

TELECOMMUNICATION



MAY 2017 (As of 25 May 2017)

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TELECOMMUNICATION



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EXECUTIVE SUMMARY

Second-largest subscriber base

- With a subscriber base of nearly 1185.55 million, as of February 2017, India accounted for the 2nd largest telecom network in the world

Third-highest number of internet users

- With 391.50 million internet subscriber, as of December 2016, India stood 3rd highest in terms of total internet users in 2016.

Most of the Internet accessed through mobile phones

- Mobile based Internet is a key component of Indian Internet usage, with 7 out of 8 users accessing internet from their mobile phones
- Since 2012, the share of time spent on watching videos on mobile devices has grown by 200 hours a year

Rising penetration rate

- As of February 2017, urban tele-density stood at 166.77 per cent and rural tele-density at 55.92 per cent

Affordability and lower rates

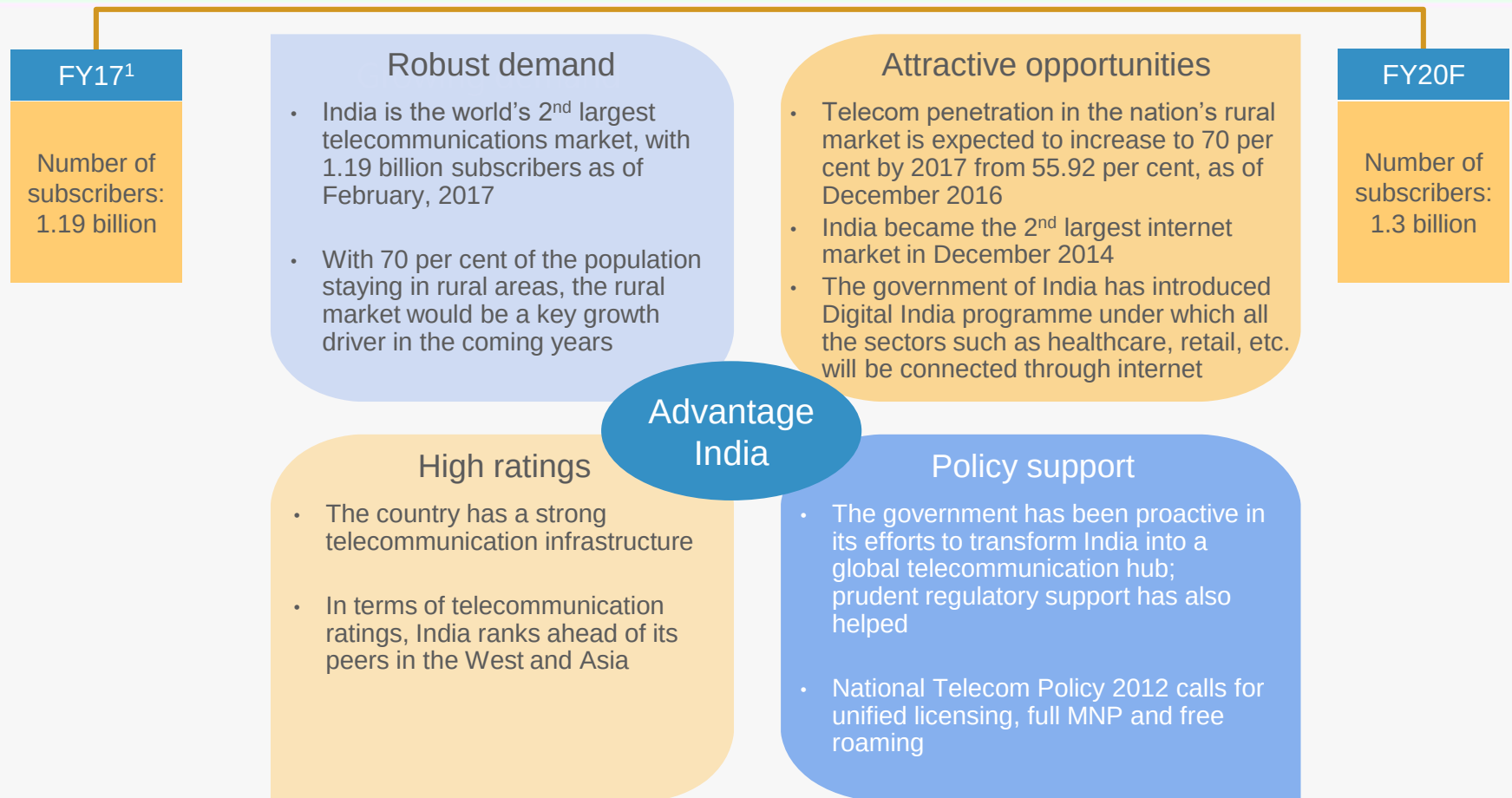
- Availability of affordable smartphones and lower rates are expected to drive growth in the Indian telecom industry

Source: Telecom Regulatory Authority of India, TechSci Research

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ADVANTAGE INDIA



Source: BMI (Business Monitor International) Report, TechSci Research, Internet Mobile Association of India (IAMAI)

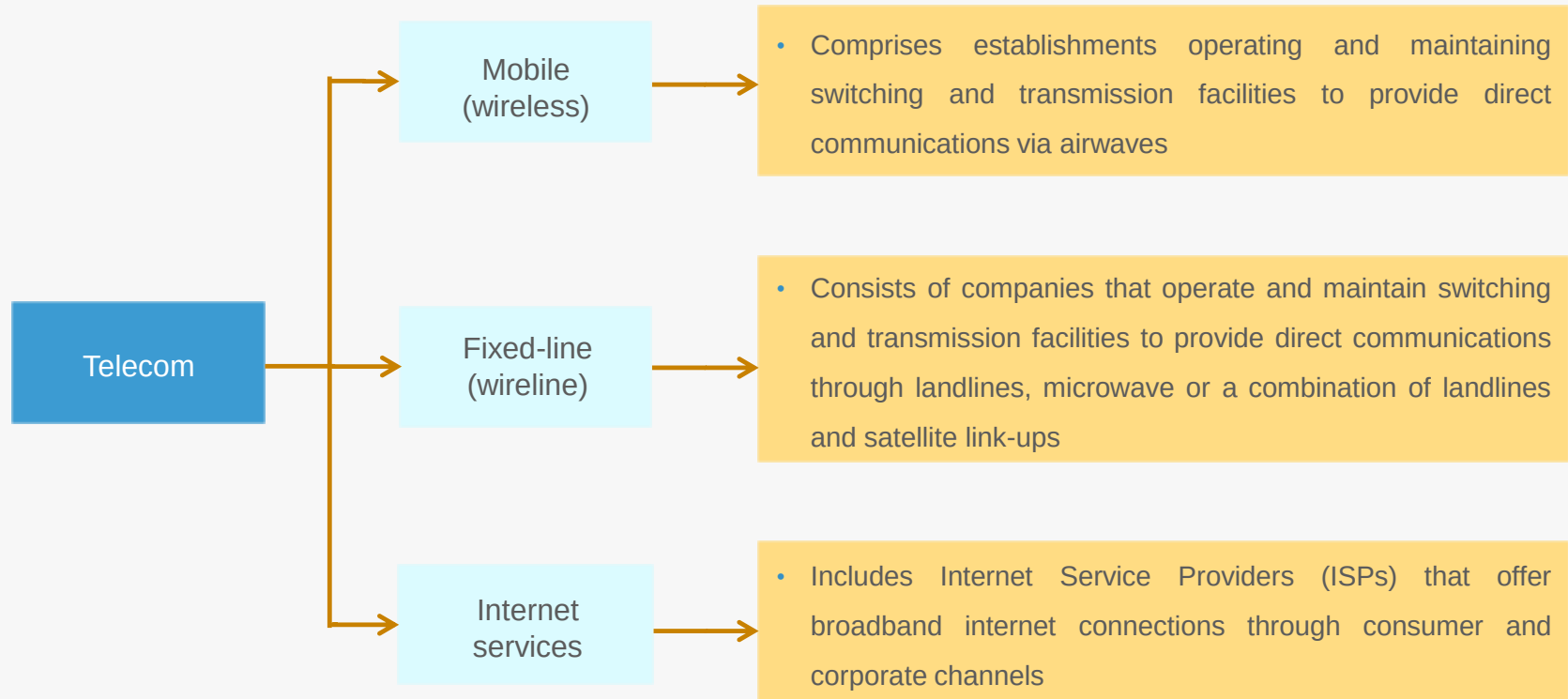
Notes: MNP - Mobile Number Portability

¹Data as of February 2017



MARKET OVERVIEW AND TRENDS

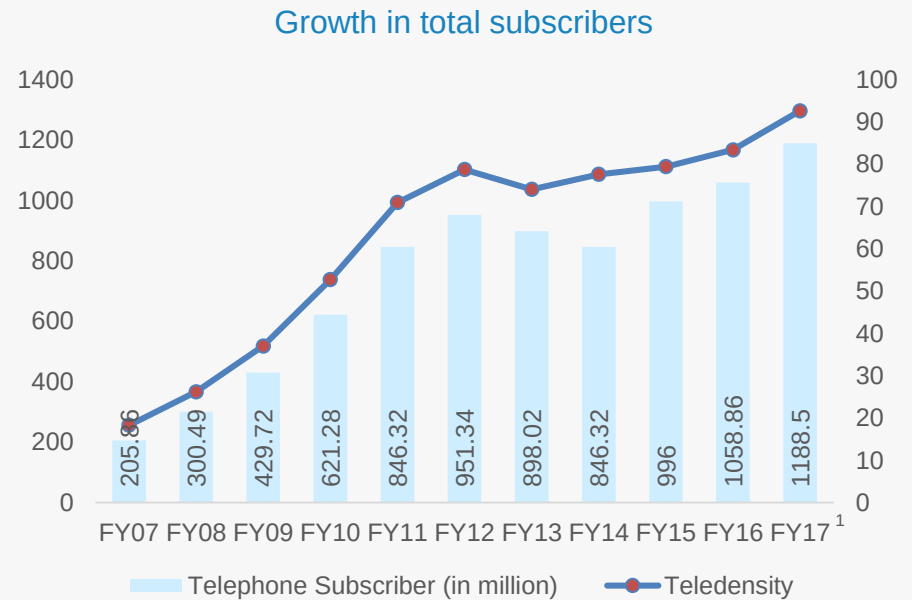
THE TELECOM MARKET SPLIT INTO THREE SEGMENTS



Source: TechSci Research

TELECOM SUBSCRIBER BASE EXPANDS SUBSTANTIALLY

- * India is currently the 2nd largest telecommunication market and has the 3rd highest number of internet users in the world
- * India's telephone subscriber base expanded at a CAGR of 19.16 per cent, reaching 1188.5 million during FY07–17
- * Tele-density (defined as the number of telephone connections for every 100 individuals) in India, increased from 17.9 in FY07 to 92.59 in FY17¹



