



Supply Chains Under Tension

The Impact of COVID-19 on Global Value Chains and the Relocation of Operations from and within the Asia-Pacific Region



Singaporean-German Chamber of Industry and Commerce
Deutsch-Singapurische Industrie- und Handelskammer

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List of abbreviations

AANZFTA	ASEAN-Australia-New Zealand Free Trade Agreement
ACFTA	ASEAN-China Free Trade Agreement
AEC	ASEAN Economic Community
AJECF	ASEAN-Japan Economic Partnership Agreement
AKFTA	ASEAN-South Korea Free Trade Agreement
AIFTA	ASEAN-India Free Trade Agreement
APAC	Asia-Pacific
APIs	Active Pharmaceutical Ingredients
ASEAN	Association of Southeast Asian Nations
COVID-19	Coronavirus Disease
CPTPP	Comprehensive and Progressive Agreement for Transpacific Partnership
GDP	Gross Domestic Product
GVCs	Global Value Chains
ILO	International Labour Organization
KITA	Korea International Trade Association
MNCs	Multinational Companies
RCEP	Regional Comprehensive Economic Partnership
SMEs	Small and Medium-Sized Enterprises
WTO	World Trade Organization
WTO DSB	World Trade Organization Dispute Settlement Body

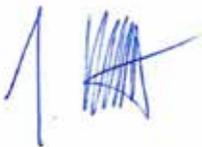
Foreword

The COVID-19 pandemic has had major effects on the dynamic and changing nature of globalization. The interruption of global supply chains on many levels has stirred up discussions about relocation trends in Asia and Europe. In an already complex environment of fast-growing economies, shifting supply chains and trade tensions, the question of whether the pandemic could act as a catalyst for relocation decisions deserves further investigation.

The Singaporean-German Chamber of Industry and Commerce (SGC) is excited to present our new study on the effects of the COVID-19 crisis on global supply chains, supported and funded by the Friedrich-Ebert-Stiftung (FES). We thank Robin Hoenig and Kai Dittmann for this insightful and far-reaching survey that provides a unique overview of the pandemic's impact and beyond.

The study offers an exceptionally comprehensive data set with responses from hundreds of companies, summarizes existing and planned operational and strategic response measures, and lays the foundation for a more nuanced discussion of the shifts in regional and global value chains. During public debates over reshoring initiatives, decoupling, protectionist trade policies, public health measures and geoeconomic shifts, it is more important than ever to take a closer look at the effects and factual developments on the ground.

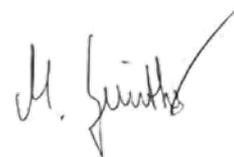
We are grateful to the 337 companies that took part in this survey. Their expert knowledge and hands-on, practical experience are the basis of this study. We also express our gratitude to the partner offices of the German Chamber Network in the Asia-Pacific region, who played a vital part in distributing the questionnaire.



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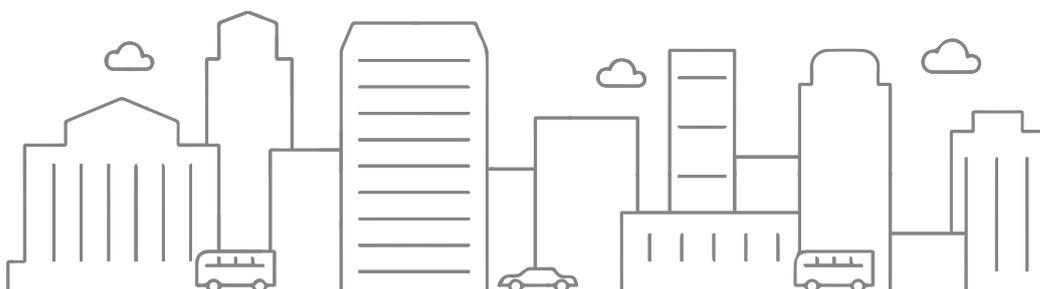
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About the Singaporean-German Chamber of Industry and Commerce (SGC)

The Singaporean-German Chamber of Industry and Commerce (SGC) is part of a network of 140 offices of the German bilateral Chambers of Commerce (AHKs) abroad in 92 countries. AHKs are institutions of German foreign trade promotion. The Association of German Chambers of Industry and Commerce e. V. (DIHK) coordinates and continuously develops the network of German Chambers of Commerce Abroad. They are proportionately funded by the Federal Ministry of Economics and Energy affairs (BMWi).

The SGC is a bilateral chamber and one of the largest national Business Chambers in Singapore with a membership of about 600 representatives from a variety of industries from Germany and Singapore. The SGC is a valuable and well-established networking platform and well connected with authorities in Singapore and Germany. Through its active industry committees SGC gives a voice to businesses. With its distinct service unit and trade fairs arms - DEinternational and Fairs & More respectively - the SGC builds a primary source for receiving reliable information on the German and Singapore business environment as well as bilateral trade relations. DEinternational serves clients in their business needs e.g. searching for business partners, organising business missions and business trips, finding staff members, and providing market analysis. DEinternational works in many areas such as energy efficiency, water management, Industrie 4.0, smart city development, research and many more.

In particular, we would like to thank the following German chambers in APAC for supporting this Project:



About Friedrich- Ebert-Stiftung in Asia



The Friedrich-Ebert-Stiftung (FES) is an independent non-profit organization headquartered in Germany. Founded in 1925, FES works to promote social democracy and dialogue, shape the economy of tomorrow and enhance cooperation for freedom and security.

In line with this commitment, FES strives to understand the trends of globalization, labour mobility and regional integration in order to promote change for more social justice, sustainable peace and economic development in the Asia-Pacific region and globally.

Being among the leading international think tanks, FES has offices and projects in over 100 countries. The Singapore-based FES Office for Regional Cooperation in Asia (ORCA) was established in 1969 and coordinates regional programmes in close collaboration with the FES country offices in the region.

At the crossroad where think tanks, academia and political practitioners meet, FES creates a public discourse for a just and sustainable economic and social order on national, regional and worldwide levels.

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Executive summary

Over the course of 2020 and into 2021, the COVID-19 crisis has significantly disrupted the global economy and highlighted key vulnerabilities of our complex global production systems. This has sparked national and international debates around the shifting nature of global value chains (GVCs) and whether companies should refocus their internationalization strategies.

To better inform the public debate and provide a factual foundation for future discussions, the Singaporean-German Chamber of Industry and Commerce, supported by the Friedrich-Ebert-Stiftung Office for Regional Cooperation in Asia, has undertaken a comprehensive survey to study the pandemic's impact on supply chains, business relocation activities and expectations of long-term trends. The 16-question survey collected responses in December 2020 from 337 companies that are part of the German Chamber Network in the Asia-Pacific region.

Main findings:

- ▷ Our study finds that, while the overall geoeconomic disruptions are severe, the changes in supply chains are more nuanced. Short-term direct relocations of production seem less likely in most industries. At the same time, we observe sector-specific shifts, especially in supplier networks to and within the Asia-Pacific region. A sizable share of respondents expect to witness relocation activities in the long-term future.
- ▷ In the long term, the trend expectations vary between different subregions: while companies in East Asia expect increased globalization, respondents from ASEAN countries expect increased regionalization. The majority of companies does not anticipate to see sustained decoupling, not least because of the complexity of global value chains.
- ▷ The survey results illustrate how the pandemic has undermined companies' ability to manufacture and operate. This is most notable in labour-intensive sectors, like manufacturing of textiles and clothing, where half of all companies had to reduce their production.
- ▷ Across all manufacturing sectors, the pandemic resulted in a decrease in output and, notably, in supply shortages, causing interruptions along different supply chains. Overall, 40 per cent of manufacturers experienced such delays.
- ▷ To address supply-chain vulnerabilities, the study finds that most manufacturers are currently in the process of or are planning to diversify their supplier network. There is a strong link between manufacturing delays due to shortages in supply and the identified need to diversify networks.
- ▷ Fewer manufacturers, mostly multinational companies (MNCs), seek to solidify supply-chain resilience by diversifying their production capabilities. This is particularly observed in the textile and clothing sector, the chemical industries, and pharmaceutical and medical devices. All three industries have a strong manufacturing footprint in China.
- ▷ Across different regions, the need to diversify the production base is most prevalent in China compared to other parts of the Asia-Pacific region and is coherent with the goal of shifting manufacturing capabilities in these sectors to strengthen supply-chain resilience.



- ▷ Regarding nearshoring and reshoring, the study finds that COVID-19 has not caused or augmented large-scale relocation activities from and within the Asia-Pacific (APAC) region in the year 2020. Furthermore, as the surveyed companies require, on average, a two-year lead time to move their operations out of their host market, short-term shifts are less likely. At the same time, there are examples for relocation decisions, which we will discuss.
- ▷ The survey shows that companies generally attach a lower importance to the impact of the corona crisis relative to other factors that drive relocation, such as economic framework conditions.
- ▷ Beyond COVID-19, the study identifies two main relocation trends. The first trend is continued offshoring from Germany and the EU to the APAC region. In particular, financial services and the chemical industries are increasingly expected to gain an even bigger foothold in the region.
- ▷ The second trend captures relocation activities within Asia. Much of this is expected to centre around the ASEAN economies, suggesting that Southeast Asia will become increasingly important in global value chains.
- ▷ In light of these trends, the study also reveals that further globalization and regionalization are expected to unfold in the years to come. In particular, ASEAN-based respondents anticipate that value chains will become increasingly regional. This is underpinned by regional economic integration initiatives, such as the ASEAN Economic Community (AEC) and the importance that respondents assign to free trade agreements such as the Regional Comprehensive Economic Partnership (RCEP).
- ▷ The data collected identifies an important difference between manufacturers of essential and non-essential goods. Manufacturers of essential goods expect value chains to become increasingly regional, while manufacturers of non-essential goods expect further globalization to unfold. The pandemic has underscored the importance of robust supply chains for critical goods and the need to reduce time-to-market leads. Regionalization allows for the latter and explains why manufacturers of essential products expect an increasing regionalization of value chains.

1. Introduction

Between 2017 and 2018, Bayer invested around 95 million euros into a production plant in Cimanggis in Indonesia. This plant manufactures health care products for 32 countries worldwide, including for Europe (Jakarta Post, 2019). Likewise, in 2018, the speciality chemicals company Evonik opened its first research hub in Singapore and thereby internationalized its research into the areas of functional surfaces and additive manufacturing (Evonik, 2020). Both examples capture offshoring¹, a relocation trend that has been observed for many years.

At the same time, we see relocation activities in the opposite direction: In 2019, Gtech, a UK-headquartered manufacturer of vacuum cleaners, invested 10 million pounds (12 million euros) in its plant in Worcestershire to reshore manufacturing activities previously performed by contractors in China (Woods, 2018). Sennheiser, a German manufacturer of headphones and microphones, enacted a related but different relocation policy with its nearshoring activity. With plants located in Germany, Ireland and the United States, as well as outsourced manufacturing in China and Japan, the company decided to relocate its operations from China to Bulgaria by investing 10 million euros into a factory in Ghimbav in 2018 (Bursa, 2018).

These contradictory relocation trends have become a political talking point in Europe and Asia, and there is a vast body of literature discussing offshoring, reshoring and nearshoring trends from various vantage points. COVID-19 has given this topic renewed traction as the pandemic has highlighted key vulnerabilities of complex production systems, unveiled the limited degree of self-sufficiency of many countries for essential products, and has raised the question of whether companies should reconsider their internationalization strategies.

This study aims to evaluate the dominant relocation trends in the Asia-Pacific region and examines the question whether or not the global pandemic with its multifaceted repercussions has changed or augmented offshoring, reshoring and nearshoring activities. Based on a comprehensive survey conducted with member companies of the German Chamber Network in the Asia-Pacific, we seek to analyze three overarching topics: (1) the impact of COVID-19 on global value chains, (2) the impact of COVID-19 on relocation activities from and within the APAC region, and (3) long-term relocation trends beyond the pandemic.

The publication is roughly structured along a time scale. Chapter 2 sets the stage by very briefly describing past trends of supply-chains expansion in the Asia-Pacific region and the recent relocation developments in the context of the US-China trade war. Chapter 3 gives an overview of the survey respondents to provide the reader with a foundation for the following analysis. In Chapter 4, the direct, indirect and demand impacts of COVID-19 as well as the trade and investment risks for companies will be described to offer a comprehensive overview of the extent of the disruptions. Chapter 5 will take a closer look at the responses by firms to these disruptions and outline the risk mitigation measures underway. Chapter 6 will take a more medium-term view at the feasibility, decision factors and expected expanse of relocations as a consequence of COVID-19 and beyond.

