

TECHNOLOGY & INTERNET

14 September 2021

Deep Dive 4: 5G juggernaut gains momentum – BUY TECHM

- Rebound in 5G rollout post Covid-led blip; set to reach ~1bn connections globally by CY22-CY23 and unlock growth opportunity for Indian IT
- China and the US maintain supremacy; Europe racing to scale up 5G commercial services following first pandemic wave
- BUY TECHM for its highest telecom exposure among large-cap IT at 40%; reiterate BUY with a Sep'22 TP of Rs 1,660

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US and China at the fore; Europe fast catching up: Due to Covid-19, 5G spectrum allocation took a backseat in 2020. However, spectrum assignment is now complete in most parts of the US, China, Europe, South Korea, Japan, Russia, Canada, and Australia. Further, 24 more countries will add 1-6GHz of spectrum by end-CY21. GSMA expects ~1bn 5G connections globally by CY22-CY23. While the US, China, South Korea and Japan are well ahead in terms of network rollout, investments and subscriber addition, European telcos are fast catching up.

Emerging use cases across sectors: With resurgent digitisation demand post Covid, there is no dearth of new use cases for 5G. Industries that will particularly benefit from this technology in the near term are communications, business services, financial services, automobiles, healthcare and life sciences, and gaming.

OEMs signal accelerated 5G momentum: US chipmaker Qualcomm is the driving force behind the global development, launch and expansion of 5G, and has scaled up 5G licensing in tandem with the rising demand. The company has also doubled its forecast of 5G handset sales for CY21 vs. CYs20. Similar upbeat sentiments have been echoed by major OEMs such as Intel, Ericsson and Samsung. In a historic deal this July, Ericsson expanded its longstanding partnership with US telecom giant Verizon to deliver 5G solutions in the North American market for US\$ 8.3bn.

TECHM to be prime beneficiary: Following robust Jun'21 quarter results and a rebound in the telecom vertical across our IT services coverage in general and Tech Mahindra (TECHM: 40% telecom exposure) in particular, we reiterate TECHM as our top large-cap pick. We expect strong growth given deal wins worth US\$ 815mn TCV (+180% YoY) in Q1FY22 and clientele comprising all major US and European telcos.

Reiterate BUY on 5G-led demand pickup: At ~20x FY23E P/E, TECHM is the lowest valued stock among tier-I IT services players. It is trading at ~40% discount to TCS compared to an average ~22% discount over FY14-FY15 – the phase of strong 4G-led growth pickup at TECHM. We have an unchanged Sep'22 TP of Rs 1,660, set at a one-year forward P/E of 20x. Maintain BUY.

Recommendation snapshot

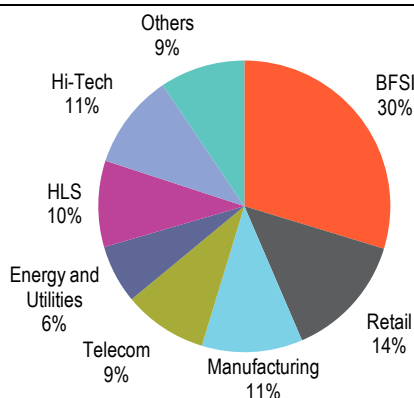
Ticker	Price	Target	Rating
AFFLE IN	4,909	6,200	BUY
COFORGE IN	5,178	5,860	BUY
ECLX IN	2,194	2,880	BUY
HCLT IN	1,208	1,360	BUY
INFO IN	1,692	2,020	BUY
INMART IN	8,706	7,200	HOLD
JUST IN	989	1,330	BUY
LTI IN	5,489	5,960	BUY
MPHL IN	3,000	3,020	HOLD
MTCL IN	3,935	2,400	SELL
PSYS IN	3,588	3,050	HOLD
TCS IN	3,845	4,270	BUY
TECHM IN	1,430	1,660	BUY
WPRO IN	671	620	HOLD

Price & Target in Rupees | Price as of 13 Sep 2021



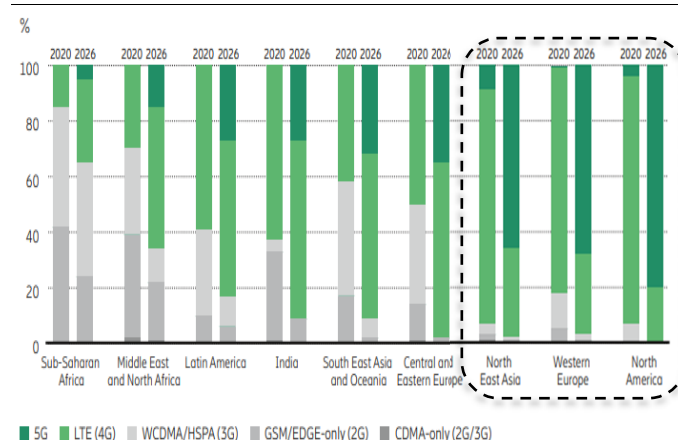
Focus charts

Fig 1 – Revenue share of telecom vertical at ~9% for top-5 Indian IT players as of Q1FY22



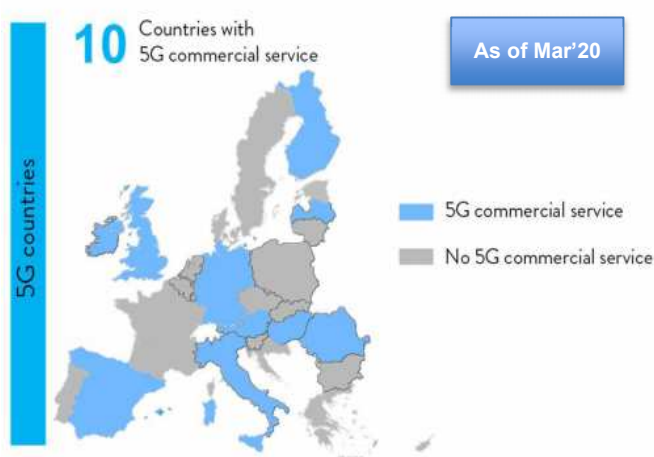
Source: Company, BOBCAPS Research | Top 5 IT – TCS, INFO, HCLT, WPRO, TECHM; HLS: Healthcare and Life sciences

Fig 2 – Mobile connections by technology & region: 5G to be dominant in US, Europe and Northeast Asia by CY26



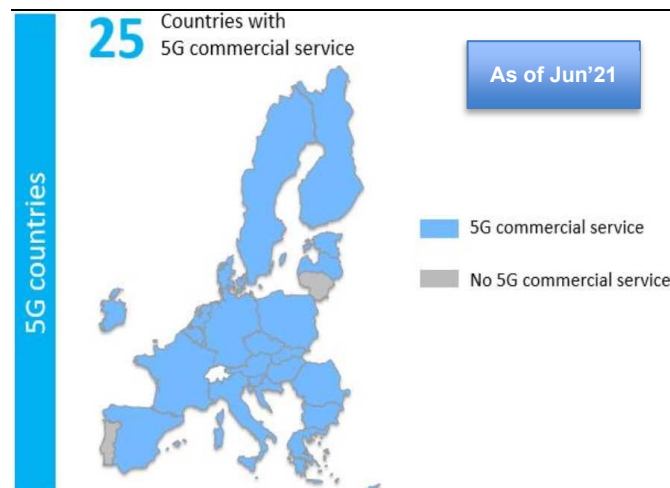
Source: Ericsson Mobility Report Nov'20, BOBCAPS Research

Fig 3 – 5G commercial services only in 10 European countries in Mar'20...



Source: European 5G Observatory Report Mar'20, BOBCAPS Research

Fig 4 – ...but registered strong pickup to 25 countries as of Jun'21



Source: European 5G Observatory Report Jun'21, BOBCAPS Research

Fig 5 – 5G spectrum allocation timeline across countries in CY21; highest number of assignments in one year

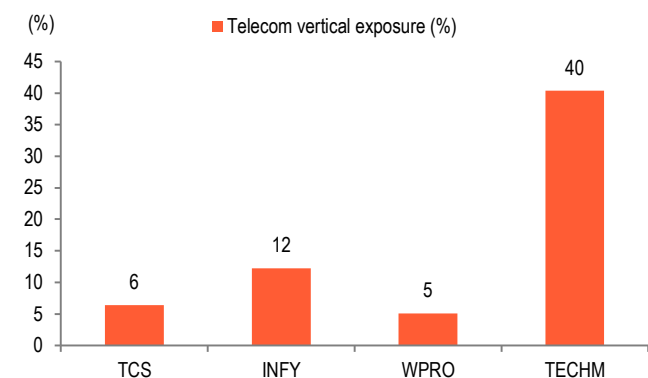


Source: GSMA Intelligence, BOBCAPS Research

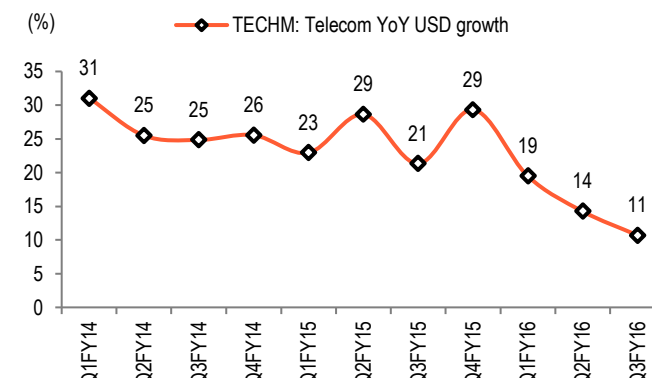
Fig 6 – OEMs doubling down on hardware as seen from Qualcomm guidance

Qualcomm	CY20 est.	CY21 est.
5G handset forecast	240mn	450-550mn
Management remarks during June quarter earnings call	<p>Turning to the handset market, fiscal Q3 was better than the expectations we shared with you last quarter. In China, just midway through the calendar year and despite the impact of Covid-19, 5G now represents the majority of domestic mobile phone shipments.</p> <p>Given the strong adoption of 5G in developed regions in China, we have a bias towards the high end of our 5G forecast. In the fourth fiscal quarter, we are forecasting revenues of US\$ 8.4bn-9.2bn and non-GAAP EPS of US\$ 2.15-2.35.</p>	

Source: Qualcomm, BOBCAPS Research

Fig 7 – TECHM has the highest exposure to the telecom vertical, Q1FY22


Source: Company, BOBCAPS Research

Fig 8 – TECHM: Expect FY14-FY15 YoY growth spurt in telecom vertical to recur post 5G commercialisation...