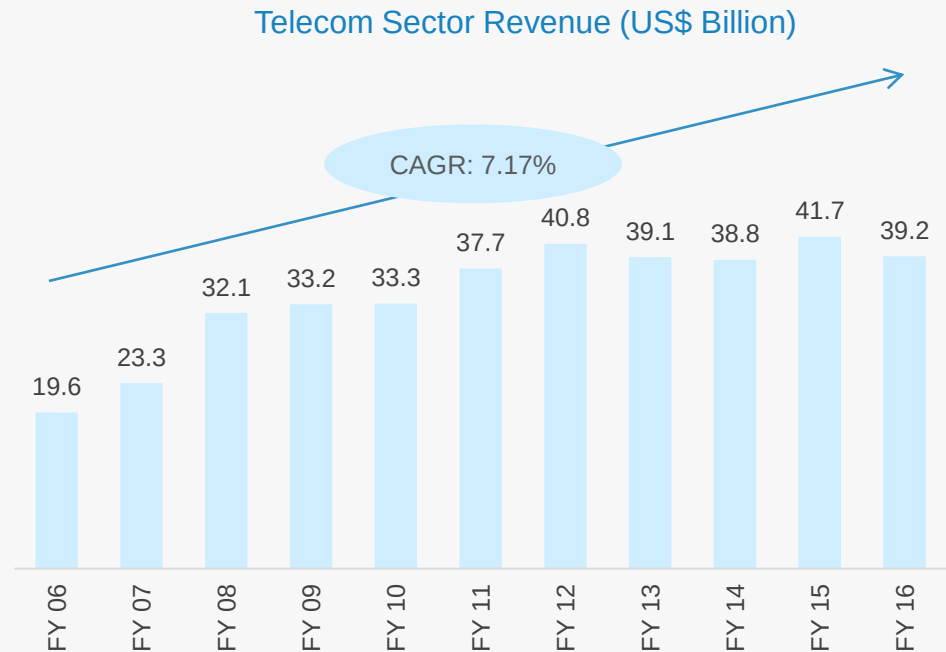
Source: Telecom Regulatory Authority of India, TechSci Research

Notes: CAGR - Compound Annual Growth Rate

¹Data till February 2017

SURGING TELECOM REVENUES

- * Indian telecom sector's revenue grew at a CAGR of 7.17 per cent to US\$39.2 billion in FY16 as compared to US\$19.6 billion in FY06
- * Revenues from the telecom equipment is estimated at US\$20 billion in FY16.

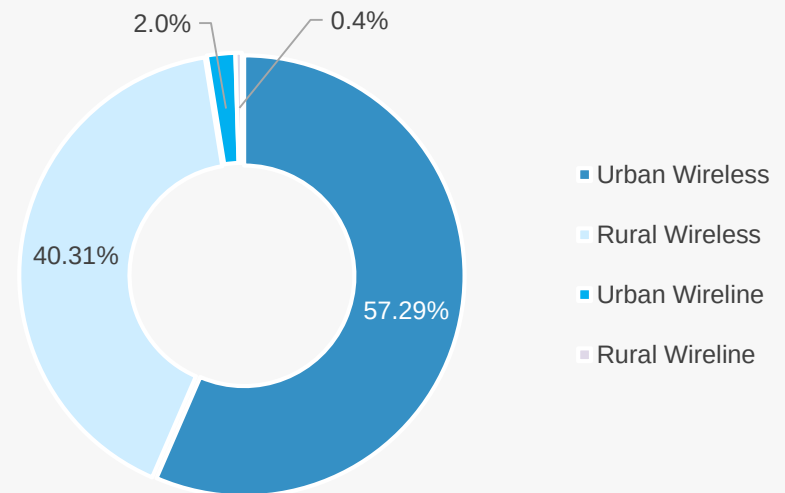


Source: Telecom Regulatory Authority of India, TechSci Research
Note: CAGR - Compound Annual Growth Rate; FY – Indian Financial Year (April – March);
Figures mentioned are as per latest data available

WIRELESS SEGMENT DOMINATES THE MARKET

- * In March 2016, India's telephone subscriber base reached 1058.86 million
- * In March 2016, the wireless segment (97.60 per cent of total telephone subscriptions) dominated the market, with the wireline segment accounting for an overall share of 2.4 per cent
- * Urban regions accounted for 57.29 per cent share in the overall telecom subscriptions in the country, while rural areas accounted for the remaining share

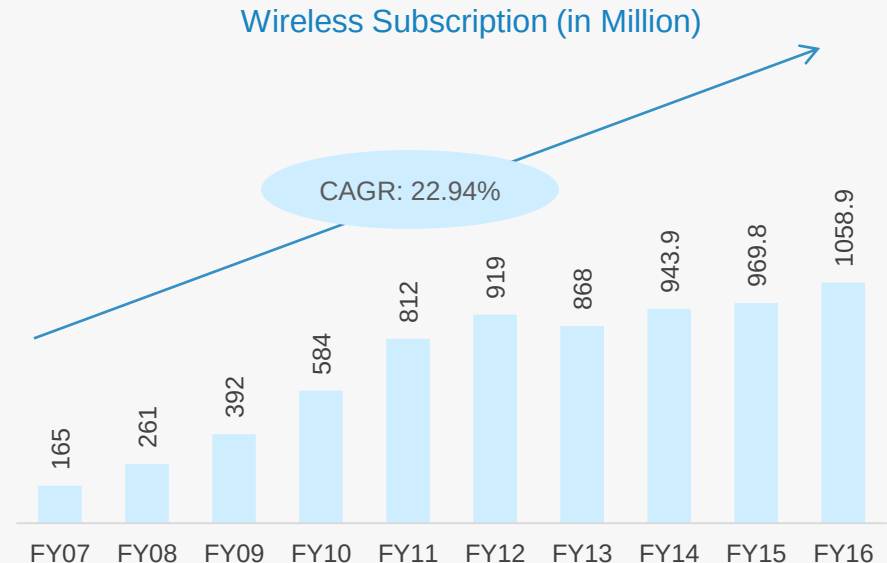
Composition of telephone subscribers (FY16)



Source: Telecom Regulatory Authority of India, TechSci Research

WIRELESS SUBSCRIPTIONS WITNESS ROBUST GROWTH OVER THE YEARS

- * During FY07-16, wireless subscriptions in the country increased at a CAGR of 22.94 per cent, with the number of subscribers reaching to 1,058.85 million in FY16
- * In FY16, urban wireless teledensity stood at 148.73 while rural wireless teledensity stood at 50.88
- * India is the world's 2nd largest smartphone market & is expected to have almost 1 billion unique mobile subscribers by 2020

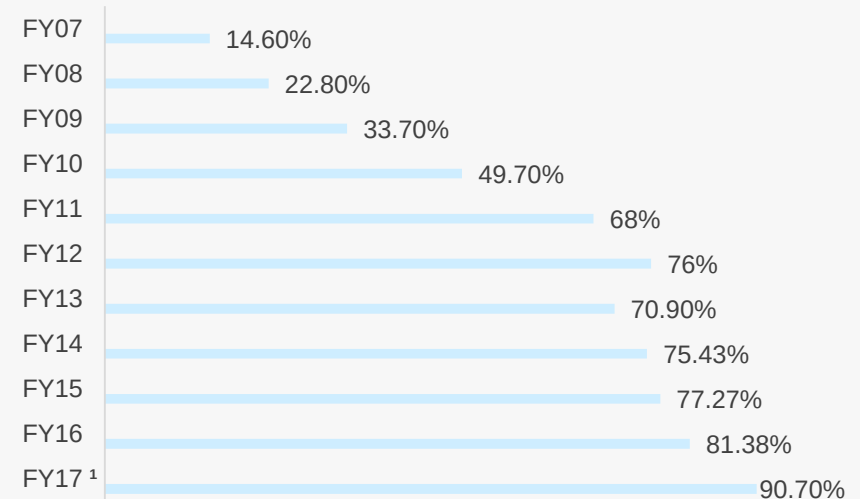


Source: Telecom Regulatory Authority of India, TechSci Research
Notes: CAGR - Compound Annual Growth Rate

WIRELESS TELEDENSITY GROWS OVER THE YEARS

- * The mobile segment's teledensity surged from 14.6 per cent in FY07 to 90.70 per cent in FY17¹
- * GSM services continue to dominate the wireless market with a 98.66 per cent share (as of December 2016); while CDMA services accounted for the remaining 1.34 per cent share.

Growth in wireless teledensity



Source: Telecom Regulatory Authority of India, TechSci Research

Notes: Teledensity - The number of telephone lines for every 100 people in a country,

GSM - Global System for Mobile Communications,

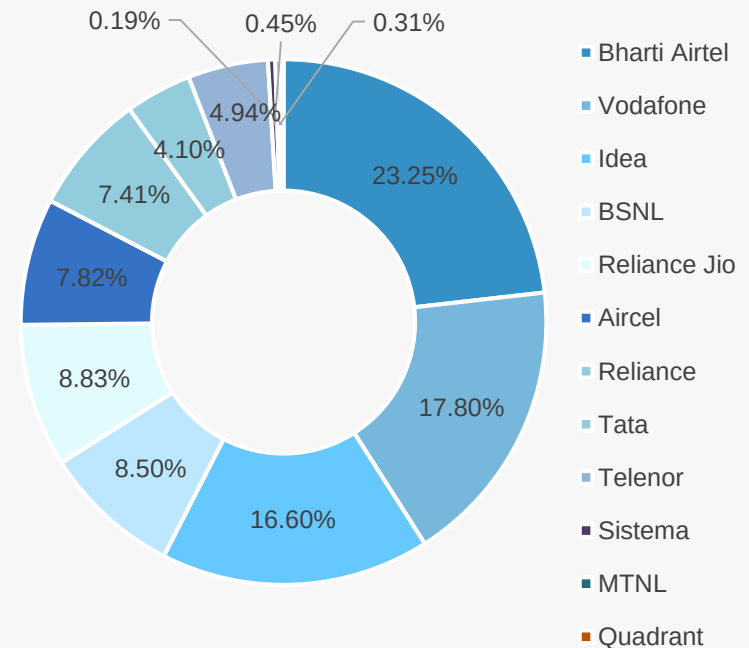
CDMA - Code Division Multiple Access

¹Data till February 2017

WHILE BHARTI AIRTEL DOMINATES WIRELESS SEGMENT...

