Building a resilient enterprise: Now, Next and Beyond

Sector response to COVID-19 Telecommunications

May 2020

EY
Building a better working world

Contents

"The world is facing the worst economic fallout since the great depression"

- Kristalina Georgieva, IMF Chief

The COVID-19 pandemic and the subsequent lockdown has dealt a severe blow to an already-stressed global economy

The suddenness, spread and severity of the pandemic across the globe has pushed countries and institutions into uncharted territories

200+ countries, areas or territories with COVID-19 cases

3 billion people under lockdown or 1/3rd of the world's population

Simultaneous **double digit dip** in global supply and demand

2-3% contraction of global GDP

Global unemployment levels at an all time high

170 countries to experience negative per capita income growth in 2020-21

~2500+ government pronouncements to manage the crisis

Significant decline predicted for global trade in 2020-21

 # Estimates based on multiple sources: Bloomberg, UNCTAD, WEF, WTO & ILO.

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Covid-19 will have significant implications for an already stressed Indian economy

Macroeconomic impact

Significant dip in GDP growth while India continues to be among the fastest growing economies globally

Adverse impact on fiscal deficit due to dual impact of fiscal stimulus and lower revenue collections

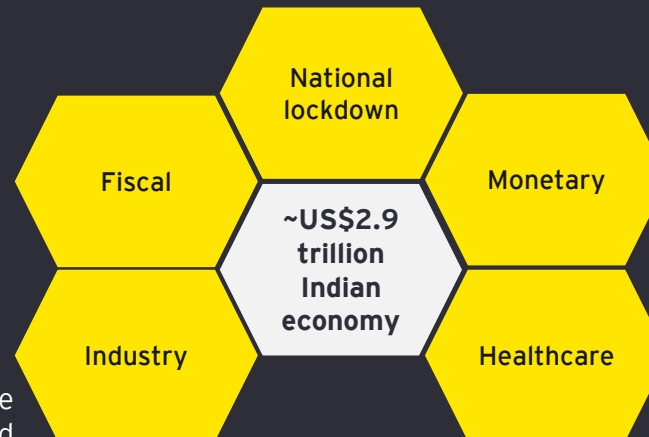Substantial erosion of investor wealth due to flight of foreign capital

India's response – *economic recovery to commence with graded relaxation of lockdown from 4 May 2020*

Stringent national lockdown
Stringency Index (100=strictest)

🇮🇳	🇮🇹	🇪🇸	🇬🇧	🇺🇸
100	95.2	90.5	71.4	66.7

Economic stimulus of INR1.7 trillion

Food security measures for poor

Direct cash transfers

Govt. to bear employee provident fund contributions

Extension of dates for filing financial results

Accelerated payment of government dues to small / medium industries

Hexagon diagram:
- National lockdown
- Fiscal
- Monetary
- ~US$2.9 trillion Indian economy
- Industry
- Healthcare

CRR cut to release INR ~1.4 trillion liquidity

Repo rate reduced to historical low of 4.4%
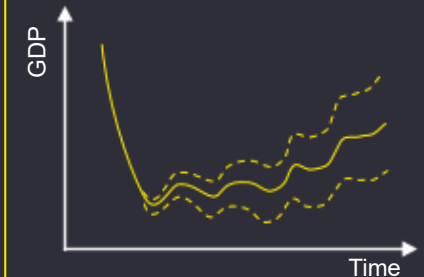
Moratorium on loan payments

INR 150 billion allocated to augment healthcare

Government-sponsored insurance cover for all healthcare workers

600+ dedicated hospitals, 100K+ isolation beds

Path to recovery

Most likely scenario
"See-saw" recovery

► Deeper and pervasive recession, followed by a slower recovery and likely deflation

► Higher public deficit levels due to stimulus programs

► Protracted weak demand and global value chain disruptions

► Higher capital outflows and currency depreciation

 # Multiple sources: Oxford, Bloomberg, Reuters & RBI.

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Sectoral impact of the crisis shall vary across industries

Categories affected by COVID-19	Banking, financial services & insurance	Energy & resources	Healthcare & life sciences	High Tech & tele-communications	Media & entertainment	Public sector	Retail	Advanced manufacturing	Mobility	Education	Non-profits	Travel & transportation
Workforce	Significant	Moderate	Major	Significant	Significant	Moderate	Severe	Severe	Severe	Severe	Severe	Severe
Operations	Significant	Moderate	Severe	Moderate	Severe	Moderate	Moderate	Severe	Severe	Moderate	Moderate	Severe
Supply chain	Minor	Severe	Moderate	Severe	Moderate	Minor	Severe	Severe	Severe	Minor	Minor	Severe
Revenues	Severe	Moderate	Moderate	Severe	Significant	Significant	Moderate	Severe	Severe	Severe	Severe	Severe
Overall assessment	Significant	Moderate	Moderate	Moderate	Moderate	Significant	Severe	Severe	Severe	Moderate	Moderate	Severe

Legend: ○ Minor ◔ Moderate ◑ Significant ◕ Major ● Severe

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Prolonged see-saw shaped recovery shall lead to a *new normal* across sectors...

