



## Overall all-India data capacity adequate

### However, room for addition in top cities

We hosted *Telecom Day* in New Delhi. We had a series of meetings with the telecom regulator, equipment vendors and service providers to gauge the business/regulatory outlook on the sector. Our key takeaways:

- Based on our discussions with the regulator, we surmise that the Vodafone-Idea merger should be concluded in 9-12 months. However, it could take 4-6 quarters post the merger for network synergies to start kicking in.
- On pan-India basis, the top telecom service operators have data capacity equivalent to 8-10x the current consumption. In the top cities, however, the capacity-consumption gap is lower. Bharti has data coverage and capacity close to RJio's, but as capacity requirements would be higher in top cities, it would continue to make capital investments.
- The increase in data capacity would be disproportionately high relative to the capex incurred due to (a) lower cost of technology advancement, (b) higher share of investments in low capital-intensive components like software, and OSS/BSS v/s BTS, and (c) reduced optic fiber investments in smaller tier cities owing to better backhaul microwave technology.
- Interconnection usage charge (IUC) is not the key priority for the regulator, but it is likely to announce revised IUC in 3-6 months. Gradually, IUC would be reduced to zero. Call drop is no longer an issue.

### Vodafone-Idea merger could happen faster than expected

Based on our interaction with TRAI, we understand that the Vodafone-Idea merger is unlikely to face major roadblocks. The merger should be completed in 9-12 months. The merged entity would have one year from the effective date of merger to comply with the revenue and spectrum market share thresholds. With RJio's commercial launch in FY18, the revenue market share could get adjusted below the 50% threshold in most circles. Network synergies could take time to accrue, given that Vodafone and Idea have different vendors, different long-term contracts, and different technologies operating on multiple spectrum bands. It could take 4-6 quarters post the merger for the synergies to start kicking in.

### Overall data capacity adequate, but room for addition in top cities

Typically, 10% of the sites account for 50% of the data traffic. Circle-wise data consumption indicates that 18-20% of overall consumption happens in the top-3 metros against 10% in 'C' circles, implying that data usage in the top-3 cities is twice the usage of all the 'C' circle states put together. Thus, despite pan-India data capacity at 8-10x consumption, there could be room for capacity addition in top-tier cities. Based on spectrum and cell sites, Bharti's capacity is in line with RJio's and Vodafone-Idea merged would be in a better position than RJio. However, if we bifurcate in terms of geographic reach, RJio cell sites would be spread across Pan India to widen coverage, whereas Bharti and Vodafone-Idea would have higher proportion of broadband sites in top-tier cities. In terms of technology, RJio is

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completely on 4G sites, while a high proportion of Bharti's and Vodafone-Idea's sites are 3G, which need to be upgraded to improve data capacity. Also, Vodafone-Idea has a significant proportion of its operations on the 2500MHz spectrum, for which the ecosystem is not adequately developed.

**Data capacity addition to be disproportionately high relative to capex incurred**

In 2015, 70-80% of the telecom industry's investment was going into connectivity, while platform and OSS/BSS each accounted for 10% of investment. In 2017-18, only 40% of the capex would be towards connectivity, while platform and OSS/BSS would account for about 30% each. Incrementally, a higher share of investment would be towards building and advancing the platform and OSS/BSS applications. Incremental technology upgradation would require much lower capex, as all new BTS are technology and band agnostic – incremental capex could be 25-30% of the total BTS cost. The backhaul in the metros would be through fiber, but newer microwave technologies are in the works to increase backhaul capacity. Lower-tier circles would be on e-wave bands, which give 4x the speed (at 1-5gbps) as the current microwave backhaul.

**IUC to be revised downwards; call drop issues have waned**

The call drop issue is no longer a big worry – post TRAI/DOT intervention, there has been significant improvement. Spectrum refarming and network rejig had impacted call quality, but the call drop issue is largely on the backburner now. On IUC, TRAI is working on the consultation paper issued last year. It is likely to announce the revised IUC in 3-6 months. Over the long term, IUC should be eliminated. Telecom auction could be a yearly phenomenon.