Source: Company, BOBCAPS Research

Fig 9 – Peer comparison

Ticker	Rating	CMP (Rs)	TP (Rs)	EPS (Rs)			ROE (%)		US\$ revenue CAGR FY21-23E (%)	P/E (x)	
				FY22E	FY23E	FY24E	FY22E	FY23E		FY22E	FY23E
TCS IN	BUY	3,845	4,270	109.8	127.0	145.4	41.6	39.0	15.1	35.0	30.3
INFO IN	BUY	1,692	2,020	54.1	61.1	67.0	29.7	31.5	14.3	31.2	27.7
WPRO IN	HOLD	671	620	23.5	27.1	29.4	21.2	21.7	18.0	28.5	24.8
HCLT IN	BUY	1,208	1,360	52.2	59.0	64.6	21.5	21.8	11.3	23.2	20.5
TECHM IN	BUY	1,430	1,660	66.6	77.9	89.7	21.8	22.7	13.9	21.5	18.4
LTI IN	BUY	5,489	5,960	134.1	158.4	181.8	29.5	29.3	18.7	40.9	34.7
MPHL IN	HOLD	3,000	3,020	82.0	95.7	108.0	22.5	24.3	14.0	36.6	31.3
MTCL IN	SELL	3,935	2,400	87.7	93.9	112.2	31.0	28.4	15.8	44.9	41.9
PSYS IN	HOLD	3,588	3,050	74.0	91.4	104.2	19.9	21.5	21.0	48.5	39.2
COFORGE IN	BUY	5,178	5,860	131.8	174.3	219.1	25.3	28.8	26.8	39.3	29.7

Source: Company, BOBCAPS Research

Contents

Focus charts	2
5G analysis – Key findings	5
Global 5G outlook – exponential growth path	6
5G pickup to be swifter than older technologies	7
OEMs echo optimism on demand traction	8
Next-gen network to benefit key sectors	9
Trends for 2021 and beyond	10
Regional 5G footprint growing rapidly	11
Europe rushes to cover Covid-led delays	11
US rollout undaunted by pandemic	14
Patchy deployment in Asia	16
TECHM – key beneficiary among Indian IT players	18
Highest telecom exposure among peers	18
Technology change cycle offers large opportunity	18
Resurgent June quarter performance	19
Reiterate BUY on TECHM	19

5G analysis – Key findings

As a follow-up to our analysis of technology spends in the telecom vertical (see [Deep Dive 2: Telecom tech spends resilient; upgrade TECHM](#), 18Jun20), we now examine shifting trends in the global telecom industry towards 5G services, capex progress by telcos amid the pandemic, and potential beneficiaries of the vast emerging opportunity among our IT services coverage.

Our research indicates that the initial Covid-led slowdown in CY20 has been followed by an acceleration in 5G deployment globally. Key findings:

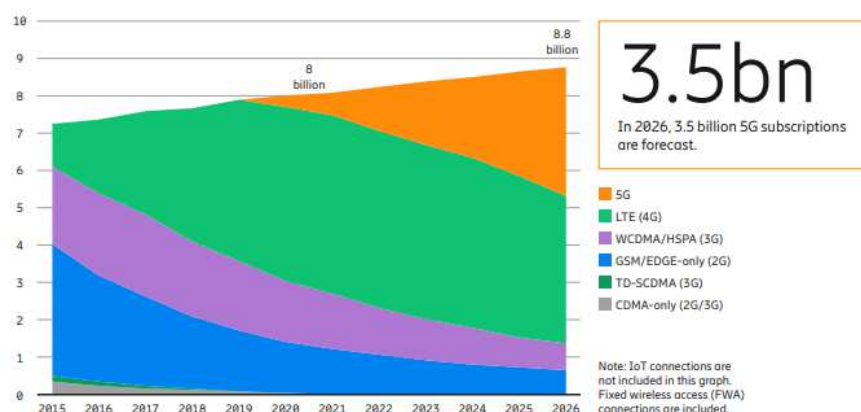
- North America and China have continued to ramp up 5G networks despite Covid. Europe is striving to overcome pandemic-led delays and progressing well on its roadmap.
- New spectrum has been assigned in 39 countries and GSMA Intelligence expects further assignments in a record 28 more in CY21.
- Commentary not just from telecom players but also global OEMs such as Qualcomm, Samsung and Ericsson echo the optimism on upcoming 5G-led demand.
- In this context, TECHM remains our top pick among large caps for its high telecom exposure (40% revenue share vs. sub-15% for peers), robust deal wins and marquee global clientele.

Global 5G outlook – exponential growth path

The race toward 5G connectivity is well underway. Although network rollout did slow due to Covid-19, 2020 was by no means a lost year from the perspective of 5G investment. On the contrary, the pandemic reinforced the desperate need for far greater digitisation of the economy and intensified the 5G race across the globe. Indeed, adoption of this technology reached ~200mn subscribers globally by end-CY20. Region-wise, the US, China and Northeast Asia are in the lead while Europe is catching up. As per various industry sources, 5G is expected to:

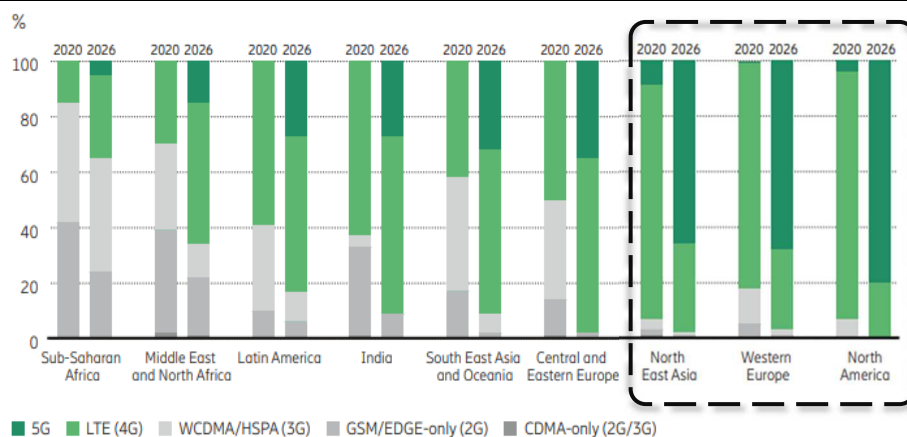
- add US\$ 1.5tn-1.9tn to the global economy by CY25
- reach 1bn connections globally by CY23, 2-3bn connections by CY25 and ~3.5bn by CY26 (GSMA Intelligence)
- form 40% of all mobile subscriptions by CY26 (Ericsson Mobility Report Jun'21)
- enable new and improved use cases that will account for about two-thirds of telco revenues in CY25 (ETNO: European Telecom Network Operators' Association).

Fig 10 – Mobile subscription breakup by technology – 5G subscribers to form 40% share by CY26



Source: Ericsson Mobility Report Jun'21, BOBCAPS Research

Fig 11 – Mobile subscriptions by technology and region – US, Northeast Asia lead; Europe gathering pace



Source: Ericsson Mobility Report Nov'20, BOBCAPS Research

5G pickup to be swifter than older technologies

After losing momentum in Q2CY20, spectrum allocation has begun to accelerate across the globe. New spectrum earmarked for 5G has been assigned in 39 countries and the process is underway in 15 more. GSMA Intelligence expects new spectrum assignments in at least 28 countries in CY21 (4 completed in Q1) – the highest number of assignments in a single year since 2017 when the first 5G auctions took place.