New normal shall emerge across the economy...

Industries

Industries may experience a step-change in digitalization, flexibilization and resilience considerations

Markets

Market roles shall increasingly be based on trust and shared risk

Societies

Employee and consumer behavior will change irrevocably

...having a cross-sectoral impact

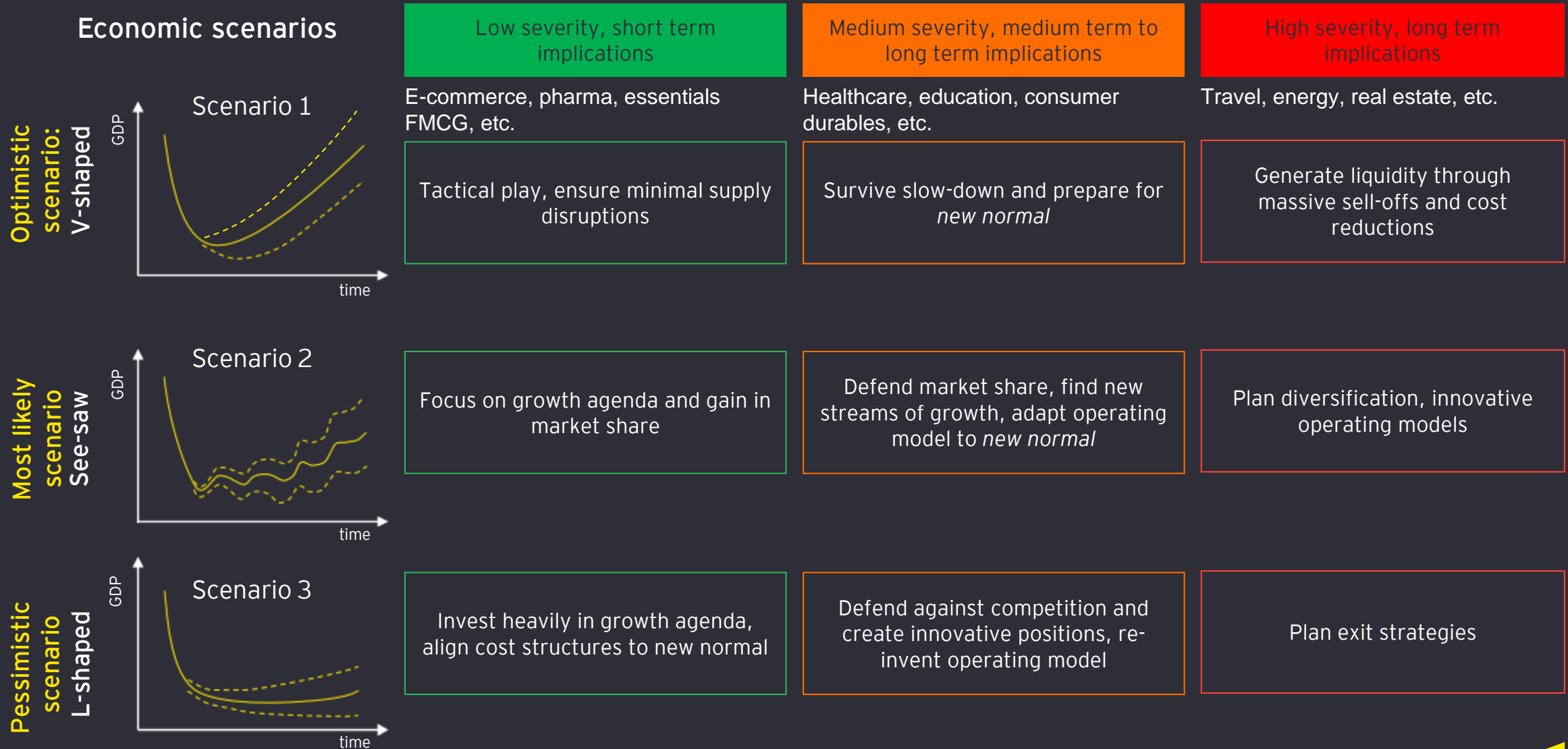|	
Virtualization of customer interactions	Consumers see the benefit of virtual and online service offerings and are likely want to keep it after the pandemic.
Reputation and trust	Companies have an increased focus on their reputation and are offering services for free, support their neighborhood or repurpose their production capacities for required goods.
Sharing resources	Companies are adapting their supply chain and ecosystem to the new challenges, creating new collaborations, alliances and asset-sharing business models that are blurring the boundaries of established industries.
Fluid workforce	The changes to working styles can lead to the transformation of established working models in the long term.
Supply chain repurposing/adjusting	Companies reassess their supply chain strategies and identify measures to strengthen local/regional supply chains and to reduce assets.
Infrastructure will become a bottleneck	Logistics are a likely bottleneck impacting global supply chains.
Digitalization is picking up speed	The pandemic shows the weaknesses of today's systems, particularly with regard to flexibility, visibility, paperless processes and forecasting capabilities.
Regulators will continue to becoming more flexible	Regulators became more flexible, adjusting regulation to face new challenges.