### Regulatory authority meeting notes

- **Vodafone-Idea merger could happen faster than expected:** The Vodafone-Idea merger is unlikely to face many roadblocks. The regulator and both companies are working on a time frame of 9-12 months. The merged entity would have one year from the effective date of merger to comply with the revenue and spectrum market share thresholds. With RJio's commercial launch in most circles, the revenue market share could get adjusted below the 50% threshold.
- **IUC to reduce gradually:** TRAI is working on the consultation paper issued last year on interconnection usage charge (IUC). It intends to announce the revised IUC in 3-6 months. Over the long term, IUC should decline to zero.
- **Net neutrality to be upheld:** A consultation paper has been floated on discriminatory pricing; the last date for comments is April 26, 2017. TRAI's view is to restrain operators from providing discriminatory pricing.
- **Call drop issue on the backburner:** Call drop is not a big worry any more. It has improved due to TRAI/DOT's intervention with the telcos. There would be five major players in the market once the M&A announced by the telecom companies are completed – RJio, Airtel, Vodafone-Idea, BSNL-MTNL, and RCOM-Aircel-MTS. Refarming of spectrum and network rejig to improve data coverage had impacted call quality in the last couple of years and also created a perception of inferior call quality. Given the improvement following TRAI/DOT intervention, the call drop issue is largely on the backburner for now.
- **Newer bands for backhaul microwave:** For backhaul network, TRAI has suggested microwave connectivity through V-band on 2400MHz and higher bands. This is in line with the US. In the metros and tie-1 cities, the long-term solution for backhaul capacity is through optic fiber network connectivity.
- **No predatory pricing:** Globally, no regulator has been able to prove predatory pricing. The fall in profit margin of incumbent operators cannot be a reason for setting tariff floor prices. As per the guidelines, only a player with dominant revenue/subscriber market share can be seen as engaging in predatory pricing.
- **Telecom auction could be a yearly phenomenon.**

### Equipment vendor meeting notes

- **Backhaul capacity:** Since it is not possible to ramp up backhaul capacity on optic fiber network across the country, newer microwave technologies are in the works to increase backhaul capacity. On E-band and V-band microwave spectrum for backhaul, larger allocated spectrum at higher bands can support multi-gigabit data rates.
- Typical network footprint:
  - a) 10% of the sites have 50% of the traffic
  - b) 50% of the sites have 30% of the traffic
  - c) 40% of the sites have 20% of the traffic
 So, telcos need to plan for peak data capacity sites instead of overall capacity. Though overall data capacity is significantly higher than current utilization, in the metros and top-tier cities, telcos would require data capacity addition.
- **3G v/s 4G:** Both 3G and 4G network footprint can address data coverage issue. But a 4G cell site garners 2-2.5x higher capacity. So, to accommodate higher data volumes, telcos are shifting existing 3G network to 4G.

- **Data consumption to explode:** Cisco estimates consumption/user to reach 4-5gbps/month in 2018. Therefore, capacity has to grow manifold.
- **Capex to shift from cell site to platform and OSS/BSS:** There are three components of telco investments – (a) connectivity, i.e. radio access and hardware devices, (b) platform, i.e. software, (c) OSS/BSS, i.e. application services. In 2015, 70-80% of the investment was going into connectivity, while platform and OSS/BSS each accounted for 10% of the investment. In 2017-18, 40% of the capex would go towards connectivity, while platform and OSS/BSS should see capex of about 30% each. Incrementally, higher share of investment would go towards building/upgrading the platform and OSS/BSS applications.
- **Capacity expansion to cost lower:** Incremental technology upgradation would require much lower capex, as all new BTS are technology and band agnostic, which would allow advancement through software upgradation. Incremental capex could be 25-30% of the total BTS cost.

## Bharti meeting notes

### Data consumption and capacity

- **ARPU model:** The business model is shifting from volume and pricing-led approach to wallet share of the customer. The strategy is to drive ARPU, even if yields remain low.
- **Data consumption on circle basis:** 18-20% in top-3 metros, 40% in 'A' circles, 30% in 'B' circles and 10% in 'C' circles. The top-3 metros have twice the data usage of all the 'C' circle states together. This is the key reason for capex requirements, despite overall pan India capacity at 8-10x consumption.
- Bharti's spectrum is largely 4G compatible.
- Rjio has 120,000-130,000 4G sites v/s Bharti's 110,000 broadband towers.
- For 2G voice, not more than 2-3MHz is needed. Progressively, Bharti will be using majority of the spectrum towards data network.
- Bharti has far higher data capacity in top metros and tier-1 cities/states to compete with Rjio.
- Bharti's current data capacity is 8-10x its current data volumes. Its capacity is close to Rjio's. With the addition of Telenor and Tikona's spectrum, its capacity will increase further.
- Public WiFi does not remain a big threat and data speeds on public WiFi are often throttled, deteriorating consumer experience.

### Capex requirements

- Refarming and shifting of 900MHz towards spectrum towards data usage would be seamless, with limited cost. High proportion (3/4<sup>th</sup>) of the sites is now on latest equipment and can migrate to newer technology – from 3G to 4G and 5G – without major upgradation cost.
- Compared to Rjio's 120,000-130,000 towers, Bharti has 110,000 broadband towers with 170,000 sites. Over the next two years, Bharti will reach about 370,000 sites, adding 100,000 sites annually, which could be in line with Rjio.
- Bharti would maintain capex for the next two years. Assuming capex/site of USD15,000, the estimated capex for 200k site additions could be about USD3b. In two years, Bharti's India wireless capex could be about USD3b (USD1.5b per year). This is in line with the current India wireless capex and would be maintained. Current capex/sales of 25% would be gradually reduced to 15%.

