

December 2020

CREDIT SUISSE 

# Research Institute

What will last?

The long-term implications of COVID-19



Thought leadership from Credit Suisse and the world's foremost experts

# Editorial

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Crises often have a transformative effect. While some developments turn out to be temporary, others prevail long after a crisis is over. As we take stock of the COVID-19 pandemic, the Credit Suisse Research Institute brought together academic, business and political leaders at its Fall 2020 Conference to reflect upon the long-lasting consequences.

The rapid spread of COVID-19 in early 2020 caught most of the world by surprise and turned the global economy upside down. The pandemic made us aware that contagious diseases can still threaten society as a whole and that such outbreaks are in fact by-products of human progress. Throughout history, however, health crises have also helped to drive scientific and social innovation, shaping the paths of future economic development. We believe that the current health crisis will be no exception in this regard.

Yet, rather than radically changing the world as we know it, COVID-19 has accelerated existing trends. The digitalization of everyday life, the trend toward more flexible work arrangements, the deceleration of globalization, the weakening of multilateralism, the expansion of the state or the

vulnerability of cities – all of these developments were already under way prior to the outbreak of the virus. The pandemic only acted as a catalyst.

The speed at which these trends are now progressing is challenging modern society to keep pace. Legislation is lagging behind in several areas from data protection to labor laws, and governments, just like companies, have to strengthen their resilience by adopting more sustainable economic paradigms.

Acting now with a view to the world after COVID-19 can help minimize the likelihood of another pandemic-driven global crisis. It can also be an opportunity to address issues that have undermined growth and prosperity in the last few decades.

We hope that our findings will prove valuable and I wish you a most insightful read.

**Urs Rohner**

Chairman of the Board of Directors  
Credit Suisse Group AG



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# Ten trends to watch

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## **1. Inflation tail risks**

The benign inflation regime of past decades will persist in the medium term, but deflation and inflation tail risks have grown.

## **2. Multilateralism 2.0**

Multilateralism is either reset and reformed or will cede to multipolarism as a result of US-China interactions.

## **3. Democracy/autocracy**

Both can fail or thrive in a pandemic as crisis management, state capacity and citizens' trust matter more than political systems. Both will continue to co-exist.

## **4. Big state**

State power extensions will outlast the crisis, initiating desirable changes, but at the same time increasing the risk of undermining market dynamics and individual responsibility.

## **5. Nearshoring**

Globalization will not reverse, but slow further, with more emphasis on regional diversification, nearshoring of production and resilience rather than cost efficiency.

## **6. Surveillance**

Surveillance and personal data collection now enable states and companies to become information empires. Comprehensive privacy protection is crucial.

## **7. Work**

Remote work is here to stay, fostering an even broader flexibilization and new standards in the working world.

## **8. Education**

Lifelong learning will become a key part of everyone's life to create an adaptable work force and develop skills that stress human advantage over machines.

## **9. Inequality**

Inequality will remain a core focus and possibly initiate more redistributive taxes, triggering labor and capital flows in response.

## **10. Decentralization**

Cities will survive, but adapt, leaving room for more regional decentralization and a renaissance of small towns in the developed world.

# Introduction: What history tells us

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For centuries, people have suffered outbreaks of infectious diseases. The Black Death and the Spanish Flu, for instance, not only claimed millions of lives, but had far-reaching consequences for those who survived. Despite the tragic effects, pandemics have also helped drive scientific and social progress, shaping the path of economic development. Indeed, past pandemics offer important insights about how to deal with crises.

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## **Pandemics and human progress are intertwined**

For much of history, humans lived in hunter-gatherer societies, with mobility as a survival strategy. Yet when they began to settle, populations began to grow in size and villages were established. Increasingly, crowded neighborhoods and unsanitary living conditions became a reality for these sedentary societies. Animals were no longer hunted, but bred and thus kept close to humans. By altering ecosystems and blurring natural frontiers, humans became increasingly exposed to viruses and bacteria. COVID-19, assumed to have originated in Wuhan's wet markets, is the latest example of how close interaction of animals and humans can still lead to pandemics.

The ability of sedentary societies to store food made it possible to feed the non-food-producing population, leaving these people to focus on other tasks. This division of labor eventually led to new inventions such as the plough or the knife, which made food-producing individuals more productive. Over time, a diminishing share of society had to produce food for the whole community, allowing even more non-food-producing people to specialize in other fields. This reinforcing cycle made societies wealthier and cities bigger. Thanks

to inventions along the way such as trains, ships and automobiles, the world became increasingly interconnected. By facilitating the movement of people and goods between once-isolated communities, these inventions made it easier for infectious diseases to spread. In other words, the pursuit of economic progress has regularly brought more opportunities for humans, but also enabled diseases to develop and spread.



**History is another way of thinking about the present and helps identify what is truly new and what not – Dr. Margaret McMillan, Professor of History, University of Toronto**

The Black Death, the deadliest pandemic in history with an estimated death toll of 75–200 million people, was caused by the bacterium *Yersinia pestis*, which passed from rats to humans via infected fleas. Historians believe that the plague originated in Central Asia in the

1330s and found its way to Messina, Sicily, through galleys in 1347, and from there to other parts of Europe. In an attempt to control the plague, Italian cities gave health authorities emergency powers and built barricades to limit the movement of people and goods. Moreover, cities established a 40-day confinement period. These containment measures effectively changed the role of the state for centuries to come. The plague justified top-down measures to mitigate the negative impact on the population and the economy through surveillance and the suspension of human liberties. COVID-19 has the potential to be a similar catalyst for new relations between the state and individuals.



**We cannot rule out future pandemic scenarios – Albert M. Baehny, Chairman of the Board of Directors, Lonza**

Affected societies felt overwhelmed by the sheer ferocity of the Black Death, believing that the plague was a punishment for human sins. Their powerlessness turned into anger aimed at the population groups believed to have caused the health crisis. It was only by 1894 – after the Third Plague – that scientists discovered the bacterium behind the outbreak. This discovery triggered a series of developments in microbiology, medicine, urban planning and sanitation, which led to treatments and the prevention of the plague. Today, thanks to strict public health measures and modern antibiotics, the plague no longer affects great numbers of people and is much less deadly.

The most devastating disease outbreak in recent history was the Spanish Flu, a contagious respiratory disease that claimed between 20 and 50 million lives in 1918 and 1919. To combat it, governments closed places of entertainment, schools and public transportation. Moreover, masks were distributed and people were ordered to stay at home. Although it was primarily World War I that ended the first era of globalization in the industrialized world, historians argue that the Spanish Flu may well have loosened the increasing economic ties among nations. Similar considerations have been made with regard to COVID-19 – even if it may not reverse globalization, it may come to be seen as having changed the nature of globalization.

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## Shifts in power and fortunes

While disease outbreaks have preoccupied communities for centuries, they have also shaped the balance of power across the world. For instance, historians argue that diseases endemic to Europe played a decisive role in the European conquests of the New World. In Europe, the Black Death and subsequent waves of the plague laid the foundation for diverging developments across the continent. The outbreak of the plague in the 17th century, for instance, affected some regions much more than others. Italy was severely struck, while Northwestern Europe continued to develop, shaping the subsequent path of economic development. Similarly, the COVID-19 crisis could redefine the geopolitical balance of power, as countries that have handled the crisis better gain an advantage over others.

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## The world after COVID-19

Most pandemics underline the role that environmental, social and cultural factors play in their emergence and spread. As long as people do not take into account the human factor and the circumstances that have led to new disease outbreaks, human knowledge of pandemics is incomplete when it comes to preventing them.



**COVID-19 can be seen as a dress-rehearsal of some of the exacerbating stresses in precariously poised unbalanced systems – Jeremy Lent, author of the “Patterning Instinct: A cultural history of humanity’s search for meaning”**

History has shown that the human factor can also decrease the susceptibility to infectious diseases, with the current outbreak no exception. In their efforts to limit the negative impact of COVID-19, governments are adopting more sustainable economic paradigms such as strengthening public health systems and addressing the vulnerability of cities. Countries are thus starting to plan the world after COVID-19 in an effort to minimize the likelihood of another pandemic-driven global catastrophe. Some experiences of the COVID-19 pandemic may well prevail long after the crisis. This report discusses how the world might look after COVID-19.





# 1. On balance, a deflationary shock

The short- to medium-term impact of COVID-19 on growth and inflation has clearly been negative. Yet the longer-term impact may be less negative than that of other major recessions. Despite significant fiscal deficits, we think government debt should be sustainable as long as deficits are gradually reined in. It seems premature to worry that the low-inflation regime of past decades will end anytime soon, but an eventual excessive rise of inflation is a tail risk that needs monitoring.

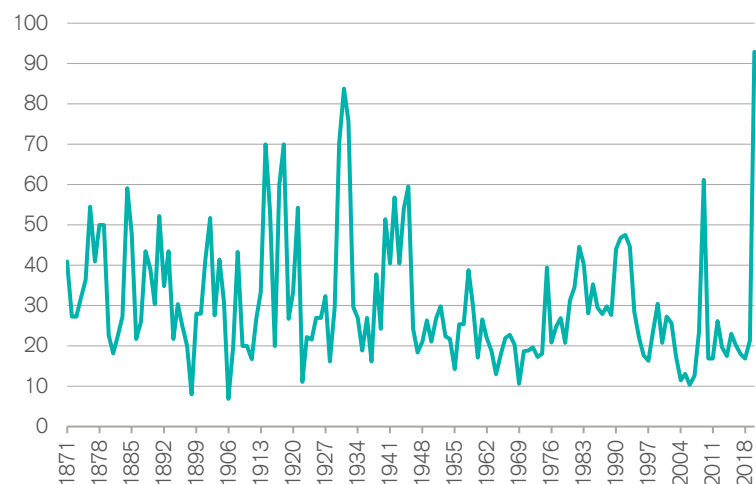
## A negative growth shock in the short term

While the COVID-19 crisis led to a sharper and more synchronized downturn than the Great Depression of the 1930s (**Figure 1**), it will most likely not last nearly as long. In the Great Depression, severe policy errors, particularly tight monetary policy, a virtually non-existent counter-cyclical fiscal policy and rigid labor market structures caused a decade of massive unemployment and general economic calamity. This time, the policy responses have been quite different. Jordà et al. (2020) analyzed the macroeconomic consequences of past pandemics back to the 14th century and found persistent negative growth impacts over 30–40 years. Yet, in the past, a massive death toll among the working age population led to a significant decline in the return on capital and low growth, even if it boosted the wages of the survivors. Given the lower mortality rate of the COVID-19 pandemic among the young and middle-aged and in view of advances in science and medical care, the economic impact of this pandemic is likely to be far less severe than that of past pandemics.

Even so, the question arises whether the COVID-19 recession could break the longer-term growth trend. Given the rapid and forceful

**Figure 1: Broader downturn than the Great Depression**

Share of countries in recession, in %, 1871–2020

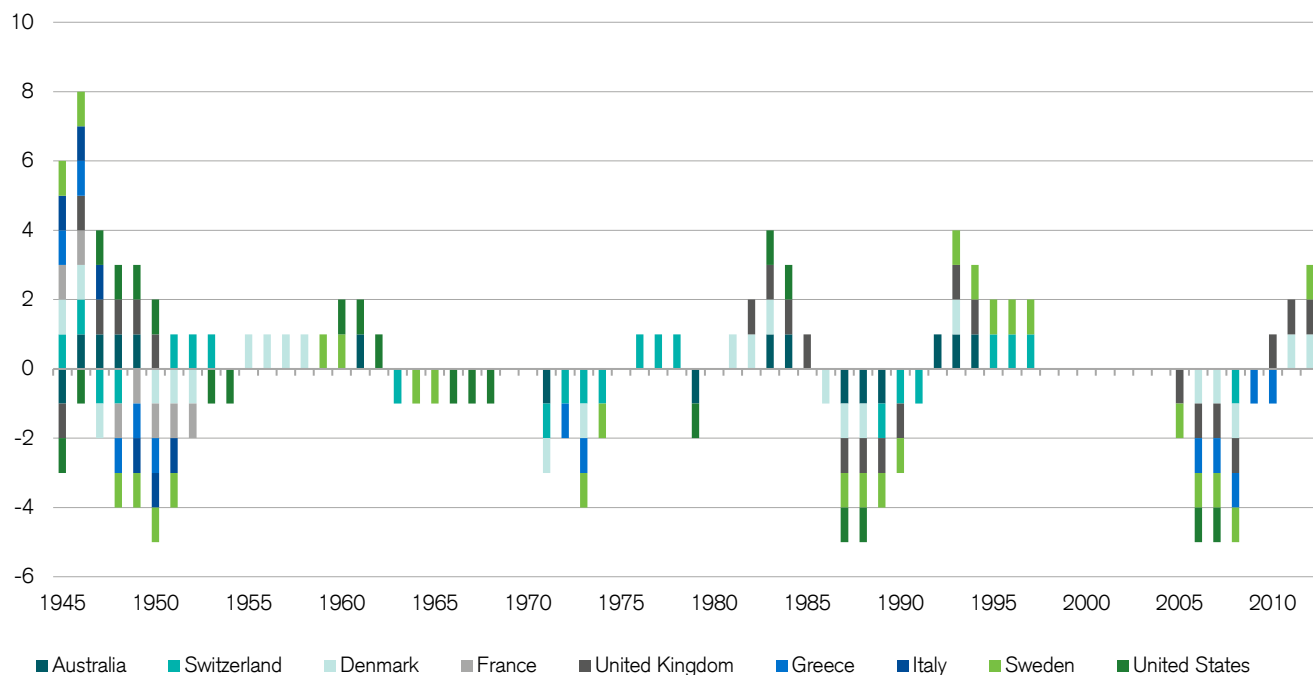


Source: Bolt et al. (2018); Kose, Sugawara, and Terrones (2019, 2020); World Bank, Credit Suisse



**Figure 2: Post-World War II shocks have dampened the growth trend**

Countries where rolling 5-year GDP growth deviates more than one standard from trend



Source: Maddison Project Database, version 2018, Bolt et al. (2018), Credit Suisse

fiscal and monetary policy responses, it is close to certain that any longer-term impact on growth will be far more limited than after the Great Depression. Yet a negative impact similar to that of the oil shocks of the mid-1970s or the financial crisis of 2008–09 cannot be ruled out (Figure 2). Permanently increased costs related to heightened preventative medical care or safety measures in public transport, trade and office usage could raise unit labor costs and weigh on global productivity growth. There could also be second-round effects on growth from reduced consumer or business consumer confidence, with the latter harming domestic and international investment (“scarring” effects; Kozłowski et al. [2020]). If the pandemic has also reinforced protectionist trends (see Chapter 4), these negatives would be exacerbated. In combination, these negatives will likely outweigh some of the transformational and productivity-enhancing results of the pandemic like the accelerated digitalization. Since the COVID-19 pandemic is an exogenous and well-identified shock that can be counteracted in a highly targeted manner, the longer-term negative effects should be less severe than those resulting from a prolonged build-up in economic imbalances, which caused the financial crisis, for instance.



**Falling productivity of innovation activities is a long-term problem – David Dorn, Professor of Globalization and Labor Markets, University of Zurich**

**Limited risk to debt sustainability, for now**

As a result of the fiscal support measures, the loss in tax revenue and the growth slump, public sector debt-to-GDP ratios have surged in 2020. The International Monetary Fund (IMF) expects debt-to-GDP ratios in advanced economies to rise by over 20 percentage points on average in 2020, far exceeding the rise in 2008–09 (Figure 3). The key issue is whether debt will become unsustainable and/or add to pressure on central banks to fund the debt with potential inflationary consequences.

Three parameters determine whether debt is sustainable: the primary fiscal deficit (i.e. the deficit excluding interest payments), the interest rate on debt and the GDP growth rate.

**Figure 4** provides a range of scenarios under which debt could become unsustainable by focusing on critical interest rate levels and changes. We assume that countries will manage to achieve balanced primary budgets from 2022 onward and return to their projected trend GDP growth by then. Under those assumptions, Japanese government bond yields, for example, could rise by one percentage point relative to the average for 2020 without destabilizing the debt ratio. In Germany, yields could even rise by 3.7 percentage points, and in the USA by 1.9 percentage points. Given our view (and the consensus view) that yields on advanced economy government bonds will remain low for quite some time, such increases seem unlikely.

The situation is different for Italy. Although its benchmark yield declined in 2020, it remains above the tolerable interest-rate level. Still, Italy will require a primary surplus of about 0.6% of GDP to stabilize its debt ratio after 2022. Yet, if we remember that Italy had a primary surplus of 1.6% on average in the decade before the COVID-19 shock, this requirement may not be unfeasible. Moreover, this analysis does not take into account that additional central bank bond purchases would ease financing conditions and increase the fiscal leeway of governments.

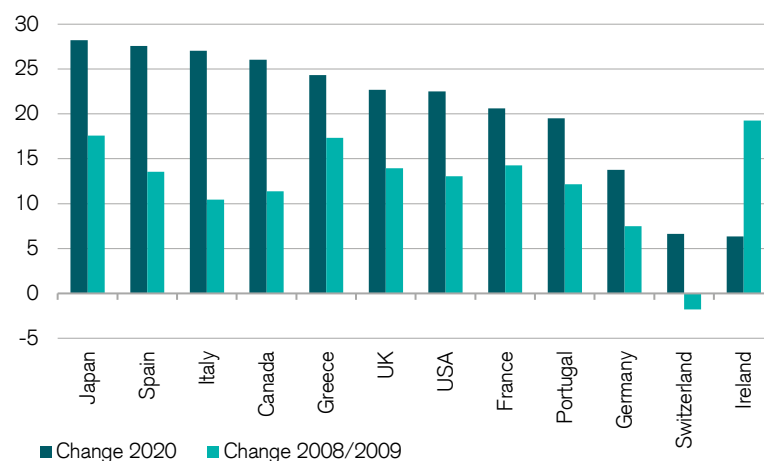
### Base case is low inflation, excessive inflation a tail risk

A key issue is whether the COVID-19 crisis might eventually boost inflation. In recent months, inflation declined sharply in advanced economies (**Figure 5**) and many emerging markets although the lockdowns early in the COVID-19 pandemic constituted a negative supply shock, which should have boosted prices. Yet such short-term developments do not necessarily mean that inflation will not eventually rise more than expected or desired by central banks.

Drawing on the so-called quantity theory of money, some observers worry that the dramatic expansion of central bank balance sheets since the beginning of the pandemic implies substantially heightened inflation risks (Goodhart [2020]). Indeed, as a share of GDP, the increase in the balance sheets of the Federal Reserve (Fed) and European Central Bank (ECB) has been more than twice the expansion during the Global Financial Crisis (**Figure 6**). Moreover, larger money aggregates such as M2 have also surged. Meanwhile, the velocity of circulation has mechanically dropped in recent months (**Figure 7**) as GDP not only failed to respond to the increase in money supply but actually shrank. However, the sharp rise in M2 and other large money aggregates was essentially due to two special factors. First, guaranteed and/or

**Figure 3: Sharp rise in debt ratios as a consequence of COVID-19**

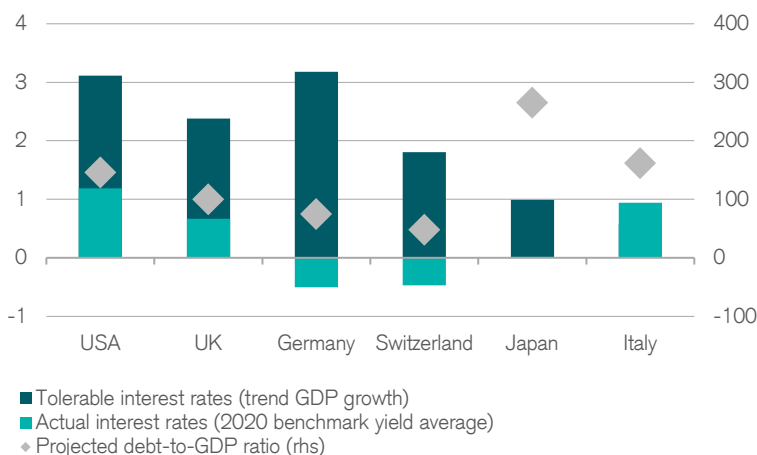
Change in general government gross debt, % of GDP



Source: IMF, Credit Suisse

**Figure 4: Debt sustainability scenarios**

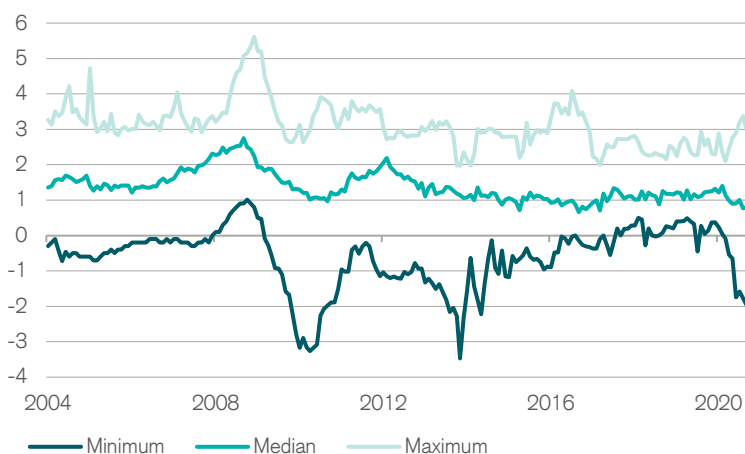
Actual vs. tolerable level of interest rates (l.h.s., in %) and government debt ratios (r.h.s., % of GDP)



Source: IMF, European Commission, Datastream, Credit Suisse

**Figure 5: Declines in core inflation at the start of the pandemic**

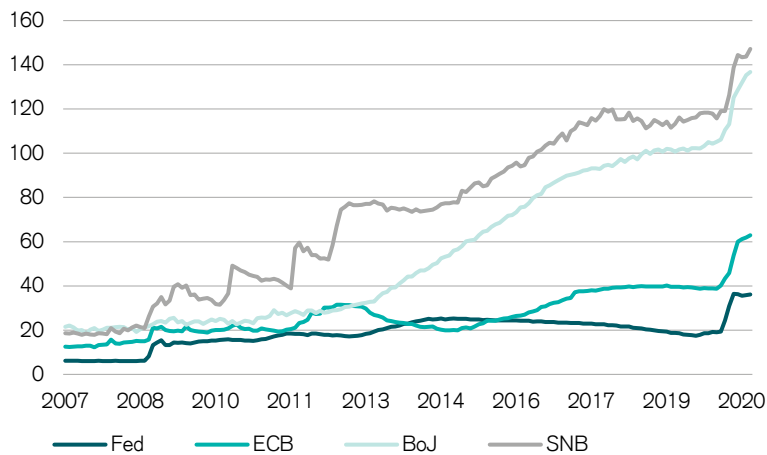
Core inflation rate in developed markets\* (% YoY), median and range



\* Sample: USA, UK, Canada, Korea, Switzerland, Japan, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden.

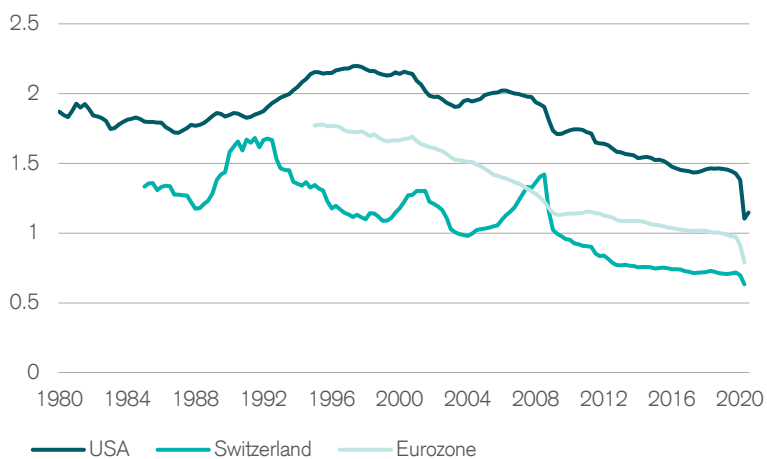
Source: Datastream, Credit Suisse

**Figure 6: Dramatic expansion of central bank money**  
Total assets, % of GDP



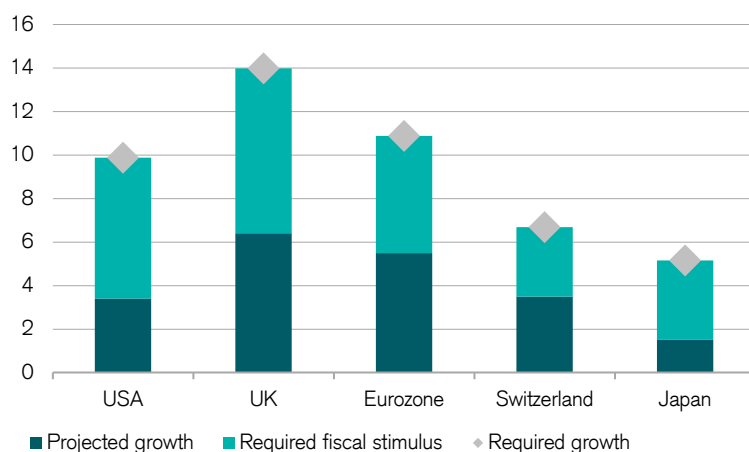
Source: Datastream, Credit Suisse

**Figure 7: Significant drop in velocity**  
Money velocity (M2)



Source: Datastream, Credit Suisse

**Figure 8: Closing the output gap is a challenge**  
GDP growth rate (in %) and fiscal impulse (% of GDP) required to close the output gap in 2021



Source: Datastream, Credit Suisse

subsidized loans sharply accelerated credit growth in many economies. This credit creation by banks boosted the money supply because the funds were redeposited with banks. This acceleration in credit growth is likely to be temporary since many companies will pay back at least some of the loans, while governments phase out their credit guarantee programs. Second, central bank purchases of financial assets from the non-financial private sector also added to the money supply. These purchases should be wound down once economic activity and inflation reach central bank targets.

Conversely, as GDP recovers, velocity should mechanically increase and might even rise above its early 2020 starting point. Yet the downward trend of the past decades is unlikely to reverse as long as interest rates, i.e. the opportunity cost of holding money, remain low. Even if velocity did increase, inflation would not necessarily rise. In fact, the relationship between money supply growth and consumer price index (CPI) inflation has weakened significantly over past decades. Generally, we find no statistically significant relationship between the two from 1990 to 2019. In economies with modern transaction technologies, it seems that the volume of spending on goods and services, which determines prices, can be increased without requiring “more money.” We see little reason for the relationship between the two variables to be re-established anytime soon.

In our view, inflation would only rise if the so-called output gap tightened significantly. This could happen, for example, if the combined fiscal and monetary impulses and demand multipliers were substantive. So far, this is not the case. Despite their unprecedented size, however, fiscal packages and short-time work schemes were the most important component, compensating 60%–80% of incomes for a limited number of households. In the USA, income support temporarily raised disposable income above trend. Loan guarantees were another large part of the fiscal reaction, but were likely spending-neutral in the first round. **Figure 8** shows that the growth rates required to close the output gap by end-2021 would need to be higher than currently forecast. Closing the output gap would thus require additional large fiscal packages – unlikely for political reasons – or an implausibly high fiscal multiplier of at least unity. In fact, the multipliers for such programs are estimated to be much smaller as a considerable share of the impulse goes into savings.<sup>1</sup>

1. Fiscal interventions may also affect potential GDP, i.e. government action could result in growth-enhancing investments or in growth-reducing distortions. The former more successful fiscal program would delay the closing of the output gap and thereby limit inflation risks, while the latter would boost inflation, but on a lower growth path.

The “workhorse” of macroeconomics, the so-called Philips curve, postulates that unemployment drives inflation. From a cyclical perspective, the COVID-19 crisis will lead to higher unemployment, which should dampen inflation pressure, all else being equal. Yet measuring this link would be difficult, particularly in Europe, where wage subsidies and short-time work schemes have prevented unemployment from rising. Most studies have shown that the Philips curve relationship has weakened in past decades (Del Negro et al. [2020]). In the USA, the curve is particularly flat, suggesting that inflation hardly responds to changes in labor market conditions (Figure 9). The correlation between the unemployment rate and wage growth is slightly stronger. As one would expect, higher unemployment leads to slower wage growth and vice versa. There is also some correlation between wage growth and CPI inflation. Goodhart suggests that demographic change could trigger inflation, as ample government support for a rising number of retirees boosts demand for goods, services and fewer workers. However, the example of Japan suggests that the elderly have tended to boost savings rather than spending.

### How much do we need to worry about central bank independence?

Finally, the coincidence of a severe recession with high government debt has raised fears that central banks will be “subjugated” by governments and forced to inflate debt away. Some

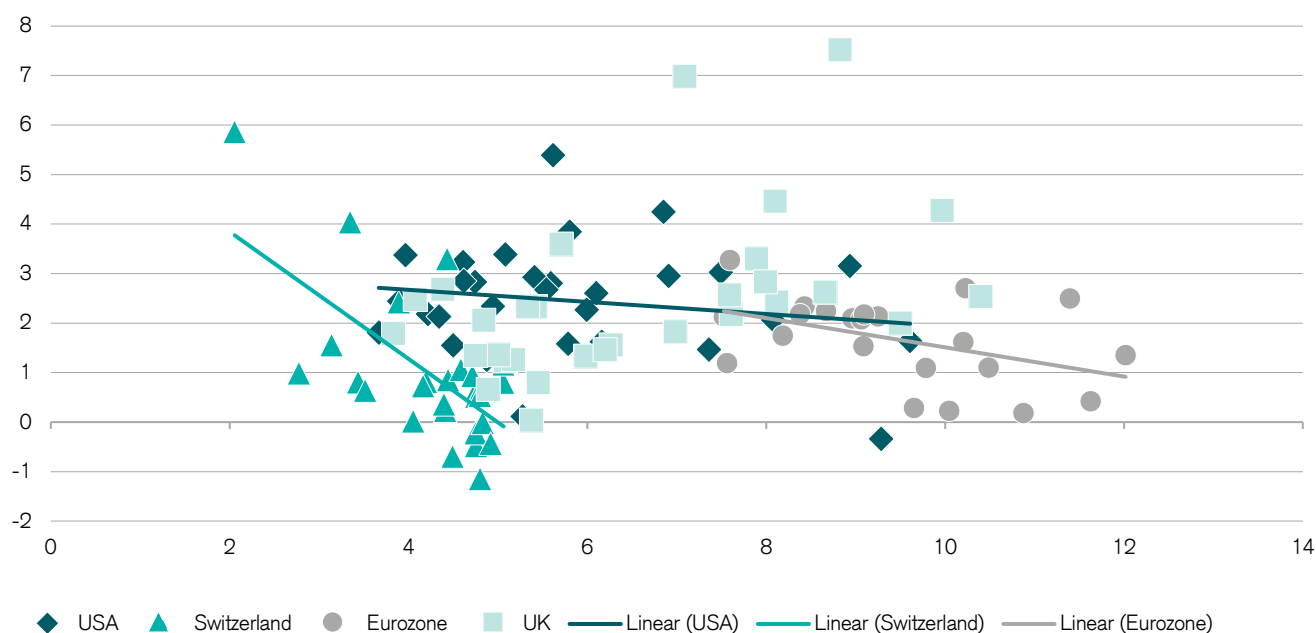
claim that central banks’ current asset purchase programs and their extraordinarily low interest rates are, in fact, just that. However, while central banks are currently experiencing fiscal expansion through asset purchases and low interest rates, this seems to be fully justified by their mandates in the current low-inflation environment. It is difficult to detect any signs of waning central bank independence at this point. While a few politicians have called for specific easing policies or have intervened in central banks’ long-term strategies, it is worth noting that it has tended to be the central bankers who have called on politicians to further support the economy by means of fiscal policy.

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**Central banks will continue pursuing low-interest monetary policies**  
 – David Dorn

That said, the critical question is how central banks would react if the objectives of monetary and fiscal policy began to diverge, i.e. once higher interest rates (and, more specifically, rates at levels that make debt-servicing costs for governments unsustainable) become necessary to avoid economic overheating. Yet, even in such a case, it is not clear that central banks would become the extended arm of their finance ministries.