Source: EY Knowledge

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…each sector will need to adapt their response

Economic scenarios

	Low severity, short term implications	Medium severity, medium term to long term implications	High severity, long term implications
	E-commerce, pharma, essentials FMCG, etc.	Healthcare, education, consumer durables, etc.	Travel, energy, real estate, etc.
Optimistic scenario: V-shaped — Scenario 1	Tactical play, ensure minimal supply disruptions	Survive slow-down and prepare for *new normal*	Generate liquidity through massive sell-offs and cost reductions
Most likely scenario See-saw — Scenario 2	Focus on growth agenda and gain in market share	Defend market share, find new streams of growth, adapt operating model to *new normal*	Plan diversification, innovative operating models
Pessimistic scenario L-shaped — Scenario 3	Invest heavily in growth agenda, align cost structures to new normal	Defend against competition and create innovative positions, re-invent operating model	Plan exit strategies

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Challenges for telecom and digital infrastructure companies

	Impact on telecoms sector
1	Subscriber addition impacted due to retail store closure
2	Inaccessibility to offline recharges impact feature phone and rural users
3	Customer support services under strain
4	Pressure on telecom networks as data consumption spirals
5	Low adoption of business collaboration and productivity tools impact remote working
6	Surge in teleworking increases cyber and data security risks
7	Telecom and OEM companies exposed to long-term supply side risks
8	Inability to contain costs to adversely impact net margin and working capital
9	Financial accounting and reporting considerations in book of accounts

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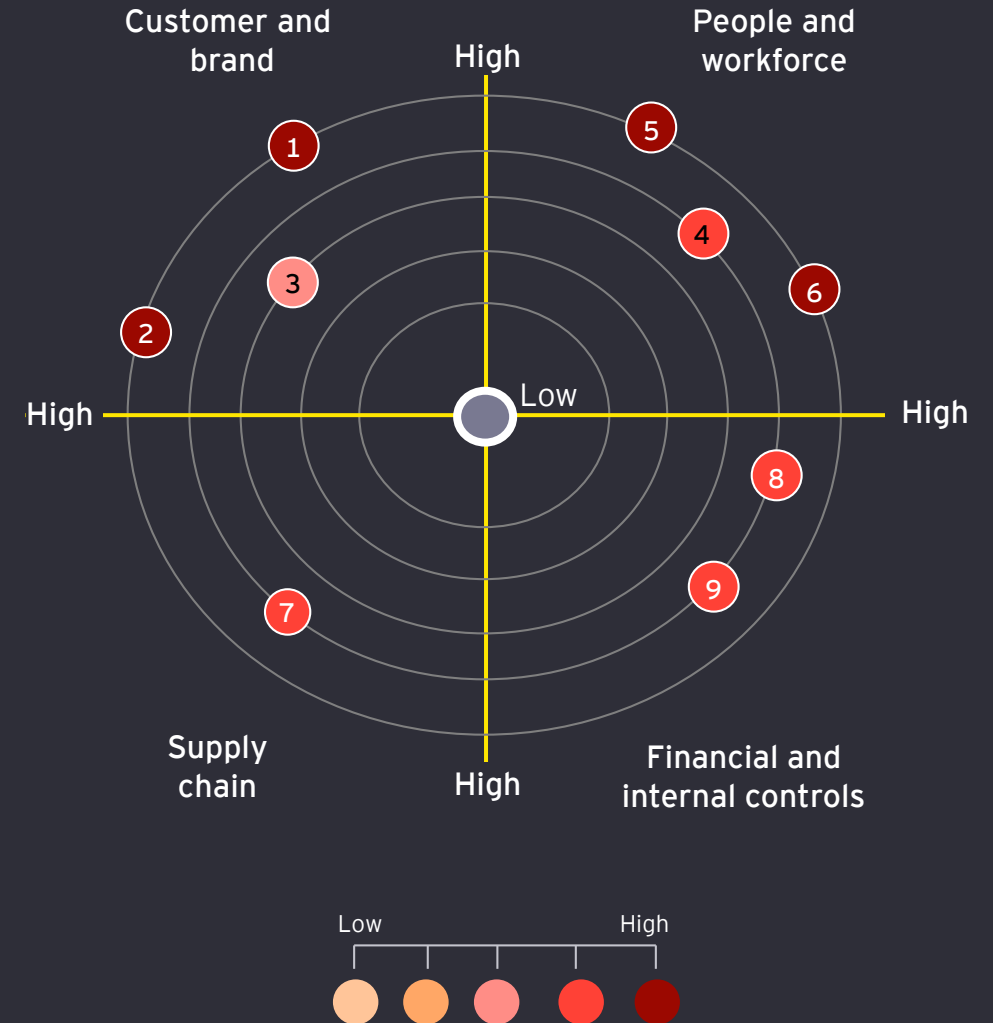
Client conversations within telecoms

