T Mobile, Escotel, Modi Group and Aircel each of which got 3 licenses each. The number of licenses won by the companies that participated in the bidding process, and the total amount of license fee paid by each are tabulated below:



Table 2.3
The Companies that Won the Cellular License for Different Telecommunication Circles

Name of the operator	Number of Licenses	Metro/Circles	License Fee (Rs mn)
Reliance Telecom	7	Assam, Bihar, West Bengal, North East, M P, Orissa, Himachal Pradesh	3,369
Koshika	4	UP-East, UP-West, Bihar, Orissa	8,428
BPL Cellular	4	Mumbai, Maharashtra, T N, Kerala	30,107
JT Mobile	3	A P, Karnataka, Punjab	36,600
Escotel	3	Haryana, UP-West, Kerala	11,632
Modi group	3	Calcutta, Karnataka, Punjab	-
Aircell Digilink	3	Haryana, Rajasthan, UP-East	8,329
Birla AT & T	2	Gujarat, Maharashtra	34,518
Hexacom	2	Chennai, Madhya Pradesh	-
Bharti Group	2	Delhi, Himachal Pradesh	-

Source: Compiled from various sources

Note: BPL Cellular is Part of the BPL Groups, which holds the Mumbai License

The Bharti Group holds-Bharti cellular in Delhi and Bharti Telenet in Himachal Pradesh

Modi Group holds three license- Modi Telstra in Calcutta, Modicom/Spice in Karnataka and Punjab

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The licensing process, which was based on the single round of auction of two GSM cellular licenses in each of the circle, encouraged wide participation by allowing significant foreign ownership in a country where domestic capital was less abundant than the developed country. However, the single round of bidding for the different circle, led to complicated bidding strategies by the companies, the outcome of which were often high and inefficient bids. Other problems of the bidding process was the lack of transparency in the decision making process of the DOT, which although allowed consortia to bid for unlimited number of licenses, modified the rule after the winners were announced and restricted the maximum number of licenses to three per category for each company. For the above change in the ownership rules, some of the companies had to vacate the circle for which they had won the license. Moreover the time taken by the

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DOT in actually awarding the licence after announcing the winner was also looked upon as a drawback of the entire exercise.

2.2 Performance of the CMSP's: Post license period

After the bidding process for the cellular licenses for the metro cities and the other 20 circles were over, cellular operations in the country were first launched in Kolkata by Modi Telstra, on 23 August 1995. Few years after the commencement of services by the private Cellular Mobile Service Providers (CMPS) in the metro cities and in the different circles of the country, the New Telecom Policy (NTP) was announced in the year 1999, The NTP 99 had analysed the performances of the CMSP in detail and made a few important observations, which had implications regarding formulation of effective policies for the further development of the cellular mobile service in India. Some of the important observations made are documented as follows:

- **Heavy Capital Expenditure of some of the CMSPs:** It was observed that few of the CMSPs had incurred heavy capital losses due to their wrong assessment of the market and over provision of capacity. The backbone laid by them is currently under utilised.
- **Low Subscriber Base:** Though the cellular subscriber base is growing at a phenomenal rate yet the base is still very small. Due to the wrong assessment, the number of subscribers and the subscriber base for cellular telephony has been lower than what has been projected by the CMSPs.

- **Slower Revenue Growth Rate:** The average revenue growth was less than what was estimated by the private CMSPs while bidding for the license. The average revenue per user (ARPU) was Rs. 11,000/- Rs. 800/-and Rs. 600/- per month for A, B and C category circles respectively. The ARPU was reported to be highest in the metros.
- **High Operational Expenditure:** For most of the CMSPs the operational expenditure were very high which was about 75% of their revenue and the operators were found to be making efforts only to control operational expenses.

Apart from the above listed problems, it was also seen that time taken for obtaining clearances and to settle issues like interconnectivity had also added to the increase in cost and overruns with respect to time. It was observed that financial closure¹ has been achieved only for projects with six or seven circles as a result of which the financiers were also loosing confidence. They cited reasons like low returns, lack of adequate cash flow and long payback time as the causes for their holding back of investments. Most of the CMSPs as a result were incurring losses and payback was expected to begin only from the 7th or the 8th years for some of the circles. This was cited as a reason by many of the CMSPs to argue that the license period of 10 years was unviable.

However it was also seen that the Metros, were doing better than the other circles, which can be because of the initial grace period and relatively lower license fee in the first three years (as seen from table 2.1). The optimistic projections of the subscriber base by the

¹ Financial Closure: It is defined as the legally binding commitment of the equity holder or debt lender to provide or mobiles funding for the project, which must account for a significant part of the project cost, securing the construction of the facility.

private CMSPs, which resulted in unrealistic license fee bids, had led to a situation where the viability of the circle operators was not in keeping with the expectation at the bidding stage. As a result of this many of the private operators had sought the help of the government asking for remedial action, as financial closure had not taken place for most of them.

In October 1998, the government of India in order to improve the viability of the private service providers extended the license period of the circles from 10 years to 15 years. This was soon followed by the New Telecom policy (NTP) 1999, announced in March 1999, where the government took the landmark decision to migrate to a revenue sharing regime from the existing fixed license fee regime for cellular services, in addition to a one time entry fee for the new entrant. The license period was also increased from 15 years to 20 years for the circles as well as for the metros. Thus from July 1999 the government permitted the existing circle and metro operators to migrate to the revenue sharing regime as per NTP 99.

Apart from the migration to revenue sharing regime from fixed license regime, the NTP 99 also envisaged a few important changes for the CMSPs, which are tabulated below:

- The initial license period was increased to 20 years, which is extendible for a period of 10 years thereafter.
- DOT/MTNL would be made the licensee as the third operator in each service area for implementation in a time bound manner.

- Entry of more operators in the service area shall be based on the recommendation of the TRAI.
- New CMSPs will be required to pay a one-time entry fee.
- The CMSPs will be free to provide services in their area of operation using any type of network equipment that meets the International Telecommunication Union (ITU)/ Telecommunication Engineering Center (TEC) standards.
- Direct interconnectivity between a licensed CMSP and any other type of service provider including VSNL in their service area shall be permitted.
- The CMSPs apart from providing mobile telephony services shall be permitted to carry long distance traffic within their service area without any additional license.

However the NTP 99 didn't provide the framework for determination of the "Entry Fee" or the basis of determining the revenue sharing, and it was solely left to TRAI to work out the framework. Therefore TRAI was expected to consider the matter very carefully, taking into account the relevant aspects, so that the new licence structure and the entry fee were in line with the objectives of the NTP 99, the main thrust of which was to provide affordable and effective communication.

2.3 Migration Package for the CMSPs

As seen from the earlier section, the government in the NTP 99, decided to move from the regime of upfront license fee payment to one of revenue sharing, in order to save the private cellular mobile service providers from being unviable for business. For the interim period, the revenue sharing percentage was decided at 15 per cent, with the final

decision to be taken by the government later, on the basis of a TRAI recommendation. The TRAI had specified Rs. 600 as monthly rental and Rs. 6 as the maximum airtime charge per minute for the standard tariff package after the migration to revenue sharing. These calculations of TRAI were based on data of cost incurred by the metro service providers. However the migration to the new license fee regime led to a substantial cost reduction, and the data for metro service providers showed that this reduction was about 50 per cent of the cost of the existing license fee. As the reduction in cost was substantial, a re-look at the tariff structure for the standard packages was necessary.

In order to understand the rationale of NTP 99, and subsequently the migration package, we have to first understand the rationale for the license fee. The different reasons stated by the government of India for levying license fee from the private cellular mobile service providers were the following.

- For recovering the cost of administering the license from the service providers.
- As an entry barrier to eliminate non-serious players or as a method of selection of limited number of players.
- For augmenting government revenues for national development effort. This can be realised in the form of license fee charges from the operator or service tax, which may be different for different services. In the case of license fee from operator, it could be some consideration for the revenue expected to accrue to operator, especially in a limited competition scenario.
- Entry of only one or two players because of the limited availability of the frequency spectrum, which is a scarce national resource. Private sector should

contribute a reasonable sum as a license fee after ensuring reasonable Internal Rate of Return (IRR) for them. This contribution should not be limited merely to regulatory expenses and R&D etc.

- To obtain a part of the supernormal profit when a limited number of players are allowed to operate in the market.

The basis for the determination of the license fee has to be linked to mainly two things; they are 'Policy Objectives' and 'Competition Strategy'. The license fee structure has implications for the viability of the project and on cost to the end user. It is necessary that the licensee fee should be reasonable and fair to ensure 'Affordable' and 'Effective' communications and to create a modern and effective telecommunication infrastructure, which was at the core of the NTP 99.

2.3.1 Implication of the Migration Package

The consequences of the New Telecom policy were far reaching and there was more to the migration package than just creation of affordable and effective communication. A cursory glance at the policy will reveal that because of the Migration Package announced by the government because of which the private operators would be allowed to switch to a revenue sharing regime instead of the license fee regime, the government virtually lost Rs. 4,500 crore license fees (Rs.783 crore for basic services, Rs.2,944 crore for cellular services plus interest) that the telecom operators already owed to the government. Instead of this the Government would now collect only a meagre amount per connection under the new revenue sharing scheme plus a small one-time entry fee.

Under these circumstances, it is worthwhile to recapitulate the conditions under which licenses were issued to the cellular service operators. As stated earlier, the government policy suggest that in order to expedite telecom penetration in the country in the Eighth plan period, there was a need to seek additional resources, namely foreign and Indian private capital. This was the basis of tendering for the auctioning of two cellular licenses per state to private operators. Though the argument for inducting private operators was for augmenting capital investments in telecom, during the tendering stage, licence fees were made virtually the sole criteria for award of licenses as both the government of the day and the private operators were vociferous in their arguments that the telecom pie was big enough to provide for the quoted license fees and cheap telecom services. However some economists had argued that high license fee is effectively a tax on the telecom subscriber and instead commitments regarding rural and urban deployment should be the basis as it was argued that the private operators would concentrate only on a few of the better off states and not invest in rural telephony or in states where the revenues are likely to be low, which was one of the objectives of the Eight FYP. This is turn, would lead to even further skewed telecom development in the country.

Soon after award of licenses to the private operators, these operators sought time to make their payments, as many of them didn't have deep enough pockets to pay for the huge license fee amount that they had bid for. A large part of the problem was the bad financing methods. The companies made liberal assumptions regarding the availability of funds from debt financing and the capital markets. Most of the early debt that they could arrange went for paying the licensee fees. Thus after having secured the license by

bidding at unrealistic levels, the private companies were interested in converting these license fees from up front payments to a revenue sharing arrangement or pay out from profits in order to stay in the business.

The problem with such migration is that it makes the tendering procedure redundant as the parties that secured the license did it on the basis of irrational commitments regarding license fees. If the license fees are done away with, then the entire basis of award of contract falls apart, and whatever little the merit of inducting private capital -- augmenting the Government coffers with license fees -- also disappears.

The simplest course of action for the government, when the private operators failed to pay the license fee committed by them would have been to cancel the licenses and issue fresh licenses after compensating the existing license holders for their assets. This was what the Attorney General had advocated earlier to the private operators. However, the working group on telecom that drew up the New Telecom Policy of 1999, allowed the private operators to switch from a licence fee arrangement to a revenue sharing one, which in effect only encouraged the defaulters and sent completely wrong signals to the market.

It was moreover argued that the migration package shouldn't have been offered to the CMSP's of the metros, as these companies were issued licenses before the announcement of NTP 94. Moreover they were not paying a one time license fee like that of the circle operators, instead they had to pay a fixed license fee for the first three years and after

that, for the subsequent years they had to pay only Rs 6,023 per subscriber per year as the license fee.

The metro operators commanded nearly 60 per cent of the Rs. 2000 crore total revenue of the cellular operators and have made up to 100 times the face value of their stocks through various deals over time. These are cash rich operators who were certainly not sick. While the 22 circle cellular operators have already paid Rs. 4,000 crore in two years and have outstanding dues of about Rs. 2,5000 crore, the metro operators have paid only Rs. 130 crore². The “Migration Package” which offered huge profits to the metro operators, only increased their bloated profits, which only help them to maintain their monopoly status.

The only person to object to the DOT’s “migration package” was the then telecommunication minister Mr. Jagmohan, who backed DOT’s contention that such a change in licensing arrangement would be wrong. But never the less, the government made the decision of migrating to the “revenue sharing” regime and it also removed its telecommunication Minister from his post. Thus the New Telecom Policy that was adopted bailed out private telecom operators and provided the fig leaf of “migration from NTP94 to NTP99”. In essence, the government has bailed out defaulters and provided a policy that the defaulters were asking for violating their original contract. At one stroke, the entire tendering procedure followed in the cellular services tender had been rendered fraudulent.

² “Telecom Bailout or telecom Sell-out”, P. Purkayastha

2.4 Entry of the Third and the Fourth Operator

As stated earlier, one of the main issues of NTP 99, apart from switching to revenue sharing regime, was the entry of DOT/MTNL as the third operator in each service area in a time bound manner, and also the introduction of the fourth operator. This was expected to bring about an explosive growth in the cellular service market and to intensify competition, which in the long run was expected to benefit the consumers as the tariffs would fall and the quality of service would improve. Before the entry of the 3rd and 4th operator there were 42 networks, with two private operators providing service in metro cities and 17 circles with the exception of West Bengal, Punjab and the Northeast, where there was only one service provider and Andaman & Nicobar Islands, where there were no operators.

In the first week of January 2001, the government of India announced the guideline for the fourth operator for cellular mobile services, where it was decided that a multi-stage informed bidding process would be followed for each of the metros and the circles. Unlike the first round of bid for the first and second cellular operator in 1993, when players had to bid for license fees, this time, the bidding was for the entry fee, to be paid upfront. The license fee, meanwhile, has been pegged at 17 per cent for the private cellular mobile service providers. NTP 99 has also permitted resale of business/transfer of license by one network owner, subject to the consent of the licensor. Unlike the previous policies, where the government restricted the number of cellular operators to four, the guidelines for the fourth operator mention that, "additional licenses may be

issued from time to time in future if the need arises, after consulting with the regulator, that is the TRAI."

The guideline for the fourth cellular operator was announced by the Union Minister for Communications, Mr. Ram Vilas Paswan in January 2001. The process of issuing licenses was scheduled to start by the end of January 2001 with the issue of the notice followed by pre-bid conference in February 20. The invitation for financial bids was to start by April 30, 2001, with the bidding process to be completed by July 2001.

The main guidelines for the bidding process as explained by the telecom secretary Sayamal Ghosh were as follows:

- For entry fee, a 'multi-staged informed ascending' bidding process for the entry fee would be followed, which would include a pre-qualification round followed by three rounds of financial bidding. In this process the price quoted by the highest bidder would be treated as the reserve price for the next round. This would have to be matched by all the bidders wanting to participate in the next round. A process of elimination will be followed wherein the lowest bidder will be eliminated at each stage.
- To thwart non-serious players from bidding, it has been made mandatory for the successful bidders to deposit at least 20 per cent of the bid amount within a day and the balance 80 per cent within 10 days of the final bid opening.

- To be eligible to participate in the bidding process the net worth of the company had to be Rs 100 crore for category A service area, Rs 50 crore for category B, and Rs 30 crore for category C service area with a paid-up equity capital of 10 per cent by the promoter of the company. However, for companies applying in more than one circle, the total minimum networth required will be calculated on the basis of the formula ' $100X + 50Y + 30Z$ ', where X, Y, and Z are respectively the number of bids in A, B, and C service areas. The net worth of only such promoters who have not less than 10 per cent share in the equity capital of the bidder company shall be added. The bidding companies will be required to submit financial bank guarantee of Rs 50, Rs 25 and Rs 15 crore for category A, B, and C service areas before the date of signing the license agreement besides submitting performance bank guarantee of Rs 20 crore, Rs 10 crore and Rs 2 crore for Category A, B and C service areas.
- The government placed no restriction on the number of bidders in a particular service area or on the number of licenses that can be awarded to a bidder company. But the existing players were not allowed to bid for the fourth license in their current area of operation. A bidder company was also allowed to apply for any number of service areas, subject to certain minimum net worth and paid-up equity criteria. However, a promoter cannot have stakes in more than one company bidding for the same service area.

In terms of the guidelines for the fourth operator, the license fee has been fixed at the maximum revenue share of 17 per cent of adjusted gross revenue, for all metro cities and telecom circles, except 10 per cent for Andaman and Nicobar circles. As expected, this 17 per cent is inclusive of the universal service obligations fund and 2 per cent towards wireless charges for use of cellular spectrum of up to 4.4 MHz + 4.4 MHz. Any additional bandwidth shall attract additional revenue share (typically 1 per cent additional if bandwidth allocated is up to 6.2 MHz + 6.2 MHz, subject to availability and justification.). Any digital technology, which has either been validated by the Telecom Engineering Center or has been used for a customer base of 100,000 for one year anywhere in the world, was allowed to be used by the service provider.