- * As of February 2017, Bharti Airtel was the market leader, with a 23.25 per cent share in the wireless subscription, followed by Vodafone (17.80 per cent share)
- * The top 5 players in the sector include - Bharti Airtel, Vodafone, Idea, Reliance and BSNL – accounting for 74.98 per cent of the wireless subscribers in the country

Access Service Provider-wise market share in terms of wireless subscribers (FY17¹)

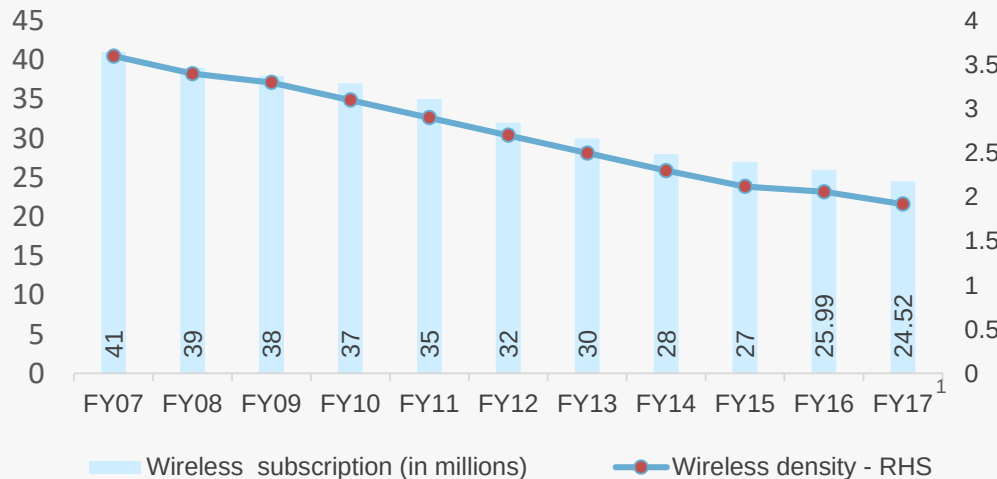


Source: Telecom Regulatory Authority of India, TechSci Research
Notes: BSNL - Bharat Sanchar Nigam Limited
¹Data till February 2017

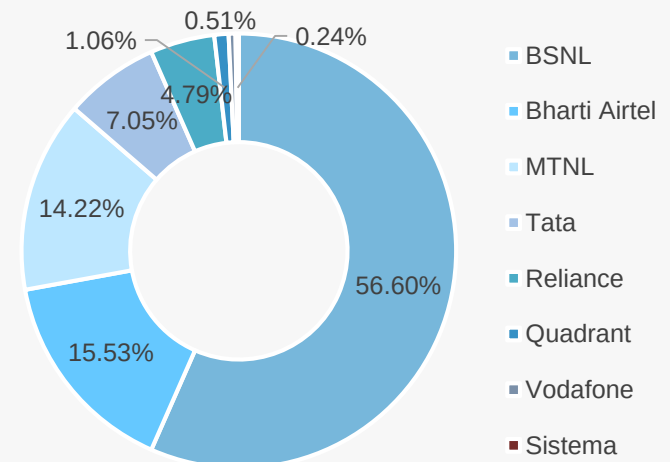
BSNL DOMINATES FIXED-LINE SEGMENT

- * Total fixed-line subscription stood at 24.52 million, while teledensity reached 1.92 per cent due to wide usability of the wireless segment in FY17
- * In FY17, BSNL is the market leader with a 56.60 per cent share, followed by Bharti Airtel (15.53 per cent)
- * BSNL, MTNL & Bharti together account for 86.35 per cent of the total fixed-line market in FY17.

Fixed-line segment subscription and teledensity (FY17¹)



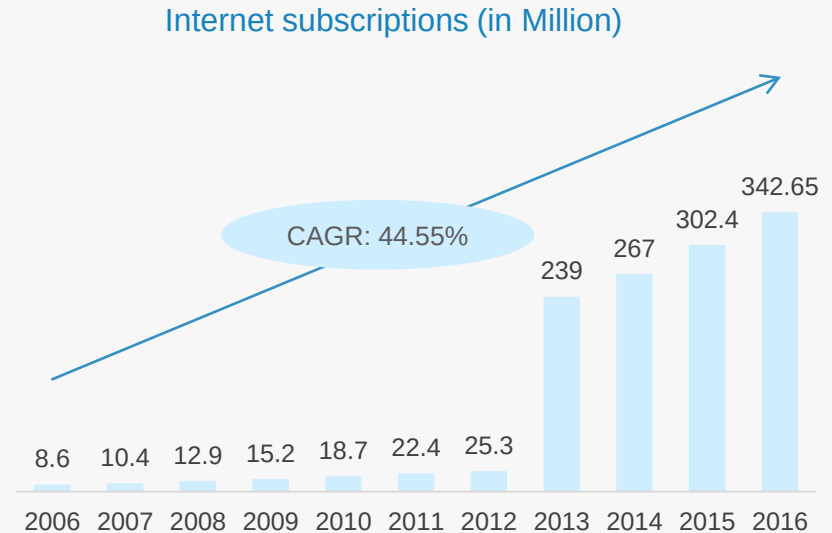
Fixed-line market share (FY17¹)



Source: Telecom Regulatory Authority of India, TechSci Research
Notes: BSNL - Bharat Sanchar Nigam Limited
¹Data till October 2016

NUMBER OF INTERNET SUBSCRIBERS INCREASING AT A FAST PACE

- * The number of Internet subscribers in the country increased at a CAGR of 44.55 per cent, with the number reaching 342.65 million in March, 2016 from 8.6 million in 2006

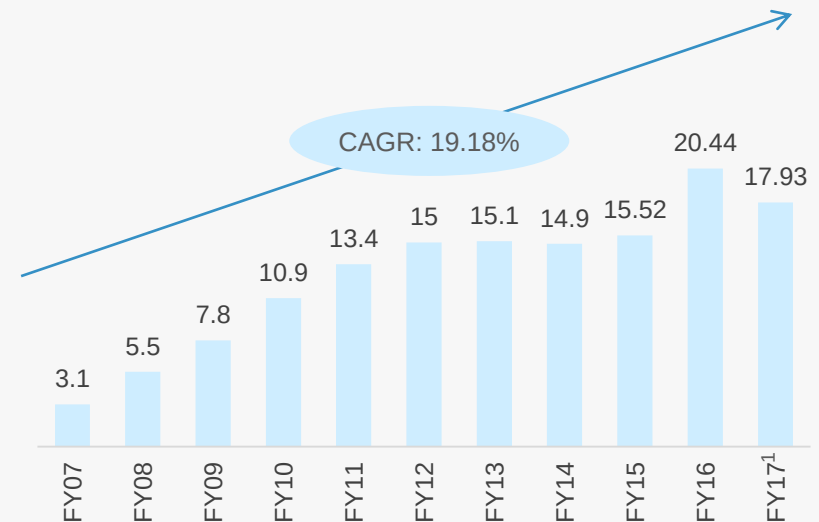


Source: Telecom Regulatory Authority of India, Business Monitor International, TechSci Research
Including Internet Access by Wireless Phone Subscribers,
CAGR - Compound Annual Growth Rate;
BSNL - Bharat Sanchar Nigam Ltd,
Internet live stats

STRONG GROWTH IN BROADBAND DRIVES INTERNET ACCESS REVENUES

- * Broadband subscription in the country witnessed an increase at a CAGR of 19.18 per cent during FY07–17¹.

Wired broadband subscriptions (in million)



Source: Telecom Regulatory Authority of India, TechSci Research

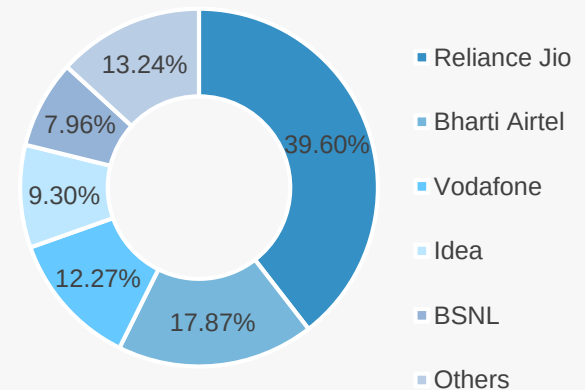
Notes: CAGR - Compound Annual Growth Rate

¹Data till October 2016

BHARTI ACCOUNTS FOR MAJOR SHARE IN BROADBAND SUBSCRIPTIONS

- * As of February 2017, Reliance accounted for the largest share of 39.60 per cent in the total broadband market (wired and wireless) of India
- * Vodafone accounted for the 2nd largest share of 17.87 per cent in the country's broadband market (wired and wireless), during the same period

Market break-up by broadband subscriptions (wired and wireless) (FY17¹)



Source: Telecom Regulatory Authority of India, TechSci Research

Notes: BSNL - Bharat Sanchar Nigam Ltd,

¹Data till February 2017

KEY COMPANIES IN THE MARKET

	Company	Ownership	Presence
	Mahanagar Telephone Nigam Ltd (MTNL)	Government (56.3 per cent), Life Insurance Corporation (18.8 per cent)	Fixed-line & mobile telephony (in Delhi & Mumbai), data and Internet
	Bharat Sanchar Nigam Ltd (BSNL)	Government (100 per cent)	Fixed-line and mobile telephony (GSM – outside Delhi & Mumbai), data and Internet in 22 circles
	Reliance Communications	ADAG Group (approximately 59.70 per cent)	Mobile (CDMA) and broadband
	Bharti Airtel	Bharti Group (43.72 per cent), Pastel Ltd (14.79 per cent), Indian Continent Investment (6.65 per cent)	Broadband and mobile (GSM) in 22 circles
	Vodafone India	Vodafone (84.5 per cent), Piramal Enterprises (11.0 per cent)	Broadband and mobile (GSM) in 22 circles

Source: Companies' websites, Bloomberg, TechSci Research

NOTABLE TRENDS IN THE INDIAN TELECOM SECTOR ... (1/2)

Green Telecom

- The green telecom concept is aimed at reducing carbon footprint of the telecom industry through lower energy consumption
- Tata has invested around US\$16.38 million to convert its 10,000 base stations from indoor to outdoor to reduce energy consumption and carbon footprint across its 20 telecom circles in India so far

Expansion to Rural Markets

- There are over 62,443 uncovered villages in India; these would be provided with village telephone facility with subsidy support from the government's Universal Service Obligation Fund (thereby increasing rural teledensity)
- In March 2016, the rural subscriber base accounted for 42.42 per cent of the total subscriber base, thereby fuelling growth across the sector

Emergence of BWA Technologies

- The most significant recent developments in wireless communication include BWA technologies such as WiMAX and LTE
- In 2015, Airtel launched its 4G services in 296 cities across the India
- In 2015, BSNL started its 1st 4G Wireless Broadband Internet Service- WiMax
- Reliance Jio, has launched 4G services across pan- India as on December 2015

Internet Of Things (IOT)

- IoT is the concept of electronically interconnected and integrated machines, which can help in gathering and sharing data. The Indian Government is planning to develop 100 smart city projects, where IoT would play a vital role in development of those cities.