Sector developments

1. Customer onboarding
Impact: Telcos, DTH, broadband providers

Low ○ ○ ○ ○ ● High

- No subscriber addition with retail store closure
  - Subscriber adds: 3 m (Feb'20); 1.5 m (Mar'20) and Nil (Apr'20)
- e-KYC requires physical visit. Absence of end-to-end digital process impacts customer onboarding
- Fulfilment issues impact installation of DTH and broadband (dongles, modem) connections

> - How can telcos onboard new customers and navigate KYC challenges?
> - What innovative strategies can be adopted for delivery of essential services like SIMs?
> - How will changes to customer operations drive long-term shifts to digital channels?

2. Offline recharge of prepaid plans
Impact: Telcos

Low ○ ○ ○ ○ ● High

- Telcos dispense 2.2 m recharges daily - 60% offline
- Impacts 250m prepaid users –150 m feature phone and 100 m smartphone users without payment access
- Telcos adopt alternate tie-ups with ATM, pharmacies and grocery stores
- Govt. guidelines permit retail store to partially operate. Physical visits to remain muted amid social distancing

> - In absence of offline retail recharge points, how will feature phone and rural users recharge?
> - How will changes to plan upgrade and bill payments happen?
> - How can emerging technologies together – at scale and speed – increase customers support?

3. Service management
Impact: Telcos, DTH, broadband providers

Low ○ ○ ● ○ ○ High

- Companies call centers running at reduced capacity – increase lead time to service for query resolution
- Focus on digital self-care tools for recharge, bill payment; chatbots for query resolution
- Significant impact on feature phone users

> - How do telcos balance customer support on query and complaints with remote workforce?
> - What are the cost benefits of digital service enablement over physical set ups?
> - How will customer experience function look like now?

4. Network operations
Impact: Telcos, infra providers (OEMs, tower cos)

Low ○ ○ ○ ● ○ High

- Surge in demand for home broadband
- Network traffic increased 20%. No short term impact – networks designed to absorb surge in traffic
- Logistical issues impact tower installations and O&M (diesel refill, site inspection)
- 20% of telco workforce in front line (NOC, Site maintenance). Multiple documentation for curfew passes cause delays

> - How do you manage distributed workforce to ensure uninterrupted services to users?
> - How can digitalization and automation drive network efficiencies?
> - Have telcos identified traffic bottlenecks and adopted prioritization tools to balance network issues?

Questions EY can help answer

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Client conversations within telecoms

Sector developments

5 Remote working for businesses
Impact: All

Low ○—○—○—○—●—High

▶ Absence of adequate business collaboration and productivity tools impacting SMEs and start-ups' remote workforce
▶ Increase enterprise play: Offer unified communication, cloud based productivity apps and security-as-a service
▶ Remote workforce: Security and access management

▶ Is business equipped to handle growing virtual workforce in the current scenario?
▶ Is there a talent management plan in place to drive Productivity from Home (PFH))?
How can telcos shape new value propositions and accelerate SMEs fully into the cloud?

6 Cyber security
Impact: All

Low ○—○—○—○—●—High

▶ Cyber risks - phishing, malware, COVID-19 related ransomware attack, security breaches
▶ Companies to strengthen cyber resilience:
▶ VPN licenses and endpoint security
▶ Security Information and Event Management (SIEM)
▶ Preferential Access Management (PAM)

▶ Do companies have business continuity plans in place?
▶ Have companies adopted measures to detect and monitor events from employees and threat actors?
▶ Are there proper controls to wipe, restrict, revoke and take action against threats?