It was also stated that the bidding company must be an Indian company registered under the Indian Companies Act, 1956. The foreign equity of the bidding company was not supposed to exceed 49 percent of the total paid-up equity of the company at any time during the entire period of the license. The license would be issued on a non-exclusive basis for a period of 20 years and will be further extendable by 10 years. Unlike in the past, the resale of the business and transfer of the license will be permitted, subject to the prior written consent. However, permission will be granted only after ensuring that competitiveness in a service area is not compromised. The government also has reserved the right to issue additional license from time to time.

In terms of rollout obligations, the guidelines stipulate that in telecom circles, at least 10 per cent of district headquarters will be covered in the first year and 50 per cent within

three years of effective date of license. In metros, 90 per cent of the area will need to be covered within one year. Direct interconnectivity among all service providers in a service area has been permitted for terminating traffic to each other. However, a long-standing demand of the industry to be allowed direct interconnectivity between circles has been ignored. It has also been made mandatory for cellular service providers to provide inter-connection to NLD service providers, so that subscribers have a free choice. The government has also decided to allow cellular operators to set up mobile community phone service by making available the use of handsets to members of the public, who do not own a handset of their own.

The number of license to be given in the different circles are tabulated below:

Table 2.4
Number of Licenses to be Awarded in the Different Categories of
telecommunication Circles in the Second Round

Service Area	Category	No of license to be awarded
Metro Cities		
1. Mumbai (local area served by Mumbai, New Mumbai and Kalyan telephone exchange)	A	1
2. Calcutta (local area serves by Calcutta telephone exchange)	A	1
3. Delhi (local area served by Delhi, Gaziabad, Faridabad, Noida and Gurgaon telephone exchange)	A	1
4. Chennai (local are served by Chennai telephone exchange direct, Maraimal Nagar Export Promotion Zone (MEPZ), Minjur and Mahabalipurap exchange)	A	1
Telecom Circles		
5. Andaman & Nicobar Islands	C	3
6. Andhra Pradesh	A	1
7. Bihar (including Jharkhand)	C	1
8. Gujarat	A	1

Table 2.4 (Continued...)

	Service Area	Category	No of license to be awarded
9.	Haryana (except the local area served by the Faridabad and Gurgaon telephone exchange)	B	1
10.	Himachal Pradesh	C	1
11.	Karnataka	A	1
12.	Kerala	B	1
13.	Madhya Pradesh (including Chhattisgarh)	B	1
14.	Maharashtra (except the local area served by the Kalyan telephone exchange)	A	1
15.	Orissa	C	1
16.	Punjab	B	1
17.	Rajasthan	B	1
18.	Tamil Nadu (except the local area served by the MEPZ, Minjur and Mahabalipuram exchanges)	A	1
19.	Uttar Pradesh (West) (entire area covered by Western Uttar Pradesh , including Uttaranchal, with the following as its boundary district towards Eastern Uttar Pradesh: Pilibhit, Bareilly, Badaun, Etah, Mainpuri and Etawah, except the local area served by Gaziabad and Noida telephone exchange)	B	1
20.	Uttar Pradesh (East) (entire area covered by Eastern Uttar Pradesh with the following as its boundary districts towards western Uttar Pradesh: Shahjahanpur, Farrukhabad, Kanpur and Jalaun)	B	1
21.	West Bengal	B	2

Source: Special Stories, "tele.net", January 2001.

Note: The number of license to be awarded to Andaman & Nicobar Island is 3, which include 2 vacant slots, and for West Bengal are 2, which includes 1 vacant slot.

After the guidelines were set, the bidding process for the forth cellular operator' license started on June 29, 2001. The response received from the bidders was not at all encouraging for the government. Initially seven companies submitted bid for the 17 circles and there were 57 bids in all for the first round of the three round bidding. Subsequently, the numbers of bidders were reduced to six following the withdrawal of its bid by Reliance Communications on July 6. The four non-lucrative circles of Bengal, Bihar, Orissa and Andaman & Nicobar Islands did not attract any bids. Surprisingly there

were no foreign players among the bidders and even the existing players like Shyam Telecom and ModiCorp stayed out of the race. Apart from the existing players, two new entrants who took part in the bidding process were Reliable Internet Services (30 per cent owned by Reliance Telecom) and Indmobile (promoted by Priyaraja Rao of JT Mobile fame)

The situation that emerged at the end of first round of bidding process is shown in the following table:

Table 2.5
First Round Bidding Results for the Fourth Cellular Operator

(in Rs million)

Circle	License fee paid by the existing operator	Escorts	Reliance	Bharti	Ind-mobile	Bara-khamba	BPL-Batata
Mumbai	890	-	90	2036.5	-	-	-
Delhi	980	610	90	-	-	-	805
Chennai	220	-	25	-	-	1175	205
Kolkata	320	-	25	778.5	-	-	-
Maharashtra	4730	-	50	1025.6	-	-	-
Gujarat	5120	510	40	1025.6	-	-	-
Tamil Nadu	2380	21	35	778.5	-	-	-
Kerala	1480	-	20	405.3	-	-	-
Punjab	3590	710	20	-	1050	-	-
Haryana	680	-	10	214.5	-	-	-
Madhya Pradesh	150	-	-	174.5	-	-	-
Uttar Pradesh (East)	1380	180	15	305.4	-	-	-
Uttar Pradesh (West)	1160	-	15	304.5	-	-	-
Rajasthan	1090	180	10	174.5	-	-	-
Andhra Pradesh	2860	-	35	-	-	1030	-
Karnataka	3950	510	35	-	-	1504	205
Himachal Pradesh	40	11	-	-	-	-	-

Source: Fourth Cellular License Bidding, "tele.net", July 2001

The results of the first round of bidding shows that surprisingly, Karnataka attracted the maximum number of bids, that is four bids. It was even more surprising that Punjab circle attracted three bids in all. This might be due to the fact that the winning bidder will be the second cellular operator in the circle. Other circles that attracted three bids were Delhi, Chennai, Gujarat, Maharashtra, Rajasthan, Tamil Nadu and Uttar Pradesh (East). The circles to receive two bids each were Mumbai, Kolkata, Andhra Pradesh, Haryana, Kerala and Uttar Pradesh (West). Madhya Pradesh and Himachal Pradesh got only one bid each. Thus virtue of there being no competitor in Madhya Pradesh and Himachal Pradesh, Bharti and Escotel who quoted Rs 174.5 million and Rs. 11 million, won the license for these two circles respectively.

Apart from Madhya Pradesh and Himachal Pradesh circles, in the 15 other circles the bidders were directly allowed to the second round with the minimum bid of the first round being the floor price for the subsequent round. Thus the first round of bidding was a mere formality with all the bidders allowed to participate in the second round of bidding.

Reliance emerged as the most aggressive aspirant for the fourth cellular license, quoting Rs. 5.15 billion for 15 licenses. In fact, the mundane bidding process was given a peculiar twist by the company, when it submitted two different bids for each of the 15 circles. In all, the group submitted 30 of the 57 bids through Reliance Communications Limited and Reliable Internet Services. While the former is 100 per cent owned by Reliance Industries, it has an over 30 per cent stake in the latter.

This move of Reliance however attracted sharp criticism from its competitor, who cried foul over the group's almost certain entry to the second round owing to the two separate bids submitted by the two group companies. The dual bid issue was put to rest after DOT issued a letter to all the bidding parties reiterating its stand that no two parties, fully or partially owned by the same group, could bid for the same circles. Subsequently, on July 6, the Reliance Group withdrew the bids submitted by the Reliance Communications.

Despite the fact that the current three-stage bidding process is much better designed than the one-stage hawking of licenses in the first phase, the response has been tepid. Although most leading cellular operators have submitted their bids, valuations for the fourth cellular operator license are likely to be far lower than those of the first auction held in 1995. If we take into account the highest bid quoted for each of the circles in the first round, the government will get Rs. 13 billion as license fee. Thus lower tariffs prevailing in the market, higher number of players and price war started by the government owner MTNL has led to the erosion of the market valuation.

The situation after the end of the second round of the three-stage bidding process can be showed in the following table:

Table 2.6
Second Round Bidding results for the Forth Cellular Operator

(in Rs million)

Circle	Bharti	BPL-Batata	Bara-khamba	Escorts	Reliance	Ind-mobile	Winner
Mumbai	2036.6	-	-	-	901.5	-	Bharti
Delhi	-	1706.0	-	1040.0	1020.0	-	-
Chennai	-	1175.0	1268.0	-	251.5 (Out)	-	-
Kolkata	778.5	-	-	-	780.0	-	Reliance
Maharashtra	1050.0	-	1128.0	-	Out	-	-
Gujarat	1050.0	-	-	1025.6	Out	-	-
Tamil Nadu	790.0	-	-	Out	Out	-	Bharti
Kerala	405.4	-	-	1510.0	Out	-	Bharti
Punjab	-	-	-	450.0	Out	1150.0	-
Haryana	214.6	-	-	-	Out	-	Bharti
Madhya Pradesh	174.5*	-	-	-	-	-	Bharti
Uttar Pradesh (East)	305.5	-	-	-	Out	-	-
Uttar Pradesh (West)	305.5	-	-	320.0	Out	-	Bharti
Rajasthan	180.1	-	-	-	Out	-	-
Andhra Pradesh	-	-	1030.1	-	Out	-	Hutchison
Karnataka	-	1504.0	-1680.0	Out	Out	-	-
Himachal Pradesh	-	-	-	11.0*	-	-	Escotel

Source: Fourth Cellular License Bidding, "tele.net", July 2001

*Note: * - First round bids declared winners*

The trends that were becoming increasingly clear after the two rounds of the bidding process was that few of the private operators were making a serious effort for an all India presence and others were bidding for circles where they had already acquired or have plans of acquiring the license for the basic service, in order to derive a synergy between the basic and cellular services. For example Reliance had bid for 15 cellular circles, which included most of the 18 circles for which the group already had a letter of intent for basic services. Bharti Cellular was the other company, which entered the fray in a big way. It had bid for 11 circles in all. Among the metro circles, the company bid for Kolkata and Mumbai. The company also won the Madhya Pradesh circle after the second

round, which was a strategic victory for the company as it already offers basic service in the area. Bharti has already built a nationwide optic fiber network along with SingTel.

The newly formed BPL, Birla, AT & T and Tata joint venture had put in a sum of Rs. 1.22 billion to bid for the three circles of Delhi, Chennai and Karnataka. The mega merger already has a presence in Maharashtra, Goa, Andhra Pradesh, Tamil Nadu, Kerala, Gujarat, Madhya Pradesh and Chhattisgarh, and the new combination can prove to be a big threat to other players in terms of price competitiveness as it can leverage its infrastructure to cut cost, especially in the case of roaming services.

Hutchison had bid for the fourth operator in Chennai under the company Barakhamba Sales & Services, which is a subsidiary of the Sterling Cellulars. Another surprise bid came for the Punjab circle from Indmobile, a company backed by the promoters of erstwhile JT Mobile. It seems that Bharti may have some interest in Indmobile, as it has conspicuously not bid for the circle. Escotel, the company that already offers cellular services in Haryana, Uttar Pradesh (west) and Kerala and bid for the contiguous circles, namely Delhi, Gujarat, Himachal Pradesh, Punjab and Karnataka.

After the second round of the bidding process was over, the third round of bidding followed, after which the winners for the fourth cellular operators were declared for the different circles on July 31. The government was likely to have a cash flow of Rs. 16.3 billion from the entry fee for the fourth cellular operator. Having already won six circles after the second round of the bidding, Bharti added Gujarat and Maharashtra to its list in

the final round. After acquiring license in 8 of the 17 circles, Bharti has emerged as the biggest player with an almost pan-India presence. Bharti, which is already operating cellular services in Delhi, Chennai, Himachal Pradesh, Andhra Pradesh and Karnataka, has gained a foothold in Mumbai circle, as well as Tamil Nadu, Maharashtra, Gujarat, Uttar Pradesh (west), Madhya Pradesh and Haryana. In all Bharti has spent Rs. 6.9 billion for eight circles, most expensive being the Mumbai circle which was acquired for Rs. 2 billion. After the end of the bidding process for the fourth operator, Bharti has presence all over India except for the east. However it has gained some access in the east by bypassing the bidding route by acquiring Spice cell from Modi for Rs. 100 million. This has given Bharti a head start in terms of infrastructure and a ready consumer base of 90,000.

The winner for the fourth cellular licenses and their winning bids are tabulated in the following table:

Table 2.7
Winners of the Fourth Cellular License

<i>(in Rs million)</i>		
Circles	Winner	Bid Amount
Tamil Nadu	Bharti	790.0
Mumbai	Bharti	2036.6
Kerala	Bharti	405.4
Madhya Pradesh	Bharti	174.5
Uttar Pradesh (west)	Bharti	305.5
Haryana	Bharti	214.6
Gujarat	Bharti	1090.1
Maharashtra	Bharti	1898.0
Himachal Pradesh	Escotel	11.0

Table 2.7 (Continued...)

Circles	Winner	Bid Amount
Punjab	Escotel	1517.5
Rajasthan	Escotel	322.5
Uttar Pradesh (east)	Escotel	452.5
Andhra Pradesh	Barakhamba	1030.1
Chennai	Barakhamba	1544.0
Karnataka	Barakhamba	2068.3
Delhi	BPL-Batata	1707.0
Kolkata	Reliance	780.1

Source: Compiled from different sources

From the above table it can be seen that after Bharti, Barakhamba Sales and Services (Hutchison Essar combine) spent the highest amount. Although it had shelled out Rs 4.6 billion, it won only three circles, namely Karnataka, Chennai and Andhra Pradesh. Although Barakhamba bid higher than Bharti in the second round for the Maharashtra circle, it lost in the final round. Therefore apart from these three new circles, Hutchison already had a presence in Delhi, Mumbai, Gujarat and Kolkata.

Reliance, which started off on an aggressive note by applying for all the circles, ended up with only one circle that is Kolkata. The company is the single largest operator in eastern India and Kolkata was the only gap that it needed to fill. Before the start of the bidding process, Reliance was present in the North East, Assam, Bihar and Orissa. So in a sense it was able to win the circle it coveted the most, in order to consolidate its position in eastern India.

Delhi, which was another keenly contested circle, went to BPL-Batata for Rs. 1.7 billion. The mega merger of BPL, AT & T, Birla and Tata now has a strong presence in southern and western India. The company now offers services in Kerala, Tamil Nadu, Andhra Pradesh, Mumbai, Madhya Pradesh and Gujarat. The company might look at the merger and acquisition route for acquiring a presence in two other circles of Chennai and Karnataka. It might try to buy stakes of Spice Communication in Karnataka from cash-trapped Modi Group, and for Chennai circle it might try a possible alliance with the RPG Cellular, which may now find the going tough having to compete with Bharti and Hutchison, as these two companies have a wider network compared with RPG.

Escotel ended its tally with four circles after the end of the bidding rounds. The company, which bid for eight circles to begin with ended with Uttar Pradesh (east), Rajasthan, Punjab and also Himachal Pradesh, where it was the only bidder. Escotel is already present in Uttar Pradesh (west), Haryana and Kerala.

Although the cellular subscribers in almost all the telecommunication circle have something to rejoice as they now have the advantages of increased competition of four operators, there were a few circles that were not benefited by the bidding process. During the bidding process for the fourth cellular license, no bid was received for the Andaman & Nicobar, Bihar, Orissa and West Bengal circles. The lack of response is attributed to the cellular operators perception that these circles are less lucrative than the others.

There is currently no private cellular operator in the Andaman & Nicobar circle and there is only one operator in Bihar, Orissa and West Bengal apart from the state run BSNL. Although West Bengal is a Category "B" circle, it is considered as non-lucrative by the private operators.

All the six companies that had emerged as the winners of the bidding process had paid up the 20 per cent of the bid amount and were confident of paying the balance amount within the stipulated time. With BSNL likely to set up cellular operations in all the 19 circles and MTNL already present in Delhi and Mumbai, each cellular circle will have four operators with the exception of a few circles. As it was expected, at the end of the bidding process for the fourth cellular operator, followed by a series of mergers and acquisitions, the number of private operators has converged to almost half a dozen. Besides Bharti, Hutchison and BPL-Batata, Escotel and Reliance are the two companies that have emerged with a strong presence in the north and the east.

2.5 Consolidation of the Indian Cellular Market

After the announcement of the licenses, especially after NTP 99, there has been a growing trend towards consolidation in the Indian mobile industry. Mergers is the natural response by the operating firms in an industry, which is undergoing not only rapid technological changes, but also regulatory and market changes. Most mergers and other alliances can foster efficiency and thus bring increased benefits to the consumers and also the private companies concerned. Leading mobile operators in the recent past have committed billions of rupees on mergers and acquisitions.

The process of acquisition and consolidation has been driven by pressure on the operators in their service market, as well as with the perceived opportunities in the other markets with the opening up of the long distance telephony in 2000. At the end of 2000, when the restriction on the minimum ownership and lock in expired for most of the circles licencees, mergers and acquisitions and alliances increased among the unhinged cellular operators.

