

A nighttime city skyline with numerous illuminated skyscrapers. Overlaid on the scene are several glowing white arcs and starburst light effects, suggesting digital connectivity and data flow. A large, semi-transparent purple circle is positioned in the lower half of the image, serving as a background for the title text.

Short Term Effects of COVID-19 on Digital Infrastructure in Emerging Markets



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The COVID-19 pandemic has increased the value of digital connectivity and has had numerous and at times contrasting effects on the digital infrastructure sector. Among these effects are an increased demand for quality digital connectivity, driven by falling telecommunications prices in certain countries and an increase in network capacity in others, set against a backdrop in emerging markets (EMs) of a digital divide that pre-dated the pandemic. This note leverages data from industry sources and an IFC survey of digital infrastructure companies to assess the short-term effects of COVID-19 on digital infrastructure in emerging markets. The note concludes with a discussion of emerging trends and their implications for public policy and corporate and investment strategies in support of the development of the digital infrastructure sector in emerging markets in the recovery phase of the pandemic and beyond.

KEY FINDINGS

- Despite large pandemic-induced demand and supply shocks to the digital infrastructure sector, digital connectivity in EMs in 2020 grew in uptake, usage and quality, demonstrating the response and resilience of the sector.
- In EMs, telecommunications revenue grew by 5 to 8 percent, year-on-year (YoY) in 2020, on par with the pre-pandemic trend for fixed broadband services, but below the pre-pandemic trend for mobile services.
 - These trends reflect steady growth in the uptake of connectivity, on par with the pre-pandemic trend, as well as an acceleration in data usage, which was 20 to 23 percent above the pre-COVID trend.
 - The trends are also driven by a widespread drop in the price of high-usage mobile internet packages, a fast recovery in download speeds, and growth in data center capacity above the pre-pandemic trend.
 - These effects come at a time of a 2 to 3 percentage point increase in the average profitability of EM telecommunication services in 2020, compared with pre-COVID levels.

- A review of three case studies in Africa, Latin America and Asia suggests that telecommunications operators, governments and investors took measures that contributed to mitigating shocks induced by the pandemic in the telecommunications sector.
 - Telecommunications operators implemented payment deferral plans with business customers, leveraged data to anticipate the credit balance of users and recommended nearby top-up stores, while also digitalizing customer services, increasing the use of online distribution channels, partnering with technology companies and introducing plans for low-income consumers to stimulate demand.
 - Governments classified connectivity as part of essential services, allocating emergency spectrum and, in some cases, temporarily suspending price increases.
- Two trends are likely to shape the digital infrastructure sector:
 - Increased demand for quality connectivity such as high-speed mobile internet and fixed broadband. This increase in demand was met in countries across Europe and Central Asia (ECA), as well as in Latin America and the Caribbean (LAC), because network capacity was high before the pandemic. However, without increased investment in network capacity in the other regions, there is a risk of a widening gap in quality connectivity among EM countries.
 - Increased financing needs for digital infrastructure companies. On average, US\$8.9 billion of financing went into digital infrastructure projects per year between 2015 and 2019. In 2020, that amount rose roughly fourfold to US\$36 billion. However, the increase was concentrated in two regions, South Asia (SA) and ECA, and in two sub-sectors (towers and data centers), leaving Sub-Saharan Africa (SSA), Middle East and Africa (MENA), LAC and East Asia & Pacific (EAP) at risk of a widening financing gap should the trend continue.

UNDERSTANDING THE SHORT-TERM EFFECTS OF COVID ON DIGITAL INFRASTRUCTURE

The pandemic induced a number of shocks that resulted in a contraction of economic activities, with a 2.1 percent drop in the gross domestic product (GDP) of emerging markets in 2020,¹ and an increase in poverty.² These shocks affected all sectors, including the digital infrastructure sector,³ and occurred against the backdrop of a large digital divide between and within countries.⁴ Digital connectivity has proven critical to maintain activities in times of crisis with a potential to support the recovery phase of the pandemic.⁵

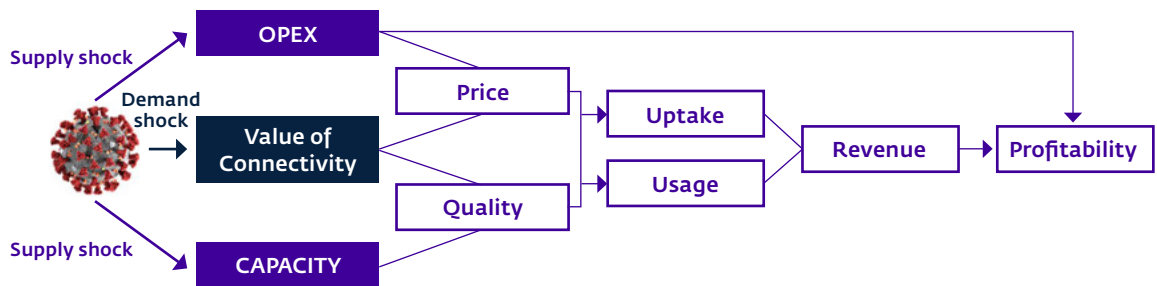
For digital infrastructure providers, rising demand for connectivity may be partly offset by adverse demand and supply shocks caused by income loss among individuals and businesses as well as disruption to digital infrastructure supply chains (Figure 1).⁶ The overall impact on the sector's performance will depend on interventions from governments, investors and businesses. Without any interventions:

- **Supply shocks** could negatively affect the performance of the digital infrastructure sector due to a rise in operating expenditure and a drop in capital expenditure as a result of physical distancing and lockdowns.⁷
- **Demand** is expected to rise as a result of increased willingness to use digital services, but could moderate as a result of loss in income, stemming from job loss and business closures.

