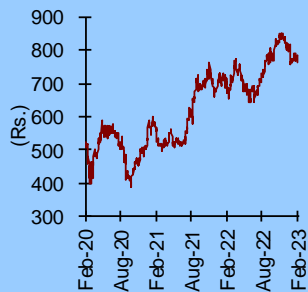


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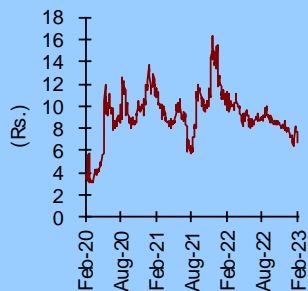
Telecom

Sector update

Bharti Airtel (BUY)



Vodafone Idea (UNDER-REVIEW)



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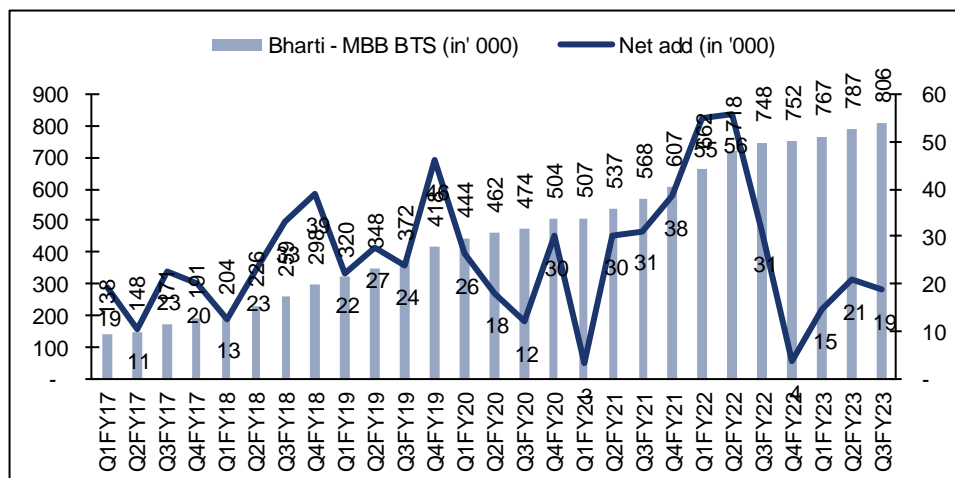
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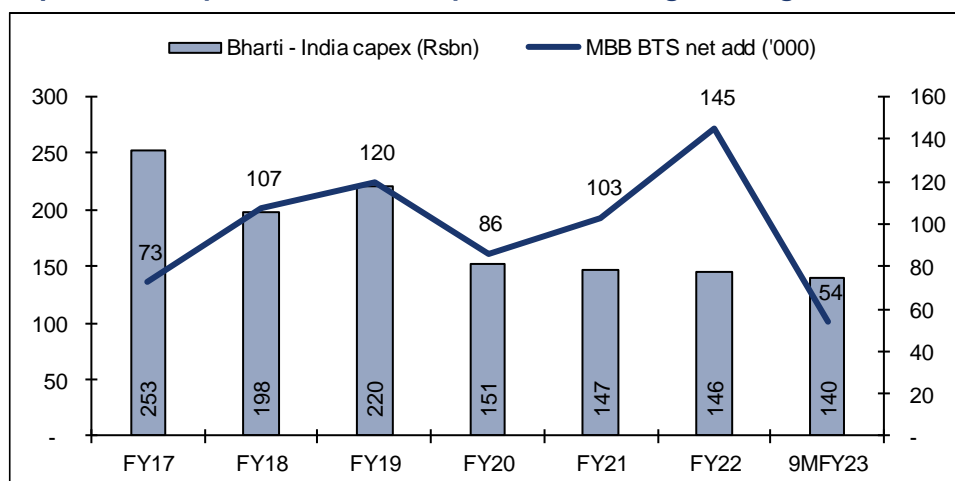
Demystifying 5G capex for Indian telecom