**Figure 9: Philips curve particularly flat in the USA**

x-axis: ILO unemployment rate; y-axis: inflation rate; in %



Source: Datastream, Credit Suisse

At least in past decades, we do not observe a strong relationship between the change in nominal government debt and inflation. Cross-correlation analyses for a sample of developed and emerging countries<sup>2</sup> show no conclusive results. If anything, inflation appears to lead the change in debt levels, suggesting that higher inflation rates in the past and the resulting easing of the debt burden could incentivize governments to take on more debt. Conversely, tighter monetary policy that lowered inflation tended to reduce debt expansion. Yet this relationship only holds for some countries and sub-periods.

A 2015 study by Bodea and Hicks suggests that central bank independence did not change between 2000 and 2014, when debt levels surged and central banks began massive asset purchase programs in response to the Global Financial Crisis. All this does not prove that central bank independence cannot be lost or weakened going forward. What would happen, for example, if markets lost confidence in a government's ability to service its debt (i.e. if risk premiums in government bond yields began to rise)? Would central banks provide support and increase their debt purchases to support governments?

We believe they would, but mainly to maintain price and financial stability. The key question is under what conditions this would occur. If support by central banks is conditional on fiscal consolidation and other reforms – as during the Eurozone crisis – worries over a loss of central bank independence and rising inflation would be misplaced. We are confident that this will remain the scenario in the Eurozone. Whether it will be the case elsewhere remains to be seen. That said, it is the population at large that is likely to discipline profligate governments eventually. High inflation is seriously damaging to most households, especially pensioners, and firms. If governments go down that path, a political reaction is likely. All in all, we consider fears of rising inflation exaggerated and believe that the post-COVID-19 world will see sluggish growth and barely visible inflation.

2. USA, UK, Germany, Switzerland, Japan, Turkey, Brazil

## Takeaways

- The COVID-19 crisis is a sharper and more synchronized downturn than the Great Depression. Yet it will most likely not last nearly as long thanks to better policy responses. The measures taken should be sufficient to mitigate second-round effects that could weigh heavily on future growth, but risks are to the downside.
- As a result of fiscal support measures, losses in tax revenues and the growth slump, public sector debt-to-GDP ratios have surged in 2020. Despite these significant fiscal deficits, government debt should be sustainable as long as deficits are gradually reined in and growth rates exceed interest rates.
- The fiscal packages did not compensate for the collapse in demand. This opened up a significant output gap, which is disinflationary. Further fiscal expansion would only create inflationary pressures if it managed to close the output gap rapidly before supply could adjust to the recovery of demand, which is a rather unlikely scenario.
- Both central bank balance sheets and larger monetary aggregates have ballooned during the crisis. Yet this was due to special factors such as government-guaranteed credits and enhanced asset purchases. Meanwhile, the linkage between money supply measures and inflation has weakened over past decades.
- We see fears of rising inflation as exaggerated and are more concerned that the post-COVID-19 world will be one of sluggish growth and barely visible inflation. That said, a structural shift toward higher inflation, either due to demographic or political factors, is a tail risk.





Gettyimages, Elena\_Sistaliuk

# 2. Reshaping international relations?

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As a recurring element of history, pandemics have often had profound effects on governments and the course of war and peace between nations. What impact will COVID-19 have on geopolitics? What does the crisis mean for China's future role in an increasingly multipolar and multi-aligned world? Will the European Union emerge from the crisis weaker or stronger?

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## The crisis of multilateralism

Even before the COVID-19 crisis, multilateralism and multilateral institutions were under siege, with a few notable exceptions such as the International Monetary Fund. Unfortunately, the COVID-19 pandemic has neither drawn the world closer together nor fostered more cooperation across nations. Governments have acted largely on their own, with borders often closed unilaterally. Even within the Schengen Area, food exports were halted and governments blamed one another, similar to other pandemics in human history. Demands from the USA, Australia and other nations for an inquiry into the origin of the virus and China's response further illustrate the exchange of allegations.



**COVID is less transformative as a lens of longer-lasting changes – Joseph Nye, former Dean of the Kennedy School of Government at Harvard University**

The changed attitude toward multilateralism has as much to do with China's rise as with the USA's retreat from the geopolitical and multilateral scene. Under the Trump administration, the USA adopted a more transactional foreign policy as priorities shifted inward. US troop withdrawals ranged from Iraq, Syria and Afghanistan to a planned reduction of the USA's military presence in Germany. The USA also withdrew from the Trans-Pacific Partnership (TPP), the Paris Climate Accord, the Iran Nuclear Deal and the World Health Organization. The World Trade Organization has been seriously weakened, with its hallmark dispute settlement mechanism currently not working due to disputes over the nomination of new judges. To the credit of the USA, the Trump administration successfully fostered a rapprochement between some states in the Gulf region and Israel. North Korea has arguably dialed down its aggressive behavior. The North American Free Trade Agreement (NAFTA) was replaced by the United States-Mexico-Canada Agreement (USMCA).

China's rise on the multilateral scene gained momentum with its adherence to the World Trade Organization in 2001. As China's economic weight increased, so did its soft power (**Figure 1**). Arguably, the recent conclusion of the Regional Comprehensive Economic Partnership (RCEP),

the world's largest plurilateral trade agreement covering about a third of the world's population and global GDP, can be considered a win for China in the Asian trade-policy arena. The rivalry between the USA and China has thus broadened well beyond US-China trade issues and other bilateral tensions. It involves questions about the freedom of navigation in the Pacific, human rights and how to interact with civil society, technology standards with regard to data governance or cyber security, and much more. Today, China's foreign policy is visibly more assertive. China's military spending, still a third of the amount spent in the USA, has been rising at a rapid pace. China's course of action in the China Seas and, most recently, tensions over border territories with India are all illustrative of China's rise to a more forceful power.

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The big question is whether we are at a geopolitical turning point and, if so, what values and norms will govern in the future – The Rt Hon Sir John Major KG CH, former Prime Minister of the UK and Senior Adviser to Credit Suisse

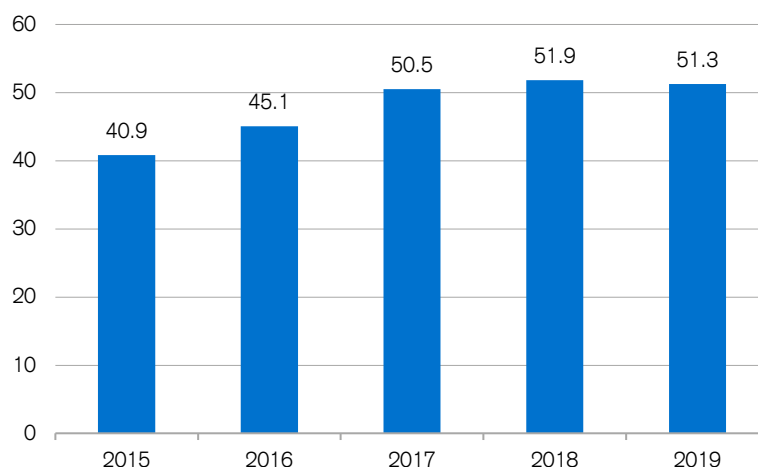
### From multilateralism to multi-alignment

Against the backdrop of a growing rivalry for economic and technological dominance, Americans hold an increasingly negative view of China, and calls for economic decoupling have grown louder across the political spectrum. According to a survey by the Pew Research Center released in summer 2020, 73% of Americans say they have an unfavorable view of China, the highest level in 15 years and up 26 percentage points since 2017 (**Figure 2**). Negative views of China are up seven percentage points since March, showing the impact the pandemic has had on American perceptions. But China has been regarded with increasing suspicion outside of the USA as well. In Europe, for example, the views of China have become increasingly unfavorable in Spain, France and Germany. In Italy, although medical equipment and doctors sent by China to help fight the virus have mitigated the increase in negative attitudes since the beginning of the pandemic, views have overall become more unfavorable in the last decade. Australia, India and Japan all have their own issues with China, as do smaller nations like Taiwan (Chinese Taipei), the Philippines and Vietnam.

The result is an increasingly emerging trend toward multi-alignment, best visible in Asia and increasingly evident in other emerging market countries. Singapore's Prime Minister Lee Hsien Loong (2020) recently summed it up: "Asia-Pacific countries do not wish to be forced to choose between the USA and China. They want to cultivate good relations with both. They cannot afford to alienate China, and other Asian countries will try their best not to let any single dispute dominate their overall relationships with Beijing. At the same time, those Asian countries regard the USA as a resident power with vital interests in the region." While the world may well see more multilateralism again under a Biden administration in areas such as climate change and non-proliferation as well as more alliance-building (particularly in Asia), growing multi-alignment should be expected.

**Figure 1: China's soft power on the rise**

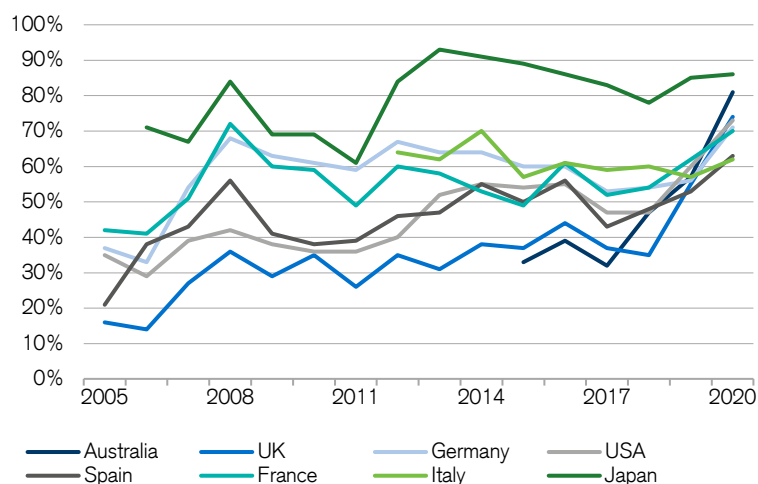
China's score in the Soft Power 30 ranking



Source: Portland

**Figure 2: Increasingly negative views of China**

Share of respondents who have an unfavorable view of China in %



Source: Pew Research Center

Smaller countries might look to strengthen their own positions by joining competing dominating powers depending on their own national interests and thereby possibly leading to a stable multipolar balance. The “Quad,” a rather informal security framework and coordination mechanism uniting Australia, India, Japan and the USA, for example, may well step up its efforts in Asia by trying to involve other countries such as Indonesia or Vietnam. In technology, countries like Australia and the UK, faced with a difficult situation over the 5G networks, have opted for Western technology, while Chinese technology will likely play an important role in many emerging market countries and the developing world. In infrastructure finance, China’s Belt and Road Initiative is competing with the European Bank for Reconstruction and Development. In pharma, China and Russia have sought to be supportive during the COVID-19 crisis, delivering aid and sending medical workers to severely challenged European countries, as well as giving Latin American and Central European countries access to their vaccine technologies, as an alternative to the European Union (EU) and the USA.

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**China has the ambition of transforming the international system to one that aligns more to its own – Elizabeth Economy, Senior Fellow Hoover Institution, Stanford University**

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#### **Shifting priorities in a multipolar world – supply chain safety and more self-reliance**

Countries around the world, including in Asia, are attempting to broaden their base and reduce their dependence on others, notably China, as suppliers, investors or key markets. This will likely entail efforts to return manufacturing to the respective home countries and diversify supply lines, and could present interesting opportunities for countries like Vietnam or Taiwan (Chinese Taipei, see Chapter 4). Japan, for instance, has offered incentives to foster this trend toward reshoring. In March 2020, then-prime minister Shinzo Abe announced subsidies of up to USD 2 billion for Japanese companies that relocate factories from China to Japan or other countries in Asia.

China, in turn, will likely scale back its connectivity programs with Latin America, the Middle East and Central Asia, and increase its focus on members of the Association of Southeast Asian Nations

(ASEAN), according to Herrmann and Wuebbeke (2020) of the consulting firm Sinolytics. This could be both positive and negative for Russia, supportive of the Belt and Road Initiative (BRI) as a lever to bring about a more multipolar world challenging US hegemony. On the other hand, some observers view increased Chinese investment in Russia’s “backyard” as unwanted competition.

“  
**The rise of a competitive marketplace in international relations is foreseeable – Parag Khanna, Global Strategy Advisory and bestselling author of “The Second World”**

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#### **And Europe? More, not less European integration**

Europe’s response to the pandemic has underscored that policymaking in the EU is not yet guided fully by cooperation and coordination. A European dimension also remains largely absent in public health policy. For the populist governments in some EU countries, the COVID-19 crisis reinforces the narrative that the enemy comes from the outside and that the nation state should remain the center of political power and in control of its destiny. The COVID-19 crisis has also again highlighted internal differences between the economically strong northern member states and southern and eastern Europe. Still, the European Central Bank (ECB) played an important role, acting swiftly with its EUR 1.35 trillion pandemic emergency purchase program.

Despite the initial lack of coordination and opposition from the so-called “Frugal Four” (Austria, Denmark, the Netherlands and Sweden), an agreement was reached in July 2020, spearheaded by France and Germany, on a massive EU Recovery Fund authorizing the European Commission to borrow up to EUR 750 billion from markets to help finance EU member states’ COVID-19 recovery for the 2021–23 period (including EUR 360 billion in the form of loans). The fund is focused on accelerating the green and digital transitions, and aimed at enhancing “strategic autonomy” in the EU. The latter priority entails efforts in regard to data localization, digital infrastructure sovereignty, financial market self-sufficiency, a stronger international role for the euro and redomiciled or shortened medical supply chains – all feeding into the debate about how the EU can increase its autonomy and international assertiveness, while remaining open and competitive.

Provided the resistance of some Eastern European member states against rule of law conditionality can be overcome, this agreement on increased EU spending and the doubling of the EU budget are significant steps toward fiscal union and further European integration. It not only aims to safeguard the EU common market, but also monetary union and the euro. Hence the COVID-19 crisis should lead to more European integration, not less.

According to the plans of the European Commission, 30% of the EUR 750 billion will be raised through green bonds, with 37% of the recovery budget spent on European Green Deal objectives and 20% on digital initiatives. This is in keeping with the European Commission's ambitions to position the EU as a global leader in the fight against climate change, and reduce CO2 emissions by 55% by 2030. It is a response to growing calls for recovery efforts to focus on a green rebuilding of the economy after the crisis by those who see the pandemic as a catalyst for a more sustainable economic order (see Chapter 9).



**Europe needs to develop the ability to respond more quickly and in a more coordinated way to China's assertive behavior on the global stage – Elizabeth Economy**

In terms of EU foreign and security policy, the pandemic provided an early reality check for the President of the European Commission, Ursula von der Leyen, who early on called for her institution's mandate to be geopolitical, intending to advance efforts toward a European Defense Union. In contrast, observers like Steven Blockmans (2020), an expert on EU external relations law at the Brussels-based Centre for European Policy Studies, maintained that "in a world dominated by Sino-American rivalry, there is a space for a third way – one that is defined by the EU in alliance with like-minded states and organizations."

Yet divisions between member states have made prompt and effective EU action to address security issues posed by Libya and Russia all but impossible. Europe has also been unable to speak with one voice when dealing with Turkey's drift from the North Atlantic Treaty Organization (NATO) and the EU in order to realize its own geopolitical ambitions. Another challenge is the still unsolved issue of migration. Owing to the pandemic, the economic situation in many developing countries has deteriorated rapidly, making an increase in migration flows likely. However, member states remain divided on the issue of sharing the volume of migrants. Calls to provide debt relief for these countries can be expected to grow louder.

### Takeaways

- The COVID-19 pandemic impacts geopolitics in various ways, primarily by exacerbating existing trends away from multilateralism to increasing multi-alignment.
- The focus on a stable multipolar balance will gradually shift toward supply-chain safety and greater self-reliance.
- The EU's agreement on an EU Recovery Fund with significant green-economy targets again illustrates that crises usually lead to more, not less, European integration.



New York, USA; GettyImages, Alexi Rosenfeld



# 3. States pushing the limits

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Fighting the COVID-19 pandemic and offsetting its economic impact have led to the biggest expansion of state power since World War II. The scale of the economic response has been very large in historical comparison, but what is even more crucial are the changes in how policymakers manage the economy. If history is any guide, the rise in state power is likely to outlast the crisis.

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## Government interventions during the crisis

The global policy reaction to the COVID-19 emergency was quick and powerful. Policymakers passed emergency laws, approved large-scale fiscal measures and launched interventions reminiscent of wartime policies. Hoping to avoid domestic shortages of essential supplies and limit their dependency on foreign producers, several countries also imposed restrictions on exports, tried to relocate part or all of international value chains domestically, or tightened restrictions on foreign investment in critical infrastructure. Governments also expanded efforts in surveillance practices to prevent the virus from spreading (see Chapters 4 and 5).

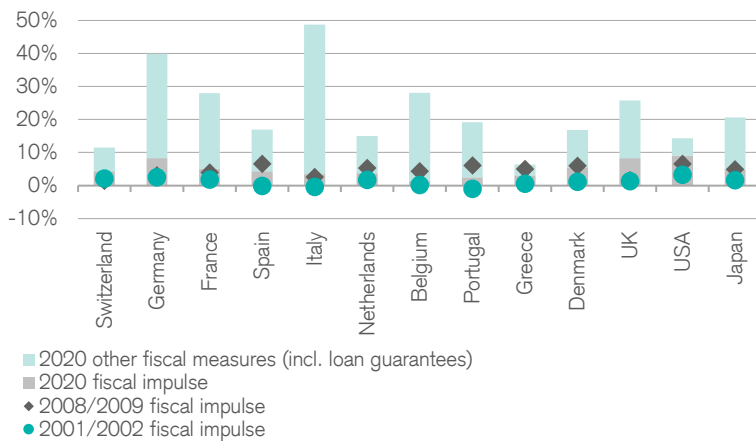
On average, the fiscal response to the pandemic by far surpasses the measures taken by governments in previous 21st century crises such as the 2001–02 Argentine Economic Crisis or the 2008–09 Global Financial Crisis (see Chapter 1). Countries' responses have differed in terms of scope and measures, with the reaction in emerging economies more limited so far due to an initially lower incidence of the pandemic, narrower fiscal policy space and less-developed safety nets and automatic stabilizers (Bank for International Settlements [2020b]).

Looking at Europe and the USA, the fiscal packages vary between 6.4% of gross domestic product (GDP) in Greece and 48.7% in Italy (**Figure 1**). In most countries, deferrals of certain payments (e.g. taxes) and other liquidity provisions, guarantees and credit lines through national banks make up the lion's share of the fiscal response. The fiscal impulse, however, which includes additional government spending (e.g. medical resources and public investment, short-time work schemes) and foregone public revenues (e.g. cancellation of taxes and social security contributions), has so far been more in line with government responses in previous crises. As a consequence of the unprecedented fiscal response, debt ratios, measured as a percentage of GDP, are expected to increase worldwide (**Figure 2**). Whether the rising debt levels will become problematic will depend mainly on the conditions at which governments can borrow money in capital markets (see Chapter 1).

The fiscal response to the pandemic has been complemented by swift and decisive monetary policy action. To ease financial stress and ensure a smooth flow of credit to the private sector, central banks worldwide deployed the full range of crisis tools within weeks. The first measure was to cut policy rates. Lending operations, asset purchase programs and foreign-exchange

**Figure 1: A powerful fiscal response**

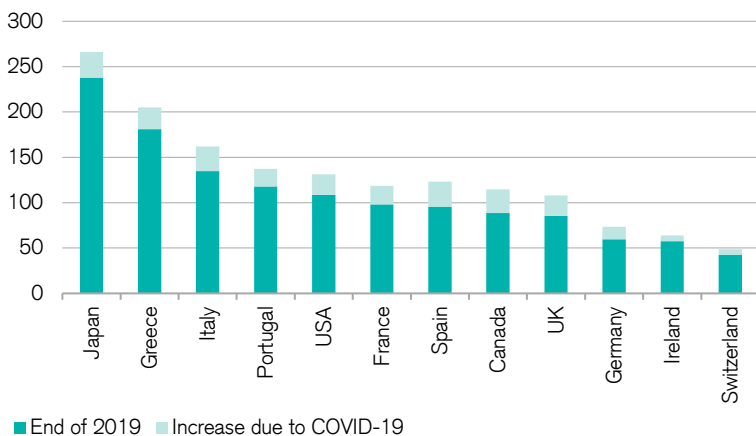
Fiscal measures in response to COVID-19 as per 24 November 2020, % of GDP



Source: International Monetary Fund (IMF), Bruegel, Federal Council, Credit Suisse

**Figure 2: Debt ratios on the rise**

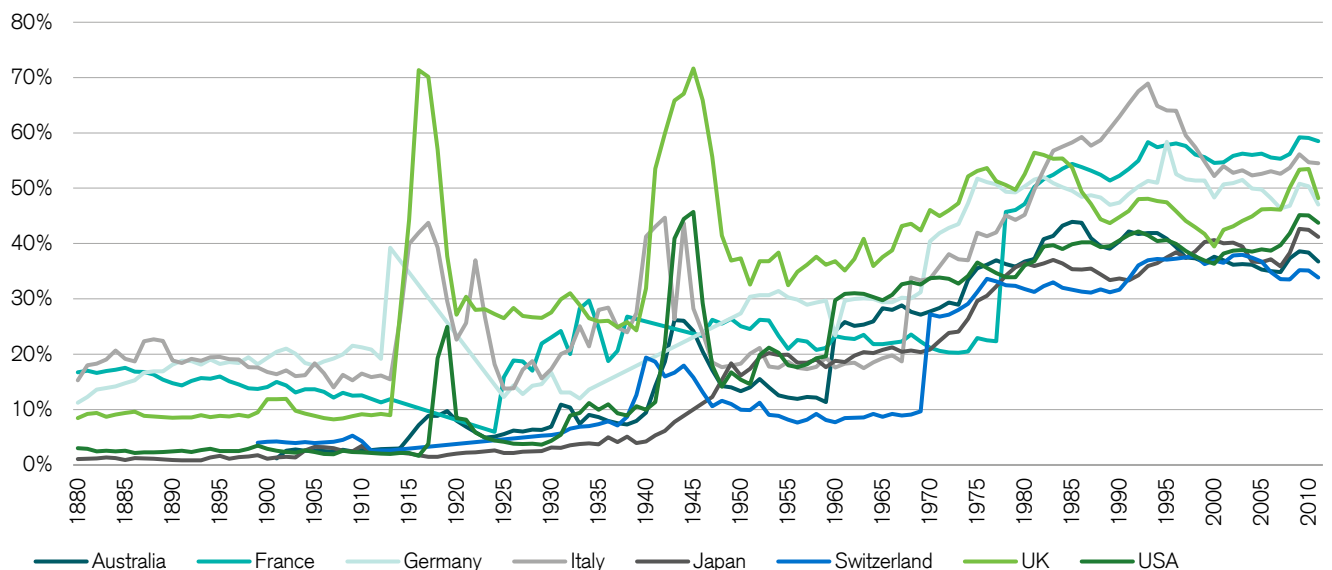
Debt ratios as per 13 October 2020, % of GDP



Source: International Monetary Fund (IMF)

**Figure 3: Government expansion in times of crisis**

Total government spending, including government interest expenditures, 1880–2011, % of GDP



Source: Our World in Data based on IMF and Mauro (2015)

liquidity measures also played a key role in alleviating stress in the financial markets (Bank for International Settlements [2020a]). Compared to the Global Financial Crisis, central banks focused less on the financial sector and more on supporting the flow of credit to households and non-financial corporations.

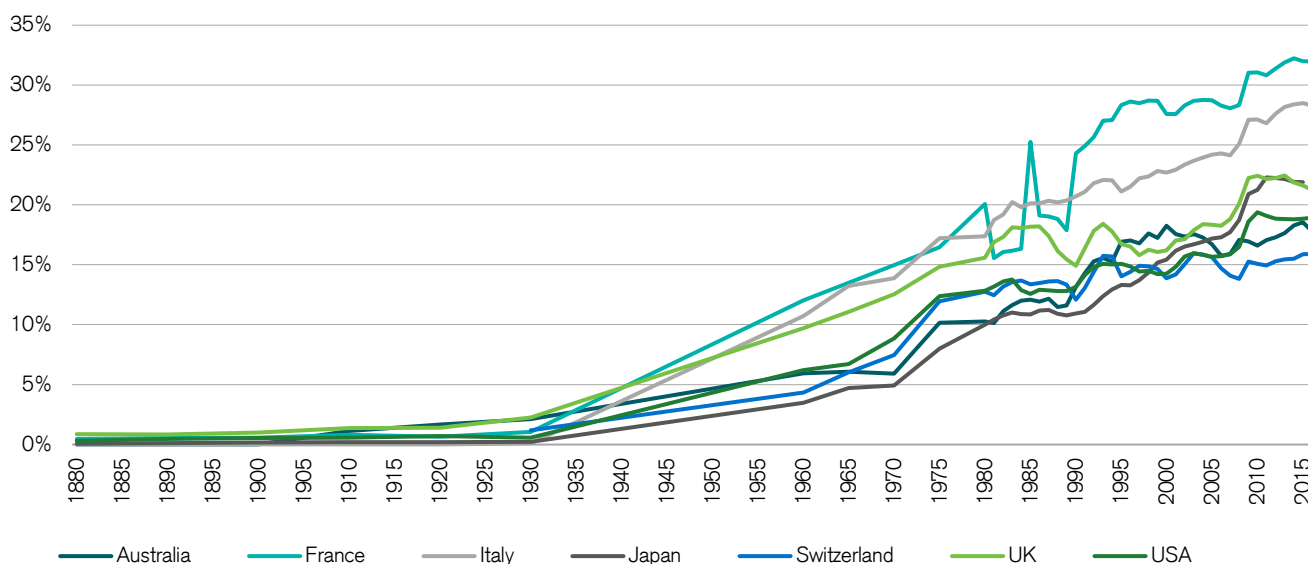
**Big government: The persistence of state power extensions**

State interventions in times of crisis are common throughout history. Conflicts, diseases, economic downturns and mass unemployment have often led to an expansion of the state and had a greater impact on government spending than party programs (Figure 3). In the 20th century, both world wars led to a large expansion of government, especially through defense spending. After World War II, the economic damage and related social needs triggered the development of the welfare state, which has been driving government spending in the advanced world for decades (Figure 4).

Regardless of conflicts and crises, the public sector has an inherent tendency to expand. As countries become wealthier, demand for government services grows. Production processes become more complex and require more regulation, state intervention and legal enforcement, fostering complex public administrations. Measures designed to be temporary often tend to become permanent. If history is any guide, the extension of state power during the COVID-19 pandemic

**Figure 4: The rise in social spending**

Public social spending, \* 1880–2018, % of GDP



\* Public social spending includes spending on health, old age, family, unemployment, active labor market programs, incapacity-related benefits and housing.

Source: Our World in Data based on OECD and Lindert (2004)

may well outlast the crisis. But at what risk? First, public debt, which reached new highs, will need to be paid off. In the absence of sufficient economic growth or high inflation, this will need to occur through heavier taxation, austerity programs or longer-lasting financial repression. The latter not only implies an invisible tax on savers, but also exacerbates the underfunding problems of pension systems.

Another lasting effect of the public sector response to the COVID-19 pandemic could be the increasingly blurred boundaries between fiscal and monetary policy. During the crisis, fiscal authorities supported central bank actions through, for example, fiscal backing of newly established programs. Compressing the costs of raising and servicing public debt, central banks supported the fiscal expansion of governments (Bank for International Settlements [2020a]). For now, scenarios of hyperinflation seem unlikely and central banks have acted within their mandates (see Chapter 1). Yet policymakers may grow accustomed to zero interest rates to support government borrowing and could even consider relying on central banks to fund initiatives unrelated to economic and monetary stability.

The pandemic may also prove decisive in shaping the attitude of policymakers and the public toward individual responsibility and risk. Preventing firms from going bankrupt and employees from losing their jobs can be justified initially, especially if the measures prove effective. Similarly, the devel-

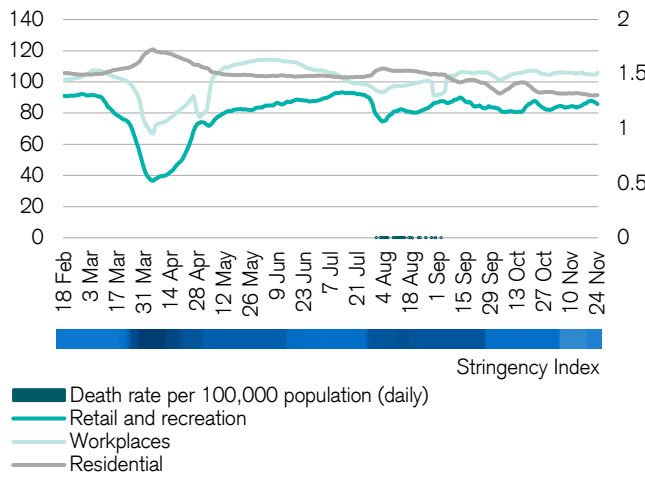
opment of a sound social safety net may be desirable in countries that did not have robust social security programs in place prior to the pandemic. Yet public intervention pursued at any cost may cause inefficiencies and undermine market dynamics. What has been appropriate during the pandemic should be revoked once the crisis is over, but this will not be an easy task. Delegating too many responsibilities to the government could also create citizens who grow accustomed to receiving financial support and therefore lack incentives to participate in a competitive economy. In the context of COVID-19, some observers have warned about the negative effects of what they call “epidemic socialism” (Gujer [2020]).

Finally, the emergency situation of the pandemic has allowed political leaders worldwide to expand their powers, bypassing parliaments and ruling by decree. Once the crisis is over, some leaders will surrender these powers, while others will want to keep them. Mature democracies with strong political institutions will likely see leaders surrender such powers, but countries with weak institutions may not.