There were eight operators in the four metros at the time of awarding of the license after the first round of bidding in 1994. By the end 2000, there were five distinct operators alliances that existed in the industry. Among the two major alliances that existed, the first one was Hutchison Max, Essar and Usha Martin, then we have the alliance of the Bharti Cellular, Skycell and JT Mobile. The other three companies that were present in the metros were BPL Mobile, RPG Cellular and Spice Cell Ltd.

Likewise in the category 'A' circles too, there were 7 operators for the 10 licenses awarded in 1995. By the end of 2000, this was reduced to 5. Out of these five operators, there were two alliances, the first one was of the Birla AT & T and Tata Cellular, while the second one was that of Hutchison Max and Fascel. The other service providers that were operating in the Category 'A' circle were JT Mobile, BPL Cellular and Spice Communications.

2.5.1 Reasons for the Consolidation of the Indian Cellular Industry

In this section we will try to look into the reasons for consolidation of the cellular industry in India. Faced with emergence of competition from well-funded competitors like the BSNL and the MTNL, which entered the cellular industry as the third operators, the private operators needed to reduce tariffs by reducing cost in order to remain competitive. Even increased competition in the market started to drive down the tariffs, as the operators had to make efforts to hold on to their market share. Thus the imperative was for mergers in order to increase efficiency gains by lowering interconnection payments, sharing of capital expenditure etc.

From a cost perspective also the operators can benefit from economies of scale with a nationwide network. This also allows them to have flexibility of price plans. Many operators were seen to charge less for incoming calls from their own network. Roaming charges are typically lower if a subscriber from the home network roams to another network owned by the same company. For example BPL offers roaming facility at Rs 6 in its circles instead of the standard rate of Rs 10. Moreover large operators can also exert significant negotiation leverage with long distance service providers and on roaming charges where they don't own networks.

The opening up of the NLD services increased the urgency towards consolidation and acquisition of cellular operators with either a strategic location along a high-density route or with a substantial network buildup, as the operators with broader footprint are able to provide this long distance service at a cheaper rate. The time, energy and expertise to

build a long distance network from scratch can be minimised by the process of mergers and acquisitions. The exclusion of mandate access to intra-circle long distance traffic for the national long distance service providers became another driving force for consolidation. Operators with multiple footprints and with plans for NLD service provision will seek to enter into cooperative arrangements with small operators, who have no plans to provide NLD services.

Clear delineation in valuations between those who have been successful and those who haven't was also an important factor for consolidation of the Indian market. Well funded aggressive players such as the Hutchison group, BPL, Bharti Group, Birla AT & T, Tata and Reliance group with the state of art networks emerged as strong competitors, particularly since these have all invested substantially in facilities and in scalable and upgradeable networks.

For weaker operators, with neither a significant subscriber base, nor well funded promoters, their business plans have fallen apart under huge license fee payments and high debts and low subscribers revenues. A large part of the problem faced by these companies was due to bad financing methods. Companies made liberal assumptions about the availability of funds from debt financing and the capital markets. In many cases the accumulated loss exceeded the net worth. They faced the stark possibility of being swamped with well-funded new entrants, who will reduce tariffs and thus negate the benefit of revenue sharing and increased subscribers' penetration. For them merger with a well-funded operator was the only possibility of survival and recoup of their investments.

In this respect it would be interesting to mention about Vinay Rai's Koshika Telecom, which suffered the ultimate ignominy of having to surrender its licenses after it failed to mobilise enough resources to pay for the license. Another company, BPL, which planned to float BPL Cellular Service in the American depository receipt/global depository receipt market, failed in its venture. However, Rajeev Chandrasekhar, the BPL chief, sold his business to the Birla-Tata-AT&T combine in the summer of 2001.

On the other hand, companies such as Bharti Tele-Ventures, Hutchison and Birla-Tata-AT&T have not only emerged as dominant players but have also gone from strength to strength, both in terms of geographical reach and financial restructuring. From a modest beginning in 1995, Bharti has expanded its operations rapidly from services in two cellular circles (New Delhi and Himachal Pradesh) and one fixed-line circle (Madhya Pradesh) to emerge as one of the few fully integrated telecom services providers. In fact, most of Bharti's existing circles have turned cash-positive at the operational level. The company's ability to turnaround the acquired circles and successfully manage expansion, has led to substantial interest from overseas investors. The company has been able to secure more than \$1 billion of private equity funding. Currently, private equity investors hold 41.7 per cent of the company's post-IPO equity of Rs 1,853 crore.

Birla-Tata-AT&T combine and Hutchison have also benefited from the equity brought in by the promoters, which has enabled them to emerge as dominant players. Hutchison, with strong support from its Hong Kong-based parent, acquired majority stake in New Delhi, Mumbai, Kolkata and Gujarat circles. On the other hand, despite being a

financially sound group, Tatas found it necessary to join hands with other two bigwigs, Birlas and AT&T. The Tatas have recently acquired a strategic stake in Videsh Sanchar Nigam Ltd, which will give them a foothold in the international long distance telephony services segment.

After the series of mergers and acquisitions, the major operator alliance in India and their respective market share that existed, has been shown in the following table.

Table 2.8
Share of National Subscriber Base for Some of the Private Cellular Operators and Their Alliance Partners in India

	Circles	Subscribers Base (end Sep 2000)	Growth		Market Share (%)	% of National Subscriber base
			FY 2000	FY 01 (6 mth)		
Hutchison/ Esar/ UTML/ Fascel						
Hutchison Max	Mumbai	190405	46.9	60.3	44.0	7.3
Sterling Cellular	Delhi	166638	53.1	24.9	41.4	6.4
UTML	Calcutta	56825	129.3	73.5	43.2	2.2
Fascel	Gujarat	114230	124.0	8.7	67.4	4.4
Total		528098	69.2	37.1	46.5	20.1
BPL Group						
BPL Mobile	Mumbai	242206	34.4	80.0	56.0	9.2
BPL Cellular	Maharashtra	91944	46.9	81.3	52.9	3.5
BPL Cellular	Tamil Nadu	80930	101.8	119.2	50.5	3.1
BPL Cellular	Kerala	96182	136.1	167.7	48.5	3.7
Total		511262	54.8	99.5	53.0	19.5
Bharti Cellular/ Bharti tele.net/ Skycell/ JT Mobile						
Bharti Cellular	Delhi	236081	54.9	56.5	58.6	9.0
Bharti Telenet	HP	8352	48.4	173.3	85.3	0.3
Skycell	Chennai	56851	49.6	45.1	44.2	2.2
Bharti Mobile	Karnataka	71013	37.2	96.3	44.3	2.7
Bharti Mobile	A P	34076	40.4	70.9	41.3	1.3
Total		406373	49.1	63.8	51.8	15.5
Spice Cell (Modi Group)						
Spice Cell	Kolkata	74570	123.9	107.6	56.8	2.8
Spice Telecom	Karnataka	89133	90.3	22.8	55.7	3.4
Spice Telecom	Punjab	121174	117.6	56.7	100.0	4.6
Total		284877	108.2	55.6	69.0	10.9

Table 2.8 (Continued...)

	Circles	Subscribers Base (end Sep 2000)	Growth	Market Share (%)	% of National Subscriber base	
Escotel Mobile						
	Escotel Haryana	38244	74.4	105.4	78.5	1.5
	Escotel U P-West	102248	81.4	177.0	51.5	3.9
	Escotel Kerala	90955	131.2	125.1	100.0	3.5
	Total	231447	96.9	142.3	68.5	8.8
Birla AT & T/ Tata Cellular						
	Birla AT & T Gujarat	55161	12.5	100.7	32.6	2.1
	Birla AT & T Maharashtra	81704	-5.7	128.7	47.1	3.1
	Tata Cellular A P	71856	44.3	43.3	55.8	2.7
	Total	208721	40.4	87.0	44.2	8.0

Source: Compiled from different sources

It is evident that the next phase of consolidation in the sector will see further polarisation of market towards few strong and larger players. Though some of the analysts feel that niche players with concentrated presence in a region also stand a fair chance of tiding over the difficult times, it is quite clear that there is space for not more than three or four private sector players with deep pockets and a focused strategy on a national level.

CHAPTER 3

PRICING OF CELLULAR SERVICE IN INDIA

Pricing of cellular services is a very tricky issue, especially for developing countries like India, where the teledensity of basic telephony is very low and the cellular service is considered as a complement to the basic service. The service has to be provided at a price, which is affordable to the consumers and encourages its use, and at the same time gives the service providers ample scope to earn a healthy return and helps them to expand their network.

The primary revenue drivers for cellular operators are mainly the addressable market and market penetration affected by competitive environment, which determine both the expected growth and the operator's market share, the average price levels and profitability, all of which is reflected in the average revenue per user (ARPU). Addressable market is the total population, which is often referred to as the point of presence (PoP). Often in the basic service, it is seen that there is a high correlation between the GDP per inhabitant and density of fixed lines. However it is not generally possible to draw such comparison in case of density of cellular lines. Although relative wealth is perhaps the most important factor, in the sense that more people can afford a

mobile subscription in the wealthier region, but it is clearly not the only factor. There are many other factors that effect mobile penetration and it pricing. These could be start up date of the service providers, level of competition, cost of service, innovative service offered, technological innovations and most importantly the license structure.

3.1 Initial Tariff Setup for Cellular Telephony in India

In India, the pricing of the cellular telephony has been regulated by the TRAI from the day of its inception in the early 90's. The license condition for the cellular services in India specified that the tariff set would be in terms of "price ceiling". The prices of cellular services typically consists of three things:

- Rental (charged per month and is independent of usage)
- Airtime Charges (charged per minute for using the cellular service)
- Other charges (Membership fees and Activation charges – charged on a lump sum basis)

The typical ceiling that was set initially by the TRAI for the rental charges for the cellular services was Rs. 156 per month. This price ceiling was not only lower than two highest rental category for the fixed network (above 0.3 million lines), but it was also lower than the rental for the alphanumeric pager, which was Rs. 250 per month.

For airtime charges, a typical day was divided into three time periods, namely "Standard", "Peak" and "Off-peak". During the standard hours, the airtime charges was

Rs. 8.40 per minute, which was calculated by applying the highest rate for PSTN, that is Rs 1.40, applied to a 10 second pulse rate. For the peak hour, which was to be restricted to 4 hours per day, the ceiling for airtime was fixed at Rs. 16.80 per minute, that is double the airtime rate for the standard hours, and for the off-peak hours the rate was Rs 4.20 per minute, which is half of the standard hours. The pulse rate for charging airtime was fixed at 10 seconds.

It was also said that the call rates for Sundays and three other national holidays, that is 26th January, 15th August and 2nd October would be half the standard hour rate throughout the day. Moreover no free calls were to be given by the service provider in the airtime. For a call from the mobile to the fixed line, typical charges were to comprise of airtime plus call charges as applicable for the fixed network for local, STD or ISD calls. Thus one minute local call from the mobile to the fixed network during the standard hour would cost Rs. 9.80, that is Rs. 8.40 as airtime and Rs 1.40 as the local call charges. Out of this the airtime charges are retained by the cellular service provider, while the rest is passed on to the fixed service provider, in this case the DOT. Similarly for a one-minute call from the fixed to the mobile network, the fixed network subscriber would be charged Rs 1.40 or less depending on the time slab, while the mobile network subscriber would be charged Rs. 8.40 by the cellular service provider.

Thus in India the regime that exists is the called party pays or the receiving party pays (RRP), under which a mobile subscriber pays for receiving a call. Historically the fixed

network subscribers have not paid for the calls received and the system of calling party pays (CPP) exists in that case.

3.2 Implications of the Old Tariff Setup

During its early days, a conspicuous feature of the cellular market in India was relatively low access charge (i.e. monthly rental), with a comparatively high usage charge. As seen from the previous section, the maximum rental per month that the operators could charge their subscribers was set at Rs. 156 per month. For the three time categories, peak, standard and off-peak as specified in the license conditions, maximum prices for usage were set at Rs 16.80, Rs 8.40 and Rs 4.20 per minute respectively.

Empirical evidence on the cellular market suggested that the existing low monthly rental of Rs. 156 had allowed "easy" access to the cellular service, while the relatively high usage charge prohibited its use. The price package that existed attracted several subscribers who do not spend a large amount on the cellular service. To a certain extent, operators had been circumventing the low access charge by way of tariff plans that charge a higher fixed fee, generally in addition to the monthly rental. It is likely that subscribers to these tariff plans were those who in any case were the moderate to high users of the service. Thus the ceiling of Rs.156 according to many operators resulted in a group of subscribers who were a "net cost" to the operator.

It was also observed that at any given time, each operator had more than one tariff plan to offer, which had free airtime "bundled" with membership fee, and the amount of free airtime varied positively with the membership fee of the different plans.

For calls originating from the cellular network and terminating on the fixed network, the subscriber, in addition to the airtime charge, pays call charges as applicable to PSTN for local, STD or ISD. For mobile to mobile calls within the same cellular service area, only airtime charges are levied. Within the existing tariff structure, calls terminating on the cellular network have to be paid for and are subject to the same price ceilings as outgoing calls. The security deposit was Rs. 3000, which was refundable and the installation charges Rs. 1200, which included costs relating to provision of SIM card, registration of the subscriber in the network, activation charges etc.

3.3 Need for Tariff Restructuring

Following an analysis of the Indian telecom tariff structure, it was decided that a re-balancing of the tariff structure was needed. The process of re-balancing of the tariff structure started in November 1997, when a new tariff regime was tried to be set up for the different telecom services like the basic service, the cellular mobile telephony, Internet, Paging, leased line tariffs, ISDN, other value added services and interconnection charges. This restructuring of tariffs by TRAI, primarily aimed to link tariff formulation to some clearly specified principles like providing a consistent and transparent framework for tariff policy, simplifying the prevailing system of tariffs and achieving cost based prices through regulation and / or competition.

A detailed analysis of the data for the different services was done by the TRAI, which developed a methodology for setting the tariff for the different services, specially the cellular tariffs that would be more cost oriented and at the same time would provide a regulatory regime, which would make it easier for the cellular service providers to develop and mature. It was also argued by the TRAI that the cost based pricing principal would make the subsidies more transparent and better targeted on specific social objectives of achieving the Universal Service Obligations (USO).

Rapid technological progresses in the telecommunication sector fundamentally alters the pace and scope of change in economic decision making, augmenting the availability and development of different products and contributing to major improvements in economic competitiveness. Moreover developments in the telecommunication sector, further strengthens its linkages with economic and social activities.

It is now widely recognised that enhancing efficiency and investment in telecommunication sector requires the introduction of competition, and an essential ingredient of transition from protected market to competition is alignment of prices to cost. TRAI argued that for consumers, cost based prices reflects economic costs and provides efficiency oriented incentive for consumption and for the service providers it better prepares the ground for competition among different operators, who would now focus more on widening their subscriber base in order to increase their profitability and thereby focus on quality of service by improvements in technology and service option.

3.4 The Logic of TRAI Behind the Tariff Re-structuring

While formulating the new tariff structure TRAI tried to make a link between the establishment of cost based tariffs through regulation and by the extent of competition in the market. Low level of price regulation was proposed where the extent of competition was high and vice versa. It was assumed that in the markets where there is competition, prices reflect cost, so the need for regulation is less, while in the markets where the extent of competition is less there is a greater need for regulation because of similar logic.

Even for services for which tariff regulation was proposed, the new tariff regime intended to allow flexibility to the service providers, as it specified tariff in terms of ceiling, which leads to a situation of competitive interaction among operators and also gave operators freedom to distinguish between different type of customers through its price packages. This also results in a better pricing and better quality of service for the customers. Under the new regime TRAI made it mandatory to report all prices and proposed changes in prices 45 days prior to their implementation. It also proposed that all operators that provide any particular service should be subject to same type of regulatory control, which means if the tariff for any service is regulated, then all operators providing the same service would be similarly regulated. Under the new scheme it was proposed that in addition to providing for depreciation, interest and maintenance, cost based price caps are calculated on the basis of a profit ranging from 10 to 20 per cent. A forward looking cost for determining the tariff was used by the authority, and also an attempt was made to incorporate the impact of technological changes on the cost and efficiency and hence on the cost based tariffs.

It was made mandatory on the part of the service providers to furnish clear and complete information on the different tariff options available to the customers at any point of time. Moreover, as ongoing technical changes were expected to alter some of the underlying premises of the pricing exercise, so a time period of two years was specified as the minimum period of re-examination of the tariff setups, unless there are major changes, which requires an early intervention.

