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TELECOM INDUSTRY IN INDIA

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Abstract: *The Indian telecommunications industry is one of the fastest growing in the world. Government policies and regulatory framework implemented by Telecom Regulatory Authority of India have provided a conducive environment for service providers. This has made the sector more competitive, while enhancing the accessibility of telecommunication services at affordable tariffs to the consumers. The growth of Indian telecom industry can be attributed to several enabling factors. The policy of liberalization of telecommunications in 1991 opened up the sector to private participation. Subsequently, regulatory and policy reforms such as the implementation of the National Telecom Policy, 1994, award of cellular licenses and establishment of the Telecom Regulatory Authority of India (TRAI) in 1997 were some of the important milestones of Telecom industry in the 1990s, which propelled the sector to a high-growth path. The launch of wireless services was an important landmark and is one of the most important drivers of overall industry growth during the past two decades. The factors such as large population, high economic growth, intense competition, low tariffs, infrastructure sharing and the introduction of enabling regulatory reforms have played prominent role in the industry's growth. The telecom revolution has benefitted rural as well as urban segments. Present paper attempts to review the status of telecom industry in India.*

INTRODUCTION

The telecom industry has been divided into two major segments, that is, fixed and wireless cellular services for this report. Besides, internet services, VAS, PMRTS and VSAT also have been discussed in brief in the report. In today's information age, the telecommunication industry has a vital role to play. Considered as the backbone of industrial and economic development, the industry has been aiding delivery of voice and data services at rapidly increasing speeds, and thus, has been revolutionizing human communication. Although the Indian telecom industry is one of the fastest-growing industries in the world, the current tele-density or telecom penetration is extremely low when compared with global standards. India's tele-density of 36.98 percent in 2009 is amongst the lowest in the world. Further, the urban tele-density is over 80 percent, while rural tele-density is less than 20 percent, and this gap is increasing. As majority of the population resides in rural areas, it is important that the government takes steps to improve rural tele-density. No doubt

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the government has taken certain policy initiatives, which include the creation of the Universal Service Obligation Fund, for improving rural telephony. These measures are expected to improve the rural tele-density and bridge the rural-urban gap in tele-density.

Indian telecom sector is more than 165 years old. Telecommunications was first introduced in India in 1851 when the first operational land lines were laid by the government near Kolkata (then Calcutta), although telephone services were formally introduced in India much later in 1881. Further, in 1883, telephone services were merged with the postal system. In 1947, after India attained independence, all foreign telecommunication companies were nationalized to form the Posts, Telephone and Telegraph, a body that was governed by the Ministry of Communication. The Indian telecom sector was entirely under government ownership until 1984, when the private sector was allowed in telecommunication equipment manufacturing only. The government concretized its earlier efforts towards developing R&D in the sector by setting up an autonomous body – Centre for Development of Tele-matics in 1984 to develop state-of-the-art telecommunication technology to meet the growing needs of the Indian telecommunication network. The actual evolution of the industry started after the Government separated the Department of Post and Telegraph in 1985 by setting up the Department of Posts and the Department of Telecommunications. The entire evolution of the telecom industry can be classified into three distinct phases viz. (1) Phase I- Pre-Liberalization Era (1980-89); (2) Phase II- Post Liberalization Era (1990-99); and (3) Phase III- Post 2000. Until the late 1990s the Government of India held a monopoly on all types of communications as a result of the Telegraph Act of 1885. As mentioned earlier in the chapter, until the industry was liberalized in the early nineties, it was a heavily government-controlled and small-sized market. Government policies have played a key role in shaping the structure and size of the Telecom industry in India. As a result, the Indian telecom market is one of the most liberalized markets in the world with private participation in almost all of its segments. The New Telecom Policy provided the much needed impetus to the growth of this industry and set the trend for liberalization in the industry (Pritish and Saxena, 2015).

