



**Economic Report on Asia** — Global value chain in the post-COVID-19 era —



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## Foreword

The COVID-19 crisis will likely be a dramatic turning point in world history. There have been major turning points in the past, including two World Wars and the end of the Cold War, in which common paradigms, norms, and systems changed enormously. Profound changes may occur across the post-COVID world, in such areas as international relations, domestic politics, and socioeconomic structures from a macro-perspective, and public perception and interpersonal relations from a micro-perspective.

In May 2020, JICA launched research on “International Cooperation in the Post-COVID-19 World,” initiated by JICA President KITAOKA Shinichi. The purpose of the research was to consider the role of international cooperation in the post-COVID-19 world from diverse perspectives through dialogues between KITAOKA and experts from Japan and other countries. In doing so, it could thereby examine the potential contributions by Japan and JICA at a time of a drastic structural change around the world. Following this, the JICA Ogata Sadako Research Institute, the research division of JICA, organized several research teams to tackle the big question of “what will happen in the post-COVID-19 world?”

This report has been prepared by one of these research teams. It focuses on “the Dynamics of the Socioeconomic Structure of Asia in the Post-COVID-19 World.” It examines how global value chains (GVCs), considered a symbol of globalization, have been impacted, influenced, and transformed in Asia by the COVID-19 pandemic and by the intensifying US-China tensions. It also considers how GVCs will change in the post-COVID-19 world. One aim is to instill the findings of this research into JICA’s mid-to-long-term operations. This report was compiled by staff members of the JICA Ogata Sadako Research Institute based on discussions within the research team.

For many years, JICA has been committed to the development of its partner countries. Since the 1970s, JICA has been working on infrastructure development through Official Development Aid (ODA) loans, grant aid, and technical cooperation for projects related to electricity, roads, railways, ports, airports, waterworks, and communications. In Asian countries especially, JICA has been fostering the environments needed for industrial growth, such as providing assistance for developing comprehensive infrastructure. JICA has also been implementing support for “soft” infrastructure, including contributions to the improvement and advancement of tariff systems, product quality, investment-related laws, and technical personnel. JICA’s work on both hard and soft components has not only benefitted the partner countries and their people but also assisted Japanese private companies to expand their businesses in Asia. At present, numerous Japanese companies are active in Asia, resulting in the expansion of value chains and supply chains in the region.

Due to the COVID-19 pandemic and the US-China tensions, value chains and supply chains in Asia are at a crucial turning point. At this turning point, strategies based on new ideas, unconstrained by conventional wisdom, are required. JICA is no exception. Continuing traditional assistance for

hard and soft infrastructure will not meet the needs of the post-COVID-19 world. JICA is therefore obliged to examine the degree of change in value chains and supply chains and any resulting changes in industrial structures. It can then consider new strategies for further development, as well as renewed roles for ODA to respond to such changes.

This report analyzes the impact of COVID-19 and the US-China tensions in terms of trade and corporate performance and finance. Moreover, by conducting original interviews, it collects raw opinions from Japanese companies with value chains and supply chains in Asia, which reveal the problems and countermeasures they are undertaking to address these problems. The current situation and issues about value chains and supply chains in post-COVID-19 Asia are examined through the interviews.

I will be gratified if this report is used as a reference for those interested in the socioeconomic structure of Asia in the post-COVID-19 world.

November 2021  
Akio TAKAHARA  
Executive Director, JICA Ogata Sadako Research Institute  
for Peace and Development



## Acknowledgements

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Experts in the research team:

- Tetsushi SONOBE (Chair) Dean, Asian Development Bank Institute (ADBI)
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Chief Economist, Asian Development Bank (ADB)
- Takashi YAMANO Senior Economist, Asian Development Bank (ADB)

The research team held a series of study group meetings to deepen the understanding of the research theme. The topics and lecturers of each study group meeting are listed below. The authors are grateful for the great contributions made by the participants.

\*Titles and positions are noted as they were at the time of the study group meeting. Titles have been translated from Japanese into English by the secretariat.

The 1<sup>st</sup> Study group meeting

- Explanation of the research by JICA, exchange of opinions

The 2<sup>nd</sup> Study group meeting

- Lecture: “COVID-19 Crisis from a Spatial Economic Point of View” by Masahisa FUJITA, Adjunct Professor, Institute of Economic Research of Kyoto University
- Lecture: “Reorganization of GVC in the Post-COVID-19 World” by Satoshi INOMATA, Chief Senior Researcher, IDE-JETRO

The 3<sup>rd</sup> Study group meeting

- Lecture: “Growing US-China Economic Conflict” by Chi Hung KWAN, Senior Fellow, Nomura Institute of Capital Markets Research
- Lecture: “Growth Factor and Impact of Chinese Platformers” by Toshihiko OKANO, Senior Specialist, NTT Data Institute of Management Consulting, Inc.

The 4<sup>th</sup> Study group meeting

- Lecture: “COVID-19 and US-China Cold War – Decoupling of Economies, Industries, and Technologies” by Yasuhiro GOTO, Professor, the Faculty of Urban Innovation of Asia University
- (Participation in discussions) Yoshiaki AZUMA, Chief Representative, Representative Office in Beijing, Bank of Japan

The 5<sup>th</sup> Study group meeting

- Lecture: “Indonesia: Policy Response for COVID-19” by Sumio ISHIKAWA, Group Head, ASEAN+3 Macroeconomic Research Office (AMRO)

The 6<sup>th</sup> Study group meeting

- Lecture: “Evaluation on the Signing of RCEP Agreement and the Outlook of Regional Economic Integration in Asia” by Fukunari KIMURA, Professor, the Faculty of Economics of Keio University
- Presentation of draft report by JICA

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Epilogue

**Megumi MUTO**



# Prologue

Megumi MUTO  
Vice President, JICA

## **SUMMARY**

The objective of this research is to understand the baseline facts about global value chains (GVCs) in East and Southeast Asia and consider how COVID-19 and tensions in US-China relations could affect GVCs in the region. We have conducted (1) an analysis of trade and GVCs using 2020 data, (2) a firm-level analysis using 2020 data, and (3) an analysis of firm-level business strategies based on in-depth interviews covering Japanese companies in Asia.

In understanding GVCs we took note of the following emerging facts: 1) China is the central hub of an economic network in the East and Southeast Asian regions; 2) platforms from China are expanding their business models in Southeast Asia; and 3) firms are competing for value added, at both ends of the “smile curve.”

We asked how the GVCs are divided and linked, which locations they operate from and to, and what is the underlying rationale. Then, we identified the areas where COVID-19 and US-China tensions may affect GVCs. The hypotheses are as follows:

### **As a result of COVID-19,**

- 1) demand will decrease due to lockdowns or declining incomes in target markets;
- 2) in labor-intensive processes located in clusters/cities, people will be unable to work onsite;
- 3) when the distance between processes is long, there will be a risk of logistical disruptions;
- 4) there will be decreases in production in the services industry (despite the relative ease of turning online, innovation may be affected);
- 5) there will be a negative effect on R&D and innovation for non-service industries; and
- 6) there will be negative effects on processes that require human-led face-to-face integration for manufacturing and infrastructure.

### **As a result of ongoing US-China tensions,**

- 7) development and innovation for core technologies will be affected, especially those that need to be acquired abroad;
- 8) regardless of whether consumer market dominance is achieved through platforms, connecting both ends of the smile curve will continue to be effective; and
- 9) further cost reduction at the middle of the smile curve will be affected, especially in relation to expanding into Southeast Asia in the search for an “exit point for the US market.”

## **1. Introduction and approach**

Identifying global value chains (GVCs) can be challenging. Country-level trade and foreign direct investment (FDI) statistics only provide aggregates, while international input-output tables utilizing sector data suggest forward and backward links. As such, understanding each link or process within a GVC, including their locations, may be hard to do. Recent literature on production networks is rich in theories and empirical analyses (for example, Escat and Inomata 2011) that build on Krugman's new trade theory and "neo" new trade theory by incorporating firm heterogeneities. Understanding the dynamics of GVCs requires an in-depth understanding of firm behavior. Firms are the decision-making units of GVCs at the micro-level. Therefore, we will focus our attention on firms, and in particular, on business strategies. In this paper, firm business strategy specifically refers to business models at the firm level to create value added.

The objective of this research is to understand the baseline facts of GVCs in East and Southeast Asia and consider how COVID-19 and tensions in US-China relations could affect GVCs in the region. We have conducted (1) an analysis of trade and GVCs using 2020 data, (2) a firm-level analysis using 2020 data, and (3) an analysis of firm-level business strategies based on in-depth interviews covering Japanese companies in Asia. Before introducing these analyses, this prologue provides some shared thoughts on GVCs: considering new trends, establishing a framework, and assessing how external shocks such as COVID-19 or US-China tensions could affect GVCs.

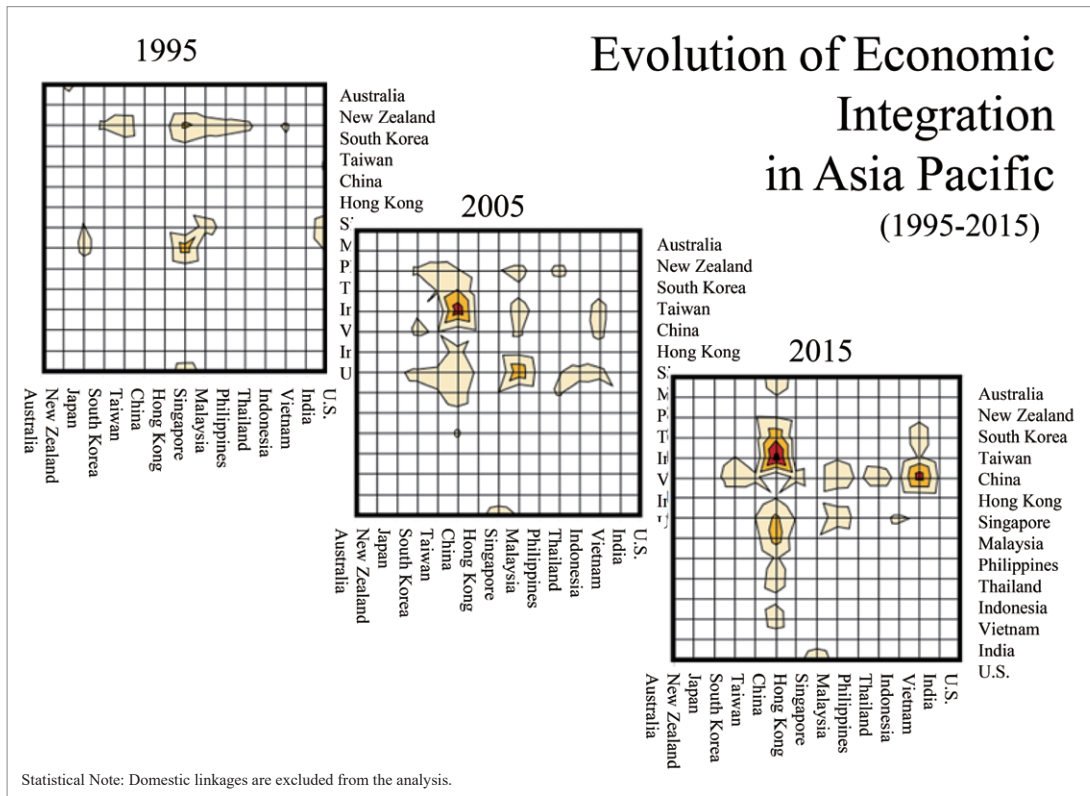
The JICA team wishes to express their thanks and deep appreciation for the academics, seminar speakers and participants who provided valuable input into the development of these thoughts.

## **2. New trends in GVCs**

### **2.1 China is increasingly becoming the hub of economic networks**

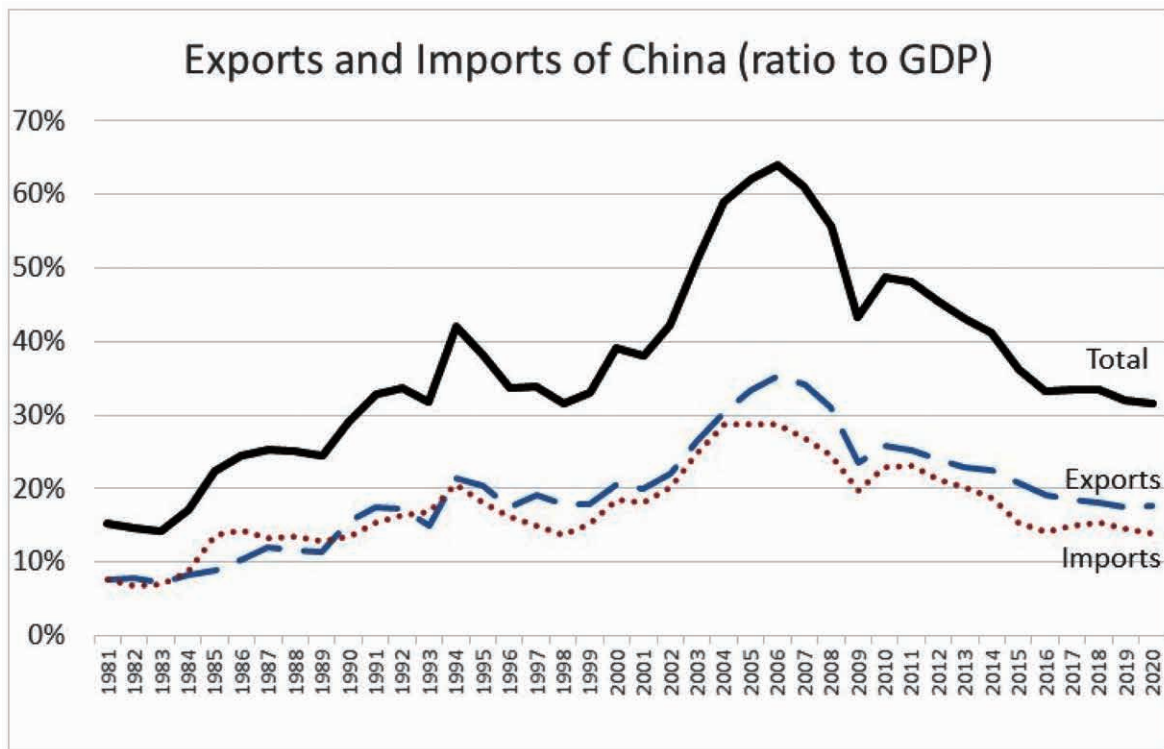
Looking back at 1995, as described by Inomata (2019), strong economic networks existed between Japan/Singapore and Singapore/Malaysia. At that time, Japan's role was that of being the supplier to the initial five ASEAN members (Singapore, Malaysia, Thailand, Indonesia and the Philippines). A decade later, in 2005, China had emerged as a supply recipient, reflecting the increase in FDI and trade-related manufacturing. Japan, Korea, Singapore and Malaysia were the suppliers. As a supplier, China became firmly established by 2015, supplying goods to Vietnam, Thailand, Malaysia and Korea while receiving goods from Korea, Singapore, Malaysia, Thailand and Vietnam. In particular, the flow of supplies from China to Vietnam is gaining ground, reflecting Chinese FDI flowing into Vietnam to avoid wage rate increases at home. Thus, China is emerging as the central hub of an economic network in the East and Southeast Asian regions. At the same time, more Chinese firms are managing GVCs in the region, while in the past, such firms were mostly non-Chinese FDI.