- The backhaul network in the metros would largely be through optic fiber cables. For lower-tier circles, it would be through microwave on E-wave band, which gives 4x the speed (at 1-5gbps) of the current microwave backhaul.
- Bharti has about 250,000km of fiber and is adding 8,000-9,000km annually.
- Bharti is also ramping up data network in rural regions, exponentially.

### Content aggregation

For content, Bharti would continue to play the role of aggregator.

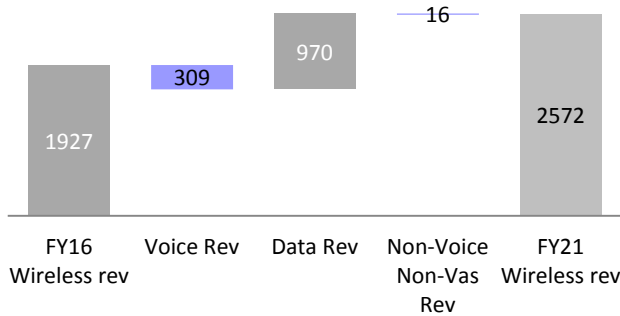
- **Movies:** Bharti has tied up with Hook and Sony, among others.
- **Music:** It is using a big caller tune library through Wync, which has the largest consumer base, even above Gaana and other top music applications.
- **Videos/TV:** Bharti has tied up with Ditto TV and will tie up with whichever OTT player progressively offers the widest collection.

### Africa

In Africa, wherever Airtel is the 3<sup>rd</sup>/4<sup>th</sup> player in terms of revenue market share, it would consider either merger or sale to ensure positive FCF, but would continue to remain in the large countries.

