

The post-COVID economy

The unprecedented disruption caused by COVID-19 is likely to lead to long-term shifts in consumer behaviour, corporate decision-making and government policy.



A blue circular sign is placed on a grey, textured pavement. The sign contains white text that reads: "Let's all stay safe and stand two metres apart".

Let's all stay safe
and stand two
metres apart

Foreword

Welcome to the seventh installment in our Impact Series, in which we highlight four likely trends that could characterise the post-COVID global economy: deglobalisation; less mobility of people and a reduction in agglomeration; greater automation and digitisation; and a push for green policies.

14 August 2020

In the midst of a crisis, it is extremely difficult to predict which of the changes will become permanent and which will quickly be forgotten as the pandemic subsides.

Our Research analysts do not aim to predict what will happen and when. Rather, they address which aspects of the global economy seem most likely to change as a consequence of the pandemic, and what form these changes could take.

Crisis-induced shocks can lead us to exaggerate how profoundly different a future 'new normal' might be. We believe the trends that are likely to be accelerated by the pandemic include more scepticism towards global free

trade, especially China's role, related ambitions to re-shore production, increased automation and digitisation, and a related rise of concentration and market power.

We also think the pandemic could be a catalyst for reversing decade-long trends, such as international mobility and urbanisation. Moreover, green policies could become part of the fiscal stimulus not only to restart the economy but also to help 'transform' it.

I hope you find these insights to be useful in navigating the current and future economic consequences of COVID-19.



Jeffrey Meli
Global Head of Research



The post-COVID economy

The unprecedented disruption caused by the COVID-19 pandemic is likely to reverberate through the global economy long after the immediate health crisis recedes. A greater focus on resilience, spatial distance and the environment could outweigh the cost efficiency, frictionless movement of goods and people and rapid urbanisation that have shaped global developments over decades.

In this Impact Series report we examine four areas that could see significant changes in the way the global economy functions, from how goods are produced and transported around the world, to the possible implications for the mobility of people, agglomeration, automation and the likelihood of green policies being central to the recovery.

1. Global trade: a move away from reliance on China

Before the pandemic: rising concerns with globalisation and a focus on income inequality and China

Global trade has expanded enormously since the early 1990s, with large amounts of component goods produced in different locations, shipped around the world and assembled elsewhere. These global value chains made it possible for multinational corporations to manufacture goods through 'just-in-time' production processes that rely on the timely delivery of intermediary goods for production to take place.

Before the 2008 global financial crisis, exports as a share of global GDP were nearly 25%, but the economic downturn placed a new focus on the impact of globalisation on individual countries. In particular, the entry of China's vast labour force into the global economy raised concerns about the impact on the incomes of medium-to-low-skilled workers

in advanced economies, who had traditionally been employed in the domestic manufacturing sectors.

At the same time, there has been a growing sentiment of anti-globalisation and a broader dissatisfaction with political elites. These trends have been amplified by growing concerns over China's trade and investment practices and its apparent ambition to become dominant in technologies such as artificial intelligence.

The US-China 'trade war' started in 2018, leading to a significant reduction in trade between the two countries and an increase in trade with others, even before the pandemic. Foreign direct investment started to move from China to other Asian economies to avoid US tariffs and other trade barriers on goods produced in China.

Europe, Japan and others have also voiced concerns about China's strategic and geopolitical intentions, especially regarding state-sponsored acquisitions of key technology firms.



Pandemic adds new focus on resilience: from ‘just in time’ to ‘just in case’

The COVID-19 pandemic has revealed new risks to globalisation: without the timely arrival of intermediate goods for the next step of production in a different location, global value chains can grind to a halt.

It also highlighted China’s key role in this global network of supply chains. The country has become the dominant or even only source for certain inputs. About one eighth of global exports flow from China, which makes it the largest source for imports in all core economic regions—more than 20% for the EU, more than 23% for Japan and more than 18% for the US. More importantly, for the majority of these imports China is the dominant producer (more than 50% of imports of a single product) in electronic and machinery products. For the EU, Japan and US, such products represent more than half of their total imports from China.

The initial lockdown of Wuhan, in the major manufacturing hub of Hubei province, showed what can happen when supply chains no longer operate smoothly. Factory closures, combined with reduced transportation networks, caused significant disruption.