Until the turn of the century, the most common framework among the Japanese to understand Asian economic development was the flying geese theory (Kojima 2000). The flying geese theory envisioned that Japan, Korea and Singapore would lead Asian industrialization, realized first by export-led growth. China, the initial ASEAN countries, as well as the other ASEAN countries,



Source: Inomata (2020a; 2020b) ; English translation by the author.

**Figure 0-1 Evolution of Economic Integration in Asia Pacific (1995-2015)**



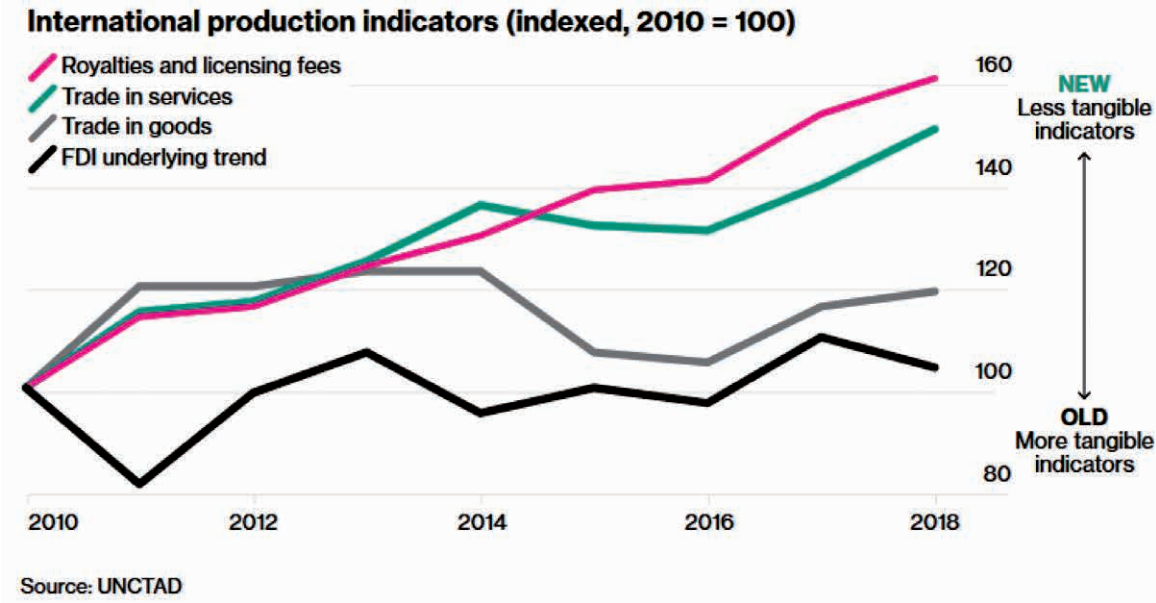
Source: compiled by authors using CEIC data, Data from the General Administration of Customs of the People's Republic of China, and IMF database referring to the format of Kwan (2020).

**Figure 0-2 GDP Ratio of Exports and Import, China**

were expected to follow the same path. However, the Asian financial crisis altered this anticipated course completely. While ASEAN countries struggled to regain their growth momentum, China gained ground by establishing itself as the “factory of the world,” led by FDI. The production of consumer goods for the US and European markets flourished, and China became the key market where Asian intermediate goods changed hands (Inomata 2019). After the wage rate increase around 2010, the flying geese theory lost its relevance, especially with regard to China. Although we see some decline in the growth rate, economic growth in China is led strongly by the internal demand of almost 1.4 billion people rather than foreign demand. In addition, endogenous growth is accelerating with R&D and innovation, accompanied by outbound FDIs.

**2.2 The transformation to service-based, data and platform-based economies**

Current FDI data illustrates only part of the cross-border market access, particularly as the gap between service-based economic activities and the real sectors continues to increase. Instead, digital-based multinationals such as GAFAM (Google, Apple, Facebook, and Amazon) are penetrating into global markets without acquiring physical assets (UNCTAD 2020).



Source: UNCTAD 2020

**Figure 0-3 International Production Indicators (indexed, 2010=100)**

Such firm behavior is most notable in China, where platforms such as Alibaba are now covering almost all aspects of the economy, including credit enhancement. Okano (2020) documents that digital innovation in China, which emerged through competition for the mass consumer market, is now entering a second phase, where efficiency and profit maximization are pursued with artificial intelligence (AI). In this second round, the business strategy goes beyond the creation of the platform itself: pursuing the efficiency and profitability of the platform and enhancement and continuity of customer experience. Platforms from China are expanding their business models in Southeast Asia, in areas such as customized financial services and in partnership with local businesses, with or without Chinese origins. These service-based, data, and platform-based

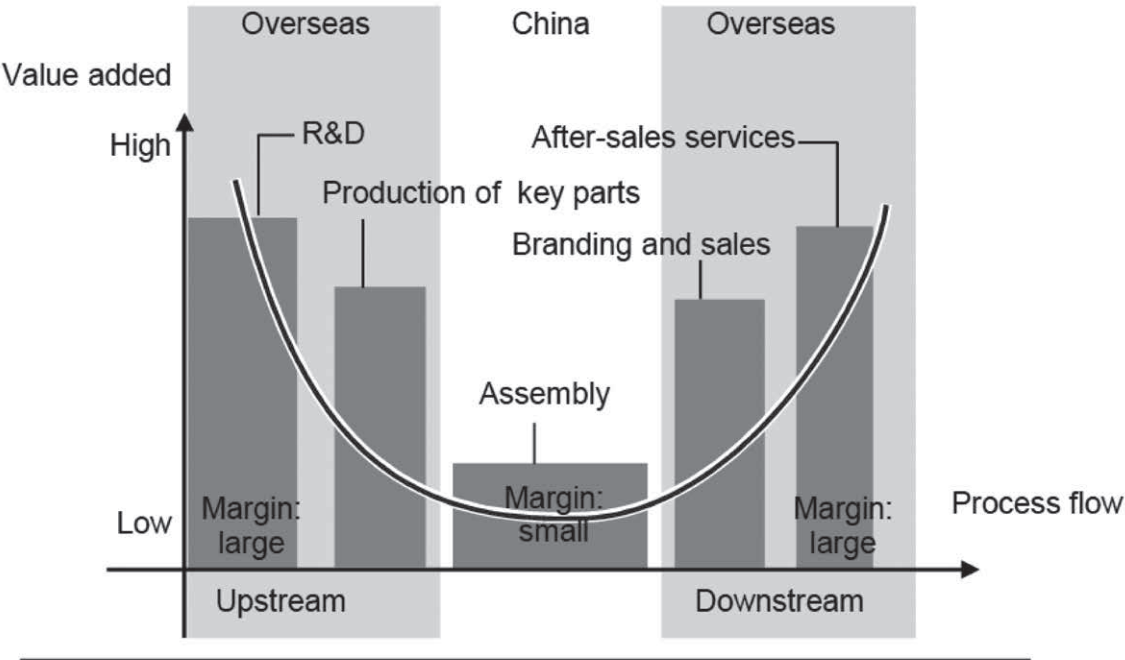


economic activities are not fully captured in conventional trade or FDI data, and thus, their full scope is not yet known.

**2.3 Firms are competing for value added at both ends of the smile curve**

GVCs may also be understood as results of dynamic competition between advanced and developing economies, searching for value added at both ends of the smile curve (Inomata 2019; Goto 2020). The smile curve, which is a useful tool to understand the characteristics of GVC in the 2000s, is a concept initiated by Mr Shih, the founder of Acer (Figure 0-4). It depicts the expected value added along the value chain, from upstream (ideas, R&D) to downstream (marketing, follow-up).

In the 2010s, China began to experience declining competitiveness. This became evident in labor-intensive manufacturing processes due to increases in wage rates. To continue growth, it became important to pursue productivity increases rather than lower production costs. Therefore, innovation and reallocation of resources to potential areas of productivity growth was essential (Kwan 2020). Chinese firms have thus been shifting the focus of their businesses to both ends of the smile curve, where potential value added is higher. At the same time, the middle area of the curve, where low cost is the norm and value added is low, is increasingly shifting from China to ASEAN (Onishi 2021). Goto (2020) describes how the battle on the smile curve is similar to that of the soccer field. Initially, the advanced economies sourced out the processes in the middle (center of the field); however, now that the emerging economies have grasped the center field, they are now trying to dominate the left-hand side of goal, which can be likened to the upstream areas of production. Throughout our analysis, we consider that such firm-level behavior lies at the core of GVC dynamics.



Source: Nomura Institute of Capital Markets Research.

**Figure 0-4 International Division of Labor Processing Trade as Seen from the Smiling Curve**

The next section interprets and integrates the above trends in GVCs to establish an analytical framework. The framework will then be used to suggest several hypotheses with regard to firm-level behavior under COVID-19 and US-China tensions.






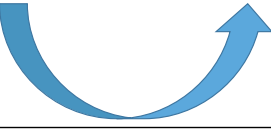






### 3. Analytical framework

#### 3.1 A smile curve for each market and industry

Firm-level business strategies are key to understanding the dynamics behind GVCs. In developing the analytical framework, we assume that each firm has its own source of value added and target markets. Each firm’s business model intends to capture the value added in the target market. Firm-level optimization to maximize the value added is the underlying reason for how GVCs are formulated.

Accordingly, we consider a simple matrix consisting of target markets and industries (Figure 0-5). Each segment of the matrix has a unique smile curve, where firms compete for value added. The target markets are China, Southeast Asia, and the rest of the world, including the US, EU and Japan. The industries are manufacturing, consumer goods, services and infrastructure. These industries are those covered in the firm-level interviews in Chapter 3. Following the new trends presented above, attention will center on the interaction between the Chinese and Southeast Asian markets. Services are an independent category. For consumer goods, we are conscious of the possibility that platforms are capturing value added by linking both ends of the smile curve.

In the next section, we will discuss firm-level strategies for each segment of the target market

Markets \ Industries	China	Southeast Asia	Rest of the World
Manufacturing			
Consumer Goods			
Services			
Infrastructure			

Source: Author

Figure 0-5 Segmented Smile Curves on Market X Industry matrices (conceptual image)

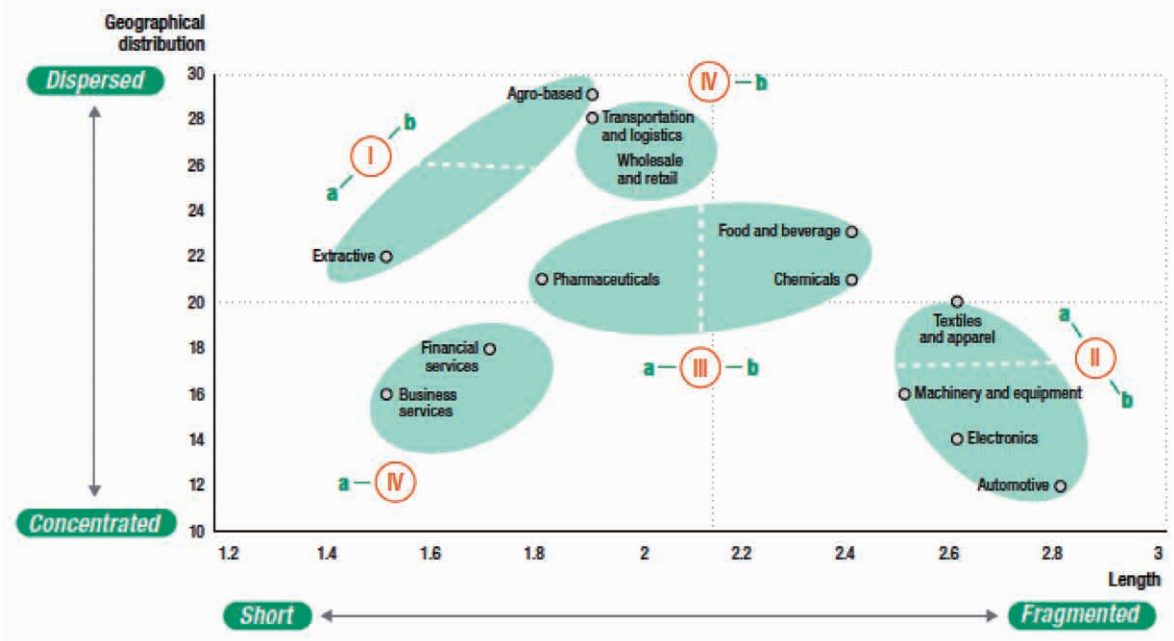
and industry. We start by asking how the GVCs are divided and linked, which locations they operate from and to, and what is the underlying rationale. Then, we identify the areas where COVID-19 and US-China tensions may affect GVCs negatively. These questions and hypotheses will be examined in Chapter 3 with firm-level analyses.