Source: TechSci Research

Notes: BWA - Broadband Wireless Access, TRAI - Telecom Regulatory Authority of India

NOTABLE TRENDS IN THE INDIAN TELECOM SECTOR ... (2/2)

Telecom Finance Commission

- Department of Telecommunication is planning to issue a global tender for inviting applications for setting up a Telecom Finance Corporation (TFC). The government has fixed a deadline according to which TFC is expected to be operational by March 31, 2017

Rising investments

- In 2017, Vodafone disclosed its plans to invest US\$1310 million to upgrade & expand Vodafone India network coverage & US\$655 million to upgrade its technology centre
- In February 2017, Japanese Telecom company - Docomo, re-invested US\$ 1.18 billion in Tata Telecom, to gather a stake of 26.5 per cent in the company.

Outsourcing non-core activities

- As part of the recent outsourcing trend, operators have outsourced functions such as network maintenance, IT operations & customer service

Mobile banking

- In December 2016, 39.5 million mobile banking transactions were made, as compared to 16.8 million in the same period in 2015.
- In May 2016, about 37 lakh mobile banking transaction attempts were able to reach NPCI's platform
- In March 2017, the government set a target of achieving 25 billion digital transactions for banks with the help of PoS machines, transactions enabled & merchants, which have been added in firms
- In March 2017, Samsung launched its mobile payment service, Samsung Pay, to facilitate smooth payment at retail outlets, instead of using mobile wallets, credit or debit cards.

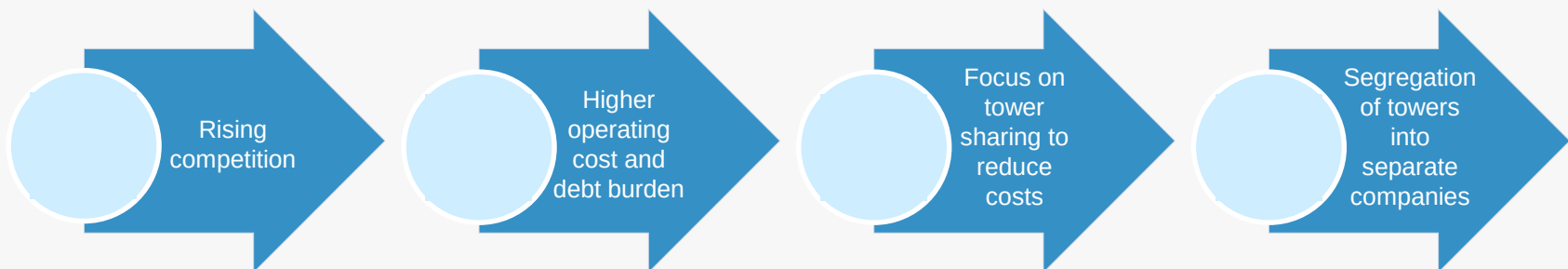
Source: 'Searching for New Frontiers of growth: Indian Banks' - PwC, TechSci Research, Reserve Bank of India

Note: NPCI - National Payment Corporation of India

EMERGENCE OF TOWER INDUSTRY

- * A surge in the subscriber base has necessitated network expansion covering a wider area, thereby creating a need for significant investment in telecom infrastructure
- * To curb costs and focus on core operations, telecom companies have been segregating their tower assets into separate companies. For example: Reliance Communications has decided to finalise a deal to sell its stake in Reliance Infratel. The value of the deal is around US\$3.68 billion
- * Creating separate tower companies has helped telecom companies lower operating cost and improve capital structure; this has also provided an additional revenue stream
- * Inspired by the success seen by Indian players in towers business, most of the operators around the world are replicating the model
- * To reduce the carbon footprint for telecom infrastructure, including mobile towers, on 1st January, 2017, TRAI (The Telecom Regulatory Authority of India), announced to bring consultation paper, that will review the issues related to carbon footprint.

Emergence of tower industry



Source: TechSci Research

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PORTER FIVE FORCES ANALYSIS

PORTER'S FIVE FORCES ANALYSIS

Competitive Rivalry

- Customers' low switching cost and price sensitivity are increasing competition among players
- High exit barriers are also intensifying competition
- There are around 6 to 7 players in each region, leading to intense competition

Threat of New Entrants

- Strict government regulations
- Extremely high infrastructure setup cost
- Difficulty in achieving economies of scale

Substitute Products

- Hardly any threat of substitute products as there is no substitute available in the market

Bargaining Power of Suppliers

- High bargaining power of suppliers as there are just a few suppliers in the sector
- High cost of switching suppliers

Bargaining Power of Customers

- Low switching cost and mobile number portability give customers high bargaining power
- Customers are price sensitive



Source: TechSci Research

Note: VoIP – Voice Over Internet Protocol

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STRATEGIES ADOPTED

STRATEGIES ADOPTED

Marketing strategy

- Players are using innovative marketing strategies to succeed in this sector. For example,
 - In August 2015, Idea Cellular launched new campaign “Get idea & dance”
 - Airtel launched new ad campaign “Airtel myPlan Family”

Differentiation

- Players differentiate themselves by providing different services to customers. For example,
 - In 2015, Airtel India launched a mobile app “Wynk Movies”, it is a library that includes videos & movies
 - In November 2015, Vodafone launched “Choose Your Number” facility where prepaid & post paid customers get numbers of their own choice

Pricing strategy

- Players price their products very carefully due to the price sensitive nature of customers & high competition in the sector. Players generally go for price war. For example,
 - In December 2016, Micromax launched low cost 4G Volte Smartphones, with a pre-activated Reliance Jio Sim offer of free voice calls & data. These smartphones are launched in the range of US\$67.21 to US\$114.57
 - In September 2016, Reliance Jio 4G network plans have been launched by the company's chairman Mr. Mukesh Ambani. Free domestic voice calls have been offered by Jio. No charge or deduction of data would be done for making voice calls to any network across the country. Also, the company has offered cheaper data plans & tariff plans ranging from US\$2.28 to US\$76.37 per month. As of October 2016, the company's subscriber base had crossed 16 million customers
 - In March 2017, CAT S60 smartphone was launched in India for US\$ 966.81. The phone is loaded with a thermal camera that can see through smoke & can be used in extreme temperatures.

Source: Company websites, TechnSci Research

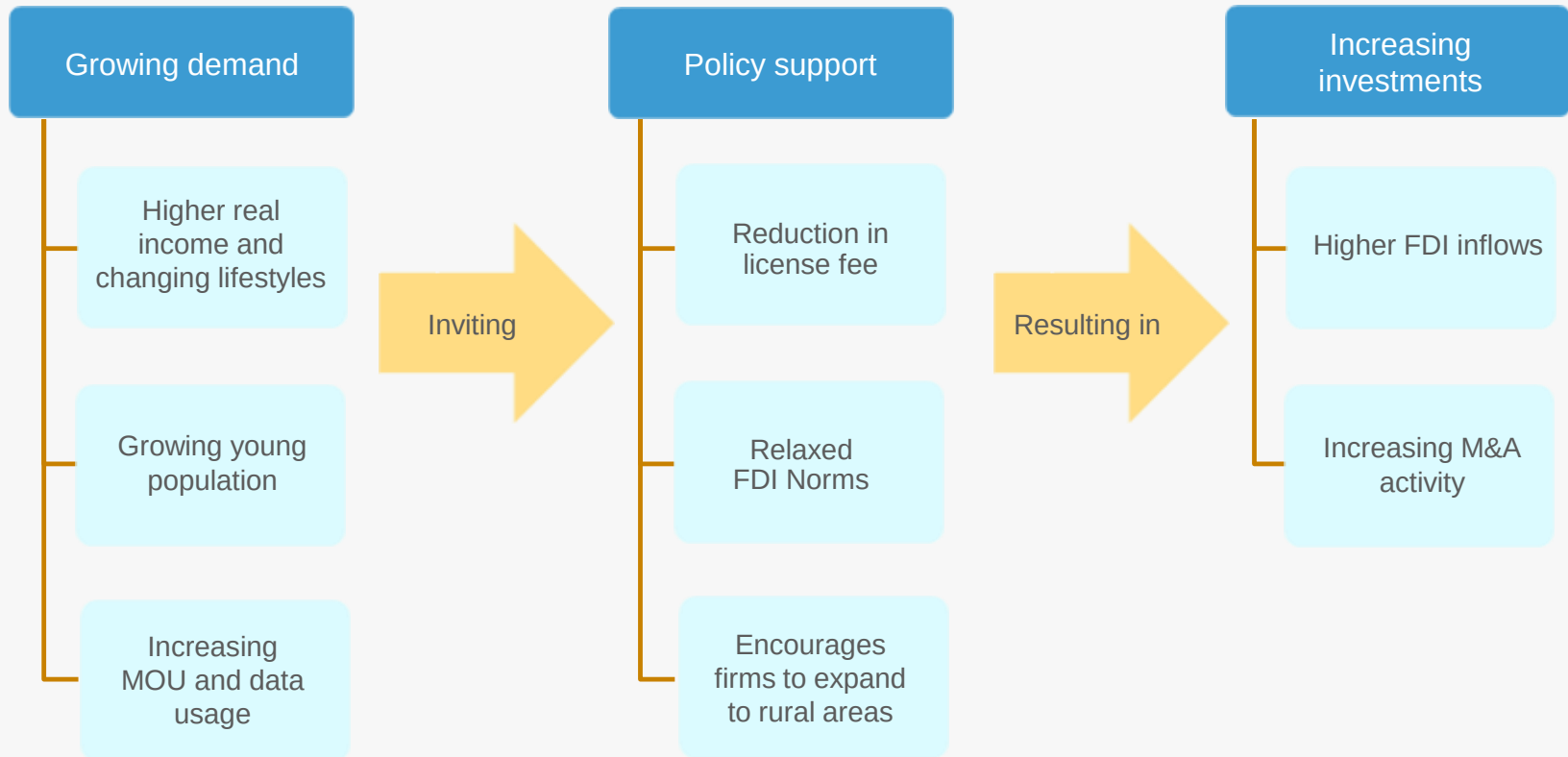
Notes: CDMA – Code Division Multiple Access, GSM - Global System for Mobile Communication

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GROWTH DRIVERS

SECTOR BENEFITS FROM RISING INCOME, GROWING YOUNG POPULATION

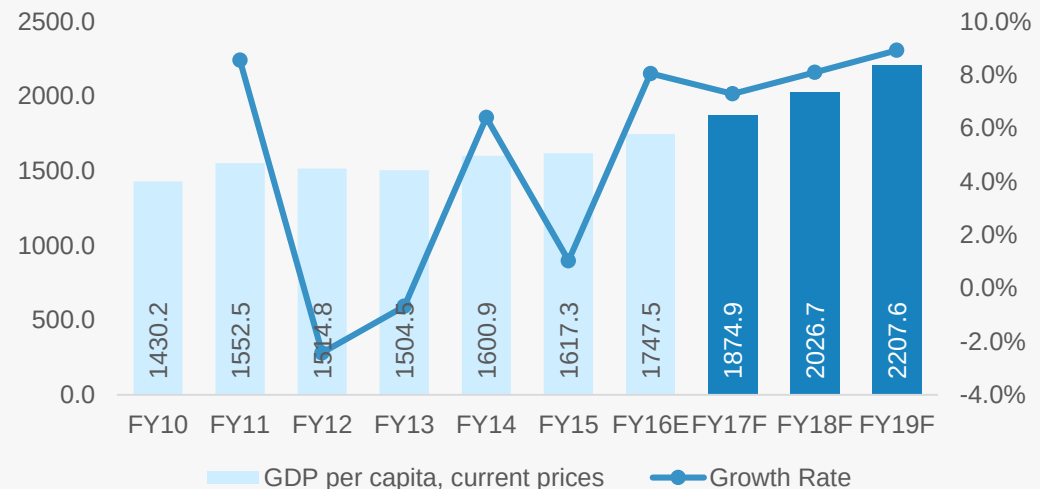


Notes: FDI - Foreign Direct Investment,
MOU - Minutes of Use per month and per subscriber, M&A - Mergers and Acquisitions