ROLE IN INDIA'S DEVELOPMENT

The phenomenal growth in the Indian telecom industry was predominantly aided by the meteoric rise in wireless subscribers, which encouraged mobile handset manufacturers to enter the market and to cater to the growing demand. Further, the manufacturers introduced lower-priced handsets with add-on facilities to cater to the increasing number of subscribers from different strata of the society. Now even entry-level handsets come with features like colored display and FM radio. Thus, the falling handset prices and the add-on features have triggered growth of the Indian telecom industry. In the late nineties, India was introduced to prepaid cards, which was yet another milestone for the wireless sector. Prepaid cards lured

more subscribers into the industry besides lowering the credit risk of service providers due to its upfront payment concept. Prepaid cards were quite a phenomenon among first-time users who wanted to control their bills and students who had limited resources but greater need to be connected. Pre-paid cards greatly helped the cellular market to grow rapidly and cater to the untapped market. Further, the introduction of innovative schemes like recharge coupons of smaller denominations and life time incoming free cards has led to an exponential growth in the subscriber base (E & Y, 2015).

The changing demographic profile of India has also played an important role in subscriber growth. The changed profile is characterized by a large young population, a burgeoning middle class with growing disposable income, urbanization, increasing literacy levels and higher adaptability to technology. These new features have multiplied the need to be connected always and to own a wireless phone and therefore, in present times mobiles are perceived as a utility rather than a luxury Liberalization of the telecom industry has fuelled intense competition, especially in the cellular segment. The ever-increasing competition has led to high growth of subscribers and has put pressure on tariffs, which have seen a sharp drop over the years. When the cellular phones were introduced, call rates were at a peak of Rs 16 per minute and there were charges for incoming calls too. Today, however, incoming calls are no longer charged and outgoing calls are charged at less than a rupee per minute. Thus, the tariff war has come a long way indeed. Increased competition and the subsequent tariff war has acted as a major catalyst for attracting more subscribers. Apart from these major growth drivers, an improved network coverage, entry of CDMA players, growth of value-added services (VAS), advancement in technology, and growing data services have also driven the growth of the industry. The telecom industry in India has experienced exponential growth over the past few years and has been an important contributor to economic growth; however, the cut-throat competition and intense tariff wars have had a negative impact on the revenue of players. Despite the challenges, the Indian telecom industry will thrive because of the immense potential in terms of new users. India is one of the most-attractive telecom markets because it is still one of the lowest penetrated markets. The government is keen on developing rural telecom infrastructure and is also set to roll out next generation or 3G services in the country. Operators are on an expansion mode and are investing heavily on telecom infrastructure. Foreign telecom companies are acquiring considerable stakes in Indian companies. Burgeoning middle class and increasing spending power, the government's thrust on increasing rural telecom coverage; favorable investment climate and positive reforms will ensure that India's high potential is indeed realized.

Globalization has made telecommunication an integral part of the infrastructure of the Indian economy. The telecom sector in India has developed as a result of progressive regulatory regime. The telecom sector in India experienced a rapid growth over the past decade on account of regulatory liberalization, structural reforms and competition, making telecom one of the major catalysts in India's growth

story. Besides, the growth in the service and IT and ITeS sector also increased the prominence of the telecom industry in India. Telecom has emerged as a key infrastructure for economic and consumer growth because of its multiplier effect and the fact that it is beneficial to trade in other industries. The contribution of the sector to GDP has been increasing gradually. The Indian telecom industry is characterized with intense competition, and continuous price wars. Currently, there are around a dozen telecom service providers who operate in the wired and wireless segment. The government has been periodically implementing suitable fiscal and promotional policies to boost domestic demand and to create volumes for the industry. The wireless segment growth has played a dominant role in taking the tele-density to the current levels. In the next few years, the industry is poised to grow further. Wireless dominated the overall subscriber growth, accounting for 97.3 percent of the overall subscriber base as of February, 2015. The high capex requirement for laying wire line networks, coupled with inexpensive availability of wireless handsets, has led to a decline in wire line growth. India's telecom sector is a voice-centric market, characterized by high volumes and low average revenue per user. Price-sensitivity of telecom products in India has resulted in low airtime tariffs. Unsustainable tariffs and competition to add new subscribers has also impacted operator margins. Wireless services have been at the helm of the Indian telecom growth story. With 960.6 million subscribers at the end of February, 2015, India is the second-largest wireless market in terms of subscribers after China. The number of telephone subscribers in India increased from 996.49 million at the end of March, 2015 to 1,006.96 million at the end of June, 2015, registering a growth of 1.05 percent over the previous quarter. The country's wireless market has been dominated by volume-based growth. Moreover, affordability of wireless services, with one of the lowest mobile tariffs in the world, has led to an aggressive growth of mobile telephony (E & Y, 2015).