### 3.2 Firm-level business strategies and location choice

The key questions necessary for deconstructing and understanding GVC are as follows: What processes do GVCs consist of? Are these processes dividing or integrating? Are the locations of the processes dispersing or concentrating? In particular, when national borders are disappearing in many ways under globalization, which countries are forming agglomerations and which countries are experiencing hollows? With the effect of COVID-19 and US-China tensions, will the identified tendencies accelerate or slow down? As the mechanisms differ depending on industries, it is important to think of these questions in regard to the types of smile curves shown in Figure 0-5.

We start by discussing these questions industry by industry, based on UNCTAD (2020). The report characterizes different industries' GVCs with two distinct drivers: one is geographical distribution, i.e., whether the GVC is dispersed or concentrated, and the other concerns the length of each process, i.e., short or long. While UNCTAD (2020) focuses on the type of firm-level governance suited to the particular combination of geographical distribution and length, we place our attention on the combination of these two factors and how they are characterized in each industry.

The first type of industry is manufacturing, shown in Figure 0-6 (Machinery and equipment, Electronics, Automotive). Manufacturing is typically located in clusters, but the processes are



Source: UNCTAD (2020)

Figure 0-6 Types of Industries plotted on Geographical Distribution/ Length of Processes

divided and the length between processes is long. GVCs for automotive industries, with GVCs crossing countries between multiple clusters, provide a good example of such clustering. The second type is consumer goods, including wholesale and retail, food and beverages. They occupy the central area of Figure 0-6, with processes dispersed/divided moderately, along with the distance between processes. The third type of industry, services, is located in clusters and the processes are not as divided. Even when divided, the distance between processes is short. However, with intangible (online) cross-border processes increasing recently, this may describe only part of the services industry. Lastly, infrastructure does not appear in Figure 0-6, taken from UNCTAD (2020), but we assume that the hard structures are close to manufacturing and the software part is close to services. With these industry characteristics in mind, we can argue that industries located in clusters or industries with a long distance between processes are at higher risk due to COVID-19.

We now proceed to link these industry characteristics with firm-level business models in their location choices and pursuit of value added. As a baseline, we assume that a profit-maximizing firm chooses to locate itself near markets due to transport costs (Krugman 2008), and that technological progress and innovation take place in agglomeration with large populations and diversity (Fujita and Hamaguchi 2020).

First, we will consider the manufacturing industry. Manufacturing is located in clusters, but the production processes are divided and the distance between processes is long. A typical case is the automotive industry, in which cross-border GVCs link many clusters in different countries. The source of value added at the left-hand side of the smile curve is technology and design. The middle area of the smile curve relies on low cost and maintenance of quality level. At the right-hand side of the smile curve, the source of value added is the customer experience and market capture. As low costs depend on the economy of scale, securing footprints in large markets is key.

When the target market is China, the majority of processes will be located inside China or in neighboring countries. Therefore, areas of inland China or parts of Vietnam with land connections to China are common choices for manufacturing processes. When the target market is Southeast Asia, the processes are likely to be located along coastal China or within ASEAN, considering access to the transport network. As for the rest of the world, the location choice depends on the cost-benefit, weighing up transport and time costs on the one hand, with cost-quality on the other. For example, Vietnam is becoming “the exit point from Asia” for the rest of the world (Ikebe 2021). However, given the long distance to target markets, the location choice may be vulnerable to external shocks.

Wherever the target market is, we assume that the core technology (including productivity and design) is developed at the headquarters or acquired from others. While in the past, core technologies came from the US, EU, Japan and Korea, China is increasingly on the list (Kwan 2020; Goto 2020). With a marketing lens, capture of customers by platforms may lead to monopolistic value creation as the platforms limit competition for their clientele. With a manufacturing lens, when human-led integration at the interface of different processes is key, the locational choice



may be unique (e.g., preference for places where expatriate engineers can live for long periods despite cost consequences).

After discussing manufacturing, we proceed to the consumer goods industry. The GVCs of consumer goods, typically B to C, are relatively dispersed, divided and diverse. On the one hand, global apparel that crosses country borders several times is closer to manufacturing. On the other hand, there are also relatively clustered and undivided value chains of consumer goods, similar to those of agriculture (“locally produced, locally consumed”). Consumer goods are, by definition, consumer market-oriented. Therefore, responding to customers’ needs and sharing of information between design and marketing (i.e., both ends of the smile curve) are the keys to value creation. A baseline requirement is that key elements will remain with the target market, from production to retailing, as well as directly assessing customer reactions to provide a source of innovation. This will occur even when some ideas or materials come from other markets. Decisions on intermediate processes may be similar to that of manufacturing by optimizing transport costs and time while balancing low cost and quality. Value chains of apparel and food products will be different according to the characteristics of the goods, such as perishability. Last but not least, C to C markets are becoming more prevalent with the rise of platforms.

The services industry is also very diverse. Service providers are typically located in clusters and processes are relatively undivided. Even with many processes, the distances between these are short. Financial and business services in major urban areas are good examples; however, there is also a significant part of the sector that involves crossing borders. Value added in the services sector is highest in large city settings where demand and supply, as well as innovation from a diverse pool of people, take place. In the knowledge-centered society of the 21<sup>st</sup> century, it is the large cities where high levels of productivity and utility are realized simultaneously (Fujita and Hamaguchi 2020). In facing COVID-19, one of the advantages of the services sector is the ability to maintain employment due to the relative ease of working online (“ITBPO Industry Employs 23 Thousand People” 2021). However, there are risks that the innovation made possible by the exchange of opinions face-to-face might lose steam in the long run. The same may apply to the development of core technologies for manufacturing.

The infrastructure industry is customer oriented, face to face, and B to B. Production is tailor-made. It is manufacturing in terms of what they produce, but it is close to services as they provide holistic solution systems. Since it is heavily customer oriented, a significant part of the process is located inside the target market. Serving infrastructure customers from a distance is possible but not effective. In addition, due to the need for human-oriented, face-to-face integration between processes, stationing key engineers in the target market is a prerequisite. Due to such characteristics, a typical strategy in the infrastructure industry is to keep close contact and tailor the processes for the customer. Many small-size and lower-end infrastructure products are closer to manufacturing products. However, large-scale and complicated infrastructure systems require integration of different types of products and processes while reflecting the customer’s needs throughout the whole project cycle. This is exactly the source of value added. As many processes are in settings with many co-workers in the field, the risk of COVID-19 is on the higher side.

Firms from Japan, China, the US, EU, Korea and local businesses in Southeast Asia pursue their business models to create and capture value added. Sometimes they forge alliances, and sometimes they compete, always focusing on their comparative advantages. Consequently, GVCs were developed in the region. In Chapter 3, firm-level analyses based on interviews with Japanese firms will provide case studies to understand GVC formation.

#### **4. Hypotheses: the effect of COVID-19 and US-China tensions on GVCs in East and Southeast Asia**

As the conclusion to this prologue, we present possible hypotheses on the effect of COVID-19 and US-China tensions on GVCs in East and Southeast Asia:

As a result of COVID-19,

- 1) demand will decrease due to lockdowns or declining incomes in target markets;
- 2) in labor-intensive processes located in clusters/cities, people will be unable to work onsite;
- 3) when the distance between processes is long, there will be a risk of logistical disruptions;
- 4) there will be decreases in production in the services industry (despite the relative ease of turning online, innovation may be affected);
- 5) there will be a negative effect on R&D and innovation for non-service industries; and
- 6) there will be negative effects on processes that require human-led face-to-face integration for manufacturing and infrastructure

As a result of ongoing US-China tensions,

- 7) development and innovation for core technologies will be affected, especially those that need to be acquired abroad;
- 8) regardless of whether consumer market dominance is achieved through platforms, connecting both ends of the smile curve will continue to be effective; and
- 9) further cost reduction at the middle of the smile curve will be affected, especially in relation to expanding into Southeast Asia in the search for an “exit point for the US market.”

#### **5. Results**

We began with this prologue by covering the recent trends of GVC in Asia, reviewed several theories on GVCs, such as spatial economics, and identified the characteristics of GVCs in several industries. In addition, some hypotheses on the potential effects of COVID-19 and US-China tensions have been developed as a result of this analysis.

Chapter One updates the trends in trade with 2020 data, taking into consideration the impacts of COVID-19. Over the past several years, most notably after 2016, trade relations between China and Southeast Asia have been strengthened. Some production processes in China have been relocated to ASEAN countries, even as trade relations between the US and China worsened. This relocation was most probably undertaken to secure a route to export to the US market. When trade in the region rebounded during the latter half of 2020, the share of trade with China increased

significantly.

Chapter Two traces firm-level impacts of COVID-19 in 2020, using data from listed companies in Southeast Asia. The analyses explore the differences between countries and sectors. Vietnam showed little effect of COVID-19 regarding firm performance, as it has successfully contained the infection. In contrast, Indonesia and Thailand have witnessed a worsening of long-term solvency indicators among their listed firms. Tourism, transport and construction sectors experienced negative impacts. Simulation of firm-level financial performance for the 1<sup>st</sup> Q of year 2021 suggested that short-term liquidity would remain relatively healthy and that policy responses could help smooth out the financials. On the other hand, the real effects on employment, notably among the non-listed firms and the informal sector, remain to be seen.

After examining the trends related to trade and firms in 2020, Chapter Three discusses the results of firm-level in-depth interviews. The selected firms are part of Japanese firms' GVCs from different industries targeting different markets. The respondents are mostly based in China or in Singapore. The in-depth interviews cover the structure of GVC, the underlying business model, and the detailed impacts of COVID-19, as well as US-China tensions. At the time of the interviews (late 2020 to early 2021), the initial shock of COVID-19 was dwindling. Fluctuations in demand and under-capacity operations – due to limitations in travel and difficulties found in labor-intensive processes – remained. The effects of US-China tensions were limited to a couple of specific cases linked to high-tech industries or US tariff increases.

However, we also have to note that the interviews were conducted before the policies of the US Biden administration had been revealed. At this time, many of the interviewed firms recognized that supply chains with low rates of reliance on China were not realistic, matching the findings of Chapter One.

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**Summary**

- Global trade declined significantly in the first half of 2020. However, by the end of the fourth quarter of 2020, it has nearly returned to the level of the previous year. While the decline in 2020 was significant, it was not comparable to that which occurred during the global financial crisis in 2008. China's share of global trade increased substantially in 2020.
- Contrary to the "decoupling due to the US-China tensions and COVID-19" argument, China and major ASEAN countries have continued to strengthen their trade ties since 2016. This trend accelerated in 2020.
- The deepening interdependence between China and major ASEAN countries can also be seen in terms of economic linkages. The depth of this relationship has been a driving force for trade recovery between the two parties, rather than a risk for them.

**1. Introduction**

COVID-19 has had a significant impact on the global trade of goods since the beginning of 2020. Moreover, even before COVID-19, there were growing concerns that, as a result of the US-China tensions, the trade structure would change, and global value chains (GVCs) would become fragmented. Considering these aspects, it is imperative to discuss global trade and economy from a GVC perspective, including whether the fragmentation or decoupling of GVCs is likely to increase.

It can be difficult to grasp the characteristics and importance of GVCs. For example, as discussed in the Prologue, even the international input-output analysis is insufficient for understanding each link or process within a GVC. The international input-output analysis is available only up until 2015, even in the latest version released by the OECD in December 2018. In addition to the micro-level analysis, it is also important to have a macro perspective that provides bird's eye views of the whole field.

