



COVID-19

Potential UK economic scenarios and their impact by sector

7 April 2020

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The COVID-19 pandemic continues to have a growing impact on the global economy, with uncertainty over the economic impact across all sectors set against an ever changing situation. Here, we present potential scenarios for how the health crisis might shape the UK economy over the coming 18-24 months, and the impacts that these scenarios could have on major industries *per available info as at 7 Apr 2020*

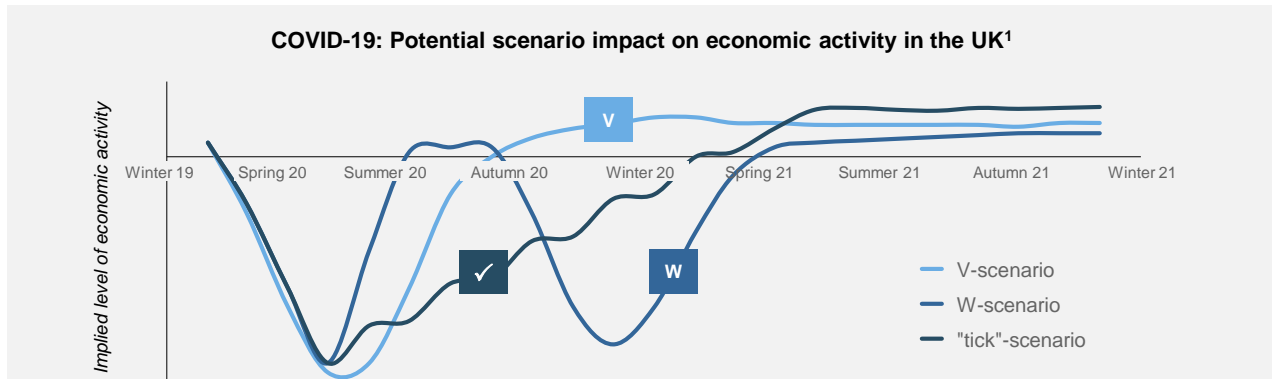


Exhibit 1 – Potential economic scenarios associated with COVID-19 recovery

In all scenarios the UK economy is expected to enter an initial period of contraction, with the subsequent recovery most likely to be informed by a number of variables including: the strength of the government’s social distancing measures, and potential curative treatments or testing programs. The speed of recovery across all of these scenarios will also be impacted by government fiscal and monetary policy as well as other government interventions as we come out of this unprecedented time.

- V** ▶ **V-scenario:** a single and sustained hit to the UK economy triggered by an extended period of strict, government-mandated social distancing for 3-6 months from March 2020.
- W** ▶ **W-scenario:** initial drop in demand due to prevention measures and economic uncertainty, followed by reversion to pre-COVID-19 levels of demand; a subsequent drop due to second wave of COVID-19 infections and response measures.
- ✓** ▶ **“Tick”-scenario:** repeated dips in demand, caused by multiple waves of viral outbreak and prevention measures, each followed by a small recovery period, with downside reducing each time as medical treatments and resilience increase.

V What do you need to believe for it to happen?

- ▶ Effective control of the virus spread through strict social distancing measures.
 - ▶ In the absence of further interventions, the epidemic can be isolated and eradicated in 3-6 months.
- OR**
- ▶ Per Oxford University modeling, only 1 in 1,000 infections will require hospitalization,² and more than 60% of the UK population has already been infected (as of 1 April 2020).

What are the leading indicators?

- ▶ Local transmission rates to dip within 4-6 weeks of strong social distancing and not rebound as measures are relaxed (Austria, Italy and Spain will provide leading examples).
- ▶ Extensive antibody testing programme reveals 60%+ of the UK population has already had COVID-19.

W What do you need to believe for it to happen?

- ▶ Initial period of social distancing does not stop the spread of COVID-19 via asymptomatic carriers.
- ▶ Incidence rate is seasonal; cases decline over summer before rebounding in autumn.
- ▶ Two periods of social distancing successfully bring COVID-19 under control, or an antiviral is identified in the near term and quickly rolled out to ease ICU capacity constraints.

What are the leading indicators?

- ▶ Rebound in cases in lead countries with similar/stricter measures (e.g., S. Korea, Italy, Spain).
- ▶ UK testing capacity increases, coupled with contact tracing of new cases by winter 2021; isolating carriers and eradicating the virus after second major outbreak (e.g., S. Korea).

✓ What do you need to believe for it to happen?

- ▶ A 12-18 month-long spread of the virus until a vaccine becomes widely available.
- ▶ COVID-19 mutation rate is low; no re-infection of previously infected individuals within 6-9 months.
- ▶ Developing herd immunity and increased NHS capacity to manage live cases sees lower economic impact longer term as measures are less restrictive, allowing phased return to business as usual.

What are the leading indicators?

- ▶ Widespread antibody testing indicates increased immunity in the broader population over time.
- ▶ Government establishes clear protocols and thresholds for social distancing measures to come into effect and monitors COVID-19 outbreaks through active testing.