RIISING INCOME FUELS DEMAND FOR TELECOM SERVICES

- * Incomes have risen at a brisk pace in India and will continue rising given the country's strong economic growth prospects.
- * Nominal per capita income have recorded a CAGR of 8.87 per cent over 2000–15
- * Increasing income has been a key determinant of demand growth in the telecommunication sector in India
- * The IMF estimates nominal per capita income in India to expand at a CAGR of 4.94 per cent during FY10–FY19
- * Per capita income in the country is expected to grow at a CAGR of 8.1 per cent during FY15-FY19
- * Per capita income in the country is estimated at US\$1,747.5 in FY16

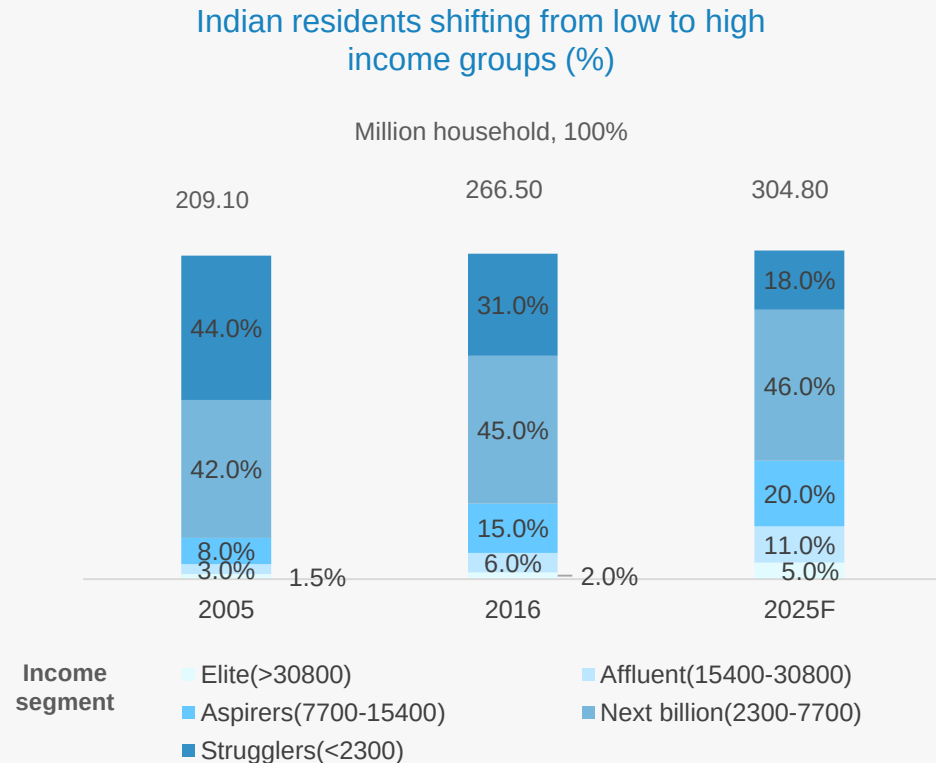
Rising per capita income in India (US\$)



Source: IMF, TechSci Research
Notes: CAGR - Compound Annual Growth Rate,
F – Forecast, E - Estimate

INCREASING INCOME AND GROWING RURAL MARKET – DEMAND DRIVERS

- * The emergence of an affluent middle class is triggering demand for the mobile and internet segments
- * A young, growing population is aiding this trend (especially demand for smart phones)

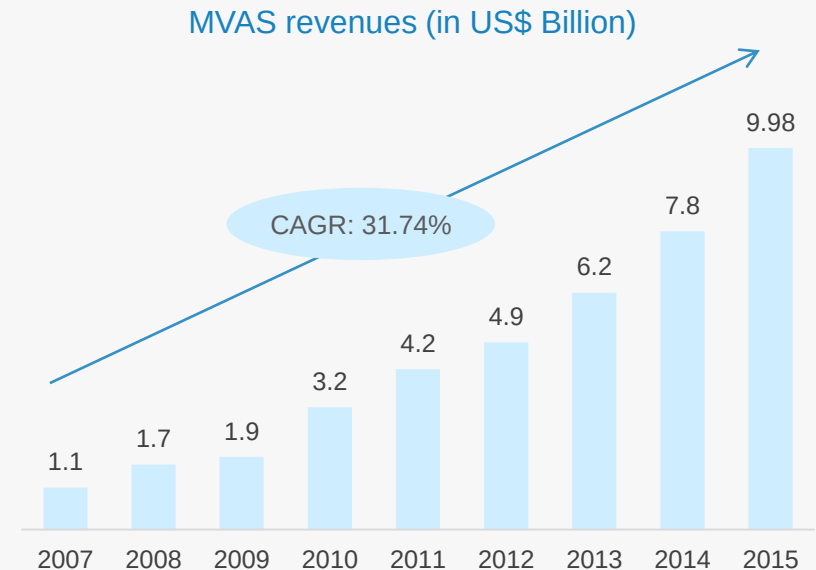


Notes: Income distribution is calculated in constant 2015 dollars; \$1=65.
Because of rounding, not all percentages add up to 100. F - Forecast

Source: BCG, TechSci Research
Note: Mobile Users Come of Age' February 2011

INCREASING INTERNET REVENUES AND SUBSCRIPTIONS

- * The Mobile Value Added Services (MVAS) industry has expanded at a CAGR of 31.74 per cent to US\$9.98 billion by 2015 from US\$1.1 billion in 2007
- * The share of non-voice revenues, which currently stands at around 10 per cent of telecom operators' revenues, is estimated to rise to more than 30 per cent in the next 5 to 7 years
- * A decline in the prices of smartphones & data subscription rates is likely to drive demand for MVAS



Source: Wipro Technologies, IMAI – Internet And Mobile Association of India
The Internet and Mobile Association of India, TechSci Research
Notes: CAGR - Compound Annual Growth Rate,
MVAS - Mobile Value-Added Services,
E - Estimate, F - Forecast

STRONG POLICY SUPPORT CRUCIAL TO THE SECTOR'S DEVELOPMENT ... (1/3)

To compensate the consumers in case of call drop

- In October 2015, Telecom Regulatory Authority of India announced an amendment for Telecom Consumer Protection Regulations 2012 according to which mobile service operators have to provide compensation to the users in case of call drop.
- The formulated regulation would be effective from January, 2016.

Standards of quality wireline and wireless services

- In 2015, Telecom Regulatory Authority of India made regulations to amend the Standards of quality of wireline (telephone service) & cellular mobile telephone services. These regulations has been laid down to ensure better & effective compliance with the quality of service regulations & to protect the interest of the customers

Relaxed FDI norms

- FDI cap in the telecom sector has been increased to 100 per cent from 74 per cent; out of 100 per cent, 49 per cent will be done through automatic route & the rest will be done through the FIPB approval route
- FDI of up to 100 per cent is permitted for infrastructure providers offering dark fibre, electronic mail and voice mail

Notes: FDI - Foreign Direct Investment,
FIPB - Foreign Investment Promotion Board
Source: TRAI, TechSci Research

STRONG POLICY SUPPORT CRUCIAL TO THE SECTOR'S DEVELOPMENT ... (2/3)

Telecommunication Tariff Order

- In 2015, TRAI passed the telecommunication tariff (16th amendment) order, according to which, every service provider should offer a special roaming tariff plan to its prepaid & post-paid customers & on payment of fixed charge for special roaming tariff plan national roaming should be free

Set up internet connections

- The Department of Information Technology intends to set up over 1 million internet-enabled common service centres across India as per the National e-Governance Plan
- On 8th August 2016, the Telecom Regulatory Authority of India (Trai) made the 10th amendment to the TCPR (Telecom Consumers Protection Regulations) permitting telecom companies to offer data packs having maximum validity of 365 days

Reduction in license fees

- In January 2015, the Government of India recommended reduction in license fees of telecom operators by 6 per cent, telecom operators currently pay 8 per cent of adjusted gross revenue as licence fee
- The issuance of several international & national long-distance licenses has created opportunities & attracted new companies into the market

Make in India

- In May 2017, the central government announced the Phased Manufacturing Program (PMP) to promote domestic production of mobile handsets. This initiative will help in building a robust indigenous mobile manufacturing ecosystem in India, and incentivise large scale manufacturing.

Notes: USOF - Universal Service Obligation Fund; OFC - Optical Fibre Cable,
WiMAX - Worldwide Interoperability for Microwave Access Telecommunications
Source: TRAI, TechSci Research

STRONG POLICY SUPPORT CRUCIAL TO THE SECTOR'S DEVELOPMENT ... (3/3)

Financial support

- The USOF is expected to extend financial support to operators providing services in rural areas & encourage active infrastructure sharing among operators
- TRAI has recommended that USO levy component to be reduced from 5 per cent to 3 per cent of annual revenues for all the licenses from April 2015