We have attempted to demystify 5G capex for Indian telecom – Bharti Airtel (Bharti) and Reliance Jio (RJio). We have assumed 5G rollout to be faster than 4G. However, capex spent will be lower than 4G as it was deployed on multiple spectrum bands - 900MHz, 1800MHz, 2100MHz and 2300MHz vs only 3500MHz for Bharti's 5G, while 800MHz, 1800MHz and 2300MHz vs 700MHz and 3500MHz for RJio's 5G. Bharti has spent Rs1,115bn on 4G over FY17-22 and RJio has invested Rs1,668bn (green field operation and also included cost capitalisation). We expect Bharti to spend Rs454bn on 5G and allied capex over FY23-25E (Rs666bn over FY23-27E) to reach 5G coverage of 70% by FY25E and 85% by FY27E. RJio to incur Rs655bn on 5G and allied capex over FY23-25E (Rs940bn over FY23-27E) to reach 5G coverage of 75% by FY25E and 95% by FY27E. Our RJio capex estimate has an upside risk.

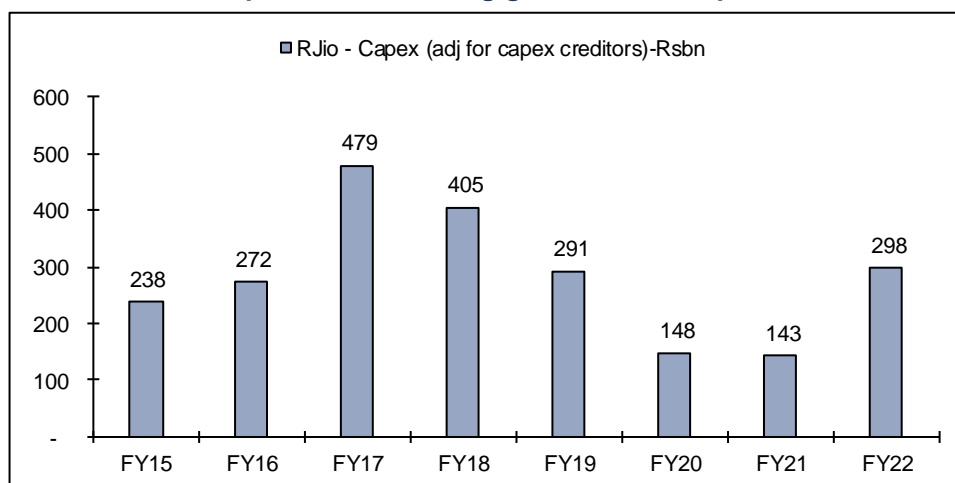
- ▶ **What is 5G capex guidance?** Bharti and RJio have announced indicative large capex outflow for 5G rollout over the next few years. **1) Bharti** has guided for total India capex of Rs750bn for the next three years wherein in FY23 and FY24, capex will be relatively high, and it will start tapering FY25 onwards. Bharti has already reached >70 cities in 5G rollout and is likely to have presence in 300 cities by Mar'23. It expects pan-India 5G footprint by end-Mar'24; and **2) RJio** has announced total 5G investment of Rs2,000bn which includes Rs900bn towards spectrum, Rs600-700bn towards network rollout and remaining for ecosystem development. RJio is targeting to rollout 5G pan-India by Dec'23. This large upfront 5G capex is likely to restrict cashflow generation for Bharti / RJio over the next two years.