3.5 The New Tariff Structure as Proposed by TRAI

3.5.1 Tariff Proposals under TTO 99

The new tariff regime for cellular services as formulated by the TRAI was described in the Telecom Tariff Order (TTO), which was released on March 9, 1999. The tariff thus announced was uniform across circle and metro operations and specified all prices in terms of ceilings. The salient features of the new tariff regime were increases in the monthly ceiling of rental from Rs. 156 to Rs. 600 and a reduction in the highest airtime usage charge from Rs. 16.80 to Rs. 6 per minute. In the tariff order it was shown by TRAI that the cost based tariff for circles taking into account circle license fee resulted in unacceptably high tariff levels, as a result of which, circle data were left out and the proposals were based on data of the metros. The cost basis for deriving the tariff for rental included capital expenses and 50 per cent of the license fee. While the cost basis for deriving airtime charges included operating expenses and 50 per cent of the license fee. Thus for deriving the new rental and airtime charges, the license fee was split equally into capital and operating expenses.

A move toward the Calling Party Pays (CPP) regime in line with international practice was also proposed in the tariff order. Until CPP is introduced, the called party shall have to pay airtime charges for receiving calls made from PSTN to the mobile network. However flexibility to exceed either of the ceiling amounts for the rental and the airtime rates in alternative price packages was absent in TRAI's tariff proposals. TRAI also decided that no free airtime will be available as part of the standard package. In addition, a 45-day reporting requirement was proposed for tariff changes that the CMTS operator desired to introduce in the market.

The salient features of the new tariff policy can be summarised in the following table:

Table 3.1
The Salient Features of the New Tariff Policy

Item	Tariff
1. <i>Date of Implementation</i>	1 st April, 1999
2. <i>Deposit</i>	Prevailing charges as specified in the present license as ceiling
3. <i>Installation charges</i>	Prevailing charges as specified in the present license as ceiling
4. <i>Categorisation of hours in the calendar day</i>	Standard hours and concessional hours
5. <i>Duration of Standard hours and Concessional hours</i>	Standard hour shall not exceed eleven hours in a calendar day except as provided otherwise. All other hours shall be Concessional hours
6. <i>Timing of Standard hours and Concessional hours</i>	Forbearance
7. <i>Pulse rate</i>	20 seconds
8. <i>Rental</i>	Rs 600/- per month

Table 3.1 (Continued...)

Item	Tariff
9. <i>Airtime charges</i>	
<i>(9a) Standard hours</i>	Rs 6/- per minute
<i>(9b) Concessional hours</i>	Forbearance, provided that airtime during Sundays and three National holidays (26 th January, 15 th August & 2 nd October) shall be priced at Concessional rates
10. <i>Calls from PSTN to Mobile</i>	The called party to pay airtime
11. <i>Call from Mobile to PSTN</i>	Tariff to be paid by the calling party are the airtime plus the PSTN charges for the local or the long distance as applicable
12. <i>Call from Mobile to Mobile within Metro license service area</i>	Both called and calling party to pay airtime
13. <i>Call from Mobile to Mobile not included in item 12 above</i>	Tariff to comprise airtime plus a supplementary long distance charge based on distance. The service provider shall make the calling party aware of the quantum of the supplementary charges to be paid by the party, by making appropriate technical arrangements.

Source: TRAI: The Telecommunication Tariff Order 1999, March 9, 1999; TRAI Order No 99/3

Note: "Forbearance" means that the authority has not fixed the tariff for the time being, and the service provider is free to fix any tariff for the particular service, subject to the reporting requirement.

As has been mentioned above, circle data were left out and the proposals were based on data of only the metros. This was initially disputed by certain service providers in the circles, who preferred the existing regime to continue in the circles until further review of the economics of circle cellular. Although a differential tariff regime for metros and circles can be theoretically conceived, the Authority, at present, favours a uniform tariff regime across the Industry.

The deposits and installations charges, specified in the above mentioned tariff order were the respective ceiling while with regard to STD and ISD deposits, TRAI decided to forbear for the time being.

In the new tariff proposal, the existing time periods of 'Peak' 'Standard' and 'Off-peak' were reduced to two categories, namely 'Peak' and 'Off-peak' hours, with peak hours being subject to a ceiling of eight hours in a calendar day. It was decided to adopt a different nomenclature for categorisation of hours for CMTS. Instead of peak and off-peak hours, the categorisation for tariff setting purpose shall be 'Standard' and 'Concessional' hours respectively.

The CMTS operators were given the flexibility to determining the timing of standard and concessional hours provided that standard hours do not exceed eleven in a calendar day. Airtime during the entire calendar day on Sundays and three national holidays, i.e. 26th January, 15th August and 2nd October shall be priced at concessional tariffs. Tariffs for concessional hours have to be less than the corresponding tariffs for standard hours. The exact level has been left free for the service provider to decide. The pulse rate for calculating airtime was decided at uniform intervals of 20 seconds.

Until CPP was introduced, it was decided that the called party should have to pay airtime charges for calls made from PSTN to the mobile networks. The calls from mobile to PSTN, shall comprise two elements:

- Airtime charges; plus

- PSTN charges for local or long distance as applicable from time to time to the fixed network.

For calls from mobile to mobile, direct inter-connectivity was allowed between cellular networks operating within the same region. Otherwise a mobile to mobile call will consist of:

- Airtime charges; plus
- A supplementary long distance charge based on distance.

This shall apply in the case of all mobile to mobile calls except for those falling within the Metro Licensee Service Area. For these calls, only airtime shall be charged. In addition, the calling party may have to pay a quantum of supplementary charge, because the called party may be at a different location, thus altering the charges to be paid by the calling party.

In case of roaming, pre-paid cards and other value added services (VAS), TRAI agreed to forbear the additional charge to be levied for the time being, except for the general reporting requirement. This condition shall also apply to pre-paid cards. But in case of pre-paid cards, it was decided that after a detailed assessment, the tariff conditions would be changed if necessary.

The issue of sharing of revenue for long distance international calls remained a debatable issue. It was decided that for the time being, the existing non-sharing arrangement between the basic and cellular networks would continue for domestic long distance and international calls.

3.5.2 Summary of Main Comments

After the announcement of the new tariff regime, comments were received from different quarters. An overwhelming majority of them were from service providers and the Cellular Operators Association of India (COAI). Although most of the comments reflected sectional interests of the group concerned, yet there were a few very pertinent comments. Subscribers and Consumer Associations responded mainly to the proposals for Basic Services. The comments in response to the cellular tariff structure can be broadly summarised as follows:

3.5.2.1 Extension of the tariff arrived on the basis of metro data to circles not justified

The approach of extending the metro data derived tariffs to circles was questioned since there are large differences in the cost structure between circles and metros. It was argued that any decision regarding circle tariff like the high license fees payable, which crucially affects the viability of the service providers should also be taken into account.

3.5.2.2 Proposals that increase the degree of regulation and limit the flexibility of the CMTS operator

The 45-day reporting requirement for all tariff changes was perceived by the cellular service providers as being restrictive. The service providers demanded that tariff changes could be filed with TRAI 3 days before introduction. Besides, it was stated that service providers be allowed the freedom to offer alternative tariff packages, provided that the package proposed by the Authority was always available to the subscriber.

3.5.2.3 Issues relating to the implementation of the CPP regime

Apart from the technical difficulty, service providers felt that implementing the CPP regime along with the attendant tariffs would result in a revenue loss to the service providers in the short term. It is important to note here that the cellular subscriber has to pay airtime charges for receiving a call.

3.5.2.4 Revenue implications of reduction in the airtime charges

Since the prime source of revenue for cellular operators is airtime, service providers argued that the highest rate for airtime use of Rs. 6 per minute is too low and would decrease revenue substantially. The operators had suggested a uniform billing interval of 60 seconds. This proposal is restrictive, especially when considered in the context of the average call holding time, which is considerably less than 120 seconds.

3.6 Amendments to the Telecom Tariff Order

3.6.1 Amendments for Post-paid Connection

TRAI in the first amendment to the Telecom Tariff Order of 1999 changed the date of implementation to May 1, 1999. This was in response to the request from DOT, which wanted the date of implementation to be postponed by five weeks as it had received requests from some of the basic and cellular service providers seeking a 2-4 weeks postponement of the tariff order. The decision for postponing the date was taken by TRAI in an open house meeting, at the office level, with the association of the service providers and their representatives and the representatives of the DOT on March 29.

As discussed earlier, several CMTS Operators in response to the TTO 99 argued that flexibility in pricing should be available to them, which would allow them to offer tariff plans apart from the standard packages envisaged in the TTO. In response to this, TRAI in its 3rd amendment (1st May, 1999) of the TTO 99 allowed the CMTS to offer 'alternative tariff packages' (ATP), where flexibility was in terms of rental and airtime charges, provided they were within the ceiling as fixed in the tariff order. However no flexibility was allowed with respect to fixed charges. In order to facilitate mobility of subscribers across different tariff packages it was emphasised that:

- (i) A customer with any service provider has a right to migrate from one tariff package to another.
- (ii) In migrating from one package to another, the customer should not pay charges for items for which service providers incur no additional cost like "installation charge" etc.
- (iii) The customer should be informed about the conditions applicable to migration from one tariff package to another.

Since lower security deposits will be in the interest of customers, the Authority in the fourth amendment to TTO 99 decided to grant flexibility to service providers to determine the amount charged towards security deposit (other than STD/ISD), provided that this amount is within the specified ceiling of the standard package, that is Rs. 3000. The impact of this decision was that now the security deposits would be different for different packages. However it says that the service provider should not levy a charge when the subscriber moves from one tariff package to the other.

In case the subscriber moves from one tariff package with a particular amount as security deposit to another with a lower security deposit, the Authority had decided that the difference will be either refunded to the subscriber or adjusted against the amount payable by the subscriber, as applicable, in the billing cycle subsequent to the move to another tariff package. In addition, as mentioned in the Third Amendment to TTO 1999, a service provider shall refund all security deposits in full at the time a subscriber leaves the network. To the extent, the customer has an outstanding amount due to the service provider at the time of disconnection this amount may be adjusted in the final transaction

In the 5th amendment of the TTO it was decided that the calling party pays (CPP) regime would be introduced, as it is the calling party who actually needs to make the call in order to contact the called party. It was also argued that the introduction of CPP would ensure greater usage of cellular services, as the widely held view was that airtime charge for incoming calls is a strong disincentive that limited the use of the phone. It was also argued that because of the same reason there is no directory for the cellular telephony. The introduction of the CPP would lead to lower average costs and thus provide a basis for reducing tariffs for cellular services. But following a court order, CPP was not introduced for cellular telephony and the issue is under further review before implementation.

As seen in the previous chapter, in view of the poor performance of the private operators under the fixed license fee regime, the New Telecom Policy (NTP) was released in the

year 1999 by the DOT, where the migration package for the cellular mobile service providers was envisaged. The migration packages allowed the private operators to move from the fixed license fee regime to a regime of revenue sharing from August 1, 1999, thereby considerably reducing the license fee burden, which was part of their fixed cost, as the private operators now have to only pay a percentage of the gross revenue as license fee to the DOT.

In the 12th amendment of TTO released on January 25, 2001, it was mentioned that the private service providers have to refund the extra amount that they have levied from their subscribers after they had moved to the regime of revenue sharing. It was argued that since reduction in the license fee meant a substantial reduction in the cost, the prices thus charged by the operators has also to be reduced. The 12th amendment specifying the amount that the cellular service providers in the metros and the circles had to refund to the subscribers for charging them more after migrating to the revenue sharing regime.

In the TTO 99, all the supplementary telecommunication services and value added services including roaming were subject to forbearance. But in respect of high tariffs charged by service providers for provision of roaming services, intervention was sought in streamlining tariffs for roaming. After considering all aspects of roaming tariffs it was decided, in consumer interest, to regulate the tariffs for national/regional roaming in the 18th amendment of the tariff order to be effective from March 1, 2002. Tariffs for roaming as specified in this Order shall be applicable for both post paid and prepaid

cellular service. This amendment, however, does not change the existing regime for international roaming.

After reviewing the different costs from the data provided by the service provider TRAI proposed there should be no fixed one-time access fee for roaming, since the relevant costs would be covered by the applicable tariffs. The refundable security deposit for roaming, however, continues to be under forbearance and shall be subject to the general regulation on security deposits prescribed in the Telecommunication Tariff Order (TTO) 1999.

The monthly fixed access charge for roaming before regulation for different service providers varied between Rs. 100.00 to Rs. 400.00, with most of them charging in the range of Rs. 100.00 to Rs. 150.00 per month. The airtime charge for national automatic roaming as charged by the service providers was Rs. 10.00 per minute on a 60 seconds pulse. In addition, the subscriber is also required to pay the applicable PSTN charge and a surcharge ranging between 10 per cent and 15 per cent on total billed amount for the call (airtime plus applicable PSTN charges). In certain cases, the surcharge is levied only on airtime and not the applicable PSTN charges. TRAI after reviewing the different costs involved was of the opinion that the roaming charges levied on the subscriber were too high. So in the 18th amendment, ceiling on monthly rental was fixed at Rs.100, while the ceiling on roaming airtime charge was fixed at Rs.3.00 per minute and the ceiling on surcharge (only on airtime) was at 15 per cent.

Following the announcement of the 18th amendment, the COAI sought more time to implement the provisions relating to one item, namely the surcharge on airtime, as it would take considerable time to implement this properly. TRAI in the 19th amendment permitted some more time till 31st December 2002 so that all cellular operators can install systems capable to implement the surcharge on airtime as notified in the 18th Amendment to the Telecommunication Tariff Order. Until then, but in any case, not beyond December 31, 2002, the surcharge shall be applicable to both components of the call i.e. airtime and PSTN charges, but magnitude of surcharge shall be reduced to 8% so that an equivalent amount is paid by subscribers. From January 1, 2003, the surcharge shall be 15% as ceiling on airtime component only. All other items of tariff specified in the 18th Amendment shall be effective from March 1, 2002, without any change.

3.6.2 Amendments for Post-paid Connection

In TTO 99, it was decided that after a detailed assessment the tariff conditions for the post-paid mobile connection would be specified, which the TRAI decided to forbear at the time of announcing the TTO. Subsequently a number of complains were received from Consumer Organizations relating to the pre-paid cards. These were regarding issues relating to the policy toward unused amounts on prepaid cards, provision of replacement of SIM Cards against lost/damaged SIM Cards and the charges specified for items like administrative/or processing by CMSPs. TRAI decided to address the issues through an amendment to the TTO 99. Subsequently the 13th amendment was revised that contained a detailed analysis of the post-paid connection and specified the new tariffs for the same.

Clause 14 d of the TTO was revised to incorporate the changes that were envisaged in the 13th amendment. The salient feature of the amendment can be tabulated as follows:

Table 3.2
Salient Feature of the Amendment of Post Paid Connections

Item	Tariff
(14.d) - Tariff for pre-paid service.	Forbearance; Provided that: <ol style="list-style-type: none"> a) At least one denomination of pre-paid cards offered by every Service Provider must be for an amount of Rs.300.00 or less with a corresponding validity period of at least one month. b) The charges for replacement of lost/ damaged SIM card shall be based on cost with a reasonable mark-up. c) If there is any amount that is unused at the end of the validity period, this amount should be carried over to the renewed card, if such renewal is done within a reasonable, specified period. d) In the case of each pre-paid card package, the customer should be prominently and clearly informed of the total amount that is available in the pre-paid card package for making calls, i.e. to pay towards usage
(14.e) Other matters relevant to tariff including billing cycle.	Forbearance.

Source: The Telecommunication Tariff (Thirteenth Amendment) Order 2001

The other issues that were addressed in the amendment are discussed in the following sections:

3.6.2.1. Charges for replacement of lost/damaged SIM Cards

The TTO 99 had prescribed a ceiling of Rs. 1200 for the activation charges, which includes costs relating to provision of SIM card, registration of the subscriber in the network, activation charges etc. But it was observed that the service providers were charging amounts varying from Rs. 200 to Rs. 1200 for replacement of the damaged or lost SIM card, which was not justified. However estimates by the TRAI revealed that the cost of the SIM Card at present varies between Rs.150.00 to Rs.175.00. It was therefore decided that the charge to be levied from subscribers for replacement of lost/damaged SIM card should not exceed the cost to the service provider plus a reasonable mark-up.

3.6.2.2. Denomination value and validity period for pre-paid cards:

A careful observation of the market for the post paid cards showed that though SIM cards of various denominations ranging from Rs. 250 to Rs 5000 were available in the different circles, with the validity period varying from 15 to 60 days. However the minimum value of pre-paid cards sold by most operators was Rs.500.00, and very few operators offer denominations of less than Rs.500.00. Moreover if a residual amount remained at the end of the validity period for the card, it lapsed i.e. the subscriber lost the amount unless he recharged the pre-paid card within the validity period. But there were certain service providers too who allowed the balance amount to be carried over if the subscriber recharges the card during a 'grace period' that is generally 15-30 days beyond the validity period.

Given all these, in the 13th amendment it was decided that in the interest of low-user subscribers, pre-paid cards of lower denominations with a reasonable validity period

should be available so that the unused value on the card is restricted to the minimum possible. Visitors to a particular service area for a limited period could also find pre-paid cards of smaller denomination more convenient. Thus the service providers now have to provide one denomination of pre-paid cards that is for an amount of Rs.300.00 or less with a corresponding validity period of at least one month. The operators were free to provide validity period beyond 30 days or grace period after expiry of validity period.