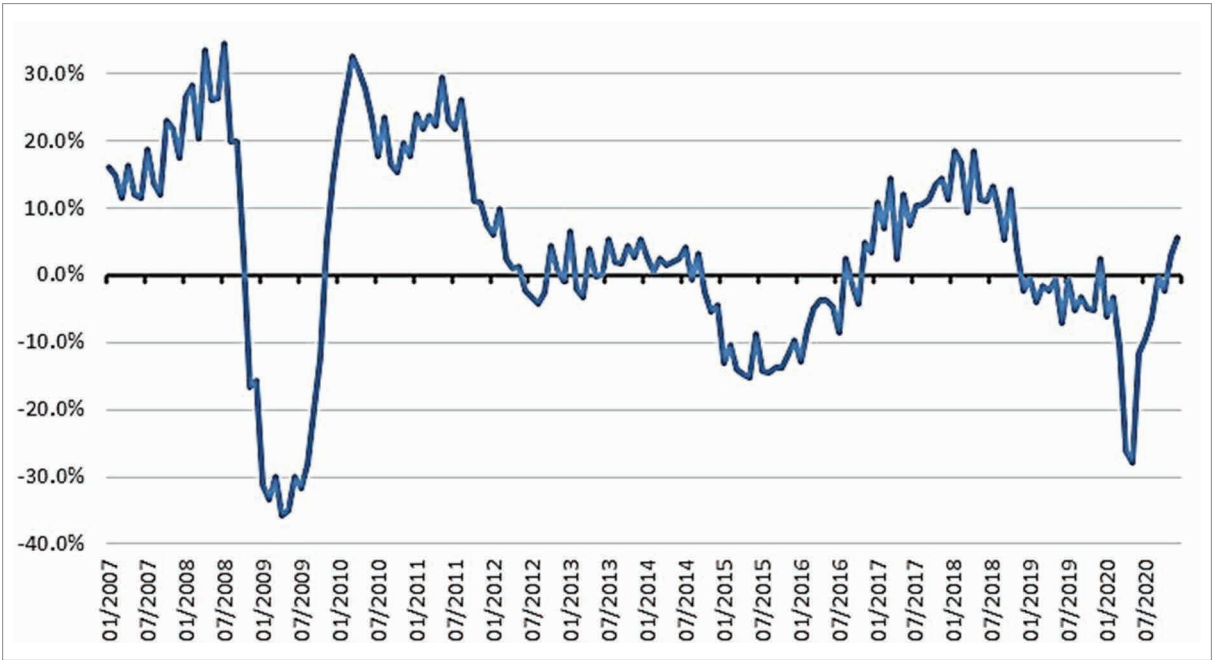
Based on an awareness of these issues, this chapter will analyze GVCs using trade-related data. The structure of this chapter is as follows. First, Section 2 reviews global trade trends; Section 3 shows the trade trends of China and major ASEAN countries, as well as changes in the linkages between them; Section 4 observes the trade trends of China and major ASEAN countries in 2020 on a quarterly basis; Section 5 analyzes the economic linkages between China and major ASEAN countries, and discusses the relationship between the trade trends and the GVCs; Section summarizes the key findings, discusses implications, and offers some brief considerations over future directions for research.



## 2. Global Trade Trends

The global trade in goods began to decline in 2019, partly due to the US-China tensions. In 2020, however, the pace of decline accelerated because of the spread of COVID-19 and the resulting restrictions, lockdowns, and other preventive measures implemented all over the world. In early 2020, many experts held pessimistic views that global trade would plummet more substantially than in 2008-2009, the time of the global financial crisis. One reason for this is because COVID-19 started in China, the world's largest exporter and the starting point of many GVCs. For example, in its April 8 outlook, the World Trade Organization (WTO) said that "WTO economists believe the decline will likely exceed the trade slump brought on by the global financial crisis of 2008-09" and predicted a 32% decline of trade in 2020 according to the pessimistic scenario and a 13% decline according to the optimistic scenario (WTO 2020a). Richard Baldwin, a leading expert on global trade, wrote in an April 7 report that "In today's COVID Crisis, we have all the makings of the 2008-2009 demand- side shock, but on top of that we have massive, supply-side shocks across most sectors of most major economies" and that "the Great Trade Collapse of 2020" is inevitable (Baldwin 2020).

However, trade in 2020 recovered at a faster pace than expected. According to International Monetary Fund (IMF) data, world trade<sup>1,2</sup> fell by more than 25% in April and May 2020 compared with the previous year. However, the decline narrowed after June, and growth turned positive in November and December (3.1% and 5.5%, respectively) (Figure 1-1). While trade declined sharply in 2020, the decline was relatively mild compared to the 2008-2009 period, which saw



Source: IMF DOTS (Direction of Trade Statistics), accessed through CEIC

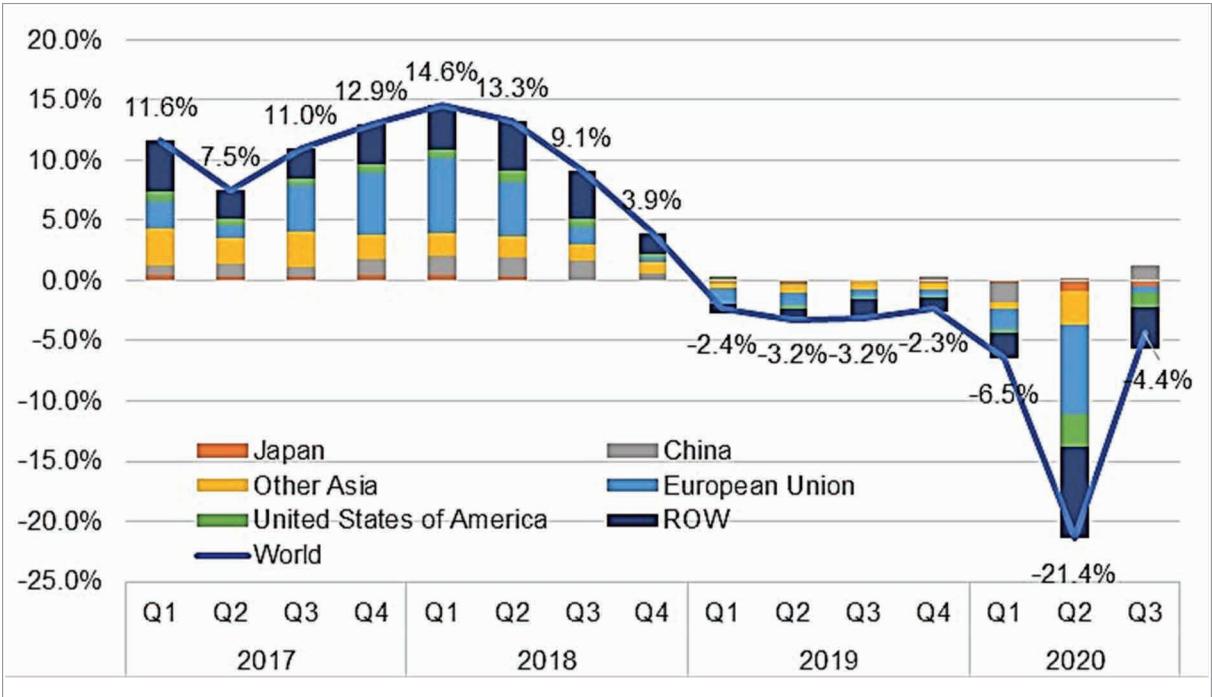
**Figure 1-1 World Exports Growth (monthly, y/y, %)**

<sup>1</sup> Sum of IMF DOTS (Direction of Trade Statistics) figures for exports (FOB basis, nominal values) for 201 countries, obtained through CEIC.  
<sup>2</sup> Value basis. World trade in volume terms fell 17.4% in May, according to the ADB (ADB 2021).

12-months of double-digit declines, including eight months of 30% declines. In October 2020, the WTO revised its trade forecast for 2020 upward to a -7.2% decline (WTO 2020b), and in March 2021, it reported that the final decline was -5.3% (WTO 2021).

There are several possible reasons why the decline in trade in 2020 was modest compared to the global financial crisis. First, the slowdown in the global economy has been more modest than initially expected,<sup>3</sup> partly due to the effects of stimulus measures, including the monetary and fiscal policies that have been strongly promoted by various countries. Secondly, the financial sector has been largely unaffected and asset markets have been unharmed. Third, contrary to earlier expectations, COVID-19 did not generate negative supply shocks, and the decline in trade was mainly due to demand shocks.<sup>4, 5</sup>

Figure 1-2 shows the growth of trade of goods between 2017 and 2020 on a quarterly basis and the contributions to trade made by exporting countries and regions. China's contribution to the



Source: WTO Data Portal. <https://data.wto.org/>

**Figure 1-2 Growth of Trade of Goods and Contributions of Major Countries/Regions**

<sup>3</sup> In its revised economic outlook published in January 2021, the IMF forecast a negative growth rate of 3.5% for 2020 and a positive growth rate of 5.5% for 2021 (IMF 2021). This is an upward revision of 0.9 percentage points and 0.3 percentage points, respectively, from their October 2020 forecast.

<sup>4</sup> In May, Professor Fukunari Kimura of Keio University pointed out that the impact of COVID-19 was a demand shock, and that the argument that it was a supply shock was accurate in March but has not been true after May, especially for ASEAN countries (Kimura 2020).

<sup>5</sup> The WTO points out the following as reasons why trade and output declined less than feared (WTO 2021):

- Strong monetary and fiscal policies by many governments were probably the biggest factors.
- Lockdowns and travel restrictions caused consumers to shift spending away from non-traded services and towards goods.
- Innovation and adaptation by businesses and households kept economic activity from falling even more.
- Manufacturing supply chains were able to resume operations.
- Many people shifted to working remotely, generating income and demand.
- Trade policy restraint by WTO members prevented protectionism from strangling world trade.

total decline of -6.5% in the first quarter was -1.6%, the percentage contribution being 24.8%.<sup>6</sup> The contribution of the EU was -2.8% (percentage contribution 25.5%). Large negative contributions of these regions reflect declines of trade in those areas where the outbreak spread in February and March. In the second quarter, the negative growth rate reached -21.4%, but China's contribution was almost zero. The EU, Asia excluding and Japan, and the United States made negative contributions. It is highly likely that GVCs in Asia were affected during this period. The third-quarter growth continued to be negative at -4.4%, but China's contribution was 1.2%, indicating that China was supporting the overall trade. At the time of writing this report, the figures for the fourth quarter have not been released, but based on the trade statistics of various countries, it is highly likely that negative growth has reduced in the fourth quarter, reflecting China's positive contribution.

**Box 1-1 Contribution and Percentage Contribution**

As mentioned in Footnote 6, "contribution" refers to a measure of how much a change in a constituent item of data affects the data as a whole. It is defined as follows<sup>7</sup>:

$$\text{Contribution} = \frac{\text{Increase or decrease in each component data}}{\text{Overall data value in the previous period}}$$

Let us consider the case of the following equation:

$$Y_t = A_t + B_t + C_t \tag{1}$$

If the data is quarterly, the data for the same period of the previous year is given by:

$$Y_{t-4} = A_{t-4} + B_{t-4} + C_{t-4} \tag{2}$$

Subtracting (2) from (1) and dividing the equation by  $Y_{t-4}$  yields:

$$\frac{Y_t - Y_{t-4}}{Y_{t-4}} = \frac{A_t - A_{t-4}}{Y_{t-4}} + \frac{B_t - B_{t-4}}{Y_{t-4}} + \frac{C_t - C_{t-4}}{Y_{t-4}} \tag{3}$$

The left-hand side of this equation is the growth rate of  $Y_t$ , while each term on the right-hand side is the contribution of each item. The phrase "China's contribution to the total decline of -6.5% was -1.6%" in the text means that, "of the -6.5% overall growth rate, -1.6% can be explained by China's movement." As is clear from the above equation, the sum of contributions of all items is equal to the overall growth rate.

On the other hand, the percentage contribution shows how much the changes in the component data affect the changes in the overall data when the change in the overall data is 100. This can be defined as follows:

<sup>6</sup> Contribution refers to a measure of how much a change in a constituent item of data affects the data as a whole, while the percentage contribution refers to a measure of how much a change in a constituent item of data affects the data as a whole when the change in the data as a whole is 100 (see Box 1-1).  
<sup>7</sup> In some cases, such as the real values in the national accounts, more complicated formulas are used.

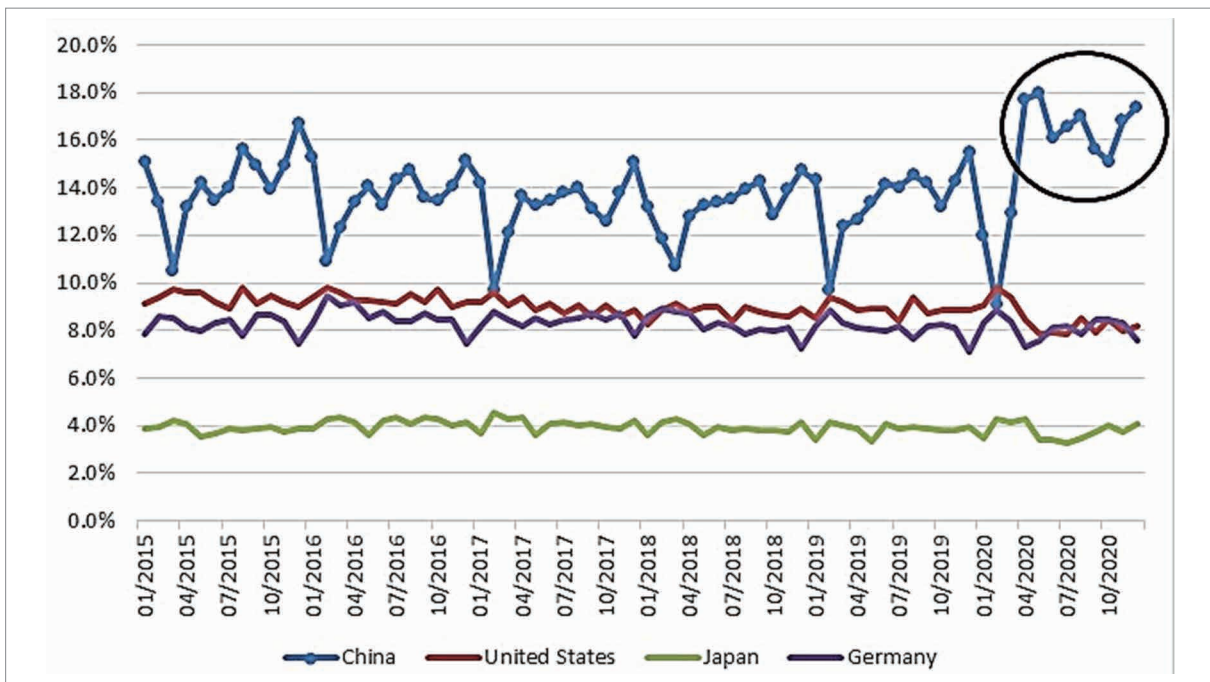
Percentage Contribution = Increase or decrease in each component data  
 / Increase or decrease in overall data value \* 100

In the example above, transforming (3) (specifically, multiplying both sides by  $(Y_{t-4} / (Y_t - Y_{t-4})) \times 100$ ) yields the following:

$$100 = \frac{A_t - A_{t-4}}{Y_t - Y_{t-4}} \times 100 + \frac{B_t - B_{t-4}}{Y_t - Y_{t-4}} \times 100 + \frac{C_t - C_{t-4}}{Y_t - Y_{t-4}} \times 100 \quad (4)$$

Each term on the right-hand side is the percentage contribution of each item. "China's percentage contribution of 24.8%" means that "China's movement can explain 24.8% of the total movement."