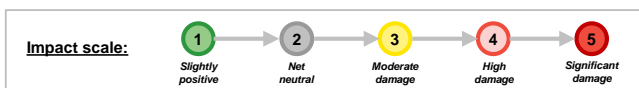
Note: 1. “Report 9: Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand,” Institute for Disease and Emergency Analytics Imperial College London, 16 March 2020.;
 2. “Fundamental principles of epidemic spread,” Nuffield Department of Medicine, University of Oxford, 24 March 2020, via Medrxiv, April 2020.;
 3. Implied economic impacts presented are illustrative, based on available information as at 7 April 2020 and do not represent an accurate forecast.
 Sources: EY-Parthenon research and analysis, Imperial College London

Key issues

- 1 Under a **V-shaped scenario**, the broader education industry should demonstrate resilience, with fees from the current term sufficient to bridge the gap into Q3 2020; a **W-shaped scenario would be more challenging due to a second wave of disruption**, and the **“tick” scenario is likely to present serious affordability challenges**.
- 2 While **nurseries and private schools will face headwinds** due to decreased discretionary income and a substitution effect, **higher education should remain resilient through a downturn**.
- 3 **Vocational training and apprenticeships should be able to leverage the opportunity of a furloughed workforce**; however, **demand for corporate training may well collapse** in the event of a recession.
- 4 Independent nurseries, some international schools, and a handful of higher education institutions (HEIs) will **potentially fall over during a recession**, which would present **investors and existing platforms with the opportunity to expand their footprints**, assuming funding is available.

COVID-19: impact by sub-segment

Sub-segment	During crisis (short term)	Post crisis (mid-long term)	COVID-19 impact	
			Short term	Long term ¹
Nurseries	<ul style="list-style-type: none"> In the short term, all revenue will be driven to zero; all non-essential staff furloughed; deferral of rent and rates and offsetting of costs Government support not immediately required 	<ul style="list-style-type: none"> V and W-shaped scenarios similar; government support will be necessary if second round of closures in autumn Redundancies will drive substitution for at-home childcare 	3	3
Private schools (K-12)	<ul style="list-style-type: none"> Fees already received for current term; only minor risk of parents negotiating refunds or discounts Loss of ancillary revenue this term Government furlough will limit short- and medium-term impact 	<ul style="list-style-type: none"> Schools will need to develop credible online solution to justify fees Affordability challenges under “tick” scenario; difficult to flex costs International school demand in steep decline 	3	3
Higher education	<ul style="list-style-type: none"> Near term impact limited by rapid shift to online and current term fees already received upfront Shoring up demand from international students and online solutions critical 	<ul style="list-style-type: none"> Higher Education (HE) Institutions will have to prepare a contingency plan for a second wave of social distancing Fundamentally, HE is a face-to-face industry, online and blended is a short-term solution 	2	3
Vocational and apprenticeships	<ul style="list-style-type: none"> Furloughed employees will be encouraged to take advantage of apprenticeship allowance while not working 	<ul style="list-style-type: none"> Levy is a function of payroll, and furloughed staff should still be applicable Impact of recession will vary by sector (e.g., retail hardest hit) 	2	2, 3
Corporate training	<ul style="list-style-type: none"> Steep dip in demand in the near term as corporate customers look to slash their cost base, with training programmes the first to go 	<ul style="list-style-type: none"> Sustained period of decreased demand as companies rationalize costs and headcounts are cut 	4, 5	4, 5
Services	<ul style="list-style-type: none"> Online program management (OPM) will outperform as schools rush to go online Limited short-term impact to Information System Management (ISM) under V-scenario 	<ul style="list-style-type: none"> OPM has a natural saturation point, with private schools and HE still valuing face-to-face instruction Drawn-out recession would challenge product renewal cycle and ISM for a whole year 	2	3



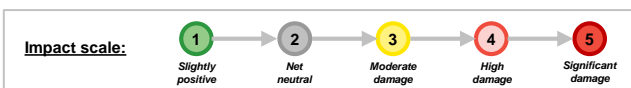
Note: 1. Potential long-term impact based on latest available public information as at 7 April 2020 and EY-Parthenon sector experience as to what the potential long-term implications might be. However, given the rapidly evolving situation and the myriad factors affecting the future, we cannot express any opinion on the extent to which the ultimate outcome will be in line with our indications.

Key issues

- 1 Immediate impact for telcos will be a reduction in revenue from variable mobile charges due to **reduced international roaming (c. 5% of revenue)** and **less out-of-home data usage (down c. 5%)**, with **spare home broadband network capacity able** to deal with demand during the day (c. 50% increase).
- 2 Massive and possibly sustained **change in user behavior** and **accelerated rise of tech-enabled businesses** will fuel the **demand for network capacity** while shifting platforms will require a **re-prioritization of expansion plans** (e.g., 5G prioritized in residential areas).
- 3 There will be key opportunities for telcos in the **enablement of mass working from home**, driving capacity upgrades and hence revenue, and the **accelerated transformation** of traditional to **digital business models** across all sectors.
- 4 Key opportunities for hosting providers, particularly hyperscalers, from the significant demand **increase for hosting capacity** as businesses move their workforce to digital, working from home models – **accelerating shift to cloud IT**.
- 5 To benefit from the reinforced role in this new digital normal, **telcos need to quickly adapt their customer and product strategy**, supported by a **clear infrastructure strategy** and **M&A to accelerate the plans**.