3.6.2.3. Carry Forward of Unused Amount

The practice of carrying forward of the unused amount on a post-paid card at the end of the validity period by some of the service providers was also made mandatory in case of all the service providers as it was in the interest of the subscribers. Thus a balance amount on the card would be now carried forward if a subscriber renews his card within the grace period.

In line with the TTO 99, TRAI made it mandatory for the service providers to suitably inform the subscribers of the break-up of the total amount charged from them for the pre-paid service. It was now mandatory for service providers to prominently display the amount of talk time value available to a pre-paid subscriber and the service providers would be required to specify various components of maximum retail price (MRP) including talk time value, on the package itself for avoiding any kind of confusion.

3.7 A Review of the Evolution of Cellular Tariff Under TRAI Regime

3.7.1 Characteristics of the Growth of the Cellular Telephony

Given the tariff setup that has evolved under the regulatory regime of the TRAI over the years as documented in the previous sections of this chapter, especially after the announcement of the Telecommunication Tariff Order of 1999, it is important to analyse the process of evolution of the tariff structure over the years along with the logic of the regulator for such a tariff policy and its implication for the different sections of the society, namely the private cellular service providers, the consumers and the government.

It is important to note in this case that the growth of the telecommunications sector proceeds typically through many phases, with significant implications for pricing strategies. It starts with dominantly local traffic on fixed lines. Pure accounting rationality would suggest that at this stage, the pricing of access should cover average costs. As the network spreads, pricing strategies separate the price of minimal access at a fixed rental and charge intensive users separately for transmission and switching costs of actual use. Rentals are kept low to attract low-income consumers onto the network.

When the network develops further and the demand for long distance traffic grows, the high usage value associated with such traffic paves the way for subsidising local traffic with revenues on charges on long distance traffic. The recruitment of new subscribers

provides an externality to those linked to the network, since the utility of the network increases with size, accelerating expansion. It is after this stage that any effort at reducing subsidies or cross-subsidisation is warranted, with the focus not on increasing the cost of access, but of reducing the cross subsidisation of local traffic by long distance traffic. Meanwhile, new uses of the network result in diversification. Available and increased bandwidth allows the network to carry non-voice signals such as data, text and graphics. Here too it could be argued that strict accounting principles should not be applied, so that users are not discouraged from utilising devices and services (such as the Internet) which have great potential.

Thus the reason for not following an accountant's view of pricing thus stems from a number of arguments. First, easy access to a telecommunications network is normally considered to be a second-order "essential good" which citizens are entitled to at a reasonable charge. Second, given the externalities (or direct benefits to other economic activities) associated with telecom access, the growth of the network is seen as yielding larger benefits to the system than the immediate benefit derived from usage by an individual consumer. Third, given the new uses generated by technological progress, which can have far-reaching economic effects and implications, pricing should not be allowed to discourage diversification of uses of the network.

These arguments in favour of a pricing strategy not based on pure accounting rationality also make a case for leaving the telecommunications sector to public utilities. Given characteristics such as lumpy investment requirements and low profits at least at some

locations, it is to be expected that the service is unlikely to be appropriately priced and satisfactorily provided by market channels. This is likely to be particularly true in developing countries, where the demand for such services is extremely uneven in spread.

If despite this case for provision through public utilities, private entry is advocated on grounds of competition aimed at improving service standards and on the basis of the arguments that available public capital needs to be supplemented with private capital to efficiently meet the demand for telecom services, it becomes necessary to attach conditions to license provision and to cap prices charged through a tariff-setting mechanism. Thus every country seriously introducing competition finds that the transition from monopoly to competition is both economically rewarding and laden with policy dilemma. A regulatory framework also becomes necessary because private entry in most telecom services allows the private entrants to earn rents on account of a number of reasons.

In case of cellular services entrants are limited by the need to allocate frequencies from a limited frequency spectrum. This gives them an oligopolistic position, which can yield rents. Moreover, even though in liberalising mode, the government cannot allow unfettered entry into an area, which inevitably involves large sunk costs in infrastructure. In the rush for occupying the market, the industry could get saddled with huge excess capacities leading to waste. Thus, though private entry was to be allowed, originally only two operators were to be permitted entry in each circle. Finally, since the idea of opening up the sector is not just to encourage the entry of private operators but also to expand the

network, private sector entrants would have to be allowed to interconnect with the existing public utility network. Given the "externality" associated with a telecom network, which makes the utility of a network a function of its size, the private operator derives substantial "un-priced" benefits from interconnectivity.

It is the existence of rents in all these forms that justifies the levy of a license fee on private entrants. But the main problem in these cases is that all the benefits derived by private operators are not from "goods" that have markets. Hence the market itself cannot compute these gains on the basis of prices it generates. It is essential that on the basis of a detailed investigation, to impute normatively, a cost to the benefits that are being handed over to private operators. Rather than resort to such a procedure, and in keeping with its belief in liberalisation and the benefits of the market mechanism, the government decided to let private operators themselves 'price' these gains by bidding for the licenses on offer in the different telecom circles.

The bidding process that followed and the private companies that won the licenses and the license fee that was agreed upon to be paid by the private companies has been documented in details in the second chapter. In this section we will try to look into the logic of the TRAI in arriving at the tariffs as documented the TTO 99. The tariff rebalancing which was sought to be achieved in the Telecom Tariff Order of 1999 was a continuation of the process that began in November 1997 based on an analysis of the Indian telecommunication market.

3.7.2 Logic of TRAI in Deriving the New Tariff Structure

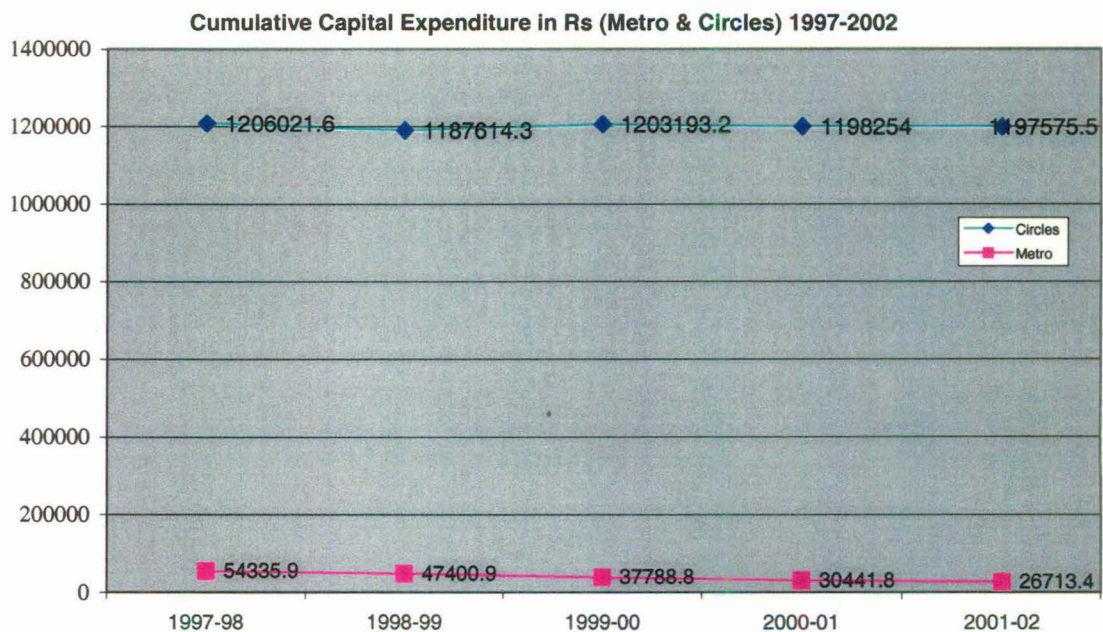
A conspicuous feature of the cellular market in India that existed before the announcement of the TTO 99 was relatively low access charge (i.e. monthly rental), with a comparatively high usage charge. The maximum rental per month that the operators could charge their subscribers was set at Rs. 156 per month. For the three time categories, peak, standard and off-peak as specified in the license conditions, maximum prices for usage are set at Rs 16.80, Rs 8.40 and Rs 4.20 per minute respectively. The low monthly rental of Rs. 156 had allowed "easy" access to the cellular service, while the relatively high usage charge prohibited its use, which according to many operators resulted in a group of subscribers who were a "net cost" to them. It was thus decided that a re-balancing of the tariff structure was needed.

Thus in its Consultation Paper on Framework and Proposals for the Telecom Tariff Order, TRAI proposed to regulate the access price (i.e. rental) and the airtime charges. It was decided that the new tariffs were to be implemented instantaneously at the beginning of the implementation period. It was argued that for cellular telephony, as in the case of the PSTN, rental was supposed to cover the fixed cost element. In this respect, the license fee has been treated as one of the costs and in order to derive the cost based rental, the licensee fee has been treated in three different ways. Three alternatives were formulated in calculation the rentals and airtime charges and in the three alternative cases the license fee has been taken as the following:

- In alternative I, licensee fee has been considered as part of the variable cost and there fore included in the airtime.
- In alternative II, licensee fee has been treated as a fixed cost and thus recovered through the rental.
- In alternative III, licensee fee has been distributed equally between fixed and variable cost.

An important point that is to be noted in this case is that for the final calculations for deriving the cost based tariff proposal, data for the metros has been considered only as there was wide variations in the cost data between circles and the metros. For instance, from the data that TRAI has used for the calculations, it can be seen that the median value for the cumulative capital expenditure per subscriber was Rs. 30,000 higher for the circle operator in the year 2000 (shown in the following figure). This difference was present not only for cumulative capital expenditure per subscriber, but also for several other variables. In view of the fact that the rental figures arrived at, by taking the circle data into consideration gave absurd figures, which were not quiet acceptable, the data for the metros has been used for the calculations.

Chart 3.1



One more thing that is to be kept in mind in this respect is that while the licensee fee obligations for the metro operators are directly linked to the subscriber base from the fourth year of operation, the circle operators' licensee fee commitment corresponds to the amount stated by the operator in the bid.

The values of the monthly rental that has been arrived at, after considering the metro data in the three alternative ways that has been explained before has been shown in the following table:

Table 3.3
Rental and Airtime charges as calculated by TRAI (Metro data for 1999-00 & 2000-01) with ARE = 30 per cent

Service provider	Alternative 1				Alternative 2				Alternative 3			
	Rental		Airtime (per min)		Rental		Airtime (per min)		Rental		Airtime (per min)	
	99-00	00-01	99-00	00-01	99-00	00-01	99-00	00-01	99-00	00-01	99-00	00-01
A	484.07	448.35	8.18	7.91	986.13	950.29	3.87	3.61	735.10	699.32	5.96	5.71
B	759.06	597.46	9.44	8.67	1214.76	1055.06	5.73	.91	986.91	826.26	7.50	6.72
D	277.76	293.94	9.10	9.32	783.38	799.27	3.52	3.43	530.57	546.60	6.30	6.36
E	394.35	341.41	10.82	10.17	894.35	841.41	6.65	5.90	644.35	591.41	8.74	8.04
F	525.61	494.33	10.30	9.90	726.93	771.84	5.15	4.62	479.53	523.54	7.72	7.26
G	405.15	355.70	7.88	7.54	880.60	840.19	3.39	2.88	642.88	597.95	5.64	5.21
H	489.74	474.60	4.85	4.97	998.55	981.87	2.47	2.45	744.15	728.23	3.66	3.71
Median	484.07	448.35	9.10	8.67	894.35	841.41	3.87	3.61	644.35	597.95	6.30	6.36
Max	759.06	597.46	10.82	10.17	1214.76	1055.06	6.65	5.90	986.91	826.26	8.74	8.04
Min	277.76	293.94	4.85	4.97	726.93	771.84	2.47	2.45	479.53	523.54	3.66	3.71

Source: TRAI; Telecom Pricing: Consultation Paper on Framework and Proposals

Note: ARE is Annual Recurring Expenditure

Table 3.4

Rental and Airtime charges as calculated by TRAI (Metro data for 1999-00 & 2000-01) with ARE = 25 per cent

Service provider	Alternative 1				Alternative 2				Alternative 3			
	Rental		Airtime (per min)		Rental		Airtime (per min)		Rental		Airtime (per min)	
	99-00	00-01	99-00	00-01	99-00	00-01	99-00	00-01	99-00	00-01	99-00	00-01
A	403.40	373.62	8.18	7.91	905.45	875.57	3.87	3.61	654.42	624.60	5.96	5.71
B	632.55	497.88	9.44	8.67	1088.25	955.48	5.73	4.91	860.40	726.68	7.50	6.72
D	231.47	244.95	9.10	9.32	737.09	750.28	3.52	3.43	484.28	497.61	6.30	6.36
E	328.63	284.51	10.82	10.17	828.63	784.51	6.65	5.90	578.63	534.51	8.74	8.04
F	438.01	411.94	10.30	9.90	688.25	725.97	5.15	4.62	440.84	477.67	7.72	7.26
G	337.62	296.41	7.88	7.54	813.08	780.91	3.39	2.88	575.35	538.66	5.64	5.21
H	408.12	395.50	4.85	4.97	916.93	902.77	2.47	2.45	662.52	649.13	3.66	3.71
Median	403.40	373.62	9.10	8.67	828.63	784.51	3.87	3.61	578.63	538.66	6.30	6.36
Max	632.55	497.88	10.82	10.17	1088.25	955.48	6.65	5.90	860.40	726.68	8.74	8.04
Min	231.47	244.95	4.85	4.97	688.25	725.97	2.47	2.45	440.84	477.67	3.66	3.71

Source: TRAI; Telecom Pricing: Consultation Paper on Framework and Proposals

Note: ARE is Annual Recurring Expenditure

From the above two tables (Table 3.1 & 3.2) it can be seen that the median value of the monthly rental is about Rs 484 in the year 2000, which declined to approximately Rs 450 in the following year under alternative I for an annual stream of capital expenditure corresponding to 30 per cent ARE (Annual Recurring Expenditure). The figures for alternative I and alternative II, for different service providers, as well as the median values shows that monthly rental of Rs 156 is below the amount derived on the basis of cost, even when compared to the operator with the lowest cost.

In case of the alternative III, where the license fee is equally distributed between fixed and variable cost shows that the maximum value for the monthly rental for the fiscal year 2001 is slightly more than Rs 800, while the median value is approximately Rs 600. It was proposed by the TRAI that the median value under alternative III would be treated as the relevant estimate for pricing monthly rentals. This was justified on the ground that the higher estimates would provide no incentive for the less efficient service provider to reduce cost. Moreover it was argued that it is likely that a major part of the service providers' revenue would come from the call charges.

The data with respect to the per minute usage shows variation ranging from Rs 3.70 per minute to Rs 8 per minute, and it was evident that under alternative III the rental and airtime charges were inversely related. It was proposed that the median value would be taken as the relevant one for airtime prices. The proposed rate of Rs 6 per minute for airtime usage, which was slightly lower than the median value of about Rs 6.30 per minute, as shown in the table. Moreover in order to simplify the structure of airtime

charges, it was also proposed that the number of distinct time categories were to be reduced from three to two in a day.

3.7.3 Problems with TRAI's Approach for Tariff Re-structuring

It has been argued by economists, like Dr. Jayati Ghosh and Dr. C. P. Chandrasekhar¹ that the tariff setting principles of TRAI has not been scientific, especially in context of a developing country like India. The basic principle adopted by the TRAI that rental should cover the capital costs, while call charges should cover operating cost, does not tally with any economic reasoning for a utility like telecommunication, given its characteristics. There were even no attempts on the part of TRAI, while calculating the cost, to normative assessment what such cost should be. While calculating capital expenditure, it was assumed that it consists of depreciation computed assuming a life span of 10 years and the weighted average of interest cost is taken to be as high as 20 per cent. Moreover all the calculations done by TRAI was on the basis of data provided to them by the service providers, which were accepted unquestioningly. The absurdity of the calculations becomes even more prominent when we look into the figures for cumulative capital expenditure per subscribers for the different metro circles, which is shown below:

Table 3.5
Cumulative capital Expenditure per Subscriber

CMSP	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02
A	43924.56	29660.49	24163.93	19362.96	17933.98	17360.00
B	59409.77	39607.47	38836.36	30362.39	23898.25	20534.22
C	100868.21	54335.96	47400.91	37786.77	30441.78	26713.42
D	6217.08	11167.23	11544.27	11110.35	11757.51	12149.71
E	7023.11	8862.42	16160.66	15774.00	13656.38	12981.09

¹ *The Political Economy of Regulation (www.macrosen.com)*

Table 3.5 (Continued...)