Finally, Chapter 7 and Chapter 8 focus on the long-term shifts in global value chains and overarching geoeconomic developments. By analyzing the large-scale expected shifts of different sectors, subregions and company sizes (from start-ups to multi-nationals), this study provides an outlook for the developments to come.

¹ “**Offshoring**” describes the relocation of business activities from the home market to far-away countries. “**Reshoring**” is the process of bringing back those operations to the home country. “**Nearshoring**” describes the relocation of business function to nearby countries (Müller-Dauppert, 2016).

2. Value chain trends in the Asia-Pacific region

The survey conducted for this study and its findings have to be read in the larger context of supply-chain developments in the region. While the COVID-19 pandemic is an extraordinary shock to the system of global value chains, it is unfolding against the backdrop of larger relocation trends in the region. This section describes the past trends and recent developments in broad strokes to put the impact of the pandemic into context.

Global value chains in sectors such as apparel and footwear, automobiles and agri-food industries develop in a sector-specific manner and vary in their degree of complexity. However, they all involve the movement of raw materials and intermediate goods through a series of countries where, in each one, a new value is defined, coordinated and implemented (United Nations, 2015).

GVCs are becoming increasingly regional. This is because much of the value-added distribution tends to occur within regional blocks that Felipe (2018) defines as “Factory Europe”, “Factory North America” and “Factory Asia”. In Europe, approximately three-quarters of intermediate products are regionally sourced.

In mid-1980s Asia, the development of regional value chains was spearheaded by Japanese companies seeking raw materials from Asian markets (UNCTAD, 2015). Supplier networks were established in two resource-abundant countries: Malaysia and Indonesia. Facilitating value chains, Singapore took on the role of a trade-and-logistics hub, which the city-state has maintained to this day. While the value chains and trade routes were being solidified, further regional linkages were being formed. In particular, the Republic of Korea and Thailand started to integrate into value chains and to supply Japan

with intermediate products (APEC, 2017b, Litsareva, 2017). As these economies continued to develop, they increasingly became a target for consumer and intermediate goods. Intermediate goods were used to support further industrialization. This attracted foreign direct investments from Japan and Western economies fuelling rapid economic growth (APEC, 2017b), but also led to vastly different outcomes regarding inequality across the region (Huang et al., 2019).

China’s rise as the global factory and ASEAN in regional value chains

When China acceded to the World Trade Organization (WTO) in 2001, regional value chains started to evolve. While Taiwan and Korea already possessed linkages to China, Japan and Western companies began to enter the market to take advantage of China’s abundant and low-cost labour. The country emerged as a centre for assembly and low-cost manufacturing (Athukorala & Ravenhill, 2016). With its newfound position as the global factory, China started to import intermediate products from Taiwan, Korea and the ASEAN economies. This enhanced regional value chains and also fostered industrial specialization. Resource-rich countries, such as Indonesia, emerged as commodity suppliers in regional trade patterns. By the mid-2000s, most East Asian and Southeast Asian countries were integrated into regional production networks.

Since the 2008 global financial crisis, value chains have gradually continued to restructure in Asia. The predominant trend was the relocation of low-cost manufacturing from China to Southeast Asia and South Asia and was primarily driven by rising labour costs in China.

Between 2004 and 2014, real wages in the Chinese manufacturing sector grew by 176 per cent. In particular, low-cost manufacturing witnessed high wage growth, including textiles (242 per cent), furniture (210 per cent), processing timber (227 per cent) and food processing (216 per cent). This was partially attributed to the introduction of China's minimum wage system in 2004, under which provincial governments were obliged to adjust the minimum wage at least once every two years (Xia, 2016). The International Labour Organization (2019) estimated that the average minimum wage tripled in nominal terms between 2004 and 2014.

The appreciation of the renminbi led to further pressure on cost structures in China. This was resolved when the People's Bank of China permitted greater nominal exchange rate flexibility vis-à-vis the US dollar (Cui & Lu, 2018). The state-designated economic rebalancing of China reflected in the National 12th Five Year Plan (2011-2016), coupled with the government's increased emphasis on industrial upgrading for high-value production, further encouraged the relocation of low-cost, labour-intensive manufacturing from China. Its industrial base gradually diversified and moved up the value chain into mid-tech industries, such as cellular phones and optical instruments, as well as capital-intensive sectors, such as organic chemicals and fertilisers. As a result, China's share of the global capital goods market rose from 5 per cent to 20 per cent between 2007 and 2016. Simultaneously, China became increasingly important in the exports of intermediate products, with its global export volume surging by 59 per cent (World Bank, 2020).

ASEAN positioned itself as an exporter of intermediate products (Han, 2019) and became an integral part of Asia's value chains. The most notable example was the electronics sector. In 2017, ASEAN economies collectively accounted for 20 per cent of China's total import of intermediate electronics inputs. ASEAN members have specialized in different segments along the regional electronics value chain (Monetary Authority of Singapore, 2019). For instance, Thailand's role in the supply chain was the production of parts, especially storage components for smartphones and laptops. In contrast, the Philippines specialized

in the production of intermediate electronic goods, notably hard drives and semiconductors (APEC, 2017a).

Disruption of global value chains: The US-China trade war

While value chains and production networks are constantly changing, they are subjected to disruptions that accelerate their restructuring. Prior to COVID-19, the US-China trade war was the most notable disruption in Asia and it continues to have multi-faceted repercussions. In mid-2018, US President Trump imposed customs duties on China for its alleged unfair trade practices (Moosa, et al., 2020). Since then, the two countries have been embroiled in countless back-and-forth negotiations, tit-for-tat tariff escalations, introduced technology restrictions and brought several cases to the WTO Dispute Settlement Body (Brown & Kolb, 2020). These tariffs escalations have resulted in a significant surge of customs duties between the two parties. US tariffs on Chinese products increased on average from 3.1 per cent to 12 per cent between January 2018 and January 2019. As tensions further heightened in the subsequent months, US tariffs reached an all-time high in September 2019, with customs duties averaging around 21 per cent for Chinese imports. China's retaliatory tariffs surged from an average of 8 per cent in January 2018 to 21.8 per cent within 20 months (Brown, 2020).

With China's tight integration into regional value chains, the tariff escalations have impacted the entire APAC region. As many value chains end in China, backward linkages and effects of the US tariffs have rippling effects across different countries and sectors in the region. This is because exports from China contain tangible inputs (raw materials and components) as well as intangible ones (services) from East and Southeast Asian economies (Oerstroem & Moeller, 2018). For instance, 78.9 per cent of exports from Korea to China were intermediate goods in 2018. A study conducted by the Korea International Trade Association (KITA) found that due to the US-China tariffs, China's imports of intermediate goods from Korea fell by 5.9 per cent in that year (KITA, 2019).

The following overview of companies that have publicly stated that they would consider moving manufacturing outside China gives an impression of the potential scale and impact of the ongoing trade tensions on relocation activities.

Table 1: Press reporting about companies considering to relocate from China during the US-China trade war

Company	Industry	Origin	Relocation options	Source
Hasbro	Toys	USA	Vietnam, Indonesia, Mexico	CNBC (Kim, 2019)
Samsung	Electronics	Republic of Korea	Vietnam, India	SCMP (Huifeng, 2019)
Alphabet Inc. – Google	Electronics, Tech	USA	Taiwan, Malaysia, Thailand, potentially Vietnam	Nikkei Asia (Cheng & Li, 2019), Nikkei Asia (Cheng & Li, 2020)
Hon Hai Precision Industry (Foxconn Technology Group)	Electronics, Tech	Taiwan	Vietnam, India	Bloomberg (Wu, 2019)
Dell	Electronics, Tech	USA	Potentially Taiwan, Vietnam, Philippines	USA Today (Zhang, 2019)
Nintendo	Electronics, Video games	Japan	Vietnam	Nikkei Asia (Kawasaki, 2019)
TCL	TV, Electronics	China	Vietnam	CNBC (Li, 2019)
Harley-Davidson	Automotive	USA	Thailand	Nakayama (2019)
Apple	Electronics, Tech	USA	Vietnam, Thailand, India	USA Today (Zhang, 2019), CNBC (Kharpal, 2020)
Microsoft	Electronics	USA	Vietnam	CNBC (Kharpal, 2020)

Although the US and China successfully agreed to a Phase 1 trade agreement, tariffs are still largely intact, and the trade conflict is far from resolved. Whilst the US has committed to cut half the tariffs it imposed on 120 billion US dollars' worth of goods, the 25-percent tariffs on another 250 billion US dollars' worth of goods remained unchanged (Brown, 2020). To date, there are no talks for a Phase 2 agreement yet. Although the new Biden administration has been clear in its opposition to broadly applied tariffs, it seems likely that it will maintain them, at least in the short term. With prevailing high tariffs, relocation effects may continue in the future, potentially causing further restructuring of value chains in Asia.

Diversifying supply chains: Germany's and the EU's Indo-Pacific strategies

In light of the ever-growing importance of the Indo-Pacific region, defined by the European Council (2021) as the “region spanning from the east coast of Africa to the Pacific island states”, for global trade, commerce and the promotion of the rules-based international order, Germany has published Policy Guidelines for the Indo-Pacific Region in September 2020, along with similar strategic documents

put forward by France and the Netherlands. The guidelines express concern over “deglobalization” trends in the context of COVID-19 and call for the diversification of supply chains (Auswärtiges Amt, 2020). In April 2021, the European Council adopted conclusions on an EU cooperation strategy. Among the goals formulated in the 9-page document are an open and fair environment for trade and investment, reciprocity, strengthening of resilience and promotion of connectivity. The “diversification of supply chains should contribute to the resilience of the European economy, especially for the most sensitive industrial ecosystems, and to the reduction of strategic dependencies on critical raw materials” (European Council, 2021). In its conclusions, the Council also highlighted the importance of safe and diverse pharmaceutical and health-related industrial supply chains. It is expected that a more detailed Joint Communication on the Indo-Pacific will be presented by the High Representative for Foreign Affairs and Security Policy and the European Commission in September 2021.

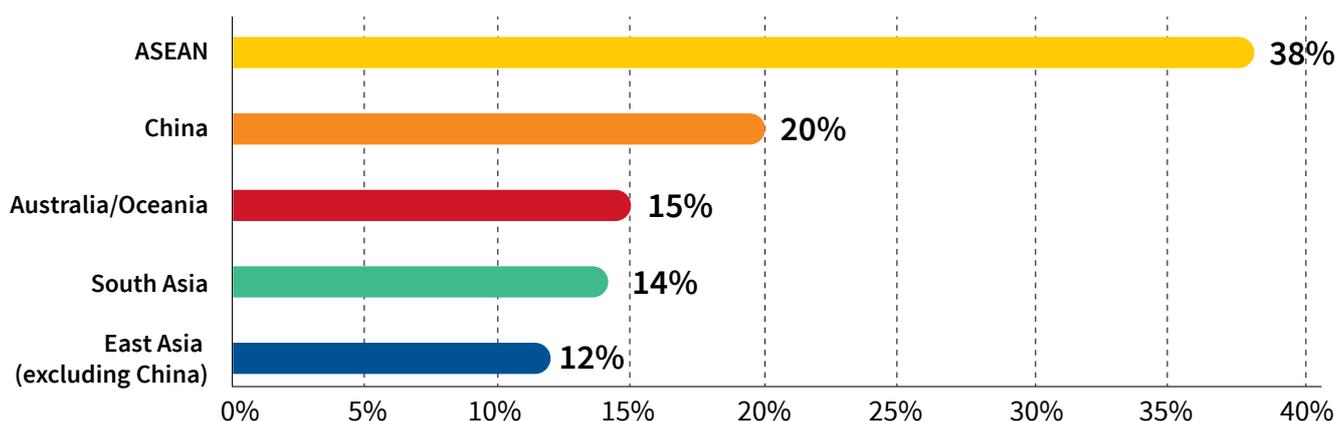


3. Regional survey: Respondents

To understand the impact of COVID-19 on global value chains, a 16-question survey was designed and distributed across the German Chamber Network in the APAC region between 5 and 21 December 2020, gathering the answers from 337 participants. The majority of respondents were small and medium-sized enterprises (SMEs) (58 per cent), while 39 per cent of respondents were MNCs and 3 per cent of respondents were start-ups. The relative majority of respondents in the manufacturing sector were in the

machinery sector (10 per cent) or automotive (9 per cent). For services, the relative majority of companies were law firms and consultancies (9 per cent) or transport and logistics companies (9 per cent). 38 per cent of respondents predominantly operate in ASEAN, while 20 per cent are China-based. 15 per cent of respondents operate in Australia/Oceania, 14 per cent in South Asia, and 12 per cent in East Asia excluding China (see Appendix).