COVID-19: impact by sub-segment

Sub-segment	During crisis (short term)	Post crisis (mid-long term)	COVID-19 impact	
			Short term	Long term ¹
B2C fixed	<ul style="list-style-type: none"> Factors such as remote working, school closures and travel restrictions will result in increased data usage at home, will drive higher-quality broadband connectivity products in the short term as a result Accelerated app-based communication will further cannibalize voice calls offering opportunities to partner with established and new OTT players – sustained long term 	<ul style="list-style-type: none"> Potential for upgrades to stick long term as consumers realize value in higher-quality broadband connectivity Some of the structural changes in remote working will continue post-COVID-19 resulting in continued strong demand for B2C fixed broadband (in particular if similar subsequent crises occur) 	1	1
B2C mobile	<ul style="list-style-type: none"> Net impact is expected to be negative as customers will rely more on fixed broadband Immediate increase in international calls will not offset the reduction of roaming short term Protection from lower usage of mobile data via contract term unless on a pay-as-you-go contract (30% of mobile users) 	<ul style="list-style-type: none"> Economic downturn and redundancies may see customers cut their spend and reduce their mobile packages, which would only partially be offset by increased usage Longer term impact will be broadly neutral to positive as spending reverts back to pre-COVID-19 period; with some impact from less travel possible 	3	2 3
B2B fixed	<ul style="list-style-type: none"> Lower use of leased lines, but an increase in traffic flow from connections between data centers to homes driving upgrades Winners and losers will have a neutralizing effect - insolvencies in SME space will offset increased demand and capacity upgrades in others (e.g., online retail, cloud services) Increased demand for support as companies transition to tech-enabled model 	<ul style="list-style-type: none"> Continued positive demand from tech-dependent companies is expected Increasing number of businesses will focus on digital/online presence and offerings to adapt to change in customer behavior Acceleration of demand for Unified Communications (UC) Solutions including, complete migration from traditional to VoIP 	2 1	1
B2B mobile	<ul style="list-style-type: none"> Similar to B2B fixed, some companies are expected to increase spend on B2B mobile for their employees to support remote working, while others will cut down spending Roaming revenue expected to drop due to travel restrictions. No significant changes in other revenue as mostly contracted 	<ul style="list-style-type: none"> Potential structural shift to remote working, may see employers increase their work mobile spend, but the impact is expected to be limited Some mobile workloads are expected to be replaced by UC solutions benefitting from a fixed connectivity environment 	2	2 1
Hosting services	<ul style="list-style-type: none"> An increase in capacity demands as companies grow adoption of the collaboration tools and UC required for effective at-home working 	<ul style="list-style-type: none"> Increased demand for server capacity will be sustained as companies grow in adoption of digital and UC solutions and remote working 	1	1



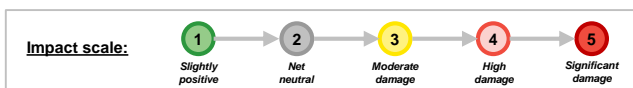
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Key issues

- 1 The technology sector will be reasonably resilient to the effects of COVID-19 given the high degree of contracted revenue and is likely to experience post-crisis benefits in the mid-long term. However, short term, the crisis **will result in delays in tech investment** as customers curtail spending - **except for certain technologies that enable remote working**.
- 2 The most pain is likely to be felt by those with high exposure to the small and medium-sized enterprise (SME) segment or more structurally challenged verticals (e.g., oil and gas, restaurants); insolvencies and cash preservation will see increased customer churn and payment delays; growth from sales to new customers may be curtailed by structural constraints elsewhere (i.e., technician availability).
- 3 Beyond the initial operational impact of the crisis, technology providers will **need to think through pricing models** (e.g., moving to more demand-based pricing) and **forge new partnerships** across the industry to provide products that are not just resilient but improve efficiencies of remote workers.
- 4 Medium to long term the crisis will have a net positive impact on the sector due to an acceleration in shift to new tech. (e.g., software as a service (SaaS), cloud) and greater recognition of IT resilience requirements, reinforcing private equity appetite for the sector.
- 5 **Increasing recognition of digital infrastructure as critical national infrastructure (CNI)** and greater understanding of the need to have better "IT resilience" among end users may spark additional investment, with governments expected to release **regulation on compliance for pandemic preparedness** rules which can span across multiple areas of IT.

COVID-19: impact by sub-segment

Sub-segment	During crisis (short term)	Post crisis (mid-long term)	COVID-19 impact	
			Short term	Long term ¹
Horizontal software	<ul style="list-style-type: none"> Software focused on supply chain logistics and remote working enablement will grow in importance; however, infrastructure needed for new business may have limited access. Long and technical sales cycles will impede growth as face-to-face interaction is limited Enterprise focused: will be relatively resilient SME focused: may struggle as SME death rates grow and clients are tight on cash, particularly in a W-curve where continued government support is unknown 	<ul style="list-style-type: none"> Increased focus on operational software as customers review contingency plans for supply chain, logistics and other business processes in potential future crisis Potential consolidation of smaller players as PE appetite for technology players returns SMEs may be more cost-conscious coming out of the crisis limiting SME focused player growth 	Enterprise 2 → 1	SME 3 4 → 2
			Enterprise 2 → 1	SME 3 4 → 2
Vertical software	<ul style="list-style-type: none"> Impact is highly dependent on the vertical served, verticals such as leisure will incur significant damage while health care and industrials are likely to be more resilient. Long and technical sales cycles will impede growth as face-to-face interaction is limited Enterprise focused: will be relatively resilient SME focused: may struggle as SME death rates grow and clients are tight on cash, particularly in a W-curve where continued government support is unknown 	<ul style="list-style-type: none"> Limited long-term impact SMEs may be more cost-conscious coming out of the crisis limiting SME-focused player growth Potential reduction and consolidation of SME-focused players 	Enterprise 2 → 1	SME 3 4 → 2
			Enterprise 2 → 1	SME 3 4 → 2
Infrastructure software	<ul style="list-style-type: none"> Short-term impact will be relatively limited as contracts are based on long-term cycles Infrastructure software will become more important as companies invest in software to support increased remote working 	<ul style="list-style-type: none"> Continued growth in importance of IT resilience will grow the willingness of companies to spend on good IT infrastructure and, in turn, the software to support it 	2 → 1	2 → 1
			2 → 1	2 → 1
Tech-enabled services	<ul style="list-style-type: none"> Impact is highly dependent on the vertical served. Players serving industries such as education and logistics will do well as demand rises As demand for focus on e-commerce rises, players enabling this channel will continue to perform well Players serving the travel and leisure industry will struggle as the industry "goes on hold" during lockdown measures 	<ul style="list-style-type: none"> Limited long-term impact Acceleration of adoption of e-commerce platforms and e-learning will boost players serving these industries 	2 → 2	2 → 1
			2 → 2	2 → 1