7 Supply chain
Impact: Telcos, OEMs, handsets

Low ○—○—○—●—○—High

▶ High dependence on imports from Asian hubs - mobile components (85%) and telco network gear (US$5b - US$6b annually)
▶ High impact on handset industry. Production halts to wipe US$2.8b – US$4b in revenues
▶ Long term supply disruption may trigger price hikes

▶ How can companies optimise supply chain to manage inventory risks and ease working capital?
▶ What will be the tax and cost implications of diversifying supply chain exposure?
▶ Is single vendor sourcing approach better than multi-vendor approach?

8 9 Cash conservation and treasury management
Impact: All

Low ○—○—○—●—○—High

▶ Cash flow management
▶ Weak cash controls to spill over on priority payments – employees, vendors and taxes
▶ Accounting implications - fair value measurement, additional disclosures, forex and treasury management
▶ Impact of government stimulus, tax and regulatory developments

▶ What steps can be taken to fast-track cash positions and implement dynamic cash forecasting?
▶ What strategies can be taken to reduce cash outgoes?
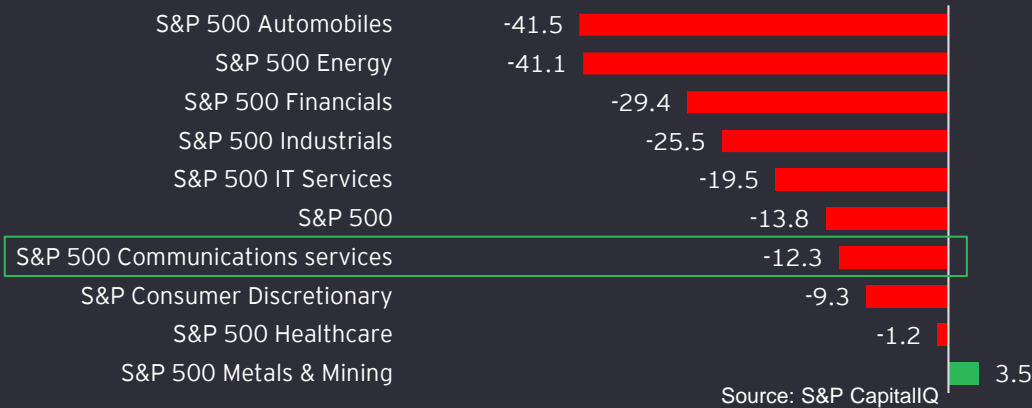▶ Do companies have tuned policies in place and a team to deal with adjusted billing and collections?

Questions EY can help answer

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Impact and outlook for telecom sector

Global impact on the sector

Global telco share performance is less impacted than other sectors

Change in S&P sector index value 03 Feb '20 to 16 Apr'20

Sector	Value
S&P 500 Automobiles	-41.5
S&P 500 Energy	-41.1
S&P 500 Financials	-29.4
S&P 500 Industrials	-25.5
S&P 500 IT Services	-19.5
S&P 500	-13.8
S&P 500 Communications services	-12.3
S&P Consumer Discretionary	-9.3
S&P 500 Healthcare	-1.2
S&P 500 Metals & Mining	3.5

Source: S&P CapitalIQ

- ▶ **Revenues:** Revenue in developed markets to decline 3.4% YoY
  - ▶ Decline in international roaming revenues (~6% of billed revenue/year) in tourism-heavy countries
  - ▶ Impact of freebies and waivers offered to B2C subscribers
  - ▶ Decline in global SME ICT spending to impact enterprise revenues
- ▶ **Infrastructure rollouts:** Supply side disruption to slow down 5G and fibre rollouts - reduction in capex. Potential upside in 2021- broadband demand to fast-track roll outs
- ▶ **Supply chain:** Global smartphone shipment to decline 3.1% YoY in 2020. Production slow down in Asian manufacturing hubs impact global supply of panels, touch sensors and printed circuit board
- ▶ **Network operations**: 10% - 70% spike in network traffic reported. Overall network resilience positive with increased telco focus on traffic management