India's wireless market began to record a systematic shift with the launch of 3G services in 2010. Operators began moving away from focusing on voice services and began to capitalize on the growth and revenue potential of data. Wireless broadband services i.e. 3G and 4G are likely to replicate the growth of voice telephony in the growth of internet and broadband, and will account for largest share of incremental revenues for the sector. 4G services in India were launched in 2012, and it is likely to witness large scale 4G roll-out from some key players. Earlier, only operators that won spectrum in 2300MHz in 2010 could launch 4G services. However, the auction of technology neutral spectrum in February, 2014 and March, 2015 is likely to change the landscape of 4G in India. These auctions saw operators winning spectrum in 800MHz and 1800MHz bands, two amongst the most developed bands for launch of long-term evolution services. India's wire line market has been reporting a constant decline for more than a decade. The growth in the demand for wireless services, coupled with low-cost access to wireless devices and affordable tariffs, have significantly reduced the attractiveness of wire line services for consumers. Wire line tele-density stood at a low 2.1 percent at the end of February,

2015. However, demand for wire-line services has witnessed renewal of some interest in the recent past given its importance in broadband delivery. Some of the private players have reported healthy addition of wire-line subscribers, led by a demand for high speed broadband. Broadband infrastructure plays a critical role in an economy and contributes significantly to development of a country. It connects consumers, businesses, governments; facilitates social interaction and presents attractive opportunities for education, governance and entrepreneurship. Countries across the world are looking to increase broadband access and also view it as the next phase of growth in telecommunications services. Broadband offers extensive benefits to emerging markets. Till recently, India was primarily dependent on wire-line infrastructure for delivery of internet services. Due to the deficient nature of the fixed infrastructure, the internet penetration has remained low and India ranks a lowly 125th in terms of fixed broadband penetration globally. As of September, 2014, wireless accounted for 92.6 percent of the country's total internet subscribers (Kulkarni, 2015).

Despite the substantial increase in the reach of telecom services, around 30 percent of the Indian population, mainly in far-flung rural and tribal areas, is still deprived of basic mobile services. Geographically, 15 percent of the country's area remains to be covered by the telecom service providers. Moreover, broadband coverage is still low in the country. It is estimated that more than 150,000 towers will be required on a pan-India level and a minimum of 50,000 towers in rural India to cater to these requirements. The telecom infrastructure segment is also expected to play a vital role to help realize the Digital India vision and facilitate inclusive growth. In particular, tower infrastructure will provide the foundation to achieve the objectives of broadband highway covering both rural and urban areas, universal access to mobile connectivity, public internet access, e-governance, e-Kranti and to develop smart cities in the country. Mobile handsets have played an integral part in the overall evolution of the mobile ecosystem in the country and have become agents of socio-economic transformation. Reduction of handset prices and increased affordability of services can be deemed critical success factors for the bourgeoning growth of wireless telephony. Currently, mobile handsets have evolved from communication-centric devices to all-encompassing communication devices that are no longer considered a luxury. In future, mobile handsets and mobile tablets are expected to play a significant role in bridging the digital divide and connecting the country. Apart from being the primary communication medium for people, mobile devices are finding numerous uses across various domains. They are being used for banking transactions, making payments, as an educational and multi-media tool and for spreading governance. During the initial years of wireless telephony in India, customers had limited choice in terms of handsets, since the majority of devices were imported by a handful of global players. Moreover, the handsets and mobile services were both very costly and beyond the reach of low-income users. Over the years, the scenario has changed dramatically with a rapidly expanding telecom market, reducing tariffs, declining production costs and rising

number of domestic players. Currently, the mobile handset and mobile tablet market in India has several players with varied offerings across all price points. India's handset and tablet market has seen significant growth over the past decade in terms of overall market size and the number of devices sold. However, there is still significant potential in the form of untapped rural population. Moreover, the booming demand for data services is also expected to drive demand for smart devices. There has been an increasing trend of consumers opting for smart phones, since these offers a compelling user experience, with access to social media, emails and the internet. The boost in the demand for smart phones has been driven by the falling average selling prices of devices and a dip in data prices. With low penetration of PCs and a deficient fixed broadband network, smart phones are expected to drive the next phase of internet growth in the country. The uptake of smart phones in India has been revolutionized by players that focus on introducing premium smart phones at affordable prices. These players have adopted innovative branding and marketing strategies to change the consumer preference toward smart phones (Rashmi and Kumar, 2015).

