





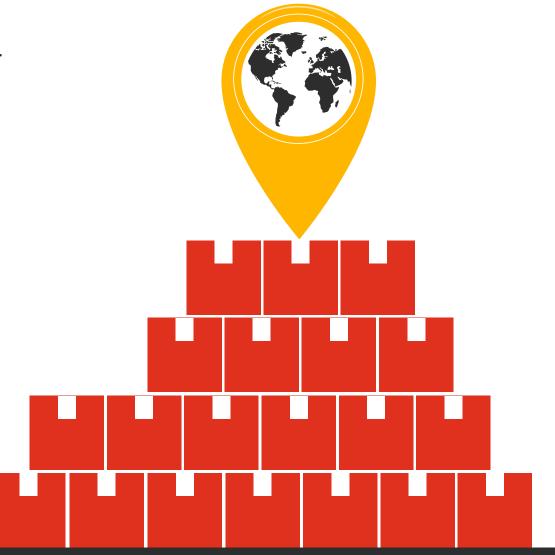
The journey from globalisation'

How COVID-19 has accelerated the shift to more local and flexible operations

Executive summary

COVID-19 has forced manufacturers worldwide to conduct emergency reviews of their supply chains. As entire economies locked down overnight, companies suddenly faced national and international markets where they could no longer reliably source components, manufacture products or distribute their goods to customers. In addition, the crisis hit when global supply chains were already under pressure from new tariffs and restrictions resulting from trade disputes.

Around the world, the pandemic has put the shift to more agile, multifootprint global operations at the top of corporate agendas. This "glocalisation" seeks to enable companies to stay closer to suppliers and customers while reducing their operating risks. This is one of the ways in which COVID-19 has dramatically accelerated the megatrends transforming the way we live and work, identified in PwC's ADAPT framework¹. ADAPT stands for asymmetry caused by wealth disparity and the erosion of the middle class; disruption triggered by abrupt technological changes and their destructive effects; ageing, as the average life span of human beings increases and the birth rate falls; populism and rejection of the status quo. with associated nationalism and global fracturing; and declining trust in the prevailing institutions that make our systems work. Polarisation has particular relevance in this context, as extended supply chains lose their appeal in a fractured world and economies become more localised as a result. The pandemic has become a global testing ground for how well companies can respond to this challenge.



Authors identify the key drivers that can enable companies to succeed at "glocalisation". These include regionalising their footprint, an increased use of robotics for manufacturing and logistics, and changing the cost model for production and sourcing. At the same time, both the opportunities and attendant risks of "glocalisation" vary in importance between regions and sectors: for example, a Western-owned manufacturer with production sites in China may regard managing the threat of an all-out trade war with the US as a more urgent priority than stricter cost controls.

"One fact is already clear: COVID-19 has ensured that the case for moving from global to "glocal" operations has gained unstoppable momentum."



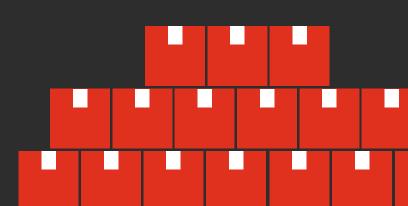
This report reflects global perspectives and draws on PwC's latest research on supply chain management issues. It summarises insights regarding Germany, India, the United States, Greater China, the UK and the Middle East, where the pandemic has accelerated efforts by industrial companies to make inflexible global footprints more agile and responsive to demand, and the analysis of these insights. These are some of the key findings from the virtual panel session, titled <a href="https://doi.org/10.1007/jht/10.2007/jht/