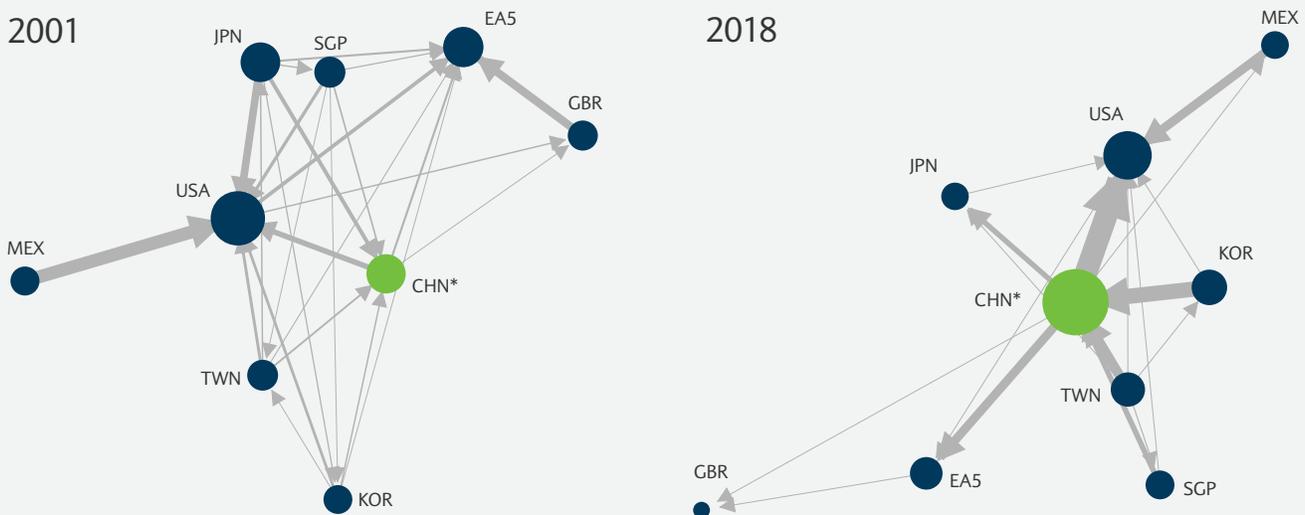
More than 50,000 companies globally have one or more tier-one suppliers in Wuhan, while about five million companies have one or more tier-two suppliers in the region.

Corporations are likely to seek to make their global value chains more resilient against future pandemics and other natural disasters as well as against growing geopolitical tensions. This could see a diversification of supply chains away from China to other Asian economies, attempts to organise production closer to home or even re-shore production to domestic suppliers.

Another aspect of the pandemic has been government intervention in supply chains to control the movement of essential (medical) equipment, often against contractual

FIGURE 1

China transformed from peripheral node in early 2000s to central node in global ICT value chain networks today



Note: CHN*= China and Hong Kong; EA5 = GE, FR, IT, SP, NL. Nodes positioned according to Fruchterman-Reingold force-directed algorithm. Node size shows relative volume of country’s total ICT trade (EX+IM). Edge width shows relative volume of bilateral trade between two countries (min 0.5% of total trade). Edge direction: from net exporter to net importer. Source OECD, Barclays Research

arrangements of private companies. The fear of future pandemics and rising geopolitical tensions could make governments more assertive, possibly even outside of emergency situations, reversing the general trend towards a version of free-markets for most areas since the 1980s.

Government initiatives to help businesses become more resilient are already underway in the US, Japan, Europe, Korea and Taiwan. Some states have introduced economic stimulus packages that aim to incentivise manufacturers to shift their production outside of China or back onshore, while others include ideas for tax benefits or using public procurement policies. This could prompt companies, especially tech ones, to reduce their 'made in China' content.

The dramatic events in the midst of any crisis can make us exaggerate the lasting changes. However, considering the magnitude and severity of the events in recent months, some permanent repercussions seem likely, and a simple return to a pre-pandemic ecosystem of supply chains is unlikely.

Sudden shifts will not occur over night, and how far they reach will also depend on how the pandemic crisis develops from here. But a simple return to the post-pandemic ecosystem of supply chains seems unlikely.



2. A less mobile people, avoiding crowded cities?

The international mobility of people is one aspect of globalisation that had continued to grow unabated until the COVID-19 outbreak. Tourism and migrant labour numbers have continued to rise, and cities have continued to grow. The fear of future pandemics and the need for social distancing may bring lasting changes.

Travel and tourism make up about 10% of global GDP

Cheap and accessible air travel has become increasingly easy, encouraging tourism, foreign education and labour migration. The lockdowns were devastating for air travel numbers and most forms of mass transport. The travel sector's eventual recovery may be only partial, as government regulations

and changes in people's behaviour may reduce the ease and frequency of travel.