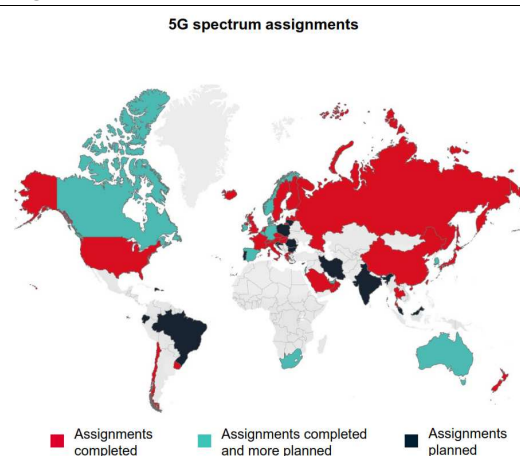
Momentum is building in Europe where 700MHz of allocations are expected to take place. Allotment of mmWave (millimeter wave) spectrum which offers ultra-fast speeds is likely to gain traction as well.

Fig 12 – 5G spectrum allocation timeline in CY21; 24 more countries likely to get 5G in rest of the year



Source: GSMA Intelligence, BOBCAPS Research | As of 31 March 2021

Fig 13 – 5G spectrum assignments completed across key geographies (US, China and East Asia)

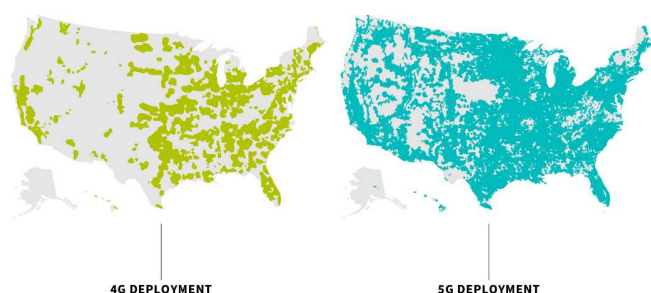


Source: GSMA Intelligence, BOBCAPS Research | As of 31 March 2021

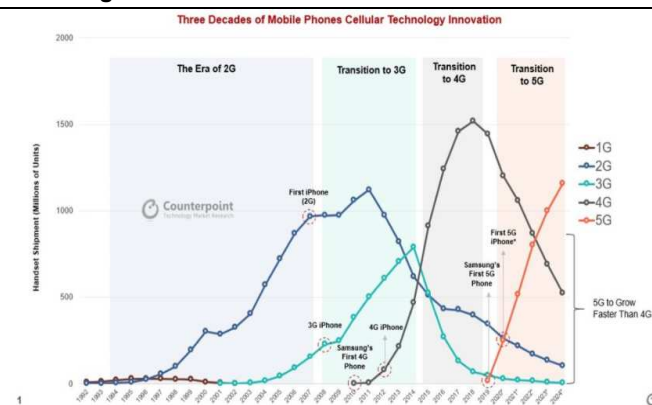
Ericsson expects 5G to be the fastest implemented mobile communication technology in history, covering over 60% of the world's population by CY26. Global subscriptions during the pandemic rose to ~200mn by the end of CY20 (175mn of these in China).

As per Counterpoint Research, 5G rollout will accelerate at an exponential rate over CY20-CY24 as the technology promises higher throughputs, wider bandwidth, greater capacity and lower latency with future 3GPP (third generation partnership project) releases. Leading telcos have started deploying 5G NR Non-Standalone (NSA) networks – where 5G services are delivered through a combination of 5G and 4G networks – and coverage is bound to ramp up in CY21-CY22.

In the US, 5G deployment is well ahead of 4G rollout in the same span of time as networks are being built out and expanded at a faster pace. The first 5G network in the US achieved nationwide coverage twice as fast as 4G, and all the three major telcos built nationwide networks 42% faster than 4G.

Fig 14 – Accelerated 5G deployment in the US vs. 4G in a span of two years


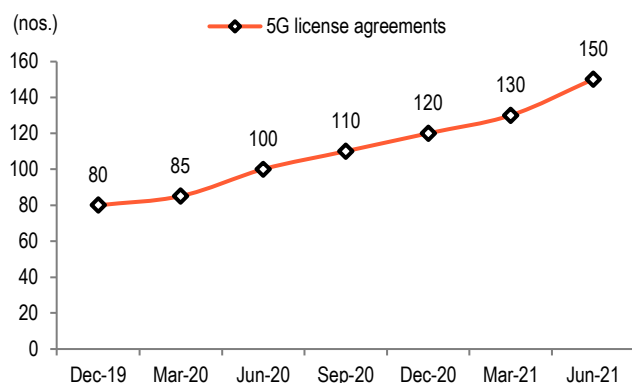
Source: CTIA Annual Survey 2021, BOBCAPS Research

Fig 15 – Three decades of changing telecom generations – 5G to grow faster than 4G


Source: Counterpoint Research, BOBCAPS Research

OEMs echo optimism on demand traction

- US-based **Qualcomm** is a leading designer and manufacturer of wireless telecom products and semiconductors. The company is at the forefront of wireless technology innovation and the driving force behind the development, launch and expansion of 5G. Qualcomm has been positive about the momentum in 5G even during the pandemic (since Q4FY20) and especially in China. This is reflected in its global 5G handset forecast of 450-550mn for CY21, more than twice its CY20 estimate.

Fig 16 – Qualcomm's 5G license agreements on the rise


Source: Qualcomm, BOBCAPS Research

Fig 17 – Qualcomm has doubled its 5G handset forecast

Qualcomm	CY20 est.	CY21 est.
5G handset forecast	240mn	450-550mn
Management remarks during June quarter earnings call	<p>Turning to the handset market, fiscal Q3 was better than the expectations we shared with you last quarter. In China, just midway through the calendar year and despite the impact of Covid-19, 5G now represents the majority of domestic mobile phone shipments.</p> <p>Given the strong adoption of 5G in developed regions in China, we have a bias towards the high end of our 5G forecast. In the fourth fiscal quarter, we are forecasting revenues of US\$ 8.4bn- 9.2bn and non-GAAP EPS of US\$ 2.15-2.35.</p>	

Source: Qualcomm, BOBCAPS Research

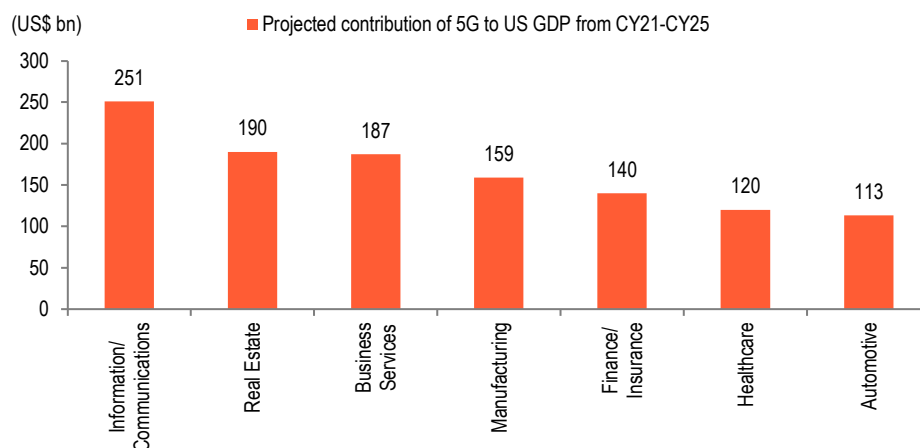
- As per other OEMs such as **Ericsson**, 5G is a transformational technology, more so than the previous generations. At end of Aug'21, Ericsson had announced 145 5G contracts and 96 live 5G networks in 46 countries.
- According to **Samsung**, 5G expansion will continue to thrive but uncertainties over component supply are likely to linger. The company is looking to actively address demand by expanding mass-market 5G lineups in H2CY21.
- Intel** announced a partnership with Ericsson in Q1FY22 to expand its cloud radio access network to boost 5G performance and also formed a collaboration with Google Cloud for 5G in Q4FY21.

Next-gen network to benefit key sectors

The true use cases of 5G will be in industries requiring real-time connections, fast access to data for mission-critical projects and ultra-low latency (~1millisecond). Some of the recent sector-specific use cases picking up momentum are (1) automobiles (driverless cars), (2) life sciences and healthcare (remote surgery), (3) gaming, (4) augmented & virtual reality (AR-VR), (5) smart cities, and (6) media and communication (better download speeds for content).

Smart cities and enterprises responsible for infrastructure management expect to rely on 5G's capacity to handle all the devices that require vast amounts of data in short periods of time. In the manufacturing sector, ultra-high-speed connectivity will enable production lines to react autonomously to supply and demand. Digital replicas can provide warnings about real machinery faults ahead of time. In media, faster speeds will support the continued convergence of telecom, media, entertainment and content.

Fig 18 – Top 5G industries in the next five years



Source: Accenture, BOBCAPS Research

Trends for 2021 and beyond

- **Network sunsets to accelerate:** 2G and 3G are expected to fall out of use in CY21. 5G and 4G rollouts have pushed telecom operators to re-farm 3G and 2G spectrums and remove the old legacy networks. By reducing the number of networks to be maintained, operators should be able to lower running costs significantly and simplify device portfolios as well as tariff structures.
- **Emerging markets lag:** 5G will take longer to reach maturity in EMs. Africa and Central Asia in particular have limited use cases. On average, EMs took 15 years to achieve 80% population coverage for 2G networks, 10 years for 3G and 8 years for 4G. As per IFC's latest report, it would take 15 years for 5G to reach 80% of the EM population.