Impact on India

India mobile services revenue to remain flat

Impact on mobile services revenue growth

Market	Pre-COVID FY20 service revenue growth	Revised FY20 service revenue growth	Change
Hong Kong	(0.4%)	(5.6%)	▼ 5.3 pps
Thailand	5.3%	2.0%	▼ 3.3 pps
Singapore	(0.1%)	(2.5%)	▼ 2.5 pps
Malaysia	1.5%	(0.7%)	▼ 2.2 pps
Indonesia	6.2%	4.6%	▼ 1.5 pps
India	17.7%	16.1%	▼ 1.5 pps
Philippines	8.2%	6.9%	▼ 1.4 pps
China	3.5%	2.3%	▼ 1.3 pps
Australia	(3.6%)	(4.4%)	▼ 0.8 pps
Korea	2.8%	2.6%	▼ 0.1 pps

Source: Credit Suisse

- ▶ **Revenues:** Muted revenue growth as subscriber addition falls
  - ▶ Decline in roaming revenues (~2% of mobile service revenue)
  - ▶ Slowdown in migration of 2G voice-only customers to 4G
  - ▶ Financial impact of validity extension to low-income users
  - ▶ Decline in offline recharge of voice and data packs for prepaid users
- ▶ **Digital adoption:**
  - ▶ Digital recharge of voice and data plans structurally positive – adoption grew 40% to 55% in past weeks
  - ▶ Increased data consumption - online learning, content streaming, video conferencing, remote working
- ▶ **Supply chain**: Domestic production slowdown to decline smartphone shipments by 3% Y-o-Y
  - ▶ Import challenges persist - 87% of mobile phone components sourced from Asian manufacturing hubs running at low capacity with manpower shortage
- ▶ **Network operations**: Telecom network remain resilient. Network Operations Centers (NOCs), virtual WAR Rooms and 20% of telecom staff on front line activated to ensure uninterrupted services

SWOT analysis for the telecom sector in India

STRENGTH

- Large subscriber base (1.1 billion). Limited churn as telcos focus on improving customer experience
- Rise in data consumption – data usage is highest globally at 11 GB per user per month
- Tariff rationalisation in Dec'19 to offset decline in revenues
- Resilient networks, function at 60% - 65% network capacity – well designed to address sudden spike in demand
- Improved market performance – stock price of listed Indian telcos recorded 15%-35% rise in last one month

WEAKNESS

- Financial duress - high debt (1.8x sector revenue) and pressure on EDITDA and profit margins
- Slowdown in customer acquisition to impact revenues
- Customer service for feature phone users
- Impact of handset industry slowdown: upward of US$3b production loss due to manufacturing halts; inability to meet demands amid restriction on offline sales
- Piecemeal approach to scale digitalization for internal efficiencies

OPPORTUNITIES

- Accelerate digitalization to reduce cost and real-time insights:
  - Service management: Call centre automation, chatbots, self-care
  - Internal processes: Digital HR, finance and tax functions
  - Network virtualisation and move to full cloud environment
- Accelerate enterprise play: upsell to support remote working of businesses
- Content partnerships to augment B2C play
- Focus on new value propositions in healthcare, education, gaming and agriculture

THREATS

- Delay in 5G and fiber roll-outs
- High prepaid market – mobile recharge on offline channels
- Cyber vulnerabilities – high risk of data theft and brand damage
- Increased risk of frauds – inadequate controls and changes in processes to support business continuity
- Supply chain volatilities – high import dependence and limited manpower

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Reversing the curve: From Now to Next and Beyond

Performance

Growth levers to drive revenues and optimize costs

Revenues

Cost

EBITDA run rate improving

EBITDA run rate to potentially decline

EBITDA run rate normalizes

Accelerate enterprise play
Customise remote working solutions for SMEs

Enhance B2C play
Partnerships for content and gaming

New revenue streams
Platform play for Education, Agriculture and Healthcare

Advance network services
SD WAN, cloud partnerships and UCC

Short term cash conservation
Accelerate receivables and delay payables, intelligently

Reduce operating leverage
Migrating from fixed to variable cost model

Drive cost efficiencies
End-to-end automation/digitalisation processes
Shift in operating model (e.g. NetCos)

Pre COVID-19

Now
Immediate 3 months

Next and Beyond
3 -12 months

Time

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Now, Next, Beyond for telecommunications – actions