Enhanced spectrum limit

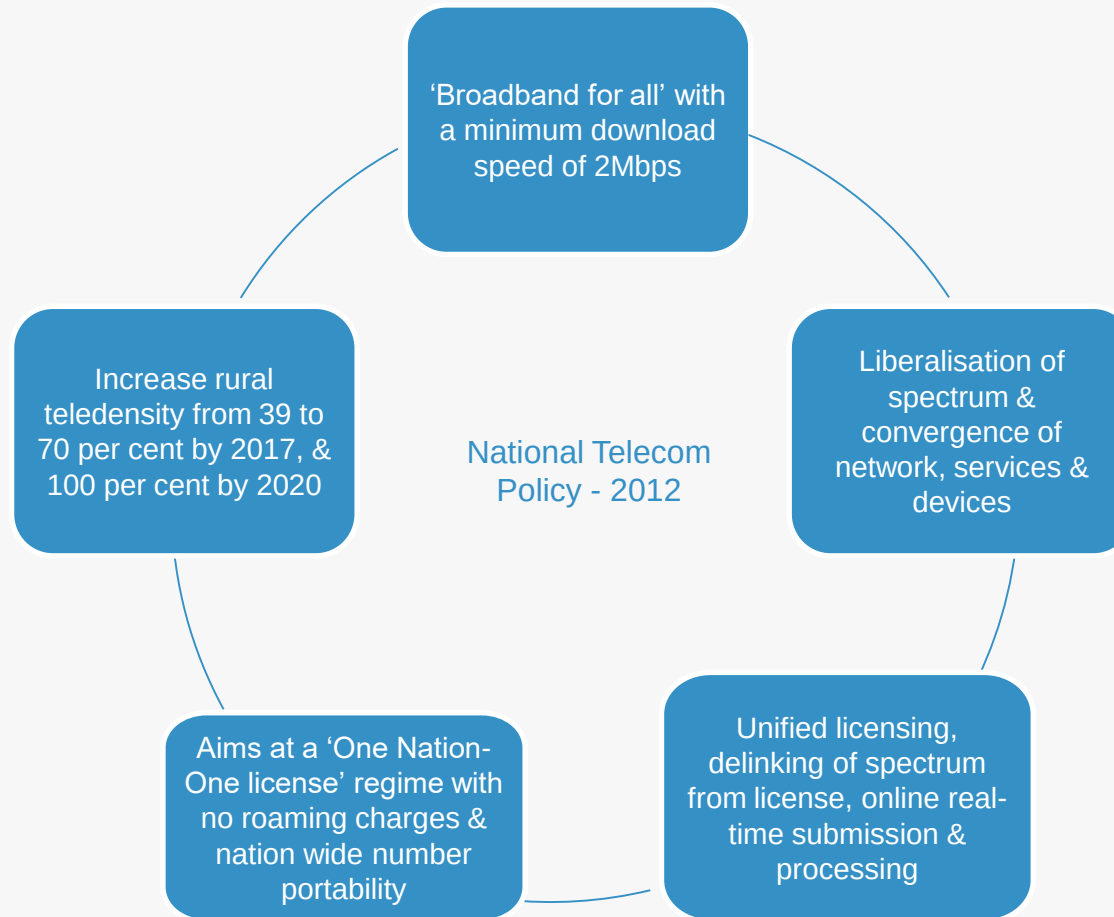
- The prescribed limit on spectrum would be increased from 6.2MHz to 2x8 MHz (paired spectrum) for GSM technology in all areas other than Delhi & Mumbai, where it will be 2x10MHz (paired spectrum)
- Telecom players can, however, obtain additional frequency; there will be an auction of spectrum subject to the limits prescribed for the merger of licenses
- As of October 2016, telecom operators like Vodafone & Tata Teleservices purchased spectrum worth US\$ 1.51 billion & US\$ 0.34 billion, respectively, from the government

Telecommunication amendment order for broadcasting & cable services

- In 2015, telecom authority issued this order mandating every DTH operator to specify the tariff for supply & installation of the customer premises equipment. DTH operator should specify the refundable security deposit, installation charges, monthly rental charge & activation

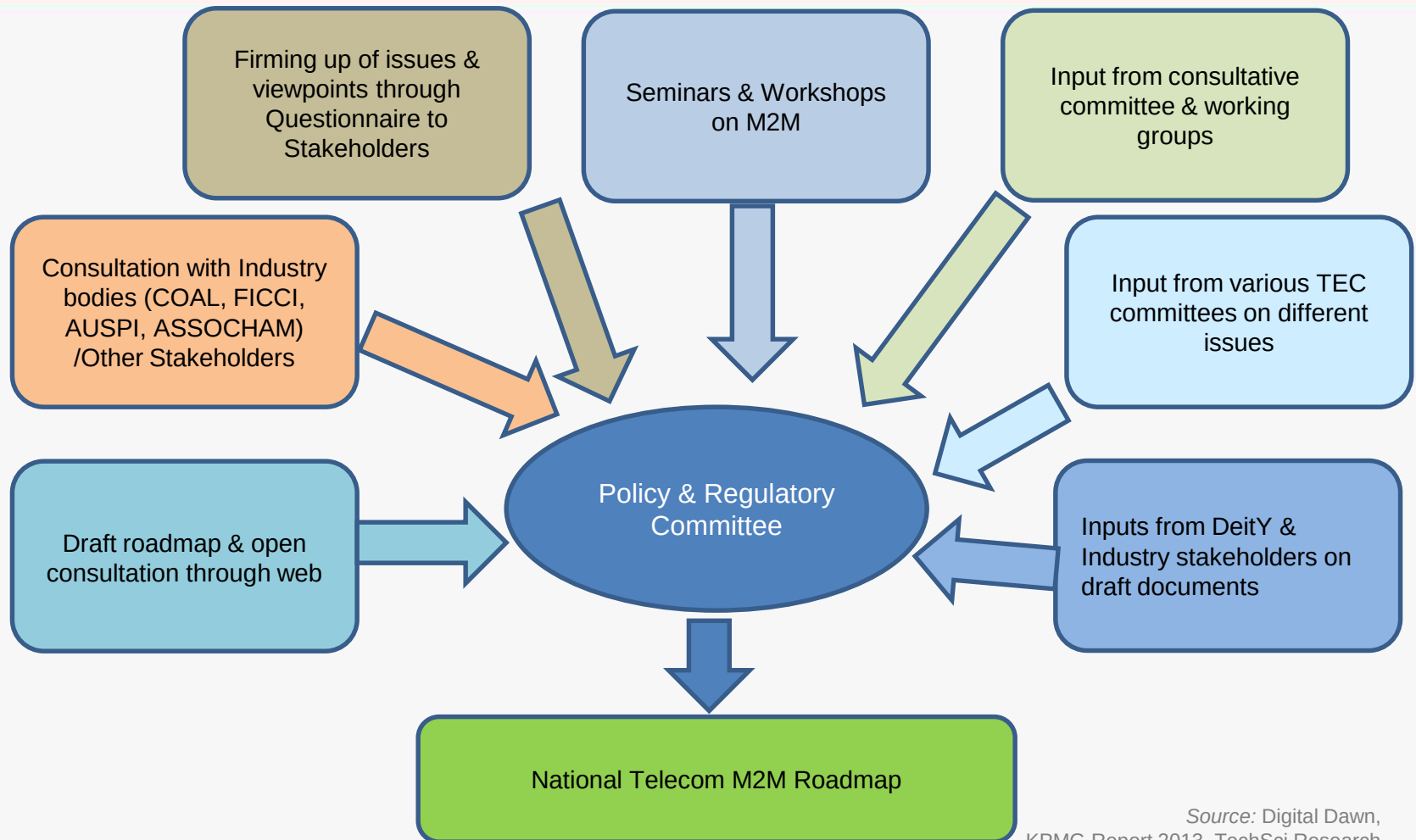
Source: TRAI, TechSci Research
Notes: USOF - Universal Service Obligation Fund; OFC - Optical Fibre Cable

NATIONAL TELECOM POLICY - 2012



Source: Digital Dawn,
KPMG Report 2013, TechSci
Research

Process of M2M Roadmap Formulation

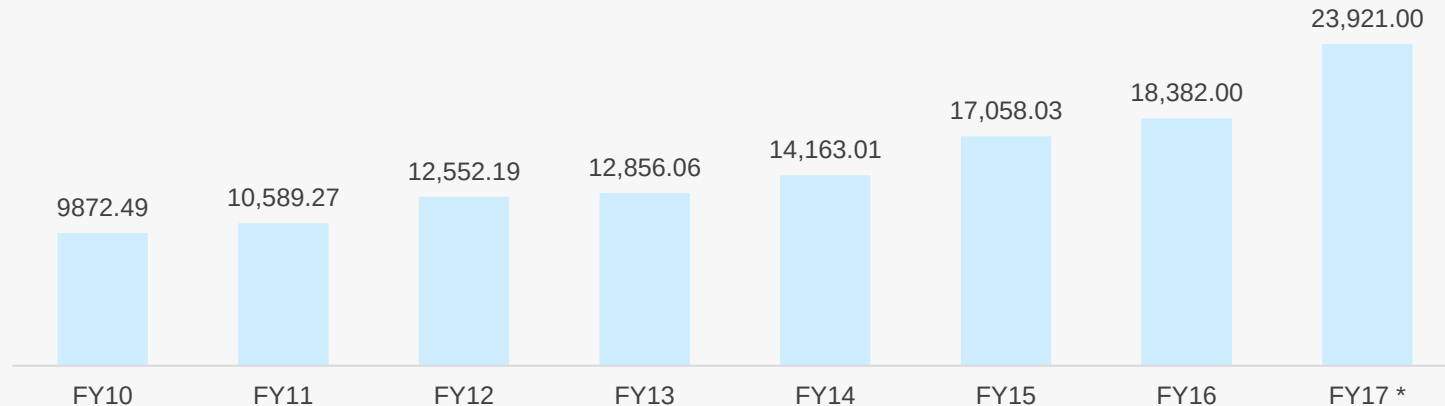


Source: Digital Dawn,
KPMG Report 2013, TechSci Research

FOREIGN INVESTMENTS FLOWING IN ... (1/2)

- * Cumulative FDI inflows into the telecom sector over April 2000–December 2016, totalled to US\$23.92 billion
- * During this period, FDI into the sector accounted for a share of 7 per cent of total FDI inflows into the country, till December 2016
- * Between April 2014 to December 2016, Telecommunication sector attracted FDI inflows of around US\$ 9.6 billion.

Cumulative FDI inflows into telecommunication (US\$ million)



Source: Department of Industrial Policy & Promotion, TechSci Research

Note: FY16 - Data mentioned is from April 2000 – September 2016

*April,16 – December, 16

FOREIGN INVESTMENTS FLOWING IN ... (2/2)

Foreign investment in India

Target	Acquirer	Acquisition price (US\$ million)	Division acquired
Ascend Telecom Infrastructure Pvt. Ltd.	IDFC Alternatives (2017)	54.29	33% stake
Telenor	Bharti Airtel (2017)	N/A	Infrastructure and Contracts
Videocon Telecommunications Ltd-1800 MHz spectrum in 6 circles	Bharti Airtel (2016)	660	100% stake
Bharti Airtel's operations in Burkina Faso & Sierra Leone	Orange SA (2016)	900	100% stake
MTS	Reliance Communication (2015)	736.98	8 – 10% stake
Augere Wireless	Bharti Airtel (2015)	21.3	100% stake
Bharti Airtel	SingTel(2013)	302	Increases stakes to 32.34%
Bharti Airtel	Qatar Foundation Endowment(2014)	1,260	PE deal – 5% stake
Vodafone India Ltd	Vodafone International Holdings (2014)	1,641	Increases stakes to 100%
Ascend Telecom	Ascend Telecom Infrastructure Pvt. Ltd	54.29	33 per cent stake

- * In March 2017, Vodafone announced its merger with Idea Cellular to become India's biggest telecom operator. The merger will result in a customer base of 400 million, nearly 35 per cent market share.
- * NTT Communications has acquired a Virtual Network Operator – International Long Distance (VNO-ILD) license in India. This license will allow NTT Com to add Arcstar Universal One International Network Services in its brand. The company will be using their ICT solutions to help enterprise customers build its ICT environment for business expansion in India.