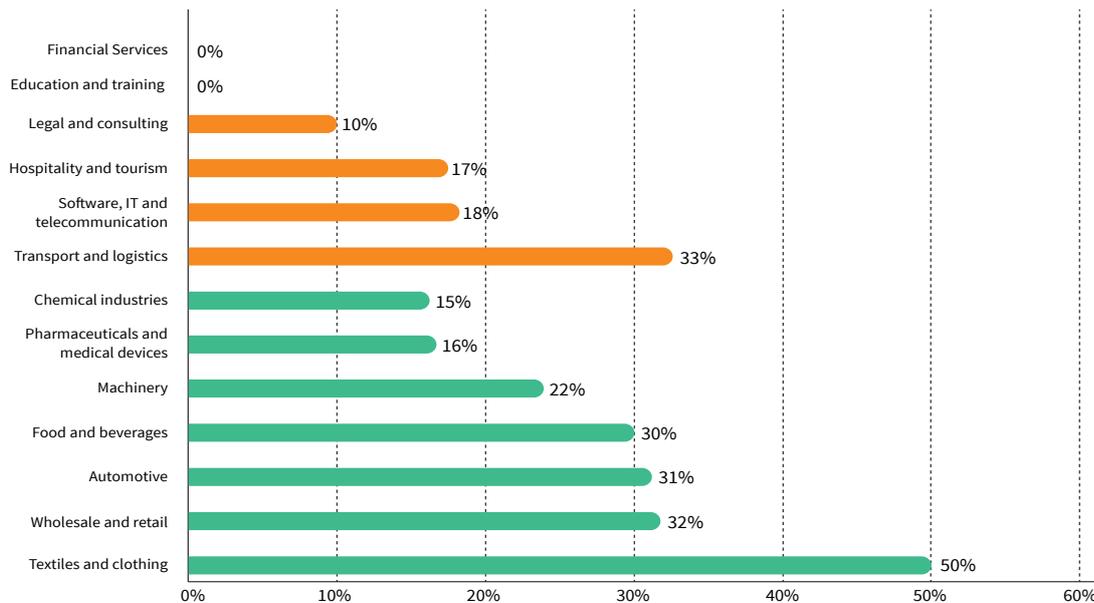
Which Asian region or country are you primarily operating in?



4. Impact of COVID-19 on value chains

We cluster our analysis along four criteria corresponding with the OECD (2020) framework: (1) direct impacts; (2) indirect impacts; (3) demand impacts; and (4) trade and investment policy risks of the pandemic on GVCs.

Graph 1: Inability to work or manufacture at full capacity due to COVID-19 measures



Direct impact on GVCs

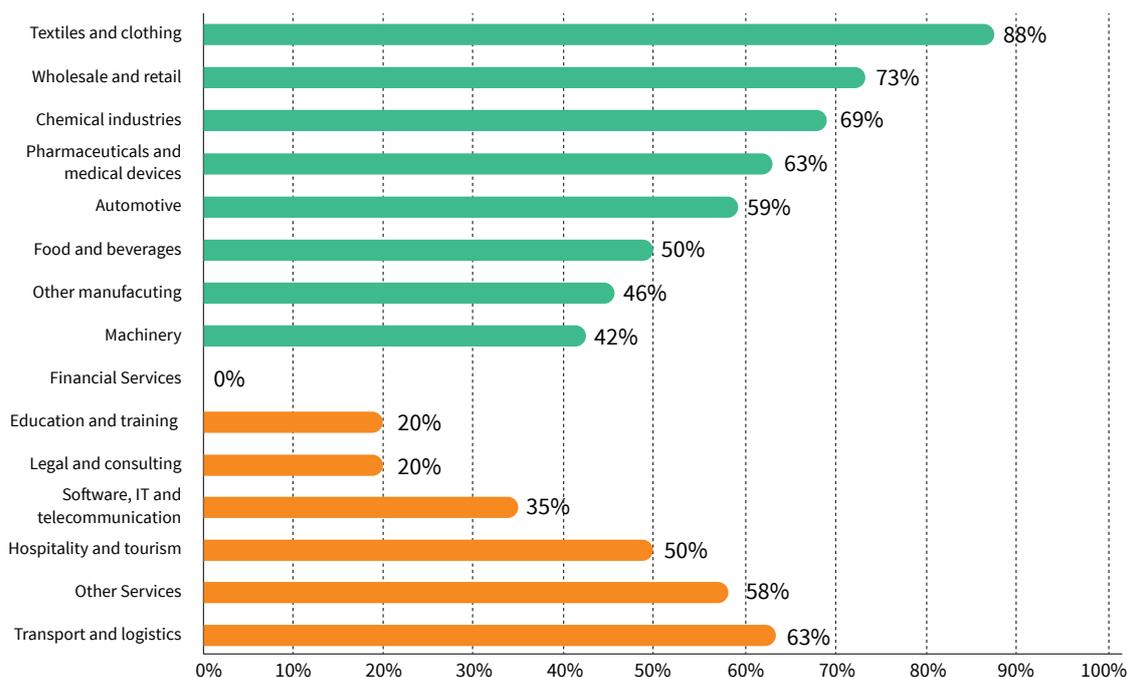
All over Asia, production and provision of services were interrupted, reduced or stopped due to public-health measures, such as enforced social distancing rules or lockdowns. These direct impacts of COVID-19 are not specific to GVCs per se but rather depend on the locations where the virus had spread (OCED, 2020). 25 per cent of respondents across APAC indicated that they have been unable to manufacture or operate at full capacity due to the COVID-19 related measures (see Appendix). The inability to manufacture at full capacity was more widespread than the inability to provide or deliver services. In manufacturing, the textile and clothing sector (50 per cent), as well as companies that produce for the wholesale and retail sector (32 per cent), were among the most affected (see Graph 1). Both industries are labour-intensive – especially the garment sector, which relies heavily on manual labour in the sewing, trimming, and assembly processes, often in confined and crowded spaces. Under these working conditions, factory shutdowns and social distancing rules have had a more significant adverse effect on output than in other industries. Our results are coherent with

the findings of other studies: In Bangladesh, 43 per cent of suppliers are currently operating with less than 50 per cent of their pre-pandemic workforce, while in Vietnam, factories have reopened at 50 to 60 per cent capacity (ILO, 2020). More capital-intensive industries, such as pharmaceuticals and medical devices (16 per cent), are less affected by the pandemic's direct effects as they require less manual labour to produce. In services, one third of transport and logistic companies (33 per cent) found their operations compromised by COVID-19. As transport and logistics firms move products across-border, COVID-related border policies undermine their ability to operate at full capacity. Most countries in the region have imposed a 14- or 21-day quarantine rule on international ships upon arrival, creating disruptions to the normal operation of cargo liner shipping services. The extended duration for completion of a round trip have led to reductions in the frequency of port calls and an increase in shipping costs (UNESCAP, 2020).

Indirect impact on GVCs

Indirect impacts encompass disruptions to international transport networks and to supply-chain linkages (OCED, 2020).

Graph 2: Sectors experiencing disruptions to international logistics



A) Disruptions to international logistics

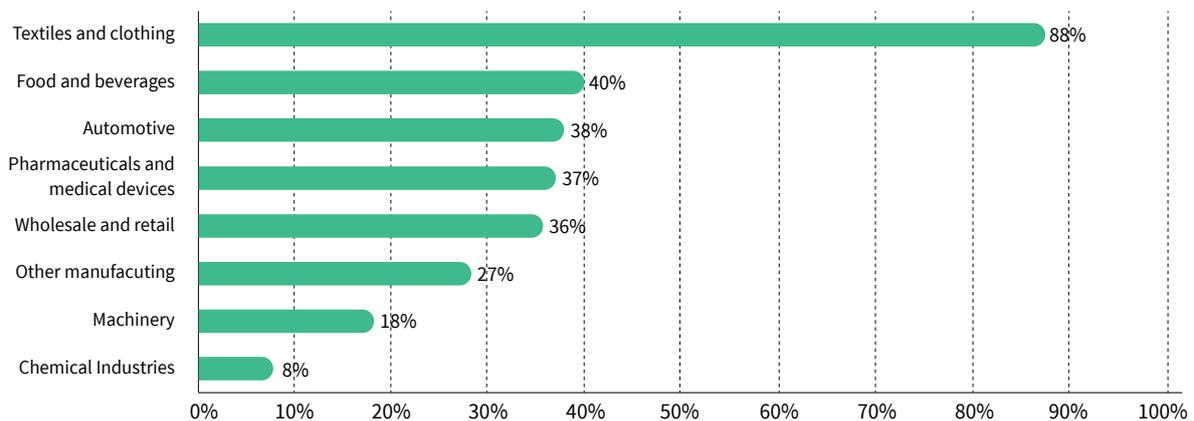
In line with the disruption experienced in the transportation and logistics sector, COVID-19 has severely constrained international air travel, resulting in a drop in air cargo capacity, creating logistics bottlenecks. According to Agility (2020), cargo capacity fell by 20 per cent compared to 2019. Also, customs clearance has been disrupted by COVID-19, leading to delays in the cross-border movement of goods, thereby undermining the efficiency of international transport networks. The survey data confirms this, as 49 per cent of respondents indicated that they experienced disruptions to international

logistics (see Appendix). A data breakdown by sector reveals that these disruptions have affected all manufacturing sectors. For instance, 63 per cent of companies in the pharmaceutical and medical device sector have reported disruptions in logistics. This is because the pharmaceutical industry mainly relies on smaller volume shipments by air to distribute products (EU Commission, 2020).

B) Supply-chain linkages: Manufacturing delays due to shortages in supply

Most manufacturing sectors rely on a complicated supplier network that can stretch across different countries and continents. Disruptions caused by COVID-19 in one location can have impacts on manufacturing elsewhere through backward linkages.

Graph 3: Manufacturing delays due to shortages in supply



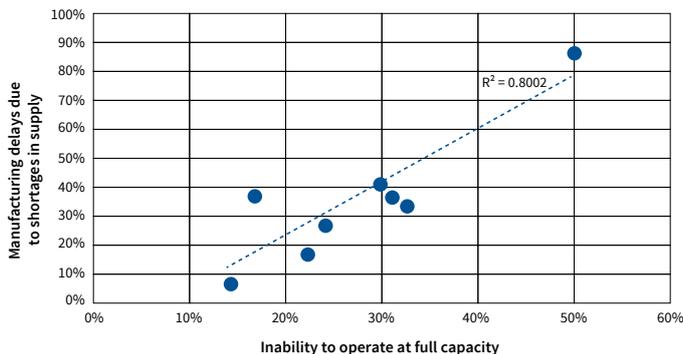
These disruptions were evident at the beginning of the COVID-19 crisis, in the first quarter of 2020, when the shutdown of Chinese factories led to worldwide shortages in components and exposed supply-chain vulnerabilities in several industries (Cai & Luo, 2020). This was first and foremost observed in the textile and clothing sector as many companies rely on China as an input supplier. Bangladesh-based garment manufacturers procure almost 70 per cent of woven fabric from China, which is also the source for 90 per cent of fabrics for Myanmar's garment sector (Reuters, 2020). With the factory shutdowns in China, the textile, apparel, and garment supply chains experienced drastic shortages in raw material supplies. This caused manufacturing delays for 88 per cent of respondents in the textiles and clothing sector (see Graph 3). Reasons for prolonged delays in manufacturing and shortages in supply can be attributed to social distancing rules in supplier factories that constrain the industry's output. These shortages then ripple through the supply chain, creating bottlenecks in raw material supplies in the textile value chain.