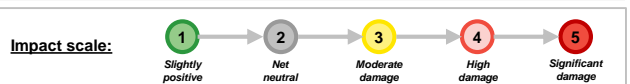
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Key issues

- 1 The impact of COVID-19 is likely to **vary significantly between different industry sub-sectors**; with sub-sectors such as e-sports and gaming seeing huge opportunity while others (e.g., B2B events, cinema, theater) face existential challenges.
- 2 Location and event based **entertainment** (sport, film, production) **faces huge short-term challenges**, but high demand and a resilient sector means **bounce back** should be possible – although **contingent on consumer sentiment on mass gatherings post crisis** and telegraphing of forward guidance by UK Government; with plenty of innovation in the meantime.
- 3 In the immediate term, there is huge consumer **demand for entertainment but substantial logistical challenges to create content and run events**, making digital key. Studios may trial new windowing approaches (e.g., US studios currently experimenting with directly releasing new movies via pay-per-view) that may disrupt the traditional theatrical window.
- 4 TV and advertising are expected to weather the storm, although growth will be capped. **TV viewing should remain high despite scheduling gaps. Advertising is likely to be hit in 2020, but lasting impact will be limited** as some sector spending offsets declines elsewhere. Streamers benefitting substantially but key question will be holding on to new users.
- 5 B2B information and supporting technology will have **mixed success depending on their exposure to end clients** and underlying performance of these sectors. **Flexibility to pivot services toward successful sectors will be key.**

COVID-19: impact by sub-segment

Sub-segment	During crisis (short term)	Post crisis (mid-long term)	COVID-19 impact	
			Short term	Long term ¹
B2B events	<ul style="list-style-type: none"> ▶ Many tradeshows canceled rather than re-scheduled ▶ Attendees expect a replacement of in-person events with digital ones to sustain industry learning 	<ul style="list-style-type: none"> ▶ Exhibitors and attendees of B2B events may develop an expectation of more digital events and learning, increasing opportunity for diversification of revenue streams ▶ Accelerated consolidation of smaller players who will materially suffer from canceled events 	5	3 4
Sport, film and production	<ul style="list-style-type: none"> ▶ Sporting events to be rescheduled or canceled, with high loss of revenues, until players can be cleared to play without contagion risk ▶ Severe short-term disruption of cinema operations due to social distancing, may drive widespread insolvency and potential consolidation – with impact proportional to length of lockdown ▶ Production paused due to social distancing unless it can be done “at-home” (talk shows), potential for more movie releases on pay-per-view 	<ul style="list-style-type: none"> ▶ Auctions for future rights may be impacted as broadcasters pass on current losses to sports rights holders ▶ Ticket holder safety at stadia a major focus ▶ Severe impact to sports if lockdown lasts long enough to force abandoning of seasons rather than rescheduling ▶ Studios may further utilize new movie release options such as pay-per-view ▶ Step-change in technology adoption and advancement of remote production and collaboration solutions 	5	2 3
TV and advertising	<ul style="list-style-type: none"> ▶ Overall viewership will increase but production challenges mean schedules are far less compelling ▶ Opportunity to capture ad revenue as short term audience numbers boosted ▶ Increased consumption of news content 	<ul style="list-style-type: none"> ▶ Accelerated shift of viewing towards streaming ▶ Operating models to evolve to incorporate more flexibility and agility in ways of operating 	1 3	2
E-sports and gaming	<ul style="list-style-type: none"> ▶ Traditional sports leagues will increasingly use videogames to maintain engagement with their audiences ▶ Gaming likely adopted by non-gamers 	<ul style="list-style-type: none"> ▶ Step-change to have more cross-over between sport and e-sports ▶ Gaming industry will need to consider ways to maintain new adopters of their products 	1+	2 1
Supporting technology and B2B information	<ul style="list-style-type: none"> ▶ Supporting tech impact depends on performance of customers, e.g., remote production is likely to benefit while broadcasters for sport likely to be hit ▶ B2B info largely protected due to long contract lengths 	<ul style="list-style-type: none"> ▶ Supporting tech has an opportunity to help clients step-change as tech adoption increases, but impacted by performance of customer base ▶ B2B info potentially impacted by low renewals in industries that are struggling 	Supporting tech 1 3 → 1 3 B2B info 2 → 2 3	



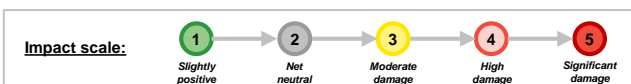
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Key issues

- 1** In the short term, non-discretionary consumer goods categories will see an immediate uplift as the population stays home, increasing demand for food and beverage (through grocery channel) in particular. However, discretionary goods will likely take a significant hit as consumers limit spending in light of immediate loss of income and uncertain outlook.
- 2** Forced closure of retail outlets will have a severe impact on the already challenged UK high street. This will likely lead to a shake-out of the zombies in UK retail. In turn, the re-shaping of the high street will accelerate. Stronger players may now find it easier to re-shape their real estate portfolios to fit a digital environment. Online propositions will be in better shape through the crisis, but all non-food retailers will be impacted by lower levels of consumer expenditure.
- 3** The restaurant and pub trade will be heavily impacted by the closure of outlets. Delivery services can offer a temporary respite, but their increasing consumer penetration and expansion of services could increase challenges in the medium term. The restaurant sector may now more quickly return to normal levels of capacity after years of over-supply; over the medium term this should benefit differentiated and better financed propositions.
- 4** Travel and hotels are already suffering an immediate impact with widespread travel restrictions in place; a key question is whether travel restrictions will still be in place over the key summer period. Consumer caution on both expenditure generally and travel specifically means post-crisis recovery is likely to be slow, and may be aggravated by longer-term reduced business travel demand. This may impact the January 2021 booking window meaning it may well take 18-24 months for the industry to return anywhere near pre-crisis levels.
- 5** In the long term, non-discretionary products are expected to continue to benefit as more consumers maintain cooking and cautious home-focused habits. Discretionary goods will continue to struggle as consumers will likely remain cautious.