Penetration of IoT devices – a precursor to 5G deployment – is lagging in most of these countries (EMs had 45 IoT devices per thousand population in CY19, five times below the ratio in high income countries). With affordability constraints, large companies will deploy their own 5G infrastructure in emerging markets.

- **Spectrum sharing will rise:** Earlier, there was no mechanism for spectrum sharing but with the advent of 5G, the exclusive spectrum licensing model has been replaced by a sharing system. Interest in the shared model is increasing as the wider mobile ecosystem explores new network models (including private networks) and use cases.
- **mmWave deployments to add value to spectrum:** Assignment of spectrum in the mmWave band (extremely high frequency band) is gaining momentum. mmWave spectrum has been rolled out in 13 countries, which is particularly significant given that it was internationally allocated to telcos only in Nov'19 at the World Radiocommunication Conference. mmWave brings many performance benefits and is an essential part of the 5G ecosystem.

Regional 5G footprint growing rapidly

Due to Covid-19, 5G spectrum allocation took a backseat in CY20. However, spectrum assignment is now complete in most parts of the US, China, Europe, South Korea, Japan, Russia, Canada, and Australia. Further, 24 more countries will add 1-6GHz of spectrum by end-CY21. While the US, China, South Korea and Japan are well ahead in terms of network rollout, investments and subscriber addition, European telcos are closing the gap with increased investments and coverage expansion.

Europe rushes to cover Covid-led delays

Europe has been a laggard in 5G deployment and suffered delayed investments and spectrum allocation amid the pandemic. As many as 17 European countries had postponed 5G spectrum auctions due to Covid-19 last year. However, the recovery has been impressive.

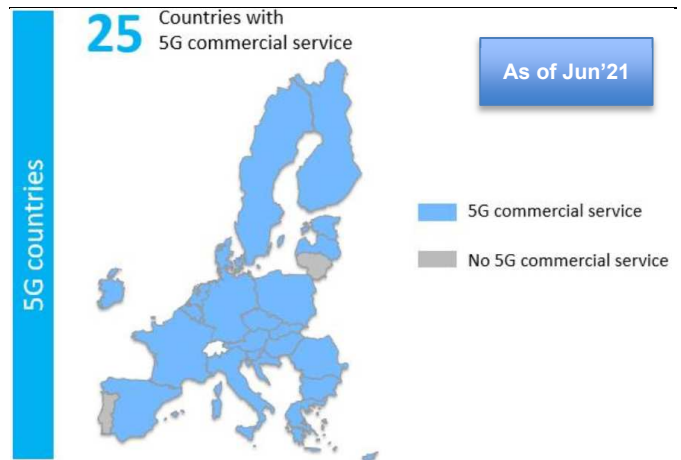
As of Jun'21, 25 out of 27 European countries have commercial 5G services compared to only 10 countries as at the end of Mar'20 (pre-pandemic). A total of 65 operators have launched commercial services in Europe as of Jun'21 including 44 operators who rolled out services in the last 12 months. Norway, Germany, Finland and the UK are the first movers in 5G implementation.

Fig 19 – 5G commercial services only in 10 European countries in Mar'20...



Source: European 5G Observatory Report Mar'20, BOBCAPS Research

Fig 20 – ...but registered strong pickup to 25 countries as of Jun'21



Source: European 5G Observatory Report Jun'21, BOBCAPS Research

Fig 21 – European telco commentary: 5G investments being scaled up; spectrum allocations complete

Company	Timeline	Comment
Deutsche Telekom (largest telecom provider in Europe by revenue)	Q2CY21	In Germany, we already covered 82% of the population with 5G. We will take this to over 90% by year-end. There are multiple services in the US, which clearly confirms the 5G leadership of T-Mobile US. On the 800MHz spectrum allocation in Germany, our position is that we – the whole industry – has to invest into coverage in 5G for ubiquitous data access everywhere.
		Our ambition is clearly to be undisputed 5G leader, both in these two categories [2.1GHz and 3.6GHz], and it will manifest itself in a 3.6GHz bandwidth play, which is giving the high-speed speeds which we are looking for.
	Q1CY21	We made strong progress on 5G and fiber. And the German regulator approved our 10-year fiber wholesale agreements... T-Mobile [subsidiary of DT] continues to make great progress with its merger integration and their 5G leadership is becoming more and more evident as you look to the ongoing network tests. Already 20% of Sprint customers and 50% of the total traffic has been migrated to the T-Mobile network and obviously creates a much better customer experience than it used to be.
Orange Telecom (first European player to launch fully automated & cloud native 5G)	Q2CY21	We posted strong FTTH net adds, especially in France and Poland. In mobile, 5G offers are now available in six countries and near 1mn 5G customers. We are the first European player to launch a fully automated and cloud-native 5G network, which we call the 0 touch network and which will also serve to develop the use of artificial intelligence to secure, optimise and anticipate the behaviour of this network of the future. At the beginning of the year, 40% of handset sales were 5G compatible. In Q2, it's 50%. So, appetite for 5G month-after-month is growing and supports good commercial momentum on handset sale. We now have close to 1mn 5G customers. But obviously, we have much more 5G handsets which are now being sold. More than one out of 2 handset smartphones sold today in France is a 5G smartphone.
	Q1CY21	5G offers are now available in five countries with a strong appetite for 5G smartphones. In France, we now cover 239 cities with 5G. Turning to equipment sales, they were back to growth, boosted by 5G main brands handsets launch. We observe a strong dynamic in handset sales. 40% of our sales -- of our handset sales -- are made on 5G, so it's good. But the real term will be in 2022. We launched 5G in 240 cities, specifically big cities such as Paris, Bordeaux, Lyon, Marseille. And by the equipment, 43% of handset sales in Q1 were 5G compatible, so we observe that the French consumer prefers as operator the arrival of 5G quarter-after-quarter and that sustains the equipment revenue in Q1.
	Q2CY21	We secured the spectrum needed in the 700MHz band at very favourable terms, which will help us to accelerate our 5G deployment and improve operating leverage. Moving to Germany where we have seen operational momentum accelerate in the quarter with O2 [subsidiary of Telefonica] ARPU now back to growth year-on-year in Q2. At the same time, we continue to get strong results in mobile network tests and have 5G available in over 80 cities. In May, we also signed a national roaming agreement with 1&1 Drillisch, continuing our partnership and securing long-term revenue streams.
Telefonica (Spanish Multinational Telecom)		Network rollout continues at pace, with 5G now live in almost 200 towns and cities, and project lining adding 89,000 new premises passed in Q2, helping to grow the company's gigabit network to 7.2mn premises passed and remaining on track for completion of the gigabit upgrade by the end of 2021. The JV has also reaffirmed its target to deliver annual synergies of GBP 540mn by mid-2026, with a net present value of GBP 6.2bn.
	Q1CY21	We want to provide the best connectivity, secure and efficient for everyone, and there will be funds allocated to this connectivity such as fixed broadband in rural areas or 5G coverage in rural areas. Second is improve competitiveness of the Spanish environment, giving SME success to technology. 5G, for instance, in Industry 4.0, smart cities, connected mobility, cultural industry support.

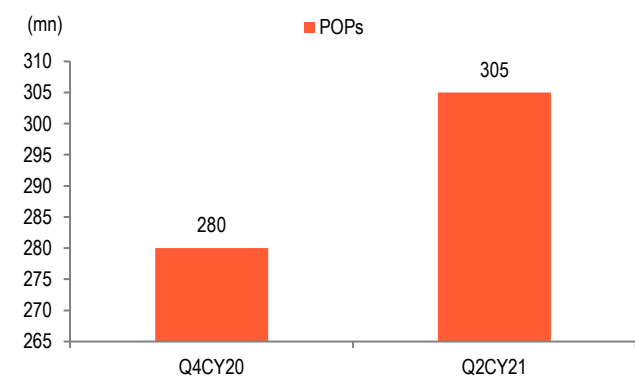
Company	Timeline	Comment
BT (British Multinational Telecom)	Q2CY21	We will grow our 5G network to cover half of the UK population by early 2023, four years ahead of the UK government's ambition. By 2028, the geographic reach of our 5G network will pass that of 4G to become the UK's largest digital network, providing signal to over 90% of the UK land mass. To enable this, new 700MHz 5G spectrum will be deployed across the majority of our mobile sites offering stronger indoor and wider rural coverage.
		We'll launch a new 5G core network control system by 2023, built upon BT's distributive Network Cloud infrastructure, bringing together all of our digital networks. All of this will be delivered within our previously announced capex plans of up to GBP 5bn a year at the peak.
	Q1CY21	We've extended our 4G coverage and our 5G network has doubled during the year, now reaching 160 towns and cities with broader and more highly rated coverage than any other operator. 5G ready connections stand up more than 3.2mn, and EE's [Everything Everywhere – acquired by BT in 2015] brand strength has attracted more than 1.6mn active users across our retail businesses. Importantly, we've secured new 5G spectrum at an investment encouraging cost to further extend coverage and underpin future enterprise 5G use cases.
		Peak capex of up to GBP 5bn a year will be required to deliver our value accretive investments in full fiber, 5G and our modernization program. This will inevitably constrain cash flow over the next few years, but a substantial benefit from the super deduction will help offset this.

