Countering the threat to Europe’s 5G rollout

European telco investments under the economic downturn
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So far, the COVID-19 pandemic has had little adverse impact on telecommunications companies (telcos). On the contrary, with a surge in home-working and digitization, communication capacity and quality requirements have increased, making telcos even more critical to our economy and society. However, going forward, the global economic crisis resulting from the pandemic will have a significant impact on the ability of telcos to invest in rolling out 5G mobile networks.

Using the experience of European telcos during the financial crisis of 2008-09, we have modelled the likely effects of the current downturn on their investment spending. Following the 2008 crisis, European telcos saw their revenues fall over two years. This revenue decline translated into a significantly larger drop in investment spending that fell particularly hard on mobile networks and IT capital expenditure (capex). Applying our findings to the current situation leads us to some major projections:

• European telcos’ investment spending over the next two years will fall by €6bn–€9bn
• Rollout of 5G mobile networks will be delayed by 12 to 18 months
• Capex budgets will come under additional pressure as telcos invest to accommodate changing patterns of demand for network capacity, caused notably by increased home-working and reduced commuting
• A carefully considered response from operators, suppliers and regulators will be needed to respond to COVID-19 impact

As a result, telcos need to act urgently to address the squeeze on their 5G investment plans. Specifically, they must review their 5G business cases and deployment timetables, given the significant growth and changing pattern of demand for network capacity that has emerged due to the COVID-19 lockdown. We expect a reprioritization of capex plans across all areas of the business to secure sufficient funding, to continue investing in 5G and to partially mitigate the risks of delaying deployment, while at the same time coping with increasing demands on their fixed infrastructure. This will involve tough choices: a complete review of capex plans, a drive to achieve further capex efficiencies and delays to selected transformation projects in other areas.
Delays in 5G deployment carry serious risks and costs for telcos, many of which own time-limited 5G spectrum licenses and will struggle to achieve their return on investment (ROI) targets the longer they delay rolling out services. Operators’ original business cases also depended on delivering not only faster versions of services available today, but also entirely new applications to support the Internet of Things (IoT) and autonomous vehicles, for example. Unless these can be delivered, the business case for 5G will be compromised.

Delays in 5G investments also pose serious risks for equipment vendors whose sales for the next two years may be jeopardized. Finally, regulators also face challenges because their plans to develop the digital economy depend heavily on the telcos’ ability to deliver nationwide 5G connectivity.

We conclude this report with a series of detailed recommendations for telcos, equipment vendors and regulators to help them minimize the risks of a prolonged squeeze on telcos’ investment capacity resulting from the COVID-19 crisis.

“The economic downturn following the COVID-19 crisis may delay telecom operator investments in 5G in Europe by 12 to 18 months.”
Outlook: The COVID-19 crisis will reduce telco revenues for the next two years

Usually, the telecoms sector is relatively resilient in times of economic crisis, partly due to its largely contracted revenue model. However, our modelling suggests that the COVID-19 induced recession across Western European markets is likely to cause telcos’ revenues to decline over the next two years, after which we expect a recovery (see Exhibit 1). Our base case forecasts a drop of 2-3 percent in the sector’s revenues for 2020 and a further 1-2 percent decline in 2021, before recovery begins during 2022.

The key factors driving the decline will be defaults and late payments among consumers and business customers, as well as users downgrading to cheaper subscription packages or renegotiating their contracts with existing suppliers. In addition, telco revenues that depend upon investment programs by business customers – installing workspace management systems or new IT tooling, for example – will be hit as many such investment projects have been paused or cancelled.

EXHIBIT 1
Impact of COVID-19 on Telecoms GVA by scenario

Source: Strategy& UK economic analysis, April 2020
The revenue implications for capex budgets will be significant, particularly for 5G investments

Telcos typically reinvest 15-16 percent of their revenues in infrastructure every year to fund technology upgrades and additional capacity. Any drop in revenue, therefore, will inevitably have a material impact on their ability to sustain the pace of investment. We expect companies to seek, at best, to maintain their capex intensity as a percentage of their reduced revenues, and in many cases we expect them to reduce capex below that level, in light of the economic conditions.

The aftermath of the 2008 financial crisis provides a useful framework to understand the likely effects of the COVID-19 pandemic on telcos’ investment plans. Although the technology context was different, there were some parallels with the situation today: When the 2008 crisis struck, telcos were investing in 4G and VDSL, transformation projects for their core networks and IT systems, as well as selective innovations. Following the crisis, European telecom revenues declined by 4.7 percent in 2009 from their pre-crisis levels before increasing by 3 percent in 2010. This resulted in a V-shaped dip with revenues in 2010 returning to the pre-crisis trendline.