TELE DENSITY

Subscriber base and tele-density is shown in Table 1. The telecom sector witnessed a substantial increase in the number of subscribers during 2014-15. During the year, overall telecom subscriber base has increased to 996.49 million. Out of total telecom subscribers, urban subscribers constituted 57.92 per cent while about 81 per cent urban subscribers were based on wirelines.

Table 1
Subscriber Base and Tele-density

Particulars	*Wireless*	*Wire line*	*Total*
Total Subscribers (Million)	969.89	26.59	996.49
Urban Subscribers (Million)	555.71	21.47	577.18
Rural Subscribers (Million)	414.18	5.12	419.31
Overall Tele-density	77.27	2.12	79.38
Urban Tele-density	143.08	5.53	148.61
Rural Tele-density	47.78	0.59	48.37
Share of Urban Subscribers	57.30%	80.73%	57.92%
Share of Rural Subscribers	42.70%	19.27%	42.08%
No. of Broadband Subscribers (Million)	83.68	15.52	99.20

Source: Annual Report, 2014-15, Telecom Regulatory Authority of India.

Internet subscribers base in the country as on 31st March, 2015 stood at 302.35 million as compared to 251.59 million as on 31st March, 2014. The total brand band subscriber base of the country was reported 99.2 million whereas it was 60.87 million on 31st March, 2014. Brand band subscribers as on March, 2015, constituted 32.81 per cent while narrow band constituted 67.19 per cent in March, 2015 (Table.2).

Presently, telecom connects the remotest of Indian regions. However, overall growth remains skewed toward urban subscribers, which account for around 58.6 percent of the overall subscriber base. The urban-rural digital divide is significant, with a tele- density of 149.3 percent in urban areas and as low as 47.2 percent in rural areas at the end of February, 2015.Subscription in Urban Areas increased from 577.18 million at the end of March, 2015 to 584.21 million at the end of June, 2015, and the urban tele-density increased from 148.61 to 149.70 during the quarter. 1.3 rural subscriptions increased from 419.31 million to 422.75 million and the rural tele-density increased from 48.37 to 48.66 during the quarter (TRAI, 2015).

Table 2
Internet Subscribers in India

[Subscribers in Millions]

Segment		*Category*		*Internet Subscribers*		*% Growth*
				March, 2014	*March, 2015*	
A.	Wired		Broadband	14.86	15.52	4.45%
			Narrowband	3.64	3.55	2.46%
			Total	18.50	19.07	3.09%
B.	Wireless	Fixed Wireless (Wi-Fi,	Broadband	0.40	0.44	11.00%
		Wi-Max, Radio &VSAT)	Narrowband	0.04	0.03	-15.82%
			Total	0.44	0.48	8.55%
		Mobile Wireless	Broadband	45.61	83.24	82.48%
		(Phone+Dongle)	Narrowband	187.04	199.57	6.70%
			Total	232.65	282.81	21.56%
	Total Internet Subscribers		Broadband	60.87	99.20	62.96%
			Narrowband	190.72	203.15	6.52%
			Total	251.59	302.35	20.18%

Source: Annual Report, 2014-15, Telecom Regulatory Authority of India.

Wire line subscriber base of service providers as on March,2015 is shown in Table 3. Overall, BSNL constituted 61.71 per cent shares in wireline services while MTNL had a share of 13.36 per cent. Thus, more than 3/4th share of wireline subscriber base comprised of public sector. In the private sector, major players were reported to be Bharti Airtel followed by Tata, Reliance and Quadarant.

GROWTH OF INDUSTRY

Worldwide, ownership and management of telecom towers has largely been in the hands of telecom operators. However, in India, towers have gained significance as a separate industry with operators outsourcing tower infrastructure to independent players. Separate tower companies with a considerable number of towers offer advantages such as rapid rollout over a large area, sharing of towers and tenancy-driven discounts, as compared to towers managed by operators. India's telecom infrastructure industry is one of the pioneers in passive infrastructure sharing.