The short-term effects of these shocks on the digital infrastructure sector include:

- **Potential price rises**, depending on changes in operating expenditure and of the willingness to pay for connectivity, depending on consumers' incomes.⁸
- **Potential deterioration in quality** as a result of network congestion induced by higher usage due to an increased value of connectivity and the utilization rate of network capacity.⁹
- **Changes to uptake and usage** as a result of the two above effects, which in turn would affect revenue and profitability, depending on the pandemic's impact on operating expenditure.

FIGURE 1: UNDERSTANDING THE SHORT-TERM EFFECTS OF COVID-19 ON DIGITAL INFRASTRUCTURE



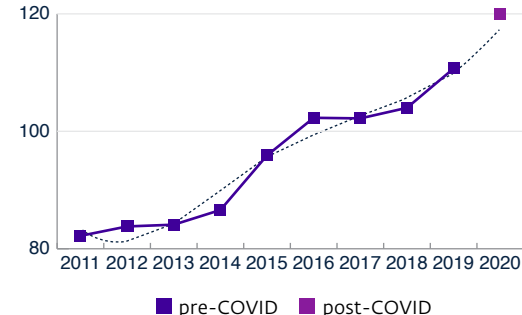
Source: IFC. In the short term (less than a year), changes in network coverage and competition intensity are expected to be marginal. These changes are expected to materialize in the medium- to long-term.

GLOBAL EM TRENDS¹⁰

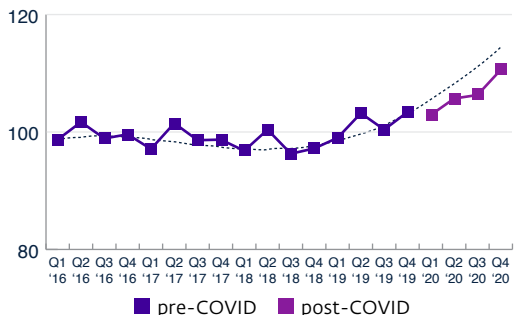
Against the background of a drop in GDP in EMs, telecommunications revenue grew in 2020 by 5-8 percent, on par with the pre-pandemic trend for fixed broadband services, but below that for mobile services. (Figure 2) In 2020, fixed broadband service revenue in EMs grew by 8.3 percent YoY, compared with 6.4 percent YoY in 2019, a growth rate in line with historically rising fixed broadband revenues. In 2020, mobile service revenue in EMs grew by 4.8 percent YoY, compared with 3.9 percent YoY in 2019. However, such growth was three percentage points below the pre-pandemic trend. This latter figure can be explained strong growth since 2017, driven by the increasing use of mobile data.

FIGURE 2: TELECOMMUNICATIONS SERVICE REVENUES IN EMS

Fixed broadband service revenue, billion USD, constant 2017



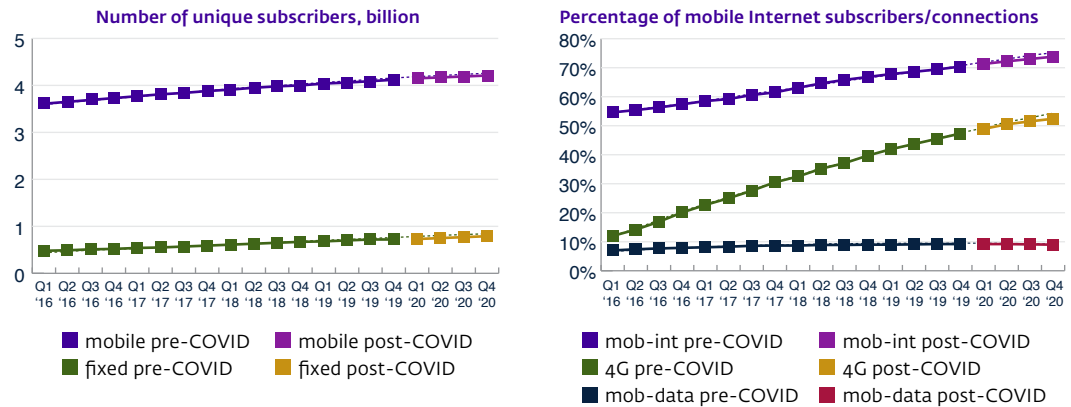
Mobile service revenue, billion USD, constant 2017



Source: IFC estimates based on data from GSMA Intelligence and TeleGeography. Service revenue aggregated at the EM level by converting country-level data into 2017 price using the GDP deflator, and then into US dollars (2017) by using the exchange rates of local currencies in US dollar.

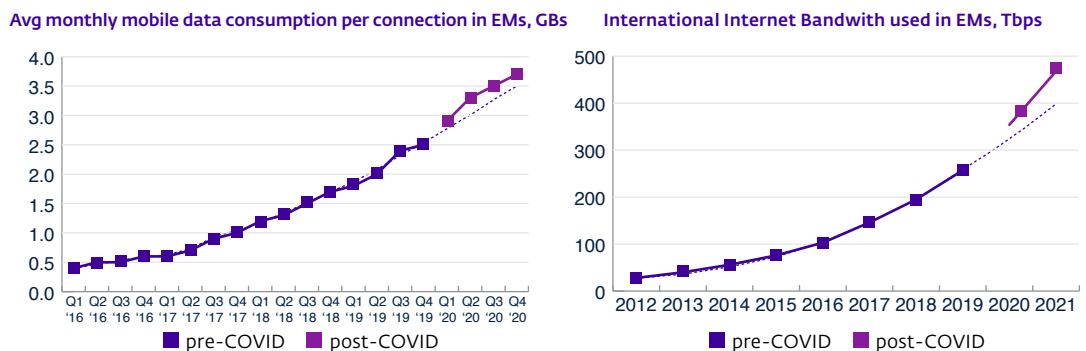
These trends in global EM telecommunications revenue reflect steady growth in the uptake of mobile and fixed broadband services, in line with the pre-COVID trend (Figure 3); an acceleration in data usage in 2020, compared to the pre-COVID trend (Figure 4) and a drop in the price of high-usage mobile broadband (Figure 5). Monthly mobile data usage per subscriber grew from 2.5 gigabytes (GB) in the fourth quarter of 2019 to 3.7GB in the same quarter of 2020—23 percent above the pre-COVID trend. Likewise, international Internet bandwidth used in 2020 was 18 percent above the seven-year pre-COVID trend.