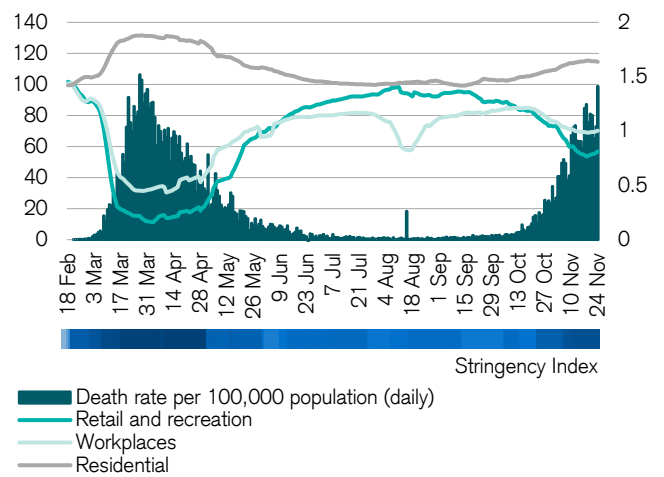
### **Stopping the spread of the pandemic: A variety of approaches**

While the coronavirus pandemic is a global phenomenon, it has been felt in different ways around the world, with governments taking different approaches to tackle it. The response in terms of containment measures has been

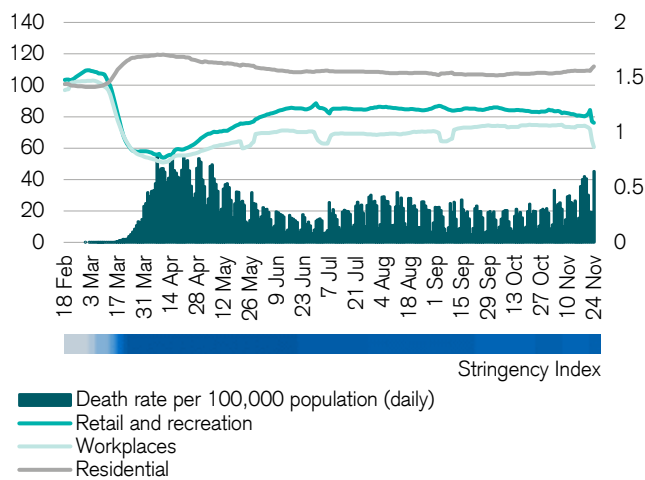
**Figure 5: Early and decisive action in Vietnam\***



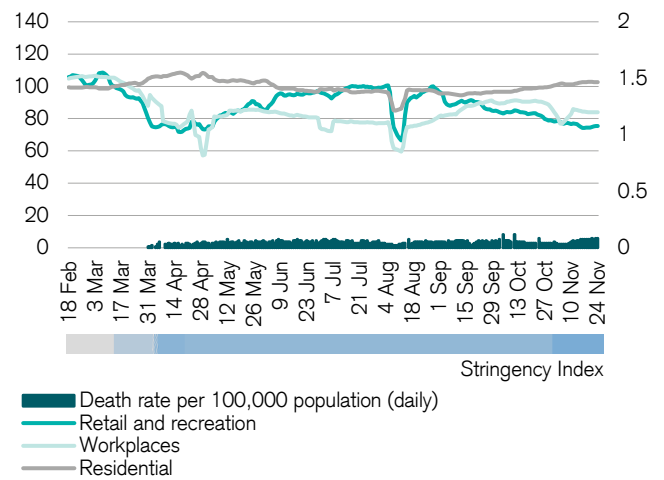
**Figure 6: Lockdown and reduced mobility in Italy\***



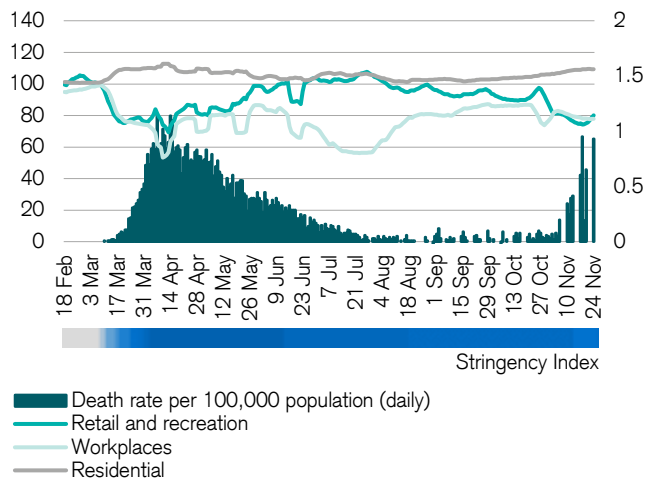
**Figure 7: High US mobility despite stringent measures\***



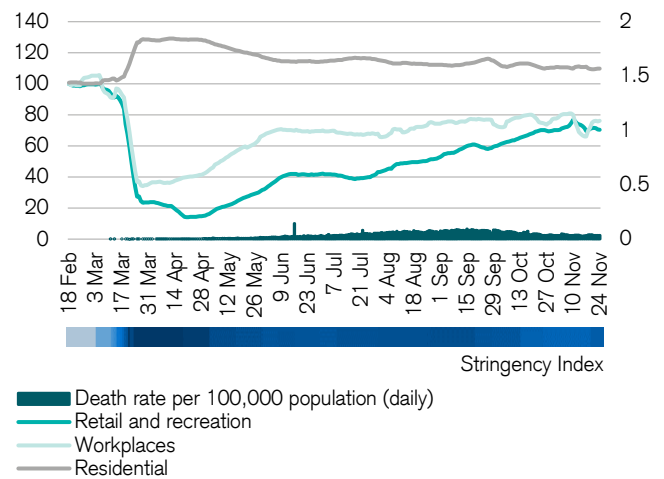
**Figure 8: Few restrictions in authoritarian Belarus\***



**Figure 9: Herd immunity strategy in Sweden\***



**Figure 10: Stringent measures for India\***



Least stringent (0) Stringency scale Most stringent (100)

\* L.h.s.: Change of visits and length of stay at different places compared to a baseline value\*\* (7-day moving average), index baseline = 100; r.h.s.: reported daily deaths per 100,000 people; below chart: Stringency Index value, scale 0–100. \*\* The baseline value corresponds to the median value for the corresponding day of the week, during the 5-week period from 3 January to 6 February 2020.

Reading example: When Italy declared a national lockdown on 10 March, Italy had a composite score of 82 in the Stringency Index. At this time, Italian citizens on average reduced their visits and length of stay to retail and recreational locations by approximately 45.9% compared to pre-crisis levels (baseline value). Meanwhile, visits at residencies increased by 15.7% compared to pre-crisis levels.

Source: Google Community Mobility Reports, Blavatnik School of Government, Worldometer, Credit Suisse



extremely strict in some countries, but limited in others. **Figures 5 to 10** illustrate the government approaches in selected countries. To compare the timing and restrictiveness of the policies implemented, we rely on the Stringency Index<sup>1</sup> developed by the Blavatnik School of Government at the University of Oxford. To see whether people obeyed containment measures, we have used data from Google's Mobility Trends.<sup>2</sup> We compared both measures to the number of daily reported COVID-19-related deaths per 100,000 people.<sup>3</sup>

During the first wave of the virus, Vietnam was among the first nations to implement wide-spread and stringent containment measures. Building on the experience from health crises like SARS in 2003, the country, like other South Asian neighbors, was able to quickly scale up its response. Comprehensive testing and a well-functioning health system were also helpful. Accordingly, Vietnam has reported very few COVID-19-related deaths so far. In contrast, Italy was utterly unprepared for COVID-19. Indeed, Italian authorities had to reinforce their health system by expanding intensive care capacities and implemented containment measures that were among the strictest in Europe. The pandemic also caught the USA by surprise: a sluggish response in the early stages and the fact that only half of US states imposed restrictions on interstate travel allowed the virus to spread around the country.

Other countries chose not to implement excessively strict measures. Belarus, for instance, placed hardly any restrictions on public life as its president dismissed the pandemic as hysteria. Sweden aimed for herd immunity, which occurs when the majority of a population becomes immune to an infectious disease, reducing the likelihood of transmission for the whole population. Accordingly, measures were relatively lax.

Another interesting example is India. Among the countries investigated, India adopted the most stringent measures. These measures were particularly hard on India's poor. Low-income migrant workers and daily-wage earners were

forced to go out to make money or return to their villages, resulting in relatively high mobility compared to the stringency of the lockdown. India, a country of 1.3 billion people, also struggled to provide enough testing kits, making it difficult to grasp the scope of the pandemic.

By the end of the summer, a second wave of infections had gripped most countries, with new containment measures introduced to contain the spread of the virus. Compared to the first wave, however, the stringency degree of the applied measures differs more between countries, reflecting an attempt to better balance public health safety and economic damage.

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### Determinants of success or failure in fighting pandemics

From the onset of the COVID-19 pandemic, one of the recurring debates has been about how successfully different political regimes are coping with the outbreak. Are authoritarian countries better equipped or can democratic governments contain disease outbreaks most effectively? A look at the examples in the previous section shows that the distinction between democracies and authoritarian regimes matters less than debates would suggest (**Figure 11**).<sup>4</sup> There is no clear pattern with regard to the successful handling of the pandemic between countries of either regime type. As for a country's success or failure, several factors play a crucial role (see box on page 27).

First, the experience gained from past disease outbreaks makes countries more efficient in dealing with new threats since speed is crucial in containing the spread of infections. Second, effective responses require sound state capacity. When a country does not have the resources and ability to take effective policy actions, a disorganized or even a failed response is often the consequence. A sound health and social security system that the broad population can easily access is also key. Finally, a crucial determinant of success is trust. When governments are transparent and reliable, they can gain people's confidence and enhance compliance with public health measures.

In general, it is easier for democracies to create trust among citizens (**Figure 12**). Democratic countries may face constraints such as the need to build a consensus in multiparty politics.

1. The Stringency Index is a composite measure based on nine response indicators including school and workplace closures, restrictions on gatherings, travel bans and contact tracing, rescaled to a value from 0 to 100 (Blavatnik School of Government (2020)). While the index tells us something about the strictness of measures, it says very little about the effectiveness of these policies.

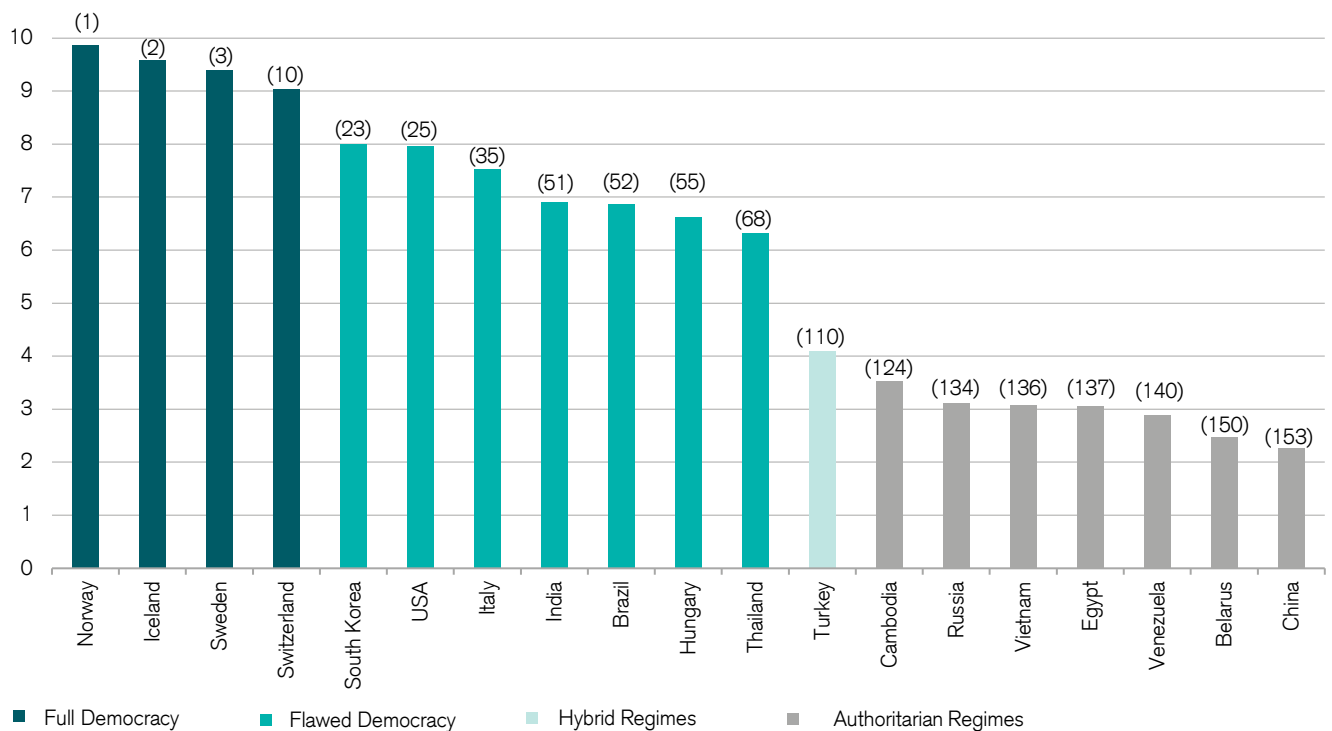
2. The COVID-19 Community Mobility Report from Google uses anonymized data provided by apps such as Google Maps and shows how peoples' movements have changed throughout the pandemic.

3. The death rate should be interpreted with caution as it depends on each country's own definition of COVID-19 related deaths and its propensity to report it.

4. To categorize countries into different regime types, we rely on the Democracy Index compiled by the Economist Intelligence Unit (EIU), which compares countries with regard to electoral process and pluralism, functioning of government, political participation, political culture and civil liberties.

**Figure 11: Democracy ranking**

Democracy Index value, 2019, selected countries (in brackets: overall ranking)



Source: Economist Intelligence Unit (EIU)

This can result in slower and suboptimal policy responses compared with swiftly and resolutely imposed measures in authoritarian regimes. Nevertheless, in a democracy, the government can be voted out if things go wrong, paving the way for a new beginning. The COVID-19 pandemic is putting public trust to the test worldwide. A survey conducted in ten countries by researchers at the Winton Centre for Risk and Evidence Communication at the University of Cambridge shows how much citizens trust their country's politicians to deal effectively with the pandemic (Figure 13).

In Germany, nearly two-thirds of respondents said they somehow trust their politicians' handling of the crisis. Yet, in Japan, Mexico and the USA, more than 50% expressed distrust.

Protecting public health in a pandemic also depends on political leaders' trust in science. Some leaders have questioned or ignored scientific advice, especially in highly polarized political environments prone to populist approaches. This can undermine public support for containment measures and international collaboration to fight the pandemic. However, excessive confidence in the capabilities of science and the health system can also be dangerous. Breakthroughs in the fight against infectious diseases led to a reduction of aggressive infections by the mid-20th century. And with this came the belief that the healthcare system in the developed world could cope with any infectious disease. This so-called "scientific

hubris"<sup>5</sup> may have led to a certain unpreparedness to face COVID-19. So it is interesting to note that some of the countries with the highest Global Health Security (GHS) Index<sup>6</sup> reading are among those with the highest COVID-19-related death rates per 100,000 people: the USA, the Netherlands and the UK (Figure 14).

### Centralization or decentralization: What works best?

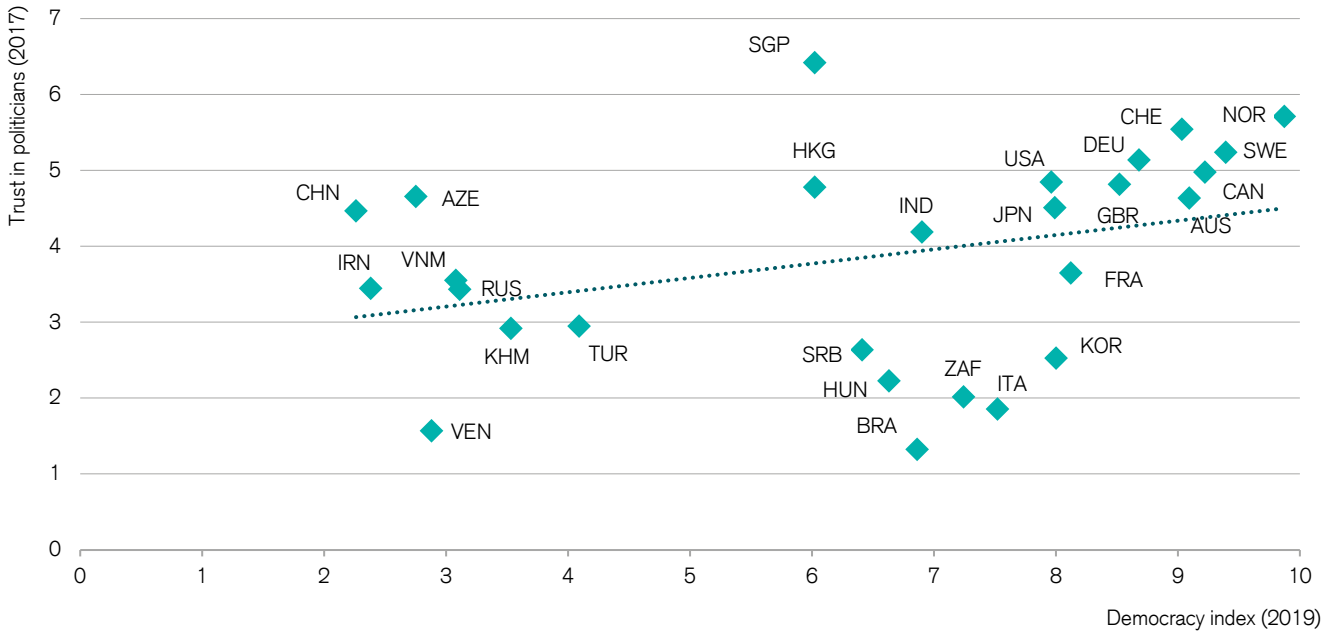
One debate that has unfolded since the outbreak of COVID-19 is whether centralized states are better suited to deal with a health crisis than federal systems. In the same way, for any given country, one can ask if a centralized decision-making process is more efficient than delegating powers to regional or local entities. In both cases, the question presents a trade-off between the ability to take rapid and coordinated action and the ability to meet the needs of local communities.

5. The term hubris derives from Greek mythology, signifying the dangerous combination of overconfidence, over-ambition, arrogance and pride.

6. The Global Health Security Index (GHS Index) is an assessment and benchmark of health security and related capabilities across 195 countries. In particular, the index assesses each country's capability to prevent and mitigate epidemics and pandemics. It is a joint project of the Nuclear Threat Initiative (NTI) and the Johns Hopkins Center for Health Security (JHU).

**Figure 12: Trust in politicians – small advantage for democracies**

Democracy Index value, 2019; Trust in politicians, scale: 0–7, selected countries, 2017\*

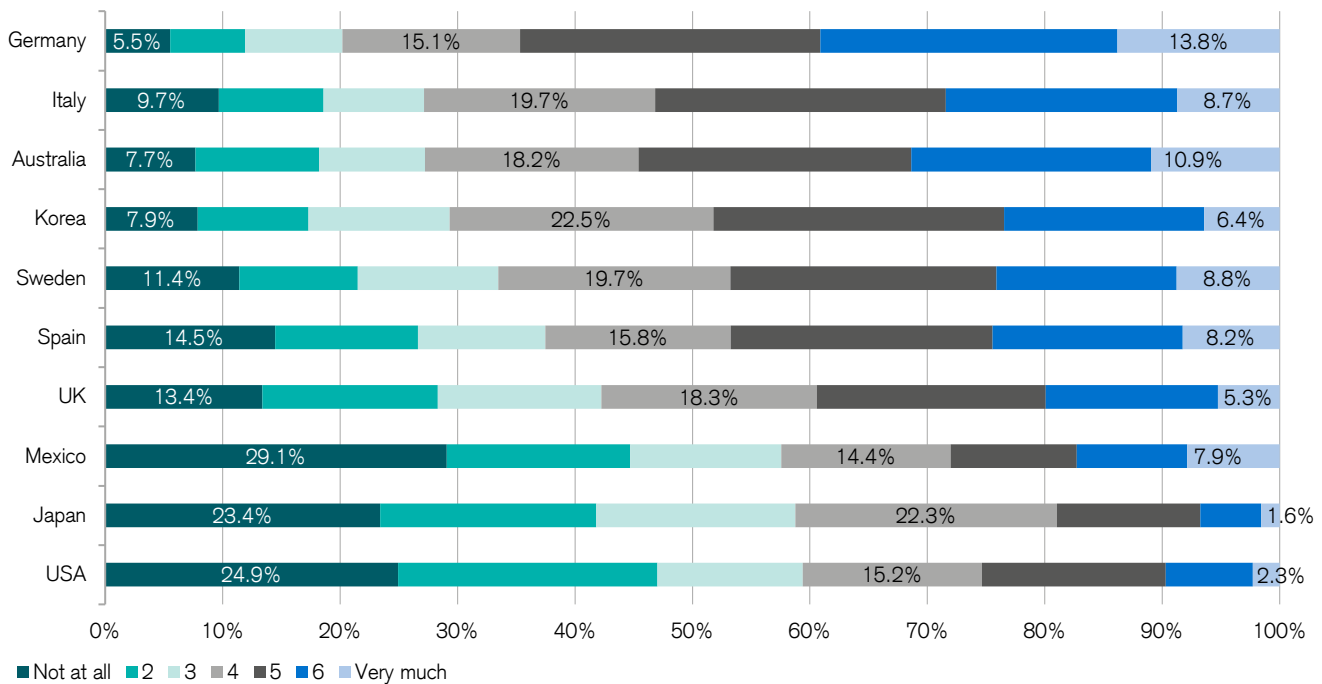


\*AUS: Australia, AZE: Azerbaijan, BRA: Brazil, CAN: Canada, CHE: Switzerland, CHN: China, DEU: Germany, FRA: France, GBR: United Kingdom, HKG: Hong Kong SAR, HUN: Hungary, IND: India, IRN: Iran, ITA: Italy, JPN: Japan, KHM: Cambodia, KOR: South Korea, NOR: Norway, RUS: Russia, SGP: Singapore, SRB: Serbia, SWE: Sweden, TUR: Turkey, USA: United States, VEN: Venezuela, VNM: Vietnam, ZAF: South Africa

Source: World Economic Forum Global Competitiveness Index, Economist Intelligence Unit (EIU)

**Figure 13: COVID-19 puts public trust to the test**

Proportion of respondents\* answering the question: How much do you trust your country's politicians to deal with the pandemic effectively? Scale: 1–7\*\*, in %



\* The survey was conducted at the end of March 2020 in all countries investigated. The exceptions are Japan and South Korea, where the survey was conducted in April.

\*\* The participants received a scale with only the two endpoints labeled.

Source: Freeman et al. (2020) at the Winton Centre for Risk and Evidence Communication at the University of Cambridge

## Critical success factors in fighting pandemics

### Experience in dealing with health crises and speed of action:

- Experience from past disease outbreaks increases the awareness that fast and decisive action is crucial, enabling countries to scale up measures quickly.
- Critical infrastructure is already in place and can be activated immediately.

### State capacity:

- To deal with a national emergency, countries need to be able to take effective policy actions. This encompasses the financial resources available to the state, the quality of administrative and bureaucratic institutions, the rule of law and the ability to ensure external and internal security.
- Cooperation with private actors and institutions can facilitate the finding of solutions and promote public interest.

### Trust in government and scientific advice:

- Citizens' relative confidence that their governments are capable, reliable, transparent and impartial enhances their compliance with public health measures, especially when these infringe on individual liberties.
- Protecting public health in a pandemic also depends on political leaders' trust in the findings of the scientific community.

### Collaboration:

- Collaboration along political lines within a country is crucial to push through meaningful policies swiftly. Polarization between political parties is an obstacle.
- Every infectious disease is a global problem. Collaboration among countries is essential for sharing experiences and implementing joint measures. International organizations may help forge international cooperation, but need to be widely recognized. International cooperation is also crucial when it comes to allocating vaccines among countries.

The ability to act swiftly is crucial when it comes to limiting the spread of a virus, which speaks in favor of a centralized response. Another argument is that the decisions of local authorities may have negative externalities that impact other locations. A region that fails to contain the spread of the disease in its jurisdiction, for instance, increases the likelihood that the disease will spread to neighboring regions. In some cases, however, strong centralization inhibits rapid action. The dependency on inefficient or even incompetent central agencies can delay the government response. Moreover, a pandemic may impact regions differently, requiring a more specific response to each local entity. Overall, the best approach is probably somewhere in the middle – in other words, adapting the decision-making level to the different stages of the pandemic, with a more centralized response in the beginning and a flexible approach once the worst is over.

**Figure 14: Scientific hubris may have led to unpreparedness**

Global Health Security Index, score: 0–100, 2019; confirmed COVID-19 deaths per 100,000 people as of 22 September 2020



Source: Nuclear Threat Initiative and Johns Hopkins Center for Health Security, Johns Hopkins University of Medicine

## Takeaways

- The policy reaction to the COVID-19 pandemic has been swift and powerful. From emergency laws to fiscal and monetary policy actions, the response has by far surpassed what governments have done in previous 21st century crises.
- In the past, conflicts, diseases, economic downturns and mass unemployment often led to an expansion of the state. If history is any guide, the extension of state powers during the COVID-19 pandemic may well outlast the crisis.
- The boundaries between fiscal and monetary policy are growing increasingly blurred. Although scenarios of hyperinflation seem unlikely, policymakers may become accustomed to zero interest rates and increasingly rely on central banks to fund their activities.
- The pandemic may trigger desirable changes like an improvement of social security nets. Too much state intervention, however, may hamper economic activity and undermine individual responsibility.
- There is no evidence that authoritarian regimes are more successful than democratic countries in fighting pandemics. Success or failure depends on various factors like experience in past health crises, speed of action, the ability to take effective policy actions, people's trust in the government and cooperation within and among countries.

Melbourne, Australia; Gettyimages, Barcroft Media







# 4. Less global, more resilient

The COVID-19 pandemic has paralyzed the global economy and disrupted global trade. Although commercial relationships are set to rebound, the crisis is likely to have a lasting impact on global supply chains, with companies weighing up cost efficiency and resilience. Has globalization suffered a decisive blow?

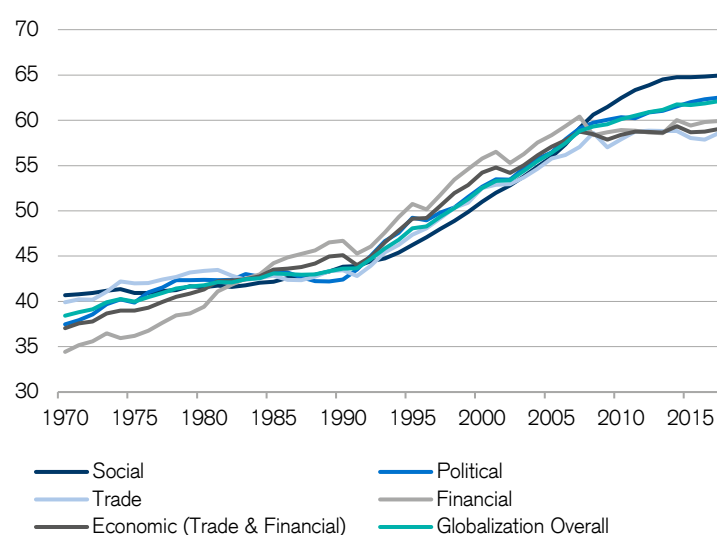
## Pace of globalization already slowing before COVID-19

Globalization has been the most powerful economic force since the fall of communism. For decades, the easy flow of trade and people has contributed to myriad outcomes, from the rise of global cities to growing wealth in emerging economies. Yet that flow has been slowing since the Global Financial Crisis (Credit Suisse Research Institute [2017]). The KOF Globalization Index shows that economic globalization has come to a halt since 2007 (**Figure 1**).



Conventional wisdom is that shifts in trade are persistent while trade shocks are temporary. In fact, both matter. Past years have seen widespread subsidization of trade – Simon Evenett, Professor of International Trade and Economic Development, University of St. Gallen

**Figure 1: Trade globalization has come to a halt**  
KOF Globalization Index and sub-indices, 1970–2017

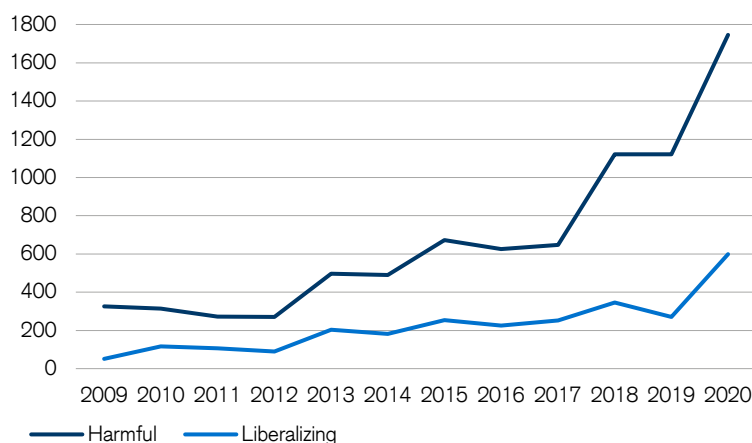


Source: KOF Swiss Economic Institute

Key to the slowdown in globalization is the flare-up of protectionist tendencies. According to The Global Trade Alert, coordinated by the Centre for Economic Policy Research (CEPR), a large number of trade-distorting state measures have been implemented every year since 2009 – far exceeding trade liberalization measures implemented over the same period<sup>1</sup> (Figure 2). Protectionism is thus understood in a broader sense, covering any state measure that places domestic economic interests above foreign ones (Evenett [2019]). After Donald Trump was

1. The database is retrospectively updated with new information on past trade policy decisions. There is therefore a reporting lag that leads to more measures registered in previous years.

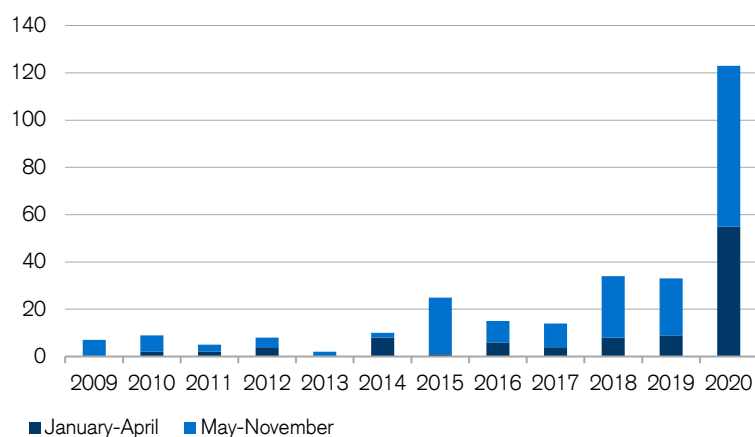
**Figure 2: Considerable increase in trade-distorting measures**  
Number of new interventions implemented each year worldwide, reporting time lag-adjusted statistics with cut-off date 30 November 2020



Source: Global Trade Alert, Credit Suisse

**Figure 3: COVID-19 has led to an increase in harmful interventions related to pharmaceutical products**

Number of new harmful interventions for pharmaceutical products implemented each year worldwide, reporting time lag-adjusted statistics with cut-off dates 30 April and 30 November



Source: Global Trade Alert, Credit Suisse

elected president in 2016, protectionism gained considerable media attention. What began in January 2018 with tariffs on washing machines and solar panels and soon extended to steel and aluminum, took on greater geopolitical dimensions in March 2018 with the imposition of tariffs on USD 50 billion of Chinese products. Since then, other US trading partners including the EU and Switzerland have been affected by US protectionist measures. Many countries, especially China, have imposed retaliatory measures.

### A further slowdown of globalization is likely, but not a reversal

After the euro crisis, the US-China trade conflict and Brexit, the COVID-19 outbreak has dealt another blow to globalization. In April 2020, the World Trade Organization (WTO) warned about the growing number of export restrictions in response to the COVID-19 crisis (World Trade Organization [2020]). At that time, 80 countries and custom territories had introduced export prohibitions or restrictions, posing a long-term risk to global supply chains and public welfare. Trade restrictions concerned mostly medical supplies (Figure 3). Another concern is the lack of transparency: according to the report, only 39 countries had submitted information on these measures in line with WTO rules for quantitative restrictions. While certain exceptions to WTO rules apply (i.e. temporary export bans or restrictions to prevent or relieve critical shortages of essential products), the WTO highlighted that importing and exporting economies would face the consequences of such measures in the long run.



Seventy-five percent of world trade is currently distorted by policy measures and 64% of Swiss exports compete against firms of countries that subsidize exporters – Simon Evenett

Does the COVID-19 crisis signal the end of globalization? We do not think so. Globalization is a broad historical trend that has been ongoing for decades and has withstood numerous challenges. While governments and businesses will learn from the crisis, rapid deglobalization or even isolation seems unlikely. Still, there are reasons suggesting a further slowdown of globalization. Table 1 on page 32 summarizes the key arguments.