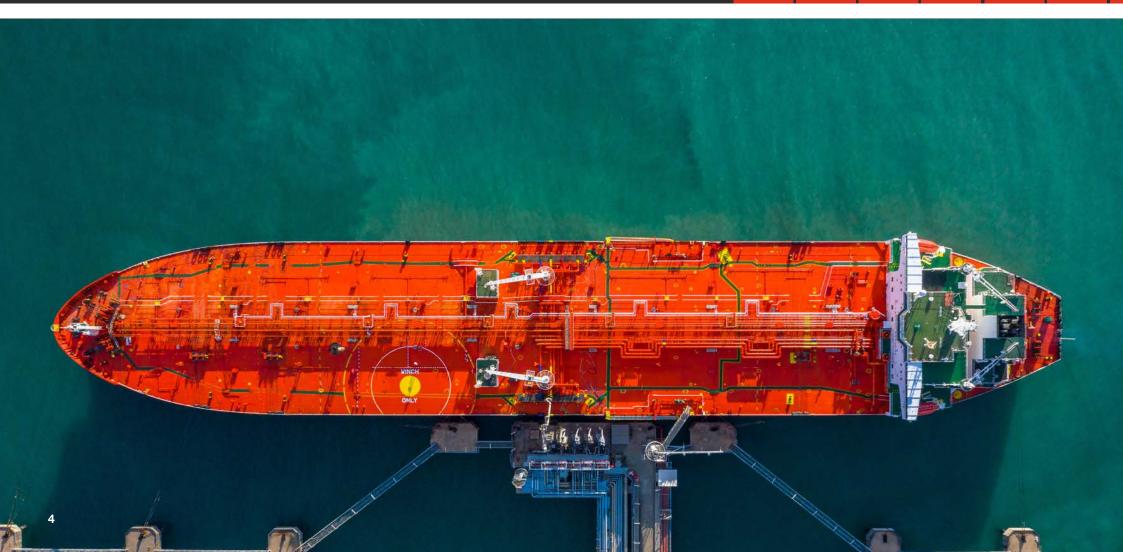
Overall, the following drivers have been identified as those that are accelerating the worldwide shift to "glocalisation" by manufacturers, regardless of where they operate:

Digitalisation and automation are enabling companies to go more local by taking labour out of the supply chain and manufacturing equation. Traditional supply chain approaches that focus narrowly on cost efficiency need to be broadened. Factoring in flexibility, resiliency and customer experience can create differentiation in the marketplace and drive improved revenue growth.

COVID-19 is encouraging supply chain and wider operational collaboration between companies, with automation helping to solve bottlenecks with innovative, rapid solutions.

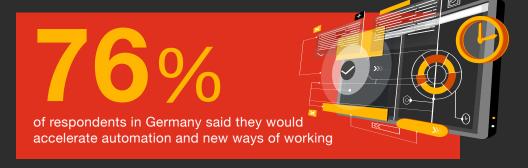
National and regional perspectives







Since COVID-19, PwC's CFO Pulse surveys have indicated that German companies are prioritising supply, distribution and operational strategies to a greater extent than the global sample.



In May², 76% of respondents in Germany said they would accelerate automation and new ways of working, compared with a global average of 48%. In June³, almost half (47%) of German CFOs said they expected changes to distribution channels, such as moving from in-person to virtual sales and deliveries, compared with 36% globally. More German respondents also anticipated changing supply chain strategies to rebuild revenue streams, such as developing alternative sourcing options and revising contractual terms.

This heightened awareness of COVID-19's impact is hardly surprising, given that German manufacturers had highly globalised supply and demand bases, and have been severely impacted by the implications of the world pandemic. "COVID-19 has disrupted supply chains and exposed an insufficient resiliency," says Michael

Wagner, a partner in PwC Strategy&'s Industrials team in Germany. "Now is the time to bring efficiency and scale into balance with flexibility and robustness."

Overall, we do not anticipate that German industrials will roll back globalisation, given their worldwide position. Instead, there will be a shift to a far more flexible global manufacturing footprint, with more localised physical value chains within a regional set-up. Even before the pandemic, many German companies were adjusting their footprint to adapt capacities and networks to meet future demand. We see the COVID-19 crisis accelerating the execution of these footprint decisions.

Going forward, we expect a growing number of companies will move to multisourcing strategies and a more flexible range of suppliers, while investing further in digital technologies, especially automation and robotics.

One of our clients, a global industrial supplier, provides an illustrative case study⁴ of exactly this kind of "glocalisation" and the additional strategies that companies can adopt to reset their cost base and reshape their businesses to emerge stronger from the crisis.