FIGURE 3: UPTAKE OF TELECOMMUNICATIONS SERVICES IN EMS



Source: IFC estimates based on data from GSMA Intelligence and TeleGeography. Fixed broadband subscribers; and percentage of mobile data-only connections on the right vertical axes. Mobile data subscriptions refer to data-only packages typically provided through dongles, whereas mobile internet subscriptions involve the provision of data and voice services through a mobile phone.

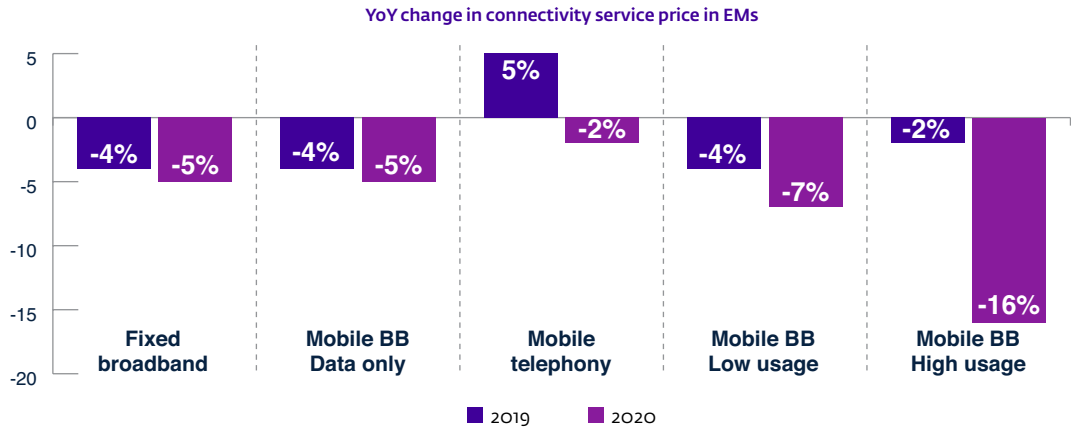
FIGURE 4: USAGE OF TELECOMMUNICATIONS SERVICES IN EMS



Source: IFC estimates based on data from GSMA Intelligence and TeleGeography.

The rise in usage was associated with a faster drop in connectivity prices, especially for high-usage connectivity service packages (Figure 5). Fixed broadband prices dropped by five percent YoY in 2020, compared with four percent YoY in 2019. The price of a high-usage mobile broadband package that typically comes with the equivalent of 1.5GB of data allowance dropped by 16 percent, compared with seven percent for the price of low-usage mobile broadband with a 500MB data consumption allowance. Mobile broadband data-only packages, often used as a substitute for fixed broadband, saw a five percent drop in price in 2020, compared with a four percent drop in 2019.

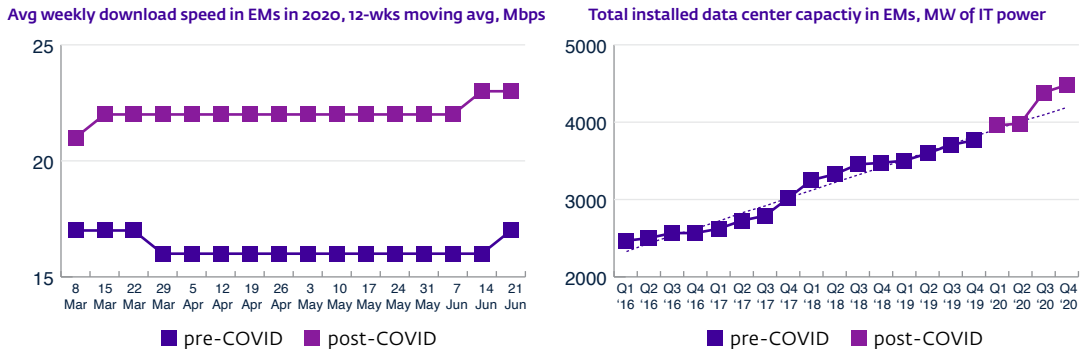
FIGURE 5. CONNECTIVITY PRICES IN EMS (2018-2020)



Source: IFC estimates based on data from the International Telecommunications Union. Average price in US dollars purchasing power parity (PPP). Price data prior to 2018 was based on a different methodology and therefore are not comparable with those collected from 2018.

Accelerated data usage was also associated with a fast recovery and steady improvement in the quality and capacity of broadband networks.¹¹ (Figure 6) Mobile download speeds dropped by 2.5 percent at the peak of the pandemic, compared to levels at the beginning of 2020, but quickly recovered as of mid-2020. Data center capacity jumped, especially from the third quarter of 2020. In 2019, installed data center capacity in EMS grew by 8.4 percent YoY, compared with 19 percent YoY in 2020, nine percentage points above pre-pandemic levels.