**Table 1: A complete makeover of the global trade system is unlikely**

	<b>Reasons why globalization may slow further</b>	<b>Reasons why globalization should continue</b>
<b>Economic factors</b>	<p><b>Shrinking global manufacturing cost differentials:</b></p> <ul style="list-style-type: none"> <li>■ The cost advantage of large manufacturing titans such as China is declining. New technologies such as fracking have driven down energy prices in North America. At the same time, labor costs in China have increased by 15%–20% annually without compensating productivity growth. Furthermore, the complexity and cost of managing global supply chains have increased. Overall, this has leveled the playing field around the globe.</li> <li>■ Advances in manufacturing technology should further reduce global manufacturing cost differentials. Robotics and other technological advances should compensate somewhat for higher labor costs in developed countries.</li> </ul> <p><b>Stability of the global trade system weaker than previously expected:</b></p> <ul style="list-style-type: none"> <li>■ The COVID-19 outbreak has revealed that the supply of important goods could collapse in times of crisis (e.g. because countries implement trade restrictions, some of which are not in line with WTO rules). These products may also experience price jumps.</li> <li>■ This will likely motivate companies to review their sourcing strategies in order to increase resilience.</li> <li>■ Producing more locally enables companies to meet growing demand for customized products and quick delivery.</li> </ul>	<p><b>Underlying drivers of globalization have not disappeared:</b></p> <ul style="list-style-type: none"> <li>■ Globalization has been slowing, yet its pace remains high. It is unlikely that such a trend, driven by complex factors, will revert rapidly, even given the large scale of the current crisis. For companies, changing supply chain structures comes at a high cost.</li> <li>■ Foreign direct investment remains high. Private sector investments abroad are likely to continue although companies may diversify their investments and establish connections with new suppliers in other locations in East Asia.</li> <li>■ Looking at past crises, people often revert to previous patterns once a crisis is over.</li> </ul> <p><b>Rebound of the global economy:</b></p> <ul style="list-style-type: none"> <li>■ The global economy is more resilient than many believe. In financial markets' judgment, recession and lockdowns will pass. Valuations of almost all securities quickly recovered after the first shock. New technologies, business procedures and production processes should protect many companies from the next crisis – making them more prepared for the future.</li> </ul>
<b>Political factors</b>	<p><b>Growing backlash against globalization:</b></p> <ul style="list-style-type: none"> <li>■ Globalization positively impacted many developing and developed countries, promoting economic development, creating jobs, making companies more competitive and lowering consumer prices. Yet it has also created losers.</li> <li>■ Since the turn of the millennium, public opinion seems to have become more disapproving of globalization as evident in anti-globalization protests that particularly criticize the undesirable distributional effects of globalization. Skepticism of foreign trade, investment and immigration has also found its way into the party platforms of major political parties around the globe.</li> </ul> <p><b>Growing nationalism and protectionism:</b></p> <ul style="list-style-type: none"> <li>■ The US-China trade conflict, Brexit and global protectionist tendencies have increased uncertainty about trade policies around the world. The stability of the global trade system is in question and companies are reacting by reviewing their supply chain resilience.</li> <li>■ In times of economic difficulty, political leaders may be more likely to implement additional protectionist policies to please constituents who favor such policies. These actions may trigger retaliatory measures from other states and further weaken the level of trust in global trade systems.</li> </ul>	<p><b>Countries are committed to stabilizing the global economy if necessary:</b></p> <ul style="list-style-type: none"> <li>■ On the back of the COVID-19 shock, governments and central banks all over the world launched monetary and fiscal policy stimulus programs on an unprecedented scale to stabilize the global economy and reduce the risk of a prolonged economic depression. If the situation takes a turn for the worse, we can count on help from governments.</li> <li>■ China remains committed to more engagement with the outside world. Since 2014, China's Belt and Road Initiative has invested almost USD 1 trillion in Latin America, Africa, the Middle East, Southeast Asia and elsewhere.</li> </ul> <p><b>Transnational cooperation is necessary to confront a global crisis:</b></p> <ul style="list-style-type: none"> <li>■ Relying purely on closing borders and isolation is of only limited use in slowing the spread of a virus and does not increase resilience. In the short run, protectionist measures are likely to be met with retaliatory measures by other countries and exacerbate shortages in important goods such as medicines. In the longer run, isolating an economy will hamper economic development. What is needed is a well-functioning health system that is accessible to all.</li> <li>■ International cooperation will be necessary to prevent or mitigate the negative effects of future pandemics, be it in the form of coordinated health screening across countries, collaboration and sharing of best practices in containing a disease, or concentrated efforts to find a cure.</li> </ul>

**“Glocalization” – The middle ground between globalization and localization?**

Some see “glocalization” – the middle ground between globalization and localization – as a likely development in the future. After a period of rapid globalization, a “slower, more attentive glocalization” may follow, making the economy and society more resilient and robust. On the one hand, this would be achieved by decentralizing markets and value chains: business models would be increasingly decoupled from geographical areas by online meetings, working from home and telemedicine. Supply networks would become more resilient, relying more on local production and a range of sources. Mobility would be reduced. On the other hand, cooperation between local and supranational institutions would intensify, spurring innovation and the spread of information. This would make it possible to respond to transboundary threats such as pandemics by sharing best practices across nations, while solving problems with local measures.

References: Collins (2015), Dettling (2020), Farrell and Newman (2020), Frieden (2018), Goffman (2020), Karabell (2020), Rodrik (2020), Saval (2017)

## Strategies to reduce the risk of dependencies and increase supply chain resilience

### Supply-chain mapping and data-based models to better predict supply and demand:

- Digitizing supply-chain management can help identify bottlenecks. This requires not only knowing who your suppliers are, but also knowing your suppliers' suppliers.
- Big data and the use of models to predict supply shortages as well as demand fluctuations can help to increase resilience to disruptions.

### Diversifying suppliers:

- Global supply chains were first hit by the COVID-19 outbreak in China. Given the global importance of China as a source of many components and finished goods, the disruptions in Chinese factories quickly led to supply shortages in other parts of the world. Diversifying the number of suppliers (i.e. "China-plus-one strategy") and sourcing critical components from different geographic regions can improve supply security.

### Shortening the supply chain:

- In the last few decades, supply chains have become longer. Driven by cost leadership, products were increasingly sourced from various suppliers. In turn, suppliers would often source inputs from other companies. What may make sense from a cost point of view also makes the supply chain more difficult to control.
- The COVID-19 crisis will lead companies to re-assess their sourcing strategies and likely shorten their supply chains.

### Holding increasing amounts of stock and decentralizing warehouses:

- As the virus quickly spread around the globe, simply shortening the supply chain would still not have been effective in many cases. Supply shortages were common in large parts of many supply chains. Hence, to increase security of supply, a certain shift away from a lean supply chain is likely, with additional stock held despite additional costs. In addition, decentralizing warehouses can improve supply chain security when certain regions are not operating or transport prices skyrocket.

### Reshoring:

- Bringing work back home is another strategy that can improve resilience. Sourcing inputs from local suppliers decreases dependency on foreign suppliers that may be affected by national trade policies and/or supply chain disruptions. Even if costs increase through reshoring, it may still make sense, especially when it comes to strategic components. Governments will also likely introduce new requirements with regard to producing critical components or products (medical goods, IT) in their own countries.
- Nonetheless, relying to a large degree on producing at home also bears considerable risk if a crisis affects the home region/state.

### Automation:

- Automation of processes will lead to efficiency gains in production in developed and developing countries. It plays a key role when decentralizing production or reshoring processes as it may at least partially offset the additional costs of onshore production.
- Automation will also help to reduce disruptions due to limitations on the number of workers, i.e. in times of a contagious disease.

## Supply chains: Safety over cost-efficiency

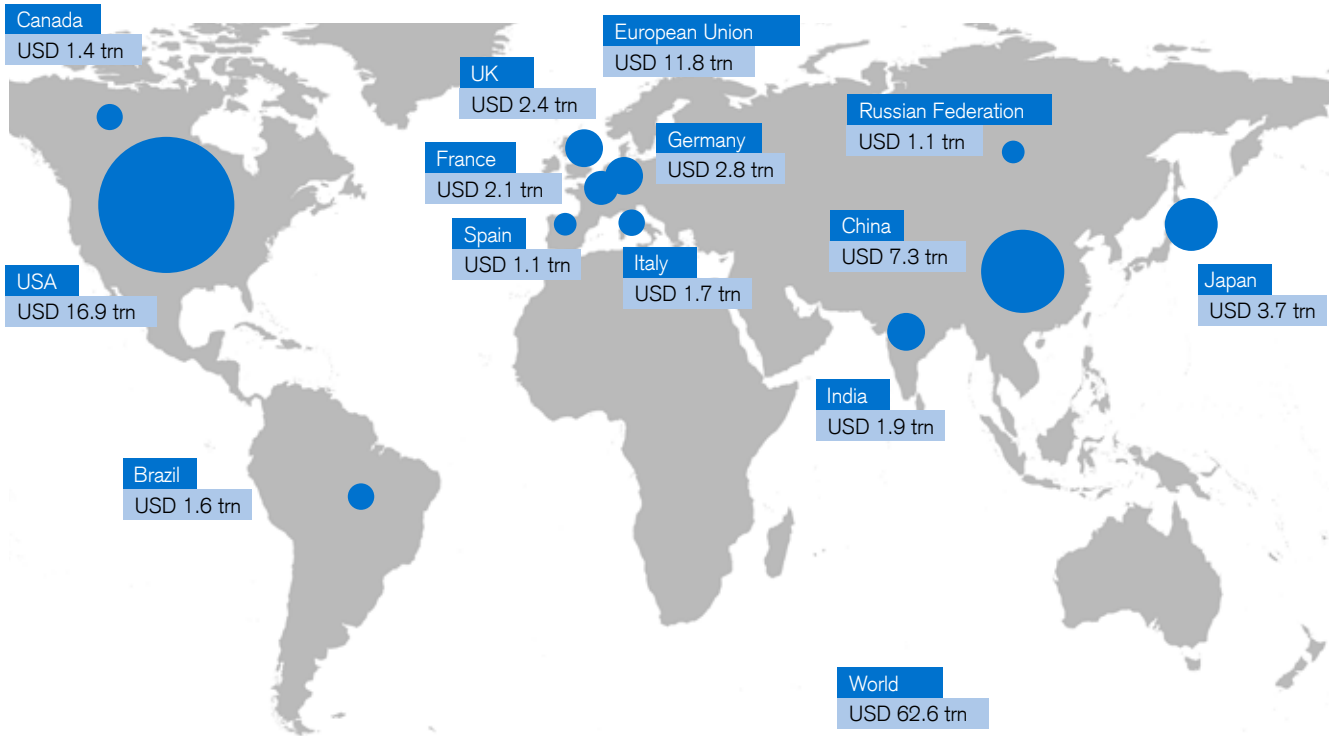
In the past, pressure to reduce supply-chain costs has motivated companies to implement strategies such as lean manufacturing, offshoring and outsourcing. Yet the COVID-19 crisis has made it apparent that globalization and globalized supply chains mean considerable exposure to what happens in Asia and other parts of the world. Companies are thus reconsidering their value and supply chains – a process that was already underway because of growing nationalist and protectionist policies – producing more locally and holding more stock. Governments and some companies may well value a resilient supply of strategic products more highly than before the crisis and federated supply chains may increase. This will put more redundancy in a system that currently may be too focused on cost efficiency alone.

### Nearshoring: Regionalization of trade around large consumer centers

The tendency toward regionalization will create new opportunities for lower-cost production countries that are closer to the main consumer centers, i.e. the USA, Europe, China and Japan (**Figure 4**). In the following, we look at countries that may see increased opportunities by benefiting from "nearshoring" activities around these four main consumption hubs. Countries that are already important manufacturers and important trading partners are more likely to be able to scale up production and benefit from the nearshoring of activities. With cost of labor a key factor for offshoring production, countries with low labor costs have a competitive advantage with reshoring or nearshoring locations.



**Figure 4: USA, Europe, China and Japan account for almost two-thirds of global consumption expenditure**  
Final consumption expenditure (in current USD trn), 2018, selected countries



Source: World Bank, OECD, Credit Suisse

To assess the potential beneficiaries of European efforts to move production from overseas locations to countries that are less expensive but geographically closer, we look at nine countries and their trade links with Germany, the UK, France, Italy and Spain (**Figure 5**). The latter five countries account for 16% of global final consumption expenditure and for the vast majority of European consumption. Owing to their stronger trade relations, Poland, the Czech Republic, Turkey and Hungary may benefit from nearshoring. They also offer a favorable business environment and comparably low wages. Despite accounting for only 0.2%–0.3% of imports, Serbia and Bulgaria score well with low nominal wages and a decent business environment.

With 27% of global final consumption expenditure, the USA is the largest consumption hub. Around it, three countries may benefit from a partial reshuffling of supply chains (**Figure 6**). Mexico, Brazil and Canada are among the top 14 important manufacturing locations worldwide, accounting for 1.2%–1.5% of global manufacturing output. Mexico and Canada are also the main suppliers to the US market, accounting for 14% and 13% of total imports to the USA, respectively – surpassed only by China (22%). In terms of human resources, the three countries are similar when it comes to

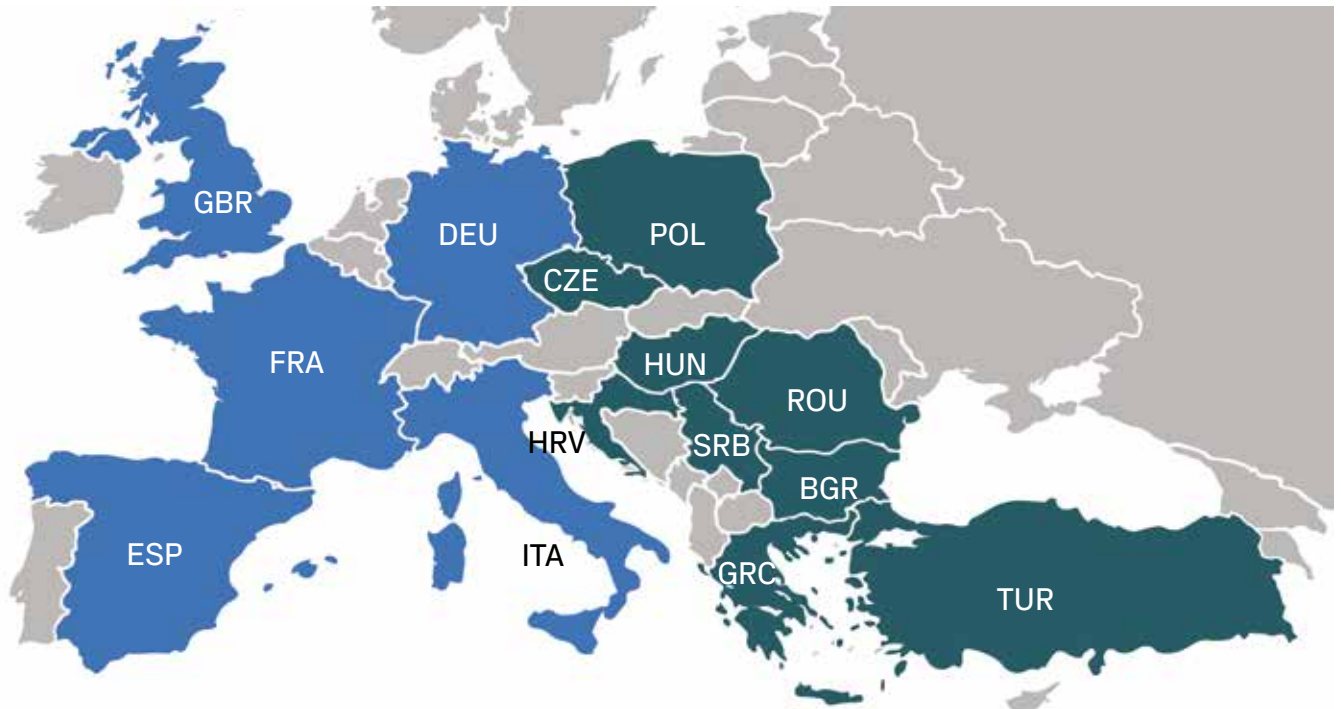
their working-age populations. With regard to educational attainment rates and business regulations, Canada clearly surpasses both Mexico and Brazil. As Brazil and above all Mexico have considerably lower labor costs, they are more likely to benefit from US nearshoring activities.

**Figure 7** lists countries that may benefit from a reshuffle of supply chains currently concentrated on China and Japan, the two major Asian consumption hubs accounting for 12% and 6% of global final consumption expenditure, respectively. In recent years, Vietnam has seen a considerable increase in exports as some companies moved manufacturing from China to avoid US tariffs on Chinese goods. Furthermore, owing to rapidly rising labor costs in China, the wage differential to Vietnam is considerable. Despite infrastructure limitations and increasing labor shortages, Vietnam has become an increasingly popular location for producing basic consumer goods – COVID-19 will likely reinforce this growth path. India may also be able to benefit from recent developments, offering a vast supply of low-cost labor and favorable demographics (see box on page 38). However, India and Indonesia currently account for a low share of Chinese imports. Thailand and Malaysia provide an attractive business environment and higher tertiary attainment rates, although nominal wages are already significantly higher.



### Figure 5: Possible beneficiaries of nearshoring around Europe

Chart above: Five major consumption hubs in Europe (blue) and possible beneficiaries of nearshoring (turquoise)  
 Heatmap below: Dark turquoise = comparative advantage and light turquoise = comparative disadvantage



	Share of global final consumption expenditure	Share of global manufacturing output	Share of imports to Germany, UK, France, Italy and Spain combined	Share of working age population	Attainment rate: Secondary education	Attainment rate: Tertiary education	Doing Business rank 2020	Nominal wage in USD PPP	Top export good (share of total trade value of countries' exports)
Turkey	0.9%	1.1%	1.7%	66.9%	60.9%	21.6%	33	1313	Cars (7.3%)
Poland	0.7%	0.7%	3.2%	67.4%	85.3%	21.9%	40	2290	Vehicle parts (5.7%)
Greece	0.3%	0.2%	0.3%	64.3%	64.8%	22.2%	79	2037	Refined petroleum (30.9%)
Romania	0.3%	0.3%	1.1%	66.1%	90.5%	14.6%	55	1729	Vehicle parts (9.2%)
Czech Republic	0.3%	0.4%	2.6%	65.0%	99.8%	20.8%	41	1687	Cars (11.3%)
Hungary	0.2%	0.2%	1.5%	66.4%	97.2%	20.2%	52	1970	Cars (9.1%)
Bulgaria	0.1%	0.1%	0.3%	64.4%	95.1%	20.6%	61	1410	Refined petroleum (5.7%)
Croatia	0.1%	0.1%	0.1%	65.0%	89.2%	18.3%	51	2065	Refined petroleum (7.3%)
Serbia	0.1%	0.1%	0.2%	66.0%	89.8%	20.0%	44	1351	Insulated wire (6.7%)

Population of working age: Population aged 15–64 (% of total population), latest year available.

Educational attainment rate: Share of population aged 25 and older that has at least completed secondary or tertiary education, latest year available.

Nominal wage: Measured by nominal wage in US dollars (converted using 2017 PPP), latest year available.

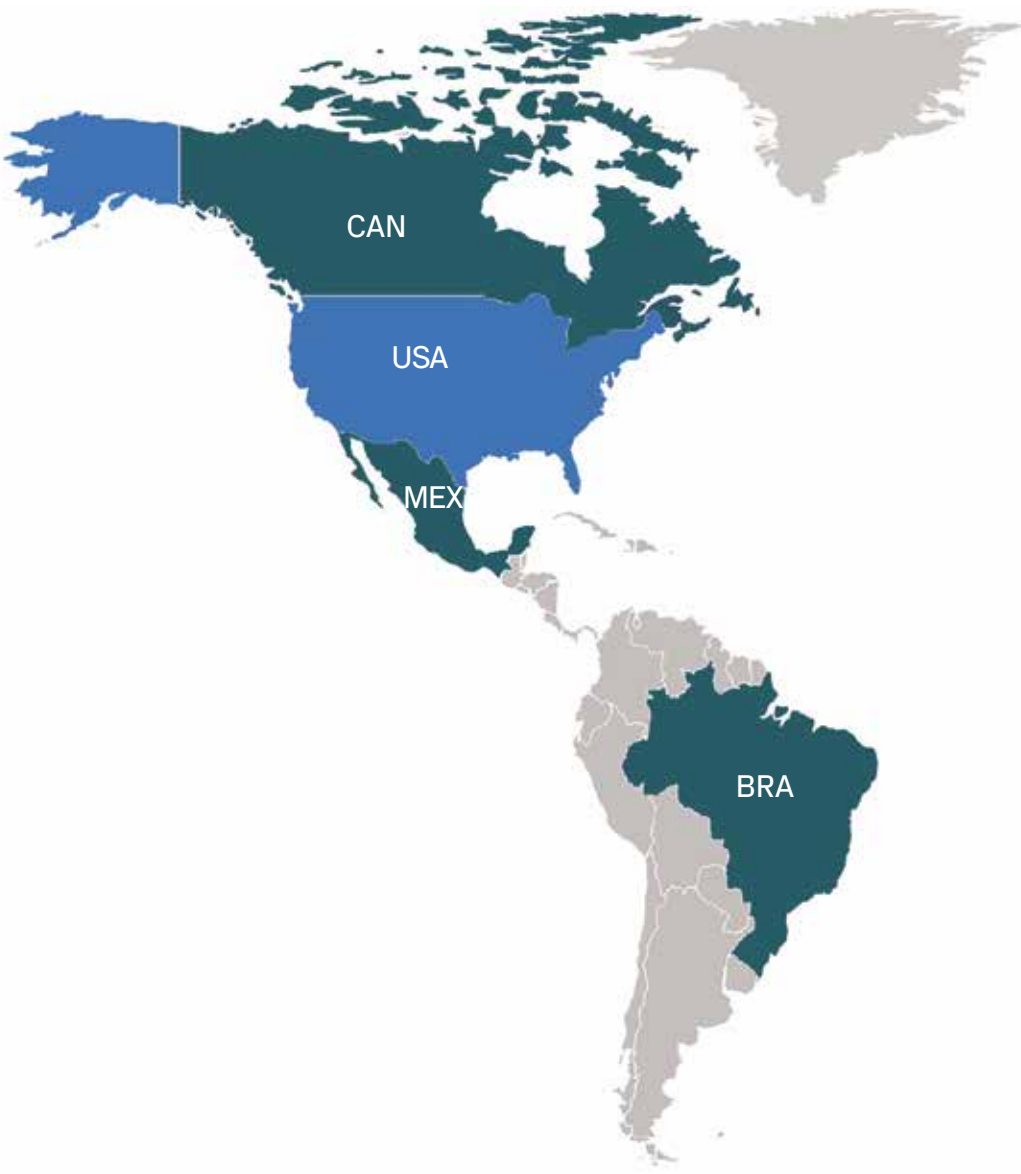
Ease of Doing Business: A high ease of doing business ranking means the regulatory environment is more conducive to the starting and operation of a local firm.

Source: World Bank, OECD, United Nations, Economic Complexity Observatory, International Labor Organization

**Figure 6: Possible beneficiaries of nearshoring around the USA**

Chart above: Main consumption hub in the Americas (blue) and possible beneficiaries of nearshoring (turquoise).

Heatmap below: Dark turquoise = comparative advantage and light turquoise = comparative disadvantage



	Share of global final consumption expenditure	Share of global manufacturing output	Share of imports to United States	Share of working age population	Attainment rate: Secondary education	Attainment rate: Tertiary education	Doing Business rank 2020	Nominal wage in USD PPP	Top export good (share of total trade value of countries' exports)
Brazil	2.6%	1.3%	1.2%	69.7%	60.0%	14.5%	124	954	Soybeans (13.7%)
Canada	2.2%	1.2%	13.0%	66.9%	83.6%	45.3%	23	3156	Crude petroleum (15.5%)
Mexico	1.5%	1.5%	14.0%	66.2%	63.2%	17.7%	60	607	Cars (11.5%)

Population of working age: Population aged 15–64 (% of total population), latest year available

Educational attainment rate: Share of population aged 25 and older that has at least completed secondary or tertiary education, latest year available

Nominal wage: Measured by nominal wage in US dollars (converted using 2017 PPP), latest year available

Ease of Doing Business: A high ease of doing business ranking means the regulatory environment is more conducive to the starting and operation of a local firm.

Source: World Bank, OECD, United Nations, Economic Complexity Observatory, International Labor Organization

**Figure 7: Possible beneficiaries of nearshoring around China and Japan**

Chart above: Two major consumption hubs in Asia (blue) and possible beneficiaries of nearshoring (turquoise).  
Heatmap below: Dark turquoise = comparative advantage and light turquoise = comparative disadvantage



	Share of global final consumption expenditure	Share of global manufacturing output	Share of imports to China	Share of imports to Japan	Share of working age population	Attainment rate: Secondary education	Attainment rate: Tertiary education	Doing Business rank 2020	Nominal wage in USD PPP	Top export good (share of total trade value of countries' exports)
India	3.1%	3.0%	1.0%	0.8%	66.8%	37.6%	12.6%	63	579	Refined petroleum (12.7%)
Indonesia	1.1%	1.5%	1.7%	3.0%	67.6%	50.9%	10.1%	73	541	Coal briquettes (11.2%)
Thailand	0.5%	1.0%	2.6%	3.5%	71.0%	45.1%	18.1%	21	1086	Office machine parts (7.1%)
Malaysia	0.4%	0.6%	2.8%	2.8%	69.3%	74.2%	17.4%	12	1956	Integrated circuits (20.6%)
Vietnam	0.3%	0.3%	2.6%	2.9%	69.6%	65.0%	7.6%	70	585	Broadcasting equipment (15.6%)

Population of working age: Population aged 15–64 (% of total population), latest year available

Educational attainment rate: Share of population aged 25 and older that has at least completed secondary or tertiary education, latest year available

Nominal wage: Measured by nominal wage in US dollars (converted using 2017 PPP), latest year available

Ease of Doing Business: A high ease of doing business ranking means the regulatory environment is more conducive to the starting and operation of a local firm.

Source: World Bank, OECD, United Nations, Economic Complexity Observatory, International Labor Organization

## Which sectors are likely to become more regional and which are likely to remain global?

The restructuring of supply chains is an evolutionary process. Supply chains have grown over decades, requiring major investments in existing value chains and production sites. Over time, network effects and skilled-labor pools have developed. Changing supply chains comes at a higher cost and, in the shorter term, higher risk. We believe that companies are more likely to maintain their current supply chains, but invest more locally to have a more diversified set-up over time.

Recent surveys show companies' reluctance to hastily implement far-reaching changes in their supply chains. According to the Institute of Supply Management (ISM), in July 2020 about 56% of US companies said they were not considering re- or nearshoring, while 20% said they were planning or had started to do so for some operations. A survey of members of the European Union Chamber of Commerce in China conducted in February 2020 shows a large commitment to the Chinese market, with only 11% considering shifting their current or planned investments to other markets (**Figure 8**). Some degree of diversification away from China is to be expected, but, as the report also notes, companies do not solely rely on China as part of a broader supply chain, but also serve the Chinese market. Still, this commitment should not be taken for granted. For instance, 41% of German companies in China surveyed by the German Chamber just one month later indicated that they were considering delaying or canceling investment decisions. In addition, 12% said they would adjust/diversify their supply chain, while 4% said they were considering relocating some or all manufacturing out of China (European Union Chamber of Commerce in China [2020]).

## “ Policy proposals by the European Union to treat some strategic sectors differently include Pharma, Defence, Digital Applications and several more – Simon Evenett

Yet some industries are likely to adapt more quickly than others and more likely to become regional, with information technology and health-care at the forefront. Given the severe repercussions of the COVID-19 pandemic, governments will likely seek to improve preparedness for

## Can India become the next manufacturing powerhouse?

The rise of China as “the world’s factory” began in the 1980s when the country opened up to foreign trade and investment and implemented free-market reforms. Initially a producer of low-end products, China gradually rose to become a manufacturing hub for a wide range of products. Cost competitiveness and infrastructure investment played a huge role in China’s rise to become the world’s largest manufacturer, overtaking the USA by 2010. Since then, upward pressure on labor and material costs has spurred a shift toward higher-value manufacturing. In addition, China is actively pursuing a strategy to promote technological advances and innovation. The share of high-skill and technology-intensive manufactures has risen from 24% in 1995 to 39% in 2018, according to estimates by the United Nations Conference on Trade and Development (UNCTAD). Even if part of this increase was attributed to processing activities in which the country is involved (i.e. assembling and exporting finished products), these figures clearly indicate that a shift is underway.

In light of rising production costs exacerbated by the trade war with the USA, many companies have begun rethinking their supply chains. Moreover, the COVID-19 shock and the Chinese shutdown have highlighted the drawbacks of being too dependent on manufacturing from a single country. Several industries are therefore seeking to broaden the regional diversification of their production activities, creating an opportunity for other nations to strengthen their position as manufacturing destinations. One of them is India, where many policymakers and industry leaders are seeing an opportunity for their country and a potential boost to the “Make in India” initiative launched by the government in 2014.

India continues to offer some of the lowest labor costs in the world and an abundance of engineers, along with an English-speaking workforce. The country’s population of 1.3 billion people provides a vast domestic market for manufacturers, and demographics are still favorable. While the working-age population in China has already started to shrink and the old-age dependency ratio is forecast to more than double in the next two decades, India still has a relatively young population and the working-age population will continue to grow until 2050.

However, India remains challenged by poor infrastructure and a cumbersome governance model. Deep and comprehensive structural reforms are needed in the areas of labor and land legislation to support the expansion of India’s manufacturing base and create factory jobs for a large pool of unskilled rural migrants. Trade openness is also suffering, with the government scrapping existing bilateral deals, raising tariffs and sparring with the WTO. Despite an increase in manufacturing exports, India’s share in global manufacturing output was a mere 3% in 2018, compared to 29% for China. Moreover, a large part of India’s exports continues to take the form of low-value, labor-intensive goods.

Some observers have argued that, by relying on the success of its IT industry, India could leapfrog the manufacturing and physical infrastructure stage of development to build the economy around digital activities. Yet it has become clear that the country will have to develop the old-fashioned way if it wants to raise the living standards of its population and eventually substitute China as the world’s factory.

future outbreaks, e.g. by prescribing increased stockpiling of critical healthcare supplies, increasing import tariffs, or even mandating that critical products be produced at home. In further areas of strategic importance, be it for political or national security considerations, supply chain redesign is also more likely.

In information technology, there is considerable debate around supply chain modifications in the semiconductor sector in the context of new export-control restrictions the USA has imposed on exports to China. The US Department of Commerce has expanded the definition of Chinese companies offering products to the Chinese military, requiring a review by national experts before shipments can be made to micro-electronic firms in China (including Huawei via its main Chinese supplier HiSilicon), which need components from outside China (mainly Taiwan [Chinese Taipei], but also the USA, Korea and Japan). Taiwan (Chinese Taipei) produces 80% of semiconductor industry output, so it is difficult to envisage shifting large parts of the value chain to countries that lack industry infrastructure and a trained workforce. Still, a shift away from China is noticeable.

In other sectors, we expect the development to be slower. For consumer sectors, we do not expect significant changes in the localization of production:

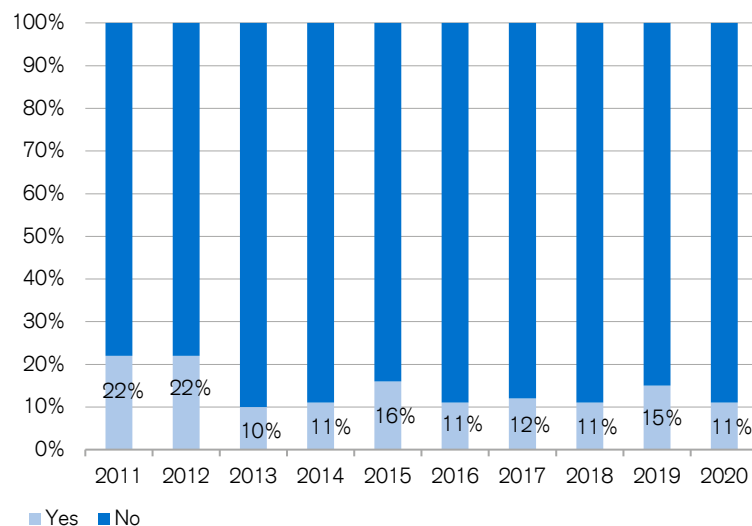
1. Food manufacturing is already fairly local due to the nature of the products (i.e. limited shelf life) or cost efficiencies.
2. The automobile sector has discussed localization due to the risk of tariffs, but a significant shift is unlikely.
3. Apparel manufacturing has moved across Asia and out of China in recent years.
4. Luxury goods are mainly manufactured in Europe, as countries of origin are part of the brand story.
5. Sporting goods manufacturing is shifting away from China to Far East countries with lower labor costs. There is still a certain bond with China due to its technical capabilities. It would not be economically viable for companies to reshore manufacturing to Europe and the USA.

Within the industrial sector, sub-sectors are affected differently. For transportation, the impact is greater when customers move supply chains and production. For logistics companies, more diversified and complex supply chains could be positive as they require more sophisticated logistics solutions and consulting. The shipping industry may be under more pressure if logistics chains become more local and more continental, as it might be difficult to reroute very large vessels (see interview on pages 41–42).

In the capital goods sector, most supply chains are already localized as some end-markets such as rail often require domestic production. Owing to strong economic growth, production in China or India is mostly for the local market or used to export to the region. Only a few companies have announced plans to bring capacities back to the USA. However, capital goods companies with exposure to automation could benefit from reshoring, as automation will be the key to profitability in high-cost regions such as the USA or Western Europe. This means more robots and fewer jobs. Also, the move to more resilient supply chains – a key requirement post COVID-19 – requires more digitalization, especially when supply chains are more localized and complex.