Before COVID-19, the company had a fixed international manufacturing supply chain and logistics infrastructure that maximised scale to achieve lower costs. COVID-19 exposed the points where supply and demand were misaligned, highlighting the need for greater end-to-end visibility in the supply chain. The company is now moving to distributed operations clusters, with an increased focus on robotic manufacturing and logistics tools.



COVID-19 is both a crisis that has to be tackled and an opportunity to make bold, transformative decisions about operational models and supply chains

- Shashank Tripathi, PwC India's Government Strategy and Transformation leader.

A new report by PwC India⁵, "Full Potential Revival and Growth", maps out the scale of the challenge. The sectors most deeply affected by pandemic-related production shutdowns, labour shortages and broken supply chains cumulatively account for around half of India's gross capital formation (GCF), meaning the country's accumulation of capital goods such as equipment, tools and electricity. Their difficulties are compounded by severe working capital issues and, in multiple instances, force majeure actions on contracts by counterparties seeking to avoid or defer payments.

Yet the turmoil created by COVID-19 also represents a chance for Indian manufacturers to rethink and reconfigure their operations to achieve greater efficiency by upgrading local supply chains. Before the pandemic, global trade was already affected by US-China tensions, with COVID-19 adding greater urgency to plans by companies and businesses to reduce the vulnerability of supply chains to international disruption. Global supply chains that directly connect with international networks are largely confined in India to coastal cities and towns and are poorly integrated with the country's vast interior. The COVID-19 national lockdown

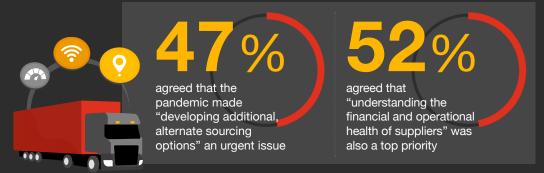
exposed multiple flaws in these local supply chains, just as the pandemic was severely disrupting trade around the world.

In response, companies across India raced to build more flexible service delivery models to strengthen their "last mile" local capabilities, either by developing them internally or through partnerships with other organisations. The retail sector in particular offers numerous examples of these partnerships, with FMCG companies rapidly forming alliances with mobile phone companies, food delivery businesses and other service providers in order to achieve resilient, efficient local supply and distribution networks. This self-reliant mindset promises to help India reduce its dependency on other countries through inward manufacturing, which in turn will drive post-COVID-19 economic recovery.

Against this background, interest in India is growing from a global supply chain perspective. While India is not yet a major manufacturing power, it is a leading exporter of digital technologies and skills which are now increasingly being applied by companies to develop robust, digitalised supply chains that can meet both domestic and international demand. Due to India's size, a critical challenge will be bringing hyper-local supply chains into the digital age through robotics and other advanced technologies. The investment is worth the potential prize of greater participation by Indian companies in global trade, even as an increase of "inward" home-based manufacturing reduces India's import dependency.

United States

Supply chain challenges have preoccupied US manufacturers since the start of the COVID-19 upheaval. In June, PwC's CFO Pulse survey⁶ for the US found that almost half (47%) the US respondents agreed that the pandemic made "developing additional, alternate sourcing options" an urgent issue, while 52% agreed that "understanding the financial and operational health of suppliers" was also a top priority.



As we noted in a July 2020 report on supply chain resiliency⁷, US manufacturers of all sectors and sizes have historically based production and sourcing decisions on total cost, by simply adding together labour, material, logistics and other line items. Reducing costs has in turn been the principal driver of offshore manufacturing, with the priority on lower labour costs. Mexico and China have been the key locations, due to their abundance of people with the relevant skills and, in Mexico's case, its proximity to the US market.

Prior to COVID-19, two trends were already emerging that undermined this offshore production and sourcing model. Firstly, rising labour costs and increased duties and

tariffs were eroding the "total cost" argument for locating operations in Mexico and China. In addition, "US manufacturers were starting to consider factors that were not in the total cost model, such as resiliency, flexibility and customer experience", says Brett Cayot, a partner in PwC's US Strategy and Operations practice.