China's support can also be seen in the share of each country in world exports estimated using IMF DOTS (Figure 1-3). Although China's share dropped to 9.0% in February,<sup>8</sup> it reached a record high of 17.6% in April and 17.8% in May and has remained high ever since. In 2020, China's share was 15.3%, much higher than that of the US (8.4%), Germany (8.1%), and Japan (3.8%). COVID-19 was contained in China earlier than other countries, which led to the resumption of economic activities ahead of other countries. China has greatly increased its presence in trade by



Source: IMF DOTS (Direction of Trade Statistics), accessed through CEIC

**Figure 1-3 Share of major countries in world exports**

<sup>8</sup> In general, economic activity in China tends to decline during the Spring Festival. Since the Spring Festival was in January in 2020 and February in 2019, it is likely that exports in February 2020 (-9.6% according to IMF DOTS, -21.7% in January) were even lower than the figures show. China's trade statistics were released every month until 2019, but on February 9, 2020, the General Administration of Customs announced that "Starting from this year, customs statistics on cargo import and export of January will be released together with those of February, to align with the schedule of National Bureau of Statistics for relevant data release." According to the statistics released by the General Administration of Customs in March, China's exports fell by -17.2% in January-February.

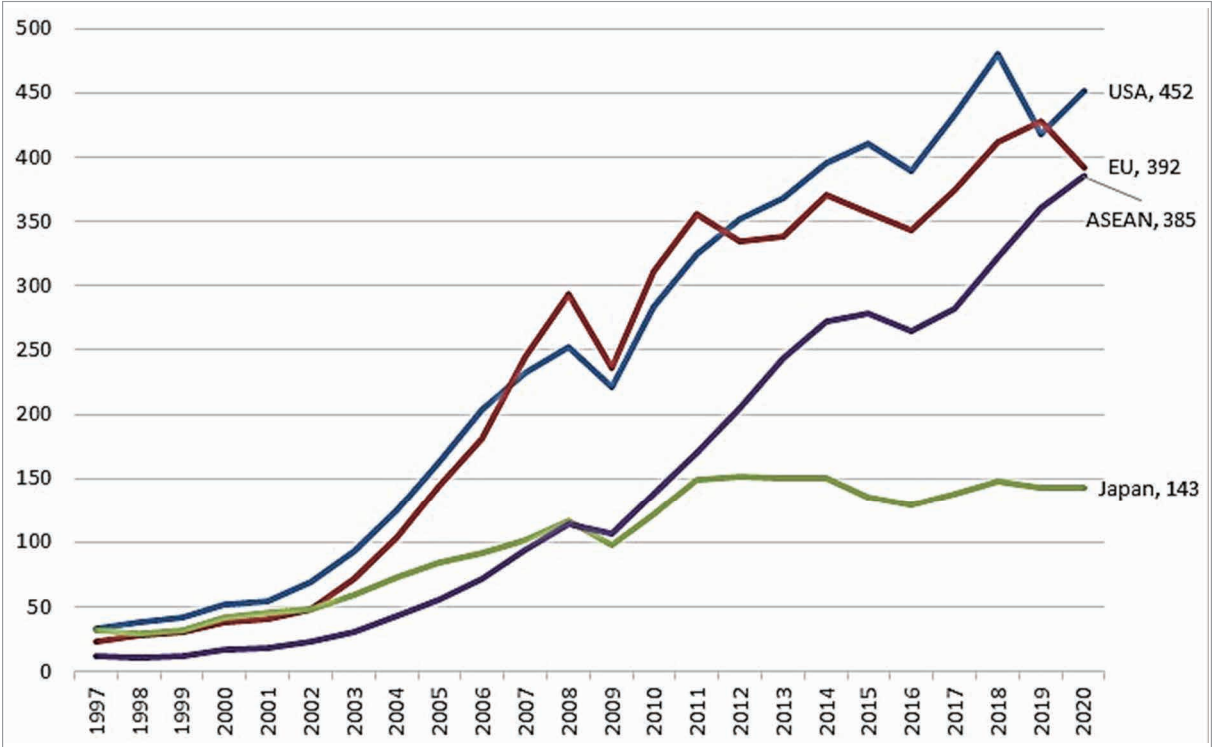
substituting production in other countries.

To summarize the above analysis, the following three aspects can be highlighted. First, although trade growth in 2020 was substantially negative, the decline was smaller than in 2008-2009, the period of the global financial crisis. Second, on a quarterly basis, the decline peaked in the second quarter and has since been reversed. Third, the recent recovery has been supported by China, with China’s presence rising remarkably.

**3. Trade Trends in China and Major ASEAN Countries<sup>9</sup>**

Let us look first at exports from China by trading partners (Figure 1-4). Exports to ASEAN have increased significantly, reaching a level comparable to that of the US and the EU. Part of this increase in exports to ASEAN may reflect the fact that exports from China to the US have become difficult due to the tensions between the US and China, which increased exports via ASEAN countries. This facet will be discussed in detail in Section 5.

Figure 1-5 shows imports of China. ASEAN has replaced the EU as China's largest import partner region since 2018. In terms of total imports and exports combined, in 2020, ASEAN became China's largest trading partner for the first time in history.



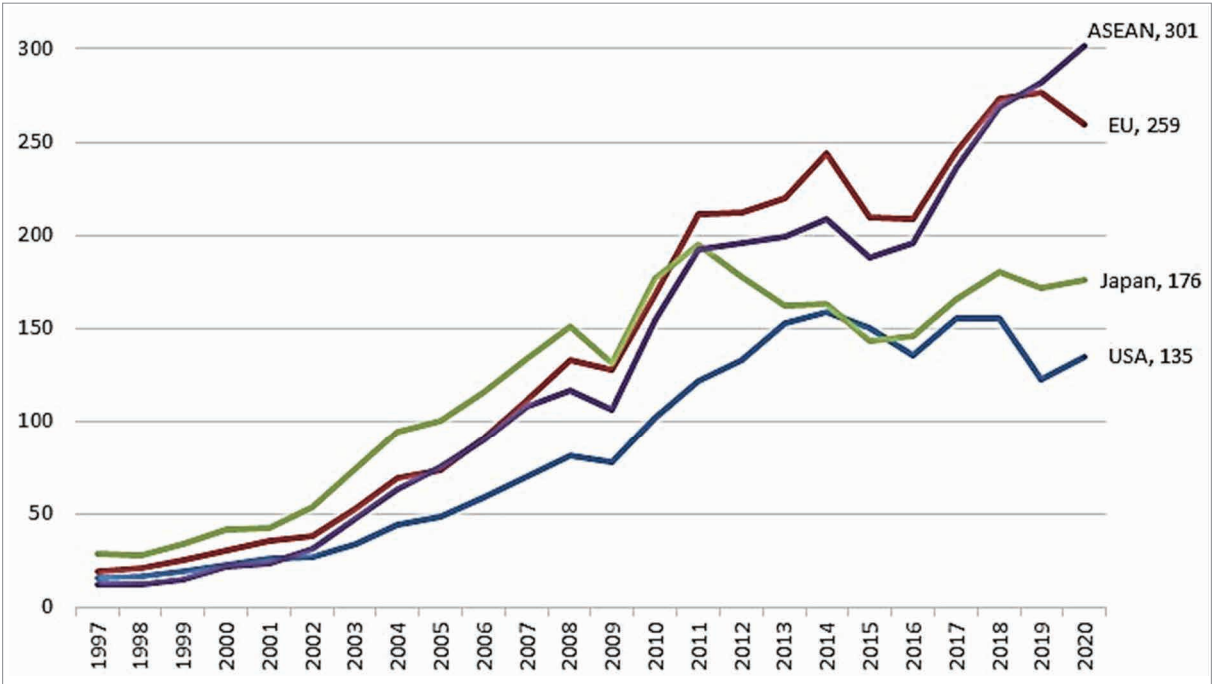
Source: CEIC

**Figure 1-4 Exports from China (billion dollars)**

<sup>9</sup> Six major ASEAN countries (Singapore, Vietnam, Thailand, Malaysia, Indonesia, and the Philippines) are hereafter referred to as the "major ASEAN countries". It should be noted that, for China's imports and exports (Figure 1-4 and Figure 1-5), trade figures with the 10 ASEAN countries including BCLM (Brunei, Cambodia, Laos, and Myanmar) are used, as this is based on Chinese-side statistics.

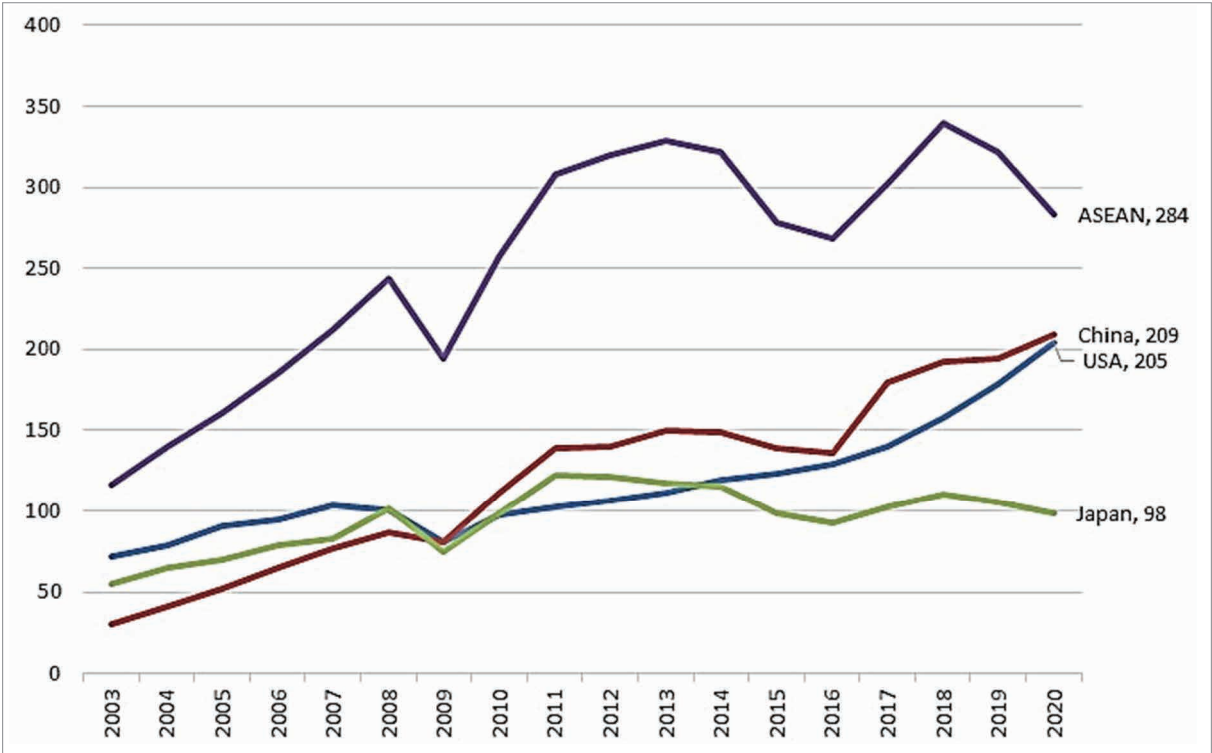


The total exports of major ASEAN countries by trading partners are shown in Figure 1-6. Since 2016, when the tensions between the US and China became more acute, these countries have



Source: CEIC

Figure 1-5 Imports of China (billion dollars)