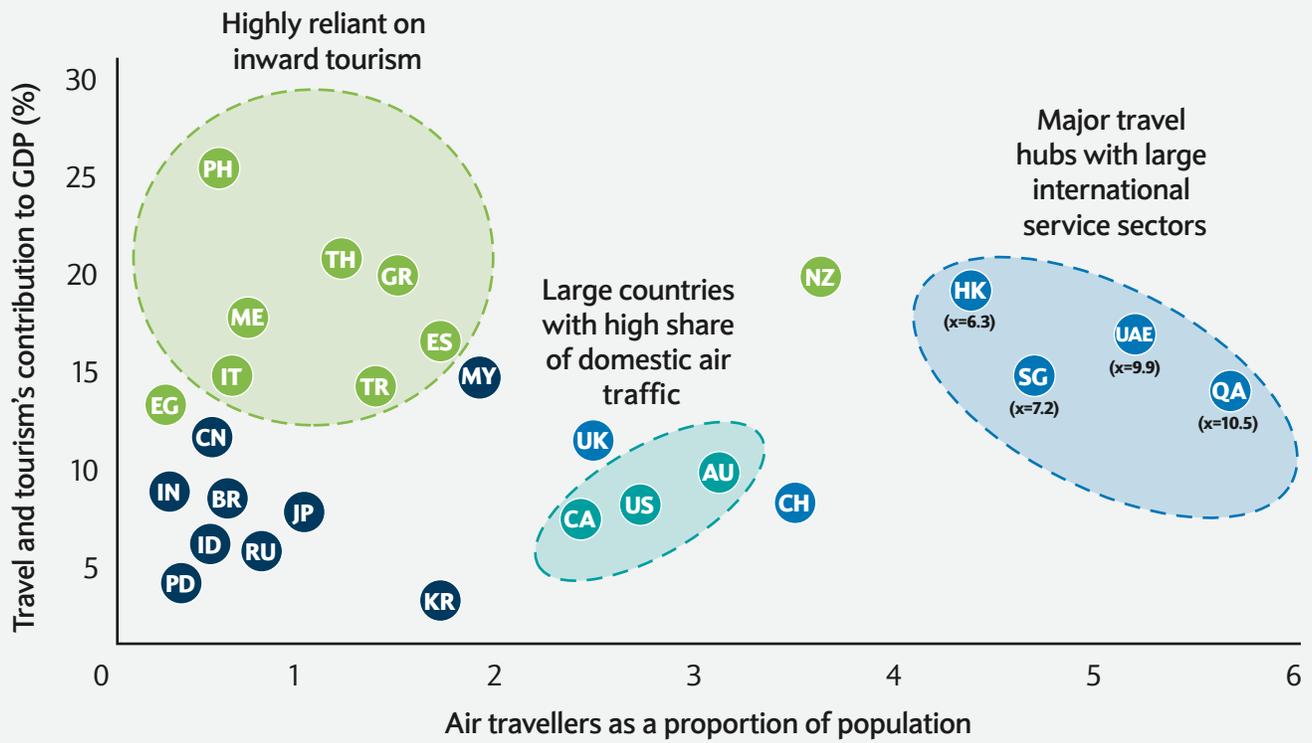
Exposure to air travel varies by country. In some countries air travel by their own populations is not particularly high, but they are very dependent on inward tourism (Thailand, Philippines, Greece, Spain, Italy, Egypt). Others have limited tourism industries but serve as international travel hubs or have large service sectors and a high share of migrant labour and expats (Hong Kong, Singapore, UAE and Qatar).

Relatively small countries also often have large international services sectors (UK, Switzerland) requiring frequent international flights, while some very large countries rely on flights for domestic transportation (US, Australia, Canada). All these economies would be affected by a reduction in air travel.



FIGURE 2

Exposure to travel and tourism takes different forms



Source: World Bank, Knoema, Barclays Research



Migrant workers disproportionately impacted

Migrant workers would be particularly impacted by reduced cross-border mobility. The International Labour Organization estimates there are 164 million migrant workers, roughly 4.7% of the global workforce.

Apart from the economic benefits migrant workers bring to their host countries, they often provide significant remittances to their home countries. Most migrant workers have jobs in the high-income economies of Europe (24%), North America (23%) and the Arab States (14%), where they represent significant shares of the workforce: over 40% in the Arab States, over 20% in North America and close to 18% in Europe.

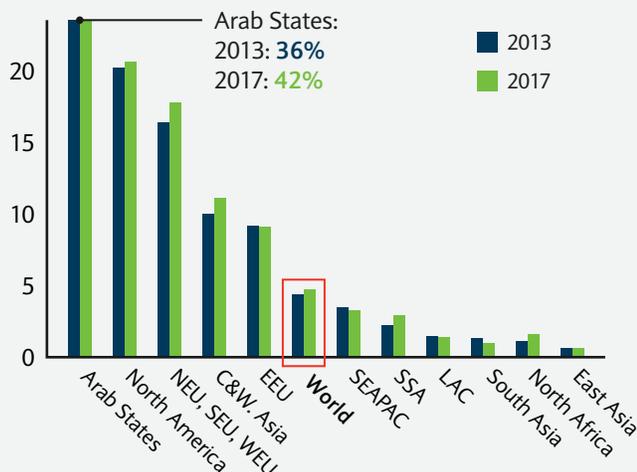
Remittances rose sharply to over \$714bn in 2019, marking a significant share of GDP for some emerging economies: 28% in Nepal (28%), 13-22% for Honduras, El Salvador and Guatemala, and 6-13% for Lebanon, Egypt and Morocco.

If migrant working were to be disrupted permanently, both host countries and countries of origin would be hit. Host countries would have to replace workers through automation, filling the void with the local population in some of the Arab states, or encouraging migrant workers to settle permanently. The home countries would lose an important source of foreign revenue, and workers looking for employment domestically would put additional pressure on local labour markets.

FIGURE 3

Migrant labour makes up large shares of the working population in some countries...