**Figure 8: Commitment to China is unlikely to diminish rapidly**

Answers to the question “Is your company considering shifting current or planned investments in China to other markets?” in %



Source: European Union Chamber of Commerce in China

## Takeaways

- Globalization is likely to continue slowing due to COVID-19, but rapid deglobalization or isolation is unlikely. There has been a trade-shift toward subsidization.
- In the past, supply chains were largely focused on cost efficiency. In the future, governments and companies will lend more weight to a resilient supply of strategic products than before: supply chains will be reviewed, production will become more diversified and to some extent more local, and increasing amounts of stock will be held.
- The trend toward regionalization will open up opportunities for lower-cost production countries that are closer to the main consumer centers (USA, Europe, China and Japan). Countries that are already important manufacturers and trading partners for these consumer hubs are more likely to scale up production and benefit from the nearshoring of activities.
- Driven by new government regulation and legislation, IT and healthcare are the sectors most likely to adapt their supply chains.
- Overall, the restructuring of supply chains is an evolutionary process that will require strong private profit motives, major policy support and many years of strong net investment in human capital as well as new production sites.



# Assessing the impact on the logistics sector

Interview with Jens Lund, CFO of DSV Panalpina A/S

Logistics firms have been directly affected by the COVID-19 pandemic. As an integral part of supply chains worldwide, their capability to cope with the crisis is crucial for their clients' competitiveness and ultimately for economic growth.

**Jens, your activities range from air, sea, rail and road freight to warehousing and complex logistics solutions. In which segment and region did you experience most disruption during the pandemic and what is your approach to help your clients to mitigate the impact of COVID-19 on their supply chain?**

Jens Lund: The initial lockdown in China in January and February mainly impacted our air and sea operations. The supply chains of our clients are in many cases based on suppliers with production in China, and the production and supply of goods from China stopped at short notice. In March and April, as countries in the rest of the world gradually went into lockdown, our road freight operations and warehouse operations were also impacted and COVID-19 truly became a global event for us – and for our customers. As a large logistics provider, DSV Panalpina is part of the critical infrastructure in many countries, and this has enabled us to keep offices and warehouses operational, even in countries with very strict lockdowns.

We service clients in many different industries, and they have been facing different challenges. Some have been shut down completely and needed extra warehouse space as stores were closed and sales were down. Some companies or countries needed assistance with urgent shipments of personal protection equipment. And for some clients, we have seen a significant increase in their e-commerce activities.

Air freight has been a special challenge since COVID-19 hit us. Normally, 50% of all air cargo is transported in the belly of passenger planes, but as almost all passenger planes were grounded, a significant part of the cargo capacity disappeared overnight. This means that capacity has been tight and rates record-high, and we have been working hard to find good solutions for our customers.

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**It has been fantastic to see that our IT systems have stood the test**

We have been in close dialogue with our clients throughout the crisis. Short term, the focus is of course to find transport solutions and keep businesses running here and now. Longer term, we can support customers in analyzing their supply chain and identify the weak links. In all parts of the world, we prioritize the health and safety of employees and of course we follow the local guidelines. Like many others, we have been working from home, and it has been fantastic to see that our IT systems have stood the test and that our staff have put in a great effort under difficult circumstances.

**The pandemic will hit global trade more deeply and for longer than we have seen in other crises. Will the logistics sector soon face a serious overcapacity problem?**

As an asset-light freight forwarder, we can quickly adjust our capacity to match the activity level. As one of the largest freight forwarders, the important thing for us is that we have good access to capacity and that we can quickly pass on changes in the freight rates to our clients. In air freight, COVID-19 has actually led to lack of capacity, due to all the grounded passenger planes. The airlines expect that it will take 2–3 years before passenger traffic returns to normal (2019 level), and this indicates that air cargo capacity will remain tight in the foreseeable future.



**During this crisis, we have seen remarkable discipline**

In the container shipping industry, overcapacity has been a recurring issue for years, but during this crisis, we have seen remarkable discipline and capacity management from the shipping lines. Through cancellation of planned sailings and idling of ships, the capacity is kept at a level that matches demand, and this has supported container rates. It seems that this discipline continues, but it is a fragile balance. In the latter part of 2020, we have seen demand coming back and we have been facing severe capacity issues both for ocean and air freight; airplanes and container ships are fully booked, and this creates challenges for global supply chains.

**In the future, companies may seek a different cost/resilience trade-off. Are you already observing shifts in supply chain structures?**

We had already seen a trend before COVID-19 with some companies starting to move production out of China. This has been driven by cost inflation in China and the tariffs implemented between the US and China. In most cases, production is not moved back to North America or Europe, but to other countries in Asia. In some sectors, e.g. the health care sector, it is likely that we will see more local production. But we believe that globalization is here to stay, and that global trade and supply chains will remain global. There will still be significant production in China; however, we expect more focus on dual supplier strategies, thus reducing the reliance on one country.

**To increase resilience in their supply chains, companies are considering holding larger amounts of stock. Is demand for warehousing solutions increasing?**

Yes, we see an increase in the demand for warehouse solutions, and we expect that we will see larger amounts of stock in certain industries. We also offer other services that create transparency in the supply chains and thereby help prevent shortages and production stops for our clients. A good example is Purchase Order Management, which enables the client to follow the status already when an order is placed with a supplier. This way, a delay will be detected early in the process and necessary action can be taken.

**Looking ahead, where do you see new opportunities for logistics companies, for instance in terms of entering new markets or innovating on new service offerings?**

We believe that the COVID-19 crisis will accelerate some of the existing trends. The digitization of our industry will accelerate, growth in e-commerce will continue and many companies will take a close look at their supply chains. This provides opportunities for a freight forwarder; we can help clients manage their complex supply chains and reduce risk. And we can use digital tools to improve our productivity. Our industry has been undergoing consolidation for many years. We believe this trend will continue, and the crisis could create some new opportunities in this respect.



**The digitization of our industry will accelerate, growth in e-commerce will continue and many companies will take a close look at their supply chains.**

Finally, I want to highlight the sustainability/responsibility agenda, which has not been forgotten in the midst of the COVID-19 crisis. We have just announced a new set of ambitious science-based environmental targets, and we will work closely with both customers and suppliers to achieve these targets. The green agenda can create business opportunities for us if we help customers optimize supply chains and reduce emissions.



# 5. A new era of surveillance?

Since the beginning of the COVID-19 pandemic, many governments have expanded efforts to collect data about their citizens to contain the spread of the virus, opening up a debate about a possible trade-off between public health and privacy. Is there a risk that the efforts to deal with the emergency may usher in a new era of surveillance that will outlast the crisis and impinge on freedom and human rights?

## Surveillance on the rise during the pandemic

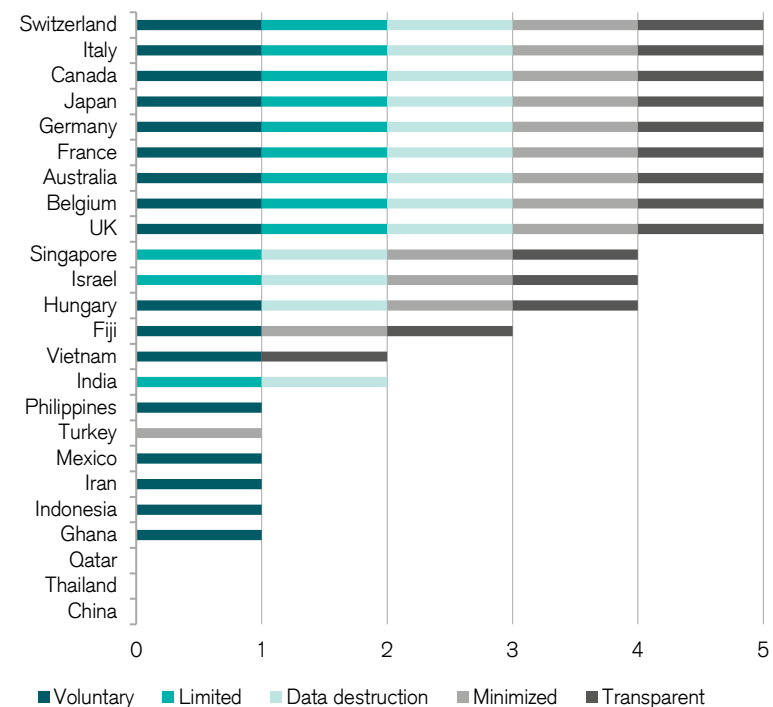
During the pandemic, the collection and use of personal data by governments and private actors became a crucial element of crisis response. Thanks to technological progress, we are able to collect data from digital sources such as telephone towers, mobile phone apps and Bluetooth connections.

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2020 introduced historically unprecedented population control – Martin Clements, Advisor to Credit Suisse CEO and Chairman on digital risk

The instruments of digital public health technology can be classified into four main categories: proximity and contact tracing, symptom monitoring, quarantine control and flow modeling (Gasser et al. [2020]). **Figure 1** illustrates the automated contact tracing efforts for selected countries around the world, according to the

**Figure 1: The spread of proximity tracing apps**

Governmental proximity tracing apps, evaluation according to principles of privacy protection\* (5 = high privacy protection), selected countries\*\*



\* Ranking according to the following principles: Are the apps voluntary? Are there limitations on how data is used? Will data be destroyed after a certain period? Is data collection minimized? Is the design transparent? \*\* According to the Covid Tracing Tracker, 46 countries around the world have government-backed contact tracing apps.

Source: MIT Technology Review Covid Tracing Tracker as per 23 November 2020

Covid Tracing Tracker of the MIT Technology Review (O'Neill et al. [2020]). This database exclusively captures automated contact tracing apps backed by national governments.

Symptom checkers are syndromic surveillance tools that collect, analyze and disseminate health-related data. Quarantine compliance tools involve real-time monitoring of whether individuals are complying with quarantine restrictions. Flow modeling tools, in turn, quantify and track people's movements within a specified geographical region. These tools typically rely on aggregated, anonymized sets of data from the geographical location of users. As the example of South Korea shows, they can also be combined with other sources of information such as electronic transaction data and surveillance camera footage to track people's movements (Fendos [2020]).

### Trade-off between the protection of public health and privacy

In the context of the pandemic, the benefits of surveillance and data collection are straightforward: governments can track the spread of the virus, identify hot spots and take containment measures. Consequently, people face lower infection risks and the economy suffers less damage. At the same time, digital surveillance has raised ethical and legal concerns. Are the different tools voluntary? Are there limitations on

how the data is used? Will the collected data be destroyed after a defined period of time and are the technologies used transparent? As **Figure 1** shows, different countries' approaches can vary considerably in this regard. Moreover, the risk-benefit ratio of these surveillance instruments might be affected by several factors, such as the pervasiveness of the internet and smart devices or user uptake rates of contact tracing apps in a given country.<sup>1</sup> Despite reassurances from politicians and industry leaders, the increased use of digital surveillance techniques has fueled fears about Orwellian surveillance systems, ushering in a broader discussion about civil liberties and surveillance.

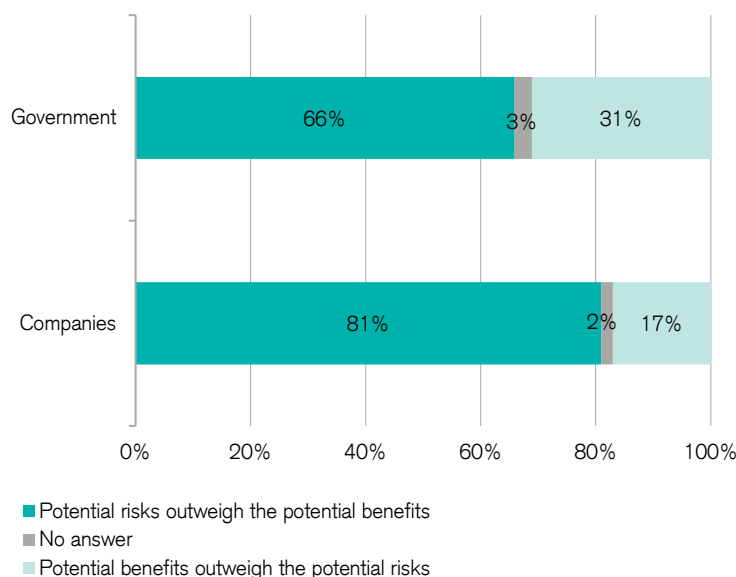
It is important to draw the right conclusions from previous crises, otherwise the pandemic could become another watershed moment in the history of surveillance – similar to the 9/11 terrorist attacks in 2001, which led to a trade-off between privacy and the protection of public safety. As traditional surveillance methods were insufficient in preventing the tragedy, the US National Security Agency (NSA) began to research new, more effective surveillance techniques. In May 2013, whistleblower Edward Snowden disclosed insights into these surveillance programs, revealing that the NSA collaborated with internet companies to collect telephone records and online information about US citizens. This raised questions about the scope and adequacy of surveillance methods used by government agencies (BBC [2014], Greenwald [2014]).



**The potency of biometric sensors in surveillance ecosystems is not yet fully appreciated. Corporates are among the biggest data gatherers and information empires – Martin Clements**

**Figure 2: Most Americans were critical about data collection prior to the pandemic**

Share of US respondents stating that the potential risks outweigh the potential benefits of data collection by government and companies, and vice versa, 2019



Source: Pew Research Center

According to a 2019 survey by Pew Research Center to understand Americans' attitudes to data collection, the majority of respondents in the USA stated that the potential risks outweighed the benefits (**Figure 2**). However, the NSA's surveillance tactics may have also helped reduce the risk of terrorist attacks in the USA after 2001 (**Figure 3**). Since 9/11, most terrorist activities in the USA have been perpetrated by so-called "lone wolves" (Bergen [2017]).

1. According to the World Health Organization (2020), a digital proximity tracing technology should be adopted by 60%–75% of a country's population to be maximally effective for contact tracing.

Extrapolating from the past into the future, one might conclude that the surveillance methods in place are insufficient to cope with a pandemic, prompting the need to move to a next level. Historian Yuval Noah Harari (2020) claims that COVID-19 might be the beginning of a transition from over-the-skin to under-the-skin surveillance, providing automated information not only about people's actions, but also about the condition of their bodies. To find out whether people are ill, surveillance systems need data about body temperatures, blood pressure and heart rates to shed light on people's medical conditions.

### What is at stake?

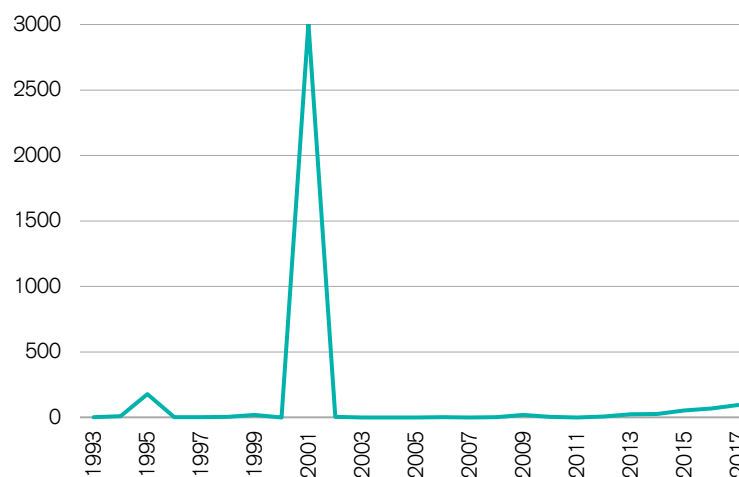
Events like the 9/11 terrorist attacks or the coronavirus pandemic have given governments the legitimacy to collect data during and potentially well beyond the crisis. Over time, people may develop a collective tolerance for surveillance. Today, people take surveillance cameras in public buildings for granted, but they were not always as ubiquitous. A similar "adjustment" could eventually take place with under-the-skin surveillance. Such a development could mean that privacy in its present form may turn into a concept that future generations will only know from hearsay. We may wonder what is at stake.

Today, big data and algorithms influence the way people gather information when navigating the internet. By facilitating access to certain information and withholding other information, search algorithms can shape users' opinions.<sup>2</sup> The use of more and more granular personal digital data can increase the danger of re-identifying individuals or groups, as well as undermining privacy and personal autonomy. This also carries an inherent risk of discrimination, as data collected can include information on gender, ethnicity, political affiliation or socioeconomic status. The use of artificial intelligence techniques may further aggravate discrimination. Mann and Matzner (2019) argue that increased algorithmic complexity makes biases more sophisticated and harder to identify. If a non-transparent algorithm discriminates against certain people, it is difficult for the parties concerned to know how or why they are being discriminated against. This information advantage gives the developers of automated surveillance techniques based on artificial intelligence significant power and scope to discriminate. In this context, under-the-skin surveillance would give the holder of the information even more power – think of a regime that may require its citizens

2. Cho et al. (2020) argue that algorithmically recommended content reinforces political opinions and potentially leads to political polarization among internet users.

**Figure 3: No major terrorist attacks on US soil since 9/11**

Number of confirmed deaths, including all victims and attackers who died as a result of the incident on US soil, 1993–2017



Source: Global Terrorism Database

to wear a biometric wristband throughout the day to monitor their mood and propensity to criticism.

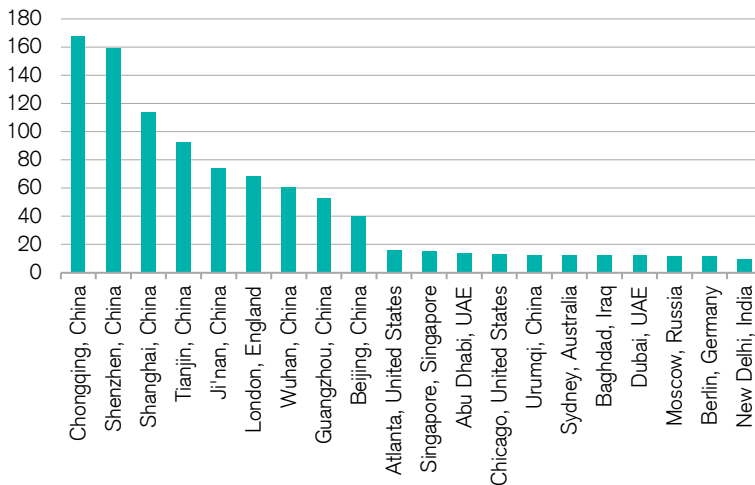
In a broader perspective, the use of digital surveillance practices and artificial intelligence tools could endanger freedom in the economy and politics (Harari [2018]). As soon as someone has the technological skills necessary to analyze and influence people to engage in transactions that may not be mutually beneficial, the principles of the free-market economy are undermined. Collecting data about people on the internet enables marketers and advertisers, for instance, to identify potential customers and target them with customized ads in an attempt to elicit a buying decision. Akerlof and Shiller (2015) refer to these practices as "phishing for phools."

In politics, voters are assumed to be well informed and vote in accordance with their free will. Again, however, if someone acquires the technological ability to collect personal data about people and manipulate them based on this data, democratic elections may be influenced by data collectors pulling strings behind the scenes. What may sound far-fetched has already been done. In 2018, the Guardian reported that Cambridge Analytica, a political consulting firm, allegedly collected personal data about millions of Facebook users in the USA and UK. Based on this data, Cambridge Analytica was able to identify those voting-age individuals that they could influence through a targeted online campaign, thus possibly affecting the outcome of elections and votes (Wylie [2019]).



**Figure 4: Chinese cities have the highest density of surveillance tools**

Estimated number of public CCTV cameras\* per 1,000 people, 2019

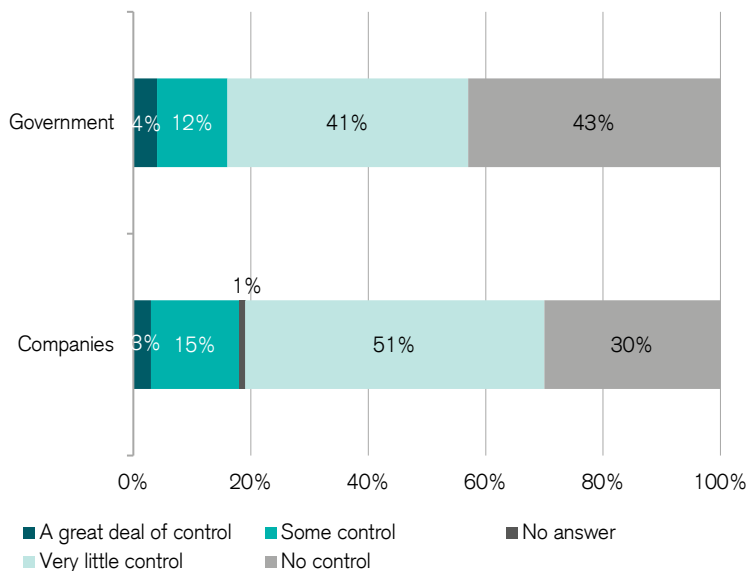


\* The focus was on the world's most heavily populated cities. Comparitech omitted any city where they could not find enough data about public CCTV cameras. For China, Comparitech had data about some cities, but also had to create estimates based on the growth rates indicated in this area. By 2020, China is anticipated to have 626 million CCTV cameras.

Source: Comparitech

**Figure 5: Sense of powerlessness when it comes to data collection**

Share of respondents answering the following question: "How much control do you think you have over the data that the government/companies collect about you?" in 2019



Source: Pew Research Center

**The rise of China's information empire**

China is setting up a nationwide ranking system that monitors the behavior of its citizens and classifies them based on their social credit. This so-called "social credit system" is designed to promote integrity and discourage dishonesty (Claridge [2020]). While it was applied to millions of people as part of a pilot project, the program is expected to be established by the end of 2020, when it will be mandatory for all Chinese citizens.

Based on the findings of surveillance data, the government rewards behaviors it likes and punishes behaviors it does not like. The exact methodology is unknown, which raises concerns about the lack of transparency and the potential to discriminate against certain groups. Experience made during the pilot project show that people received point deductions, for instance, when they jaywalked, smoked in non-smoking zones or posted fake news online (Ma [2018]). Having a bad score can result in being banned from rail travel, having the internet throttled or having fewer job opportunities. While the Chinese government punishes people with low scores, it rewards people with good scores who, for example, do not have to pay a cash deposit when booking a hotel (Ma [2018]).

For the system to work, the Chinese government had to install a large number of surveillance cameras including facial recognition technology. According to estimates by Comparitech, eight of the ten most-surveilled cities worldwide are located in China (Figure 4). Advances in artificial intelligence and the internet of things have made these surveillance tools even more sophisticated.

While the social credit system is one application, city-level surveillance can also make cities smarter. A network of digital devices with artificial intelligence and internet of things is useful to analyze traffic flows and reprogram traffic lights to minimize urban congestion. Other smart city initiatives include improvements in crime prevention and environmental management.

In the 21st century, we will view nations in terms of their information capacity rather than their resource capacity. A state's information capacity will basically be its ability to analyze itself and make rapid changes. States that heavily use artificial intelligence will be better at this. Some countries – especially in Asia – are already showing us how information empires might look in the future.

## Toward new standards in data protection?

The emergence of new surveillance techniques makes monitoring more sophisticated, exposing people to new data-gathering methods and infringing on their privacy. According to a 2019 survey by the Pew Research Center for the USA, 84% and 81% of respondents felt they had very little or even no control over data collection by government agencies and companies, respectively (**Figure 5**), revealing a sense of powerlessness when it comes to data collection.

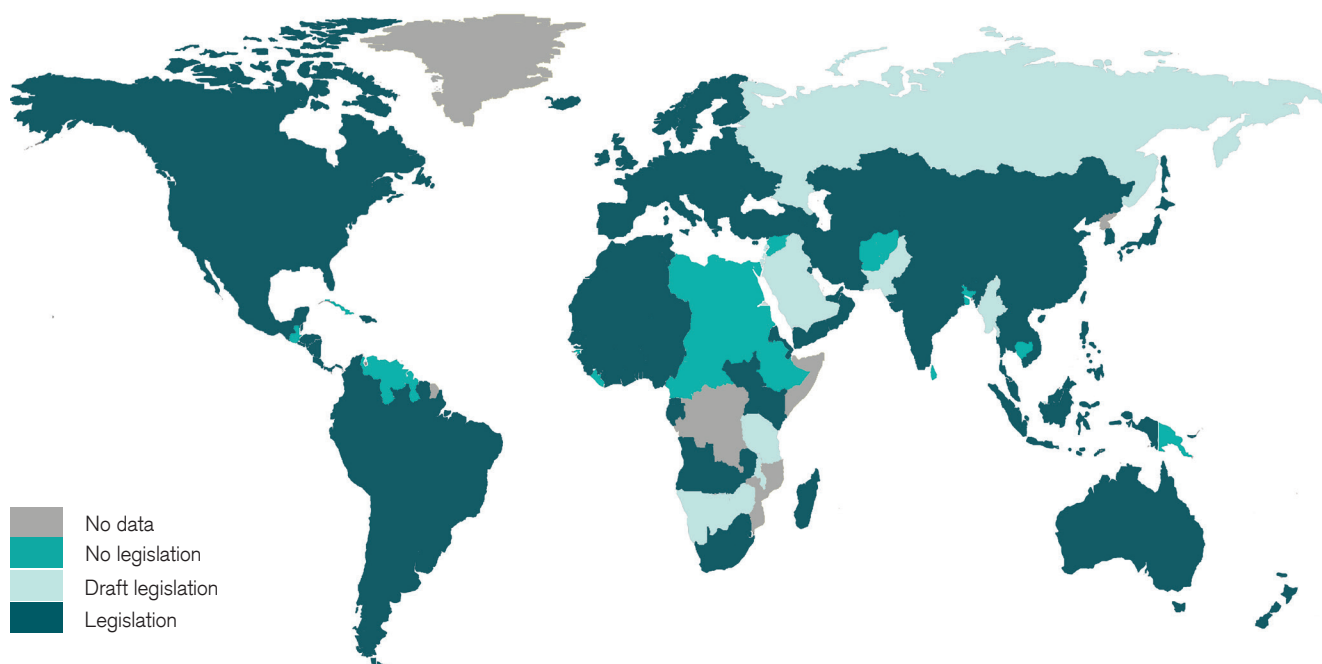
The fact that many companies can collect people's most intimate data has turned them into institutions that are too important to be left to a laissez-faire approach (Smith and Browne [2019]), highlighting the need for comprehensive data protection laws. According to the United Nations Conference on Trade and Development (UNCTAD), 66% of countries worldwide have put some legislation in place to secure the protection of data and privacy; 10% more have drafted such legislation (**Figure 6**).

In the EU, an important step toward protecting privacy was made with the General Data Protection Regulation (EU GDPR), which entered into force on 25 May 2018. Various provisions specify the handling of information by data collectors. Violating regulations can be sanctioned with up to 4% of a company's global revenues (Zuboff (2019)). Data collectors nowadays operate globally, which makes regulating them difficult. The EU GDPR therefore mentions a third-country provision, which allows the transfer of personal data of EU citizens to third countries as long as the country in question has an adequate level of data protection – the so-called “adequacy principle.” In this context, countries outside the EU have an interest in staying abreast of EU regulations to maintain the status of a third country with an adequate level of data protection.

Generally, enforcing data protection laws internationally appears to be difficult since some laws may not be in line with others abroad. According to the US Foreign Surveillance Act (FISA), for instance, the NSA and other government agencies can collect data of foreign citizens without a

**Figure 6: Data protection and privacy legislation worldwide**

Legislation or draft legislation in at least one of the following areas: electronic transactions, consumer protection, privacy and data protection, cybercrime, as per 2 April 2020



Source: UNCTAD

court order, which contrasts with the EU GDPR. The differences in how countries worldwide implement data privacy laws may trigger fears that, despite laws like the EU GDPR, other countries may still collect data on European nationals without their consent or knowledge. Yet, in July 2020, the European Court of Justice ruled that US monitoring programs are not limited to minimum standards, making it harder for US agencies to obtain data on EU nationals in the future.

Another approach to protect privacy rights is to increase awareness of how important this issue is when navigating online. For users, it is often difficult to understand how much of their data is collected and how it may be used by companies and government agencies. Educational programs at schools or widespread awareness campaigns may help to mitigate information asymmetries (Acquisti et al. [2017]). A better understanding of the risks associated with data collection may put pressure on technology giants to become more transparent in the way they collect and use data. In a more transparent world, privacy-focused online services are more likely to prevail; yet switching to them requires a collective effort.

## Takeaways

- Since the start of the COVID-19 pandemic, countries around the globe have introduced digital surveillance tools to monitor the spread of the virus and protect public health.
- Through surveillance and data collection, governments can track the spread of the virus, identify hotspots and take containment measures. Consequently, people face lower infection risks with less damage to the economy. Yet the use of these techniques has raised ethical and legal concerns.
- Traditional surveillance methods could prove insufficient to combat COVID-19, accelerating the development of more sophisticated and perhaps more dangerous surveillance systems such as under-the-skin surveillance.
- Surveillance systems give the holder of information seemingly unlimited power to manipulate or discriminate against others, which may endanger economic and political freedom.
- In the 21st century, we will view nations in terms of their information capacity, meaning their ability to analyze situations and make rapid changes. China is leading the way with city-level surveillance.
- Measures to fight the invasion of privacy include the implementation of comprehensive data protection laws, awareness campaigns and the shift to privacy-focused online services.



Gettyimages, Drazen\_

# 6. Flexibility at work

Social distancing measures, business closures and other restrictions imposed by governments to limit the spread of COVID-19 have had significant repercussions on the way millions of people around the world work. While some workers were working remotely from home, others were forced to reduce working hours or leave their jobs. The experiences gained during the crisis may lead to changes in the labor market that are likely to outlast the pandemic.

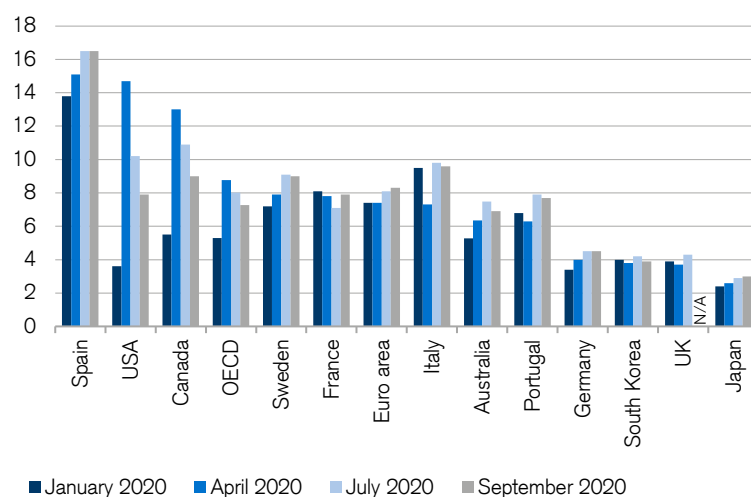
## Labor market under stress

The COVID-19 crisis has had a severe impact on the labor market. The lockdowns implemented to contain the spread of the pandemic and the resulting reduction in economic activity led to a massive rise in unemployment. The USA, for instance, witnessed the sharpest labor market downturn since the Great Depression,

with unemployment surging to 14.7% in April 2020, equivalent to 23 million jobless (**Figure 1**). In Europe, the surge in unemployment has been limited so far, essentially thanks to the fact that several countries implemented short-time work arrangements to help bridge temporary periods of low demand. These programs are public schemes that encourage firms to reduce working hours instead of laying off workers, while the government pays a significant share of lost wages. The number of applications for short-time work skyrocketed in the weeks following the lockdown in spring 2020, amounting to 26%–40% of all employees in Germany, the UK, Switzerland and France (**Figure 2**).

**Figure 1: Massive rise in unemployment in the USA**

Harmonized unemployment rate in %



Source: OECD

A more detailed analysis of unemployment rates reveals that different segments of the population have been affected by the crisis to differing degrees (see Chapter 8). The pandemic seems to have widened existing divides between men and women, professionals and low-paid workers, and established workers compared to young people entering the job market. Given their above-average share in sectors affected most by the crisis such as hospitality, leisure, retail and personal services, low-paid workers and women in particular experienced a higher rise in unemployment than other categories of employees. Whereas in past recessions, men have usually been most affected given



their prevalence in sectors like manufacturing and construction that tend to bear the brunt of downturns, women appear to have suffered more this time (Alon et al. [2020]).