COVID-19: impact by sub-segment

Sub-segment	During crisis (short term)	Post crisis (mid-long term)	COVID-19 impact	
			Short term	Long term ¹
Consumer, non-discretionary products	<ul style="list-style-type: none"> Increase in purchasing of non-discretionary items such as food and beverage have surged as consumers spend more time at home Producers simplify the number of items but are producing more of them as overall demand increases Acceleration of online ordering as consumers avoid busy grocery stores Online DIY products seeing limited impact as consumers take on projects that require them to be at home 	<ul style="list-style-type: none"> Long-term impact is likely to be positive as consumers will probably continue cooking at home as hesitance to eat out lingers, disposable income is squeezed and a desire to maintain a "safe home base" continues Producers likely to return to wider number of SKUs to capitalize on sustained at-home cooking and dining Online ordering trends likely to continue but at a slower pace. Personal care likely to accelerate trend towards a natural look and focus on skincare 	1	1 2
Consumer, discretionary products	<ul style="list-style-type: none"> Net impact negative as consumers seek to limit spending due to economic uncertainty Fashion, homeware, etc., struggling 	<ul style="list-style-type: none"> Likely to continue to see slow recovery as consumers bear economic hardships post-crisis and seek to limit discretionary spending "Big-ticket" purchases particularly likely to be adversely impacted 	4	2 3
Retail and restaurants	<ul style="list-style-type: none"> Retail and restaurants hit hard as brick and mortar sites close Retail attempting to cushion effect by pushing consumer engagement online Some restaurants will cushion losses by turning into dark kitchens/delivery establishments Restaurants already struggling pre-crisis given over-capacity and pressure on margins Retailers and restaurants dependant upon landlord goodwill to ensure longer-term deferral of lease payments 	<ul style="list-style-type: none"> Acceleration of closure of brick and mortar as restaurants and retailers review their portfolios Branded restaurants that over-expanded may consolidate positions Retail will accelerate reset towards an omnichannel strategy Likely to be significant fall-out among smaller/family operators in particular, but may be wider sector benefits through reduction in over-capacity. Likely higher unemployment may reduce recent pressures on labor costs/supply Longer-term forecast trends for eating-out favorable – but likely medium-term adverse impact of reduced discretionary income 	5	3
Travel and hotels	<ul style="list-style-type: none"> Travel will be hit particularly hard and many businesses will hibernate/close Companies with pre-existing bookings push to offer re-bookings and credits in order to retain cash Insurance companies continue to tighten their policies to avoid settling claims on travel cancellations Travel operators exercising force majeure contracts to avoid obligations with hotel owners Hotels are generally all closed and furloughing staff, other than those making specific arrangements with local health authorities 	<ul style="list-style-type: none"> Well-established travel and tour operators likely to stay afloat but will only see recovery in bookings as consumer confidence returns and travel restrictions are lifted Potential decline in business travel as remote working proves its effectiveness Staycations and domestic travel likely to grow in popularity as urge for experiences continues to be strong: long-term forecast trends in leisure travel remain strong (although likely adverse medium-term impact of reduced discretionary income) Potential growth in willingness to pay for flexibility of cancellation in bookings Impact pushed into supply chain, e.g., hotels, travel management companies (TMCs), etc. Data from Asia suggests slow recovery in hotel occupancy, which will pose additional cash-flow challenges given high fixed costs and limited ability to furlough staff post reopening Crisis likely to accelerate trend toward (better capitalized) brands at expense of private owned hotels 	5	3



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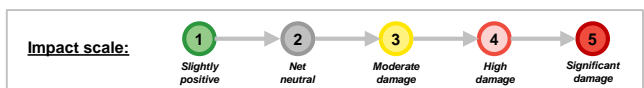
Key issues

The number of pharmaceutical and MedTech companies set to benefit through production of COVID-19 related products and treatments will be small

- 1 **Operational disruption to healthcare services companies will be significant** with immediate focus on managing the COVID-19 response. **Suspension of elective procedures** and the subsequent backlog will **contribute to longer waiting times** that may result in secondary complications. "Normal" hospital operating conditions unlikely for many months.
- 2 **Pharmaceutical and MedTech sales** (excluding COVID-19 relevant products) will be impacted in the near term as greater restrictions on sales teams' ability to interact with prescribing clinicians and decision-makers. However the bulk of existing pharma sales less affected, particularly for chronic conditions on repeat prescriptions.
- 3 **Potential pharma supply chain issues** in cases where manufacturing is concentrated in markets most affected by lockdowns (particularly the case for generic manufacturers). Wholesaler stock and supply chain redundancy should mitigate severe industry-wide shortages.
- 4 **Pause or cancellation of clinical trial activity** (excluding COVID-19) will push out timelines for drug development and have a near term adverse impact on pharma outsourcing providers reliant on clinical trial activity, e.g., CROs, medical affairs consultancies.
- 5 Forced ramp up in use of technology, e.g., remote GP consultations **may accelerate the historically slow adoption of telemedicine**; with pattern of behavior more established among patients post-crisis. The observed significant drop in A&E attendances during the pandemic highlights the number of cases that could be managed through alternative routes.