Migrant Workers (% total workers)

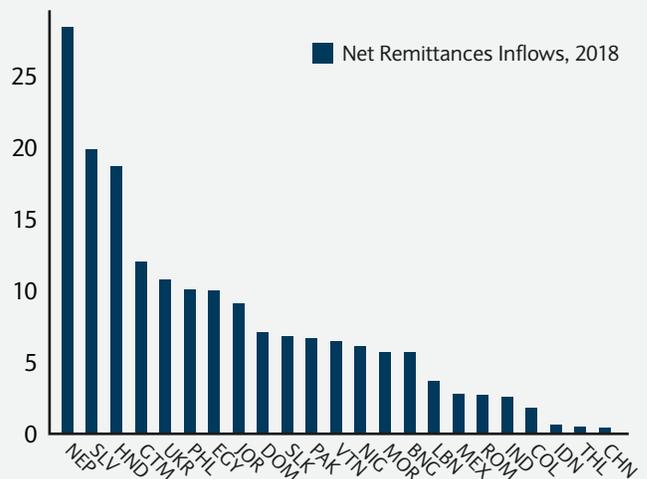


Source: International Labour Organization, Barclays Research

FIGURE 4

... while other countries highly depend on remittances from these workers

% of GDP



Source: Knomad.org, Barclays Research



City limits

The COVID-19 outbreak has highlighted one of the risks of densely populated cities, as demonstrated when the public transportation systems of New York, London, Tokyo, Mumbai and Sao Paulo quickly became virus hotspots, severely disrupting industries in these areas.

This experience may halt the trend of increasing business concentration that has lasted for decades. In 1900, only 16% of the world's population lived in urban areas, reaching 30% in 1950 and growing to 55% (4.2bn people) by 2018.

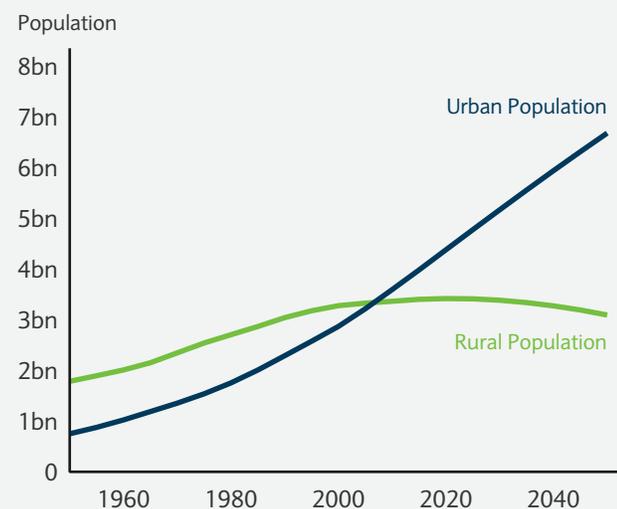
There are also many more large cities: the number of cities with 5-10 million inhabitants has more than doubled since 1990, while megacities (more than 10mn) rose from 10 in 1990 to 33 by 2018 and is expected to reach 43 by 2030, according to UN projections.

Megacities are also notable as hubs of economic activity: they often account for a high share of their country's national income and typically have higher productivity per capita than the country's average. Economic theory suggests that the concentration of capital, workers, companies and consumers creates benefits of scale, facilitates knowledge spill-over as well as promotes the rapid diffusion of ideas and new technologies. Hence, agglomeration was seen as a stimulant for growth, innovation and productivity.

Thus far, it seems that the advantages of large cities have outweighed the disadvantages (traffic congestion, long waiting times, high housing costs, and pollution) but concerns about future pandemics could change this. While largescale de-urbanisation is highly unlikely, the trend could shift towards smaller, less densely populated cities and more urban sprawl.

FIGURE 5

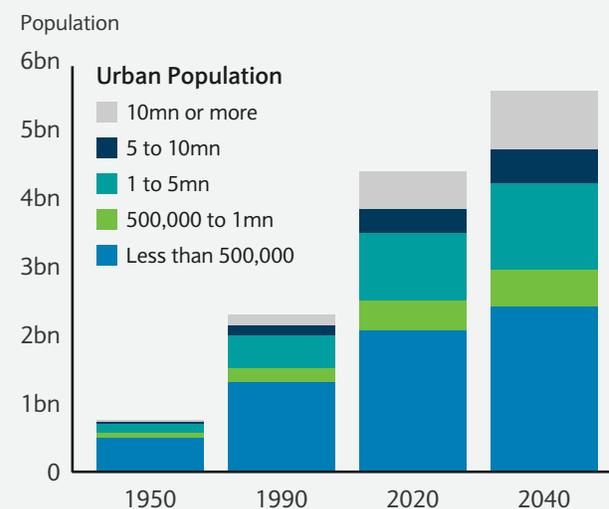
Global population growth has brought higher urbanisation...



Source: UN World Urbanisation Prospects 2018, Barclays Research

FIGURE 6

...and concentration in ever more densely populated cities



Source: UN World Urbanisation Prospects 2018, Barclays Research

3. Accelerated automation and digitisation

Faced with the prospect of increased production costs, reduced availability of migrant workers, less travel, and the need for social distancing, businesses are likely to speed up their adoption of automation and digitisation in the post-COVID world.

Working from home (WFH) accelerated the use of technologies that were previously feasible but not widely adopted. However, the possibility of remote working is not uniform across industries and countries. Born out of necessity, WFH could become a regular part of the working week. US research shows that up to 37% of jobs could plausibly be performed at home, compared to surveys before the pandemic that indicated less than a quarter of full-time employees ever worked from home, and even those who did typically did so less than half of their working hours¹.