However this revenue decline led to a much larger reduction in capex among European telcos. Our data show that operators were relatively slow to reduce capex initially because when the financial crisis broke, they had already committed a large proportion of their capex budgets. However, in 2009 they cut capex investments by an average of 13 percent and continued to hold down capex for two years. By 2011, European operators’ capex was still 4 percent lower than its level in 2007, before the crisis, although at this level it represented a similar level of investment intensity, expressed as a percentage of their revenues (see Exhibit 2).

This pattern highlights two key conclusions:

- For telcos, capex investment is significantly less resilient than revenues
- The impact on capital budgets of any decline in revenues lags by approximately 6-12 months, starting later and continuing for a time after revenues begin to grow again. If the revenue decline is V-shaped, the knock-on effect on capex is more U-shaped.

**EXHIBIT 2**

Capex spend, Europe

<table>
<thead>
<tr>
<th>Year</th>
<th>Capex Spend</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>100%</td>
</tr>
<tr>
<td>2008</td>
<td>97%</td>
</tr>
<tr>
<td>2009</td>
<td>87%</td>
</tr>
<tr>
<td>2010</td>
<td>90%</td>
</tr>
<tr>
<td>2011</td>
<td>96%</td>
</tr>
</tbody>
</table>

Source: Strategy& analysis
The major capex impacts will be on mobile networks and IT projects
We can also use the 2008 crisis to examine how cuts in capex were distributed across different areas. European telcos made the biggest cuts in areas dominated by large, discrete projects that were easier to delay or cancel:

- **IT investments** fell by 20-25 percent as transformation projects were halted. Investment in this area did not return to pre-crisis levels.

- **Mobile network investments** fell 20 percent as deployment projects were delayed. This capex reduction took place against a background of increasing network usage that necessarily required investments in additional capacity.

- **Fixed and core network investments** were relatively protected, declining by 6 percent against the pre-crisis trendline. This is mainly because a large proportion of this spending comprises essential replacements and upgrades to maintain services. The main delays were in projects to deploy fiber and VDSL.

- **Customer-driven capex** fell 10 percent mainly due to lower spending on customer acquisition in the consumer segment and delayed investments in the B2B segment. Customer capex increased after three years as postponed investments in handset replacements and upgrades were carried out. We expect delays in 5G rollouts to result in fewer new handsets being sold and consumers seeking to spend less on 5G handsets, which will have a negative impact on handset manufacturers (see Exhibit 3).

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**EXHIBIT 3**

Capex split, Europe
Indexed to 2007

![Capex Split Graph](image-url)
The read-across from 2008 – capex to fall €6bn-€9bn
In today’s context, it is important to note that although the technologies in question have changed since 2008, the split of capex across these major investment categories has not shifted significantly. Our analysis from the previous crisis therefore reinforces our view that we will see very deep cuts in investment by European telcos over the next two years, and that once again these will be concentrated on IT upgrades and mobile networks (see Exhibit 4).

EXHIBIT 4
Europe capex split 2019

<table>
<thead>
<tr>
<th>Category</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer driven NW core and replacement</td>
<td>18.0%</td>
<td>14.9%</td>
<td>21.3%</td>
<td>16.2%</td>
<td>14.9%</td>
</tr>
<tr>
<td>NW core and replacement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed access/fibre</td>
<td>29.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile/5G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT</td>
<td></td>
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</tbody>
</table>

Source: Strategy& analysis

Applying the model developed on the basis of the previous crisis to the situation today, we forecast that a 2-3 percent decrease in revenues against the pre-crisis trendline for 2020 is likely to result in a decline in capex of 9 percent in 2021. With revenues forecast to decline 1-2 percent in 2021, we expect the squeeze on capex to continue in 2022, leaving it 8 percent below its pre-crisis trendline. We do not therefore expect to see capex return to pre-crisis trend levels until 2023 (see Exhibit 5).

EXHIBIT 5
Capex forecast – lower case scenario

<table>
<thead>
<tr>
<th>Year</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capex</td>
<td>100%</td>
<td>98%</td>
<td>91%</td>
<td>92%</td>
<td>96%</td>
</tr>
</tbody>
</table>

Source: Strategy& analysis
In financial terms, the declines in capex that we predict would represent a reduction in investment spending across Europe of between €6bn and €9bn over the next two years. Leading up to the pandemic, European operators had spent several years preparing to launch the next generation of mobile communications. Given our prediction that a large proportion of these capex cuts will impact mobile investments, and particularly 5G deployments, we expect investments in mobile networks to be delayed by between 12 and 18 months. For telecoms operators that plan for a technology cycle of six to seven years, a delay of more than a year is significant and calls their pre-COVID-19 roadmaps for 5G deployment into question.