Furthermore, 38 per cent of manufacturers in the automotive industry experienced manufacturing delays due to shortages in supply (see Graph 3). The automobile industry relies heavily on global value

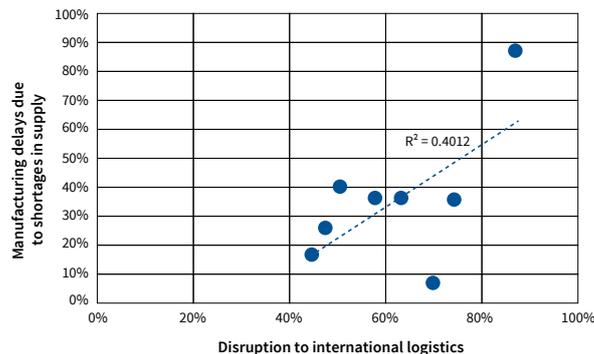
chains as the manufacturing is complex, multi-layered and internationally fragmented. When the pandemic spread, the supply chains of automotive manufacturers went down worldwide. The bulk of the supply chains resumed when China returned to work. However, as lockdowns in the EU and the US had taken down the flow of essential high-tech components that are only produced in those respective markets, manufacturers in China found their operations hamstrung since they were missing these crucial parts (EU Chamber of Commerce in China and MERICS, 2020). In turn, this led to manufacturing delays in the reverse direction.

What has been described above appears to be a consistent finding across all manufacturing sectors. The scatterplot depicted in Graph 4(a) exhibits a strong, positive correlation between the inability to manufacture at full capacity and the manufacturing delays due to shortages in supply. With an R-square of 0.4012, the association between the disruptions to international logistics and manufacturing delays due to shortages in supply is only of moderate strength. Therefore, manufacturing delays due to supply shortages are linked to the ability to manufacture at full capacity rather than disruptions to international logistics.

Graph 4a: Manufacturing delays due to shortages in supply vs Inability to operate at full capacity



Graph 4b: Manufacturing delays due to shortages in supply vs Disruption to international logistics

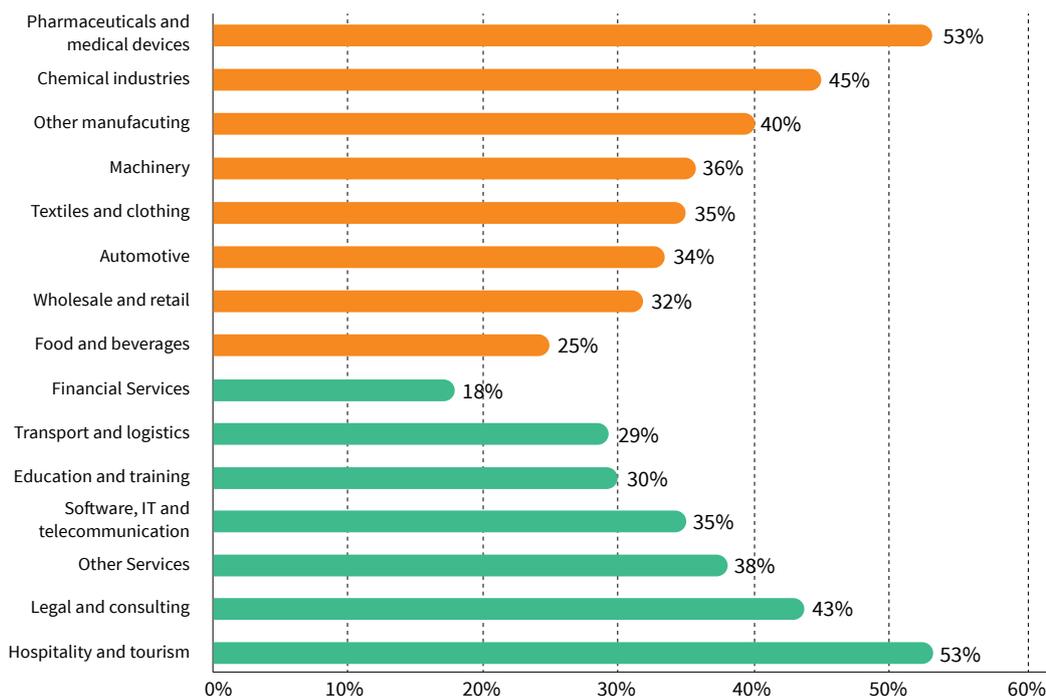


Demand impact

This relates to demand shocks, whereby production continues but fewer consumers are willing to buy the products (OCED, 2020). An example is cosmetics, where the reality of working from home, social distancing and wearing masks has reduced the demand for make-up and fragrances (Gerstell, et al., 2020). A demand impact can also result from a surge (e.g. an increase in demand for personal protective equipment) or shift in demand (e.g. ordering home delivery instead of dining at

restaurants). Demand volatility affects GVCs by transmitting shocks through demand channels. Lower or higher demand for final products will result in less or more demand, respectively, down the value chains for raw materials, intermediate products and services. Demand volatility is a crucial challenge for companies, and 37 per cent of respondents indicated that they experienced an overall decrease in demand for productions and services (see Appendix).

Graph 5: Respondents experiencing a decrease in demand for product and services



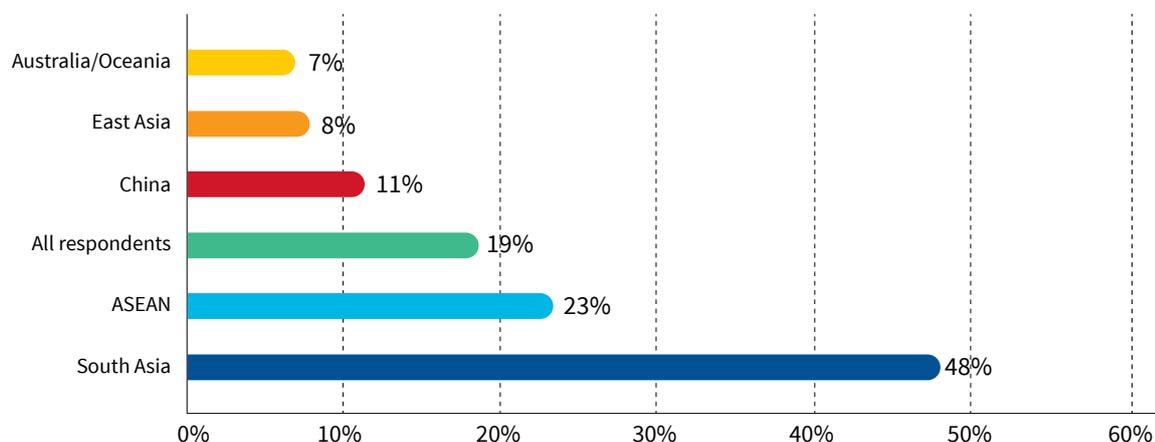
A sectoral analysis shows that both the manufacturing sector (39 per cent) and the service industry (36 per cent) faced adverse demand shocks. In manufacturing, the highest decrease in demand has occurred in the pharmaceutical and medical devices sector (53 per cent). This may be attributed to the falling numbers of routine hospital visits and medical check-ups that were observed in 2020 for non-COVID-19-related cases. The Indonesian Pharmaceutical Companies Association (GP Farmasi), for instance, reports that pharmaceutical companies in Indonesia experienced a decline of 50 to 60 per cent in demand for drugs in the first two quarters of 2020 as people increasingly avoided visiting medical facilities (Rahman, 2020). The global biopharmaceutical company Gilead Science saw a drop in demand of 47 per cent in its global sales of hepatitis C drugs (CNBC, 2020).

The 45-per-cent decline in demand of the chemical industry is linked to the sector's position in different value chains. 96 per cent of the world's manufacturing supply depends on active chemical inputs. A drop in manufacturing output and demand for cars, pharmaceuticals, clothing and footwear in turn diminished the demand for chemicals. According to the German Chemical Industry Association (VCI), the temporary increase in demand for disinfectants,

soaps and cleaning agents was not high enough to offset the downturn in sales across other sectors, resulting in a 6-per-cent annual downturn in sales (VCI, 2020).

The hospitality and tourism sector has experienced the most significant adverse demand shock among services (53 per cent). This is due to the border restrictions that have diminished the influx of foreign tourists across most countries in Asia. For instance, Vietnam's total foreign tourist arrivals amounted to 3.68 million in 2020, 80 per cent less compared to 2019 (Vietnamplus, 2020). Despite the drop in international tourists, 47 per cent of respondents did not experience an adverse demand shock. This may be because they can leverage domestic tourism. This is evident in Vietnam, where domestic tourism has been flourishing since May 2020 (ADB, 2020). Targeting the domestic market may therefore allow companies to partly mitigate the adverse demand shock caused by foreign visitors and customers' absence.



Graph 6: Additional delays in obtaining government authorization

Trade and investment policy risks

There are trade and investment policy risks associated with COVID-19 that impact GVCs. Since the pandemic's outbreak, the WTO has counted 264 new measures (i.e. export bans) that affect trade in goods. 19 per cent of companies have indicated that they are experiencing delays in obtaining government authorization. Such delays are considered non-tariff barriers as they inhibit the cross-border flow of goods and provision of services. The WTO Agreement on Import Licensing Procedures stipulates that agencies handling licensing should not take more than 30 days to deal with an application – 60 days when all applications are considered at the same time (WTO, n.d.). A regional breakdown reveals that delays in obtaining government authorization are particularly prevalent in South Asia (48 per cent) and across ASEAN (23 per cent), while only a few companies in Australia/Oceania (7 per cent) and East Asian countries (8 per cent) have encountered such issues (see Graph 6). The lockdowns and social distancing rules apply not only to companies, but also to the public sector. Certain government

agencies cannot work at full capacity (such as customs authorities), which may be why delays in government authorization are increasingly occurring since the pandemic.

Some countries in APAC, including the Republic of Korea, Australia, New Zealand, and Japan, have developed strong e-government capabilities and digitalized government services, while other governments, such as India and Bangladesh, are less developed in this regard (see table 2). This may explain why respondents from East Asia and Australia/Oceania are experiencing fewer delays in government authorizations than in South Asia, because the effects of COVID-19 are less disrupting for digitalized environments.

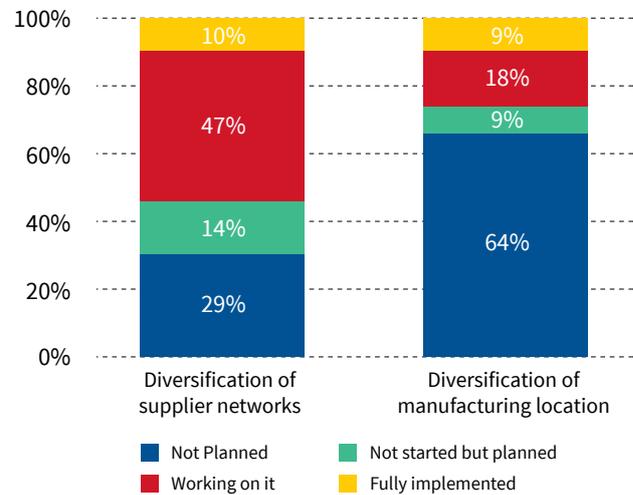
5. Resilience of GVCs and risk mitigation

During the COVID-19 crisis, companies were required to improve their robustness and resilience at firm level and learn how to operate effectively under the new normal to stay competitive. The resilience of supply chains can be defined as the ability to return to normal operations over an acceptable period of time, post disruptions, while robustness is the ability to maintain operations during a crisis.

In the manufacturing sector, diversifying the supplier networks is one way to mitigate risks and improve a supply chain's robustness and resilience. There should be redundancy in suppliers (or supplier diversification) so that in case of failure of one, others can step in and provide the required inputs and production does not experience any delays (OCED, 2020).

Manufacturers can also diversify the number of their manufacturing locations. The risk of fully localizing production is that a disaster can occur within a domestic economy (OCED, 2020). If this disaster affects the manufacturing side, production during the crisis can no longer occur. Therefore, diversifying the number of manufacturing locations can create robustness as it provides companies with more flexible production patterns. This can be illustrated with the example of Samsung Electronics, which produces its latest generation of smartphones within the Republic of Korea, while older generations are manufactured abroad. The main plant is near the city of Daegu, the Korean epicentre of COVID-19 at the end of February 2020. When the disease was discovered among its workers, the factory immediately halted

Graph 7: Implementation of strategies to build resilience and robustness in manufacturing



all activities for several days. Samsung then decided to switch part of its smartphone production to Vietnam, where it operates other factories and was able to uphold its manufacturing capabilities.

This part of the study scrutinizes whether manufacturers have already successfully diversified their manufacturing locations and supplier networks, and whether they see the need to do so in the years to come.