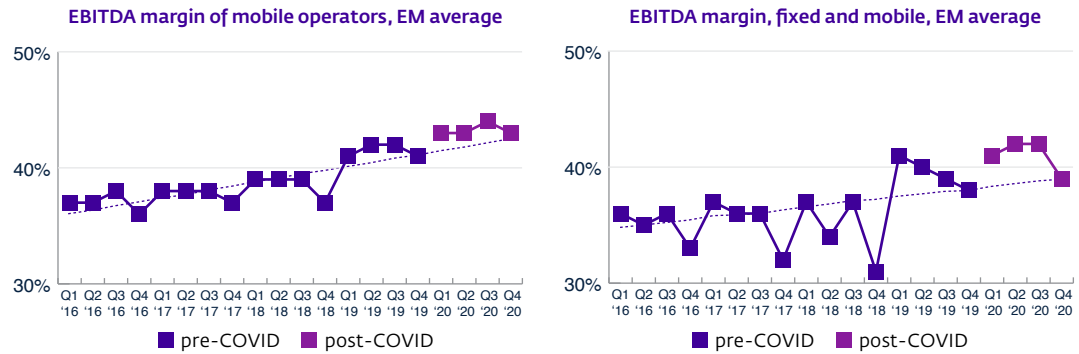
FIGURE 6: DOWNLOAD SPEED AND DATA CENTER CAPACITY IN EMS



Source: IFC estimates based on data from Ookla for download speeds and TeleGeography for data center capacity

In spite of shocks affecting the operating expenditures of telecommunications operators, these trends resulted in the increased profitability of telecommunications services (Figure 7), suggesting that adverse supply shocks were potentially more than compensated for by favorable demand-side factors. Prior to the pandemic EBITDA (earnings before interest, taxes, depreciation and amortization) margins, a measure of profitability, were below 42 percent for mobile services and below 40 percent for combined fixed and mobile operations. With the pandemic that margin increased above these levels to nearly 44 percent for mobile services and 42 percent for combined fixed and mobile services.

FIGURE 7: PROFITABILITY OF TELECOMMUNICATIONS SERVICES IN EMS



Source: IFC estimates based on data from GSMA Intelligence and TeleGeography. On the left figure, 38 countries covered for mobile revenues. On the right figure, EBITDA margin for 25 integrated fixed and mobile network operators.

Furthermore, COVID-19 resulted in sector-wide, rather than company-specific, shocks in digital infrastructure companies because all companies were affected, irrespective of their size, profitability or level of investment before the pandemic. A review of mobile companies' revenue growth rates in EMS suggests that half of them underperformed in 2020 compared to 2019, while the other half experienced stable performance, or that they outperformed pre-pandemic levels. However, such differences are not correlated with companies' size, profitability or investment prior to the pandemic, but depend instead on their regions of operation.¹²

REGIONAL EM TRENDS

The short-term effects of COVID-19 on digital infrastructure differ from one region to another. In 2020, mobile revenue was on par with pre-pandemic trends in EAP, LAC, S A and MENA but was below the trend in ECA and SSA. Fixed broadband revenue was on par with the pre-COVID trend in EAP, SA, SSA and MENA but above it in LAC and ECA.

- In regions where fixed broadband was very available, consumers increased its adoption, often to the detriment of mobile broadband. For instance, in ECA, mobile revenue was six percent below the pre-COVID trend, whereas fixed broadband revenue was 14 percent above it. In LAC, fixed broadband revenue was eight percent above the pre-pandemic level.
- Increased broadband adoption was accompanied by a drop in the price of high-usage mobile plans as operators increased data and voice allowances while keeping the average revenue per user (ARPU) roughly constant. Mobile prices, especially for high-usage plans, dropped faster in 2020 compared to 2019 in all regions, except in SA.
- There was an increase in the uptake of fixed broadband, despite a general increase in prices across all regions in 2020, compared with 2019, except in SSA.
- International data traffic grew in 2020 above the pre-COVID trend in all regions except in SA, where growth has stayed on par with pre-pandemic levels. Data center capacity is growing faster than the pre-COVID growth rate in all regions. Capacity in SA doubled in 2020. In the same year, data capacity increased by 36 percent in LAC, compared with eight percent in 2019.

More specifically, the following trends have been observed by region:

EAST ASIA & PACIFIC (EAP)

The telecommunications sector in EAP grew in 2020 on par with the pre-COVID trend (Figure 8), with mobile revenue growing by one percent 2020, compared with 0.5 percent on average annually over 2016-2019. This trend is associated with:

- Increased uptake of high-speed mobile connectivity, especially 4G and mobile data-only packages, counterbalanced by SIM card consolidation, supported by a faster drop in the price low-usage mobile packages (Figure 9) and maintenance of mobile connectivity quality.
- Underperformance of fixed broadband subscriptions, which grew but remained below pre-pandemic levels, coming amid a price increase by 21 percent in 2020, compared to a 23 percent drop in 2019 (Figure 9).
- Increased usage of data supported by an improvement in the quality of fixed broadband and a rise in data center capacity (Figure 10).
- Increased profitability with an EBITDA margin 1 to 2 percentage points above the pre-COVID trend.

LATIN AMERICAN & CARIBBEAN (LAC)

In LAC, the telecommunications sector grew in 2020. However, the pace of growth varied by business segment. Mobile service revenue was on par with the pre-COVID trend, whereas fixed broadband revenue was at 8 percent above it (Figure 8). This outcome was the result of:

- Increased uptake of high-speed mobile connectivity, especially mobile data-only packages, compensated by a faster drop in the price of high-usage mobile packages, with a limited change in the quality of mobile connectivity.
- A rise in the price of fixed broadband services (Figure 9), climbing by 16 percent YoY in 2020, compared with a rise of 3 percent in 2019.
- Increased usage of data supported by an improvement in the quality of fixed broadband and a rise in data center capacity, with a 35 percent growth rate in 2020 compared with 8 percent in 2019 (Figure 10).
- No change in profitability with an EBITDA margin at 40 percent, close to the EM average, but below the pre-COVID level.