The feasibility of remote working varies across industries, regions and countries. Whereas most jobs in finance, corporate management, and professional and scientific

services could be performed at home, the same cannot be said for jobs in agriculture, hotels and restaurants, and retail. That same US study estimates that more than 45% of jobs in San Francisco, San Jose, and Washington DC could be performed at home, which reflected the types of industries located in these cities. In contrast, the figure was less than 30% for jobs in Fort Myers, Grand Rapids, and Las Vegas¹.

Workers in occupations that can be performed at home typically earn more. Thus, the 37% of US jobs that could be performed at home would account for 46% of all wages.

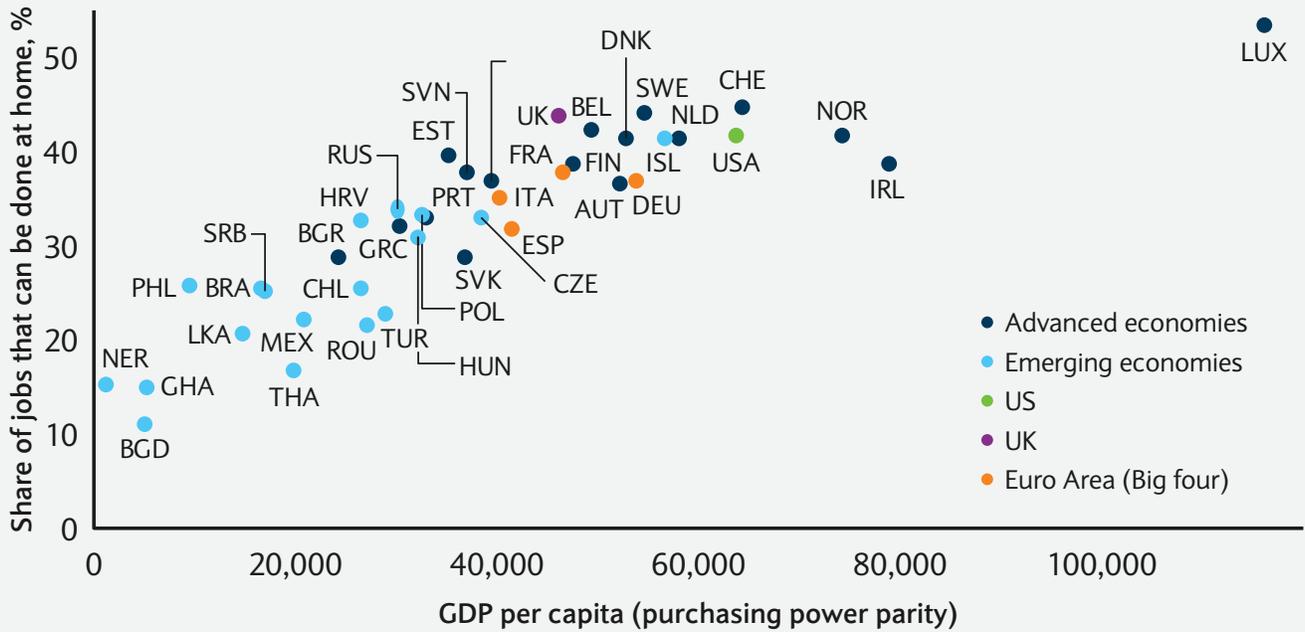
At a country-level there are some stark differences: it is estimated that fewer than 25% of jobs in Mexico and Turkey could be performed at home, while it exceeds 40% in Sweden and the UK, and 50% in Luxembourg. This would suggest that developing economies and emerging markets would face a greater challenge to switch their workforces to a WFH model. This could further exacerbate inequalities between high and low earners, and developed and developing economies.

¹ How Many Jobs Can be Done at Home?, Jonathan I. Dingel and Brent Neiman, April 2020



FIGURE 7

Remote working is typically more suitable for high-skill service jobs and thus is positively correlated with per capita income



Source: How Many Jobs Can be Done at Home?, Jonathan I. Dingel and Brent Neiman, April 2020

Automation has always been driven by cost efficiency. Now, in a world concerned about pandemics, health and safety considerations could become a motivation.



The march of the robot

Where remote working is not feasible, other forms of digitisation and automation are likely. Hotels and catering industries have already started to outsource some human duties to machines, including robot bartending on cruise ships and in airports, and delivering food to hotel rooms.

Rather than fully replace human workers with robots, service industries could adopt partial automation. Simple tasks will be automated to reduce workers' hours or to assign a job typically done by two persons (say janitorial services or manning a hotel front desk overnight) to just one person aided by a robot. Initial trials with hotel robots in Japan so far have had mixed results but improved technologies are likely to produce smarter robots.

The tech-enabled labour reshuffling thus far has been driven by cost efficiency, while in a world concerned about pandemics, health and safety considerations could become a motivation. The introduction of service robots could lead to a sharp reduction in the minimum efficient scale for many businesses, especially those providing consumer-oriented services.

This could be critical in a world under frequent forms of social distancing where restaurants and retail stores may need to survive on lower turnover.

Reshoring to take a new dimension

Any reshoring of production, diversification of Global Value Chains (GVCs), creating supply redundancies and/or moving away from zero-inventory will add to costs. Additive manufacturing (3D printing) is likely to be crucial. As 3D printing becomes more sophisticated and cheaper, it will increasingly rival traditional manufacturing processes. It will eliminate the need for large-scale central manufacturing with high numbers of low-cost workers and large warehouses.