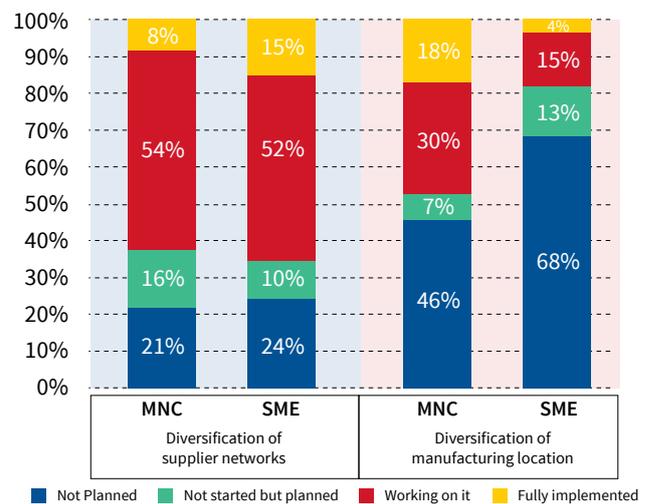
The implementation of strategies to ensure supply chain robustness and resilience

To date, only 10 per cent of respondents have successfully diversified their supplier networks, while another 47 per cent are currently working on it (see Graph 7). This is because diversifying the number of suppliers can be time-intensive and create additional costs. Firms need to invest in multiple suppliers to ensure that parts and components from different manufacturers fit together (OCED, 2020). Setting up a new production line is equally time-consuming. This section assesses respondents' ability to relocate their operations and finds that several manufacturing sectors require on average a minimum of two years to relocate. These longer lead times may explain why merely 9 per cent of manufacturers have successfully diversified their manufacturing locations.

The costs associated with building new production capabilities are usually very high as companies have to undertake major capital investments (purchasing new machinery, hiring new manpower, etc.). These cost considerations may explain why a vast majority of respondents (64 per cent) are not planning to diversify manufacturing location (see Graph 7). Therefore, to strengthen supply chain robustness and resilience, the majority of manufacturers diversify or plan to diversify their supplier networks and are less inclined to diversify their manufacturing capabilities. For GVCs in the Asia-Pacific, this means that, while the direct production capacities are subject to limited change, the flow of goods between suppliers and producers could induce larger changes in the region.

A data breakdown by company size provides further insights. There is little variation among MNCs and SMEs regarding the diversification of supplier networks. Irrespective of company size, this is the

Graph 8: Implementation of strategies to build resilience and robustness in manufacturing by company size



predominant strategy to build up supply chain robustness and resilience. It stands in contrast to the variation observed among MNCs and SMEs regarding the diversification of their manufacturing location. While more than half of the MNCs have either successfully diversified their manufacturing base or are in the planning stages, the majority (68 per cent) of SMEs are not planning to pursue this strategy, probably because MNCs tend to have more of the resources and experience necessary to diversify manufacturing capabilities.

Robustness and resilience through the diversification of the supplier networks

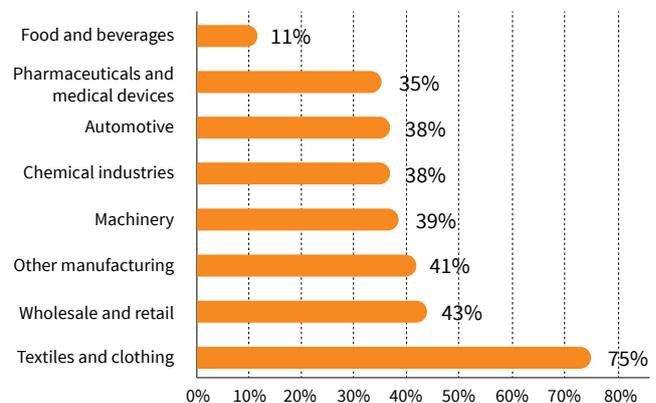
40 per cent of manufacturers see the need to diversify their supplier network in response to COVID-19.

The data reveals a strong, positive correlation between having experienced manufacturing delays due to shortages in supply and the need to diversify the supplier network (see Graph 10).

This is observed in the textile and clothing sector. A majority (88 per cent) of textile and clothing manufacturers have experienced manufacturing delays due to shortages in supply. In turn, a majority of respondents are seeking to diversify their supplier networks (75 per cent) (see Graph 9). The textile and clothing sector extensively sources from China and COVID-related disruptions have exposed the overdependency on raw materials and intermediates from the country. This is a time-sensitive industry with relatively short lifecycles (UNCTAD, 2020). Having uninterrupted access to necessary raw materials and intermediate products is pivotal in their industry's business model.

Likewise, 38 per cent of respondents in the pharmaceutical and medical-device sector have experienced manufacturing delays due to shortages in supply, and 35 per cent see the need to diversify their supplier networks (see Graph 9). An assessment of the global pharmaceutical value chains provides a convincing explanation. The global production of active pharmaceutical ingredients (APIs), essential components for manufacturing medicines, is regionally concentrated in just a few Indian and Chinese provinces and industrial parks. 80 per cent of APIs are sourced from India and China. The two countries account for 60 per cent of the world's production of paracetamol and 90 per cent of the

Graph 9: Need to diversify supplier networks

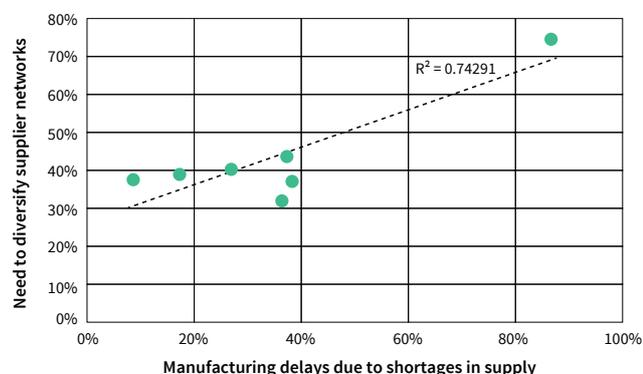


world's production of penicillin. It is also noteworthy that the Indian pharmaceutical industry relies on China for almost 70 per cent of the APIs for its medicines, making China critical in the global pharmaceutical value chain (Vyas et al., 2020).

The food and beverage sector is an outlier in this analysis. 40 per cent of respondents indicated that they faced manufacturing delays due to shortages in supply, but only 11 per cent saw the need to diversify their supplier network. This suggests that delays in manufacturing do not stem from a fragile supplier network. Instead, restrictions on labour mobility and social distancing rules may account for this. Seasonal and migrant workers face severe immigration restrictions for planting and harvesting in the fruit and vegetable sector. This, in turn, has led to bottlenecks in supplies along the food processing value chain (OCED, 2020). The survey data corroborates this, as 30 per cent of food and beverage manufacturers have asserted that they cannot manufacture at full capacity due to COVID-19 restrictions (see Graph 10).

² Data from the food and beverage sector was excluded from the analysis as this industry presented as an outlier. Therefore, the data in the scatterplot captures the remaining manufacturing sectors. This accounts for 174 respondents. The results in the food and beverage sector are discussed separately on page 23.

Graph 10: Manufacturing delays due to shortages in supply vs. need to diversify supplier networks

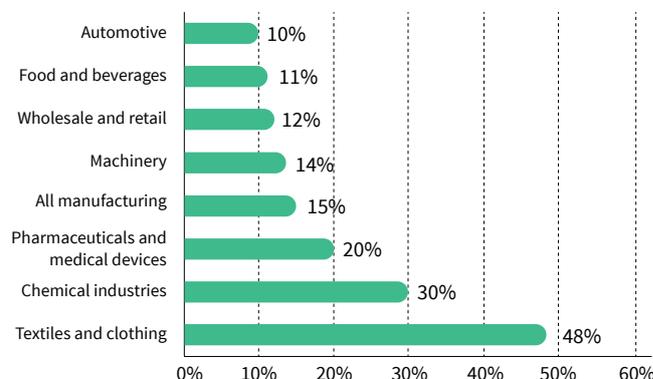


Robustness and resilience through the diversification of production capabilities

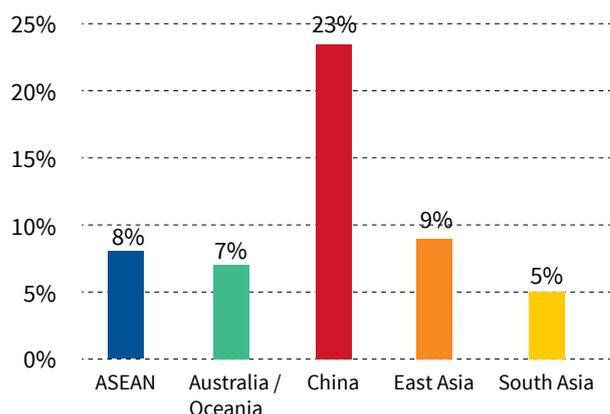
In response to COVID-19, the need to diversify production capabilities was seen as imminent among 15 per cent of manufacturers. This trend is especially prevalent in textile and clothing (48 per cent), chemical industries (30 per cent) and pharmaceuticals and medical devices (20 per cent) (see Graph 11). All three sectors have a strong manufacturing footprint in China; textile and clothing also in Bangladesh, Cambodia and Myanmar.

For chemicals, an observation similar to APIs can be made as the production of certain chemicals segments are highly concentrated in China. In 2020, 74 per cent of the global capacity of polyester fibres (chemicals used for textiles), 62 per cent of ethyl acetate (chemicals used for solvents) and 59 per cent of chlorobenzenes (used for rubber products, herbicides, solvents and herbicides) were produced in China (Gomez & Radel, 2020). Relocating some of this capacity out of China may increase supply chain robustness and resilience. When breaking down the data by region, the need to diversify manufacturing capabilities is most prevalent in China (23 per cent) compared to other regions, like ASEAN (8 per cent) or East Asia (9 per cent), which corroborates this finding (see Graph 12).

Graph 11: Need to diversify the manufacturing location by sector



Graph 12: Need to diversify the manufacturing location by region



6. Impact of COVID-19 on relocation activities in APAC

At the national level, the pandemic unveiled a lack of self-sufficiency for essential products in many countries and led to calls for more self-reliance. The COVID-19 pandemic has exposed national vulnerabilities in several sectors and supply chains and sparked a discourse on the relocation of business activity. Therefore, this section assesses the impact COVID-19 has had on offshoring, reshoring and nearshoring in the APAC region.

Ability to relocate operations

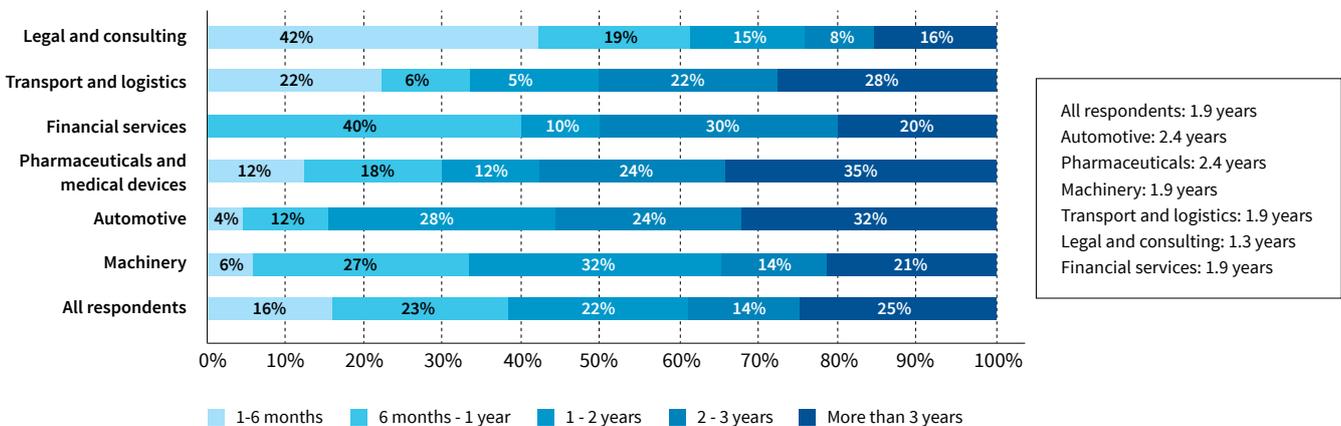
While some industries can easily switch location, change production patterns and invest in new markets, relocation decisions can require extensive lead times (Elms, 2019). It is crucial to understand how long these lead times are and whether there are variations across different industries as this will determine a company’s ability to offshore, reshore and nearshore in response to COVID-19.

Graph 13 depicts the relocation time across different industries. On average, respondents require almost two years (1.9) to move their operations out of their host markets. Overall, 16 per cent of respondents are highly flexible and can relocate their operations

within six months. On the other side of the spectrum are 25 per cent of respondents who require more than three years and are less flexible switching between locations (see Graph 13).