CMSP	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02
F	54965.36	34665.69	28352.78	21024.53	19773.24	17485.56
G	38271.31	20077.66	18821.43	16205.98	14227.91	12973.56
H	13619.79	13005.18	20008.19	19589.63	18983.88	18354.35
Median	41097.94	24869.07	22086.06	19476.29	18458.93	17422.78

Source: *The Political Economy of Regulation* (www.macroscon.com)

The above table shows that the estimated capital expenditure data that was used to derive the new tariff showed wide variation across the operators in the metros. It is to be noted here that TRAI based its calculations on the metro data, as there was wide variations between metros and the circles. The appropriate procedure would have been to make a normative estimate of costs, which would have brought the estimate closer to the lowest figure in the set, since the nature of equipment used is more or less the same. The use of normative costing procedures is routine in the case of organisations like the Bureau of Industrial Costs and Prices. Rather than opt for that procedure, what the TRAI did was to ignore the abnormally high maximal value and then take the median value of the rest of the figures to arrive at the capital cost with which rentals are to be computed when some appropriate level of utilisation as been reached. This procedure is clearly indefensible and would have inflated capital costs as well as the derived rentals. It was on this basis that the TRAI came to the abnormally high rental figure of Rs. 400 to Rs. 484 per month, as compared to the Rs. 156, which prevailed under the original tariff structure.

3.7.4 Analysis of the Tariff Structure that Actually Existed

Given the new ceiling for the cellular tariff as set by the TRAI in the TTO 99, it would be interesting to look into the tariffs that were actually levied by the private operators from the subscribers in the different circles. It would be interesting to note in this case that even before that TTO 99 was announced, few of the service providers were charging airtime rates that were well below the initial ceiling set by TRAI. In the following table tariff charged by few of the private operators in the metro circles after the announcement of the TTO 99 has been tabulated:

Table 3.6
Monthly Rental and Airtime Charges as Levied from the Subscribers by Different Metro Service Providers

CMSP	Rental	Initial Sub. Charges	Airtime (Rs) (Outgoing/Incoming)	Remarks
Spice Cell (Kolkata)	Rs 395 (Rs 495 *)	Rs 1260 Activation + Rs 1500 Dep.	1.50 / 0.75 2.00*/ 1.00*	Free incoming and outgoing from 10 pm to 8 am for Rs 75 monthly Three free numbers for outgoing calls for Rs 100 monthly
Usha Martin: Talk 1000 (Kolkata)	Rs 395	Rs 1260 Activation + Rs 1500 Dep.	1.25 / 1.25	Free incoming and outgoing from 10 pm to 8 am for Rs 75 monthly Minimum Commitment Rs 1000
Usha Martin (Kolkata)	Rs 395	Rs 1260 Activation + Rs 1500 Dep.	1.50 / 0.75	Three free numbers for outgoing calls for Rs 100 monthly
RPG Cellular (Chennai)	Rs 400 rent + Rs 600 plan fee	Rs 1260 Activation + Rs 2000 Dep.	Rs 2 1 st min; Re 1 2 nd min; Re 0.50 thereafter for out going (Rs 2*) and Re 1 for every three min incoming (Re 1*)	Free incoming and outgoing from 10 pm to 6 am for Rs 75 monthly Two free numbers for outgoing and incoming calls for Rs 200 monthly
Sky Cell Mega (Chennai)	Rs 1000	Rs 1260 Activation + Rs 2000 Dep. (Rs 5310*)	Rs 2 1 st min; Re 1 2 nd min; Re 0.50 thereafter for out going (Rs 2*) and Re 1 for every three min incoming (Re 1*)	Two free numbers for outgoing and incoming calls for Rs 100 monthly Free incoming and outgoing from 10 pm to 7 am for Rs 75 monthly
Bharti Cellular: Talker's Delight (Delhi)	Rs 400	Rs 1260 Activation + Rs 1500 Dep.	1.48 / 1.48	Three free numbers for outgoing and incoming calls for Rs 149 monthly 50 per cent discount on Sundays Monthly commitment Rs 800
Bharti Cellular: Perfect match (Delhi)	Rs 400	Rs 1260 Activation + Rs 1500 Dep.	1.78 / 1.78	Two free numbers for outgoing and incoming calls for Rs 149 monthly 50 per cent discount on Sundays Monthly commitment Rs 300

Table 3.6 (Continued...)

CMSP	Rental	Initial Sub. Charges	Airtime (Rs) (Outgoing/Incoming)	Remarks
Sterling Cellular: Talk 795 (Delhi)	Rs 395	Rs 1260 Activation + Rs 1500 Dep.	1.48 / 1.48	Five free numbers for outgoing and incoming calls for Rs 75 per number per month Free incoming and outgoing from 11 pm to 8 am for Rs 149 monthly; or Re 0.50per min for Rs 49 per month Monthly commitment Rs 795
Sterling Cellular: Talk 1000 (Delhi)	Rs 395 (Rs 494*)	Rs 1260 Activation + Rs 1500 Dep.	2.25 / 2.25 (2.25* / 1.25*)	Three free numbers for outgoing and incoming calls for Rs 99 per month Re 0.50per min for incoming and outgoing calls Rs 49 per month. Monthly commitment Rs 1000
BPL Mobile (Mumbai)	Rs 395	Rs 1200 Activation + Rs 1500 Dep.	1.00 / free	Monthly commitment Rs 1999 Free incoming and outgoing from 9 pm to 9 am for Rs 175 monthly Five free numbers for outgoing and incoming calls for Rs 75 per number per month
Hutchison Max (Mumbai)	Rs 395 (Rs 395*)	Rs 1200 Activation + Rs 1500 Dep.	1.00 / free	Monthly commitment Rs 1995 (Rs 2900*) Free incoming and outgoing from 9 pm to 9 am for Rs 175 monthly Five free numbers for outgoing and incoming calls for Rs 75 per number per month

Source: tele.net-July 2001

Note: * implies prices before April 2001

The fact that the tariff as decided by the TRAI in the TTO 99 has been on the higher side, can be seen from table 3.4 which shows that none of the service providers in the metro circles, whose data has been given in the above mentioned table were equal to the ceiling that has been set by TRAI. For example, the monthly rental for most of them were in the range of Rs 400, which was much lower than the ceiling of Rs 600 per month. Moreover in case of the call charges also, all of them were charging much below the ceiling. One of the reasons explaining this could be that although the cellular operators were issued licenses simultaneously after the bidding process, the entry of these operators was not at the same time. The operators who entered the market later sometimes kept the rates lower than the existing rates, as they had to win some of the subscribers from the existing

service providers in order to have a market presence. In such circumstances new value added services like the short message service (SMS), email, voice mail, wireless application protocol (WAP), roaming along with services like restaurant menu, weather report, dial-a-cab service, were tools for becoming competitive in the market. Moreover the entry of the fourth operator along with the entry of MTNL and BSNL as the third operator after the second round of bidding also resulted in an increase in competition and a reduction in tariffs across the sector. But the important point that has to be noted here is that the service providers who appealed to the DOT and migrated to the revenue sharing regime from the fixed license fee regime in order to survive and make their operations viable and profitable, were all able to reduce their tariffs and still remain in business and earn profits. This goes on to prove that the tariff estimations of the TRAI gave them opportunity to earn huge amount of supernormal profits. However it was also observed that in case of some of the non-lucrative circles like West Bengal and North-East, where only one service provider (Reliance) was present, the monthly rental and the airtime charges were nearly equal to the ceiling as set by the TRAI which suggests that these service providers were actually earning a super normal profit due to their monopoly position in these area. Thus the reform process in cellular telephony has more than evidently tended to favour the interest of the private operators at the expense of the consumers.

However after Mr. S. K. Verma took over the chairmanship after his predecessor Mr. S.S. Sodhi, TRAI took a landmark decision, which for the first time favoured the customers, and left the lobby of the cellular operators confused and stunned in disbelief. TRAI in its

12th amendment of the TTO ordered the service providers to refund money to their subscribers in lieu of the benefits that they had derived by migrating to the revenue sharing arrangements in August 1999 instead of the fixed license fee, which had decreased their licensee burden considerably. TRAI said that the subscribers were overcharged and thus they were ordered to refund to the subscribers an average of Rs 178 per month on account of the rental and Rs 1.35 per minute for the airtime usage. Rough calculation showed that the total refund by all operators would exceed Rs 4 billion TRAI also directed the service providers to extensively advertise about the refund.

The entry of the state owned MTNL and BSNL had major implications for the cellular industry in India especially for the pricing of the cellular service. MTNL, which was the basic service provider in the two metro cities of Delhi and Mumbai, started providing cellular services in the two metros from February 2001. When MTNL under the brand name Dolphin entered the market it had the lowest prices in terms of the monthly rental and the airtime charges and offered services like free roaming between Delhi and Mumbai. The implication of MTNL's entry into the cellular market in India has been documented in detail in the following section.

3.8 Implications of Entry of MTNL and BSNL for Cellular Market in India

MTNL's Dolphin made a splash when it entered the cellular market in February 2001. The decision of the state controlled MTNL to enter the Delhi and Mumbai cellular markets as the third operator and offer services at almost half the current tariffs, triggered

an instant and healthy price war among operators. The war spilled over to the other metros and the circles too. The private players who in a duopoly situation had been colluding were now forced to reduce rates. Meanwhile, the state owned BSNL had also announced the launch of cellular services in Patna and five other circles as the third operator.

The two metro cities of Delhi and Mumbai represent two largest cellular markets in the country with 1250248 and 1121714 (*Source: www.coai.com*) subscribers respectively in June 2002. MTNL plans to provide 800,000 connections in these two cities over the next three years. In each city, 100,000 connections will be provided in the first year, 200,000 in the second and 100,000 in the third year. The total investment for the rolling out the network in the two cities is around Rs. 1,100 million.

When MTNL launched its service, it had pitched its rate 50 per cent lower than the existing tariffs in Delhi. Outgoing calls were priced at Rs. 2.70 per minute and incoming calls at Rs. 1.50 per minute. The monthly rental is Rs 400. The tariffs have been tailored to suite specific user groups like working women, government officers, private companies and students. MTNL will also launch pre-paid cards under the brand name 'Trump', which although more expensive than the post-paid connections, was still cheaper than the similar service offered by the private players. MTNL decided to sell its pre-paid cards through 13,000 strong networks of petrol pumps and STD-PCOs.

Reacting sharply to the marketing offensive from the third operator, the two incumbents in Delhi- Bharti cellular and Hutchison-Essar promptly reduced tariffs. Airtel's (Bharti Cellular) new tariff for outgoing calls is Rs. 2.85 per minute and incoming calls at Rs. 1.60 per minute. The monthly rental is Rs. 400. Essar reduced its prices to similar levels too, with only difference was that it's outgoing was priced at Rs. 2.80 per minute. Both the companies were charging Rs. 4.00 per minute for incoming and out going calls with a monthly rental over Rs. 575 per month. The two players also reduced the tariffs for their pre-paid connection from Rs. 9.00 per minute to Rs. 6.00 per minute for outgoing calls and Rs. 4.00 for incoming calls. However both the companies denied that these price cuts were in response to the entry of MTNL as the third operator. In Mumbai however the entry of MTNL didn't had severe impact on the airtime rates, as they were already lower than that in Delhi. In Mumbai, Hutchison offers the service at monthly rental of Rs. 395 with call rates Rs 2.85 per minute, and BPL offers the service at a monthly rental of Rs. 395 and charges a call rate of Rs. 3.50 per minute.

The price war was not restricted to Delhi and Mumbai only. In Punjab, Spice has reduced its tariff from Rs. 4.00 to Re. 1.00, and the monthly rental has been reduced to Rs. 475 from Rs. 600. In Kolkata also where BSNL was soon expected to start its service, Spice and Usha had reduced prices. BSNL, which has already started its service in Patna, was expected to start service in Haldia, Chennai and Hyderabad, other than Kolkata. MTNL will follow a price strategy similar to that of MTNL and will charge a monthly rental of Rs. 400 and outgoing and the incoming calls at Rs. 3.50 per minute.

The decrease in prices as a result of more players is likely to increase the total cellular subscriber base. The subscriber base doubled from 1.5 million in December 1999 to 3 million in 2000 when the prices were reduced from Rs. 16.80 to Rs 4 per minute. The lower rate will no doubt encourage higher usage, but also decrease the ARPU.

The tariff cut by the private operators had to some extent robbed MTNL of its initial price advantage. Most subscribers to Dolphin are going to be first time users. To compete with the private operator, MTNL was working on its customer care strategies and quality of service.

Along with the entry of the MTNL there was also the issue of limited mobility. The government has allowed the basic service providers to offer limited mobility. In the present scenario, the cellular operators would now compete with basic service providers offering limited mobility. In the two metro circles of Delhi and Mumbai, MTNL is also providing CDMA base wireless local loop (WLL) technology for limited mobility with Rs.3 per minute of outgoing calls and free incoming calls.

3.9 Conclusion

Tariffs for cellular telephony in India have undergone many changes since its inception in the early 90's. Cellular tariffs in India have always been regulated by TRAI, which according to the license conditions are fixed tariff in terms of ceilings. It was argued that fixing tariffs in terms of ceiling would give the service providers freedom to distinguish between different types of customers through alternative price packages.

In the initial phases the tariff for cellular services were characterised by relatively low access charge (i.e. monthly rental), with a comparatively high usage charge. As seen from the previous section, the maximum rental per month that the operators could charge their subscribers was set at Rs. 156 per month. For the three time categories, peak, standard and off-peak as specified in the license conditions, maximum prices for usage were set at Rs 16.80, Rs 8.40 and Rs 4.20 per minute respectively.

Empirical evidence on the cellular market suggested that the existing low monthly rental of Rs. 156 had allowed "easy" access to the cellular service, while the relatively high usage charge prohibited its use. The price package that existed attracted several subscribers who do not spend a large amount on the cellular service. To a certain extent, operators had been circumventing the low access charge by way of tariff plans that charge a higher fixed fee, generally in addition to the monthly rental. Thus the ceiling of Rs.156 according to many operators resulted in a group of subscribers who were a "net cost" to the operator. The immediate result of the increase in the monthly rental was that the number of subscribers decreased as it has been shown in the *Appendix 1*.

Following an analysis of the Indian telecom tariff structure, it was decided that a re-balancing of the tariff structure was needed. The process of re-balancing of the tariff structure started in November 1997, where in a new tariff regime was tried to be set up, which primarily aimed to link tariff formulation to some clearly specified principles like providing a consistent and transparent framework for tariff policy, to simplify the

prevailing system of tariffs and achieve cost based prices through regulation and / or competition.

On March 9, 1999, the new Telecom Tariff Order (TTO) was announced. It was soon followed by a number of amendments. The TTO and few of the amendments specified the new tariff structure for the cellular telephony, the salient features of which were increases in the monthly ceiling of rental from Rs. 156 to Rs. 600 and a reduction in the highest airtime usage charge from Rs. 16.80 to Rs. 6 per minute. The cost basis for deriving the tariff for rental included capital expenses and 50 per cent of the license fee. While the cost basis for deriving airtime charges included operating expenses and 50 per cent of the license fee. Thus for deriving the new rental and airtime charges, the license fee was split equally into capital and operating expenses. It is to be noted here that the data for the circles were used for calculations deriving the new tariff by TRAI.

However it was argued by many economists that the tariff setting principles of TRAI has not been scientific as it has grossly over estimated the costs and had set the tariffs at unnecessarily higher levels. The basic principle adopted by the TRAI that rental should cover the capital costs, while call charges should cover operating cost, does not tally with any economic reasoning for a utility like telecommunication, which is considered to be a second order essential good which the citizen are entitled to at a reasonable charge. There were even no attempts on the part of TRAI, while calculating the cost, to normatively assess what such cost should be. While calculating capital expenditure, it was assumed that it consists of depreciation computed assuming a life span of 10 years and the

weighted average of interest cost is taken to be as high as 20 per cent, which was also considered to be very high. Moreover all the calculations done by TRAI was on the basis of data provided to them by the service providers, which were accepted unquestioningly.

Moreover the metro data were used by TRAI for the calculation, as there were wide variations in the circle and metro data. But the wide variation across the data for different operators in the metros were overlooked and TRAI did was to ignore the abnormally high maximal for which the median values thus obtained were mere overestimates.

The analysis of the actual tariffs as charged by the different service providers also showed that the ceilings set by of TRAI were grossly over estimates as it was seen that almost all of them were seen to charge rental and airtime per minute much lower than the ceiling. But in cases of those circles where there were less number of operators as because of the fact that these circles were considered to be non-lucrative, the rental and airtime charges were more or less equal to the ceiling. This showed that the over estimation of tariff by TRAI allowed the service providers to earn super normal profits.

Thus we can conclude that to abjure an accountants view of pricing telecommunication services arises from many reasons. Given the externalities associated with telecom access, the growth of the network yields larger benefits to the system than the immediate benefit derived from usage by an individual consumer. In fact because of the new uses generated by technological progress, which can have far-reaching economic effects and implications, pricing should not be allowed to discourage diversification of uses of the

network. But in case of cellular services entrants are limited by the need to allocate frequencies from a limited frequency spectrum. This gives them an oligopolistic position, which can yield rents. Again the idea of opening up the sector is not just to encourage the entry of private operators but also to expand the network. Thus the private sector entrants are allowed to interconnect with the existing public utility network. Given the "externality" associated with a telecom network, which makes the utility of a network a function of its size, the private operator derives substantial "un-priced" benefits from interconnectivity. So all these factors have to be kept in mind while formulating the tariff that is linked to cost, as all the un-priced benefits should be normatively calculated before setting up of the tariff.