- ▶ **What we know about 5G rollout?** **1) Bharti** – it is rolling out non-standalone 5G (NSA-5G) wherein the company will use 3500MHz band for downlink and L-1800 for uplink. The uplink on L-1800 band helps Bharti coverage by additional 100-300mts which will improve experience vs otherwise only 3500MHz based 5G network. We understand Bharti will be mounting largely integrated radio (radio and antenna), while 4G BTS will be used with additional 5G slot. NSA-5G will use core of 4G. For backhaul, Bharti will require to strengthen its fibre footprint, but it will be less pressed (vs our earlier expectation) due to E-band (71-76/81-86 GHz) allocation. E-band can provide a microwave throughput of up to 10Gbps which can help maintain reasonable quality of 5G services with one-hope fiberisation; and **2) RJio** - it is rolling out standalone 5G (SA-5G) wherein RJio will use a combination of 3500MHz / 700MHz with carrier aggregation. This will help RJio provide superior experience deep into the market due to sub-GHz spectrum. RJio will also need to invest in separate core for 5G. RJio is relatively better placed with strong fibre network for backhaul vs Bharti.
- ▶ **How much was invested in 4G rollout?** Bharti had 118k MBB BTS at end-FY16, and it has expanded to 752k by end-FY22 which means it has added 634k BTS. Notably, Bharti has rolled out 4G using multiple spectrum bands – 900MHz, 1800MHz, 2100MHz and 2300MHz which implies the equipment required was much higher compared to 5G where Bharti is rolling out 5G services on only 3500MHz spectrum band. Bharti has simultaneously strengthened its fibre presence. During the period, it has spent capex of Rs1,115bn (average spend of Rs186bn pa) in mobile services. On 4G, RJio's investment has been higher due to green field operation set-up and cost capitalisation. It has spent capex of Rs2,274bn which also includes capex on tower and optic fibre which it has divested into separate InvITs worth Rs606bn. Therefore, adjusted for tower and fibre capex, 4G rollout (includes cost capitalised) costed Rs1,668bn since FY15.