A breakdown by sector suggests that service providers require less time to relocate than manufacturers. Among services, law firms and consultancies are the most flexible companies, with 42 per cent of respondents only requiring a lead time of up to six months to relocate their operations (see Graph 13). A further notable observation is that 40 per cent of financial service providers can relocate within a period of six months to one year. The results are coherent with existing case studies. In response to Brexit, for instance, the European financial services sector has moved large parts of its securities-trading business from London to Frankfurt (Eurofound, 2020a). This relocation started in July 2017 and was completed seven months later, in January 2018. As part of Barclays global reorganization, the British investment bank reshored its operations from Cyprus back to London between April 2016 and December 2016 (Eurofound, 2020b).

Graph 13: How long would it take to relocate your business operations?



In manufacturing, respondents in the automotive sector as well as the pharmaceuticals and medical-devices sector require, on average, the longest lead times to relocate their manufacturing capabilities (2.4 years in both cases) (see Graph 13). In the automobile industry, only 16 per cent can relocate their manufacturing activities within less than a year. Rather, the majority (56 per cent) require a minimum of two years. The data is coherent with existing case studies. The reshoring of the British automotive manufacturer McLaren from Austria to Sheffield in the UK took almost four years, from January 2017 to December 2020 (Eurofound, 2020c). Likewise, the car manufacturer Vauxhall required a three-year lead time to relocate its manufacturing capabilities from Bochum in Germany to Luton and Ellesmere Port in the UK (Eurofound, 2020d).

Longer lead times in the manufacturing sectors stem from companies having to undertake higher capital investments when relocating. Moving production capabilities may also require the relocation of entire manufacturing and service ecosystems (supplier network). The availability of quality infrastructure is equally important and has to enable uninterrupted movements of components and final products within the supplier network.

Certain service industries are also less flexible in relocating, such as transport and logistics firms. Forty-four per cent of respondents require at least two years to relocate (see Graph 12). Like manufacturers, transport and logistic firms require more extensive capital investments (e.g. warehousing and warehouse technology) and access to infrastructure (ports, airports and roads).

Overall, few companies are able to relocate their operations in a short period of time. Companies generally require longer-term planning. Therefore,

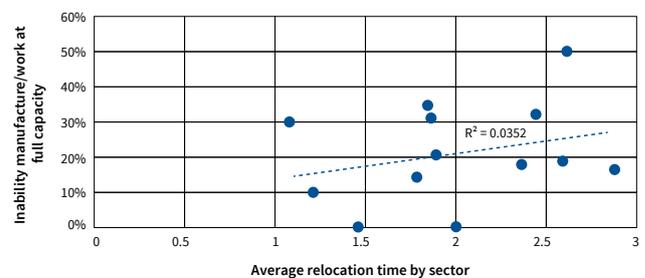
most respondents have so far been limited in ability to relocate in response to COVID-19.

To assess if COVID-19 has had a stronger adverse effect on sectors with higher relocation times, the three scatterplots in Graph 14 (a), (b) and (c) examine the correlation between the following variables:

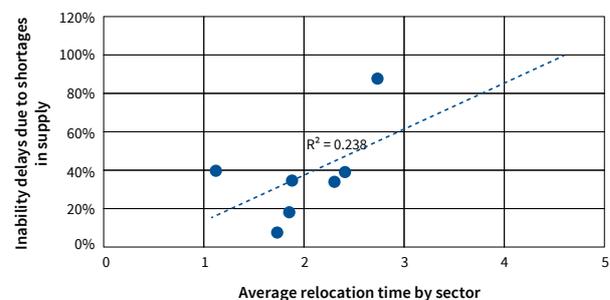
- ▷ The average relocation time by sector and the inability to manufacture or operate at full capacity and average relocation time by sector (Graph 14a)
- ▷ Manufacturing delays due to shortages in supply and average relocation time by sector (Graph 14b)
- ▷ Adverse demand impacts and average relocation time by sector (Graph 14c)

The response option “more than three years” was assigned a value of four years so that the average relocation time was quantifiable.

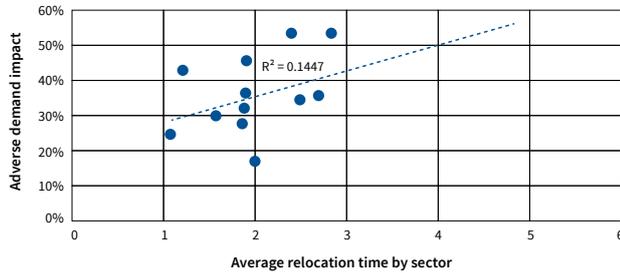
Graph 14a: Inability to manufacture/work at full capacity vs Average relocation time



Graph 14b: Manufacturing delays due to shortages in supply vs Average relocation time



Graph 14c: Adverse demand impact vs Average relocation time



Current relocation activity during the pandemic

The above-mentioned section has highlighted that only a small share of companies (16 per cent) are flexible in relocating operations in a short period of time. To identify current relocation trends, respondents were provided with an open-ended question asking about their relocation plans. Only 19 companies stated that they are currently relocating or are planning to relocate their operations. These are summed up below:

1. Three companies are planning to relocate operations but have not decided on their new market. This implies they are still in the early planning stages.

2. Only one company is currently reshoring its operation from the Asia-Pacific (China) region to Germany, while two companies are relocating operations from China and ASEAN to Europe. The location destination within Europe was not disclosed.

3. Relocation occurs mainly within the Asia-Pacific region:

- ▷ Two companies are relocating within China
- ▷ Three companies are relocating out of Hong Kong into Mainland China, and one company is relocating from ASEAN (Singapore) to China
- ▷ Two companies are partially relocating from China to Vietnam, and one company is partially relocating from China to Myanmar
- ▷ One company is relocating partially within ASEAN (from Singapore to Thailand)
- ▷ Three companies plan to add additional capabilities to ASEAN markets (e.g., establishing subsidiaries in Vietnam)

This demonstrates that most of the relocation occurs within the APAC region and involves little reshoring and nearshoring to Germany or elsewhere in the EU.

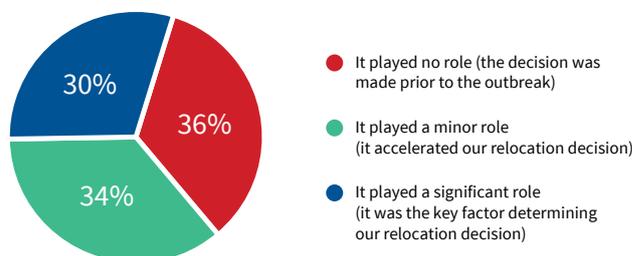


To assess the link between the above relocation decisions and COVID-19, respondents were asked what role the pandemic played in this decision. 30 per cent stated that COVID-19 played a significant role in their relocation, while 34 per cent indicated it only played a minor role. The remaining 36 per cent said it played no role at all (see Graph 15).

The pandemic’s potential to impact future relocation decisions

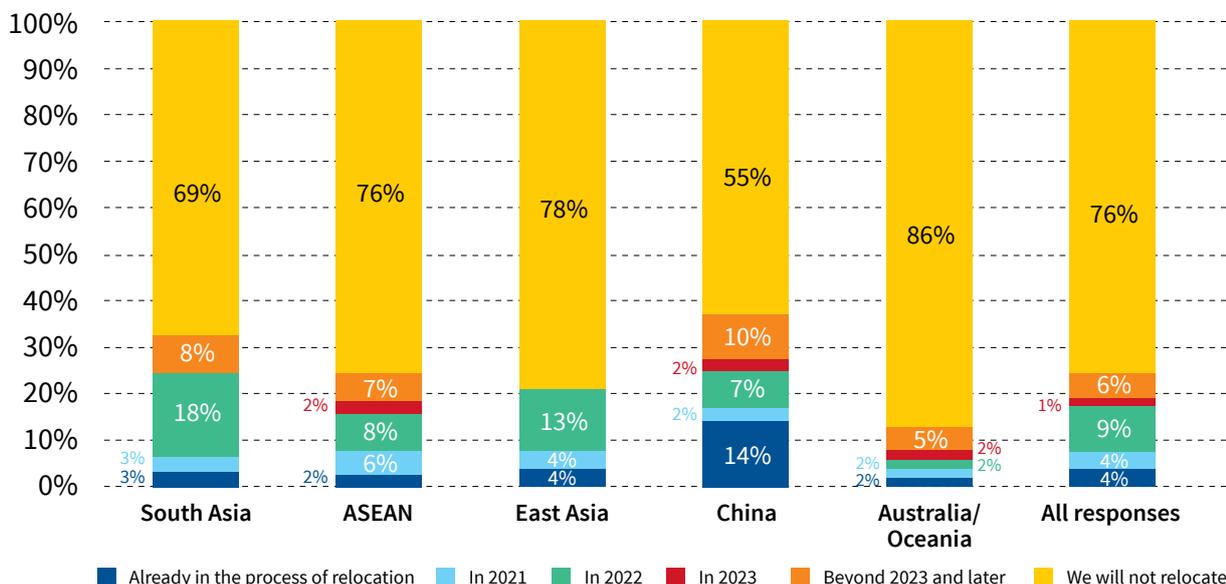
The pandemic is not over, and countries are still implementing and upholding public policy measures that disrupt economic activity. Across APAC, countries continue to apply border and travel restrictions. This may imply that the pandemic could cause further relocation activities in the future. To assess the relocation-inducing potential of COVID-19, respondents were asked by when they would relocate if the pandemic management does not improve in the years to come. 4 per cent were already in the process of relocating operations in 2020 (see Graph 16). Most of these respondents were China-based, while in other regions, relocation activities were less prevalent in 2020. Looking ahead, a sizeable proportion of respondents in South Asia (18 per cent)

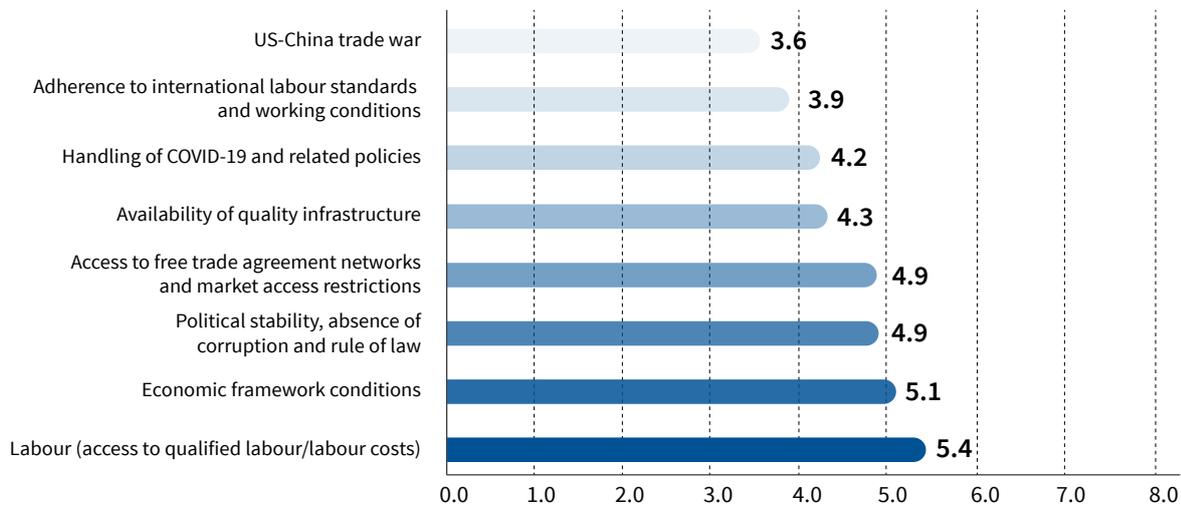
Graph 15: What role did the COVID-19 pandemic play in your relocation decision?



and East Asia (13 per cent) would consider relocating their operations if the situation does not improve by 2022. Notably, 76 per cent of all companies surveyed indicated that they will not relocate from their host country, even if the situation does not improve in the years to come. In particular, respondents from Australia/Oceania are likely to maintain operations in their host country (86 per cent). Overall, COVID-19 appears to have limited relocation effects in the long run and, in the context of this survey, does not significantly augment current offshoring, reshoring and nearshoring trends from and within the APAC region.

Graph 16: If the current COVID-19 situation does not improve in your host country, when would you consider relocating business operations?