Vertical farming to take off

Agriculture could also be an area where concerns about pandemics could push the adoption of automated technology. A form of automation, vertical farming could be a way to overcome harvesting and supply chain issues for fresh produce, especially where space is limited and land values high. It could significantly cut the distance travelled and time taken for produce to reach consumers.

FIGURE 8

Casual Dining

Estimated number of households served annually for casual dining restaurants to break even

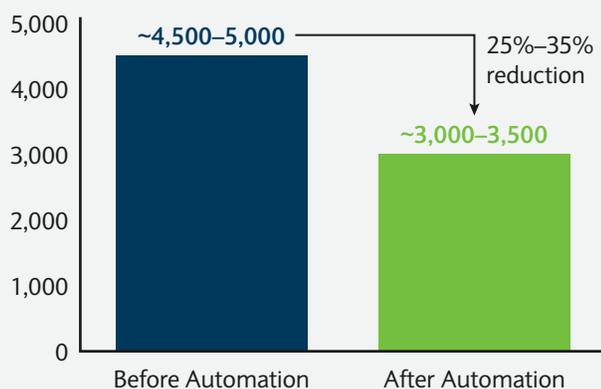
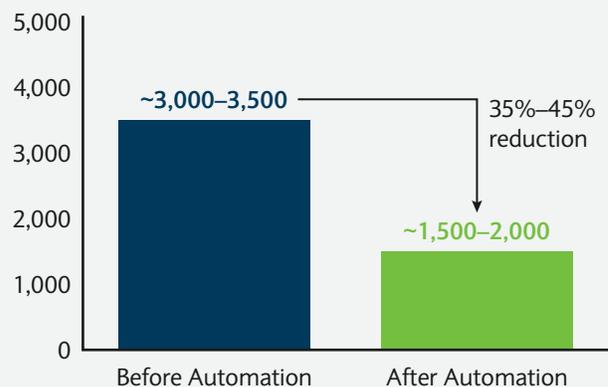


FIGURE 9

Apparel Retail

Estimated number of households served annually for an apparel retail store to break even



Source: Bain Macro Group analysis, 2016: The Declining Cost of Distance, 10 February 2016, Bain & Company.

4. Demand for green policies

The shock of the pandemic also seems to have increased the demand for green policies, with a combination of factors at work.

First, though quite different from environmental threats such as climate change, COVID-19 possibly magnified public perception of humanity's exposure to 'natural' events with a global reach.

Second, despite the hardships of lockdown, there were also visible positive environmental changes. Daily global emissions of greenhouse gases plunged 17% by early April compared with 2019, and when lockdowns were at their most stringent, emissions on average fell 26%, with the UK measuring a 31% decline. This was the sharpest drop in global carbon output since records began. Inhabitants of

large cities will have experienced their healthiest air and cleanest skies in decades. People are unlikely to want to pay the economic price to achieve these outcomes permanently by leaving planes grounded and streets free of cars. But they will have provided a memorable experience of how air quality could be improved when pollution levels are lower.

Third, the role of government was boosted during the pandemic as part of the immediate need to support households and corporates, but also to stimulate the recovery. These actions have sent public debt levels soaring, but they also provide governments with the opportunity to prioritise policy goals, which could see direct investment in environmentally friendly solutions or greater incentives for investment in low-carbon technologies.



Despite the unprecedented economic recession, the focus of policy makers on 'green' seems to have snowballed, with governments aiming at combining them with their now much larger spending and investment plans.



Demand for a ‘green recovery’ is likely to range from more bike lanes and urban traffic planning to more ambitious emission targets to respond to climate change.

The current US administration has clearly stated its scepticism regarding climate change, but the private sector is launching independent initiatives, such as BlackRock’s vow to divest from thermal coal.

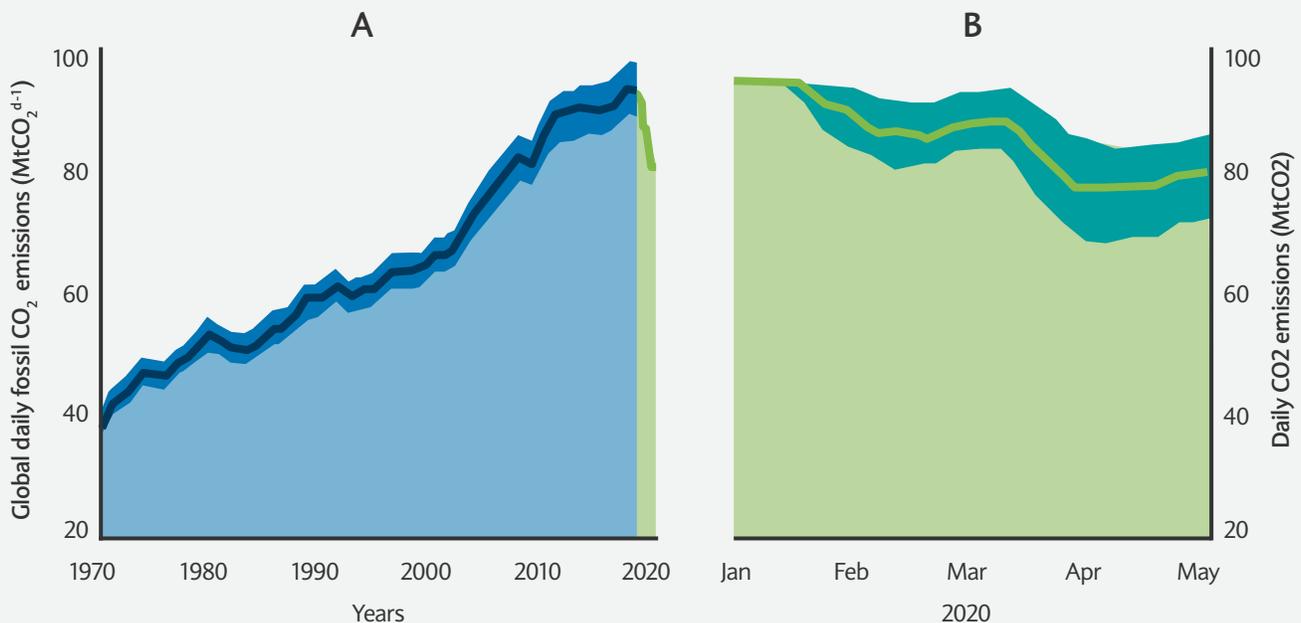
Governments in the EU and the UK aim to combine economic stimulus with green policies. The EU has pledged that its recovery plan would “do no harm” to its climate goals,