Table 3
Wire line Subscriber Base of Service Providers as on March, 2015

Sl. No.	*Service Provider*	*Urban Subscribers*	*Rural Subscribers*	*Total Wire line Subscribers*
1	BSNL	1,14,05,038	50,07,402	1,64,12,440
2	MTNL	35,51,671	-	35,51,671
3	Bharti	34,11,121	-	34,11,121
4	Quadrant Televentures Ltd.	1,72,094	55,373	2,27,467
5	Sistema Shyam	47,523	9,596	57,119
6	Reliance	11,80,287	1,890	11,82,177
7	TATA	16,23,546	49,243	16,72,789
8	Vodafone	79,560	-	79,560
	Total	2,14,70,840	51,23,504	2,65,94,344

Source: Annual Report, 2014-15, Telecom Regulatory Authority of India.

The tower infrastructure companies provide an integrated neutral host platform that is used by diverse and often competing operators. The growth of these independent tower companies, along with infrastructure sharing, has resulted in rapid rollout of services, fast go-to market time for new entrants and savings in capex and opex. This has led to affordable services for end users and improved accessibility to the hinterland. The number of telecom towers grew from around 250,000 in 2008 to 421,000 in 2014 (IBEF, 2016) . Telecom towers and tenancy ratio in India is shown in Table 4. Moreover, the tenancy ratio has increased significantly from 0.90 per cent to 1.19 per cent during the period.

Table 4
Telecom Towers Installed and Tenancy Ratio in India

Year	*Number of Towers ('000')*	*Tenancy Ratio*
2008	250	0.90
2009	280	1.30
2010	328	1.70
2011	364	1.70
2012	407	1.85
2013	411	1.91
2014	421	1.90

Source: TAIPA.

Growth of telephones in India is shown in Table 5. Overall, there has been an increase of 384.06 per cent in the total number of telephone subscribers over the period of 2007-15. However, there has been decline of 34.75 per cent in wire line subscribers during the corresponding period while the number of wireless subscribers increased to 487.42 per cent over the period. During 2007-2016, wireless subscription increased at a CAGR of 22.1 per cent.

Table 5
Growth of Telephones in India

(In Millions)

Year	*Wireless Subscribers*	*Wire line Subscribers*	*Total Subscribers*	*Annual Growth %*
2007	165.11	40.75	205.86	45
2008	261.07	39.42	300.49	46
2009	391.76	37.96	429.72	43
2010	584.32	36.96	621.28	45
2011	811.59	34.73	846.32	36
2012	919.17	32.17	951.34	12
2013	867.80	30.21	898.01	-6
2014	904.52	28.50	933.02	4
2015	969.90	26.59	996.49	7

Source: TRAI Annual Reports from 2012- 2015

Growth of internet subscribers in India is shown in Table 6. There has been phenomenon growth in internet subscribers in India during the recent past. The internet subscribers grew from 10.4 million in 2007 to 475 million in 2015. Similarly, wired broad band subscribers increased from 3.1 million in 2007 to 15.52 million in 2015. The number of internet subscribers increased at a CAGR of 52.11 per cent during the period of 2006 to 2015. Similarly, broad band subscriptions increased at a CAGR of 20.11 per cent during the period of 2007 to 2016.

Table 6
Growth of Internet Subscribers in India

Year	*Internet Subscribers (Million)*	*Wired Brad Band Subscribers (Million)*
2007	10.4	3.1
2008	12.9	5.5
2009	15.2	7.8
2010	18.7	10.9
2011	22.4	13.4
2012	25.3	15.0
2013	239	15.1
2014	267	14.9
2015	375	15.52

Source: Company Website.

Growth of telecommunication subscribers is shown in Table 7. Table indicates that over the years, the number of wireless subscribers has increased while there has been decline in the number of wire line subscribers due to an increasing demand for wireless phones as compared to fixed telephones. Wireless tele-density in India has increased from 14.6 to 78.93 in 2016.