Source: Thomson Banker, Deal Tracker, Grant Thornton, TechSci Research
Notes: M&A - Merger and Acquisition, PE - Private Equity

EXPANSION AND GROWTH STRATEGIES OF LEADING PLAYERS

New Call Telecom Investment decision

- In 2015, New Call Telecom has announced to invest US\$300 million in India within next 12-18 months. The company has decided to invest in India to increase its presence. Along with investments, New Call Telecom has already acquired Nimbuzz (global mobile technology brand) & New Delhi based Ozone networks

Vodafone India 4G launch, Reliance Jio 4G launch

- In January 2016, Vodafone India launched its 4G network services in Kolkata & Kozhikode (Kerala) following its successful implementation in other parts of Kerala such as Kochi & Thiruvananthapuram
- In September 2016, Reliance Jio launched 4G services across India, at comparatively cheaper rates. The company has targeted to acquire 100 million customers by March 2017. In addition to the existing plan India 2300 MHz spectrum & 1800 MHz in 14 circles, during the auction in 2016, Jio invested over US\$1,527.7 million to acquire 1800 MHz spectrum in 6 circles & 800 MHz spectrum in 10 circles

Mobile wallet by Vodafone

- Vodafone India has entered into an agreement with Walmart India to make payments using M-Pesa mobile wallet services. Under this agreement, Vodafone M-Pesa will offer safe, secure & convenient transactions & on placing an order with Walmart India, Vodafone M-Pesa agent will reach out to customer & cash in into his M-Pesa account

New Entrant in the Smartphone Market

- In January 2017, gaming accessories & console manufacturer - Razer acquired Nextbit, to foray into the smartphone market of India. China based companies such as Xiaomi, One Plus, OPPO, Huawei, etc. have also launched their smartphones in India.
- Domestic Players such as Micromax, Karbonn & Lava are the top 3 budget smartphone companies in India

Source: Thomson Banker, Deal Tracker, TechSci Research

Note: M&A - Merger and Acquisition

TELECOMMUNICATION



OPPORTUNITIES

OPPORTUNITIES ACROSS SEGMENTS IN THE INDUSTRY ... (1/2)

Increasing mobile subscribers

- The number of wireless subscribers in India reached 1.16 billion, by February 2017
- Of the total 1164.25 million subscribers in 2017, around 57.69 per cent subscribers are likely to be from urban areas & the rest (42.31 per cent), from rural areas

Untapped rural markets

- By February 2017, rural tele-density reached 56.35 per cent, growing from 43.05 per cent as of March 2016
- By February 2017, rural wireless tele-density in the country increased to 55.92, while, the urban wireless tele-density reached to 166.77 during the same period

Rising internet penetration

- Internet penetration is expected to grow steadily & is likely to be bolstered by government policy
- Number of broadband subscribers reached 391.50 million at the end of December 2016
- To encourage cash economy, Indian government announced to provide free Wi-fi to more than 1000 gram panchayats

Source: KPMG, TRAI, TechSci Research

OPPORTUNITIES ACROSS SEGMENTS IN THE INDUSTRY ... (2/2)

Development of telecom infrastructure

- Telecom infrastructure was expected to increase at a CAGR of 20 per cent to 571,000 towers during 2008–15
- TRAI has made several recommendations for the development of telecom infrastructure, including tax benefits & recognising telecom infrastructure as essential infrastructure

Growth in MVAS and cloud computing

- The Indian Mobile Value-Added Services (MVAS) industry is expected to reach US\$9.5 billion by 2015 from US\$4.9 billion in 2012
- Public cloud services in India generated US\$1,316 million by in 2016. Indian public cloud services market is expected to reach US\$1.9 billion by 2019.

Telecom equipment market

- Telecom equipment market was estimated to be US\$20 billion in 2015-16
- It is anticipated to reach US\$30 billion by 2020
- Under Digital India programme, 'every Indian has a smartphone by 2019' programme implemented

Growing Cashless Transactions

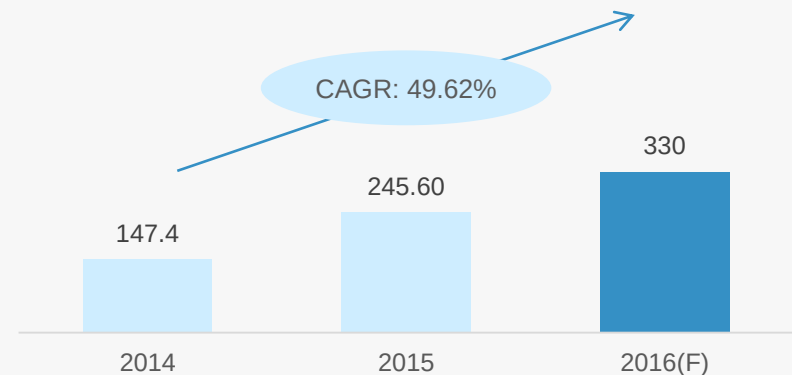
- In order to overcome the cash related problems being faced by people, due to demonetisation, Paytm launched a service through which consumers & merchants can pay & receive money instantly, without an internet connection
- This has enabled non-smartphone users to go cashless

Source: Press Information Bureau, Government of India, TechSci Research
Notes: VAS - Value-Added Services, NTP - National Telecom Policy

MOBILE APPLICATION MARKET: FAST GROWING SEGMENT

- * The mobile application (app) market is expected to expand at a CAGR of 49.62 per cent to US\$330 million during 2014–16
- * The mobile app market is estimated around US\$245.6 million in 2015
- * The segment's growth is expected to be driven by increasing mobile connections & availability of low-range smartphones
- * Over 100 million apps are downloaded every month across different platforms such as iOS, Blackberry, Nokia & Android
- * As of May 2017, Whatsapp users in the country spend 50 million minutes on chatting through WhatsApp video call feature each day. The app is available in 10 Indian languages, and more than 50 different languages globally.

Mobile App Market Size (US\$ million)



Source: Gartner, Deloitte, Assorted News Articles, TechSci Research

Notes: CAGR - Compounded Annual Growth Rate, *CAGR is calculated in US\$ million terms, F - Forecast

TELECOMMUNICATION

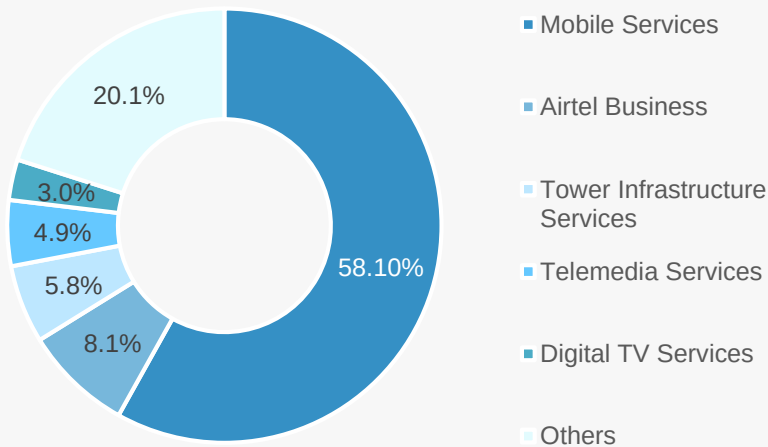


SUCCESS STORIES

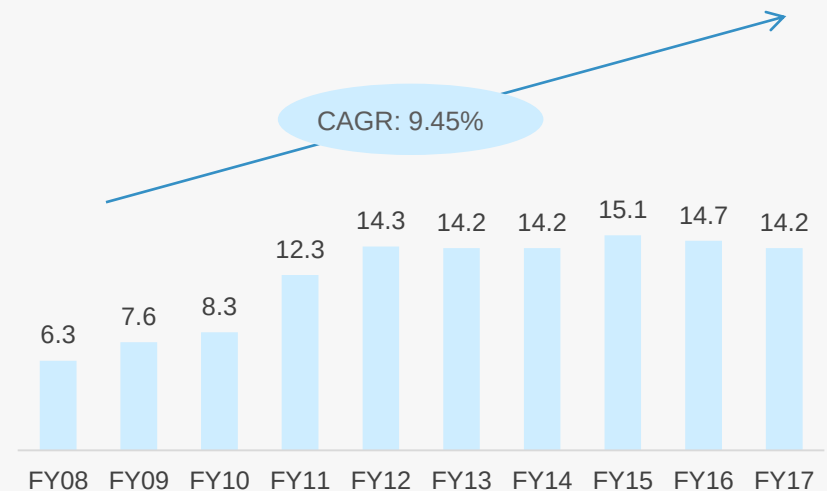
BHARTI AIRTEL: AN INSPIRING SUCCESS STORY ... (1/2)

- * Set up in 1995, Bharti Airtel is world's leading mobile operator with presence in 20 countries
- * It is the country's leading mobile operator, with a customer base of 372.35 million as of March 2017 & the world's 3rd largest telecom operator
- * Revenues increased at a CAGR of 9.45 per cent during FY08-FY17 from US\$6.3 billion in FY08 to US\$14.2 billion in FY17

Major segments⁽¹⁾ (FY16)



Revenues (in US\$ Billion)

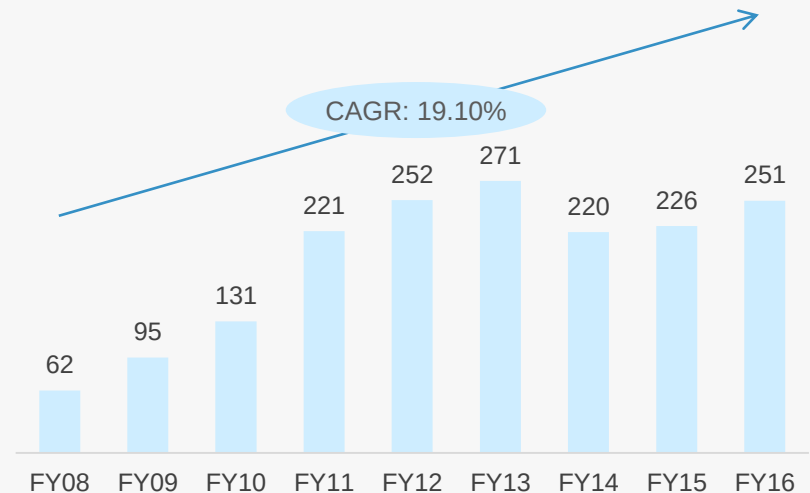


Source: Company website, TechSci Research
 Notes: CAGR - Compound Annual Growth Rate
 Note: ⁽¹⁾ - Revenue is including eliminations