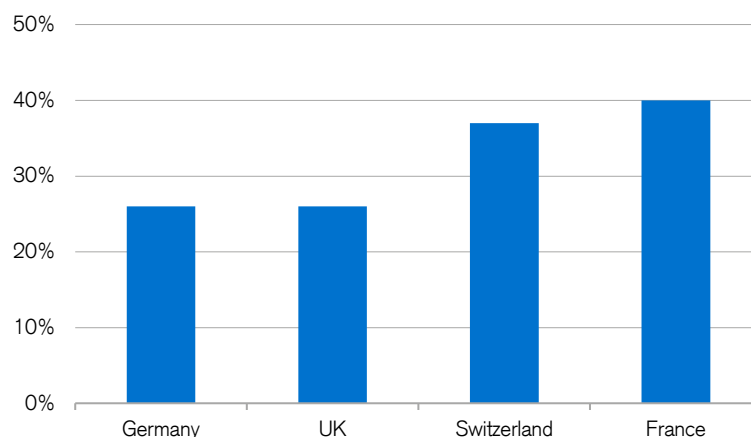
Among the population groups that have suffered most from the social and economic consequences of the pandemic, young people stand out as they have been affected by multiple shocks including disruptions to education and training, loss of employment and income, and having greater difficulty finding jobs. According to ILO estimates, a total of 178 million young workers aged 15–24 years around the world – more than four in ten – were working in hard-hit sectors when the crisis began, and almost 77% were in informal jobs, making them vulnerable to income and job losses. The impact on this generation may be long-lasting – empirical evidence shows that entering the labor market during a recession can negatively affect young people’s labor market outcomes for a decade or longer (Cockx [2016], Schwandt and von Wachter [2019]).

How persistent the current weakness in the labor market proves to be will depend primarily on the pace of the economic recovery. A rebound in global growth should lead to a decline in unemployment, provided that further lockdowns can be avoided. However, we expect unemployment to remain above pre-pandemic levels in the coming years. Weak earnings, battered balance sheets and sluggish sales forecasts will initially lower demand for workers. In the medium term, structural changes triggered by the crisis, such as a more widespread use of labor-saving technologies, could further slow the recovery of the labor market. In other words, some of the COVID-19 shock to the labor market could turn out to be permanent.

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Over the past months, many people with more experienced profiles have entered into the ranks of the unemployed, and the systemic bias barriers that face many unemployed people of all ages are harder than ever to overcome – Mona Mourshed, founding CEO of Generation

**Figure 2: Preventing job losses through short-time work**

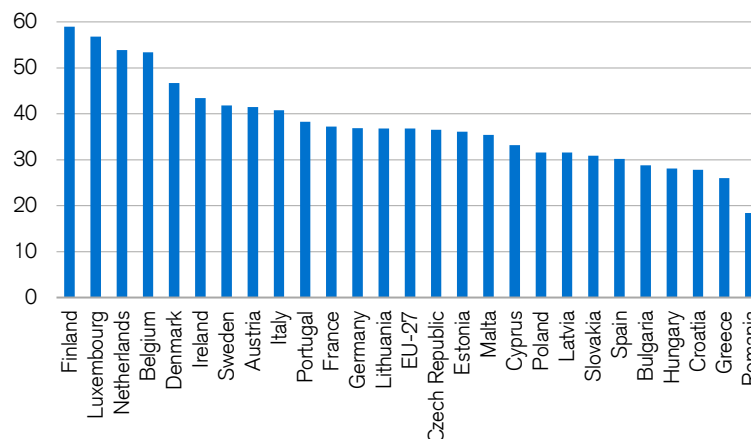
Share of employees on short-time schemes (claims as per April/May 2020), selected countries



Source: Credit Suisse, Ministry of Labor in various countries

**Figure 3: More than a third of Europeans started working from home as a result of the COVID-19 pandemic**

Share of respondents in EU-27 countries\* stating that they started working from home as a result of the COVID-19 situation, in %

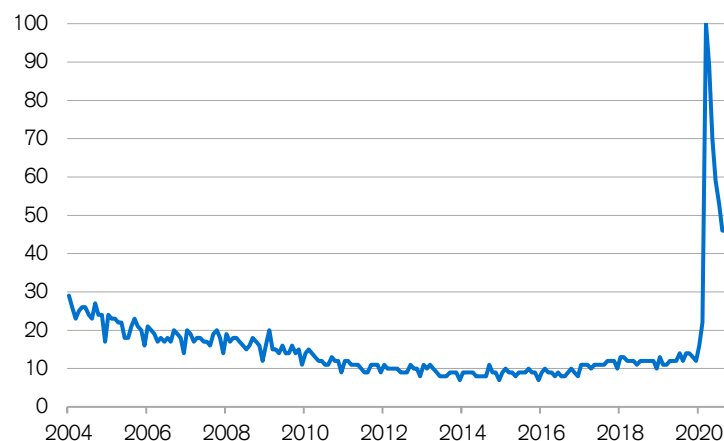


\* Slovenia was excluded from the data due to translation issues; Low reliability of data in Cyprus, Latvia, Malta, Netherlands and Sweden.

Source: Eurofound

**Figure 4: Surge in the interest – and need – for remote working**

Google Trends: Relative frequency of search queries worldwide on the topic “teleworking,” top month (March 2020) = 100\*



\* Last data point: November 2020

Source: Google, Credit Suisse



## Unprecedented surge in remote working

The COVID-19 pandemic forced many office workers to work from home, literally overnight. A few numbers help to show the magnitude of this shift: according to a survey conducted by Gallup in late April 2020, 52% of US workers always worked remotely after the outbreak of the virus and 18% did so sometimes. By comparison, in 2017–18, data from the US Bureau of Labor Statistics showed that only 8% of wage and salary workers worked exclusively from home at least one day a week. In the EU, the share of employees between 16 and 64 years of age stating that they usually worked from home was 5.4% in 2019. According to a survey conducted by Eurofound in April 2020, 36.8% of respondents in the EU started working from home as a result of the pandemic (Figure 3). Worldwide, Google search queries on the topic of teleworking more than quadrupled in March 2020 compared to the end of 2019 and have remained above pre-crisis levels since then (Figure 4).

Of course, not every job can be performed from home. Traditionally, the share of regular remote workers has been highest in sectors such as information and communications, professional and business services or financial activities. At Credit Suisse, for instance, more than 90% of all employees worldwide were able to work from home after the outbreak of the virus.

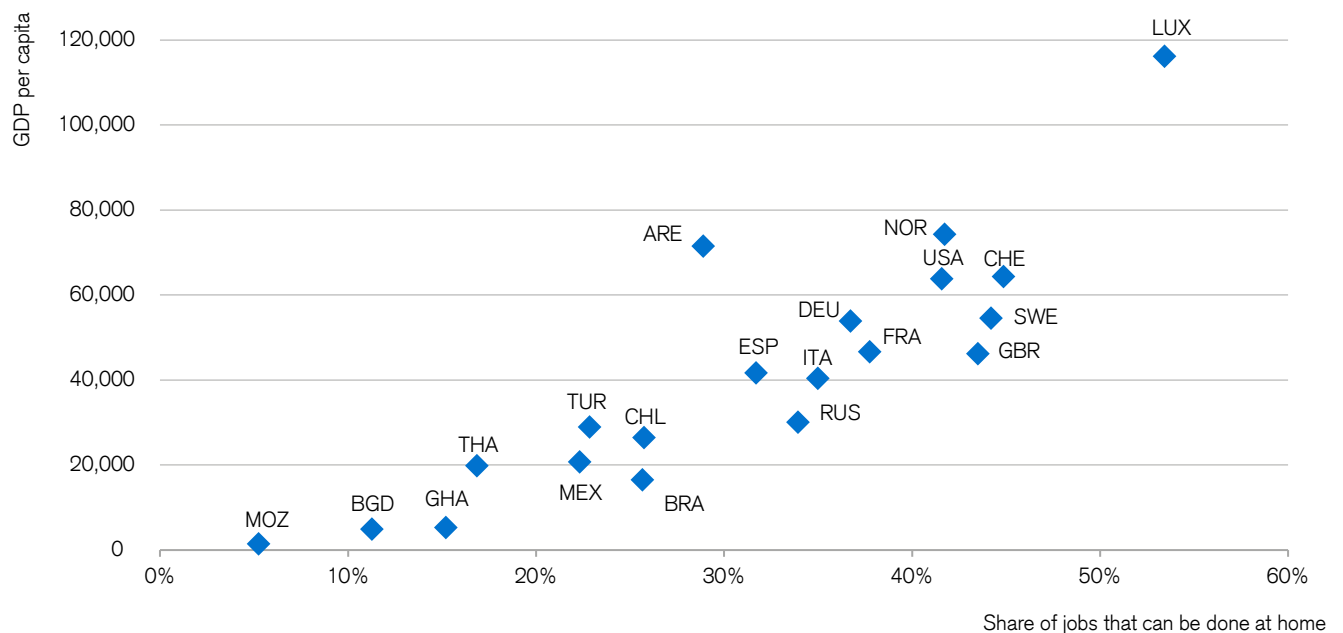
The likelihood of having access to telework generally increases with education level and income (see Chapter 8). How to ensure safe working conditions for employees who cannot work from home became a critical issue in the pandemic. But the crisis has also shown that some activities that were rarely performed online prior to the pandemic can actually be done remotely, at least to some degree. Think of a doctor or a psychologist teleconsulting, or a music teacher giving lessons via video conferencing. One study by Dingel and Neiman (2020) shows that 41.6% of jobs in the USA could theoretically be done from home. In Luxembourg, Switzerland, Sweden, the UK or Norway, this number also exceeds 40% (Figure 5). In developing and emerging markets, however, the share is much lower, meaning that low-income countries in particular face greater difficulties to continue working during periods of social distancing.

## The world of work: Toward new standards

In the future, we may see an expansion of remote working arrangements because employees increasingly favor them. People new to remote working will have discovered some of its advantages, such as the flexibility allowing them to reconcile professional and personal life.

**Figure 5: High share of jobs that can be performed remotely in developed countries**

Share of jobs that can be done at home\*; GDP per capita, at current prices (converted to international dollars using PPP exchange rates), 2019, selected countries\*\*



\* Calculations are based on latest employment counts available from the ILO for each country (2015–19)

\*\* ARE: United Arab Emirates, BGD: Bangladesh, BRA: Brazil, CHE: Switzerland, CHL: Chile, DEU: Germany, ESP: Spain, FRA: France, GBR: United Kingdom, GHA: Ghana, ITA: Italy, LUX: Luxembourg, MEX: Mexico, MOZ: Mozambique, NOR: Norway, RUS: Russia, SWE: Sweden, THA: Thailand, TUR: Turkey, USA: United States

Source: Dingel and Neiman (2020)



**In times of COVID, we at Facebook are focusing on four areas: Connecting people globally through our services in times of distance, giving people access to resources from health authorities, supporting small businesses and accelerating their digital transformation journey, and managing our own global workforce of 56,000 remotely, to drive innovation and make our platforms even safer – Angelika Gifford, Vice President Central Region at Facebook**

For some employees, remote working has even translated into higher productivity given the absence of distractions in the office or the lack of a daily commute. About 50% of remote workers in the USA surveyed by Gallup in mid-May 2020 said they would like to continue working from home because they prefer this form of working to traditional working practices in an office.

From an employer's point of view, it may be hard to find arguments against remote working going forward. Employers who may have been reluctant to introduce remote working before the pandemic had to mandate it during the crisis. Subsequently, this may have reduced the fears of some managers and executives about remote working, especially concerning employees' productivity. Previous studies such as from Bloom et al. (2015) show that, under the right conditions, implementing remote working by firms actually leads to higher work satisfaction, productivity and profitability.

While remote working offers numerous benefits, it also has its challenges. Some of the conditions for productive remote working were not always in place during the COVID-19 crisis. For instance, not everyone had the adequate space, infrastructure and privacy necessary to work productively from home. Especially when schools and daycare facilities were closed, remote working became a burden for the families affected. Another concern is the lack of in-person collaboration that can make working in an office so valuable. Despite teleconferencing opportunities, the lack of social contact could translate into lower creativity and innovation. Another challenge is to set up a dispersed workforce safely, on a large scale and in an increasingly complex digital environment (see box top right). To unlock the advantages of remote working, companies will need to address these issues in the future.

## Challenges for IT providers

During the transition to remote working, companies had to ensure that their infrastructure could accommodate their employees working from home. After all, a remote workforce not only requires technological equipment like laptops, tablets or smartphones, but also the bandwidth, speed and capacity to work efficiently from home. More specifically, not only IT hardware and a good internet connection are needed, but so are virtual communication tools, online project management tools and file sharing (Credit Suisse [2020a]). While companies have been investing in cloud solutions for some years now, the pandemic triggered a further expansion in this field. At the same time, privacy and security concerns grew during the crisis since the shift to remote working was accompanied by an increased threat of cyberattacks.

Shielding a company against cyberattacks has always been a priority for IT departments. Yet with the COVID-19 pandemic, IT providers had to intensify efforts to enable remote working for a large number of employees. One problem is that many employees use private devices that include a wide range of operating systems, making an organization more vulnerable to cyberattacks (Credit Suisse [2020a]). Similarly, employees use a variety of internet providers offering varying security levels. Data theft and ransomware attacks not only involve direct financial consequences, but can also damage an organization's reputation in the long term. While investing in technology is indispensable, so is educating employees about the risk of cyberattack and how to safely navigate the internet.

## Globotics upheaval

Due to the spread of machine translation, anyone with a digital device, internet access and the relevant skills can theoretically telecommute, for instance from low-cost countries to US and European offices. Moreover, breakthroughs in telepresence and augmented reality are making these remote working experiences seem less remote. Finally, the move toward more flexible working arrangements and the increased adoption of collaborative software platforms have decreased the boundaries for "telemigration" (Baldwin [2019]). In other words, new technologies are making it easier for foreign-based workers to access tasks performed in offices abroad.

More recently, advances in artificial intelligence (AI) have given computers an almost limitless skill set, creating a potential threat for service workers in the form of white-collar robots. Combining the new form of globalization with the rise of white-collar robots results in new forms of competition. In his book, Baldwin (2019) refers to this phenomenon as globotics. Compared to past upheavals, this time it is mainly workers in knowledge-intensive businesses in the service sector who are concerned about this competition rather than people in manufacturing and agriculture. Since a great deal of people in developed countries today work in the service sector, globotics could have a significant impact on labor markets.

The COVID-19 pandemic has shown that the move to a more decentralized form of working is increasingly possible for some service workers. Together with the expansion of the gig economy, a new form of working might become more widespread. These developments were initiated prior to COVID-19, but the pandemic accelerated them.

The shape and form of future workplaces have yet to be determined, but it is hard to imagine that remote working will completely fade away once the pandemic is over. While we do not expect the number of employees working from home to stay at the high levels attained during the crisis, it appears reasonable to expect the experiences made during the COVID-19 pandemic to accelerate the adoption of remote working practices in the future. Employers and employees alike will favor solutions that have proved convenient and cost-effective during the pandemic. Thus, remote working should become more common than before the crisis.

Technology has facilitated the transition to remote working and thus reduced geographic boundaries. The workspace suddenly becomes more global when more and more people shift their work online. It also gives businesses access to a growing global talent pool – why should companies only use the talents of internal employees when they have access to a global workforce? This consideration may lead to a redefinition of traditional work arrangements, with companies hiring more freelancers instead of full-time employees (see bottom-right box on page 54). In this context, a foundation to such practices has been laid in recent years with the gig economy. Gig workers are essentially freelancers hired on a project basis. They use internet platforms to connect with their customers and offer their services in a wide range of areas, from domestic work to business consulting and computer programming.

According to a 2018 Gallup survey, 36% of all US workers participate in the gig economy in one way or another. The boom of platforms catering to the gig economy in recent years can be explained by the many advantages these unconventional working relationships offer. First, the workforce is more flexible and agile: the work is usually project-based and it is up to the gig worker to schedule working hours, which is particularly convenient for workers who work around family schedules. Second, these platforms give gig workers an opportunity to access a huge market with a variety of jobs. Third, ratings on some platforms allow the customer to rate gig workers, thus reducing asymmetric information for future customers. In light of these advantages and further advancements in technology, we expect the gig economy to continue expanding in the future.

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## Revival of unionization?

The flexibility of gig workers makes these new working arrangements resilient to certain labor market shocks. For instance, an independent Uber driver can move from one working relationship to another, equipped with only a digital device, internet access, a car and a valid driver's license (Marshall and Barber [2020]). However, gig workers were particularly hard-hit during the pandemic as global demand for them plummeted significantly. In fact, COVID-19 emphasized the long-term struggles that gig workers commonly face: while the gig economy offers flexibility, many workers have limited access to unemployment benefits, health insurance or sick leave (Moulds [2020]). This legal ambiguity as to how to treat gig economy jobs when it comes to benefits or minimum hourly wages was exemplified during the crisis when a number of jobs dried up, and gig workers were left with no income during that period. For the same reasons, gig workers were also particularly vulnerable if they fell ill or were ordered into quarantine. Some gig workers then resorted to boycotts or entered into “gig collectives” in an effort to protect themselves. Ultimately, these initiatives may reinforce the efforts of several existing unions in recent years to incorporate and represent non-standard workers more broadly (Johnston and Land-Kazlauskas [2019]).

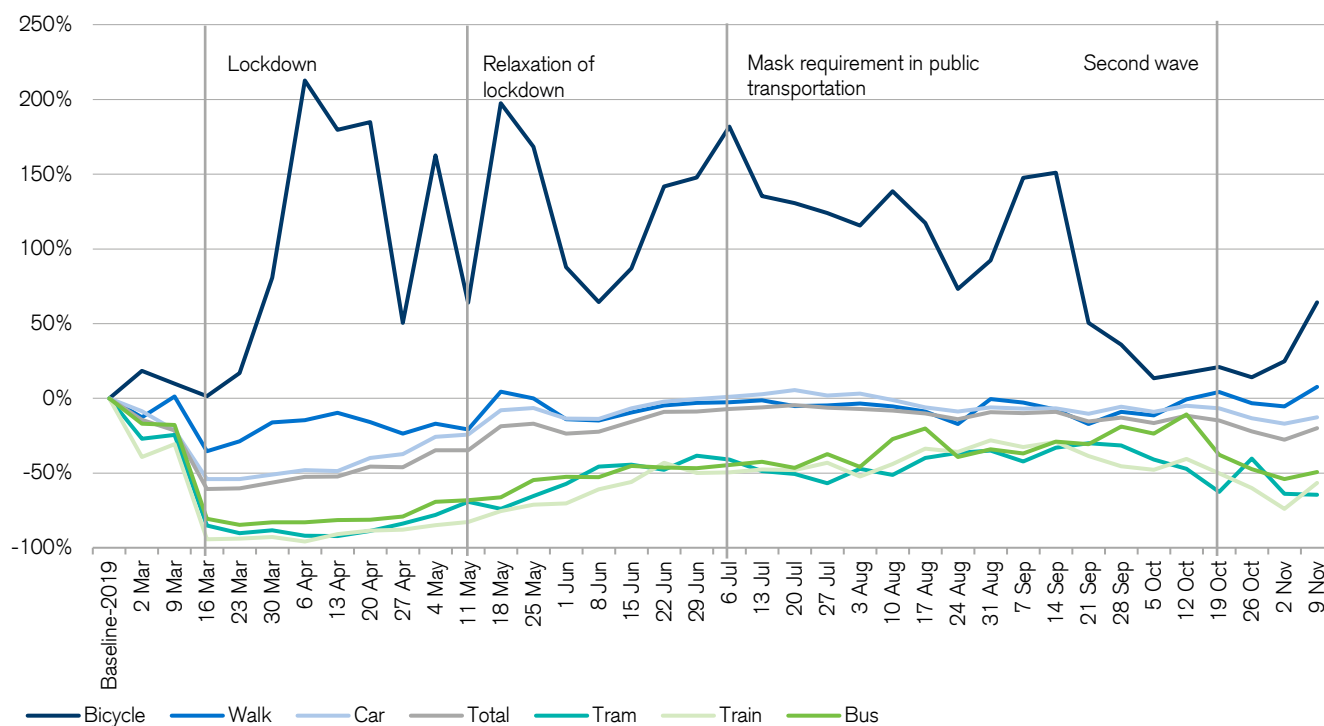


**Accelerated by the pandemic, we've seen the megatrends reshaping the world of work, with increasing flexible working, growing skills gaps and digital transformation having a particular impact on how we earn a living and approach employment needs and careers. It's now clear that our current policy and business structures are not keeping pace with these changes and it makes our call for a New Social Contract even more urgent – Alain Dehaze, CEO of the Adecco Group**

The pandemic has shown that current labor laws are inadequate for this increasingly heterogeneous workforce – although the world of work has undergone significant change in the past few years, many labor laws remain the same. In order to bring about sustainable change for gig workers, the legal framework for this new form of work must also change.

**Figure 6: Public transportation impacted most by containment measures in Switzerland**

Change in kilometers traveled compared to baseline 2019\*, by means of transport



\* The baseline-2019 is the average value during September 2019 and October 2019.

Source: Institute for Transport Planning and Systems (IVT) at ETH Zurich and the Faculty of Business and Economics (WWZ) at the University of Basel

Thus, policymakers need to address topics such as employer-provided occupational pensions or unemployment benefits. According to Alain Dehaze,<sup>1</sup> CEO of The Adecco Group, the world's leading workforce solutions company: "We need to realign the expectations and responsibilities that individuals, businesses and governments have toward each other, focusing on flexibility, security, and solutions that are geared toward life-long employability."

### Implications for office space and mobility

At a time when remote working has experienced an unprecedented boost and the gig economy is continuing to expand and may be gaining a foothold in our law books, questions arise about the need and future shape of work places and office space. James Gorman, CEO of Morgan Stanley, for instance, announced in spring 2020 that his bank is considering reducing its footprint in the office space market. Other CEOs and CFOs have expressed similar intentions, realizing that working from home can save a considerable amount of office costs.

Based on currently available data for Switzerland, we have identified three scenarios for the long-run effects of remote working on office space. While these scenarios apply to Switzerland, they may provide some insight into other countries with a similar economic structure. In our "Return" scenario, we expect only a limited reduction in demand for office space in Switzerland of 5% at most. In what we call the "Game Changer" scenario, we assume that demand for office space could fall by up to 25% over the next ten years. In our main scenario, we expect a long-term reduction of 10%–15%. Note that overall demand is likely to fall by a smaller net percentage, as other structural trends (economic growth, tertiarization) can have a positive impact on office space demand. Based on historical data for Switzerland, we expect a 1% reduction in demand to result in a decline of approximately 2.4% in rental prices. Thus, future rental price potential would remain clearly limited (Credit Suisse [2020b]).

The surge in remote working and a new organization of working practices will not only affect demand for office space, but also the mobility of workers. As part of the measures to contain the virus, the population in many countries was required to mostly stay at home, with a major impact on people's daily mobility. Tracing data for Switzerland shows

1. Quotes from Mona Mourshed, Alain Dehaze and Christopher Pissarides are taken from the Credit Suisse Salon Virtual Series "COVID-19 – Unleashing the revolution of work & education," 18 May 2020

that the use of public transportation has only slowly recovered from the dramatic drop in the lockdown period and, before the start of the second wave of COVID-19 in October, was still below pre-crisis levels (**Figure 6**). Tracing data also shows increased bicycle use, which can serve as a substitute for local commuting to avoid crowds in public transportation. Tracing data for Germany shows a similar pattern, with people showing a strong preference for individual transportation during the pandemic (Schwär [2020]). Whether public transportation will recover after the pandemic depends on its ability to adapt.

Business travels across borders also became rare if not impossible during the pandemic, with many countries under lockdown. While businesses had to adapt to this new reality, they also learned about the benefits of restricted business travel – they save time traveling and reduce costs when opting for teleconferences rather than in-person visits. Since business travel expenses are usually passed on to customers, companies' services could become cheaper with reduced travel activity. In a world where companies face constant pressure to reduce costs, businesses may have no choice but to shift (international) meetings online. Rising awareness of sustainable business practices may also play a role. We therefore expect the number of business trips to decline in the long run.



**The arrival of AI endangers not only middle-skilled jobs but also some from the upper tier of the job distribution – Sir Christopher Pissarides, Nobel Prize laureate and Regius Professor of Economics, London School of Economics**

#### **Implications for education: Lifelong learning**

Evidence from past crises shows that structural changes in the labor market are an inevitable result of crises: some jobs recover after a recession, while others disappear. Autor et al. (2006) found that, since the 1980s, mostly middle-skilled jobs have disappeared at least in part due to progress in technologies that substitute for labor in routine tasks, thus leading to job polarization. While this rationale might be true for the era when computers and computer software entered the market, much more sophisticated technologies like artificial

intelligence (AI) have appeared more recently (see bottom-right box on page 54). The COVID-19 crisis could thus provide a taste of future upheavals in the labor market.

According to a McKinsey report, 75 to 375 million employees worldwide will be displaced by 2030 due to a shift in jobs demanded (Manyika et al. [2017]). Simultaneously, technological progress is creating new opportunities requiring a radically different set of skills. Children entering primary school today may ultimately work in entirely new jobs and functions. To find employment in such a fast-paced environment, people will need to constantly invest in their own capabilities. A key step in that direction is the endorsement of lifelong learning and a strong focus on skilling, reskilling and upskilling. Lifelong learning will become a key part of people's lives in an attempt to create an adaptable workforce, and it is expected that EdTech (education technology) will play a decisive role in the transition of employees from one industry to another. Companies will also have an increasing incentive to promote further education in the workplace, collaborating with online course providers and thus creating a culture of continuous learning.

#### **Takeaways**

- Having experienced the benefits and challenges of remote working during the pandemic, employers and employees may want to continue these working practices.
- New work arrangements have appeared on the horizon in recent years, with gig work the most prominent one. The COVID-19 pandemic may accelerate their expansion, but the legal framework for these new forms of work must change as well.
- New forms of competition have emerged through improvements in telepresence and the rise of white-collar robots in recent years, making workers in knowledge-intensive service sectors with typically higher incomes more vulnerable to job losses.
- Mobility patterns have changed during the pandemic toward more individual transportation. Whether public transportation will recover depends on its ability to adapt.
- Demand for office space and business travel will probably decrease as a consequence of the shift toward remote working and cost pressures that companies face.
- Lifelong learning will become a key part of people's lives in an attempt to create an adaptable workforce.



Gettyimages, da-kuk



# 7. Disruption in education

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Education technology (EdTech) may be nothing new. Yet educational institutions have never fully exploited its potential. Rather, online learning has mostly complemented traditional learning methods. A lack of investment in EdTech, combined with limited knowledge about how to use these technologies on the part of educators, students and parents, and concerns about potential digital divides due to a lack of widespread broadband connectivity have all contributed to inertia in adopting EdTech. Yet the COVID-19 pandemic might prove to be a turning point as, during the crisis, hundreds of millions of learners worldwide were suddenly forced to use EdTech daily, revealing its benefits and pitfalls and delivering a better understanding of what the future of education may hold.

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## **An unprecedented boost from COVID-19**

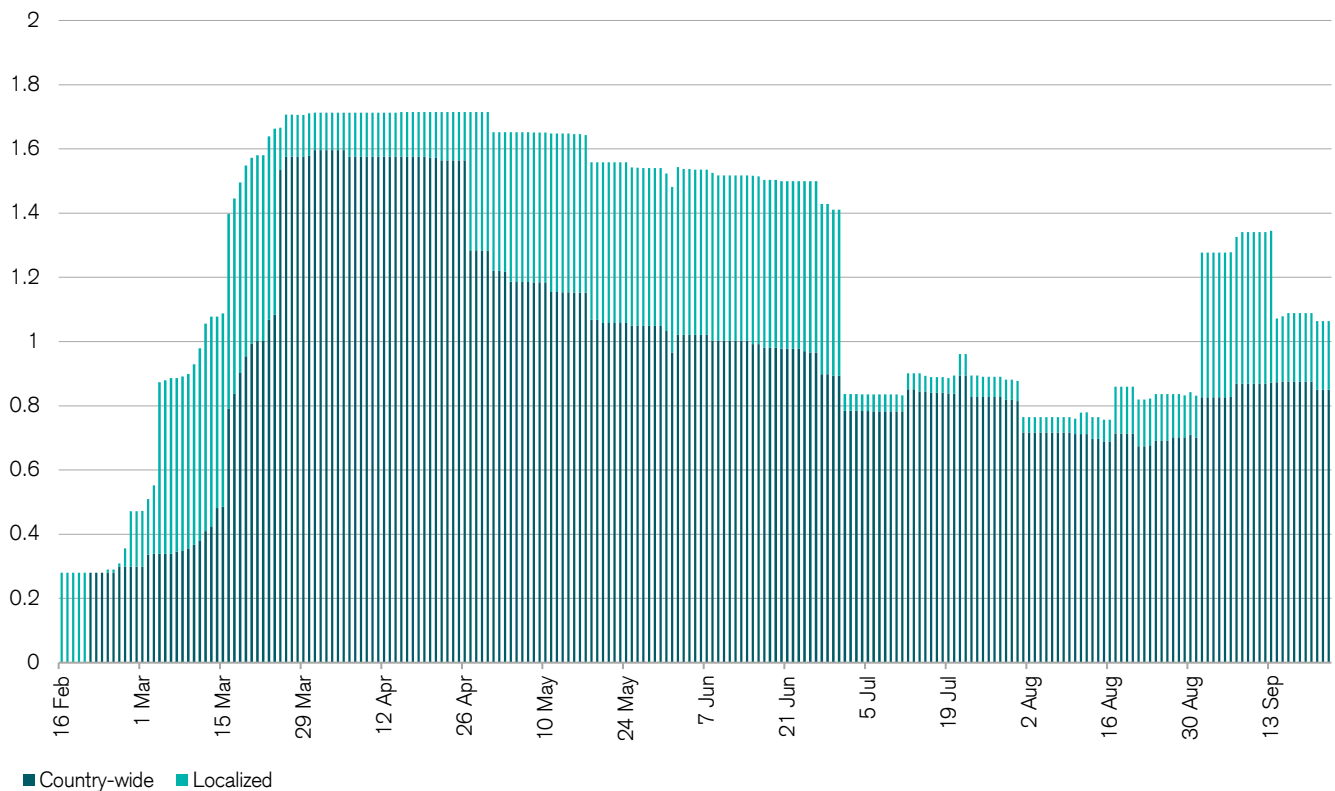
According to UNESCO (2020), more than 90% of the world's learners were affected by localized or national closures of educational institutions at the peak of the COVID-19 crisis in April 2020 – equivalent to approximately 1.7 billion students (**Figure 1**). A sudden transition to remote learning became a reality for hundreds of millions of learners worldwide, drawing on a mix of workplace and education technologies including Zoom, Google Classroom and Microsoft Teams. Practically overnight, educators had to deal with remote learning and everything that it entails.

Evidence from remote learning during the pandemic shows the benefits of EdTech. First, EdTech reduces costs while giving access to high-quality online courses. Its reach is global, providing access to people with limited resources,

geographical restrictions and physical disabilities (Credit Suisse [2020]). Second, EdTech tracks students' performance through learning analytics, enabling educators to identify struggling students and provide personal assistance in private calls, for instance. Educators can thus create personalized learning journeys for their students, allowing them to learn at their own pace. Third, EdTech is effective in the sense that different digital formats can improve learning outcomes and increase students' engagement by applying a multi-sense approach. Personalized content creates an attractive environment for students, as they are less under-challenged or overwhelmed than in a setting where one generalized learning content is produced for a heterogeneous group of students. In the future, both educators and students may want to adopt solutions that increased their flexibility and proved convenient and cost-effective during the pandemic.