COVID-19 has dramatically accelerated this drive by US companies to diversify manufacturing and supply chains and develop more agile, flexible operations that are both more efficient and closer to the end user. Based on analysis for our 2020 supply chain resiliency report, we estimate that US manufacturers that shift production from China could cut operating costs by an average of 23% if they "near-shored" to Mexico and by 24% if they transferred to another Asian low-cost country (LCC).

Some long-standing US companies in China may prefer instead to adopt a "China + 1" model to avoid forfeiting well-developed supply and production networks or direct access to mainland customers. In addition, we expect to see more post-COVID-19 dual strategies where US manufacturers have operations in both the US and Mexico, or in Mexico and another LCC in Asia.

Greater China

Viewed from China, the same shift to lower-cost countries due to wage inflation in the coastal provinces has been visible in recent years both for international companies from Europe and Asia with extensive mainland operations and for domestic manufacturers that have diversified their footprint overseas. China's Belt and Road Initiative (BRI), launched in 2013, has encouraged the expansion of mainland companies into Southeast and South Asia and East Africa.

Meanwhile, some international companies which source from China have rebalanced their supply footprint to include Southeast Asian, South Asian, and East African countries. However, the sheer size of the Mainland China market means a significant proportion of domestic and foreign manufacturers have adopted a "China for China" footprint strategy by manufacturing on the mainland for sale domestically rather than for export, and not importing goods to sell in the same huge market.

Two factors are now complicating these strategic calculations. Firstly, geopolitical friction has entered the equation, due to ongoing trade disputes between Washington and Beijing. In PwC's 2020 China Business Report⁸, published in partnership with the American Chamber of Commerce in Shanghai, our survey of 346 US companies operating in the mainland found that only 59% are optimistic or slightly optimistic about the five-year business outlook, compared with 80% as recently as 2018. In 2020, the proportion responding as optimistic was roughly half the 2018 level. Revealingly, almost one-third (29.5%) of the 2020 survey cited uncertainty about US-China trade and commercial relations as a reason why their investment plans were lower than in 2019. While there has been great anticipation around the US elections and the possible impact on policy, the incoming Biden administration has signaled that it intends to change China trade policy slowly and in a measured way, if at all.

"Historically, supply chain decisions have revolved around cost," says Jan Nicholas,

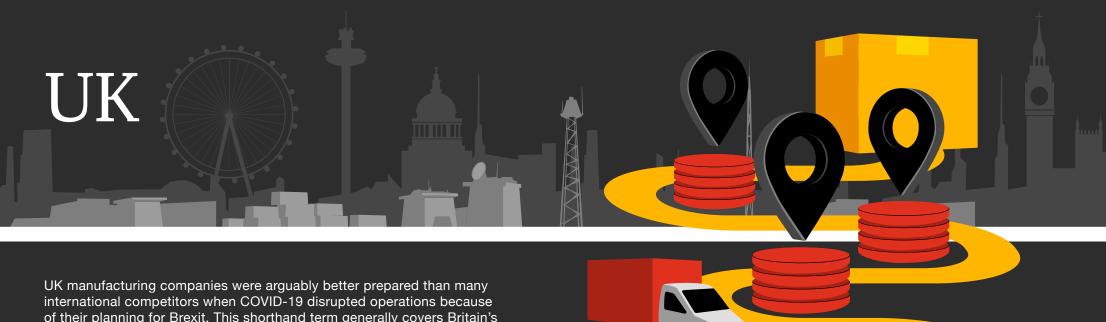
US-China trade tensions mean companies are worrying about geopolitical risk first, and cost has become a boundary condition rather than the primary objective. They are aware that they cannot create a cost problem while addressing geopolitical risk, but cost no longer comes first.

- Jan Nicholas, leader of PwC's operations consulting and supply chain team in Hong Kong.

leader of PwC's operations consulting and supply chain team in Hong Kong.

Amid this geopolitical uncertainty, COVID-19 has introduced a second factor into the strategic equation. The pandemic has accelerated the existing diversification trend by domestic and foreign manufacturers as companies seek to rebalance their supply chain and manufacturing to include suppliers beyond China. As we highlighted in a June 2020 report⁹, "Strategic realignment for MNCs in China", the pandemic has exposed supply chain weaknesses, with the message brought home for many companies by a realisation of the world's overreliance on China for personal protective equipment (PPE).