COVID-19: impact by sub-segment

Sub-segment	During crisis (short term)	Post crisis (mid-long term)	COVID-19 impact	
			Short term	Long term ¹
Biopharma and MedTech	<ul style="list-style-type: none"> ▶ With hospitals focused on the crisis, companies will be forced to pause non-essential clinical trials for the foreseeable future ▶ Sales of drugs and devices not associated with treating COVID-19 will be challenging, with hospital decision-maker attention focused elsewhere ▶ Volume increase is expected for products that might have expected efficacy on COVID-19 (HIV drugs, SARS vaccines) ▶ The industry is unlikely to suffer wide-scale supply chain and/or manufacturing issues as it works through existing product stock, although some shortages may be observed 	<ul style="list-style-type: none"> ▶ Recurring sales from daily or repeat prescriptions will stabilize revenues, however, drug development will be delayed during the crisis due the pause in new clinical trials and patient recruitment ▶ Companies that feed into the drug development and clinical trial industry will see direct knock-on effects from the pause in drug discovery activities ▶ Experience from previous downturns shows pharma and MedTech sales achieve full recovery, driven by underlying health needs 	3	2
Health care services	<ul style="list-style-type: none"> ▶ Hospitals and health care staffing will be reconfigured around treating COVID-19 for the foreseeable future, with all elective surgery and treatment put on pause ▶ There will be a marked uptick in telemedicine use across the UK, with patients actively avoiding A&E and hospitals in general for the duration of the crisis ▶ Private hospitals have been effectively nationalized on a contract basis to hit peak demand ▶ Majority of providers have access to government funding, with cash flow issues unlikely in the short-medium term 	<ul style="list-style-type: none"> ▶ Hospitals and health care staff will not return to business as usual until the COVID-19 crisis has been brought to within a manageable case load on a sustained basis ▶ Elective surgery likely to be rationed in the medium-term to offset the cost of addressing the COVID-19 crisis ▶ Increased adoption of telemedicine is expected following a shift in patient and health system acceptance during the crisis ▶ Private providers may see an uptick as wealthy consumers choose to pay out of pocket for elective surgery in light of long wait times 	3	2 1



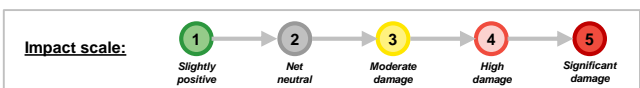
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Key issues – global and UK focus

- 1 Within the Energy sector, Oil and Gas (O&G) is suffering from the **worst collapse in prices for over 20 years**, due to **over-supply from Saudi Arabia, Russia and the US**, and **up to a 25% fall in demand** for oil products and natural gas. In Power and Utilities (P&U), **energy demand is down almost 20% due to COVID-19 specific issues**, taking out power plants. There is **concern on customer defaults on bill payment**.
- 2 In O&G, **OPEC, Russia and the US are likely to take coordinated action** in the next 12 months to reduce production targets and shore up crude oil prices, to address rising budget deficits and more importantly **stabilize the industry globally**. In the **absence of production cuts, the industry will continue to face considerable challenges**, with far-reaching economic and political consequences well beyond COVID-19.
- 3 A long period of economic uncertainty may see all upstream players – including North Sea – **deferring large capital investments** until oil and gas prices stabilize, which could have the **knock-on effect of supply constraints further down the road**. Reduced demand for transport fuels will put pressure on downstream refineries, with the **UK potentially seeing one of its six refineries shut down**.
- 4 In P&U, **gas-fired generators will be squeezed by reduced demand for electricity** at peak hours. Existing **renewables generators should fare better**, with lowest operating costs, and guaranteed high prices (picked up by the consumer via state subsidies). New renewable projects may be delayed due to lack of demand, and lower gas prices. A number of **smaller, challenger electricity and gas retailers** (which are poorly capitalized) are at high **risk of failing** as their customers bear the economic impact of COVID-19 and either stop paying bills or defer payments.
- 5 Long term, the current crisis and the high volatility of oil and gas **could accelerate the transition away from the current hydrocarbon-intensive economy**; however, **policy changes will have to be enacted to guide this shift**, which will be challenged by historically low oil and gas prices that are generally welcomed by government as a stimulus for economic growth.