Chart 1: MBB BTS quarterly rollout by Bharti from Q1FY17

Source: I-Sec research, Company

Chart 2: In back-ended 4G capex, Bharti incurred lower capex for higher 4G BTS rollout with advanced technology. This is always the case in telecom, upfront capex doesn't provide much competitive advantage in long run

Source: I-Sec research, Company

Chart 3: RJio's capex in establishing green field 4G operation in India

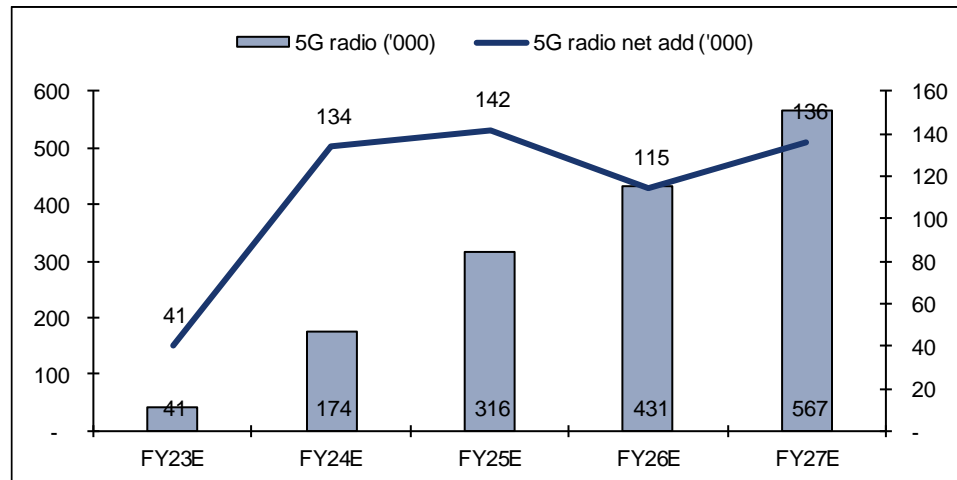
Source: I-Sec research, Company

5G investment for Bharti. We expect Bharti to add 41k 5G radio in FY23 and 134k in FY24. This means Bharti will have loaded 5G on 50% of its towers with 3500MHz band and 10% with 26GHz band for capacity and FWA. Bharti should start re-farming 2100MHz band from FY25, and subsequently a few 1800MHz in future to 5G. We expect Bharti to have 85% of towers loaded with base 5G band by FY27 and it will have an average 1.85x 5G radio/tower in the same period. We estimate a 5G radio will cost Rs1.2mn/radio which will decline by 5% each year and re-farming will cost 0.2mn/radio. This implies Bharti will have to spend total Rs309bn in three years on 5G radio. Bharti will strengthen 5G backhaul with deployment of E-band microwave on towers loaded with 5G. The cost estimated is Rs0.2mn/MW equipment. This will add total spend of Rs25bn in three years. Bharti will have to continue adding fibre which will cost Rs120bn cumulatively in the next three years. Our assumption / working suggests Bharti is likely to spend Rs454bn on 5G over FY23-25E.

Table 1: Bharti to spend cumulatively Rs454bn on 5G over FY23-25E

Rs mn	FY22	FY23E	FY24E	FY25E	FY26E	FY27E
Towers	2,37,577	2,70,577	2,90,577	2,95,577	3,00,577	3,05,577
Net add	20,676	33,000	20,000	5,000	5,000	5,000
4G BTS	7,52,136	8,27,136	8,57,136	8,07,136	7,57,136	6,57,136
Net add	1,45,353	75,000	30,000	(50,000)	(50,000)	(1,00,000)
4G BTS/ tower	3.17	3.06	2.95	2.73	2.52	2.15
5G radio		40,587	1,74,346	3,16,019	4,30,635	5,66,692
C-band		40,587	1,45,289	2,06,904	2,40,462	2,59,740
26GHz		-	29,058	59,115	90,173	1,06,952
Refarming				50,000	1,00,000	2,00,000
Net add		40,587	1,33,760	1,41,673	1,14,615	1,36,058
5G radio/ tower		0.15	0.60	1.07	1.43	1.85
Capex per radio		1.2	1.1	1.1	1.0	1.0
Capex for refarming		0.2	0.2	0.2	0.2	0.1
New radio		40,587	1,33,760	91,673	64,615	36,058
Refarming		-	-	50,000	50,000	1,00,000
Capex on radio						
New radio		48,704	1,52,486	99,282	66,480	35,243
Refarming				8,123	7,716	14,661
Total		48,704	1,52,486	1,07,404	74,196	49,904
Capex on MW						
5G fired tower		20,293	62,821	43,131	26,846	15,423
Capex per MW		0.2	0.2	0.2	0.2	0.2
Total		4,059	12,564	8,626	5,369	3,085
Capex on fibre						
RKMs	30,254	40,000	40,000	40,000	40,000	40,000
Capex per RKms		1.0	1.0	1.0	1.0	1.0
Total		40,000	40,000	40,000	40,000	40,000
Capex for 5G		92,763	2,05,050	1,56,031	1,19,565	92,989