Source: Company, BOBCAPS Research

Noteworthy coverage progress of select European operators

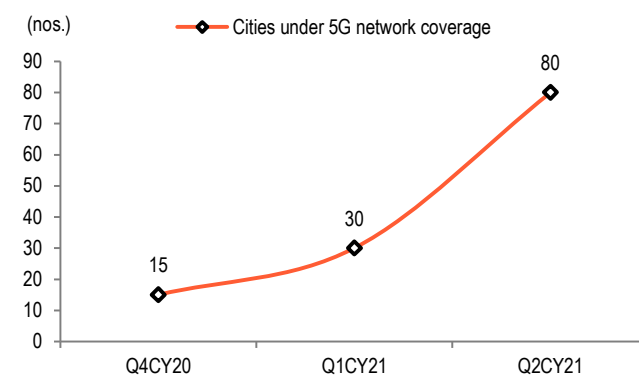
- In Europe, Orange Telecom successfully launched 5G in six countries and has a total of 941,000 5G customers as of Q2CY21.
- Telefonica has steadily increased its 5G coverage from 15 cities in Q4CY20 to 80 cities in Q2CY21. Its investment in the space also grew 8% YoY in H1 (Fig 19).
- Deutsche Telekom now has ~305mn 5G POPs (points of presence) in the US vs. 280mn in Q4CY20. It has also increased its POPs in Germany and aims to cover 90% of the German population by the year end (Fig 20).
- British Telecom aims to expand 5G coverage to half of the UK population by CY23 and 90% of UK landmass by CY28. It further plans to launch new 5G core network control systems by CY23.

Fig 22 – European telcos (Deutsche Telekom) expanding 5G coverage



Source: Company, etno.eu, BOBCAPS Research

Fig 23 – European telcos (Telefonica) expanding 5G coverage



Source: Company, etno.eu, BOBCAPS Research

US rollout undaunted by pandemic

US telcos remained largely on course with their 5G roadmaps despite the pandemic, translating into strong spending over the last year and a half. Mobile operators in the US incurred dedicated 5G capex to the tune of US\$ 29.9bn in CY20 (up 2.7% YoY), marking a five-year high. As of Jan'21, US mobile operators have covered 75% of the country with 5G, per PWC. By CY23, 32% of North American connections are expected to be on this network (per PWC), rising to 84% of mobile subscriptions by CY26 (per Ericsson).

Commercialisation is well underway and telcos have launched 5G services focusing on fixed wireless access (FWA) and mobile broadband. Key players expanding their 5G footprint in the US are the leading trio of T-Mobile, Verizon and AT&T. Some of the smaller players include Comcast, US Cellular, Charter and C Spire.

- AT&T has invested US\$ 60bn in 5G/wireless, fibre and premium content as part of its targeted capital allocation strategy.
- Verizon began 5G investments in earnest in Q4CY20 by using dynamic spectrum sharing and grew its 5G small cells by 5x YoY. The company leveraged its 60+ 5G ultra-wideband (UW) mobility cities, 10+ 5G UW home cities and 10+ 5G public mobile edge compute centres to drive 5G expansion.

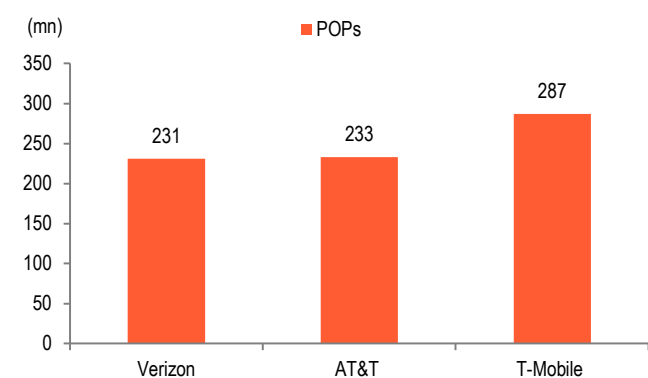
Fig 24 – Verizon's 5G strategy timeline – now connectivity at high speed due to C-band and mmWave launch

Verizon	Q4CY20	Q1CY21	Q2CY21
5G Agenda	5G nationwide using dynamic spectrum sharing; 5x YoY increase in 5G small cells; expansion of 5G Edge and diverse partner ecosystem	Expansion of 5G UW (ultra-wideband) coverage and availability	mmWave deployment and C-band launch

Source: Company, BOBCAPS Research

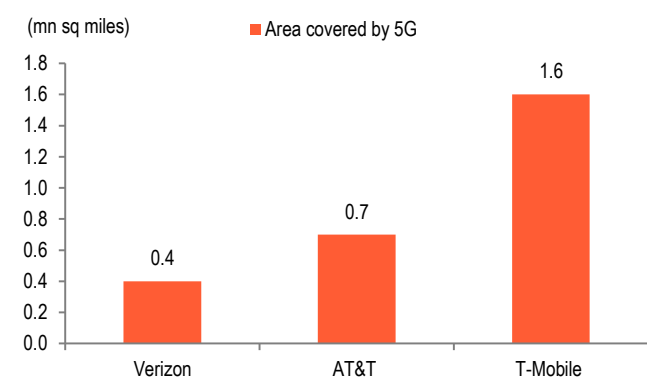
- T-Mobile has scaled up its 5G capabilities by acquiring 40MHz of spectrum in top markets covering 225mn POPs. The company wants to maintain its 5G leadership with the densest network and high spectrum capacity.

Fig 25 – 5G coverage by top-3 telcos in the US



Source: Company, BOBCAPS Research

Fig 26 – 5G coverage by top-3 telcos in the US



Source: Company, BOBCAPS Research

Fig 27 – Commentary by US telcos on 5G: Investments pouring in, especially for C and mmWave bands

Company	Timeline	Comment
AT&T		We are still early in the cycle of upgrading our base to 5G devices...I feel very strong about our position in the market.
	Q2CY21	We continue to invest at strong levels. More than US\$ 60bn in the last 12 months in 5G wireless, including spectrum, fiber and premium content.
	Q1CY21	And given the number of things we have underway that we're scaling, including the fiber build, ...and what we're doing around starting to roll into 5G deployment, etc., making sure that we get that latitude in there is really important...
Verizon		We are also expanding our 5G ultra-wideband and 5G home markets. Capital expenditures continue to support the growth in traffic on the company's 4G LTE network and continued expansion of the company's 5G ultra-wideband and 5G nationwide networks. Capital expenditures related to C-Band were more than US\$ 160mn in first-half 2021.
	Q2CY21	With Verizon's company-operated retail stores fully opened and consumer behavior closer to pre-pandemic levels, [the company] built momentum throughout the quarter and timed its promotions to take advantage of the economic recovery and increased customer activity. This increased activity and [the company's] differentiated customer proposition drove 5G adoption and step-ups to premium unlimited plans. Verizon ended second-quarter 2021 with ~20% of wireless phone customers having 5G-capable devices.
	Q1CY21	First-quarter 2021 capital expenditures were US\$ 4.5bn, including ~US\$ 40mn of C-Band related items. Capital expenditures continue to support growth in traffic on the company's 4G LTE network and continued expansion of the company's 5G ultra-wideband and nationwide networks.
T-Mobile		Capital spending is to be in the range of US\$ 17.5bn-18.5bn, including the further expansion of 5G mmWave in new and existing markets, densification of the 4G LTE wireless network to manage future traffic demands and continued deployment of the company's fiber infrastructure. Expenditures related to deployment of the company's C-Band 5G network will be in addition to this amount and are expected to be ~US\$ 10bn over three years, with US\$ 2bn-3bn expected in 2021.
	Q2CY21	Extended range 5G covers 305mn people and 1.7mn sq miles – more geographic coverage than Verizon and AT&T combined. Ultra-capacity 5G covers 165mn people with average speeds of 350Mbps, on track to cover 200mn people nationwide by end of year.
	Q1CY21	Extended range 5G covers 295mn people across 1.6mn sq miles, 4x more than Verizon and 2x more than AT&T. Ultra-capacity 5G covers 140mn people and on track to cover 200mn people nationwide by the end of 2021. Majority of independent third-party network benchmarking reports show T-Mobile as the clear leader in 5G speed and availability.
US Cellular	Q2CY21	Our 5G and network modernization programs are on track. We continue to be very optimistic on the performance capabilities of mmWave spectrum. Additionally, the 5G fixed wireless access tests of market demand have seen early, encouraging results and will provide valuable learnings as we look to bring this high-speed product to market.
	Q1CY21	Our 5G and network modernization programs are on track and we now offer 5G in portions of substantially all of our markets. We have also begun deploying our mmWave spectrum in order to offer fixed wireless access in three test markets, which will provide us with valuable learnings as we look to roll out this high-speed product to additional markets in our footprint. Our purchases of mid-band spectrum in the recent auctions will further enable our 5G capabilities well into the future.