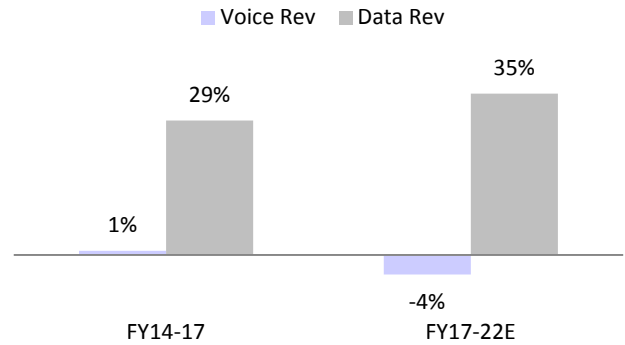
Story in Charts

Exhibit 1: Data surge to more than offset the voice decline



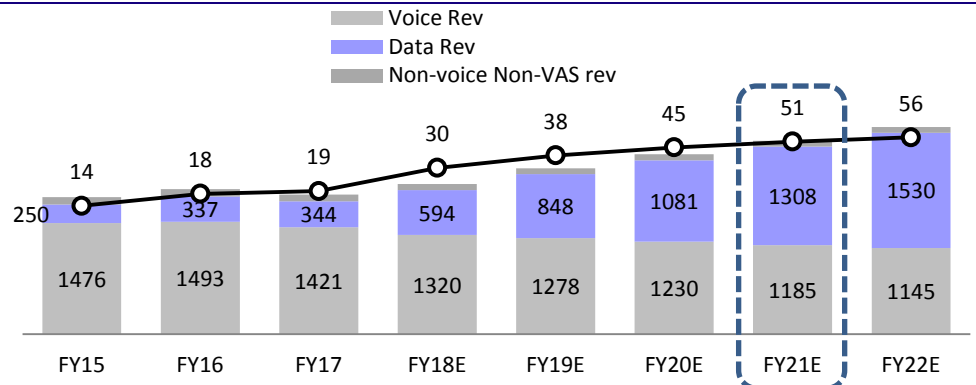
Source: Company, MOSL

Exhibit 2: Data revenue to grow at 35% CAGR over FY17-22E



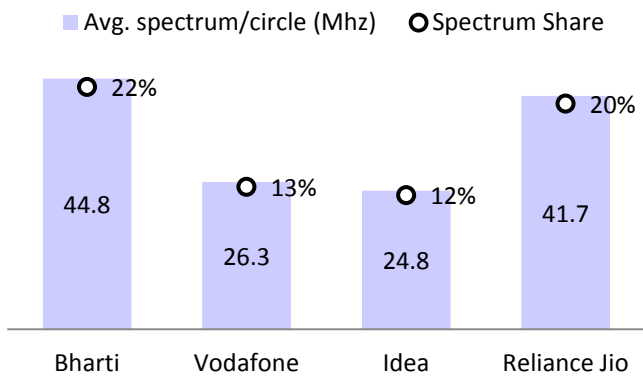
Source: Company, MOSL

Exhibit 3: Data revenue to surpass voice revenue by FY21E



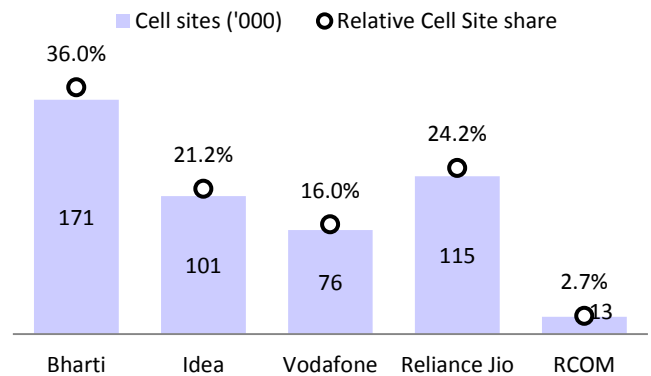
Source: Company, MOSL

Exhibit 4: Bharti/RJIO hold over 40% of the spectrum pool



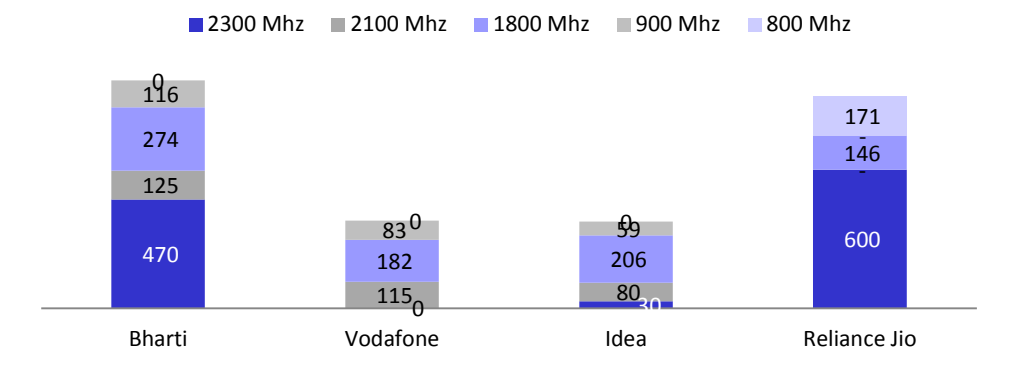
Source: Company, MOSL

Exhibit 5: Bharti's relative cell-site share among incumbents is at 36%



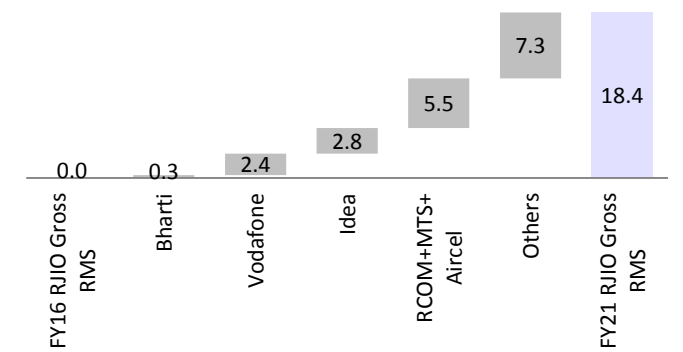
Source: Company, MOSL

**Exhibit 6: Operator/Band-wise spectrum holding**



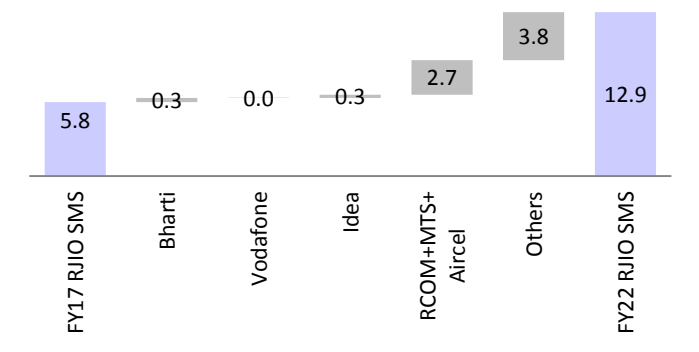
Source: Company, MOSL

**Exhibit 7: Expect RJIO's revenue market share gain...**



Source: Company, MOSL

**Exhibit 8: ...and subscriber market share to come largely at the expense of marginal operators**



Source: Company, MOSL