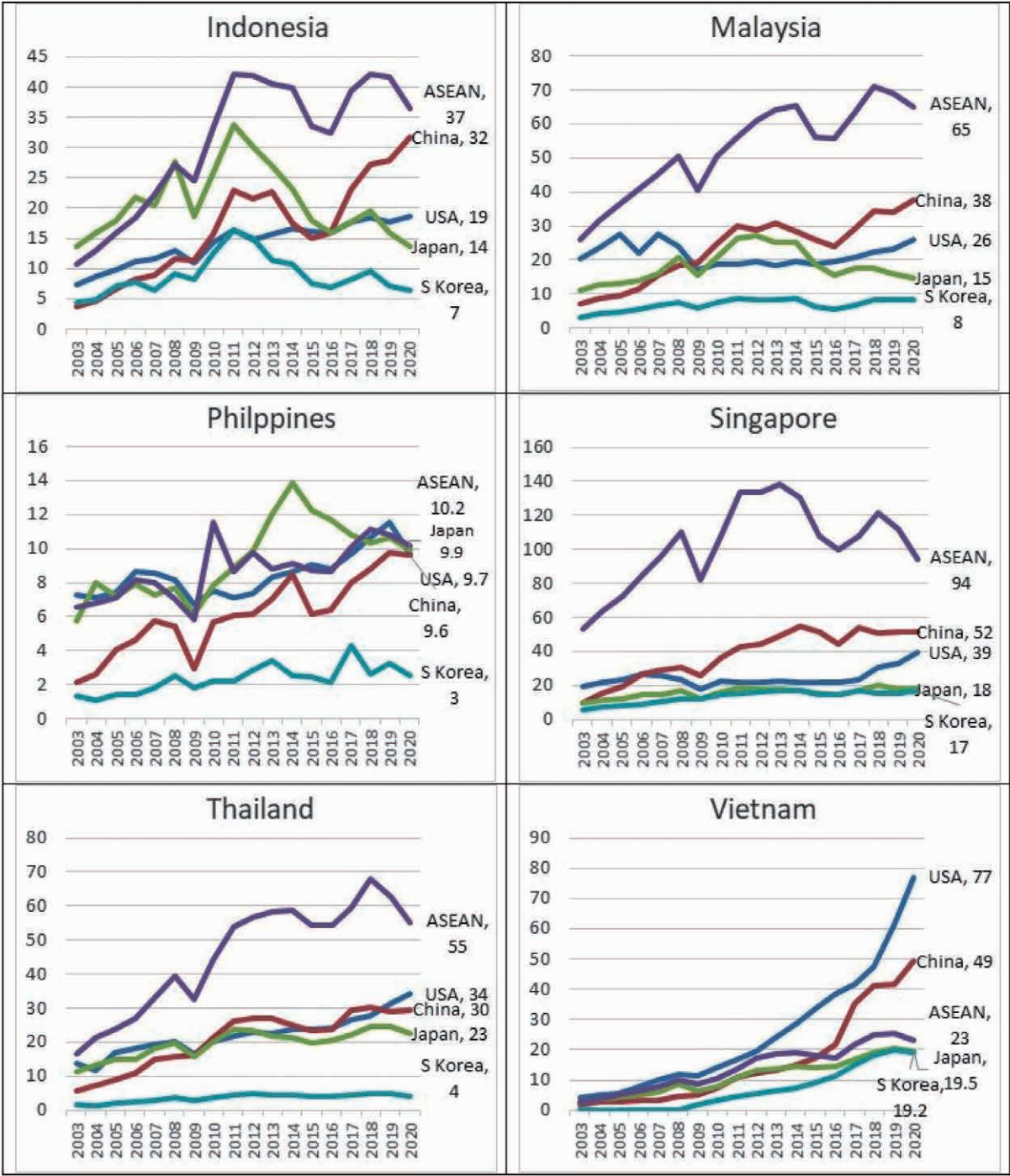


Source: CEIC and ASEAN stats. <https://www.aseanstats.org/>  
 Note: Due to data limitations, ASEAN statistics were used until 2012, and those of CEIC were used after 2013.

Figure 1-6 Exports from major ASEAN countries (total value, billion dollars)

increased their exports to both the US and China. This trend has not changed – even in 2020, when overall exports have declined. It is often argued that "the US-China tensions and COVID-19 will cause decoupling among trading partners". However, in reality, both the US and Chinese markets are becoming increasingly important for major ASEAN countries.

Looking at this trend by country (Figure 1-7), it is noteworthy that, while all countries increased exports to both the US and China, exports to China have been growing sharply in Indonesia and Malaysia, and exports to the US have been increasing significantly in Thailand and Vietnam.



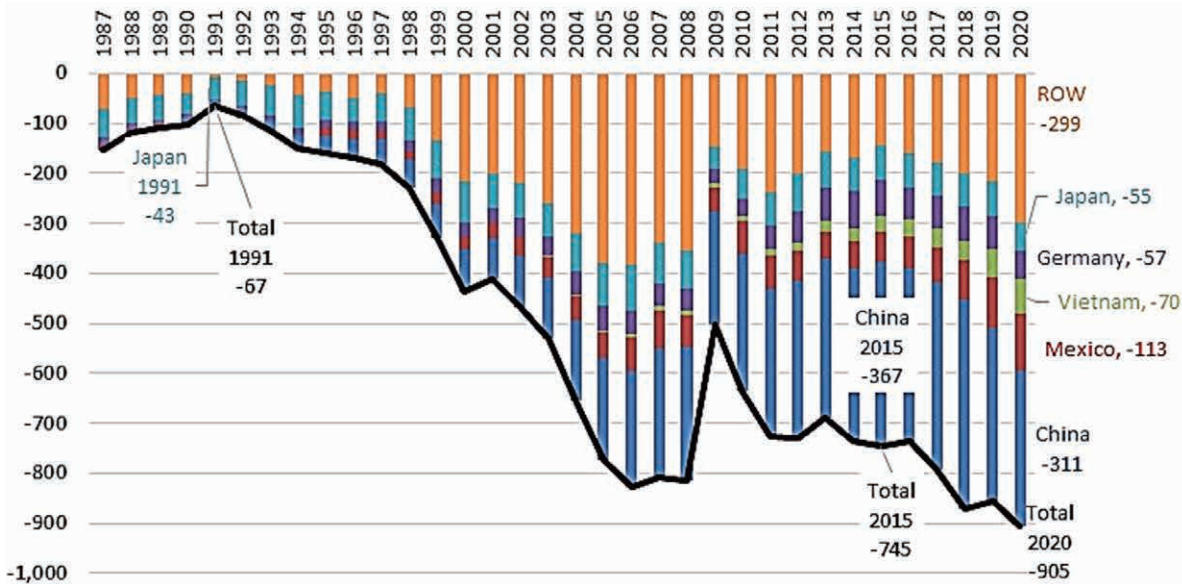
Sources and notes are the same as in Figure 1-6

Figure 1-7 Exports from major ASEAN countries (billion dollars)

The growth of Vietnam's exports to the US is especially distinct. US statistics show that the US deficit with Vietnam had risen to the third-largest by 2020 (7.7% of the total trade deficit), and the surplus with the US could be a risk for Vietnam (See Box 1-2).

**Box 1-2 US Trade Deficit with Asian Countries**

Figure 1-8 shows the US goods trade deficit by trading partners based on US statistics. The deficit with Japan was the largest until the mid-1990s, accounting for 65% of the total in 1991. After that, especially after China's accession to the WTO in 2001, the deficit with China continued to grow, reaching 49.3% in 2015. Since 2016, the share of the deficit with China has been shrinking, falling to 34.3% in 2020. This apparently reflects the growing tensions between the US and China, including the US adding tariffs on goods from China. As if to keep pace with this trend, Vietnam's deficit with China has been on the rise, and in 2020 the trade deficit with Vietnam was the third-largest (7.7%) after China and Mexico (Japan was the seventh). The US is wary of Vietnam's exports to the US, and a surplus with the US could become a risk for Vietnam. In light of these risks, Dr. Ryo Ikebe, Senshu University School of Commerce Associate Professor, points out that Vietnam needs to "hasten the upgrading of its industrial structure to one that requires more equipment and technology, such as intermediate goods and materials processing, rather than processes such as assembly and inspection" (Ikebe 2021).



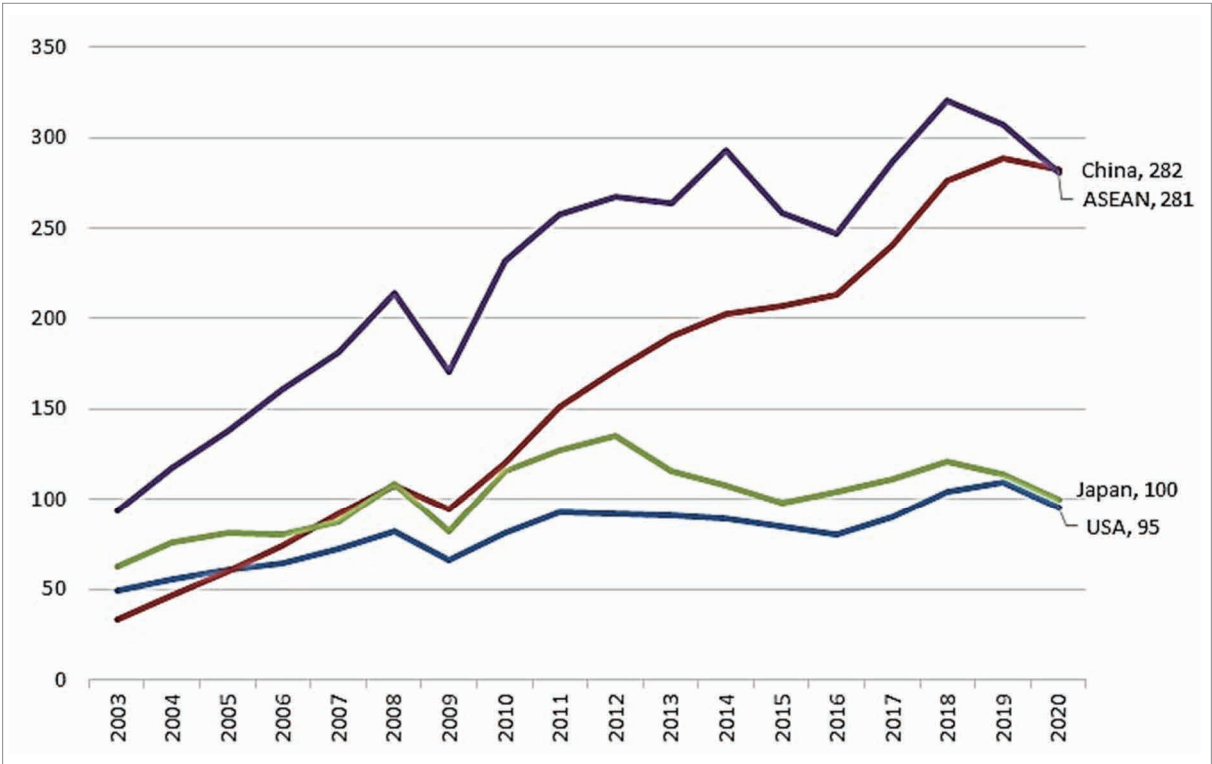
Source: Author calculations based on data from the Census Bureau, US Department of Commerce.<sup>10</sup>

**Figure 1-8 Trade deficit by US trading partners (in billions of dollars)**

Trade deficits with other ASEAN countries have been also growing, with Malaysia and Thailand ranking eighth (3.5%) and 11th (2.9%), respectively in 2020.<sup>11</sup> The trade deficit with major ASEAN countries combined amounts to 16.3% of the total US trade deficit.

<sup>10</sup> <https://www.census.gov/foreign-trade/balance/index.html>  
<sup>11</sup> Trade data by major trading partner for 2020 can be found at: <https://www.census.gov/foreign-trade/statistics/highlights/top/top2012yr.html>

Next, let us examine the movement of imports of major ASEAN countries by trading partners. What is striking is that imports from China exceeded those from ASEAN in 2020. Major ASEAN countries have been gaining status as both production bases (Factory Asia) and consumer markets (Shopper Asia) (ASEAN-Japan Centre 2020), and it can be confirmed that imports from China have become increasingly important in relation to both aspects.