Enterprise focus areas	How is it playing out for the telecoms sector	Actions — Immediate 3 months (Now)	3 to 6 months (Next)	Beyond 6 months (Beyond)
Customer experience	▸ Self-care tools (digital, app, IVR, USSD) ▸ Distributed and lean call center operations	▸ Facilitate secure remote working for SMEs - security, equipment, reliable connectivity ▸ Safety protocols for field engineers and increase availability of self-install and troubleshooting ▸ Route call centre traffic to self-care (IVR, USSD, social media, app, chat bots) ▸ Explore availability of recharge points at – tie ups with co-operatives ▸ Digitize lead to fulfilment journey for enterprise customers	▸ Reshape and refresh business continuity plan ▸ Embrace automated operation and maintenance programs ▸ Leverage SDN/NFV for network agility ▸ Scenario based RAN planning ▸ Fast-track process automation and use of IoT sensors (e.g., diesel filling) ▸ Accelerate fibre rollout in high density areas (e.g., society buildings)	▸ Deploy cognitive chatbots and virtual call centre ▸ Intelligent and voice enabled kiosks for acquisition, recharge, payments ▸ Extend digital and digitally-assisted purchase options while streamlining your product catalogue
New revenue streams	▸ Accelerate B2B play	▸ Tailored solutions for SMEs (VPN bandwidth, collaboration and productivity tools, security) ▸ Special tariff plans for consumers working from home; additional data top-up plans ▸ Explore newer content partnerships (e.g., age-group or interest-specific) ▸ Strengthen cloud partnerships	▸ B2B – increase play – marketplace ▸ B2C play with cloud gaming, eSports, home automation ▸ Advanced network services (e.g., SD-WAN) and cloud services	▸ Strengthen platform play ▸ Partnerships for industry specific solutions - healthcare, education, IoT for Industry 4.0 ▸ Remote interaction (for sales and service delivery for IT/ ITES/ Professional Services) – UC&C

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Now, Next, Beyond for telecommunications – actions

Enterprise focus areas	How is it playing out for the telecoms sector	Immediate 3 months — Now	3 to 6 months — Next	Beyond 6 months — Beyond
Network resilience	▸ Minimizing network disruption ▸ Geographic re-distribution of network equipment to meet shift in data demand ▸ Capacity augmentation ▸ Shift from HD to SD content streaming to avoid network congestion	▸ Explore Intra Circle Roaming (ICR) ▸ Augment capacity with cell-on-wheels ▸ Overhaul traffic segmentation frameworks ▸ Categorize network services and allocate dedicated channels ▸ Use analytics to optimize energy usage ▸ Allocate additional bandwidth to home networks ▸ Revisit field force route planning to optimise tower O&M ▸ Ensure fuel and diesel availability for towers on priority basis ▸ Engage with local municipality for additional towers/unblock sealed sites	▸ Reshape and refresh business continuity plan ▸ Embrace automated operation and maintenance programs ▸ Leverage SDN/NFV for network agility ▸ Scenario based RAN planning ▸ Fast-track process automation and use of IoT sensors (e.g., diesel filling) ▸ Accelerate fibre rollout in high density areas (e.g., society buildings)	▸ Remote troubleshooting and repair assists ▸ AI-based network planning for 4G/5G ▸ AI-based network automation ▸ Dynamic bandwidth allocation ▸ Recommendation engine factoring site traffic parameters ▸ Automate network query resolution using AI and deep analytics ▸ AI-based RAN optimization
Securing supply chain	▸ Diversify supplier base ▸ Exploring alternatives to deliver RCs/ SIMs to consumers ▸ Ensuring adequate inventory – equipment, CPEs, etc.	▸ Tie-ups with e-commerce and essential services providers ▸ Develop contingency plans, i.e., alternative vendor selection, re-prioritization of network build	▸ Diversify supplier base ▸ Re-evaluate contractual terms ▸ Evaluate tax implications	▸ Increase localisation efforts to avoid future disruption ▸ Adopt multi-vendor strategy to reduce single supplier dependency

Actions

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Now, Next, Beyond for telecommunications – actions

Enterprise focus areas	How is it playing out for the telecoms sector	Actions — Immediate 3 months — Now	3 to 6 months — Next	Beyond 6 months — Beyond
Talent and workforce	▸ Embracing remote working ▸ Distributed workforce management	▸ Improve communication protocols and employee engagement ▸ Repurpose/ reskill idle employees ▸ Identify gaps and review workforce mix ▸ Minimize personnel on-site	▸ Shared field force (partner for managed telecom and whitegoods field service) ▸ Automate network operations and maintenance ▸ Digital training programs for employees	▸ Enhance chatbot and virtual assistants to resolve employee queries remotely ▸ Implement virtual methods of recruitment – leverage AI, RPA and ML ▸ Reskill to shift to digital (e.g., chatbot conversation design, mixed AI-agent customer interactions)
Strengthening cybersecurity	▸ Review VPN licenses ▸ Preferential Access Management (PAM) ▸ Security Incident and Event Management (SIEM) ▸ IT support and help desk support	▸ Desktop-as-a-Service for new joiners ▸ Review and upgrade VPN licenses ▸ Multi-factor Authentication (MFA) ▸ Monitor privileged access ▸ Increase emergency management capabilities ▸ Prepare and deploy security and IT helpdesk ▸ Block emails suspicious emails and spam ▸ Allow remote access to critical IT staff	▸ Increase endpoint monitoring ▸ Nextgen identity and access management ▸ Establish second-factor authentication for formerly in-person processes ▸ Enhance cyber monitoring for enterprise assets ▸ Conduct Vulnerability Assessment/ Penetration Testing (VAPT)	▸ Focus on privacy and trust-by design ▸ Security Information and Event Management Systems (SIEM) for log monitoring ▸ Build or access third party Security Operations Center