Source: Company, BOBCAPS Research

Patchy deployment in Asia

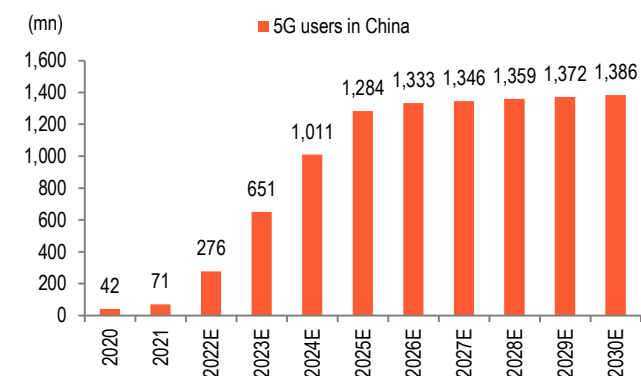
5G expansion in Asia has been patchy. China, South Korea and Japan look to be the frontrunners even as other Asian countries lag. Japan has been testing 5G since CY10, three South Korean telecom companies collaborated to bring 5G to the country towards the end of CY18, and three wireless carriers together brought 5G to China in CY19.

India is also catching up, with Bharti Airtel announcing in early CY21 that its network was 5G ready. Reliance Jio plans to provide 5G in H2FY21 and will launch its own 5G handsets. Vodafone has been upgrading its network since CY17. Nevertheless, 4G remains the dominant technology in India and is expected to grow from 680mn connections in CY20 to 830mn in CY26.

China

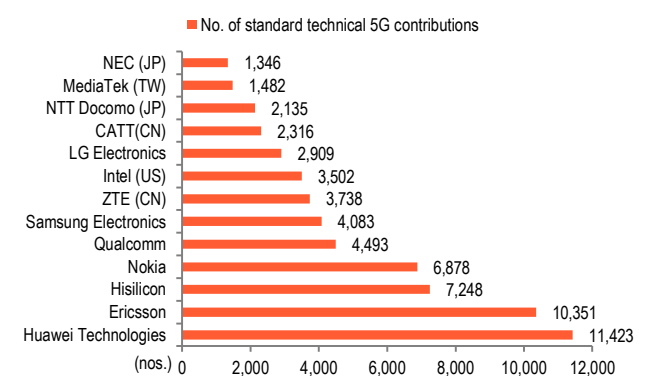
While the rest of Asia saw deployment slowing due to Covid-19, China built the world's largest 5G high-speed mobile network with 260mn connections as of Apr'21. By Feb'21, China had 792,000 5G base stations, laying a strong foundation for new subscribers. It aims to complete deployment of the network during the 14th 5-Year Plan (2021-25) period, when considerable progress will be made in terms of network speed and coverage. Huawei Technologies has been aggressively pursuing 5G dominance, adding the most technological contributions to the 5G standard.

Fig 28 – 5G users in China to grow rapidly



Source: Statista 2021, BOBCAPS Research

Fig 29 – Chinese telecom equipment makers well ahead of the rest in terms of 5G investment



Source: Statista 2018, BOBCAPS Research

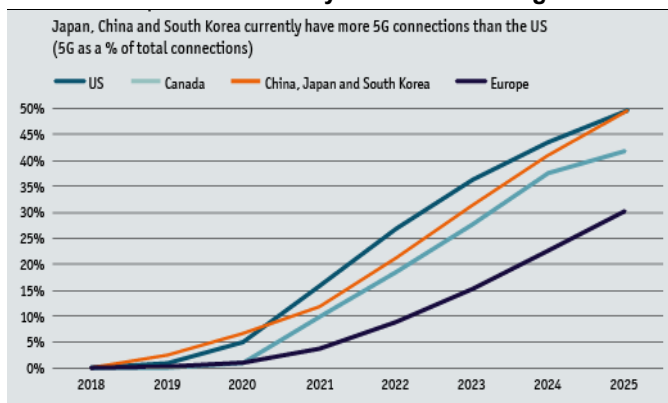
South Korea and Japan

South Korea and Japan have been at the forefront of 5G adoption in Asia. Around 40-59% of Japanese and South Korean mobile subscribers are expected to be on this network by CY25, per GSMA.

South Korea had the largest share of population coverage on 5G as of Dec'20 and ended May'21 with 15.84mn subscribers, per GSMA. The country's largest telco, SK Telecom, ended May with a total of 7.39mn subscribers in the 5G segment, followed by KT with 4.8mn and LG Uplus with 3.6mn. As per Opensignal, South Korea scored the highest among all countries in 5G mobile download and upload speeds as of Dec'20.

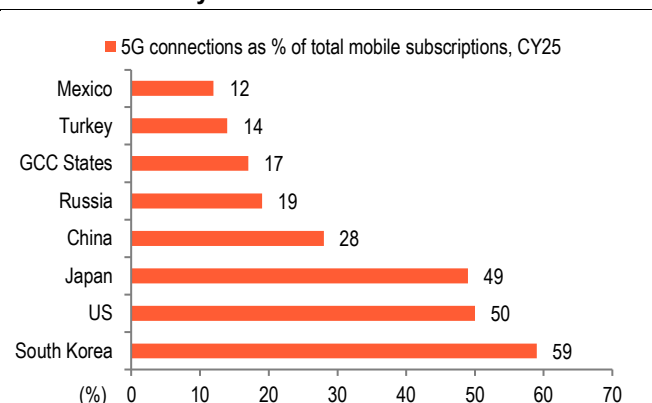
Notably, though China, Japan and South Korea started off as the countries with the highest share of 5G coverage, the US is expected to outperform them in the near future (GSMA). However, South Korea will likely continue to have the largest share of population covered by CY25.

Fig 30 – China, Japan and South Korea led in 5G connection share as of May'20 but US moving ahead



Source: BOBCAPS Research, GSMA May'20

Fig 31 – South Korea to top 5G connection share by CY25 followed by the US

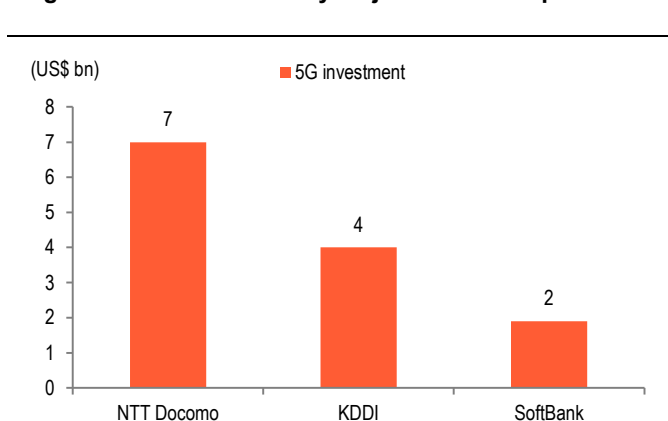


Source: BOBCAPS Research, Statista, GSMA Dec'20

Japanese telco NTT Docomo began 5G research in 2010 and officially launched commercial services in Mar'20 with a maximum initial data speed of 3.4Gbps. The company plans to invest roughly US\$ 7bn to expand its network to cover 97% of the country's population by CY25, as well as install 8,001 BTS in the 3.7GHz and 4.5GHz spectrum bands and 5,001 BTS in the 28GHz band.

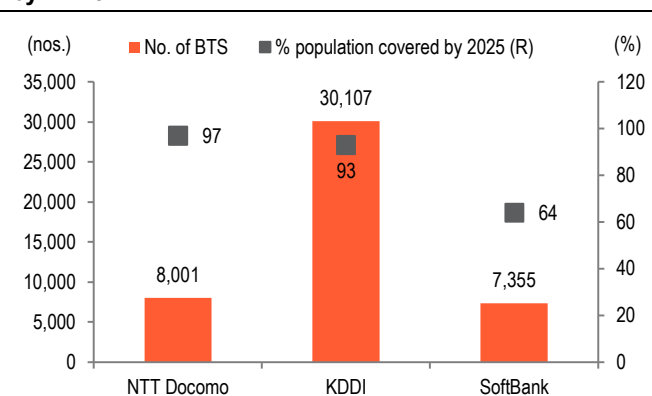
SoftBank and KDDI are two other major 5G players in Japan. SoftBank plans to invest over US\$ 1.9bn to cover 64% of the country's population by CY25. KDDI has announced an investment of US\$ 4bn to expand its 5G network and plans to cover 93% of the population over five years.

Fig 32 – 5G investments by major telcos in Japan



Source: Company, BOBCAPS Research

Fig 33 – Majority of Japan's population to be 5G covered by CY25



Source: Company, BOBCAPS Research

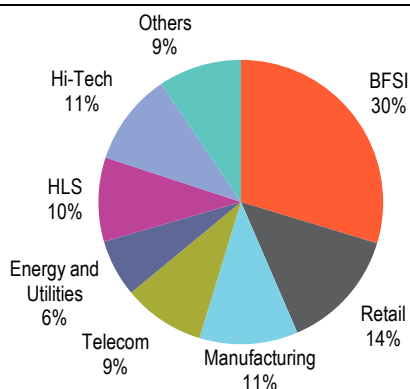
TECHM – key beneficiary among Indian IT players

Following robust Jun'21 quarter results and a rebound in the telecom vertical across our IT services coverage, we reiterate TECHM as our top large-cap pick. We expect the company to deliver strong growth given its highest exposure to the telecom sector (40% revenue share), robust deal wins and marquee client base. We have an unchanged Sep'22 TP of Rs 1,660, set at a one-year forward P/E of 20x.