COVID-19: impact by sub-segment

Sub-segment	During crisis (short term)	Post crisis (mid-long term)	COVID-19 impact		
			Short term	Long term ¹	
Utilities	Generation	<ul style="list-style-type: none"> Slowdown in energy usage (c. 20% due to commercial and industrial shutdowns) With total electricity demand down, gas generators are squeezed due to renewable baseload, which is sold at higher, guaranteed prices, keeping energy bills high (in turn increasing risk of default) 	<ul style="list-style-type: none"> Longer-term, UK wind/solar generators will do well, as will existing nuclear generators Expected renewables and storage projects likely to be deferred and projects underway to be slowed down Gas prices likely rebound from historic lows but this may take a year or more 	3	3
	Distribution	<ul style="list-style-type: none"> Limited impact in the near term, with the business continuing as usual Ensuring distribution network resilience and increasing capacity for electrification will continue to be a focus 	<ul style="list-style-type: none"> In a low interest rate environment, more B2B consumers will switch to distributed generation, requiring more investment for lower revenues and stressing the regulated distribution business model 	2	3
	Retail	<ul style="list-style-type: none"> Risk of customers and SMEs not paying or deferring bills in the near term and standalone retailers being unable to meet obligations to energy wholesalers 	<ul style="list-style-type: none"> Medium-term risk of bankruptcy, particularly for challenger retail players, with incumbents responsible for bailing them out and absorbing customers; bailout costs passed on to taxpayers 	3	3, 4
Oil and gas	Upstream	<ul style="list-style-type: none"> Barring an agreement between OPEC, Russia and US, oil prices will remain low in the near term, fundamentally challenging production and upstream investment, with all pre-Final Investment Decision (FID) projects paused UK-based oilfield services companies will immediately be impacted with potentially up to 25% job losses 	<ul style="list-style-type: none"> Estimated 5% dip in global demand for whole of 2020, keeping prices low Supermajors will cut capex, costs, headcounts, and defer projects to weather the storm and maintain cash flow through capex reductions North Sea production will be challenged but remain afloat due to hedging and a desire to avoid decommissioning costs 	4	4, 5 Oilfield services
	Midstream	<ul style="list-style-type: none"> Surplus Liquefied Natural Gas (LNG) has been diverted to Europe pushing down prices, but facilities full and demand met Existing LNG contracts being renegotiated due to low prices US exports are becoming unprofitable 	<ul style="list-style-type: none"> Like upstream, LNG will suffer delays in new projects due to collapse in demand Longer-term, the LNG industry is expected to revert to normal, with higher gas prices and US exports viable, and regional gas prices differences returning 	3	3
	Downstream	<ul style="list-style-type: none"> Oversupply in the refinery sector, with one refinery potentially being forced to shut in or potentially be closed Fuel retailers will suffer with both fuels and grocery/convenience sales down; jet fuel sales will collapse 	<ul style="list-style-type: none"> Transport demand for gasoline and jet fuel will bounce back post-lockdown Electric car sales will dip as customers delay purchases and avoid high costs, meaning less destruction of gas demand 	3	3



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Key points

Given hugely diverse nature of industrial products as a sector we have focused on select end-markets – the impact of COVID-19 varies widely across sectors, sub-sectors and individual companies within each

1 Short term, the crisis will result in **sharp drops in demand and delays to large capex investment**, except for certain areas (e.g., packaging) where shift in consumer behavior is driving increased demand. **Longer term, end markets are expected to be recover** although **speed of this recovery is likely to be slow** in some sectors.

2 As the situation unfolds, we expect that **many manufacturers will grapple with securing and ramping up their supply chains** (many of which are global in nature); this **may be exacerbated by potential insolvencies** as we come out of a period of low economic activity – a W-shaped scenario likely to be more harmful with two periods of very low activity. **Winners will be those who address these issues early.**

3 Beyond the initial operational impact of the crisis, there will be a **widespread review of sourcing strategy to improve resilience and sustainability** across all sub-sectors – this **may potentially mean reversing of previous trends towards offshoring and JIT manufacturing** as well as **supplier diversification to mitigate supply chains exposure** for critical components.

4 Medium to long-term the crisis **may result in an acceleration in underlying industry trends** as part of businesses' strategic responses for example: **adoption of advanced manufacturing methods; development of digital/B2C online propositions, rationalization of physical store footprints** (e.g., auto retail, construction products) and moves along the value chain to **add value-added services, systemized solutions and recurring revenue** (through, e.g., aftermarket or monitoring).

COVID-19: impact by sub-segment

Sub-segment	During crisis (short term)	Post crisis (mid-long term)	COVID-19 impact	
			Short term	Long term ¹
Aerospace and defense	<ul style="list-style-type: none"> Major aircraft manufacturers have slowed or stopped production across several locations, putting pressure on supply chains Elevated risk of deferred orders by airlines (can be somewhat mitigated by stretching production and shifting orders across customers) Grounded fleets lead to large reductions in aftermarket and services activity – all but essential maintenance likely to be delayed 	<ul style="list-style-type: none"> Medium-long term outlook likely contingent on level of major airline failures (and condition attached to bailouts) OEMs and component manufacturers may look to diversify end-markets (aerospace vs. defense vs. space vs. wider sectors, e.g., energy) and explore increasing the share of aftermarket Any revisiting of supply chain strategy and alternative manufacturing likely to be slow due to nature (i.e., certifications) of the sector 	OEMs + suppliers	
			AM	
Automotive	<ul style="list-style-type: none"> Sharp drop in demand for new and used cars across Europe, resulting in widespread production shutdowns and impacting across the chain from vehicle manufacturers to car dealers Distress and disruption of supply chains likely to make ramp-up in recovery problematic (requiring action now). OEMs may need to support retail networks and change sales targets Services and repair remain open; although much reduced activity due to lower miles driven and 6-month MOT holidays 	<ul style="list-style-type: none"> Over 75% of UK car production is exported, so demand profile in Europe key to recovery – and may be slow, also given stock in the system Strategic responses will include review of supply chain resilience, alternative manufacturing methods, dealer footprint and digital retail/customer engagement Hygiene concerns may require a review of OEM's mobility service plans Retail – re-assessment of footprint, increase in digital showrooms and improving CRM practices. OEMs likely to start exploring B2C channels 	OEMs + suppliers	
			Retail	
			Service/Repair	
Construction and building products	<ul style="list-style-type: none"> Immediate impact will be driven by end-use exposure, i.e., critical infrastructure works (e.g., hospitals, transport, potentially warehousing) which will be more protected vs. industrial/commercial/homebuilding Most sites now closed/projects put on hold, with knock-on effect into merchants and building materials producers (demand generally domestic and likely to reduce significantly) Short term/medium term, securing trades (many European and older) may be challenging 	<ul style="list-style-type: none"> Post-crisis implications will vary by segment, although recovery likely to rebound slowly: <ul style="list-style-type: none"> Housebuilding/Contractors: expand into planning and operations of buildings, explore off-site construction to reduce reliance on trades Merchants: crisis will exacerbate previous pressure on merchants, leading to development of digital channels and addition of services Building products: expand reach directly to end-users, add services, exploring systemisation and modular building solutions 	Housebuilders and contractors	
			Merchants	
			Building products	
Packaging	<ul style="list-style-type: none"> Net neutral in consumer goods segments with increase in demand for "at home" items incl. food, likely to be offset by decline in demand in "out of home" packaging (e.g., take-away drinks cups, etc.) Industrial packaging demand (~25% of market) is likely to be impacted by fall in general activity - following GDP Operationally nimble players likely to benefit through ability to respond to shorter term changes in demand 	<ul style="list-style-type: none"> Packaging industry likely to come out of crisis and continue as previously; there may be a push to diversify to product offering (although likely to remain within existing substrates) Return to sustainability of materials post-COVID likely – however, focus may change due to potential residual consumer fears around "hygiene" 		