5G deployment plans depend on major investments in networks, as well as large investments by corporate users of these networks to develop new use cases. Much of this spending now faces delays. Investments in innovative platforms and service development, meanwhile, could be paused indefinitely, pushing many of the advanced applications of 5G technology, such as many IoT use cases, further into the future.

How COVID-19 is reshaping demand for telco services

With COVID-19 much has changed and we see significant issues on the demand side across all major areas of the telcos’ operations – fixed, mobile and wholesale networks – that will challenge their existing 5G rollout plans.

Demand has both surged and shifted

Since widespread lockdowns came into force around the world, broadband video consumption has surged. Netflix reported the biggest quarterly jump in subscribers in its 13-year history, while it is reported that Netflix and YouTube have reduced streaming quality in Europe temporarily to ease the strain on networks.

At the same time, video conferencing has reached the mass market. During March, Zoom passed 200m users a day. During April, it passed 300m. Online gaming traffic has doubled on mobile and almost trebled on fixed broadband. Telia Carrier, for example, has reported changes in video conferencing traffic of more than 400 percent at certain times (see Exhibit 6, next page). This level of growth has major impacts on fixed, mobile and wholesale networks:

- **Fixed Networks:** Streaming traffic on fixed broadband has increased 50 percent across European networks, operators report. Telefónica’s fixed data traffic spiked 35 percent over a month, surpassing the 30 percent growth it had registered over the previous year. Online education and home-working accounted for most of the jump, according to Telefónica.

- **Mobile Networks:** Operators report that streaming traffic on mobile networks has increased 40 percent since the start of the COVID-19 crisis, according to European telcos. Vodafone says mobile data usage has increased around 15 percent across Europe in recent weeks, peaking at 30 percent in Spain and Italy.

- **Wholesale Networks:** Telia Carrier said traffic volumes had gone up more than 50 percent during the COVID-19 crisis. On average, points-of-presence (POPs), where an operator connects to its network, have grown 20.5 percent, with a peak of 208 percent growth.
Data from telcos demonstrates that many of these effects were global, with similar shifts in usage appearing in geographically diverse markets. For example, alongside the increase in mobile data traffic, Vodafone said fixed broadband usage had also gone up more than 50 percent in Italy and Spain alone, two of the first European countries to introduce lockdowns. Weekly data on upstream traffic on one of Vodafone’s European fixed broadband networks illustrates the surge in demand caused by the introduction of home-working and social distancing measures. The red line represents the week before the restrictions came into effect, the other two lines are for the two subsequent weeks (see Exhibit 7).
Shifting demand has big implications for the supply/network side

Operators are reacting to pressures both from the consumer side and from the network side. In the UK, operators such as Virgin Mobile have responded to the increase in demand for connectivity by giving away GBs of mobile data, scrapping low usage caps, providing extra TV channels and upgrading network speed. In Turkey, operators have offered free data to allow customers to connect to the Ministry of Education’s online education services.

From a network perspective, companies are struggling to upgrade their corporate network infrastructure to support home-working, while fixed and wholesale network operators are investing heavily to ensure network resilience and avoid failures. Telia Carrier, for example, added capacity on its core network backbone at a significantly higher rate during March, compared with the previous five months (see Exhibit 8).

EXHIBIT 8
Monthly backbone buildouts

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Source: Telia Carrier, Strategy& analysis

However, not only must operators react to significantly higher demand for network capacity. They must also navigate the new location complexity that is emerging, now that people are increasingly working from home and travelling much less. This shifts the overall traffic burden towards residential areas and tends also to move it from mobile to fixed networks. This poses challenges for networks that were built on the basis of previous patterns of consumption, which assumed 60 percent of usage would be in the workplace.

Naturally, this forces operators to revisit their capex planning and to address the question of whether and how far these changes in the pattern of demand will prove permanent. Although we expect data traffic to return to more normal patterns in the months to come, as lock-downs end and people slowly return to work, we believe there will be a long-term shift towards home-working and therefore less commuter travel. This will result in changes in traffic towards residential locations and therefore a sustained increase in demand for fixed network capacity.
Operators will also have to factor in potential changes in their supply chains as they try to reduce single-country risk and ensure diversity of supply. This shift will come at a cost. Telcos may be forced to source via higher-cost, western suppliers instead of lower-cost Chinese competitors. We calculate that this translates into a 15-20 percent cost increase, which is equivalent to 2-3 percent drain on their available capex capacity.