Highest telecom exposure among peers

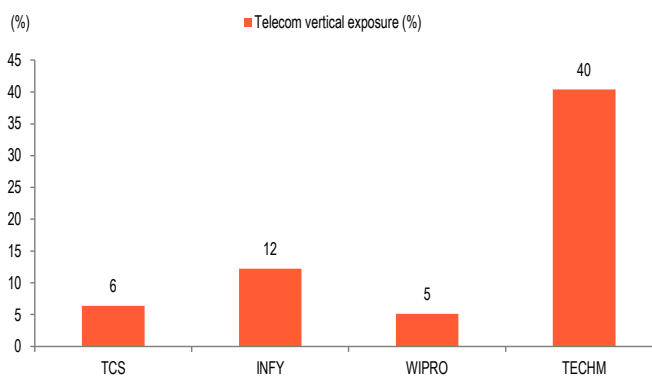
Telecom is one of the key verticals for Indian IT companies after BFSI, retail & manufacturing, hi-tech, and healthcare & life sciences – it formed ~10% of revenue for the top 5 players (TCS, Infosys – INFO, HCL Tech – HCLT, Wipro – WPRO, and TECHM) as of Q1FY22. Among large-caps, TECHM has the highest telecom exposure at 40.5% of revenue (FY21). INFO and TCS follow at 12% and 6% respectively. For mid-caps under our coverage, the vertical is a relatively smaller revenue contributor – possibly due to the peculiarity of the telecom industry which is dominated by a few large service providers.

Fig 34 – Revenue share of telecom vertical at ~10% for top-5 Indian IT players, Q1FY22



Source: Company, BOBCAPS Research | Top 5 IT – TCS, INFO, HCLT, WPRO, TECHM | HLS: Healthcare and Life-Sciences

Fig 35 – TECHM has the highest exposure to the telecom vertical, Q1FY22



Source: BOBCAPS Research, Company

Technology change cycle offers large opportunity

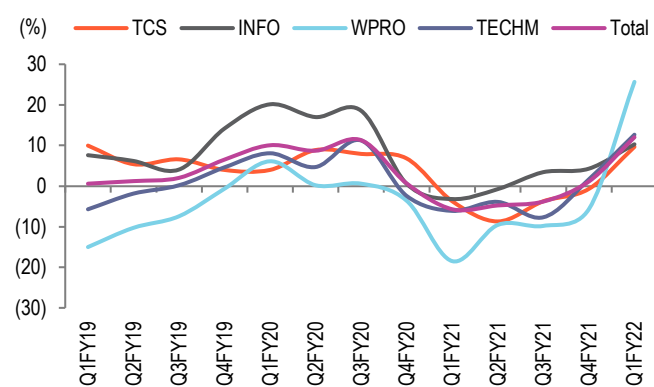
Most of the work for TECHM and similar IT companies during a telecom technology change cycle revolves around system integration and making apps, workloads and device operating systems compatible with the new generation (5G) technology – this involves changing the source code and debugging any compatibility errors.

There is usually a gap of a couple of years between spectrum auction of a new generation technology and its outsourcing to IT players. Firstly, the telecom companies set up hardware and software. Thereafter, they turn to IT service providers to manage and run them. Hence, (OEMs) such as Nokia, Ericsson and Samsung usually have the opportunity to participate in the rollout phase early on. Later, IT firms step in to offer IoT platforms, data analytics solutions and cloud migration of data as part of managing the network.

Resurgent June quarter performance

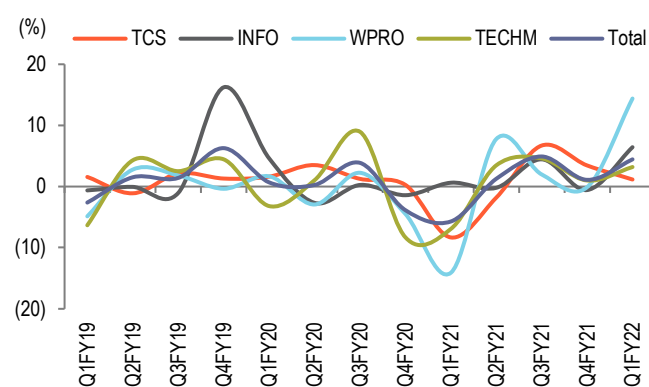
In Q1FY22, Indian IT companies saw resurgent YoY growth in their telecom/communications vertical led by 5G, after five subdued quarters. QoQ growth also seemed to break out of its usual pattern. TECHM performed well with 3.2% QoQ and 12.6% YoY USD growth. We expect the company's growth momentum to continue given deal wins of US\$ 815mn TCV (+180% YoY) in Q1 and a client base comprising all major telcos in the US and Europe.

Fig 36 – Indian IT saw a YoY growth upsurge in telecom vertical revenue in Q1FY22...



Source: Company, BOBCAPS Research

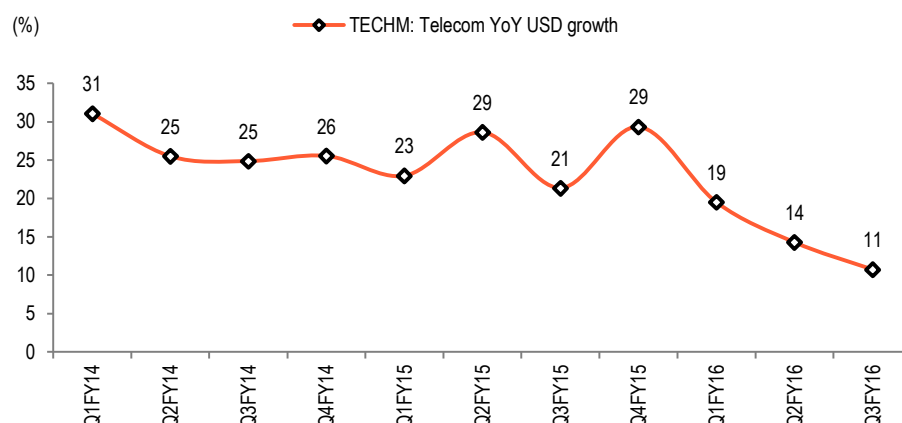
Fig 37 – ...and an upbeat QoQ print as well



Source: Company, BOBCAPS Research

When 4G was picking up in the US during FY14-FY15, TECHM posted double-digit YoY growth in its telecom vertical for 10 quarters. We expect the company to clock a similar growth escalation for a prolonged period as the 5G technology cycle gains momentum.

Fig 38 – TECHM: Expect FY14-FY15 YoY growth spurt in telecom vertical to recur post 5G commercialisation...



Source: Company, BOBCAPS Research

Reiterate BUY on TECHM

At ~20x FY23E P/E, TECHM is the lowest valued stock among tier-I players. It is trading at 51% premium to its five-year mean but still lags the 60-70% premium garnered by tier-I peers. We reiterate our positive stance on TECHM given its large exposure to the telecom vertical and ongoing pickup in 5G demand. Our FY22/FY23

EPS estimates remain at Rs 66.6/Rs 77.9. We value the stock at an unchanged one-year forward P/E of 20x – our Sep'22 TP remains unchanged at Rs 1,660.