Table 7
Growth of Telecommunication Subscribers in India

(In Millions)

Year	*Total Subscribers*	*Wireless Subscribers*	*Internet Subscribers*	*Wired Broad Band Subscribers*	*Wireless Tele density*
2007	205.86	165	10.4	3.1	14.60
2008	300.49	261	12.9	5.5	22.80
2009	429.72	392	15.2	7.8	33.70
2010	621.28	584	18.7	10.9	49.70
2011	846.32	812	22.4	13.4	68.00
2012	951.34	919	25.3	15.0	76.00
2013	898.02	868	239	15.1	70.90
2014	846.32	944	267	14.9	75.43
2015	996.00	970	375	15.52	77.27
2016	1022.61	997	—	16.13	78.93

Source: TRAI, 2016

Growth of GSM and CDMA subscribers is shown in Table 8. Wireless segment of Indian telecom industry comprises both GSM and CDMA subscribers. GSM is a wireless digital phone technology that stands for Global System for Mobile Communication developed in 1982. GSM network operates in the 900 MHz and 1800 MHz frequency bands. One of the key features of GSM is the Subscriber Identity Module, commonly known as SIM card. This allows the users to retain their information even after they switch handsets. CDMA technology developed in 1995 stands for Code Division Multiple Access. It is a form of multiplexing which allows numerous signals to occupy a single transmission channel. This technology is used for transmitted data or voice over radio frequencies (800 MHz and 1.9 GHz frequency bands). CDMA technology provides excellent voice capacity and data capability for mobile and fixed wireless networks. There has been an increase of 627.28 per cent increase in the number of GSM subscribers and 21.08 per cent in CDMA subscribers during the period of 2007 to 2015. During 2015, the share of GSM subscribers was recorded 94.19 per cent while CDMA subscribers constituted 5.81 per cent only. The GSM subscribers increased from 917.73 million at the end of March, 2015 to as against 930.92 million at the end of June, 2015, showing a quarterly growth of 1.44 percent. Bharti with 230.66 million subscribers continues to be the largest GSM mobile operator, followed by Vodafone. The CDMA subscriber base declined from 52.16 million at the end of March, 2015 to 49.89 million at the end of June, 2015, thereby showing a decline rate of 4.36 percent. Reliance Communications Group with 26.82 million subscribers continues to be the largest CDMA mobile operator (IBEF, 2016).

Overall subscribers and tele-density is shown in Table 9. There has been an increase of 133.18 per cent in the number of subscribers during 2009 to 2015. During 2015, total numbers of subscribers were reported to be 1002 million with the tele-density of 79.67 per cent.

Table 8
Growth of GSM and CDMA Subscribers in India

Year	*GSM Subscribers*	*CDMA Subscribers*
2007	120.47	44.64
2008	192.70	68.37
2009	297.26	94.50
2010	478.68	105.64
2011	698.37	113.22
2012	814.06	105.11
2013	794.03	73.78
2014	847.41	57.10
2015	876.15	54.05

Source: TRAI Annual Reports

Table 9
Overall Subscribers and Tele-density

Year	*No. of Subscribers (In Millions)*	*Tele-density (%)*
2009	429.7	27
2010	621.3	52.7
2011	846.3	70.9
2012	951.3	78.7
2013	898	73.3
2014	933	75.2
2015	1002	79.67

Source: TRAI

Market share of different service providers in wireless and wire line segment is shown in Table 10. Indian telecom industry comprises both public and private service providers. Public sector telecom operators occupy a major share in the wire line segment as compared to the wireless segment. The private telecom operators dominate the wireless market. Their share is very less in the fixed line segment. BSNL and MTNL are the two major public sector service providers. The major private sector service providers are Bharti Airtel, Vodafone, Reliance Communication, Idea Cellular and Tata Telecom. Over the period of 2012 to 2015, share of public sector service providers has declined while the share of private sector service providers in telecom services has increased significantly (Mishra *et al.,* 2015).

Subscriber base of wireless services are shown in Table 11. During the period of 2010-11 to 2014-15, there has been increase in the subscriber base of Bharti Airtel, Vodafone, Idea and Aircel while subscriber base of other service providers has declined over the period. Mobile Number Portability requests have been increasing gradually. The requests were reported 117.01 million at the end of March,

Table 10
Market Share of Different Service Providers in Wireless and Wire line Segment

Year/ Service Providers	*2012*		*2013*		*2014*		*2015*	
	Wireless	*Wire line*	*Wireless*	*Wire line*	*Wireless*	*Wire line*	*Wireless*	*Wire line*
BSNL	10.72	69.84	11.66	67.67	10.46	64.87	7.96	61.71
MTNL	-	10.75	-	11.45	-	12.43	0.36	13.35
Bharti Airtel	19.72	10.16	21.69	10.87	22.71	11.78	23.30	12.83
Vodafone	16.37	0.06	17.56	0.12	18.41	0.19	18.95	0.30
Reliance Commn.	16.65	3.95	14.17	4.11	12.26	0.75	11.29	4.45
Idea Cellular	12.26	-	14.01	-	15.01	-	16.27	-
Tata Indicom	8.89	4.48	7.65	4.98	6.97	0.19	6.81	6.29

Source: TRAI Annual Reports

2014 wich increased to 153.85 million at the end of March, 2015. The highest number of porting requests has been received in Rajasthan followed by Gujarat in northern and western India, while in southern and eastern India; the highest number of porting requests was received in Karnataka followed by Andhra Pradesh.