The double challenge for domestic and foreign manufacturers in China is how to satisfy both Chinese and international demand while balancing the geopolitical and economic tensions between the US and China without offending either country. This balancing act will require sensitive handling and is likely to influence footprint choices. While executives have so far been reluctant to commit to large-scale footprint change, the escalating tensions will force many companies to decide; those with clear mitigation strategies will come out ahead of those that defer until a decision is forced on them.



uK manufacturing companies were arguably better prepared than many international competitors when COVID-19 disrupted operations because of their planning for Brexit. This shorthand term generally covers Britain's formal departure from the EU on 31 January 2020 and its negotiations for a trade agreement with the EU by the end of 2020, the deadline set by the UK government. In both cases, uncertainty surrounding the outcome meant manufacturers had to assess the flexibility and resilience of supply chains, which are often closely tied to continental Europe.

Despite this forward planning, COVID-19 still caused severe disruption to manufacturers based in the UK, one of the world's most globalised economies.

As in many other countries, the crisis acted as a reality check for supply chain deficiencies. In this context, unlikely alliances between companies in different sectors have been formed to help combat COVID-19. In March, for example, the construction equipment manufacturer JCB linked up with the vacuum-cleaner company Dyson to produce the steel casing for Dyson-designed ventilators (though ultimately, the ventilators were not required by UK hospitals).

At the same time, the potential impact of Brexit on supply chains has prompted a wider political debate about the UK's need to build onshore manufacturing capacity that is resilient and flexible.

Yet this pressure to "go local" has been accompanied by warnings from UK business groups and manufacturing associations that it takes a long time – and

careful planning – to change supply chains. The same debate has fed in turn into discussions about sustainability, including the cost of meeting climate-change targets.

Some companies have discovered that if they have more agile, flexible operations in multiple locations that are closer to the market they can sell more, says Cara Haffey, PwC's UK leader of Manufacturing and Automotive. These discussions have featured far more since COVID-19 than in the previous five years.

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- Cara Haffey, PwC's UK leader of Manufacturing and Automotive.

Middle East

In April, PwC Middle East's report on Local Value Creation¹⁰ noted that supply chains in the region tend to rely heavily on imported goods. Even before the pandemic, this exposure to imports left Middle East countries exposed to a range of risks, including commodity price fluctuations, geo-political crises, and natural disasters.

In this context, COVID-19 has dramatically underscored the need for manufacturers in the region to bolster resilience and sustainability by localising production and supply chains in critical areas such as spare parts, essential raw materials, maintenance and repair services and agricultural goods. Previously, localisation programmes have largely been driven by the energy sector. The pandemic has exposed additional critical supply chain vulnerabilities, notably in healthcare, where countries across the region are now rapidly building capacity in locally-sourced pharmaceuticals and protective medical equipment. Aside from the clinical front-line, COVID-19 has created other dangerous supply bottlenecks in critical areas such as spare parts for equipment for utilities.

Lack of spare parts for water utilities has the potential to threaten people's lives given the region's dependency on desalinated sea water for drinking.

- Bashar El-Jawhari, PwC Middle East's Industry 4.0, procurement and supply chain competency leader.

These combined factors make local solutions an operational necessity for companies in the Middle East, as the region emerges from national lockdowns. Going forward, the youthful demographic profile of Middle Eastern countries will create further social pressure for more local supply chains and production capacity, in order to create employment for young skilled people.

Despite these challenges, and the continuing COVID-19 upheaval, we believe that the region is well-prepared for a successful "glocalisation" journey in two respects.

Firstly, major public and private sector companies have long experience at building sustainable, flexible operations in a region afflicted by political unrest – an experience that has served them well during the pandemic.

Secondly, in recent years Middle Eastern countries led by the United Arab Emirates (UAE) and Saudi Arabia have made massive investments in information and communications technology (ICT) in order to reduce their dependence on oil revenues by creating dynamic, digitalised "knowledge economies".

As a result, manufacturers in the Middle East now have access to world-class technology to modernise and localise supply chains and production.