Graph 17: Ranking of relocational factors

The relative importance of COVID-19 in future relocation decisions

The above analysis suggests that COVID-19 does not cause or augment significant relocation trends in the short run and long run for the companies surveyed. To understand why the pandemic does not seem to trigger offshoring, reshoring or nearshoring considerations by the respondents from and within APAC, the relative importance of COVID-19 compared other relocation factors was surveyed. To this end, survey respondents were asked to rank the importance of the following variables:

- The US-China trade war
- Adherence to international labour standards and working conditions
- Handling of COVID-19 and related policies
- Availability of quality infrastructure
- Access to free trade agreement networks and market access
- Political stability, absence of corruption and the rule of law
- Economic framework conditions
- Labour (access to qualified labour / labour costs)

The results show that the factor “handling of COVID-19 and related policies” received a weighted score of 4.2 out of 8, making the pandemic and its related effects one of the less important factors in a relocation decision. This result is consistent across different regions, including ASEAN (score: 4.2), China (score:

3.94), East Asia (score: 3.47) and South Asia (score: 3.82). The exception is Australia/Oceania. In this part of the world, companies attach high importance to the pandemic (score: 5.27). As these countries have applied relatively strict measures to contain the spread of the virus, the result is unsurprising. For instance, to control COVID-19, Australia is one of the few countries that have temporarily restricted the movement of people between different territories within the country. Moving forward, this may imply that further outbreaks and/or the mismanagement of COVID-19 may trigger business relocation out of this market.

In certain sectors, COVID-19 plays a more important role in the relocation decision than in others. We clustered all sectors in labour-focused and labour-intensive industries (wholesale and retail, food and beverages, tourism and hospitality and education and training) on one side, and the less labour-intensive and more capital-intensive industries (pharmaceuticals and medical devices, chemicals and software, IT and telecommunication services) on the other. The data reveals that the former cluster will consider pandemic-related management and policies more closely in a relocation decision compared to the latter cluster (see Table 3). This is because COVID-19 has disrupted labour mobility and social distancing rules undermine the ability of labour-intensive sectors to operate at full capacity.

For a specific breakdown, the heat chart in Table 4 provides a detailed overview of each separate sector.

Table 3: Ranking of relocation sector by industry cluster

Ranking of relocation factor	Labour-focused and labour-intensive cluster	Less labour-focused and more capital-intensive cluster
#1	Access to labour (score: 5.58)	Access to labour (score: 5.54)
#2	Handling of COVID-19 and related policies (score: 5.44)	Political stability, absence of corruption and the rule of law (score: 5.51)
#3	Economic framework conditions (score: 4.82)	Economic framework conditions (score: 5.16)
#4	Access to free trade agreement networks and market access (score: 4.69)	Availability of quality infrastructure (score: 4.90)
#5	Availability of quality infrastructure (score: 4.55)	Adherence to international labour standards and working conditions (score: 4.52)
#6	Political stability, absence of corruption and the rule of law (score: 4.49)	Access to free trade agreement networks and market access (score: 4.48)
#7	Adherence to international labour standards and working conditions (score: 3.63)	Handling of COVID-19 and related policies (score: 3.38)
#8	The US-China trade war (score: 3.42)	The US-China trade war (score: 2.81)

Next to COVID-19, the US-China trade war has been considered a significant source of disruption to value chains in Asia as several companies have shifted out of China in response to the escalating tensions (see Section 3b). Among respondents outside China, the US-China trade dispute is not perceived as an essential relocation factor. Companies perceive themselves not to be too severely affected by the trade war in their host countries. This implies that the tariffs' impact only trickles back through the supply chain in a limited manner. There is one stark

regional discrepancy. There is one stark regional discrepancy: China-based respondents consider the impact of the US-China trade war as the third most important relocation factor (score: 5.12), making it more important than both the availability of quality infrastructure (score: 3.39) and political stability, absence of corruption and the rule of law (4.41). This may suggest that if the US-China tariffs remain in place then future relocations out of China may be attributed to the US-China trade war.

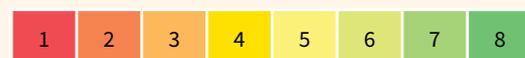
Table 4(a): Importance of relocation factor by sector

	Wholesale	Machinery	Pharmaceuticals	Chemicals	Automotive	Textile	F&B	Other manu-facturing	All manu-facturing	Legal and consulting	Transport	Financial services	Software, IT	Hospitality	Education and training	All services
Labour (access to qualified labour/labour costs)	6	5.82	5.88	5.73	5.74	6.2	5.43	5.73	5.74	5	4.6	5.55	5.40	5.2	5.17	5.07
Economic framework conditions	4.9	5	5.44	5.17	5.04	3.8	4.13	5.52	5.09	4.58	5.65	5.00	4.92	6.20	4.43	5.13
Political stability, absence of corruption and rule of law	5.28	4.49	6.5	5	3.38	3	4.33	5.04	4.68	5.08	6.05	5.00	5.5	4	4	5.23
Access to FTA networks and market access restrictions	3.94	5.59	4.33	4.2	6.04	5.40	5.80	4.83	5.08	5	4.1	4.55	4.83	4.8	5.14	4.66
Availability of quality infrastructure	4.42	4.29	4.88	5.4	3.32	3.2	6	3.6	4.27	4.25	4.95	4.45	4.92	4.4	4.29	4.41
Handling of the pandemic	5.37	3.56	2.67	3.25	4.48	4.4	5.33	3.81	3.95	5.73	3.47	3.98	3.92	6.4	6	4.56
Adherence to international labour standards and working conditions	4.5	4	4.32	5.42	4.39	3.8	4	3.88	4.13	2.92	4.17	4.55	3.83	3	3.88	3.6
US-China trade war	3.56	4.24	2.47	2.7	4.9	5.40	2.4	4.2	3.86	4.26	2.56	3	3.17	2	3.43	3.35

Table 4(b): Importance of relocation factor by region

	ASEAN	China	East Asia	South Asia	Australia/Oceania
Labour (access to qualified labour/labour costs)	5.37	5.52	5.7	5.24	4.76
Economic framework conditions	5.38	4.9	5.43	4.71	5.03
Political stability, absence of corruption and rule of law	5	4.41	5.29	5.68	4.59
Access to FTA networks and market access restrictions	4.6	5.58	4.6	5.40	4.76
Availability of quality infrastructure	4.8	3.39	4.4	4.57	4.34
Handling of the pandemic	4.2	3.94	3.47	3.82	5.27
Adherence to international labour standards and working conditions	3.7	3.86	4.3	3.63	4.15
US-China trade war	3.3	5.12	3.05	3.1	3.69

Legend

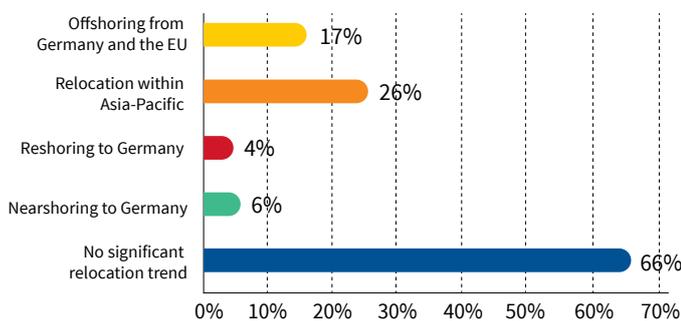


Least Important → Most Important

7. Long-term relocation beyond COVID-19

While the survey data has indicated that COVID-19 has so far not fundamentally changed the GVCs in the Asia-Pacific, a large share of companies (44 per cent) expect relocation activities to occur within their industry in the future. Two predominant relocation trends are identified. Both centre around the APAC region:

Graph 18: Long-term relocation trend



Relocation from the EU, including Germany, to APAC

The first trend that respondents expect to observe is further offshoring from Germany and the rest of the EU to the APAC region. 17 per cent of respondents foresee their industry increasingly shifting from the West to the East in the years to come. A sectoral breakdown reveals that the chemical industry and the financial service sector expect proportionally higher offshoring activity from Germany and elsewhere in Europe to APAC than other sectors.

For the chemical industry, this may be linked to the industry's position in different supply chains. With manufacturing increasingly taking place in APAC, the market for chemicals has also drastically grown in Asia and resulted in offshoring. Between 2008 and 2018, the share of chemical sales in the EU fell from 26.5 per cent to 16.9 per cent, while the APAC's share rose from 40.1 per cent to 58.7 per cent (Deloitte, 2020).

Likewise, the Asian financial market has drastically expanded over the last decade. For instance, it is projected that by 2030, China, India, Indonesia and Japan will account for 46 per cent of the global insurance market, twice the share of 2015 (ADB, 2020), making this region attractive for insurance providers. The survey results show that economic framework conditions and market access are important relocation factors for financial services (see heat chart in Table 4) when relocating operations.

Relocation within APAC

The second significant trend that respondents expect is the relocation activity within the APAC region (26 per cent of respondents expect this trend – see Graph 19). The data breakdown shows that the relocation within APAC centres mostly around ASEAN. Companies expect ASEAN to become an even more attractive market in the years to come. This relocation trend has already been observed for several years. As some ASEAN member states have gradually moved up the value chain, the region offers diverse and complementary economies, allowing companies to draw on the different competitive advantages, making ASEAN an attractive location for companies to relocate to.

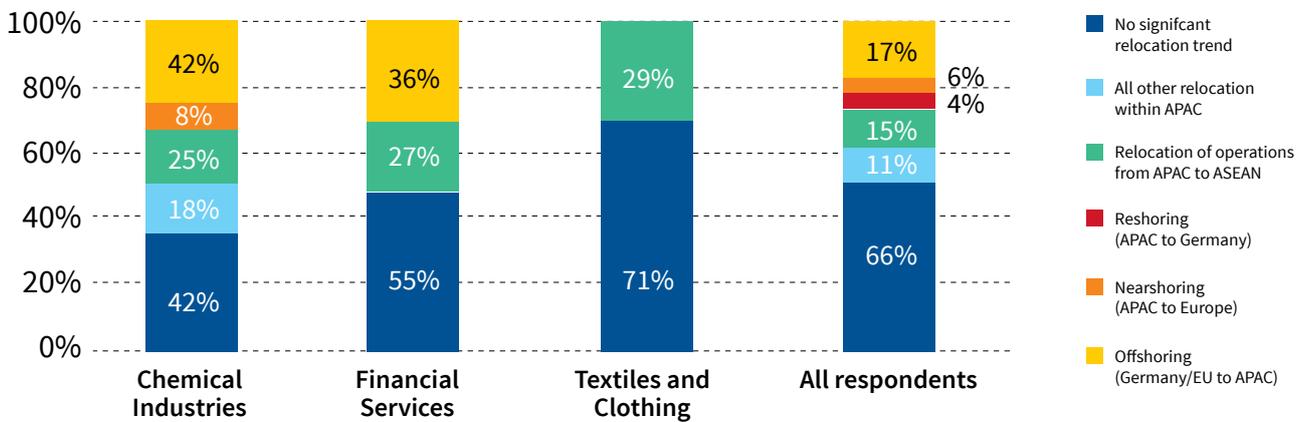
A sectoral breakdown reveals that most relocation from APAC to ASEAN is expected by respondents in the textile and clothing sector (29 per cent – see Graph 19). The industry is labour-intensive and companies have indicated that access to cheap and qualified labour is the most critical consideration when making a relocation decision. Comparatively lower wages in ASEAN, such as in Vietnam or Cambodia, appear to continue to draw the textile and clothing value chain into Southeast Asia. At the same time, adherence to international labour laws becomes even more important in the textile and clothing sector against this backdrop. Respondents assigned higher importance to compliance with ILO conventions than access to quality infrastructure and political stability (see heat chart in table 4).

As the textile and clothing sector is highly price competitive and custom duties are on average high, access to free trade agreement (FTA) networks is a key relocation factor, according to respondents. ASEAN is well connected with bilateral and plurilateral FTAs to regional partners, including Australia, China, Korea, Japan, Australia and New Zealand. Beyond that, some ASEAN member states have enforced important bilateral and plurilateral FTAs, such as the Transpacific Partnership (CPTPP) and the EU-Vietnam FTA, that entail not only tariff concessions for textile and clothing but also promote the localization of value chain chains in signatory countries. This may explain why respondents expect a relocation trend from around Asia to ASEAN in the future.

Reshoring and nearshoring from APAC to Germany and Europe

While companies like Marklin, Sennheiser electronic and Gtech have reshored or nearshored their operations from APAC closer to their headquarters, our survey data suggests that companies generally do not expect any major reshoring (4 per cent) or nearshoring (6 per cent) trend from Asia to the EU or Germany to solidify in the long run. There is also no significant trend across different industries.