EUROPE & CENTRAL ASIA (ECA)

In ECA, the telecommunications sector grew in 2020 but also at different paces depending on business lines. By the end of 2020, mobile service revenue was at 6 percent below the pre-COVID trend, whereas fixed broadband revenue was 14 percent above it (Figure 8). These outcomes were associated with:

- Uptake of mobile connectivity that was at the same level as before the pandemic, associated with SIM card consolidation and a faster drop in the price of high-usage mobile packages (Figure 9) with limited change in the quality of mobile connectivity.

- Uptake of fixed broadband that was at the same level as before the pandemic, but with a limited drop in the price of fixed broadband: a fall of four percent in 2020, compared with a drop of 12 percent in 2019.
- Increased data use supported by an improvement in the quality of fixed broadband without any significant change in data center capacity (Figure 10).
- No change in profitability with an EBITDA margin at 45 percent, one of the highest among EMs, probably reflecting increased operating expenditures.

SUB-SAHARA AFRICA (SSA)

In SSA, telecommunications revenue grew in 2020 but at different speeds depending on business lines. Mobile service revenue was below the pre-COVID trend, whereas fixed broadband revenue was on par with that trend (Figure 8). These performances were associated with:

- Growing uptake of mobile connectivity — albeit running at the same pace as before the pandemic — associated with SIM consolidation and a faster drop in the price of high-usage mobile packages with declining quality of mobile connectivity.
- No significant change in the uptake of fixed broadband services despite a significant drop in its price: down 22 percent in 2020, compared with a rise of 2 percent in 2019.
- Increased data use, with a drop in quality and no change in data center capacity (Figure 10).
- Increased profitability, with an EBITDA margin at 40 percent in 2020, compared with 35 percent on average, pre-pandemic.

SOUTH ASIA (SA)

Telecommunications revenue in SA grew in 2020, on par with the pre-COVID trend (Figure 8). This trend was associated with:

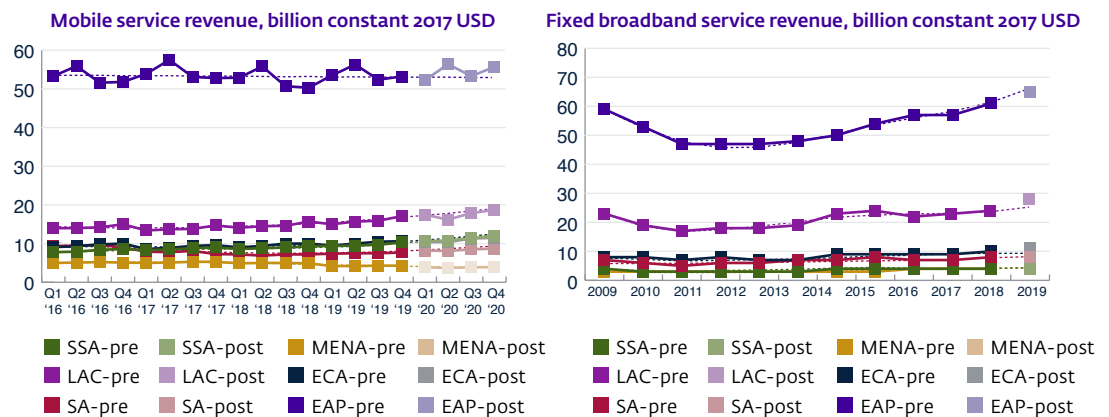
- Growing uptake of quality mobile connectivity, but at 1 percentage point below the pre-pandemic trend, especially in relation to the share of 4G connections. This was 5 percentage points below pre-pandemic levels, driven by an increase in the price of mobile connectivity (Figure 9).
- Increased uptake of fixed broadband services, with the number of subscribers 17 percent above the pre-pandemic trend, despite an increased price and deteriorating quality.
- Data usage, among the highest across EMs, grew in 2020 but was on par with the pre-COVID trend, amid a doubling of data center capacity from the third quarter of 2020. (Figure 10).
- A slight increase in profitability, with an EBITDA margin at 47 percent in 2020, compared with an average of 45 percent, pre-pandemic.

MIDDLE EAST & NORTH AFRICA (MENA)

Telecommunications revenue in MENA in 2020 was on par with the pre-COVID trend (Figure 8). Mobile revenue was declining pre-pandemic and continued at the same pace in 2020, while fixed revenue was flat prior to the pandemic and remained at comparable levels in 2020. These performances were associated with:

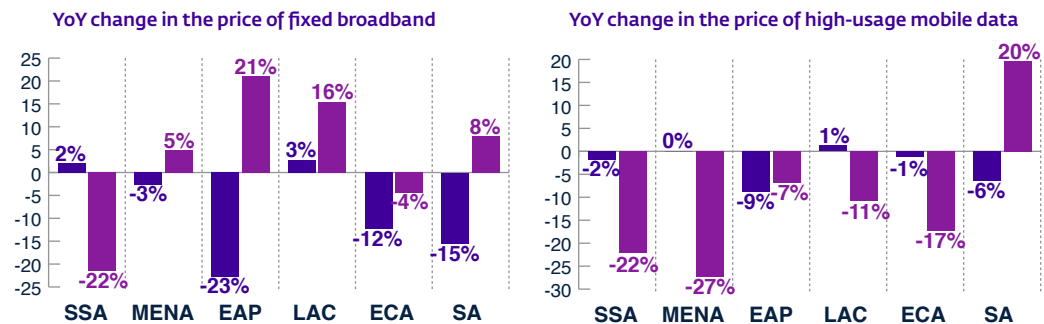
- Growing uptake of mobile and fixed connectivity but at the same pace as pre-pandemic, combined with a faster drop in the price of mobile connectivity, counterbalanced by a surge in the price of fixed broadband.
- Increased usage of data with no significant change in quality or data center capacity (Figure 10).
- Profitability with an EBITDA margin at 42 percent in 2020, comparable with the pre-pandemic average.