**Figure 1: COVID-19 impact on global education**

Number of learners impacted by national and localized school closures\* worldwide, in billions, 16/02/2020 – 23/09/2020



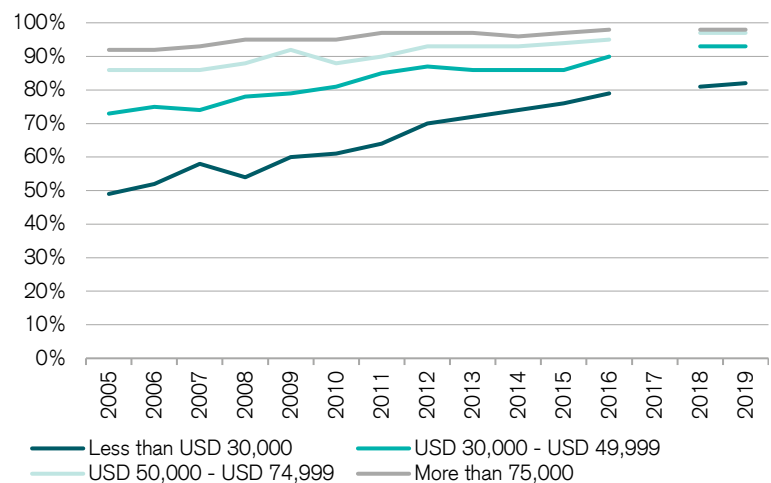
\* Figures refer to learners enrolled at pre-primary, primary, lower-secondary and upper-secondary levels of education, as well as tertiary education levels.

Source: UNESCO

### Pitfalls of remote learning

As technology connects students and educators, its pitfalls also come to light. A major concern is the lack of broadband access and non-universal device ownership in both developed and developing countries. How can you teach remotely if learners have no access to the necessary materials? In most developing countries, access to digital devices or connectivity is limited (see Chapter 8). Even in developed countries, digital access is not universal. According to Pew Research Center (2019), only 82% of low-income adults in the USA reported using the internet in 2019 – for high-income adults, the number was 98% (Figure 2). This indicates a digital divide between those with access to information and communication technology and those without. Yet inequality concerns go well beyond access to technology. The digital divide also relates to the use of technologies: students who lack digital literacy are less likely to benefit from EdTech than digitally literate ones (OECD [2018]). Some students simply need more assistance during the transition to remote learning than others. If this assistance is unavailable, the digital divide exacerbates inequality (see Chapter 8).

**Figure 2: 18% of low-income US adults do not use the internet**  
Share of US adults who use the internet, by income level, 2005–19\*



\* No data for 2017

Source: Pew Research Center

The crisis also emphasized the critical role of educational institutions outside of learning. In the USA, for instance, the National School Lunch Program provides low-cost or free lunches to more than 30 million students daily. With educational institutions under lockdown, students dependent on low-cost food lost this access. The COVID-19 pandemic is also a reminder that educational institutions are not only a place to transfer knowledge, but also a place to learn social skills and integrate into a society. Acquiring such skills is indispensable, as it improves one's perspectives in the labor market later in life. Moreover, skills like social and emotional intelligence, critical thinking, creativity, innovativeness, or the ability to handle unknown situations will become even more critical in the labor market of the future – these soft skills matter as they stress the advantages humans have over machines (Baldwin [2019]). While technologies can transfer knowledge quite efficiently, they cannot (yet) compete with schools in terms of acquiring these important soft skills.

(Savage [2020]). The problem is that, over the past decade, some governments have reduced funding for higher education, putting pressure on colleges and universities to admit financially strong students. As a result, institutions' reliance on international students has grown over the years. With international students staying away, colleges and universities will need to look for domestic students who pay full tuition. At the same time, their ability to offer financial aid to students from economically poor families is limited, making higher education less accessible and thus raising inequality concerns. Against this background, universities in many countries have recognized that they can increase revenue by offering online degrees to qualified students all over the world. Yet financial resources and reputation still remain an issue, since in the competition to develop attractive online offerings, universities that can afford to invest in instructional technologies are bound to have an advantage.

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### EdTech in higher education

While students and faculties are adapting to online courses, massive open online courses or MOOCs<sup>1</sup> have been expanding their services: To help minimize the impact of the virus outbreak on students, some MOOCs started offering universities assistance in delivering online courses. However, the low completion rates of MOOCs prior to the crisis raised doubts about whether this model could one day replace traditional university courses (Reich and Ruy Pérez-Valiente [2019]). To enhance completion rates, online course providers such as FutureLearn have focused on peer learning, where students talk about the content they have learned, emphasizing the importance of social interaction when learning (Murray [2019]). This indicates the importance of educational institutions as a place where soft skills are developed. Studying from home with a laptop or a smartphone is not quite the same as an on-campus experience. What might remain is a middle way in the form of blended learning, which combines online learning with traditional in-class learning methods.

The immediate problem for some top-tier universities around the world is financial in nature. For example, with travel restrictions in place, many foreign students canceled their studies abroad

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### Takeaways

- Education technology (EdTech) is nothing new, but educational institutions have never fully exploited its potential. The COVID-19 pandemic may have changed this.
- EdTech reduces costs, provides global access to high-quality courses and allows for more personalized learning journeys.
- In order for remote learning to be a model for the future, internet access and broadband connectivity must be ubiquitous.
- Educational institutions will not disappear due to their critical role in integrating and teaching students social skills and societal norms.
- Developing soft skills that stress humans' advantages over machines is more important than ever.
- Reduced funding for universities and dependence on foreign students in a world of lower mobility calls into question the business model of some teaching institutions and, more generally, tertiary education policies.

1. MOOCs are online teaching platforms that provide open access, video-based content with global reach to a large number of users. On these platforms, knowledge is disseminated through high-quality courses on a wide range of topics.



Cape Town, South Africa; Getty Images, nattrass

# 8. The great divide

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The COVID-19 pandemic and the measures governments have implemented to contain the spread of the virus affect people within and between countries quite differently. Socially disadvantaged population groups are more likely to suffer job losses and lower income. While wealth has remained steady thanks to decisive fiscal and monetary action, as shown in our 2020 Global Wealth Report, the pandemic has set disadvantaged population groups apart through inequality of opportunities in education, health, access to jobs as well as higher infection risks due to working and living conditions. As a result, COVID-19 will likely see policy-makers focus on corrective measures.

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## Income and wealth distribution prior to COVID-19

Global income inequality is undeniably high: in 2013, the top 10% income earners globally were earning USD 14,500 or more per year while the bottom 10% were earning USD 480 or less per year, resulting in a ratio between these two values of 30.2. Owing to rapid economic growth in emerging and developing countries, however, global income inequality has been on the decline in the last decade: In 2003, the ratio between the two extremes was 37.6 (**Figure 1**). The corresponding Gini coefficient has also declined from 68.7% to 64.9%<sup>1</sup> (Hellebrandt and Mauro [2015]). Within countries, income inequality patterns vary considerably from country to country. One of the countries with the highest level of income inequality is the USA, where the share of pre-tax income

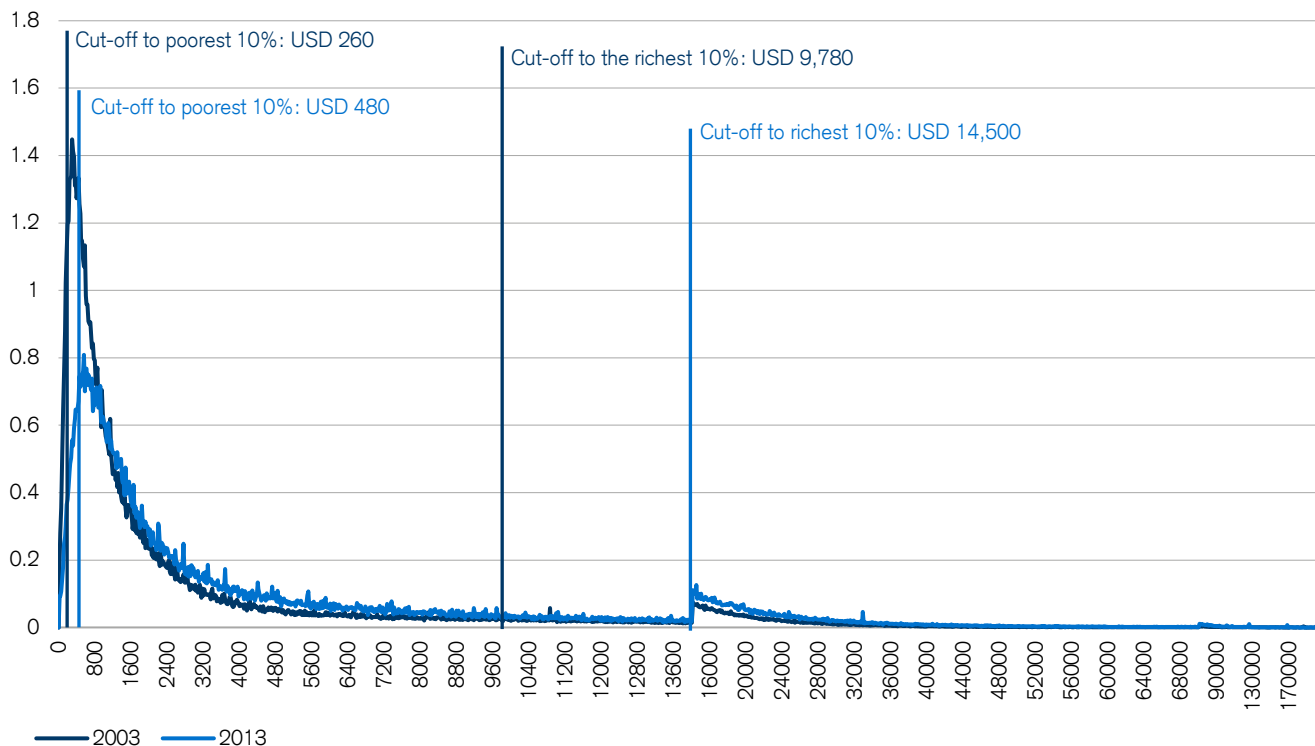
1. The Gini coefficient ranges from 0 (or 0%) to 1 (or 100%), with 0 representing perfect equality and 1 representing perfect inequality.

going to the top 1% totaled 20.5% in 2019. This share is comparable to the levels attained prior to World War II, implying that the declining trend observed until the mid-1970s has been reversed in recent decades (**Figure 2**). In countries like France, Denmark or the Netherlands, the pre-tax income shares of the top 1% in the income distribution have remained roughly at the same low levels since the 1950s, following an L-shaped trend. According to Blanchet et al. (2019), increased worker protection and free access to public education and healthcare have prevented income inequality in many European countries from rising. Progressive tax systems and transfer programs added redistribution.

Prior to COVID-19, global wealth grew at a fast pace, as shown in the Global Wealth Report 2020 (Credit Suisse Research Institute [2020]). Aggregate global wealth stood at USD 399.2 trillion at the end of 2019, up 10% from the year before. Wealth per adult also grew rapidly by 8.5% to reach USD 77,309 at the end of 2019, an all-time high. Every region recorded

**Figure 1: Global income inequality is high, but shrinking**

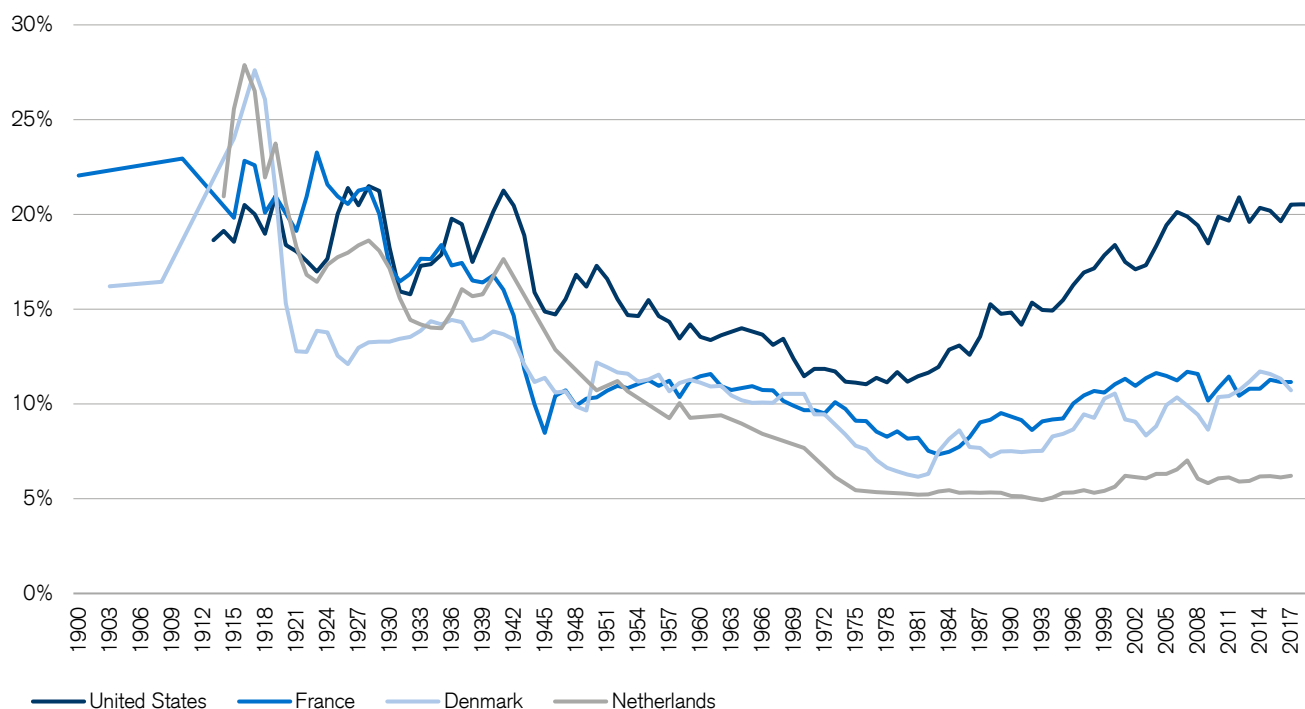
Percentage of the world population at a given income level\*; yearly income adjusted for price changes over time and for price differences between countries; PPP (in constant 2011 international US dollars), 2003 and 2013



\* the x-axis is not entirely linear: above a yearly income of USD 14,000, for instance, the income groups are bigger.  
Source: Hellebrandt and Mauro (2015)

**Figure 2: Differences across countries in pre-tax income inequality**

Share of total pre-tax income going to the top 1% of the population, 1900–2019



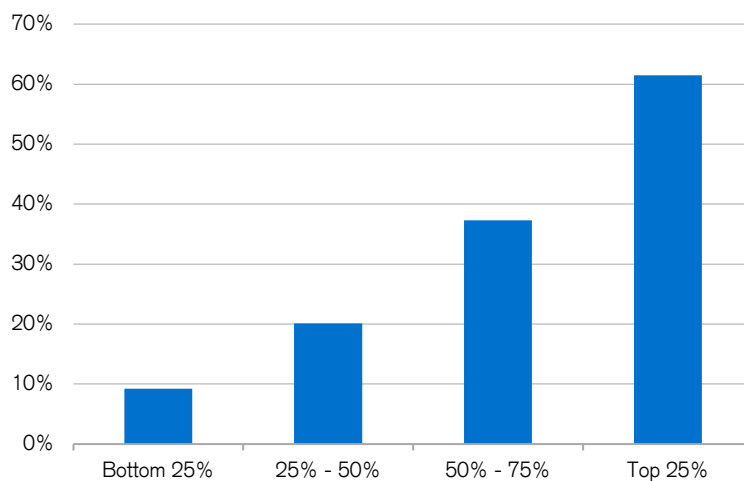
Source: Our World in Data based on World Wealth and Income Database (2018)



notable gains in both total wealth and wealth per adult, with Africa, China and North America leading the way. Financial assets recorded most of the gains compared to non-financial assets. Household debts also rose by 6% worldwide, with particularly large increases in China, India and Africa. Of course, global wealth is unevenly distributed and stark variations in average as well as median wealth per adult remain across countries and regions. The highest median wealth per adult is USD 206,480 in Australia, which compares with USD 3,943 in India. Yet, thanks to these wealth developments, the world has been better placed to absorb any losses related to COVID-19 in 2020.

Wealth is a key component of the economic system. It is used as a store of resources for future consumption, particularly during retirement. It also enhances opportunities for informal sector and entrepreneurial activities. But most of all, wealth is valued for its capacity to reduce vulnerability to shocks such as unemployment, ill health, natural disasters or indeed a pandemic. The contrast between those who have access to an emergency wealth buffer and those who do not is evident at the best of times. When as in 2020, a vast number of individuals simultaneously suffers an adverse shock, the importance of household wealth is difficult to overestimate.

**Figure 3: Low-income workers less likely to work from home**  
Workers able to work from home, by range of usual weekly earnings, USA, 2017–18, in %



Source: Bureau of Labor Statistics

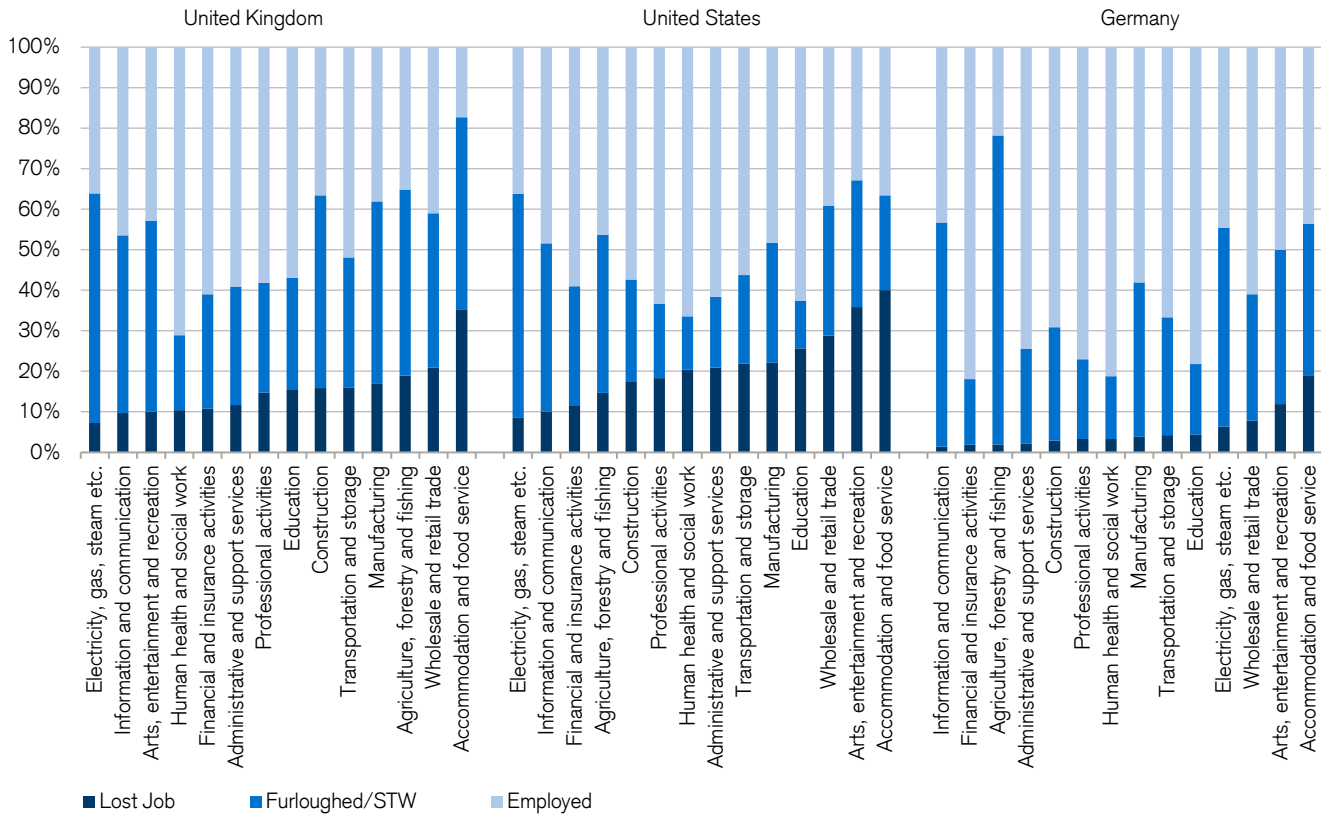
### An unequal virus

COVID-19 has divided countries' working population into two groups: those who ensure that society keeps running during lockdowns and everyone else. Among essential workers, some can work from home, but most of them have to provide their labor in person. They produce food in factories, drive buses, keep post offices open and provide hospital care, potentially exposing themselves to contagion. Data from the Bureau of Labor Statistics (2020) for the USA shows that working from home is mainly possible for people in the upper tail of income distribution: While 9.2% of the bottom 25% earners in the USA were able to work from home in 2017, the number was 61.5% for the top 25% (**Figure 3**).

Whether workers lost their jobs during the COVID-19 crisis depends primarily on their industry. Workers in the areas of accommodation and food services, for instance, on average faced higher job losses than those active in the information and communication industry (**Figure 4**). Within a given industry, there is a strong relationship between the share of tasks workers can perform from home and the percentage of workers who lost their job in that industry. Relying on a survey conducted in the USA, the UK and Germany, Adams-Prassl et al. (2020) found that workers who can perform a high share of tasks from home are significantly less likely to have lost their jobs due to the pandemic.

**Figure 4: Job losses differ across industries**

Employment status by industry\*, early April 2020, selected countries



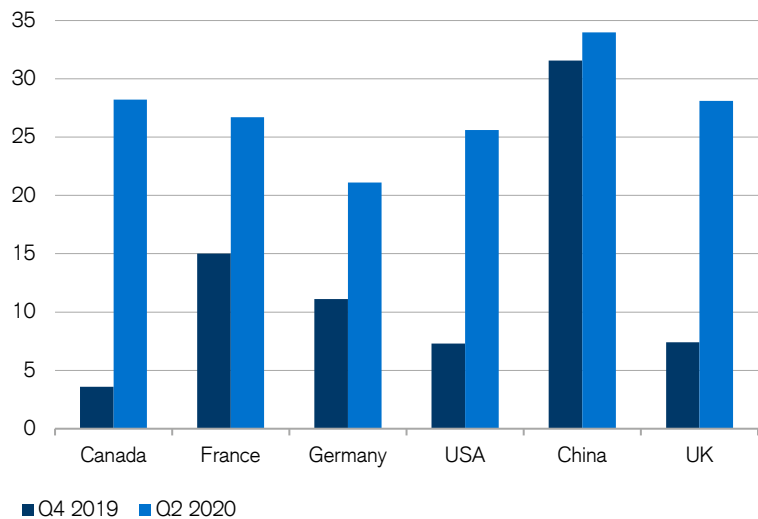
\* The chart shows the share of workers who are employed, furloughed or on short-time work (STW) in the USA/UK and Germany, or who lost their job due to the COVID-19 crisis. The sample is restricted to employees (in their current or last job) only.

Source: Adams-Prassl et al. (2020)

This also holds true for employees on permanent contracts compared to employees with temporary work arrangements. Therefore, the pandemic, through its impact on labor markets, has almost certainly contributed to increasing income inequality where governments have not been able to undertake measures to support households. In many developed countries, comprehensive government support was provided, leading to a most unusual increase of savings rates among households at the same time as the global recession was unfolding (Figure 5). In countries with more limited capacity to provide support, implications from job losses for the population have been starker. Population subgroups like women, minorities, young people and low-skilled workers have been affected particularly negatively.

**Figure 5: Households are saving more**

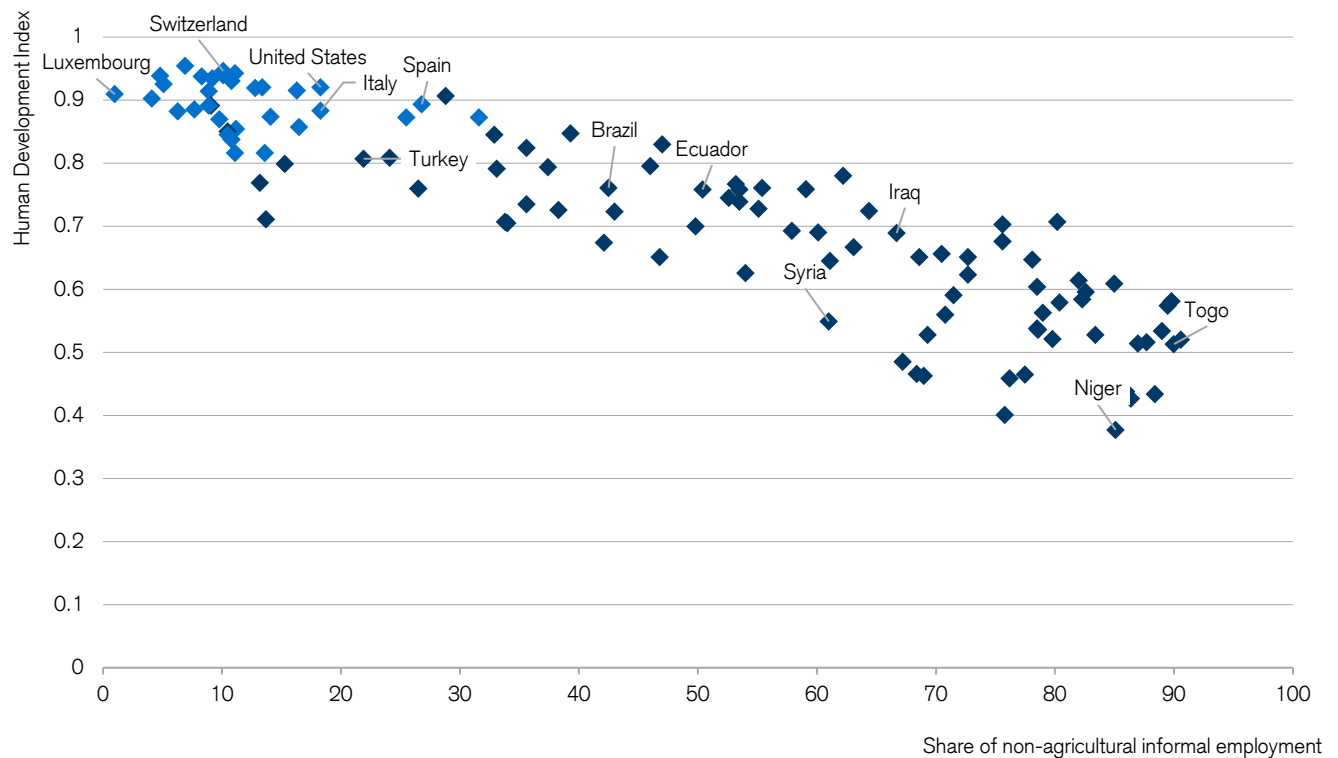
Household savings rate in %



Source: Haver Analytics ©, Credit Suisse

**Figure 6: Higher share of informal work in developing countries**

Share of non-agricultural informal employment, as a percentage of total employment, latest year available; Human Development Index\*, 2018, developed countries (bright blue), emerging and developing countries (dark blue)\*\*



\* The Human Development Index summarizes the average achievement in key dimensions of human development, including health, longevity, education and standard of living.

\*\* Development categorization of countries according to the United Nations

Source: ILOSTAT, United Nations

Many developing countries also have a large informal sector, meaning that many workers have no access to social security payments and are more difficult for the government to track (Figure 6). Informality puts workers at risk of losing their income and makes them more vulnerable, especially during a crisis like COVID-19. When nationwide lockdowns require people to stay at home, informal workers typically lose their source of income and, without financial assistance from the government, are left with little or no income. For this reason, many poor workers in developing countries were forced to disregard lockdown measures to feed their families. In doing so, they faced a higher risk of infection, undermining the government's efforts to contain the spread of the virus.

Household wealth, in contrast, has surprisingly remained steady as the rapid recovery of financial assets in response to government and central bank reaction helped stabilize global wealth. Credit Suisse's Global Wealth Report 2020 reported that after the sharp drop of global wealth in the first quarter of 2020, it rapidly recovered in the second quarter to reach USD 400 trillion by the end of June, 1 trillion

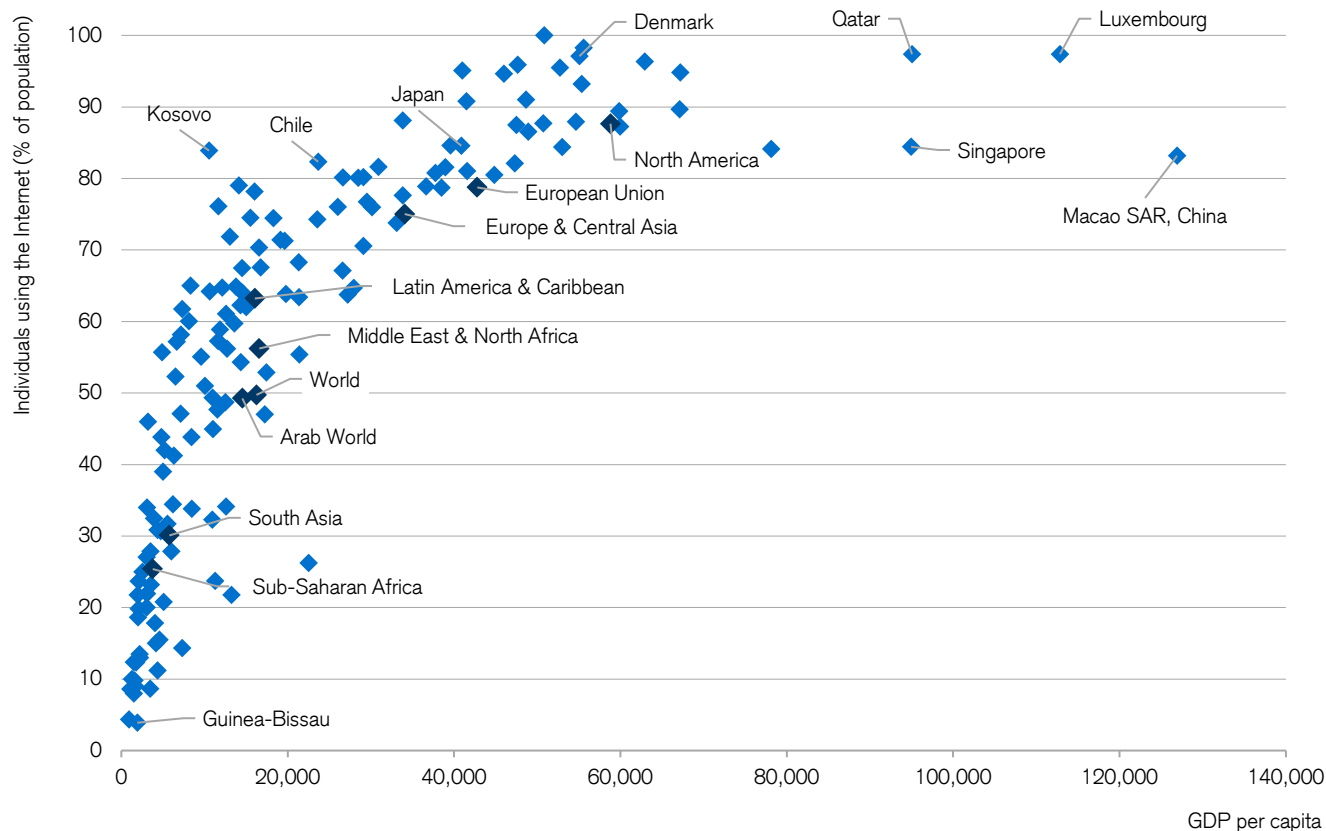
higher than at the beginning of the year. While it is too early to assess fully the impact of the COVID-19 pandemic on global wealth distribution, the authors of the report find no evidence that the pandemic has systematically favored higher-wealth groups over lower-wealth groups or vice versa, within countries. The main legacy of the pandemic for the distribution of wealth may result from the sizable variation in the impact across industries and sectors. Yet, across countries, there have been significant distributional effects, with low-income countries where the borrowing capacity of governments limited bailouts suffering more setbacks.