Graph 19: Long-term relocation trend by Industry



³ For instance, the CPTPP entails a yarn-forward rule, while the EUVFTA entails a double transformation requirement in its rules of origin for textiles.

Impact of COVID-19 on supply chains and relocation of operations: an SME's perspective⁴

Watson E.P. Industries Pte. Ltd is an expert for one-stop design and manufacturing solutions. With manufacturing plants in Singapore and China, Watson's expertise includes product design and development, tool design and fabrication, printing and full product assembly. Watson is an established leader in EMI shield coating and electroplating on plastic components. Over the last 35 years, Watson has successfully integrated itself into global value chains and has become a supplier in key industries, including in industrial and consumer electronics, telecommunications, hygiene and sanitation.

Impact of COVID-19 on Watson EP Industries operations

When China went into lockdown at the beginning of the virus outbreak, Watson EP Industries immediately experienced shortages in supply of its electronic components and metal parts and had to notify its customers about delays. Watson has since developed a risk mitigation strategy. Joyce Seow, Group Executive Director, explained that "in response to shortages in supply, we have been working on alternate sources for critical suppliers. We managed to get alternate sources for most suppliers but for those with customized toolings, we had to work closely with them to ensure continuity of supply." Watson has also experienced a declining manufacturing output as the company was unable to produce at full capacity. Ms Seow noted that especially during the period of strict lockdowns in Singapore dubbed "Circuit Breaker" in April and May 2020, the company could only operate on a stand-by basis as most of their 70 employees had to stay

at home. After the partial reopening of the economy in June 2020, Watson's manufacturing capability was able to increase, however, it is still not back at pre-COVID levels.

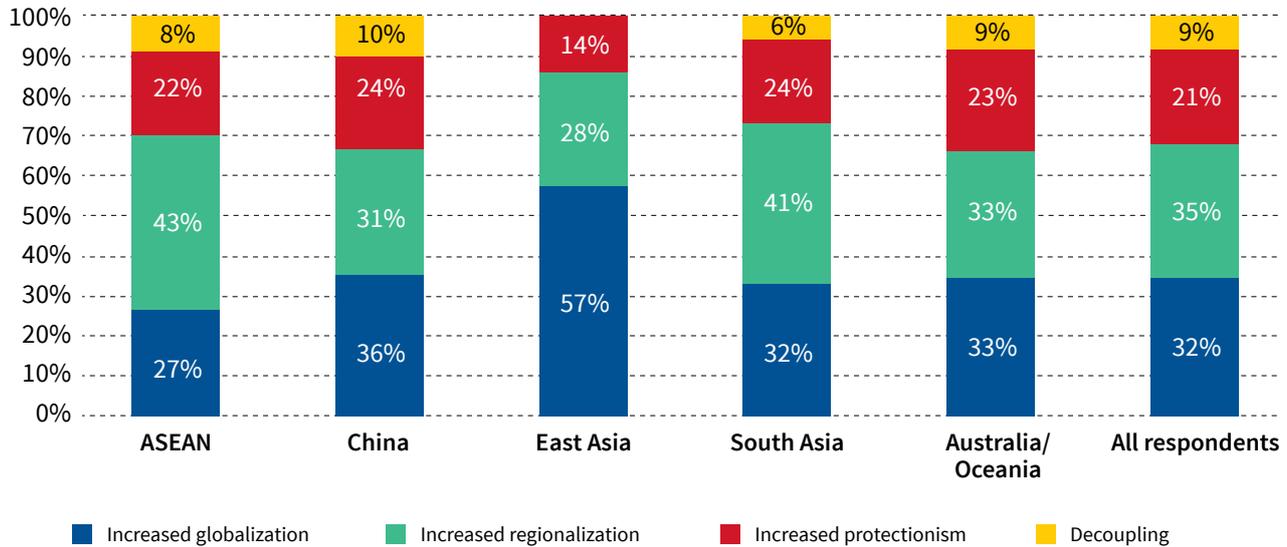
Impact of COVID-19 on Watson EP industries relocation decision

When the US-China trade war started, Watson EP Industries found itself compromised by the tariffs implemented on products imported from China. Products, parts and components that had previously entered into the US-market at a zero-tariff rate suddenly faced a customs duty of 15 per cent upon arrival at US customs. As a result, Watson transferred some production capacity from China to Singapore. Ms Seow explained: "We already held a 40,000-square-foot manufacturing facility in Singapore and therefore made the decision to build on existing overheads, including employing more staff. We are now supplying our US customers from the Singapore plant." At the same time, Watson reached the decision to offshore manufacturing capabilities within ASEAN. As this requires a larger amount of capital and prolonged investments, the relocation decision is currently not final.

⁴ This case study was written based on an interview with Joyce Seow, Group Executive Director of Watson EP Industries.

8. Global and regional trends: Decoupling, regionalization or globalization?

Graph 20: Expected trends in a post-pandemic world by region



The survey data reveals that the vast majority of respondents (91 per cent) do not expect to witness a sustained decoupling trend in the long run. This may be because localized production will, in many cases, not significantly improve the robustness of supply chains, according to Miroudot (2020). When a disaster occurs, a global network can draw on supply from other locations to maintain deliveries. As we saw with the COVID-19 pandemic, even a global crisis is likely to hit different countries at different times, opening up options to compensate for a shutdown in any one location (Miroudot, 2020). From a value chain perspective, decoupling is difficult as value chains are inherently organized internationally and therefore enormously complex. For instance, upstream activities, such as research and development, or design, occurs in innovation hubs, and it is extremely difficult to cultivate such

clusters. The access to certain raw materials (e.g. rare minerals) are also limited to some countries and regions. Lastly, processed inputs in manufacturing contain their separate value chain, which are frequently specialized in only a few markets.

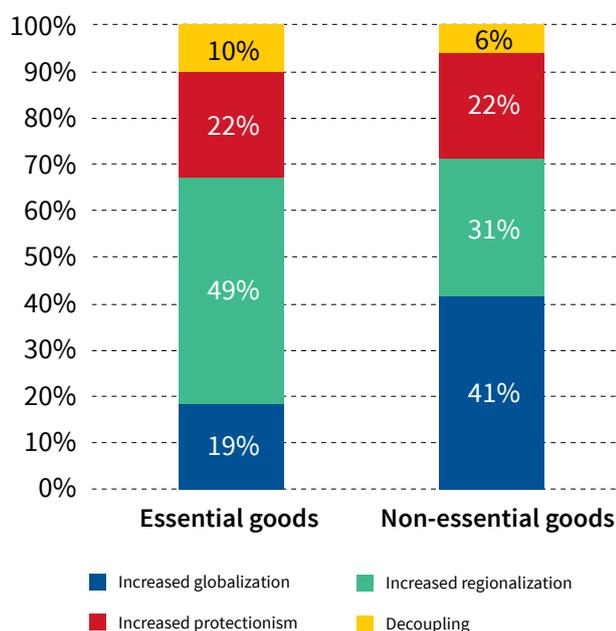
Instead, respondents expect increasing regionalization (35 per cent) or globalization (32 per cent) to occur across APAC. Among the regions, some degree of variation exists. In ASEAN, respondents expect increasing regionalization (43 per cent), while respondents in East Asia expect further globalization (57 per cent). Existing ASEAN integration frameworks, like the ASEAN Economic Community (AEC), are driving the growth of regional production networks and may explain why respondents in ASEAN expect regionalization to unfold in the years to come. Likewise, ASEAN's external trade policy has formed

several free trade areas, including the ASEAN-China Free Trade Agreement (ACFTA), ASEAN-Japan Economic Partnership Agreement (AJECP), ASEAN-India Free Trade Agreement (AIFTA), ASEAN-South Korea Free Trade Agreement (AKFTA), ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA) and, most recently, RCEP as the world's largest free trade area. These are specifically designed to create and solidify regional value chains and centres around the ASEAN region. While the two East Asia economies Japan and South Korea are also party to RCEP, their FTA network extends beyond the APAC region and facilitates linkages to other regional production networks, such as in North America

and the EU. Beyond that, Korea has launched FTA negotiations with the South American trade bloc MERCOSUR and with the Eurasian Economic Union, while Japan started trade talks with Colombia. For Japan, this would be the third South American FTA partner after Chile and Peru.

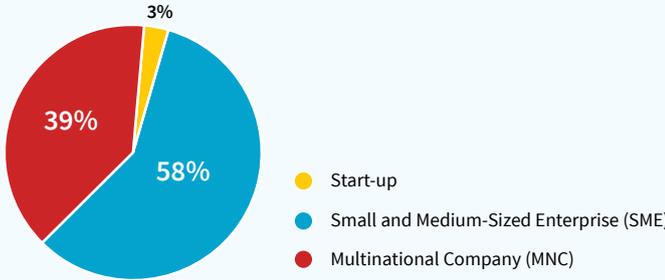
A significant divergence is evident when classifying respondents in the manufacturing sector into essential goods and non-essential goods. The former covers respondents from pharmaceuticals and medical devices, food and beverages and chemicals industries. The latter covers textiles and clothing, motor vehicles, machinery, and manufacturing for wholesale and retail. While producers of essential goods expect increasing regionalization (49 per cent) to occur, manufacturers of non-essential goods lean towards increasing globalization (41 per cent). The pandemic has underscored the importance of robust supply chains for critical goods and the need to reduce time-to-market leads. Regionalization allows for this and may explain why such manufacturers expect increasing regionalization of value chains.

Graph 21: Expected trend: Essential goods vs non-essential goods

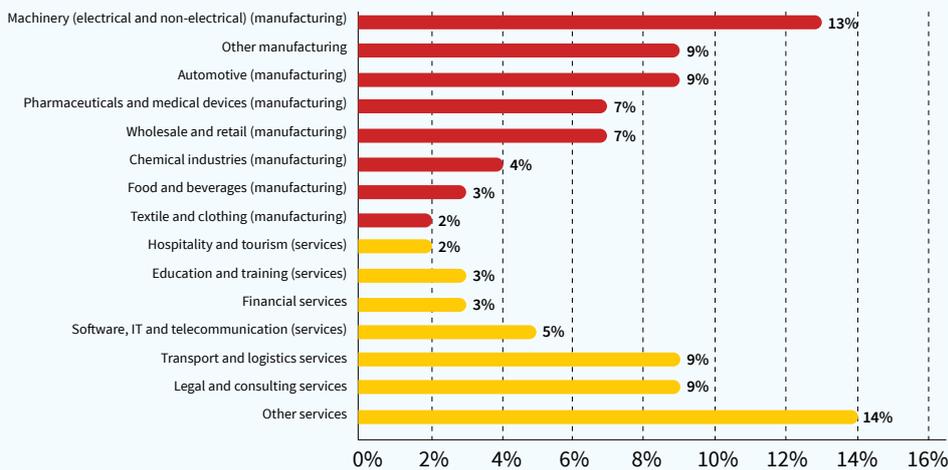


Appendix

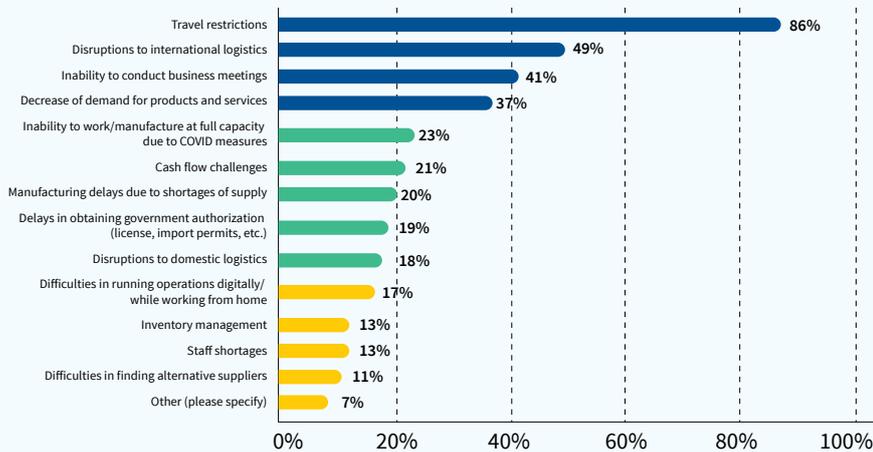
What company size are you?



What sector are you primarily operating in?



What are the key challenges you are facing due to COVID-19 and related policy measures?



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