FIGURE 8: REGIONAL TELECOMMUNICATIONS SERVICE REVENUE ACROSS EMS



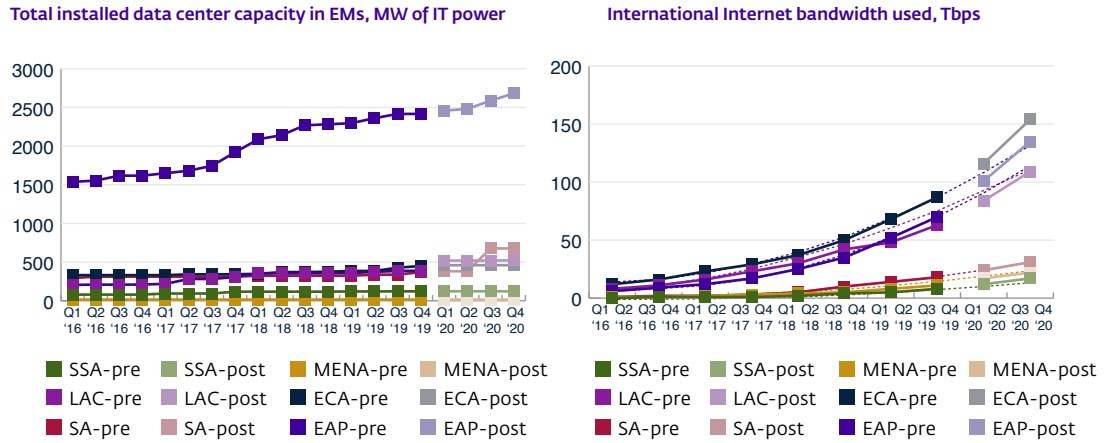
Source: IFC estimates based on data from GSMA Intelligence and TeleGeography. East Asia and Pacific figure on the right vertical axis

FIGURE 9: REGIONAL TELECOMMUNICATIONS SERVICE PRICES ACROSS EMS



Source: IFC estimates based on data from ITU

FIGURE 10: REGIONAL DATA CENTER AND INTERNATIONAL INTERNET BANDWIDTH CAPACITY ACROSS EMS

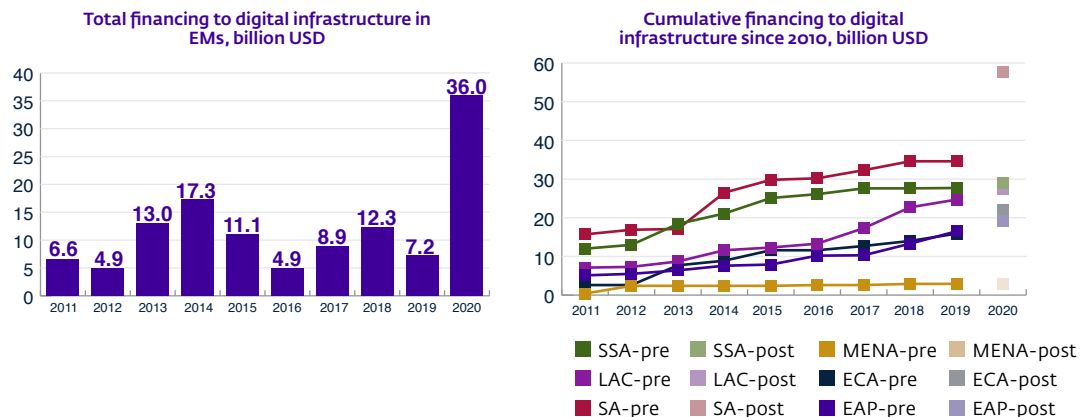


Source: IFC estimates based on data from TeleGeography. For internet bandwidth, EAP, LAC and ECA on the right vertical axis

FINANCING TRENDS

Increases in the profitability of telecommunications services have come amid a surge in the financing of digital infrastructure in 2020 (Figure 11). On average, \$8.9 billion of financing went into digital infrastructure projects each year in the period 2015-2019. In 2020, that amount rose roughly fourfold to \$36 billion, largely driven by two regions: SA and ECA. SA experienced the biggest growth in financing with 67 percent YoY growth in 2020, compared with three percent compound annual growth between 2015-2019. ECA came next with 40 percent YoY growth in 2020, compared with seven percent compound annual growth in the period 2015-2019. In other regions, telecommunications financing in 2020 remained broadly on par with the pre-pandemic trend. The largest increases in financing occurred in the towers and data centers sub-sectors, where the value of financing rose respectively fivefold and fourfold in 2020, compared with the annual average between 2011 and 2019.

FIGURE 11: FINANCING OF DIGITAL INFRASTRUCTURE IN EMS



Source: IFC estimates based on data from IJGlobal. Value of loans and equity investments. Right-hand side graph shows regional trend in pre- and post-pandemic financing.

TABLE 1: AVERAGE FINANCING OF DIGITAL INFRASTRUCTURE IN EMERGING MARKETS

Sub-Sector	Average (2011-2019) \$ million	Value in 2020 \$ million	Growth rate: 2020 vs. 2011-2019
Towers	887.2	4575.4	415.7%
Data centers	919.9	4545.1	394%
Mobile network operators	36723.2	98807.7	169%
Broadband	6881.5	11429.7	66%
Satellite	1993.6	2751.0	38%

Source: IFC, based on data from 285 TMT transactions recorded by IJGlobal.