dedicating parts of the planned €750bn recovery fund to support greener transport, cleaner industry and renovated homes.

In 2019, the UK became the first major economy to legally bind itself to cutting net greenhouse gas emissions to zero by 2050, and the Chancellor has also stated his preference for environmental concerns to be ‘central’ to the recovery programme. In a YouGov poll in the middle of May 2020, a third of respondents agreed that the government should prioritise getting the economy moving again even if it could mean relaxing climate change targets, but 42% answered that economic and climate change targets should be prioritised equally.

FIGURE 10

Lockdowns demonstrated how much change in human activity can reduce CO₂ emissions and pollution more generally



A. Annual mean daily emissions in the period 1970–2019 (blue line), with uncertainty of $\pm 5\%$ ($\pm\sigma$; dark blue shading). The green line shows the daily emissions up to end of April 2020 estimated here.

B. Daily CO₂ emissions in 2020 (green line) and uncertainty (dark green Shading).

Source: Nature - climate change: Temporary reduction in daily global CO₂ emissions during the COVID-19 forced confinement; 19 May 2020, Barclays Research

Conclusion: are we heading for a less integrated world?

The likely post-COVID trends highlighted in this Impact Series report point to a world where the global economy becomes less integrated as a result of trade barriers, reshoring of supply chains, and reduced labour migration and foreign direct investment. These changes are likely to have macroeconomic implications.

The globalisation of the past decades has been marked by the synchronisation of business cycles in different countries and more stable global growth - the so-called 'great moderation'. A less integrated world could therefore mean higher volatility in national and regional growth, with implications for inflation.

The net effect of post-pandemic trends seems straightforward: higher barriers to trade and re-shoring should re-strengthen domestic workers' negotiation position in advanced economies. But rising wages as a driver of inflation are likely to be countered by intensified automation and digitisation.

Large jumps in the use of e-commerce and other digital services during the pandemic could also accelerate the rise in market power associated with the economies of scale, network effects and the winner take-all outcomes. Thus far, these developments have contributed to disinflation rather

than inflation. Inflation could rise again if trade disruptions and higher-cost local production were to coincide with continued fiscal and monetary stimulus.

However, we are more likely to see temporary bouts of inflation rather than a complete reversal in the global trend of lower inflation. The post-pandemic changes are likely to widen existing divides: between low, and middle versus high-skilled workers, and between advanced and emerging markets. Most of the trends would favour advanced economies, boosted by their fiscal stimulus plans and increased investment in technology.

Emerging market economies could lose much of the benefits that come with direct foreign investment and their participation in global value chains. They would have to re-think their export-led development models, involving the channelling of abundant and cheap rural labour forces into the factories of their fast-growing cities. Indeed, future epidemics could turn very large cities into liabilities rather than engines of growth.

With these challenges in mind, the reality is likely to be much more nuanced than any abstract analysis of global trends allows.



About the authors

Christian Keller is a Managing Director and Head of Economics Research at Barclays, leading a global team covering both Developed and Emerging Markets. Mr. Keller is based in London and joined Barclays in 2007 from the International Monetary Fund (IMF) where he had worked since 1999. Based at the IMF headquarters in Washington D.C., Mr. Keller worked on IMF programs with Emerging Market economies in Europe, Latin America and Asia, and served as the IMF's Resident Representative in Turkey from 2005-7. Mr. Keller graduated with a PhD in Economics from University of Köln, Germany, and holds a joint-MA in Economics and Finance from University of Köln and HEC, Paris.

Iaroslav Shelepko is a London-based economist at Barclays responsible for the coverage of Germany, EA and global economic issues and thematic quantitative research and macroeconomic forecasting. Coming to Barclays in 2015, he spent two years in Quantitative Analytics, focusing on FX derivatives modeling, then joined Economics research team in 2017. Mr. Shelepko holds a Specialist in Mathematics degree from Saint-Petersburg State University, Russia and an MA in Economics from New Economic School, Russia.