Source: I-Sec research, Company

Chart 4: Bharti's 5G rollout is expected to be faster than 4G

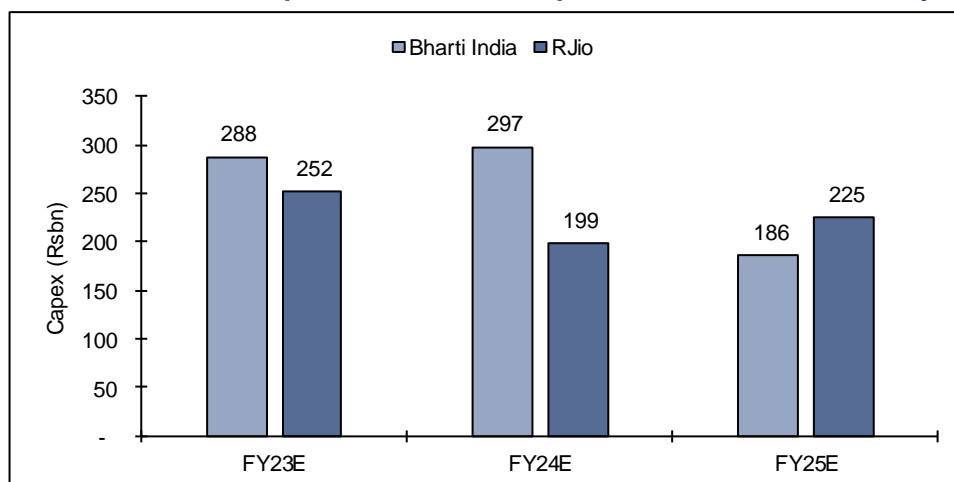
Source: I-Sec research, Company

5G investment for RJio. We expect RJio to add 89k 5G radio in FY23 and 182k in FY24. This means RJio will have loaded 5G on 65% of its towers with 3500MHz / 700MHz band (including CA) and 25% with 26GHz band. RJio will also start re-farming 1800MHz band from FY25, and subsequently a few 2300MHz in future to 5G. We expect RJio to have 95% of towers loaded with base 5G band by FY27 and it will have an average 1.96x 5G radio/tower in the same period. We estimate a 5G radio will cost Rs1.8mn/radio (higher due to two radio or CA) which will decline by 5% each year and re-farming will cost 0.2mn/radio. This implies RJio will have to spend total Rs604bn in three years on 5G radio. RJio will also rollout 5G backhaul using E-band microwave on 20% of 5G loaded tower. The cost estimated is Rs0.2mn/MW equipment. This will add total spend of Rs20bn in three years. RJio will have to spend Rs30bn cumulatively in the next three years for deployment of core. Our assumption / working suggests RJio is likely to spend Rs655bn on 5G over FY23-25E.

Table 2: RJio to spend cumulatively Rs655bn on 5G over FY23-25E

Rs mn	FY22	FY23E	FY24E	FY25E	FY26E	FY27E
Towers (est)	2,70,000	2,95,000	3,00,000	3,05,000	3,10,000	3,15,000
Net add	20,000	25,000	5,000	5,000	5,000	5,000
4G BTS	8,10,000	8,85,000	9,00,000	8,84,500	8,37,000	7,87,500
Net add	60,000	75,000	15,000	(15,500)	(47,500)	(49,500)
4G BTS/ tower	3.00	3.00	3.00	2.90	2.70	2.50
5G radio		88,500	2,70,000	3,66,250	4,81,500	6,16,500
700MHz + C-band		73,750	1,95,000	2,28,750	2,63,500	2,99,250
26GHz		14,750	75,000	1,22,000	1,55,000	2,04,750
Refarming				15,500	63,000	1,12,500
Net add		88,500	1,81,500	96,250	1,15,250	1,35,000
5G radio/ tower		0.30	0.90	1.20	1.55	1.96
Capex per radio		1.8	1.7	1.6	1.5	1.5
Capex for refarming		0.3	0.3	0.2	0.2	0.2
New radio		88,500	1,81,500	80,750	67,750	85,500
Refarming		-	-	15,500	47,500	49,500
Capex on radio						
New radio		1,59,300	3,10,365	1,31,178	1,04,557	1,25,353
Refarming				3,777	10,996	10,886
Total		1,59,300	3,10,365	1,34,955	1,15,553	1,36,238
Capex on MW						
5G fired tower		14,750	39,000	45,750	52,700	59,850
Capex per MW		0.2	0.2	0.2	0.2	0.2
Total		2,950	7,800	9,150	10,540	11,970
Core		20,000	5,000	5,250	5,513	5,788
Capex for 5G		1,82,250	3,23,165	1,49,355	1,31,605	1,53,997

Source: I-Sec research, Company

Chart 5: We see an upside risk to RJio capex estimate for next three years

Source: I-Sec research, Company

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