CHAPTER 4

CONCLUSION

The idea of mobile communication is a new concept, which was introduced in India for the first time in May 1991, when the government announced its intention to introduce cellular service by awarding licenses to private operators for providing the service in the four metro cities of Delhi, Mumbai, Kolkata and Chennai. The licenses for the metros were awarded to eight private operators in the year 1994. This was followed by the second phase, where the licenses for 20 telecommunication circles were given to private operators, following a bidding process. The bidding was for the highest license fee to be paid by the companies.

Soon after the private companies started operation in the different circles it was observed that their operations were becoming unviable because of the heavy capital expenditure and higher operational expenses incurred by them and also because of the slower growth of the subscriber base than what they had initially predicted. All these factors led to a situation of slower revenue growth for the private companies who were finding it increasingly difficult to survive. A large part of the problem was with bad financing methods. Companies made liberal assumptions about the availability of funds from debt financing. Most of the early debt financing went into paying the license fees as a result of

which the companies were practically left with very little funds for their operation. They sought help from the government in the form of reduced licensee fees and increased license tenure.

The government of India in order to improve the viability of the private service providers announced the New Telecom policy (NTP) in the year 1999, where it took the landmark decision of migrating to a revenue sharing regime from the existing fixed license fee regime for the cellular services. However due to this shift in policy, the government virtually lost Rs. 4,500 crore license fees that the telecom operators already owed to the government. Thus the main idea of introducing private capital for augmenting public capital for the huge investments required for the telecom infrastructure was defeated by the revenue sharing arrangement. Even the tendering procedure, where the private operators secured their licenses only on the basis of commitments regarding license fees became redundant.

In fact the migration package shouldn't have been offered to the CMSP's of the metros, as these companies were issued licenses before the announcement of NTP 94, and were not paying a one time lump sum license fee like that of the circle operators.

Subsequently the government in order to increase competition in the market decided to allow the entry of the third and the fourth operators in all the telecommunication circles of the country. It was decided that the license for the third operator would be given to MTNL in the two metros of Delhi and Mumbai, while for the rest of the circles it was

reserved for BSNL. The fourth operators were also awarded the licenses after a three-round, information-ascending bidding process.

Soon after the announcement of the winners for the fourth cellular operator's license, a major drive towards market consolidation followed with leading mobile operators committing billions of rupees on mergers and acquisitions. Through the mergers and acquisitions route, the market became polarized between few strong and large players. The urgency for consolidation derived from a cost perspective and other reasons among which one was a clear divide between those who were successful and those who were not. Well funded aggressive players with state-of-the-art networks emerged as strong competitors, particularly since they had all invested substantially in facilities and in scalable and upgradeable networks.

Tariffs for cellular telephony in India, which has always been regulated by TRAI have also undergone many changes since the early 90's. According to the license conditions tariffs are fixed in terms of ceilings. In the initial phases the tariffs for cellular services were characterised by relatively low access charge (i.e. monthly rental), with a comparatively high usage charge. The maximum rental per month was set at Rs. 156 per month. For the three time categories, peak, standard and off-peak as specified in the license conditions, maximum prices for usage were set at Rs 16.80, Rs 8.40 and Rs 4.20 per minute respectively.

Empirical evidence on the cellular market suggested that the existing low monthly rental of Rs. 156 had allowed "easy" access to the cellular service, while the relatively high usage charge prohibited its use. So it was decided that a re-balancing of the tariff structure was needed for the cellular industry. The process of re-balancing of the tariff structure started in November 1997, where tariffs were sought to be set so as to achieve cost based prices through regulation and / or competition.

The new tariff structure for cellular telephony was announced in the Telecom Tariff Order (TTO) 99, the salient feature of which was an increase in the monthly ceiling of rental from Rs. 156 to Rs. 600 and a reduction in the highest airtime usage charge from Rs. 16.80 to Rs. 6 per minute. For deriving the new rental and airtime charges, the license fee was spilt equally into capital and operating expenses. It is to be noted here that the data for the circles were used for calculations aimed at deriving the new tariff by TRAI, as it argued that there were wide variations in the circle and metro data.

It was however felt that the tariff setting principles of TRAI have not been scientific as they were grossly over estimated the costs and set the tariffs at unnecessarily higher levels. The basic principle adopted by the TRAI that rental should cover the capital costs, while call charges should cover operating cost, does not tally with any economic reasoning for a utility like telecommunication, which is considered to be a second order essential good which the citizen are entitled to at a reasonable charge. There were even no attempts on the part of TRAI, while calculating the cost, to normatively assess what such cost should be, as there are a number of un-priced benefits that a private operator

derives, for which there exists no markets, like interconnection etc. Again all the calculations done by TRAI were on the basis of data provided to them by the service providers, which were accepted unquestioningly. In fact the wide variation across the data for different operators in the metros were overlooked and what TRAI did was to ignore the abnormally high maximal for which the median values thus obtained were mere overestimates.

The analysis of the actual tariffs as charged by the different service providers also showed that the ceilings set by of TRAI were gross over estimates as it was seen that almost all of them were seen to charge rental and airtime per minute much lower than the ceiling. But in the cases of those circles where there were less number of operators since these circles were considered to be non-lucrative, the rental and airtime charges were more or less equal to the ceiling. This showed that the over estimation of tariff by TRAI allowed the service providers to earn super normal profits.

Thus the need to abjure an accountant's view of pricing telecommunication services arises from many reasons. Given the externalities associated with telecom access, the growth of the network yields larger benefits to the system than the immediate benefit derived from usage by an individual consumer. In fact because of the new uses generated by technological progress, which can have far-reaching economic effects and implications, pricing should not be allowed to discourage diversification of uses of the network. But in case of cellular services entrants are limited by the need to allocate frequencies from a limited frequency spectrum. This gives them an oligopolistic position,

which can yield rents. Again the idea of opening up the sector is not just to encourage the entry of private operators but also to expand the network. Thus the private sector entrants are allowed to interconnect with the existing public utility network. Given the "externality" associated with a telecom network, which makes the utility of a network a function of its size, the private operator derives substantial "un-priced" benefits from interconnectivity. So all these factors have to be kept in mind while formulating the tariff that is linked to cost, as all the un-priced benefits should be normatively calculated before setting up of the tariff.

These arguments in favour of a pricing strategy not based on pure accounting rationality also make a case for leaving the telecommunications sector to public utilities. Given characteristics such as lumpy investment requirements and low profits at least at some locations, it is to be expected that the service is unlikely to be appropriately priced and satisfactorily provided by market channels. This is likely to be particularly true in developing countries, where the demand for such services is extremely uneven in spread.

If despite this case for provision through public utilities, private entry is advocated on grounds of competition aimed at improving service standards and on the basis of arguments that available public capital needs to be supplemented with private capital to efficiently meet the demand for telecom services, it becomes necessary to attach conditions to license provision and to cap prices charged through a tariff-setting mechanism. A regulatory framework also becomes necessary because private entry in

most telecom services allows the private entrants to earn rents on account of a number of reasons that have been stated earlier.

Despite all these arguments, the government in keeping with its belief in liberalisation and the benefits of the market mechanism, decided to let private operators themselves 'price' these gains by bidding for the licenses on offer in the different telecom circles. However private operators, driven by the liberalisation fever into speculation, based their bids on over-optimistic projections of market potential and on unusually low costs of operation, making them irrational both in terms of the number of circles which were sought by individual operators and the size of the bid in monetary terms. Subsequently, as seen earlier, they had to be bailed out in form of the migration package. So from this we can conclude that the growth of the cellular industry in India has been driven by intervention by the government aimed at overcoming the consequences of the irrational behavior on the part of the private players, though the initial policy was to believe in the efficiency of unfettered market populated by the private players.

APPENDICES

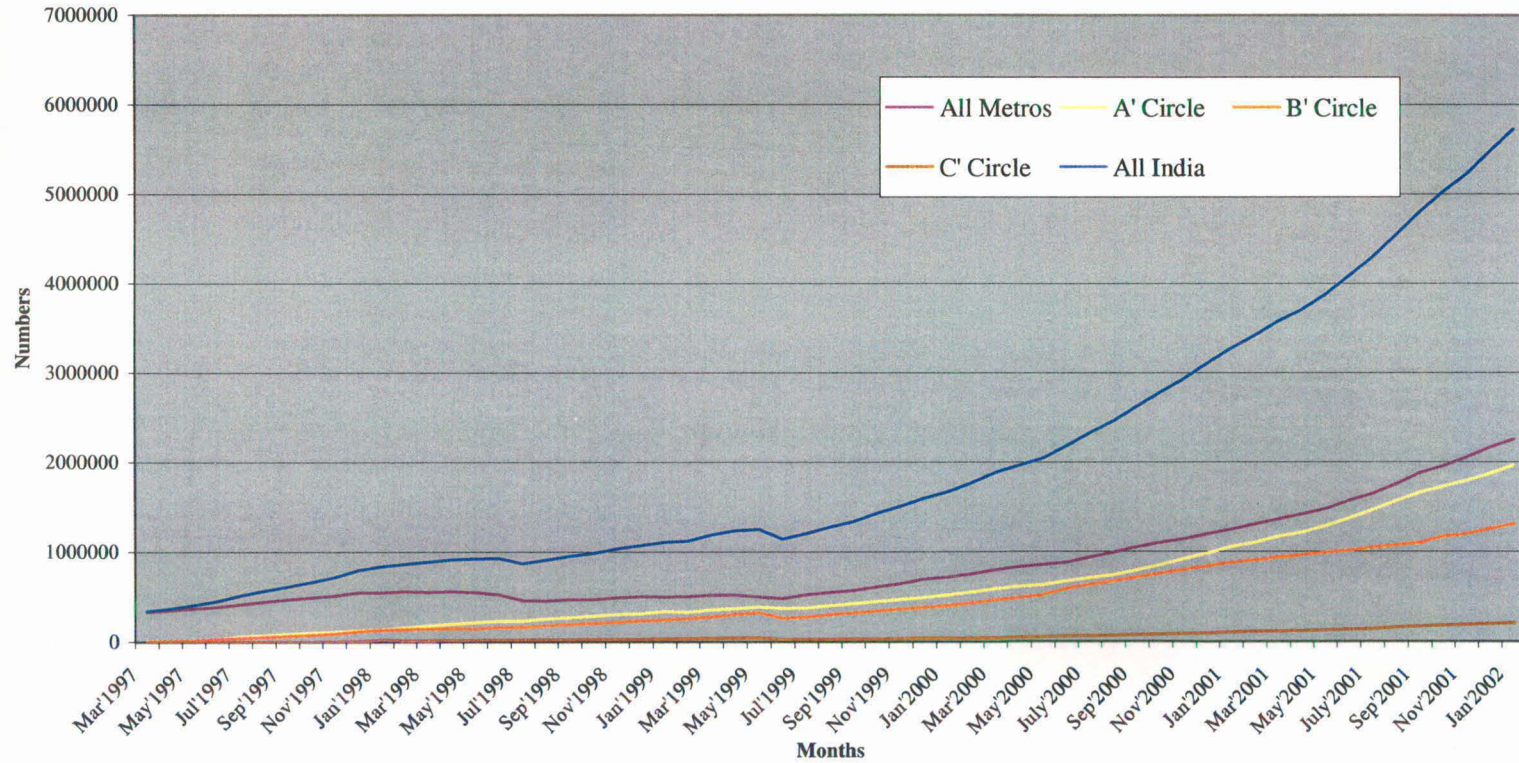
Appendix 1

The figure in the following page shows the growth of the cellular subscribers in India. From the figure it can be seen that there has been a sudden decline in the number of subscribers around June 1999. This might be because of the fact that the new tariffs as per the Telecom Tariff Order 1999 were announced. In the new tariff order the cap for the monthly rental to be charged was increase from the existing level of Rs 156 per month to Rs 600. This sharp increase in the monthly rental might have led to the decline in the number of subscribers.

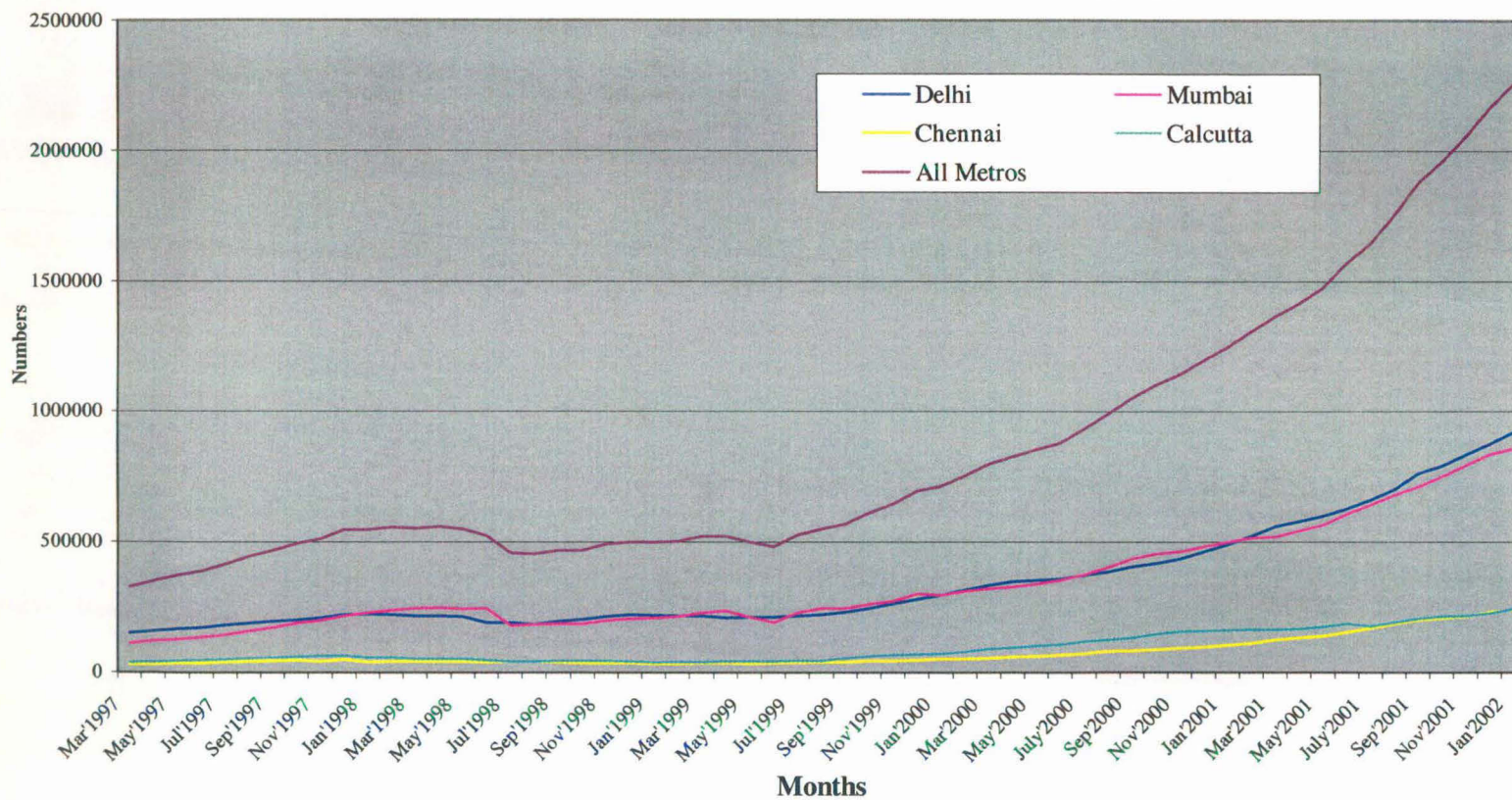
Subsequently, after June 1999, the number of subscribers showed an increasing trend. This could be because of the fact that the airtime rates were reduced from a very high level of Rs 16.80 per minute to a maximum of Rs 6 per minute. Thus the reduction of maximum airtime rate to be charged in the new tariff regime along with the further decline in the airtime rates and also the rentals charged by the service providers due to increased competition and many other factors have helped in increase of the number of the subscribers. The growth in the number of subscribers has been at a faster rate than before, which is evident from the slope of the graph. The slope after July 99 was more that what it was before, not only for whole of India, but also for all other circles too.

The figure in the following page shows the growth of cellular subscribers in India, along with the growth in the Category "A", "B" and "C" circles and the metro circles. The subsequent figures shows the pattern of growth in Different categories of circles.