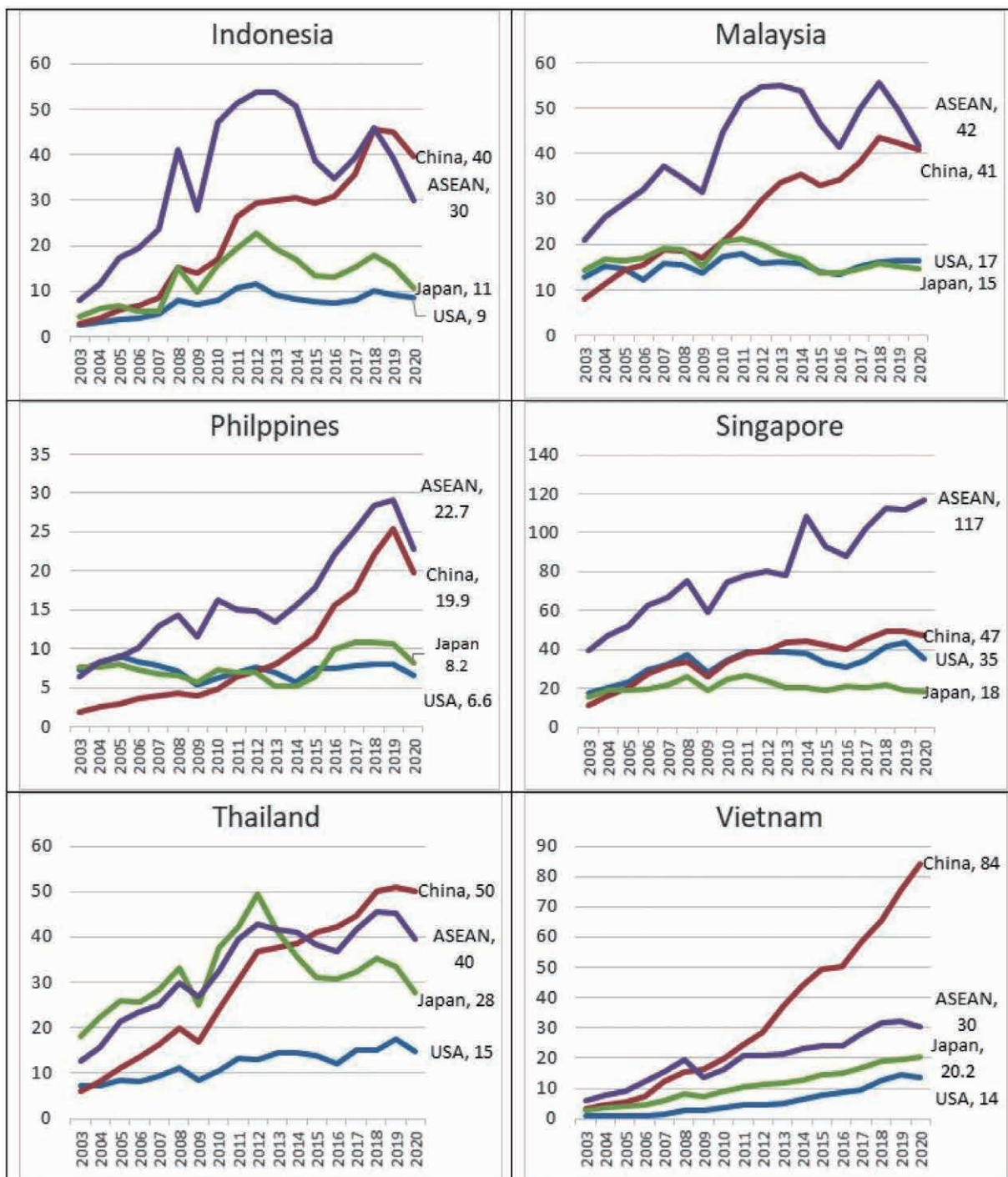


Sources and notes are the same as in Figure 1-6

**Figure 1-9 Imports of major ASEAN countries (total value) (billion dollars)**

The data on imports of each country (Figure 1-10) reveals that imports from China have been increasing at a faster pace than those from ASEAN in all countries except Singapore. In Indonesia, Thailand, and Vietnam, China has already become a larger import partner than within ASEAN. In Vietnam, in particular, the growth of imports from China has been remarkable, reaching nearly three times that of ASEAN. In addition, imports from South Korea to Vietnam (not shown in the graph) have been growing rapidly, reaching \$46.7 billion in 2020, far exceeding imports from ASEAN (\$30.5 billion). South Korean companies such as Samsung have been rapidly expanding their investments and production in Vietnam, and this development is thought to have led to an increase in imports of parts and other products from South Korea to Vietnam.



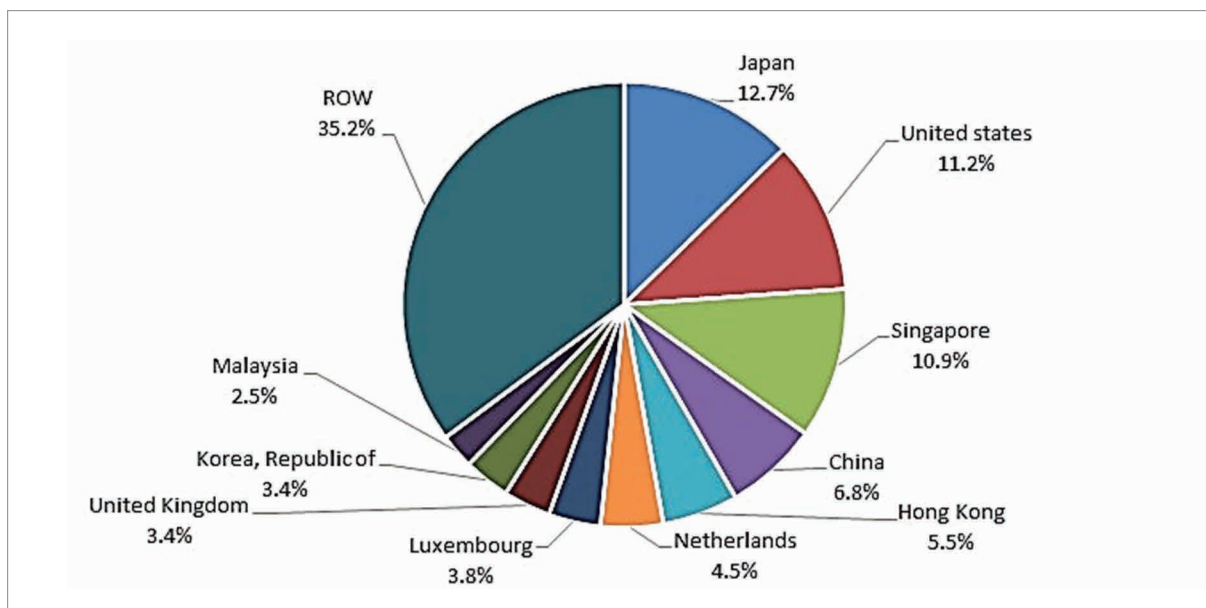


Sources and notes are the same as in Figure 1-6

**Figure 1-10 Imports by Major ASEAN countries (\$ billions)**

Imports from Japan and the US, with the exception of a few, have been on a downward trend or have been leveling off. However, data on FDI (foreign direct investment) into ASEAN (Figure 1-11) indicate that both countries are the largest sources of investment, suggesting that Japanese and US companies are building up IPNs (international production networks) in Asia and procuring parts locally.





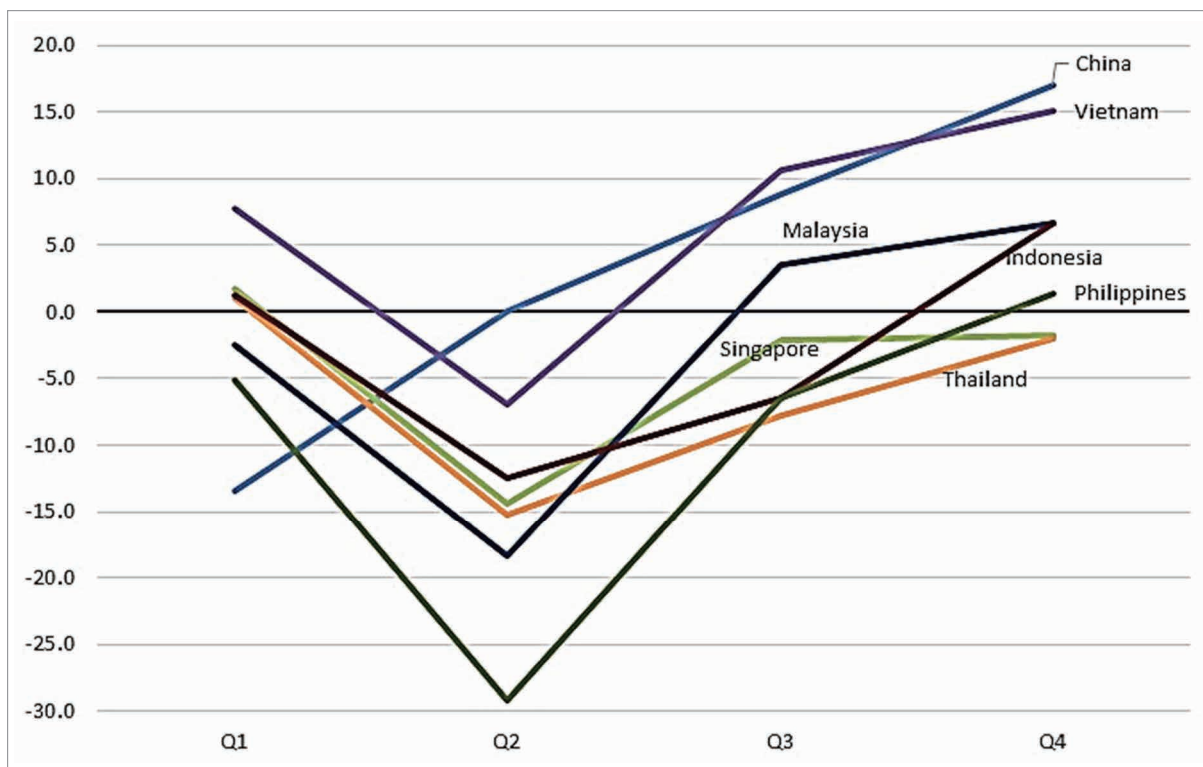
Source: ASEAN Stats. <https://data.aseanstats.org/fdi-by-hosts-and-sources>  
 Note: Simple sum of flows from 2010 to 2019

**Figure 1-11 Foreign Direct Investment into ASEAN**

#### 4. Asia's Trade Trends by Quarter in 2020

Figure 1-12 shows the movement of exports from Asian countries and regions in 2020 on a quarterly basis. These countries can be categorized into four groups.

First, exports from China, which declined by 13.5% in the first quarter ahead of other economies, turned to positive in the second quarter and accelerated in the third and fourth quarters. Second, Vietnam's export growth has been accelerating since the third quarter, despite a decline in the second quarter, and was positive for the full year 2020 (7.0%), surpassing China (4.0%). Third, growth of exports from Malaysia and Indonesia were slightly negative for the full year 2020 (Malaysia -2.6%, Indonesia -2.6%), though they turned positive by the fourth quarter. Fourth, Singapore, Thailand, and the Philippines remained at or below levels of the previous year in the fourth quarter, with significant declines for the full year 2020 (Singapore - 4.1%, Thailand - 6.0%, Philippines - 10.1%).



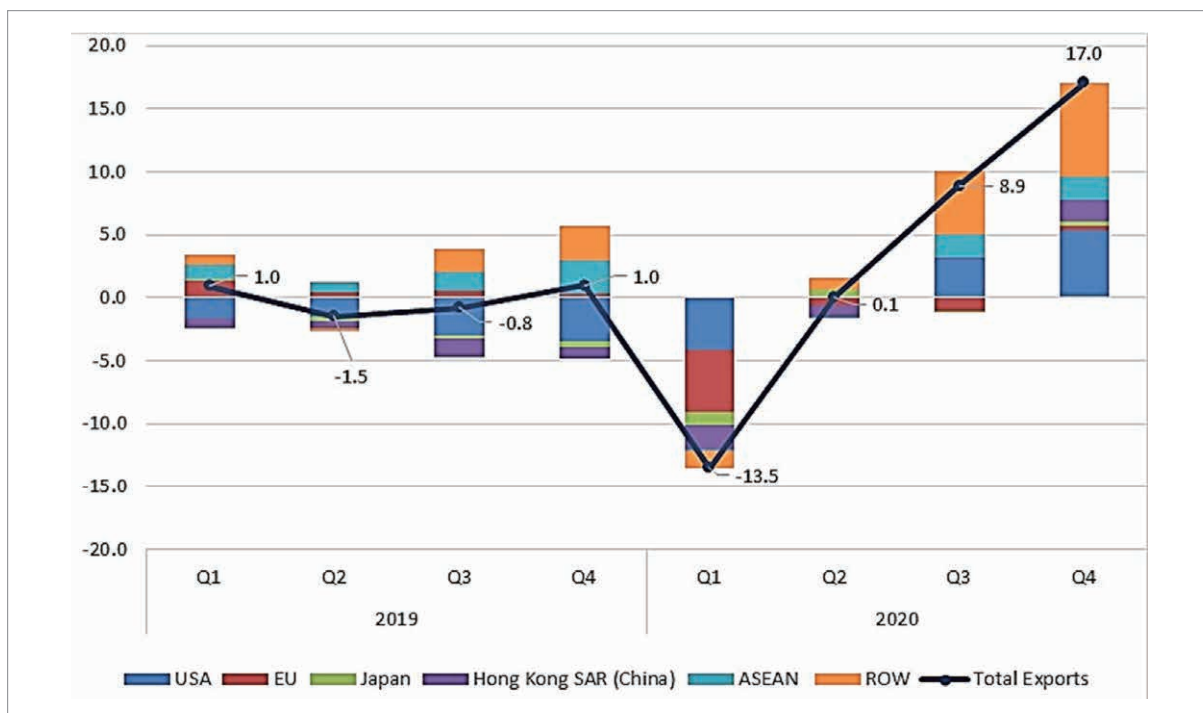
Source: CEIC

**Figure 1-12 Exports from China and major ASEAN countries by quarter, 2020 (y/y, %)**

In this section, we will examine the movement of exports by destination. The growth of China's exports and their contribution by destination are shown in Figure 1-13. In 2019, exports from China to the US and Hong Kong, China made a negative contribution, while those to ASEAN made positive contributions. This trend suggests that, while the tensions between the US and China has made it difficult for China and Hong Kong, China to export to the US, some of the production in China may have been substituted by production in ASEAN countries.

In the first quarter of 2020, exports to all regions declined, especially to the US (contribution: -4.1%, percentage contribution: 30.7%) and the EU (contribution: -5.0%, percentage contribution: 36.8%), which accounted for most of the decline. On the other hand, exports to ASEAN declined only slightly (-0.1% contribution, 0.5% contribution).