CASE STUDIES

Three case studies involving IFC’s clients illustrate how operators and governments responded to the pandemic in the digital infrastructure sector and what the main outcomes were (Case Studies 1, 2 and 3 below).¹³ These case studies cover the sub-sectors of the broadband value chain, including mobile networks, terrestrial broadband networks and submarine cables, and relate to operators in SSA, LAC and SA.

As part of what was observed in these case studies, telecommunications operators considered a number of interventions, including increased network capacity; stockpiling spare equipment and cards; payment deferral plans with business customers and partnering with tech companies, as well as introducing inclusive plans to stimulate demand. They also introduced innovative measures to prevent disconnection of pre-paid customers, including leveraging mobile data consumption to anticipate the credit balance of users and recommending nearby stores for customers to top up.

These interventions were accompanied by digitalization of customer services and increased use of online distribution channels, as well as a switch to home-based work for eligible personnel. Disruption in retail distribution networks has resulted in substantial growth in airtime recharging through online channels. Some operators partnered with mobile financial service providers, while also encouraging tech-savvy customers and smartphone owners to use self-service “all-in-one” applications supporting airtime recharging, plan management and other services. Increased use of such applications reduced the impact of lockdowns on distribution channels by enabling recharge via multiple digital means, reducing commissions and call volumes to customer help centers, while also providing opportunities to advertise new products and promotions—ultimately reducing operational costs for operators.

Further, government interventions included the classification of connectivity as part of essential services, which facilitated network operations and maintenance, and temporarily limited disconnection of services for non-payment. In markets with high inflation, this was detrimental to the operators’ revenues. Governments also allocated emergency spectrum to support the sudden increase in mobile network capacity. In some cases, governments also introduced measures to temporary suspend price increases.¹⁴

CASE STUDY 1: A BROADBAND OPERATOR IN AFRICA

The company has one of the largest broadband networks in Africa. It faced a large increase in demand for broadband capacity, but also experienced fluctuations in cash collection from existing business and corporate clients. It relied on IFC's financing to settle payment plans with clients and invest in network capacity to meet the surge in demand. As a result, network performance was preserved, as well as jobs, and the clients' operations.

BACKGROUND

One of the largest broadband networks on the continent and delivers a significant proportion of the international capacity required by many of the cloud-based platforms and social media companies.

COVID-19 shocks

- Increased demand from digital platforms, especially cloud services companies
- Limited ability to repair, maintain and install equipment across our large multi-national network
- Fluctuations in cash collections from existing clients: many requests for credits, grace periods; downgrade of service due to reduced demand, temporary suspension of services or complete cancellation due to cashflow challenges

Interventions by the operator

- Working from home wherever possible; suspension of international travel; business continuity plan to maintain network
- IFC COVID-19 Facility enabled:
 - The ordering of multiple spares of equipment and cards and to ship them in advance
 - The bolstering of key parts of the network that were likely to become short-term capacity bottlenecks
 - Engagement of local firms to provide remote support instead of sending own engineers
 - Agreement on payment plans with clients based on extending the recoupment period
 - Recruitment of extra staff to meet greater demand as lockdowns started to ease

Outcomes

- ✓ 'Ride the storm' of potential delays in billing for new services
- ✓ Maintained and improved network performance
- ✓ Protected jobs and created employment opportunities
- ✓ Preserved operations of clients by averting risk of cash crisis and potential bankruptcy

Source: IFC TMT survey, 2021.

CASE STUDY 2: A TELECOMMUNICATIONS OPERATOR IN LAC

The company is the largest broadband provider in a LAC country. It experienced a surge in demand for connectivity with limited supply chain shocks. It accelerated the digitalization of customer services, stimulated demand through inclusive offers, community support and preserved service affordability. This resulted in high network performance, job protection and development of digital skills.

BACKGROUND

Largest telecoms operator in a large LAC country, providing fixed and mobile internet access services as well as paid content services.

COVID-19 shocks

- Increased demand: 50 percent increase in the use of data on the home internet; 70 percent in mobile voice services and 30 percent in mobile data.
- No effect on technological supply chain, despite 70 percent of the technological equipment having foreign components, due to sufficient stock.

Interventions by the operator

- Increased digitalization of customer services, with an online store and digital payment solution, enhanced cybersecurity measures.
- Granted more gigabytes, prepaid credit and unlimited WhatsApp, mobile data bonus for educational domains.
- Temporary abstention from cutting off services in the event of delay or non-payment, pursuant to decrees issued by the government.
- Agreement signed with regulator in relation to a temporary suspension of price increases and the introduction of plans tailored to low-income users.
- Provided connectivity and subsidized services for more than 500 hospitals, ambulatory medical centers, and health rooms, more than 2,900 educational domains and offered free services to more than 11,000 educational establishments.
- Home-based work for up to 70 percent of staff with supporting services: expansion of private virtual network.

Outcomes

- ✓ Maintained high network performance by expanding network capacity thanks to historical and new investments, and launching 5G
- ✓ Protected jobs and created employment opportunities
- ✓ Invested in digital skills, including for girls

CASE STUDY 3: A TELECOMMUNICATIONS OPERATOR IN SOUTH ASIA

A mobile network operator experienced a surge in demand for connectivity but faced a temporary drop in customer base as a result of disruption to the distribution networks induced by lockdowns. It introduced innovative measures to limit service disconnection, including online recharge services, store recommendation algorithms, and acquired or shared spectrum to overcome capacity constraints. This resulted in increased service revenue, especially for mobile data and improved profitability.

BACKGROUND

Mobile network operator providing voice and data services to several million subscribers.

COVID-19 shocks

- Increased demand for mobile data: over 17 percent increases in data consumption per subscriber between the first and second quarter of 2020.
- Temporary drop in customer base resulting from SIM card consolidation as most subscribers are under pre-paid contracts and struggled to reach multiple scratch-cards distribution centers amid lockdown and often choose to retain SIM cards of the largest network operator.