Impact scale:



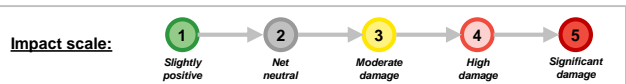
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Key issues

- 1 **Volumes and discretionary spend on non-essential business services will decline**, both during the crisis and through any subsequent recession. However, there will be a **need for surge capacity for certain services**, especially in the government and health care sectors.
- 2 While **some sub-sectors will be resilient** (e.g., front office BPO, logistics and warehousing), **others will be adversely impacted** (e.g., permanent staffing, on-site catering, corporate training, consulting). Service providers exposed to SMEs are likely to experience revenue decline for a prolonged period.
- 3 **Changes to contracting mechanisms will be required**; service providers and clients will need to agree the service and commercial implications of de-scoped services (potentially requiring re-negotiation of performance regimes), while more rapid and agile contracting will be required for services requiring surge capacity (especially in the public sector).
- 4 **New paradigms for the workplace and consumption** (e.g., remote and flexible working, e-commerce and delivery) will place greater emphasis on **digital capabilities** (e.g., remote workforce management, collaboration, internet of things).
- 5 **Supply chain resilience will need to be maintained** in many sub-sectors (e.g., construction, facilities management) and there will be an increased need for **working in partnership** (prime contractors will need to determine how to extend support to an increasingly fragile supply chain, sub-contractors will have to overcome increasing delivery issues).

COVID-19: impact by sub-segment

Sub-segment	During crisis (short term)	Post crisis (mid-long term)	COVID-19 impact	
			Short term	Long term ¹
Business process outsourcing (BPO)	<ul style="list-style-type: none"> ▶ Front office and customer contact BPO will fare well during the crisis (especially in the public and health care sectors), with increasing emphasis on multi-channel interaction ▶ There will be volume pressure in certain services (e.g., travel management) ▶ Impacts will vary by industry served, with retail, travel and leisure most adversely impacted 	<ul style="list-style-type: none"> ▶ Demand for outsourced solutions will continue through the downturn as clients seek cost savings and increased cost flexibility ▶ However, pricing pressure will increase, especially on contract renewals ▶ There will be an acceleration of technology-enabled workforce management and automation, which drives cost efficiencies but also reduces contract scale 	2	2
Construction, engineering and Facilities Management (FM) services	<ul style="list-style-type: none"> ▶ Around 65% of UK construction projects have been put on hold in the face of safety and workforce availability issues ▶ FM services to the public, health care and essential infrastructure sectors will be resilient. Offices, retail and leisure will be adversely affected and most project-related work will be paused 	<ul style="list-style-type: none"> ▶ Construction has historically been highly cyclical. However, low interest rates and a structural housing shortage could provide some support to the sector ▶ The outlook for continued fiscal stimulus via civil infrastructure investment is unclear, especially in light of short-term rescue packages ▶ Potential COVID-19 insolvencies may drive construction sector consolidation; workforce shortages may limit the speed of recovery ▶ There may be an acceleration of investment in digital technology and industrialization 	4	3
Professional services	<ul style="list-style-type: none"> ▶ Spend on discretionary and non-essential professional services will be reduced or deferred (e.g., marketing, corporate training) ▶ Staffing and recruitment will be adversely impacted, although temporary and flexible resourcing will fare better ▶ Overall demand for consulting will reduce, especially in strategy and transactions, although there will be increases in restructuring, operational transformation and BCP* 	<ul style="list-style-type: none"> ▶ Short-term impact is likely to continue during a prolonged recession, although there may be rebound in services related to corporate and private equity transactions 	3	3
Logistics and distribution	<ul style="list-style-type: none"> ▶ Increased use of e-commerce and delivery will imply resilience and growth. Need to divert resources to areas of high demand ▶ Operators will be challenged by labor supply and may need to resort to increased sub-contracting to provide flexibility as short-term volumes increase. Reduced availability of imports may impact the market 	<ul style="list-style-type: none"> ▶ Continued economic decline may reduce volumes of goods transported (decline of ~20% during the great financial crisis) ▶ Potential for increased price competition and risk taking by some players ▶ Labor supply will be challenging and players will need to manage increased supply chain risks 	1	2 3



* Business continuity planning (BCP)

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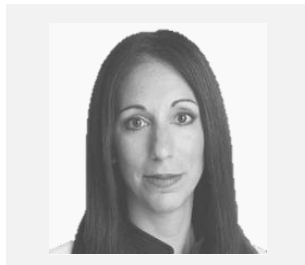
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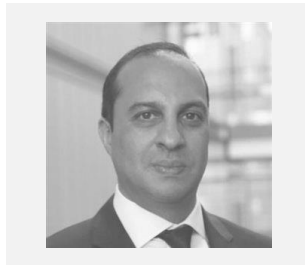
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