Shreya Sodhani is a research analyst based in Singapore, covering India, the Asean countries, Australia and New Zealand. She joined Barclays in 2018 and holds a Master's in Business Management from the Indian Institute of Management, Ahmedabad. Shreya also holds an honors degree in Economics from St. Xavier's College, Kolkata.

Brian Tan is a regional economist based in Singapore, covering emerging Asia economies. Prior to joining Barclays in 2018, he spent four years as a Southeast Asia economist at Nomura and four years at Citibank, where he focused on the economies of Malaysia and Singapore. Brian holds a Bachelor of Social Sciences (Hons) degree from the National University of Singapore, where he read economics.



Important Research Content Disclosures

BARCLAYS

This communication has been prepared by Barclays.

“Barclays” means any entity within the Barclays Group of companies, where “Barclays Group” means Barclays Bank PLC, Barclays PLC and any of their subsidiaries, affiliates, ultimate holding company and any subsidiaries or affiliates of such holding company.

CONFLICTS OF INTEREST

BARCLAYS IS A FULL SERVICE INVESTMENT BANK. In the normal course of offering investment banking products and services to clients, Barclays may act in several capacities (including issuer, market maker and/or liquidity provider, underwriter, distributor, index sponsor, swap counterparty and calculation agent) simultaneously with respect to a product, giving rise to potential conflicts of interest which may impact the performance of a product.

NOT RESEARCH

The information provided does not constitute ‘investment research’ or a ‘research report’ and should not be relied on as such. Investment decisions should not be based upon the information provided.

BARCLAYS POSITIONS

Barclays may at any time acquire, hold or dispose of long or short positions (including hedging and trading positions) and trade or otherwise effect transactions for their own account or the account of their customers in the products referred to herein which may impact the performance of a product.

FOR INFORMATION ONLY

THIS INFORMATION HAS BEEN PREPARED BY THE RESEARCH DEPARTMENT WITHIN THE INVESTMENT BANK OF BARCLAYS. The information, analytic tools, and/or models referenced herein (and any reports or results derived from their use) are intended for informational purposes only. Barclays has no obligation to update this information and may cease provision of this information at any time and without notice.

NO OFFER

Barclays is not offering to sell or seeking offers to buy any product or enter into any transaction. Any offer or entry

into any transaction requires Barclays’ subsequent formal agreement which will be subject to internal approvals and execution of binding transaction documents.

NO LIABILITY

Neither Barclays nor any of its directors, officers, employees, representatives or agents, accepts any liability whatsoever for any direct, indirect or consequential losses (in contract, tort or otherwise) arising from the use of this communication or its contents or reliance on the information contained herein, except to the extent this would be prohibited by law or regulation.

NO ADVICE

Barclays is not acting as a fiduciary. Barclays does not provide, and has not provided, any investment advice or personal recommendation to you in relation to any transaction and/or any related securities described herein and is not responsible for providing or arranging for the provision of any general financial, strategic or specialist advice, including legal, regulatory, accounting, model auditing or taxation advice or services or any other services in relation to the transaction and/or any related securities described herein.

Accordingly Barclays is under no obligation to, and shall not, determine the suitability for you of the transaction described herein. You must determine, on your own behalf or through independent professional advice, the merits, terms, conditions and risks of any transaction described herein.

NOT A BENCHMARK

The information provided does not constitute a financial benchmark and should not be used as a submission or contribution of input data for the purposes of determining a financial benchmark.

INFORMATION PROVIDED MAY NOT BE ACCURATE OR COMPLETE AND MAY BE SOURCED FROM THIRD PARTIES

All information is provided “as is” without warranty of any kind. Because of the possibility of human and mechanical errors as well as other factors, Barclays is not responsible for any errors or omissions in the information contained herein. Barclays is not responsible for information stated to be obtained or derived from third party sources or statistical

services. Barclays makes no representation and disclaims all express, implied, and statutory warranties including warranties of accuracy, completeness, reliability, fitness for a particular purpose or merchantability of the information contained herein.

PAST & SIMULATED PAST PERFORMANCE

Any past or simulated past performance including back-testing, modelling or scenario analysis contained herein is no indication as to future performance.

No representation is made as to the accuracy of the assumptions made within, or completeness of, any modelling, scenario analysis or back-testing.

OPINIONS SUBJECT TO CHANGE

All opinions and estimates are given as of the date hereof and are subject to change. The value of any investment may also fluctuate as a result of market changes. Barclays is not obliged to inform the recipients of this communication of any change to such opinions or estimates.

IMPORTANT DISCLOSURES

For important regional disclosures you must read, visit the link relevant to your region. Please contact your Barclays representative if you are unable to access.

EMEA <https://www.home.barclays/disclosures/important-emea-disclosures.html>

APAC <https://www.home.barclays/disclosures/important-apac-disclosures.html>

US <https://www.home.barclays/disclosures/important-us-disclosures.html>

ABOUT BARCLAYS

Barclays Bank PLC is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority and is a member of the London Stock Exchange. Barclays Bank PLC is registered in England No. 1026167 with its registered office at 1 Churchill Place, London E14 5HP.

COPYRIGHT

© Copyright Barclays 2020 (all rights reserved).