**Actions to take with 5G rollouts at risk: key steps for operators, vendors and regulators**

The COVID-19 crisis is highly likely to lead to a marked slowdown in investment by European telcos over the next two years, particularly in mobile networks. This will have major implications for the rollout of 5G services.

There is no doubt that 5G will remain the near-term technology priority for telcos, however we believe the business cases that telcos have previously adopted will have to be revised. More ‘blue sky’ applications that depend on 5G, such as dense networks of micro-cells to provide ubiquitous connectivity for autonomous vehicles, are likely to be put on hold. Equally, in countries that have not yet sold 5G licenses, operators may be reluctant to make major investments in new spectrum under the current conditions. We therefore expect the pace of rollouts in these countries to slow significantly.

In order to preserve sufficient headroom to invest in 5G roll-outs, operators should undertake a major rethink of their capex allocations across all areas of their business and further improve their management of capex to realize efficiency gains. At the same time, suppliers need to reconsider their production and investment plans to cope with slowing 5G investments. Regulators meanwhile, will want to ensure continuity in investment and digitalization.
Operators should reassess and reprioritize their overall capex budget to secure the funding required to implement their amended 5G roll-out plans and so partially mitigate the risks from delay in 5G.

Operators should focus on strategies to achieve more cost-effective network deployment:

- They should explore sharing network base stations with other operators (particularly in rural areas where build costs are higher and usage is lower), as well as spectrum-sharing, where this is permitted.

- Where possible, they should bring forward the decommissioning of legacy technologies (2G, 3G, analog TV channels etc.) so that the spectrum can be redistributed and redeployed for use with 5G or to provide increased capacity for 4G.

- They should consider the financial and operational benefits of joint ventures to enable sharing of fiber networks, or a carve-out of their fiber backbone into a separate company (as has been mooted for BT Openreach).

- They need to review their vendor strategy and de-risk their supply chain to reduce cost and deployment risks.
Implications for equipment vendors – coping with 5G slowdowns

1. Vendors that have budgeted for significant 5G investments by operators need to consider how to incentivize and accelerate equipment sales to counter any slowdown in rollouts. Measures could include commercial rebates or alternative charging models.

2. Vendors should assess the impact on supply chains of problems in producing and exporting equipment from countries facing disruption, notably China.

3. Vendors should examine ways, including standardization and automation, to reduce the costs of deploying 5G equipment and protect their margins. Areas of focus in the search for greater efficiency should include their transportation, installation and administration costs.

“Delays in 5G investments will affect both consumers and business customers, but also public authorities and equipment vendors”.

Regulators should do everything possible to reduce risks to the development of the digital economy from any slowdown in the rollout of 5G. If telcos are forced to delay deployment, developments such as sensor-based IoT applications, and in the longer term autonomous vehicles, will be threatened along with the wide range of companies making and using these systems. Regulators can safeguard against this threat by helping operators to maximize their available capex. Options include revising price expectations for spectrum licenses as well as the payment timetable.

Regulators should also consider extending the deadlines to achieve set levels of coverage that are built into licenses, and should review which types of coverage are to be prioritized – business districts vs rural areas, for example – and consider incentivizing operators to rethink their deployment plans and bring them into line with the new regulatory priorities.

Regulators should reconsider existing spectrum allocations, as the US FCC did as part of the Keep Americans Connected initiative during the COVID-19 crisis. This allowed operators to use additional spectrum to meet increasing broadband demand.

Regulators should examine how to support deployments into the remotest rural areas, for example by allowing collaboration between operators, investments by municipalities or by providing targeted funding to support rollouts.

The economic slowdown caused by COVID-19 and resulting delays in 5G deployments will inevitably extend the technology cycle beyond the typical five-to-seven years that the telco industry had originally assumed. This creates serious risks and costs for operators, putting ROI targets in jeopardy and compromising the business case which anticipated 5G’s rollout in support of new IoT applications.

However, delays also bring material downsides for many other stakeholders. Equipment vendors face obvious challenges, along with the wide range of innovative companies planning and building services that depend on 5G connectivity. Ultimately, governments seeking to develop the digital economy and ensure their countries’ future economic competitiveness will see their agenda challenged by the likely slowdown in the transition to 5G.

For all these groups, there is a pressing need to revisit pre-COVID-19 investment plans and assumptions and adapt to the new conditions the pandemic will leave behind.
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