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Now, Next, Beyond for telecommunications - actions

Enterprise focus areas	How is it playing out for the telecoms sector

Actions

	Immediate 3 months — **Now**	3 to 6 months — **Next**	Beyond 6 months — **Beyond**

Revisiting cost models	▸ Reduce operating leverage by cost variabilization
	▸ Prioritize CAPEX investments between 4G and FTTx
	▸ Optimize OPEX
		▸ Imbibe cash conscious culture
		▸ Embrace variabilization of costs
		  ▸ Collection – no fixed cost; link to actual collections
		  ▸ Bad debt recovery – % of amount recovered
		  ▸ Manpower cost – increase variable pay linked to revenue
		  ▸ Pass through charges – payments to be settled at net-off basis
		▸ Re-negotiating contracts with ad-vendors for OOH advertising
			▸ Reduce operating leverage by cost variabilization
			  ▸ Pay per use for O&M/ AMC
			  ▸ Collections linked billing cost
			  ▸ Pay per converted click for Digital marketing costs
			  ▸ Payment linked to cash revenues for regulatory charges
			▸ Prioritize CAPEX investments between 4G and FTTx
				▸ Further reduce operating leverage by cost variabilization
				  ▸ Utilization based payments
				  ▸ Stock options/ revenue share instead of fixed rentals
				  ▸ Taxes linked to cash based accounting
				▸ Fast-track implementation of cloud virtual agents and chat bots
				▸ Centralize shared services (e.g., Network planning and Optimization, NOC) and network functions (e.g., SON, SDN/NFV)

Robust IT infrastructure and support	▸ Strengthen IT security framework and resilience	▸ Analytics to identify pockets of instability in IT and re-engineer staffing models ▸ Expedite automation and AI programs (e.g., customer journey mapping, capex planning)	▸ Re-engineer engagement models with IT partners for reducing fixed OPEX and through structures that incentivize movement to shared/cloud infrastructure ▸ Engage process owners in revised transformation plans ▸ Break down silos that are limiting the pace of transformation	▸ Enable shared infrastructure and IT service delivery mode ▸ Leverage AL/ ML platforms to develop self-healing algorithms ▸ Re-engineer engagement models with IT partners to move to shared/cloud infrastructure

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Changing narrative: focus on growth levels to drive big shifts

● Move from digital-first to digital-throughout ●

▶ Drive AI and automation program more broadly across organization and at far greater speed – network, customer, IT, front desk, back office

▶ Digital customer experience: digital channels to self-service and support journeys. Make chatbots much more than a bridge to the call center for complex queries and increases in mixed AI-agent customer interactions

▶ Build and evolve capabilities to support new value propositions, e.g., SD-WAN, cloud networking, SD-WAN

● Revisiting network capex programs, delayed 5G timelines ●

▶ Network capex deferrals – focus toward enhancing capacity and coverage for 4G

▶ Fiber penetration to rise as a result of higher demand for fixed broadband

● Focus on new revenue streams ●

▶ Creating new value propositions through technology innovation and cross-industry partnerships

  ▶ Accelerate enterprise play beyond connectivity – business collaboration tools, cloud based productivity tools, security-as-a-service

  ▶ Partnerships with industry verticals – healthcare (remote diagnostics), education (e-learning), entertainment (content and gaming)

  ▶ Enhance consumer offerings to include cloud gaming and new forms of connectivity

  ▶ Leverage emerging technologies – cloud, AI, automation, blockchain and edge computing to deliver new forms of customer engagement

● Cost efficiencies to gain prominence ●

▶ Transition from fixed cost to variable cost model to reduce operating leverage (pay-per-use for O&M/AMC, Network utilization based site rentals, retail store redundancies)

▶ Automation of business processes for internal efficiencies (e.g., finance, tax, billing and operations)

▶ Fundamental shift in market structures (e.g., formation of Netcos)

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