### Inequality of opportunities

Overall, looking at the consequences of the pandemic, several factors overlap: population groups at the bottom of the income distribution are more likely to work in industries that have been hard hit by the pandemic, where only a minority can work from home, wages are low and temporary work more widespread. Moreover, these population groups are more likely to live in overcrowded housing, have poorer health conditions

**Figure 7: Access to internet varies across countries**

Internet users as a percentage of population, 2017; GDP per capita, PPP-adjusted (constant 2017 international dollars)



Source: World Bank

and limited access to the healthcare system, all factors that make them more vulnerable to contracting COVID-19. Economist David Glaeser (2020) argues that a high share of slum dwellers in urban areas increases a city's susceptibility to COVID-19, making people in developing countries generally more vulnerable to disease outbreaks. These findings underline the key role played by housing conditions in densely populated cities and the inherent need to make housing more crisis resistant (see Chapter 9).

Closing schools may exacerbate the educational divide and therefore hamper social mobility. Whereas those who have the resources and infrastructure can bridge the pandemic with home schooling, private tutors or online learning, disadvantaged families find it more difficult to compensate for a traditional learning environment in schools (Rohner [2020]). Thus, the digital divide may further aggravate inequalities within and between countries. In North America, for instance, 87.6% of people use the internet, while in Sub-Saharan Africa, the figure is 25.4% (Figure 7). While the risks associated

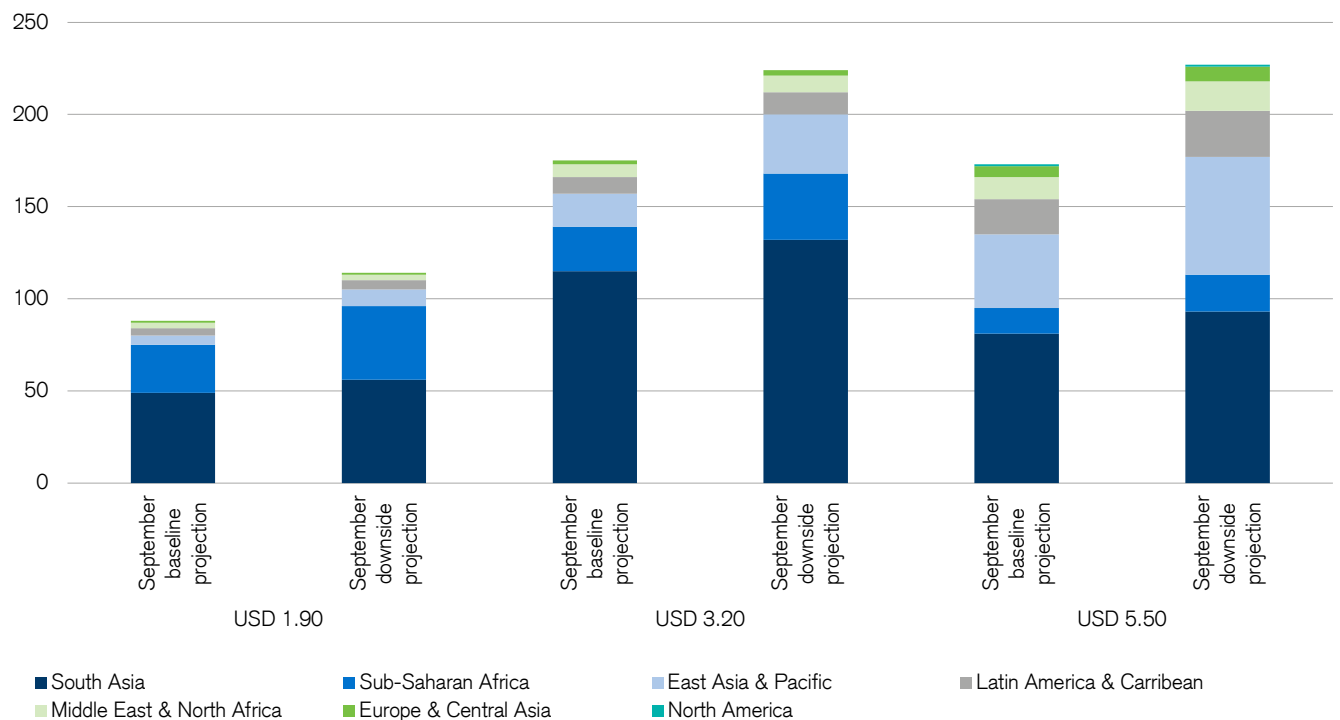
with acute poverty may manifest very quickly, the impact on human capital may take years to emerge (Rohner [2020]).

The longer the crisis lasts, the more these factors will increase inequality between developed and developing countries. Lakner et al. (2020) estimated in September 2020 that 172 million people around the world might slip below the USD 5.50 poverty line due to COVID-19, with the majority of "new extreme poor" living in South Asia (Figure 8).<sup>2</sup> According to the World Food Programme (2020), the pandemic may push millions of people to the brink of starvation in some developing countries.

2. In Sub-Saharan Africa, only a few people fall below this threshold as only a few people had living standards at this level prior to the pandemic.

**Figure 8: The longer the crisis, the higher the poverty**

Regional distribution of COVID-19-induced poor, baseline and downside scenario for three poverty lines (USD 1.90, USD 3.20 and USD 5.50) as per September 2020\*, in millions



\* The baseline scenario assumes that the outbreak remains at levels expected in September and that economic activity recovers later this year. The downside scenario assumes that the outbreak persists longer than expected, making it necessary to maintain or reintroduce lockdown measures.

Source: Lakner et al. (2020), Povcal Net, Global Economic Prospects

### Social market economy on the rise? The role of inclusive capitalism

Growing social inequality has fueled movements that have led to disadvantaged groups voicing their grievances. These protests are an expression of dissatisfaction and a voice for change. The model of the social market economy, which is primarily associated with Germany but also shapes other European countries' approach, aims to align economic strength with social balance. Owing to a broad social safety net and labor market instruments such as short-time work, these economies were better equipped to cushion the economic and social impact of the pandemic. The development or strengthening of social security nets in countries less well-equipped may well be one of the long-lasting results of the pandemic. This would include addressing limitations in health and long-term care systems as well as labor market regulation with a focus on raising minimum wages.



**Fiscal transfers cannot last and there is no prospect of a return to austerity. The result may well be a material change in politics either with a sharp turn to the left or more populism – Brian Nolan, Professor of Social Policy, Oxford University**

The size of public debt and the need to re-balance fiscal accounts coupled with a need to address some of the income inequalities increases the possibility of more redistributive taxation. The UK, for example, is considering tax increases of around 2% of GDP to limit the persistent rise in public debt. Reforming and increasing taxation of multinational corporations, for example in sectors like technology, has been a focus of policymakers worldwide

and may be strengthened going forward. Taxes on wealth and intergenerational wealth transfers are possible, although there is a debate among economists about the efficacy of such measures compared to an increase of value added tax rates.



**Historically, redistributive taxes have generally not risen in response to increasing inequalities but when there was a strong notion that low and middle income people needed to be compensated for burdens borne, such as during and after the two World Wars – James Davies, Professor Emeritus of Economics, University of Western Ontario**

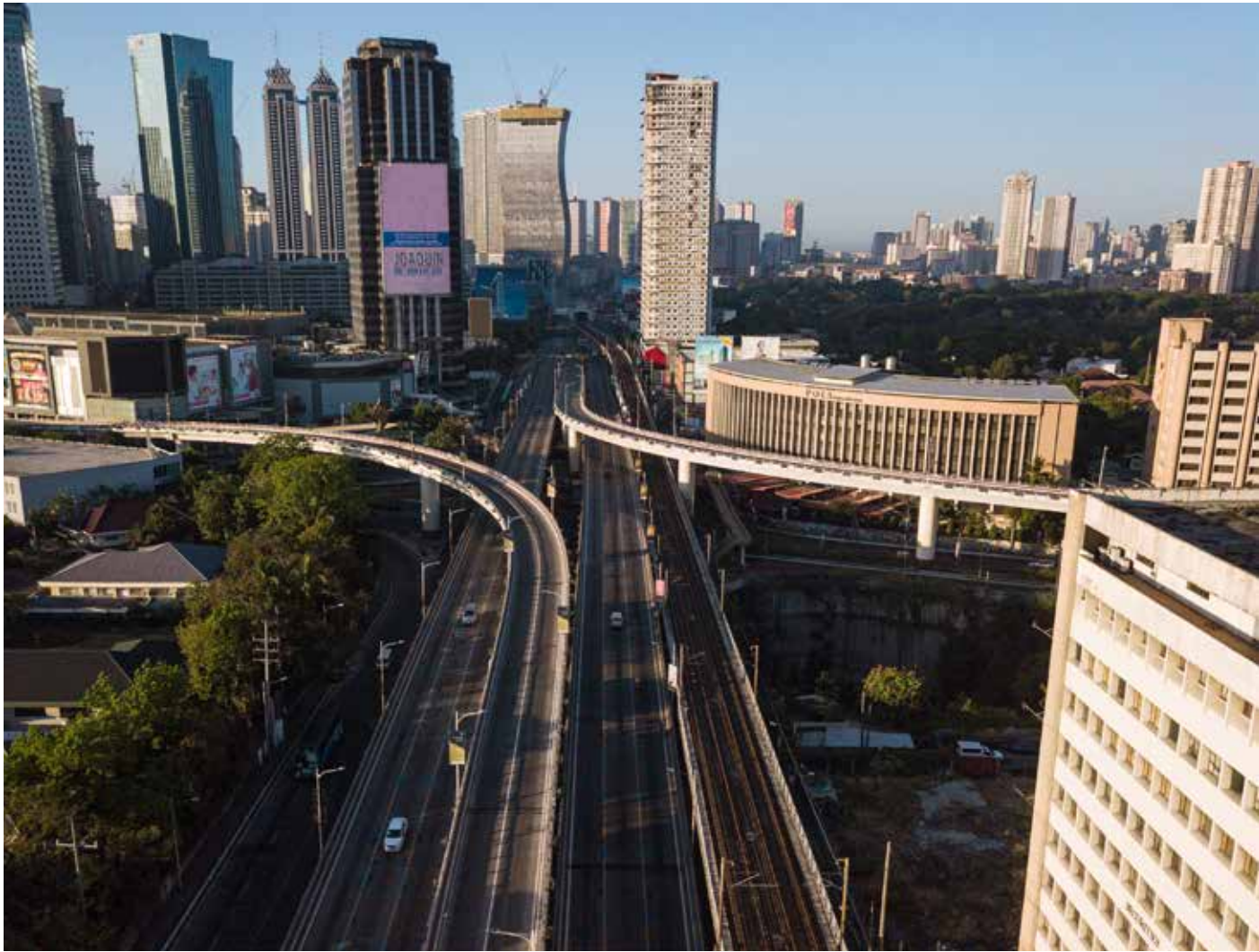
Private public partnerships and innovations to improve the equality of opportunities may be a promising way to let the private sector and private capital help solve some of the pain points of society in areas such as affordable healthcare, affordable education and affordable housing, all essential in driving social mobility. For example, using technology in healthcare services is one promising avenue to make healthcare more affordable and accessible to a larger share of the population. Similarly, integrating technology into education is revolutionizing learning models in both developed and emerging countries with better graduation scores. The private sector is part and parcel of participating in efforts to alleviate inequality of opportunities, in a model that can be referred to as inclusive capitalism.

## Takeaways

- COVID-19 is likely to exacerbate income inequalities and uneven cross-country wealth distribution and inequality of opportunities.
- Inequality and the increased susceptibility of people from disadvantaged backgrounds have broader consequences for society as a whole, e.g. in the form of increased contagion risks, poverty-driven migration waves or crime and social unrest.
- Growing social inequality has fueled movements that have allowed disadvantaged groups to voice their discontent, potentially triggering change.
- Shifts to more social market economies are a possible outcome.
- The private sector has an important role to play in providing effective solutions to some of society's pain points as far as equality of opportunities is concerned.



Manila, Philippines; Getty Images, TanMan



# 9. Urban life at a crossroads?

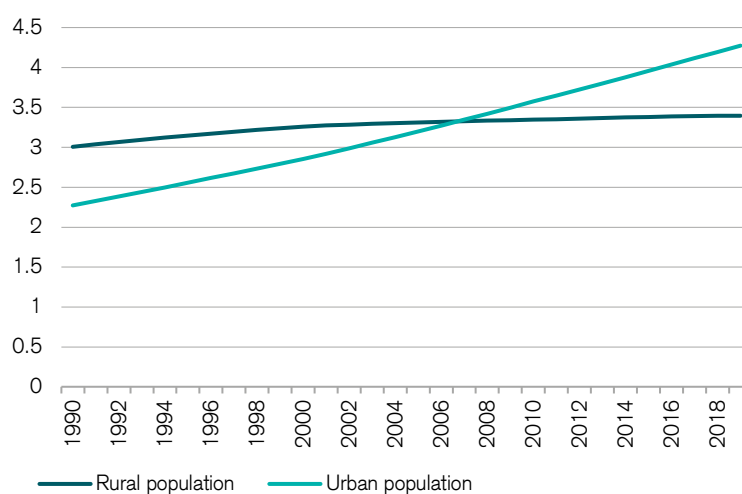
Until recently, cities all over the world were growing and bustling. Not even well-known problems like traffic volumes, pollution, high living costs and crime were able to stop the triumphant march of urban areas. Compared to past crises, however, many workers now have alternatives – they can work from home at greater distances from city centers. Will COVID-19 bring the expansion of big cities to a halt and suburban or more rural areas to the fore? History suggests not. Cities have always been engines of national growth and at the forefront of innovation – they can recover after a crisis, but this requires adjustments to make them more resilient.

## The power of big cities...

For much of human history, many people around the world lived in small communities of hunter-gatherers. It was only when these communities became sedentary that people started to live in small towns (see Introduction). Over the past few centuries, many towns have grown into big cities with huge metropolitan areas. In 2007, a significant threshold in global urbanization was crossed when the global urban population became larger than the rural population (**Figure 1**). This reflected the remarkable growth in urbanization that has taken place over the last 200 years, first in developed countries and later in many developing countries (**Figure 2**). In 2019, approximately 4.3 billion people lived in urban areas around the world. What makes urban life so appealing?

Compared to rural areas, densely populated cities offer significant advantages in efficiency that lead to gains in productivity and competitiveness. When people come together in a cluster of workers, firms, customers and investors, these places become centers of knowledge, innovation

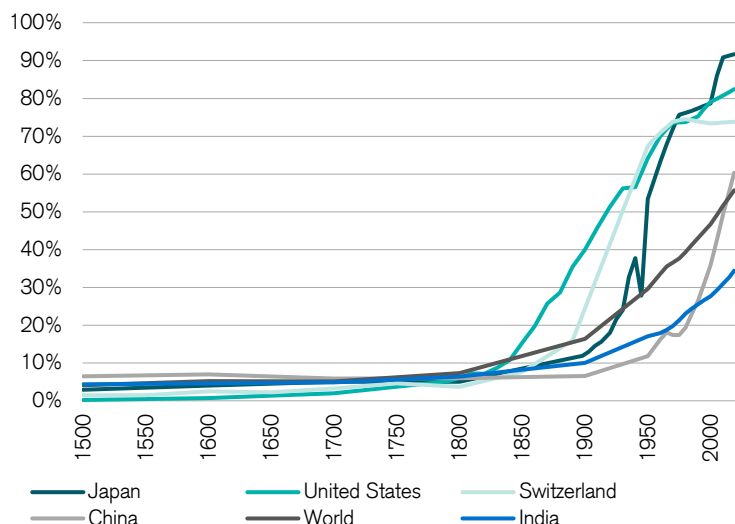
**Figure 1: Most of the world's population lives in urban areas**  
Number of people living in urban and rural areas,\* in billions, 1990–2019



\* Calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects. Note: the UN reports data on urbanization based on nationally defined urban shares. There are different definitions of urbanization across countries.

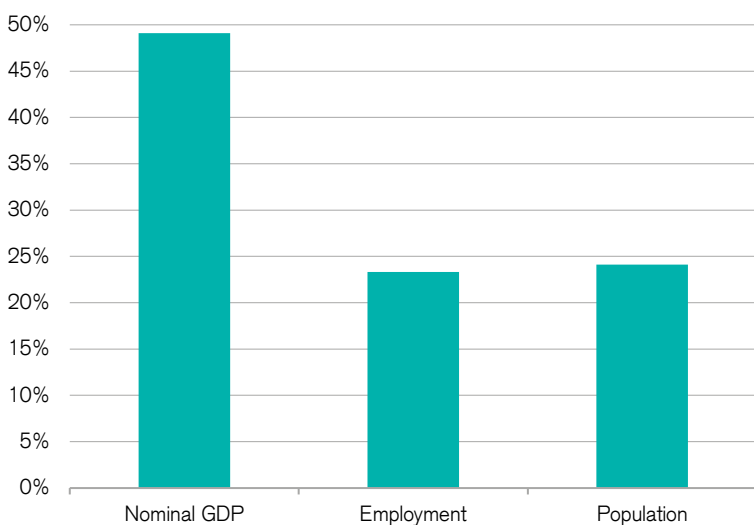
Source: World Bank

**Figure 2: Boom of urban areas mainly in the last 200 years**  
Share of urban population, % of total population, selected countries, 1500–2019



Source: Our World in Data based on UN World Urbanization Prospects, US Census Bureau, Bairoch (1988), Kuroda (1984), Klein Goldewijk et al. (2010), de Vries (1984)

**Figure 3: Cities as engines of growth**  
300 largest metropolitan areas' share of world total, in %, 2016



Source: Bouchet et al. (2018) based on Oxford Economics data

and specialization that attract even more people to develop new ideas and technologies (United Nations Human Settlement Programme [2011], Florida [2020]). In fact, the economic power of large metropolitan areas lies in the productive environment they offer to companies. Population density and good connections to other cities offer companies access to a shared talent pool they need to remain productive (Bouchet et al. [2018]). These factors promote job creation and make large cities the engines of growth in both developed and developing countries. In 2016, the world's 300 largest metropolitan areas accounted for 23.3% of global employment, but about 49.1% of global GDP (Figure 3).

### ...and their vulnerabilities

As cities grow in size, however, the negative aspects of urban concentration become evident: big city life is often associated with high costs of living, congested streets, polluted air, segregation and relatively high crime rates. At very high levels, urbanization eventually reaches a saturation point and tends to plateau or even slow down (United Nations [2018]). The COVID-19 pandemic has once again made it clear how difficult it is for high-density cities to slow the spread of infectious diseases. Major cities around the globe including New York, Paris and Mumbai quickly became COVID-19 hotspots.

However, it is not density per se, but rather overcrowding that is most responsible for the spread of an infectious disease. COVID-19 shed light on the quality of housing and inequality that exists in urban cities around the world. In more affluent areas, residents generally have access to good healthcare and can work remotely, while people in poor areas are clustered tightly together, making it harder to comply with social distancing rules. Moreover, they are more exposed to the risk of infection at their workplaces and on their way to work, since they normally cannot work remotely and many workers have to commute (see Chapter 8). According to economist David Glaeser (2020), a high share of slum population in urban areas increases a city's susceptibility to COVID-19, emphasizing the importance of the conditions people live in.

These developments raise concerns about the risk of living in urban cities and the possibility of bringing a long-standing urbanization trend to a halt. Pictures of once vibrant and successful cities almost deserted as the lockdown paralyzed economic activity have nurtured these concerns. However, history has seen similar instances where a delay in the urbanization trend or even de-urbanization seemed likely. Could it be different this time around?

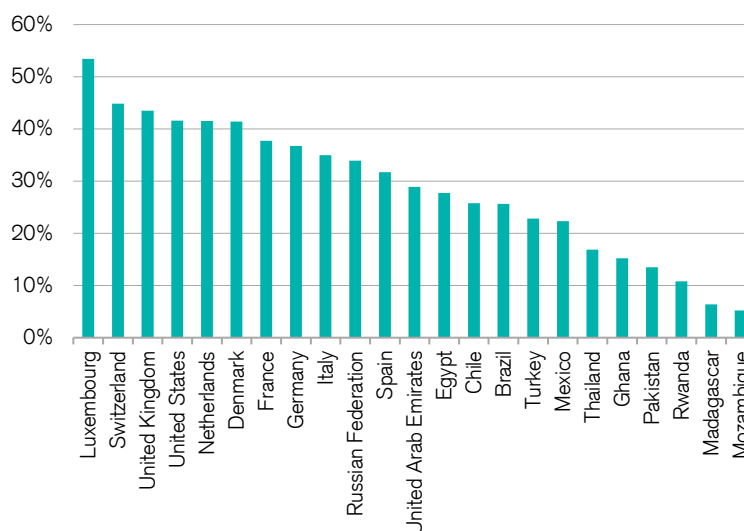
## More room for decentralization

Contrary to past crises, many people now have alternatives to working in cities because they can work from home. Lockdown-style policies during the pandemic have demonstrated how remote working can be a viable alternative to traditional office work (see Chapter 6). Post-COVID-19, employers and employees may choose to retain these working practices, thus resulting in a more decentralized workforce that lives and works at greater distances from urban centers.

For remote workers, to live in the countryside has become a viable option. Real estate prices are typically lower, meaning that a bigger house that also accommodates a personal office becomes affordable. The fact that no daily commuting is needed makes longer commuting distances acceptable. Moreover, less commuting also improves people's work-life balance. Hence, in combination with attractive regional or rural centers within manageable distances, rural areas can increase their attractiveness as a place of residence, provided the necessary infrastructure including broadband networks is available. Small cities could experience a renaissance and become a suitable alternative to metropolitan areas. Not surprisingly, they are in some cases becoming the object of rural gentrification with, for example, high-income earners moving away from major urban centers into outer areas and contributing to their development and prosperity. An efficient and attractive network of smaller cities allows for better integration of peripheral locations, not in the sense of structural preservation policy, but in terms of complementarity.

Such a scenario will most likely unfold in developed countries where the share of remote jobs is higher and disparities in settlement attractiveness and GDP per capita between urban and rural areas are lower (**Figures 4 and 5**). Conversely, the opportunity costs of leaving metropolitan areas are particularly high in developing countries, making an urban exodus a very unlikely scenario. Moreover, in the developed world, a weakening of the urbanization trend had already begun prior to the COVID-19 pandemic. Economist Richard Florida (2020) argues that those who have left cities in the USA during the COVID-19 crisis are most likely families with children that had planned to move to the suburbs or the countryside even before the pandemic. COVID-19 and the ability to telecommute may have only strengthened their decision. This shows similarities with what happened in the USA in the 1920s in the wake of the Spanish Flu, when the pandemic triggered a wave of suburbanization, helped by the revolution in private transportation and the growing number of automobiles (Florida [2020]).

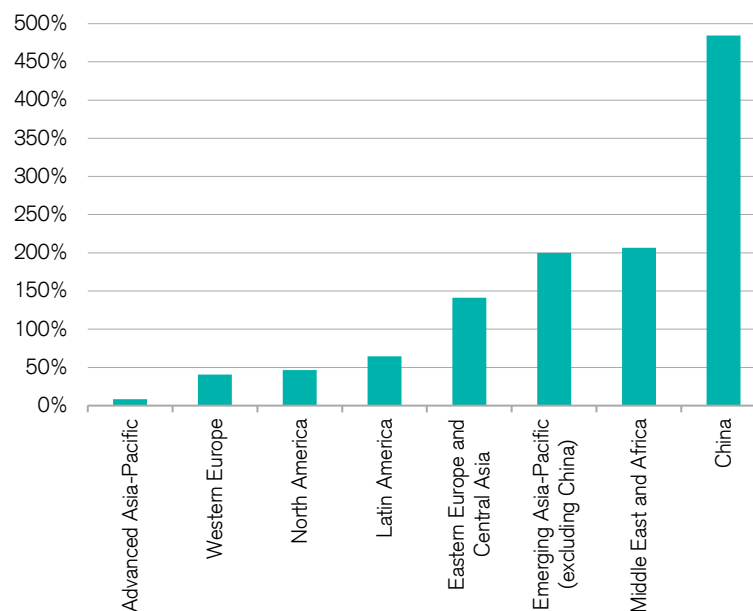
**Figure 4: Remote work is more likely in developed countries**  
Share of jobs that can be performed from home,\* in %, selected countries



\* Calculations are based on latest employment counts available from the ILO (2015–19)  
Source: Dingel and Neiman (2020)

**Figure 5: Highest per capita GDP disparities in developing countries**

Percentage difference between GDP per capita in the 300 largest metropolitan areas and the rest of their respective regions and countries, in %, 2016



Source: Bouchet et al. (2018) based on Oxford Economics data

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## Cities need to become more resilient

Despite a potential deceleration in the speed of urbanization and a greater decentralization of economic activity triggered by the COVID-19 pandemic, it is premature to declare the end of cities. Throughout history, cities have overcome wars, economic crashes, natural disasters and pandemics, none of which permanently impaired their growth. Temporary shocks seem to have few long-term effects on the spatial structure of economies (Davis and Weinstein [2002]).

Given the comparative advantages of big cities in terms of productivity and innovation, permanently leaving metropolitan areas could result in companies failing to exploit their full development potential. Moreover, some drawbacks of remote working may gradually become apparent. The transition to remote work due to COVID-19 was relatively smooth because workers had built up client and team relationships prior to the pandemic (The Economist [2020]). Over time, well-coordinated teams could become less productive when permanently working remotely, especially as a new generation of workers enters the labor market. Many companies could therefore decide to remain in or return to the cities that may have become more affordable in an initial wave of outflows.

Yet, to remain attractive for companies and employees, big cities need to adapt to the possibility of disease outbreaks. In this sense, COVID-19 could be an opportunity to redesign cities and make them more resilient for the future, not least helping to stop developments that have worked to undermine cities in recent decades, such as racial and economic inequality, gentrification and rising housing prices (Florida [2020]). History shows that past health crises have led to major changes in cities, which made them flourish again afterward. In response to the cholera pandemic in the 1850s, for instance, New York, Paris and London developed their sewage systems (Tharoor [2020]). These adjustments ushered in a new era in urban sanitation and contributed to the success of these cities. With the ongoing pandemic, big cities could be subject to a real-time experiment again.

With regard to the current pandemic, one priority is public space. Public spaces need to be expanded and better allocated, including parks, pedestrian and bicycle-only spaces, outdoor seating and public facilities. This is particularly important in crowded neighborhoods where floor space at home is in short supply (Lall [2020]). In these areas, affordable housing initiatives could help improve housing conditions. Along with programs to enhance education and job opportunities, this could allow people from disadvantaged backgrounds to lay the foundation for better living.

Another important topic is public transportation, given its critical role in helping economies to recover. After the virus outbreak, public transport operators quickly implemented measures to make transit systems safe for staff and passengers, including stricter cleaning protocols, proper ventilation and social distancing. However, if cities want public transport to remain a viable option for commuters, they will need to adapt the infrastructure. One approach is to increase service frequency to decrease passenger density. “Pop-up bus lanes” or priority bus lanes can be a solution. The New York Metropolitan Transit Authority, for example, has requested 97 kilometers of new bus lanes in response to the pandemic (Ardila-Gomez [2020]). In the medium term, it may be necessary to rethink the role of public transport, questioning the amount of space that private cars take up compared to mass transit and considering the potential of driverless cars.

Other adjustments may be more ambiguous: new surveillance technologies and contact tracing could also characterize the cities of tomorrow, reducing the risk of contagion, but raising concerns about privacy (see Chapter 5). On a positive note, city-level surveillance can also make cities smarter. A network of digital devices using artificial intelligence and internet of things could redirect traffic flows and reduce urban congestion. In addition, increased monitoring of activities could lead to less crime and better environmental management. Smart-city initiatives could therefore address some of the issues that were a concern for city-dwellers prior to the pandemic.

Part of a country’s recovery plan could also include an emphasis on green development. In this context, the EU presented the Green Deal plan, which aims to channel funds into emissions-reducing sectors (Carrington [2020]). With this plan, the EU wants to continue with the emission savings achieved during the pandemic: in April 2020, global daily CO<sub>2</sub> emissions were approximately 17% below the pre-crisis level (**Figure 6**). A critical feature of the EU plan consists in creating at least a million green jobs, with workers in polluting industries receiving financial support to transition to new roles in more sustainable industries. Cities will need to play a crucial role in the successful implementation of the plan because of their high levels of pollution due to household singularization, higher incomes and greater consumption opportunities (Gill and Moeller [2018]). At the same time, cities enjoy advantages of scale compared to rural centers, with considerable potential to cut emissions through policies related to transport systems, urban planning, building regulations and household energy supply (Dodman [2009]).



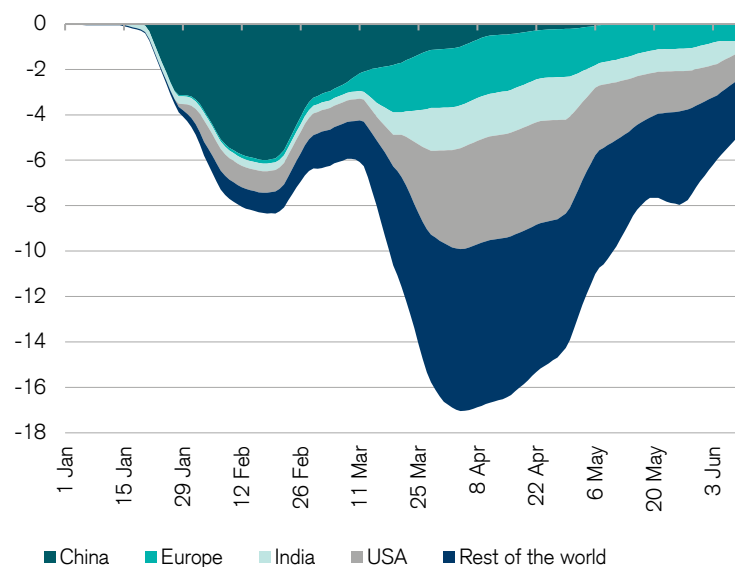
Nevertheless, implementing potentially expensive city-level policies comes at a cost, and financial bottlenecks are a reality for many governing bodies. Urban developers may not be in a position to address the changing needs of citizens, especially at a time of lower fiscal revenues due to a decline in property, sales and income taxes. These challenges may delay cities' responses to COVID-19, but should not be neglected for too long, since resilience is the key for future urban development. Cities that manage this transition, not forgetting their weakest citizens, will be the ones that survive the health crisis and thrive in the 21st century.

### Takeaways

- Big cities are engines of growth. Agglomeration economies generate knowledge spillovers that drive innovation and productivity.
- As cities grow in size, the negative aspects of urban concentration become evident: high costs of living, traffic, pollution, segregation and crime. Once it reaches very high levels, urbanization tends to plateau or even slow down.
- The COVID-19 pandemic has shown how vulnerable high-density cities are in a health crises. However, not density per se, but overcrowding contributes most to the spread of a disease, shedding light on inequality issues in urban areas around the world.
- By opening up alternatives for workers to exercise their professions at a greater distance from the city, remote work is fostering a decentralization of economic activity in developed countries. Rural areas and small cities become more attractive.
- Despite a potential deceleration in the speed of urbanization, it is premature to declare the end of big cities. As history shows, cities can recover after a crisis, but this requires adjustments to make them more resilient.
- The pandemic offers urban planners a unique opportunity to make cities better, emphasizing public space, public transportation, housing and green development. Cities that manage this transition will have a comparative advantage.

**Figure 6: Reduction in global CO2 emissions during COVID-19**

Change in global daily CO2 emissions attributed to each country and region, in %, compared to the beginning of 2020, 1 January–11 June 2020



Source: Le Quéré et al. (2020), Global Carbon Project



Genoa, Italy; Getty Images, Massimo Scarselletta



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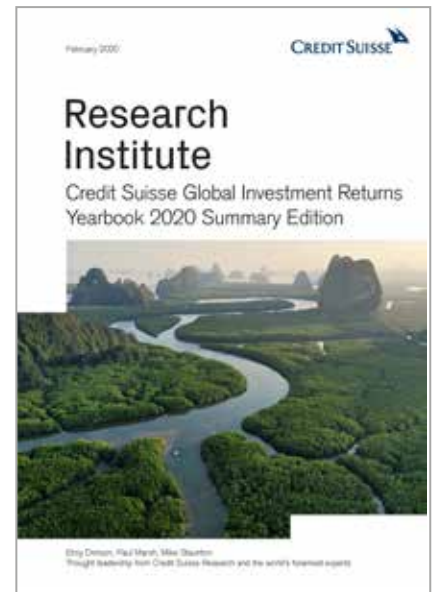
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