Fig 39 – TECHM trading at a discount to tier-I IT players

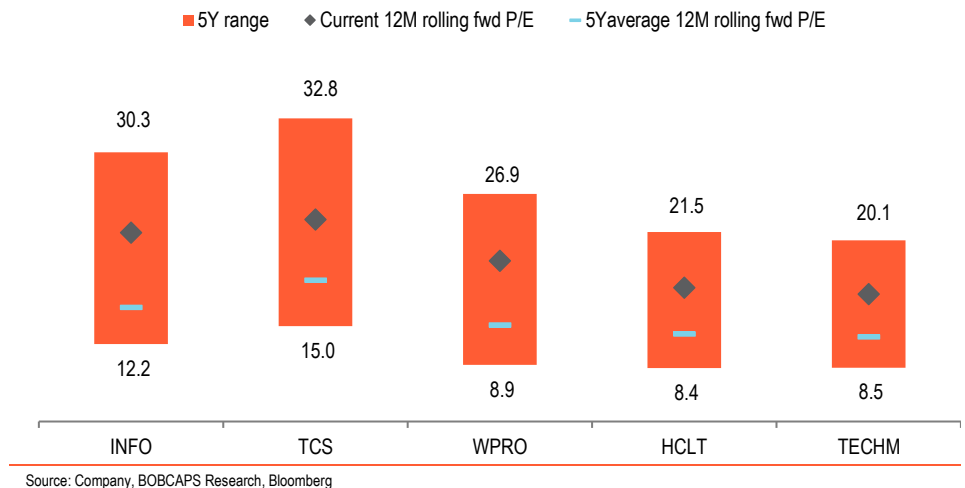


Fig 40 – Stock performance

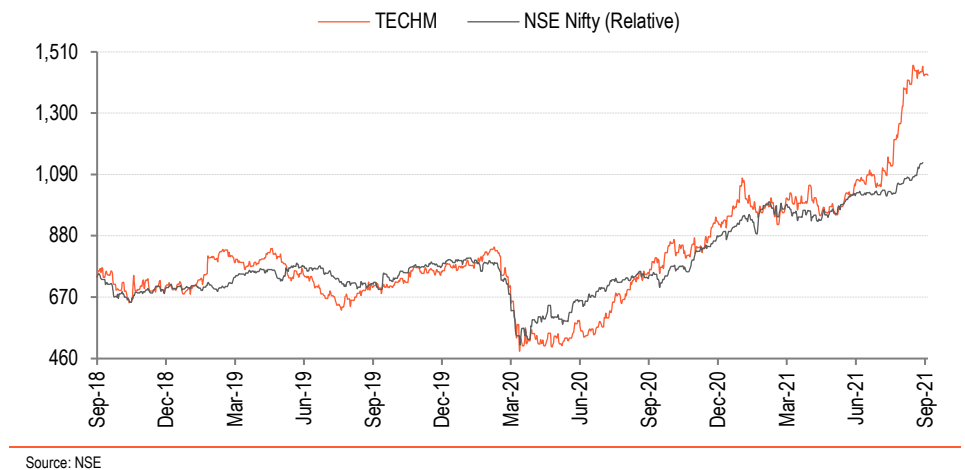


Fig 41 – Peer comparison

Ticker	Rating	CMP (Rs)	TP (Rs)	EPS (Rs)			ROE (%)		US\$ revenue CAGR FY21-23E (%)	P/E (x)	
				FY22E	FY23E	FY24E	FY22E	FY23E		FY22E	FY23E
TCS IN	BUY	3,845	4,270	109.8	127.0	145.4	41.6	39.0	15.1	35.0	30.3
INFO IN	BUY	1,692	2,020	54.1	61.1	67.0	29.7	31.5	14.3	31.2	27.7
WPRO IN	HOLD	671	620	23.5	27.1	29.4	21.2	21.7	18.0	28.5	24.8
HCLT IN	BUY	1,208	1,360	52.2	59.0	64.6	21.5	21.8	11.3	23.2	20.5
TECHM IN	BUY	1,430	1,660	66.6	77.9	89.7	21.8	22.7	13.9	21.5	18.4
LTI IN	BUY	5,489	5,960	134.1	158.4	181.8	29.5	29.3	18.7	40.9	34.7
MPHL IN	HOLD	3,000	3,020	82.0	95.7	108.0	22.5	24.3	14.0	36.6	31.3
MTCL IN	SELL	3,935	2,400	87.7	93.9	112.2	31.0	28.4	15.8	44.9	41.9
PSYS IN	HOLD	3,588	3,050	74.0	91.4	104.2	19.9	21.5	21.0	48.5	39.2
COFORGE IN	BUY	5,178	5,860	131.8	174.3	219.1	25.3	28.8	26.8	39.3	29.7

Source: Company, BOBCAPS Research

Financials – TECHM

Income Statement

Y/E 31 Mar (Rs mn)	FY20A	FY21A	FY22E	FY23E	FY24E
Total revenue	368,677	378,551	441,945	518,834	597,979
EBITDA	57,261	68,471	85,355	103,288	119,070
Depreciation	14,458	14,577	14,190	16,603	19,135
EBIT	42,803	53,894	71,165	86,686	99,935
Net interest inc./(exp.)	(1,919)	(1,740)	(1,544)	(1,650)	(1,650)
Other inc./(exp.)	11,924	7,871	6,380	3,503	3,503
Exceptional items	0	0	0	0	0
EBT	52,753	59,530	76,029	88,578	101,848
Income taxes	11,604	15,999	18,517	21,702	24,953
Extraordinary items	0	0	0	0	0
Min. int./Inc. from assoc.	1,301	762	1,103	1,640	2,060
Reported net profit	42,505	44,281	58,587	68,477	78,895
Adjustments	0	0	0	0	0
Adjusted net profit	42,505	44,281	58,587	68,477	78,895

Balance Sheet

Y/E 31 Mar (Rs mn)	FY20A	FY21A	FY22E	FY23E	FY24E
Accounts payables	0	0	0	0	0
Other current liabilities	103,830	102,292	115,027	135,039	155,638
Provisions	11,055	13,121	12,108	14,215	16,383
Debt funds	24,282	16,618	16,618	16,618	16,618
Other liabilities	12,304	12,304	12,304	12,304	12,304
Equity capital	4,359	4,370	4,370	4,370	4,370
Reserves & surplus	217,705	248,075	279,488	315,860	357,609
Shareholders' fund	222,064	252,445	283,858	320,230	361,979
Total liab. and equities	373,535	396,780	439,915	498,406	562,922
Cash and cash eq.	30,167	26,904	47,606	88,241	134,827
Accounts receivables	75,772	64,728	87,178	102,345	117,958
Inventories	358	242	242	242	242
Other current assets	121,702	110,932	114,056	120,376	126,881
Investments	61,046	104,436	104,436	104,436	104,436
Net fixed assets	76,047	80,405	77,264	73,632	69,446
CWIP	501	1,183	1,183	1,183	1,183
Intangible assets	33,877	40,082	40,082	40,082	40,082
Deferred tax assets, net	8,443	9,133	9,133	9,133	9,133
Other assets	0	0	0	0	0
Total assets	373,535	396,780	439,915	498,406	562,922

Cash Flows

Y/E 31 Mar (Rs mn)	FY20A	FY21A	FY22E	FY23E	FY24E
Cash flow from operations	46,075	64,824	49,926	78,959	91,528
Capital expenditures	(15,386)	(12,048)	(11,049)	(12,971)	(14,949)
Change in investments	(16,880)	43,390	0	0	0
Other investing cash flows	13,843	(64,787)	7,924	5,153	5,153
Cash flow from investing	(18,423)	(33,445)	(3,125)	(7,818)	(9,796)
Equities issued/Others	0	(569)	0	0	0
Debt raised/repaid	0	(13,624)	0	0	0
Interest expenses	0	(1,789)	0	0	0
Dividends paid	(17,912)	(18,660)	(26,099)	(30,505)	(35,146)
Other financing cash flows	0	0	0	0	0
Cash flow from financing	(17,912)	(34,642)	(26,099)	(30,505)	(35,146)
Chg in cash & cash eq.	9,740	(3,263)	20,702	40,635	46,585
Closing cash & cash eq.	30,167	26,904	47,606	88,241	134,827

Per Share

Y/E 31 Mar (Rs)	FY20A	FY21A	FY22E	FY23E	FY24E
Reported EPS	48.3	50.4	66.6	77.9	89.7
Adjusted EPS	48.3	50.4	66.6	77.9	89.7
Dividend per share	16.9	17.6	24.6	28.8	33.2
Book value per share	252.5	287.1	322.8	364.1	411.6

Valuations Ratios

Y/E 31 Mar (x)	FY20A	FY21A	FY22E	FY23E	FY24E
EV/Sales	3.4	3.3	2.8	2.4	2.0
EV/EBITDA	21.7	18.1	14.5	11.9	10.0
Adjusted P/E	29.6	28.4	21.5	18.4	15.9
P/BV	5.7	5.0	4.4	3.9	3.5

DuPont Analysis

Y/E 31 Mar (%)	FY20A	FY21A	FY22E	FY23E	FY24E
Tax burden (Net profit/PBT)	80.6	74.4	77.1	77.3	77.5
Interest burden (PBT/EBIT)	123.2	110.5	106.8	102.2	101.9
EBIT margin (EBIT/Revenue)	11.6	14.2	16.1	16.7	16.7
Asset turnover (Rev./Avg TA)	104.1	98.3	105.6	110.6	112.7
Leverage (Avg TA/Avg Equity)	1.6	1.6	1.6	1.6	1.6
Adjusted ROAE	19.8	18.7	21.8	22.7	23.1

Ratio Analysis

Y/E 31 Mar	FY20A	FY21A	FY22E	FY23E	FY24E
YoY growth (%)					
Revenue	6.1	2.7	16.7	17.4	15.3
EBITDA	(9.6)	19.6	24.7	21.0	15.3
Adjusted EPS	1.2	4.2	32.3	16.9	15.2
Profitability & Return ratios (%)					
EBITDA margin	15.5	18.1	19.3	19.9	19.9
EBIT margin	11.6	14.2	16.1	16.7	16.7
Adjusted profit margin	11.5	11.7	13.3	13.2	13.2
Adjusted ROAE	19.8	18.7	21.8	22.7	23.1
ROCE	15.1	16.3	20.7	24.9	29.2

Working capital days (days)

Receivables	72	68	63	67	67
Inventory	1	0	0	0	0
Payables	114	121	111	110	111

Ratios (x)

Gross asset turnover	5.0	4.8	5.6	6.9	8.4
Current ratio	2.0	1.8	2.0	2.1	2.2
Net interest coverage ratio	(22.3)	(31.0)	(46.1)	(52.5)	(60.6)
Adjusted debt/equity	0.0	0.0	(0.1)	(0.2)	(0.3)

Source: Company, BOBCAPS Research | Note: TA = Total Assets

Disclaimer

Recommendation scale: Recommendations and Absolute returns (%) over 12 months

BUY – Expected return >+15%

HOLD – Expected return from -6% to +15%

SELL – Expected return <-6%

Note: Recommendation structure changed with effect from 21 June 2021

Our recommendation scale does not factor in short-term stock price volatility related to market fluctuations. Thus, our recommendations may not always be strictly in line with the recommendation scale as shown above.

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