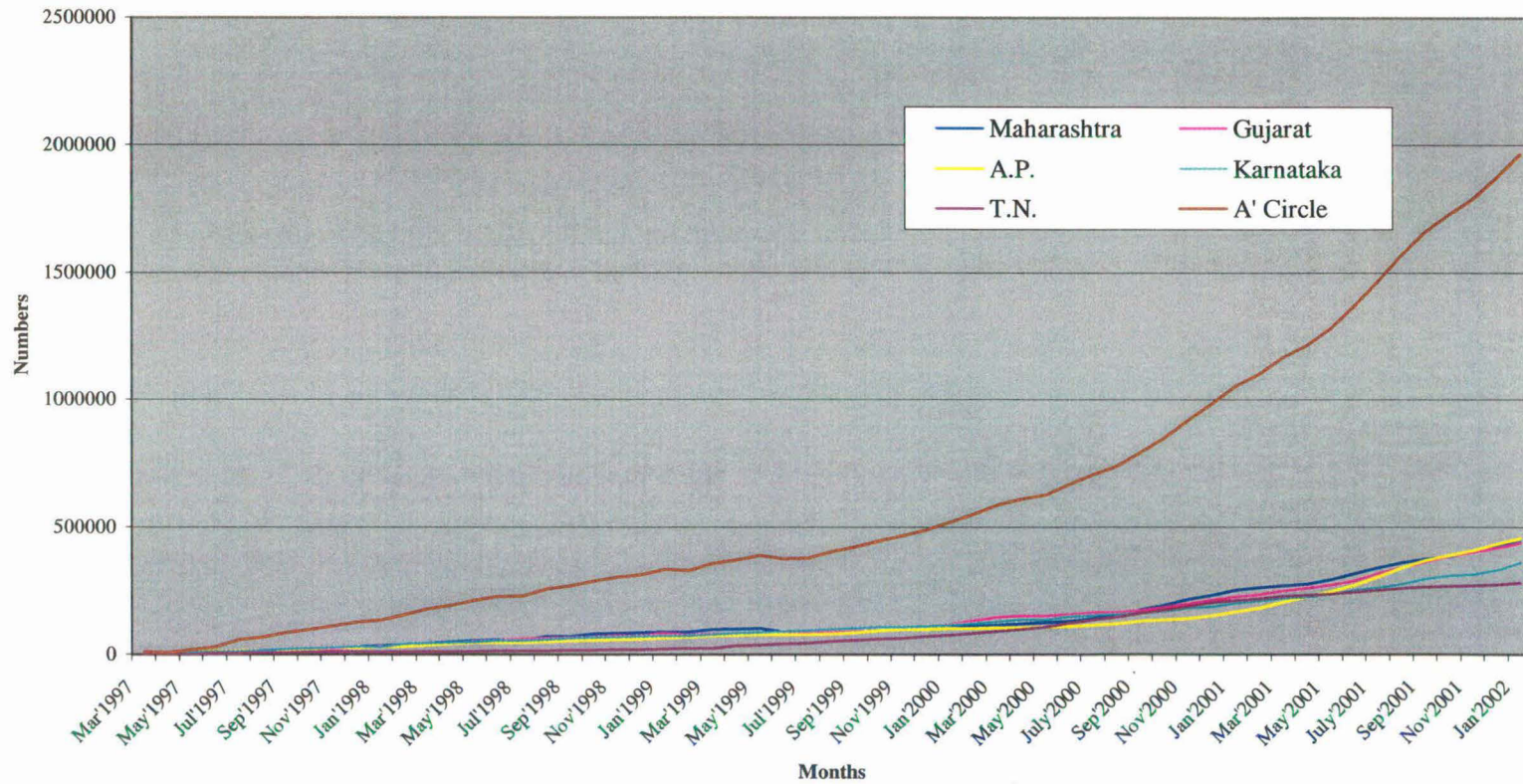
**Number of Cellular Connection in the Metro's, the three Circles and All India:
Mar '97-Jan '02**



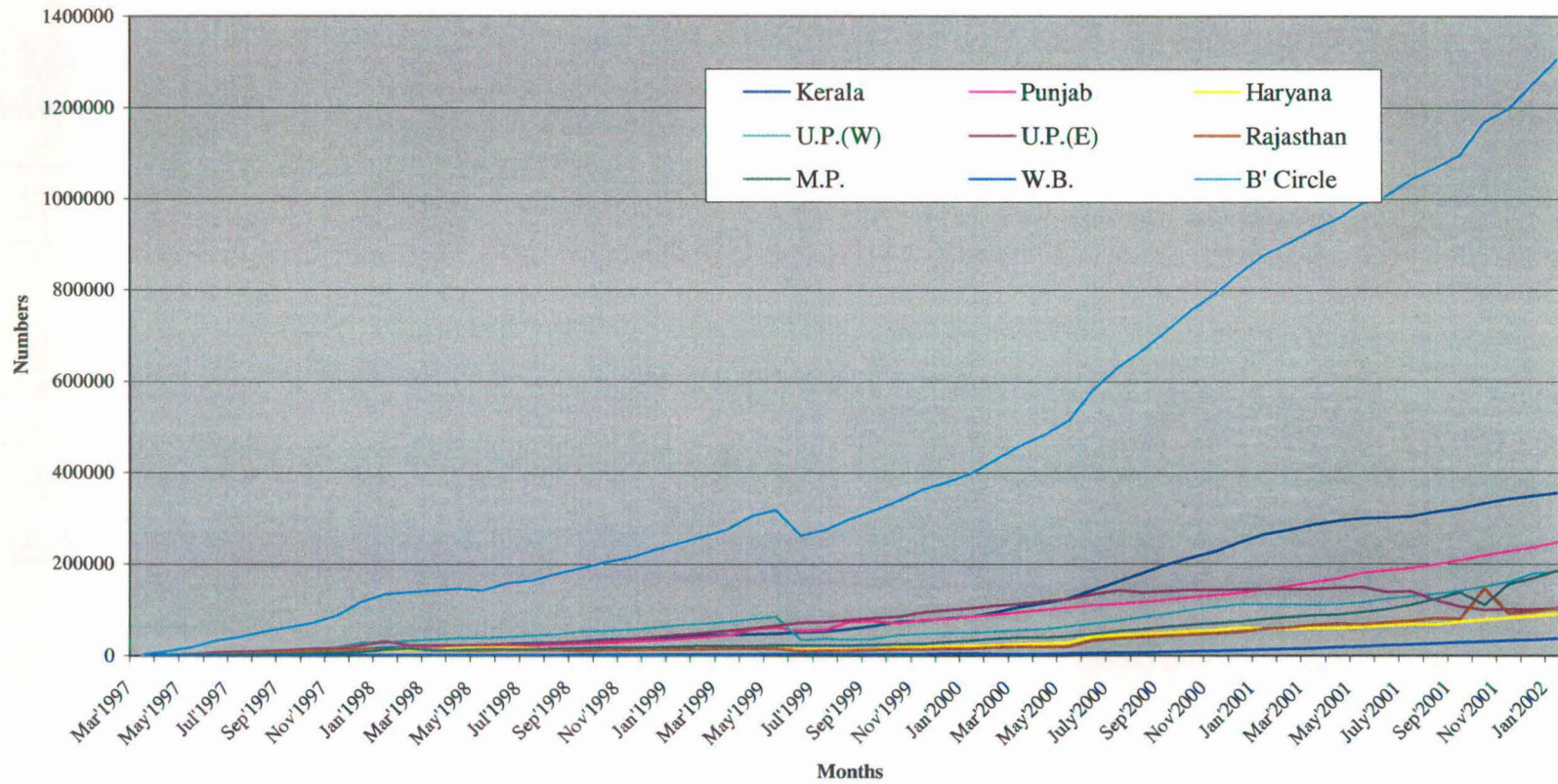
Number of Cellular Connection in the Metro's: Mar '97-Jan '02



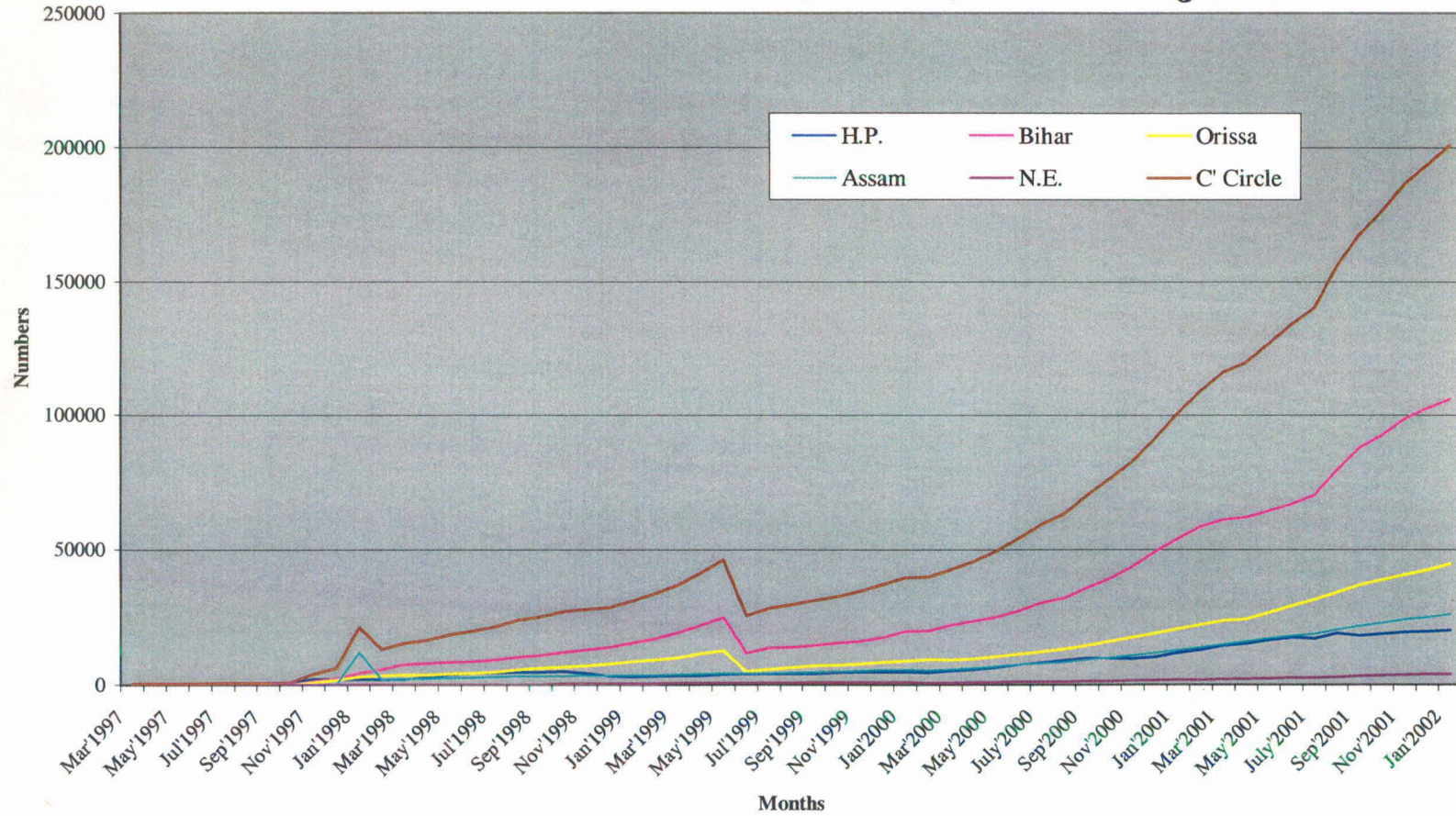
Number of Cellular Connections in Circle "A": March '97-Jan '02



Number of Cellular Connectins in Circle "B": Mar '97-Jan '02



Number of Cellular Connections in Circle "C": Mar '97-Jan '02



APPENDIX 2

List of Abbreviations

ARPU	Average Revenue Per User
ATP	Alternative Tariff Package
BSNL	Bharat Sanchar Nigam Limited
CMS	Cellular Mobile Service
CMSP	Cellular Mobile Service Provider
COAI	Cellular Operator Association of India
CPP	Calling Party Pays
DEL	Direct Exchange Lines
DOT	Department of Telecommunication
DSF	Delhi Science Forum
DPT	Department of Post and Telegraph
DTS	Department of Telecommunication Services
GDP	Gross Domestic Product
GSM	Global System of Mobile
ILD	International Long Distance
IRR	Internal Rate of Return
ISD	International Subscribers Dial
ITA	Indian Telegraph Act
ITU	International Telecom Union
MTNL	Mahanagar Telecom Nigam Limited
NLD	National Long Distance
NTP	National Telecom Policy
PCO	Public Calling Office
PSTN	Public Switch Telephone Network
RFP	Request for Proposal
RPP	Receiving Party Pays
SIM	Subscribers Identification Module
SMS	Short Message Service
STD	Subscribers trunk Dial
TEC	Telecom Engineering Center

List of Abbreviations Continued.....

TRAI	Telecom Regulatory Authority of India
TTO	Telecom Tariff Order
USO	Universal Service Obligation
WAP	Wireless Application Protocol
WLL	Wireless Local Loop

APPENDIX 3

List of Cellular Mobile Telephone Service Licensees

Sl. No.	Service Area (Metro City / Telecom Circle)	No. of Licensees	Name of Licensee
1.	Delhi	4	Bharti Cellular Ltd. Sterling Cellular Ltd. Mahanagar Telephone Nigam Ltd. Birla Tata AT & T Ltd.
2.	Mumbai	4	BPL Mobile Communication Ltd. Hutchison Max Telecom Ltd. Mahanagar Telephone Nigam Ltd. Bharti Cellular Ltd.
3.	Kolkata	4	Bharti Mobitel Ltd. Usha Maartin Telekom Ltd. Bharat Sanchar Nigam Ltd. Reliable Internet Services Ltd.
4.	Chennai	4	RPG Cellular Services Ltd. Bharti Mobinet Ltd. Bharat Sanchar Nigam Ltd. Barakhamba Sales & Services Ltd.
5.	A & N		Bharat Sanchar Nigam Ltd.
6.	Andhra Pradesh	4	Birla Tata AT & T Ltd. Bharti Mobile Ltd. Bharat Sanchar Nigam Ltd. Barakhamba Sales & Services Ltd.
7.	Assam	2	Reliance Telecom (P) Ltd. Bharat Sanchar Nigam Ltd.
8.	Bihar	2	Reliance Telecom (P) Ltd. Bharat Sanchar Nigam Ltd.
9.	Gujarat	4	Fascel Ltd. Birla Tata AT & T Ltd. Bharat Sanchar Nigam Ltd. Bharti Cellular Ltd.
10.	Haryana	4	Escotel Mobile Communication (P) Ltd. Aircel Digilink India Ltd. Bharat Sanchar Nigam Ltd. Bharti Cellular Ltd.
11.	Himachal Pradesh	4	Bharti Telenet Ltd. Reliance Telecom (P) Ltd. Bharat Sanchar Nigam Ltd. Escorts Telecommunications Ltd.

Sl. No.	Service Area (Metro City / Telecom Circle)	No. of Licensees	Name of Licensee
12.	J & K	1	Bharat Sanchar Nigam Ltd.
13.	Karnataka	4	Spice Communications Ltd. Bharti Mobiles Limited Bharat Sanchar Nigam Ltd. M/s. Barakhamba Sales & Services Ltd.
14.	Kerala	4	BPL Cellular Limited Escotel Mobile Communications Ltd. Bharat Sanchar Nigam Ltd. Bharti Cellular Ltd.
15.	Maharashtra	4	BPL Mobile Cellular Ltd. Birla Tata AT & T Ltd. Bharat Sanchar Nigam Ltd. Bharti Cellular Ltd.
16.	Madhya Pradesh	4	RPG Cellcom Ltd. Reliance Telecom (P) Ltd. Bharat Sanchar Nigam Ltd. Bharti Cellular Ltd.
17.	N.E.	3	Reliance Telecom (P) Ltd. Hexacom India Ltd. Bharat Sanchar Nigam Ltd.
18.	Orissa	2	Reliance Telecom (P) Ltd. Bharat Sanchar Nigam Ltd.
19.	Punjab	4	Spice Communications Ltd. Bharti Mobile Ltd. Bharat Sanchar Nigam Ltd. Escorts Telecommunications Ltd.
20.	Rajasthan	4	Aircel Digilink India Ltd. Hexacom India Ltd. Bharat Sanchar Nigam Ltd. Escorts Telecommunications Ltd.
21.	Tamil Nadu	4	BPL Mobile Cellular Ltd. Aircel Ltd. Bharat Sanchar Nigam Ltd. Bharti Cellular Ltd.
22.	UP (W)	3	Escotel Mobile Communications Ltd. Bharat Sanchar Nigam Ltd. Bharti Cellular Ltd.
23.	UP (E)	4	Aircel Digilink India Ltd. Koshika Telecom Pvt. Ltd. Bharat Sanchar Nigam Ltd. Escorts Telecommunications Ltd.
24.	West Bengal	2	Reliance Telecom (P) Ltd. Bharat Sanchar Nigam Ltd.

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