Table 11
Subscriber Base of Wireless Services
(Subscriber Base in Millions)

Service Providers	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*% age growth/ reduction over 2014*
Bharti	162.20	181.28	188.20	205.39	226.02	10.04
Vodafone	134.57	150.47	152.35	166.56	183.80	10.35
Idea	89.50	112.72	121.61	135.79	157.81	16.22
Reliance	135.72	153.05	122.97	110.89	109.47	-1.28
BSNL	91.83	98.51	101.21	94.65	77.22	-18.42
Aircel	54.84	62.57	60.07	70.15	81.40	16.04
Tata	89.14	81.75	66.42	63.00	66.32	5.27
Unitech / Telewings	22.79	42.43	31.68	35.61	45.62	28.11
Sistema	10.06	15.68	11.91	9.04	8.86	-1.99
Videocon	7.11	5.95	2.01	4.99	7.13	42.89
MTNL	5.47	5.83	5.00	3.37	3.51	4.15
Loop	3.09	3.27	3.01	2.90	0	0
Quadrant	1.47	1.33	1.37	2.17	2.73	25.81
S Tel	2.82	3.43	0	0	0	0.00
Etisalat	0.97	0.78	0	0	0	0.00
Total	811.59	919.17	867.8	904.51	969.89	7.23

Source: Service Providers

Growth of Indian handset market is shown in Table 12. There has been phenomenon increase in handset market value and handset market volume over the period of 2008 to 2015. The average selling price of mobile handset has increased

by 36.11 per cent over the period. There has been an increasing trend of consumers opting for smart phones since this offer a compelling user experience, with access to social media, e-mails and the internet. The boost in the demand for smart phones has been driven by the falling average selling price of devices and a dip in data prices. Moreover, the emergence of dual SIM handsets has also boosted the demand for smart hand phones (IBEF, 2015).

Table 12
Growth of Indian Handset Market

Year	*Average Selling Price of Mobile Handsets (Rs.)*	*Handset Market Value (Rs. Billion)*	*Handset Market Volume (Million)*
2008	2409	265	110
2009	2315	301	130
2010	2300	345	150
2011	2122	382	180
2012	2305	461	200
2013	2327	570	245
2014	2778	750	270
2015	3279	1000	305

Source: Indian Cellular Association.

Revenue from telecom services in India is shown in Table 13. India's telecom sector is a voice centric market, characterized by high volumes and low average revenue per user. There has been an increase of 53.47 per cent in gross revenue from telecom services in India during the period of 2009 to 2014. Revenue from telecom services in India was reported a tune of Rs. 2338.2 billion in 2014.

Table 13
Revenue from Telecom Services in India

(In Rs. Billions)

Year	*Gross Revenue from Telecom Services*	*Growth*
2009	1523.6	18.0
2010	1579.8	3.7
2011	1716.6	8.7
2012	1954.4	13.9
2013	2125.9	8.8
2014	2338.2	10.0

Source: TRAI, 2016

CONCLUSION

The telecom sector witnessed a substantial increase in the number of subscribers and tele-density. There has been decline in wire line telecom subscribers while wireless telecom subscribers have increased significantly in the recent past. The share of private sector in telecom services has increased gradually while the share

of public sector has declined over the period. Similarly, there has been high growth in GSM subscribers while the number of CDMA subscribers drastically declined in the recent past. There has been increasing demand in smart phones and particularly dual SIM based handsets in India. The Mobile Number Portability requests have also increased in the recent years. Investment in telecom sector has shown an increasing trend with the lion share of private sector as foreign direct investment has increased significantly with the liberalization o economy. However, Indian telecom sector requires huge investment in order to meet out the challenges and increasing demand of 3G and 4G services.

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