Interventions by the operator

- Assessing airtime balance status and recommended available service points and channels to recharge and thus avoided service discontinuation; introducing an online airtime recharging service (Digital iRecharge) which increased usage by 685 percent.
- Partnering with tech companies (health tech and e-commerce) to stimulate demand.
- Network expansion through renewal of spectrum in 2020 and additional spectrum acquired in 2021.
- Dynamic spectrum rollout across several thousands of sites and the lease of additional fiber network capacity.
- IFC COVID Facility to (i) simplify products, (ii) monetize investments, (iii) lead in the 4G business, (iv) boost self-care (new app) and e-recharge, and (v) retain high-valued customers.

Outcomes

- ✓ Highest increase in service revenue market share in 2020 compared to 2019 among all MNOs, especially for mobile data
- ✓ Limited erosion of customer base and gradual increase in the number of active subscribers
- ✓ Significant growth in data subscriber and data usage
- ✓ Maintained and improved network performance
- ✓ Improved profitability

EMERGING TRENDS AND WAY FORWARD

A key takeaway from 2020 is that despite large demand and supply shocks that affected the digital infrastructure sector, the pandemic did not generally result in a drop in uptake, usage or quality of digital connectivity in EMs. As suggested by the case studies, interventions from digital infrastructure operators, government and investors played a role in achieving such resilience. However, more research is needed to identify lessons learned from these interventions to support the recovery phase of the pandemic and beyond.

Two emerging trends could affect the performance of the digital infrastructure sector:

- Increased willingness to pay for quality connectivity, with a faster rise in demand for fixed broadband internet and high-speed mobile internet, corroborated by the acceleration of data usage. Such a trend could continue in the medium term, supported by increasing digitalization of activities. Investments in digital infrastructure like submarine cables, fiber-to-the-home, towers and data centers will be critical to meet such demand. These investments can be facilitated by an enabling regulatory environment.
- Increased financing needs for digital infrastructure, consistent with increased willingness to pay for quality connectivity. Such a trend is underway in two regions at the moment (SA and ECA) but could unfold in other regions depending on investor appetite. Increased financing of digital infrastructure, especially in SSA, MENA, LAC and EAP, will be critical to sustaining growth in usage and addressing demand for quality connectivity in these regions. Development finance institutions could play a role in mobilizing private capital in supporting the financing of digital infrastructure in these regions.

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ENDNOTES

- 1 World Economic Outlook, June 2021. <https://www.imf.org/en/Publications/WEO/Issues/2021/07/27/world-economic-outlook-update-july-2021>
- 2 "Updated estimates of the impact of COVID-19 on Global Poverty: Turning the Corner on the Pandemic in 2021?" <https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty-turning-corner-pandemic-2021>
- 3 COVID-19's Impact on the Global Telecommunications Industry, IFC, 2020. https://www.ifc.org/wps/wcm/connect/1d490aec-4d57-4cbf-82b3-d6842eecd9b2/IFC-Covid19-Telecommunications_final_web_2.pdf?MOD=AJPERES&CVID=n9nxogP
- 4 Around 3.5 billion people were unconnected to the mobile internet before the pandemic, of whom 90 percent were in emerging markets and developing economies. IFC estimates based on data from ITU.
- 5 Strusani & Hounghonon, 2020. "The Impact of COVID-19 on Disruptive Technology Adoption in Emerging Markets." <https://www.ifc.org/wps/wcm/connect/537b9b66-a35c-40cf-bed8-6f618c4f63d8/202009-COVID-19-Impact-Disruptive-Tech-EM.pdf?MOD=AJPERES&CVID=njn5xG9>
- 6 Strusani & Hounghonon, 2020. "What COVID-19 Means for Digital Infrastructure in Emerging Markets." https://www.ifc.org/wps/wcm/connect/8f9237d2-eceb-433f-a2do-300907808722/EMCompass_Note_83-for+web.pdf?MOD=AJPERES&CVID=n7M5wS.
- 7 These effects may, however, be alleviated by home-based work, digitalization, especially of distribution, increased availability of spectrum, and classification of connectivity as an essential service.
- 8 However, this could be counterbalanced by governments interventions or business strategies to stimulate usage.
- 9 Such drop could be limited by interventions from governments and investors to maintain or increase the capacity of digital infrastructure.
- 10 In this study, emerging markets are defined as IDA/IBRD-eligible countries, generally low or middle-income countries. A total of 143 emerging markets countries have been considered, of which 26 low-income countries, 53 lower middle-income countries and 54 upper middle-income countries.
- 11 This accords well with findings by Niccolo Comini (2020): "The Effects of Lockdown Measures on Internet Speed – An Empirical Analysis of 18 countries in Africa." <https://openknowledge.worldbank.org/bitstream/handle/10986/35148/The-Effect-of-COVID-19-Lockdown-Measures-on-Internet-Speed-An-Empirical-Analysis-of-Eighteen-Countries-in-Africa.pdf?sequence=1&isAllowed=y>
- 12 IFC estimates based on data from GSMA Intelligence.
- 13 An early account of COVID-19's responses in the digital sector can be found here. <https://blogs.worldbank.org/digital-development/covid-19-were-tracking-digital-responses-worldwide-heres-what-we-see>
- 14 More government interventions can be found here: https://dataviz.worldbank.org/views/DD-COVID19/Overview?:embed=y&.isGuestRedirectFromVizportal=y&.display_count=n&.showAppBanner=false&.origin=viz_share_link&.showVizHome=n
<https://blogs.worldbank.org/digital-development/covid-19-were-tracking-digital-responses-worldwide-heres-what-we-see>