BHARTI AIRTEL: AN INSPIRING SUCCESS STORY ... (2/2)

- * Bharti Airtel had over 251.2 million subscribers, as of March 2016
- * The company's overall subscriber base in the country expanded at a CAGR of 19.10 per cent, reaching 251.2 million from 62 million over FY08–FY16
- * Bharti Airtel has a mobile subscriber base of 200 million in India
- * The company had expansion plans in Africa to tap the huge growth potential
- * It became the 1st Indian telecom company to offer 4G service on mobile phones
- * On 8th April, 2016, Bharti Airtel Ltd acquired 4G TD spectrum for 8 circles namely Bihar, J&K, Tamil Nadu, West Bengal, Assam, North East, Andhra Pradesh & Orissa from Aircel Ltd.
- * As of November 2016, the company signed a US\$ 60 million deal with Finnish gear maker 'Nokia' to implement voice-over-LTE (VoLTE) calling technology

Total subscribers (Million)

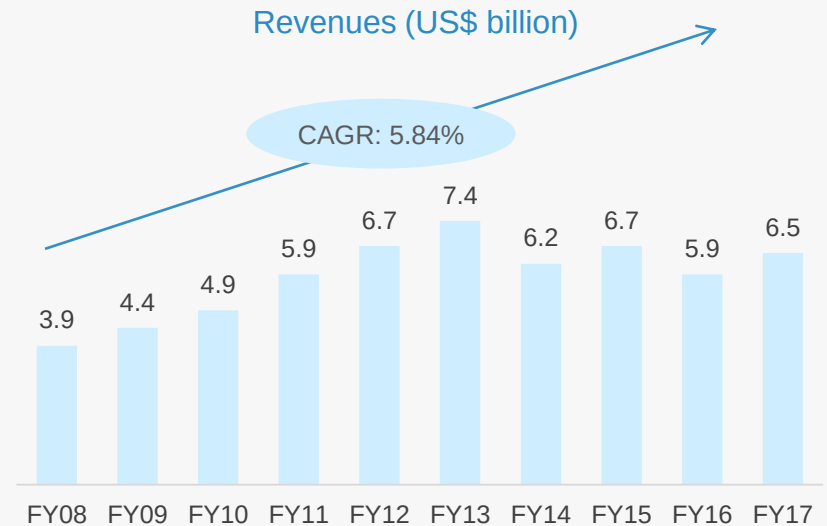


Source: Company website, TechSci Research
Notes: CAGR - Compounded Annual Growth Rate

- * Bharti Airtel has committed a capital expenditure of US\$2.5 billion for the financial year 2017-18. In the first quarter of 2017, the company has made two strategic announcements - acquisition of Telenor India and agreement with Tikona Digital Networks to acquire its 4th generation technology (4G) business.

VODAFONE: INDIA'S THIRD-LARGEST MOBILE OPERATOR ... (1/2)

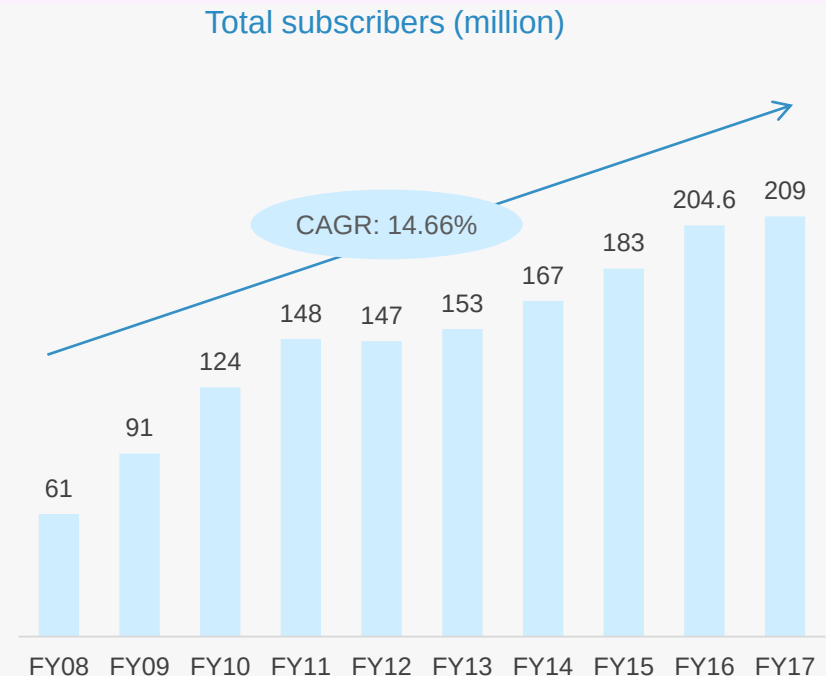
- * Established in 1994, Vodafone is one of India's leading mobile operators, with more than 209 million customers as of FY17
- * Vodafone's revenues from India increased at a CAGR of 5.84 per cent to US\$75.4 billion during FY08–17



Source: Company website, TechSci Research
Notes: CAGR - Compounded Annual Growth Rate

VODAFONE: INDIA'S THIRD-LARGEST MOBILE OPERATOR ... (2/2)

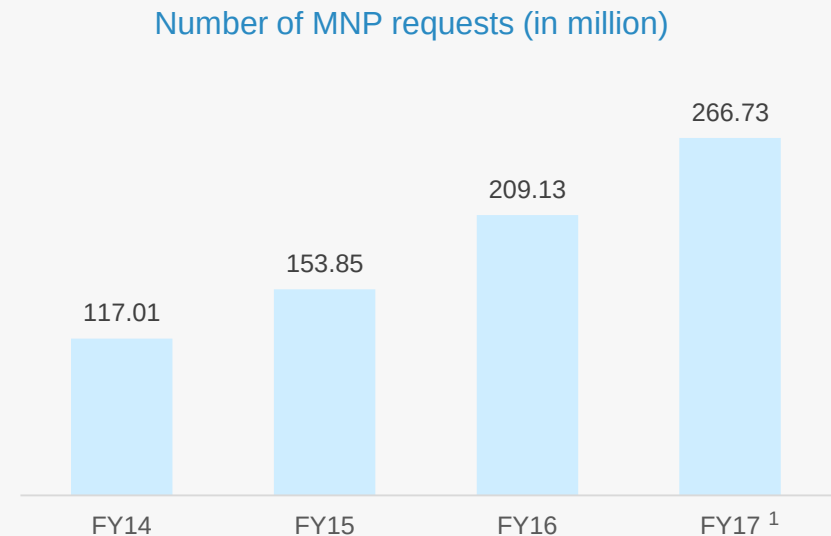
- * Vodafone's customer subscription increased at a CAGR of 14.66 per cent to 209 million during FY08–FY17
- * Gujarat, Uttar Pradesh, Maharashtra & West Bengal together account for over 45 per cent of the total customer base
- * Vodafone Group plans to invest heavily in the establishment of a fibre-optic network in India
- * Vodafone has launched 4G services in Delhi, Kolkata, Karnataka & Kerala in February 2016. In May 2016, the company also planned to cover 4 circles of Gujarat, Haryana, UP (East) & West Bengal



Source: Company website, TechSci Research
CAGR - Compounded Annual Growth Rate

MOBILE NUMBER PORTABILITY: A PARADIGM SHIFT IN INDIAN TELECOM

- * Mobile Number Portability (MNP) in India was introduced in November 2010
- * MNP allows subscribers to change their mobile service provider while retaining their old mobile number
- * The portability service was made available for both postpaid & prepaid customers as well as on both GSM & CDMA platforms
- * The implementation of MNP has brought a slew of benefits for customers in terms of better plans & offers
- * MNP requests in India increased to 266.73 million at the end of February, 2017



Source: TRAI Report, TechSci Research
¹Data till February 2017

TELECOMMUNICATION



USEFUL INFORMATION

INDUSTRY ASSOCIATIONS

Association of Unified Telecom Service Providers of India (AUSPI)

B-601, Gauri Sadan 5, Hailey Road, New Delhi – 110 001, India

Tel: 91 11 23358585

Fax: 91 11 23327397

Website: <http://www.auspi.in/>

Association of Competitive Telecom Operators (ACTO)

601, Nirmal Tower, 26, Barakhamba Road, Connaught Place, New Delhi – 110 001, India

Tel.: 91 11 43565353 / 43575353

Fax: 91 11 43515353

E-mail: info@acto.in

Website: www.acto.in

Internet & Mobile Association of India (IAMAI)

F-36, Basement, East of Kailash, New Delhi – 110 065, India

Tel: 91 11 46570328

E-mail: kalyan@iamai.in

Website: www.iwww.iamai.in

Cellular Operators Association of India

14, Bhai Vir Singh Marg, Sector 4, Gole Market, New Delhi – 110001, India

Tel: 91 11 2334 9275

E-mail: contact@coai.in

Website: www.coai.com

BMI telecoms business environment ratings

- * Industry rewards: it considers average revenue per users, number of subscribers, subscriber growth, and number of operators
- * Country rewards: it considers urban/rural split, age range, GDP per capita, US\$
- * Industry risks: it considers regulatory independence
- * Country risk: it rates the country on short-term external risk, policy continuity, legal framework corruption
- * Telecom ratings: overall rating of the above indicators

GLOSSARY ... (1/2)

- * **BWA:** Broadband Wireless Access
- * **CAGR:** Compound Annual growth rate
- * **DoT:** Department of Telecommunication
- * **FDI:** Foreign Direct Investment
- * **FTTH:** Fibre To The Home
- * **FY:** Indian Financial Year (April to March)
- * **IMF:** International Monetary Fund
- * **INR:** Indian Rupee
- * **IPTV:** Internet Protocol Television
- * **M&A:** Mergers and Acquisitions
- * **MoU:** Minutes of Use per month and per subscriber
- * **MPEG:** Moving Picture Experts Group

- * **OFC:** Optical Fibre Cable
- * **TRAI:** Telecom Regulatory Authority of India
- * **USOF:** Universal Service Obligation Fund
- * **US\$:** US Dollar
- * **VAS:** Value-Added Services
- * **WiMAX:** Worldwide Interoperability for Microwave access telecommunications
- * Wherever applicable, numbers have been rounded off to the nearest whole number

EXCHANGE RATES

Exchange rates (Fiscal Year)

Year	INR equivalent of one US\$
2004-05	44.81
2005-06	44.14
2006-07	45.14
2007-08	40.27
2008-09	46.14
2009-10	47.42
2010-11	45.62
2011-12	46.88
2012-13	54.31
2013-14	60.28
2014-15	61.06
2015-16	65.46
2016-2017E	66.95

Exchange rates (Calendar Year)

Year	INR equivalent of one US\$
2005	43.98
2006	45.18
2007	41.34
2008	43.62
2009	48.42
2010	45.72
2011	46.85
2012	53.46
2013	58.44
2014	61.03
2015	64.15
2016 (Expected)	67.22

Source: Reserve bank of India,
Average for the year

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