"Glocalisation" of supply chains and operations

Key global trends to watch

Around the world, digitalisation is critical to successful "glocalisation" strategies, as highlighted by a PwC survey in 2019¹¹ of 1,600 supply chain executives and decision-makers in 33 countries worldwide. Companies identified as "digital champions" that used advanced supply chain technologies achieved annual operational savings of 6.8%, well ahead of less advanced businesses. Critically, they also achieved greater transparency, flexibility and local asset utilisation.

COVID-19 has accelerated the drive by manufacturers to digitalise and increase automation to build resilient and truly connected local supply chains that can withstand external shocks. This effort extends to increased investment in areas such as data-driven forecasting or Al-based algorithms that can now be applied to demand planning. With no immediate end to the pandemic in sight, automation will be vital both in increasing supply chain and production efficiency, and in helping to mitigate safety measures in factories – such as social distancing – through the use of robotics.

At the same time, COVID-19 is forcing more manufacturers worldwide to question the validity of the traditional total cost perspective, which narrowly emphasises cost efficiency over other factors such as flexibility, supply chain resiliency, customer experience and geopolitical concerns. For example,

PwC's October 2020 Pulse survey¹² of US chief operating officers (COOs) found that the single-location manufacturing model is starting to lose its hold on executives with responsibility for supply chains.

Lastly, in a post-pandemic world where reliable, real-time data is essential for both business and health and safety reasons, we anticipate an emerging trend for greater supply chain and operational collaboration between companies – whether through sharing automation technology to devise innovative, rapid solutions to bottlenecks or joint sourcing of protective equipment to shield employees from the virus.

Amid these emerging themes, one fact is already clear: COVID-19 has ensured that the case for moving from global to "glocal" operations has gained unstoppable momentum.



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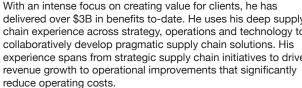


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delivered over \$3B in benefits to-date. He uses his deep supply chain experience across strategy, operations and technology to experience spans from strategic supply chain initiatives to drive





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About PwC

PwC has operated in the Middle East region for more than 40 years.

Collectively, our Middle East network employs in the region more than 6,000 people including 276 partners working from 23 offices (in 22 locations) across 12 countries: Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, the Palestinian territories, Qatar, Saudi Arabia and the United Arab Emirates.

We are one of the fastest growing PwC member firms worldwide and the largest professional services firm in the Middle East.

Our tailored solutions help clients to meet the challenges and opportunities of doing business in the Middle East market and beyond.

We have experience in industries including government, energy and utilities, financial services and banking, retail, construction and engineering, manufacturing, entertainment and telecoms.

Our clients in the Middle East include prominent public and private companies, governments, banks and family businesses.

There are over 100 members of staff from other international territories on secondment to our Middle East firm, meaning we bring global perspectives and the full extent of our worldwide network to the work that we do for our clients in the region.

Our regional network functions as one seamless practice unit structured on the basis of industry lines. This enables us to mobilise our industry specialists across the Middle East region, whenever and wherever needed.

About GMIS

The Global Manufacturing and Industrialisation Summit (GMIS) was established in 2015 to build bridges between manufacturers, governments and NGOs, technologists, and investors in harnessing the Fourth Industrial Revolution's (4IR) transformation of manufacturing to enable the regeneration of the global economy. A joint initiative by the United Arab Emirates and the United Nations Industrial Development Organization (UNIDO), GMIS is a global platform that presents stakeholders with an opportunity to shape the future of the manufacturing sector and contribute towards global good by advancing some of the United Nations Sustainable Development Goals.

The first two editions of the Global Manufacturing and Industrialisation Summit were held in Abu Dhabi, United Arab Emirates in March 2017, and Yekaterinburg, Russia in July 2019, respectively, with each edition welcoming over 3,000 high-level delegates from over 40 countries.

GMIS 2020, the third edition of the Global Manufacturing and Industrialisation Summit, will be held virtually as a sequence of Digital Series starting June 2020 followed by a virtual Summit in September 2020, and will focus on the theme of glocalisation.

To learn more about GMIS, please visit https://gmisummit.com/ and follow GMIS on Twitter: @GMISummit, Instagram: @gmisummit, and Facebook: @GMISummit.



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