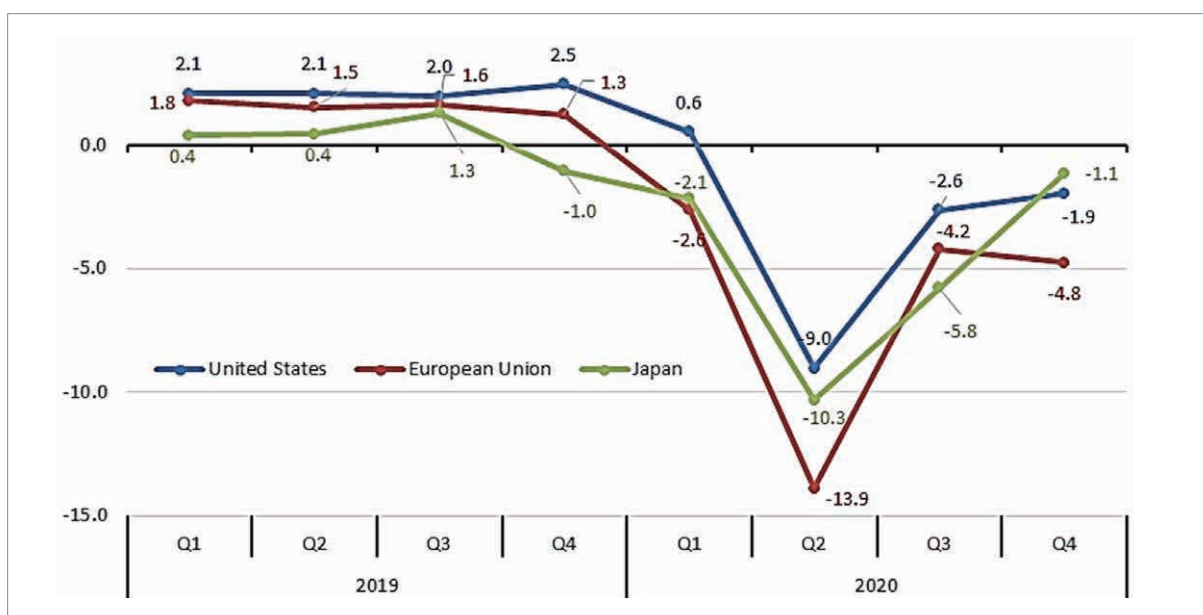
In the third and fourth quarters, export growth accelerated to 8.9% and 17.0%, respectively. The contribution of exports to the US was particularly large at 3.0% (percentage contribution 34.1%) and 5.4% (percentage contribution 31.7%), respectively. Exports to ASEAN also contributed 1.9% (percentage contribution: 21.4%) and 1.9% (percentage contribution: 11.1%), respectively, in the same periods. This confirms the strengthening of the economic ties between China and ASEAN, as discussed in Section 3.



Source: CEIC

Figure 1-13

Figure 1-14 indicates GDP growth of the US, Japan, and the EU. In the first quarter of 2020, the EU and Japan had negative growth, but the US had positive growth. This is clearly not consistent with the movement of Chinese exports shown in Figure 1-13. This suggests that the cause of the large decline in Chinese exports in the first quarter was not a demand shock in developed countries, but a supply shock caused by the suspension of production of parts supplies in China.



Source: CEIC

Figure 1-14 Real GDP of the US, Japan, and the EU (y/y, %)

Table 1-1 shows the contribution of each trading partner to the decline in exports from major ASEAN countries, Hong Kong, China, and Chinese Taipei in the second quarter of 2020.<sup>12</sup>

**Table 1-1 Growth of Exports from each economy and Contribution by Trading Partners in Q2 2020**

Total	USA	China	Japan	EU	South Korea	Hong Kong, China	Chinese Taipei	Singapore	Vietnam	Thailand	Malaysia	Indonesia	Philippines	ROW	
Hong Kong, China	-8.8	-2.1	-0.4	-0.6	-3.3	-0.2	—	0.1	-0.3	0.1	-0.2	-0.1	-0.0	-0.2	-1.7
Chinese Taipei	-2.4	0.7	2.4	0.3	-1.4	-1.3	2.5	—	-0.3	-0.9	-0.2	-0.4	-0.3	-0.2	-3.3
Singapore	-14.4	1.6	-1.2	0.4	0.2	-0.0	-0.5	0.5	—	-0.6	-0.8	-3.6	-2.4	-0.6	-7.4
Vietnam	-6.9	2.1	2.0	-1.0	-1.4	-0.0	1.3	0.1	-0.4	—	-0.8	-0.6	-0.5	-0.4	-7.4
Thailand	-15.2	1.1	1.4	-1.3	-2.9	-0.6	-0.4	-0.2	-0.0	-1.0	—	-1.3	-0.2	-1.3	-8.4
Malaysia	-18.4	-0.8	1.6	-1.5	-2.1	-0.3	-0.4	-2.2	-1.0	-0.8	-2.0	—	-0.6	-0.7	-7.7
Indonesia	-12.5	-1.0	2.2	-1.9	0.1	-0.4	-0.2	0.1	-2.0	-0.6	-1.5	-1.6	—	-1.6	-3.9
Philippines	-29.2	-7.9	-3.0	-3.3	-4.7	-1.3	-0.9	-0.9	-0.6	-0.6	-1.4	-0.5	-1.0	—	-3.1

Source: Author calculation based on CEIC Database

The following two facts can be highlighted from this table. First, the impact of COVID-19 differs depending on the position of each economy in the GVCs. For instance, in Hong Kong, China, where many industries belong to the downstream<sup>13</sup> of GVCs, the decline in exports to the US and the EU contributed significantly to the overall decline. On the other hand, in Chinese Taipei, Singapore, Vietnam, and Indonesia, the contributions of exports to the US and EU were positive or slightly negative, while exports within Asia had significantly negative impacts. These countries supply intermediate goods to other countries in the Asian production network, and the decline in production of those trading partners is thought to have had adverse impacts.

Second, in Singapore, Vietnam, Thailand, and Malaysia, negative impacts of the decline in trade with the Rest of the World (ROW) were huge. Delving into details, the impacts of trade with India were the largest, where contributions for Singapore were -1.7%, Vietnam -1.8%, Thailand -2.3%, and Malaysia -3.0%, respectively. India's imports declined by -52.9% in Q2 2020 compared with the previous year, the largest decline since 1991 when data are available, indicating that the impact of India's lower demand was significant in countries with high export exposure to India. Other than exports to India, exports to Panama (-1.2% contribution) and Australia (-1.0%) in Singapore, exports to the UAE (-1.0%) and Brazil (-0.5%) in Vietnam, exports to Cambodia (-0.9%) and Australia (-0.6%) in Thailand, and exports to Australia (-0.9%) and Bangladesh (-0.7%) in Malaysia had noticeable negative impacts.

<sup>12</sup> Hong Kong, China and Chinese Taipei are included in the analysis for comparison purposes.

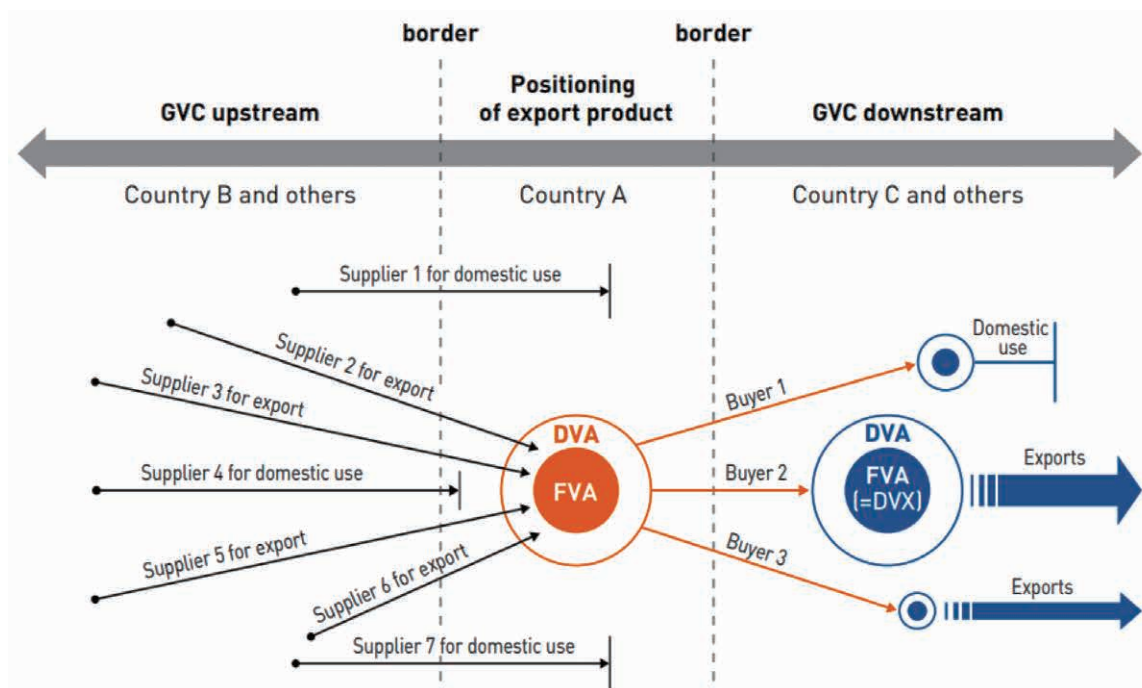
<sup>13</sup> See the Prologue for a discussion of the concept of "downstream."

## 5. Economic Integration and Trade Trends in China and Other Major ASEAN Countries

In this section, the UNCTAD-Eora Global Value Chain Database<sup>14</sup> is used to identify the economic linkages between China and major ASEAN countries. This database covers the entire world (189 countries and the "Rest of the World") and contains time-series GVC data collected since 1990. The following analyses are based on the country-by-country value-added matrix of the database, where the rows indicate the country of origin of the value added and the columns indicate the country exporting the value added.

The degree of participation in GVCs is defined as the sum of the forward participation ratio and the backward participation ratio. The forward participation ratio is the ratio of the value of exports of intermediate goods used as an input in the production of goods exported by destination countries to the total value of exports of the home country (DVX in Figure 1-15). On the other hand, the backward participation ratio represents the share of foreign source value added included in imported intermediate goods used in the production of export goods in the home country's total exports (FVA in the figure below). The higher these ratios are the higher the degree of participation in GVCs.<sup>15,16</sup>

This section reviews the status of GVCs in Asia in terms of both forward and backward participation and discusses their relationship with the trade trends described in the previous sections.



Source: ASEAN-Japan Centre (2020)

**Figure 1-15 Conceptual diagram of GVC**

<sup>14</sup> <https://worldmrio.com/unctadgvc/>

<sup>15</sup> See Aslam, Novta, and Rodrigues-Bastos (2017) for GVC concepts including DVX and FVA.

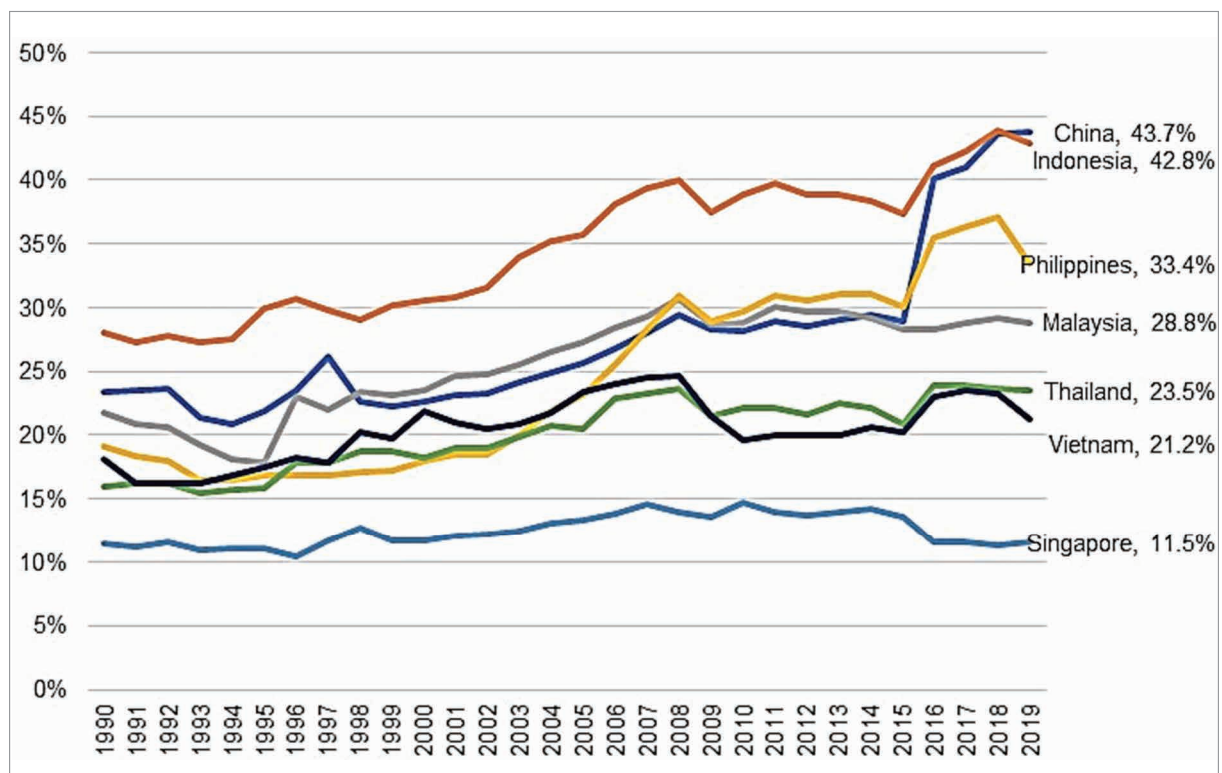
<sup>16</sup> It should be noted that high or low levels of FVA and/or DVX do not necessarily indicate the upgrading of GVCs in that country (Ito 2020; Kimura 2020).



## 5.1 Forward Participation Ratio

Figure 1-16 indicates the forward participation ratios of Asian countries (trading partner: world, industry: all industries). The ratios have been increasing in China, Indonesia, and the Philippines. This facet suggests that these countries are shifting from being traders with a focus on processing trade to traders as suppliers of higher value-added intermediate goods.

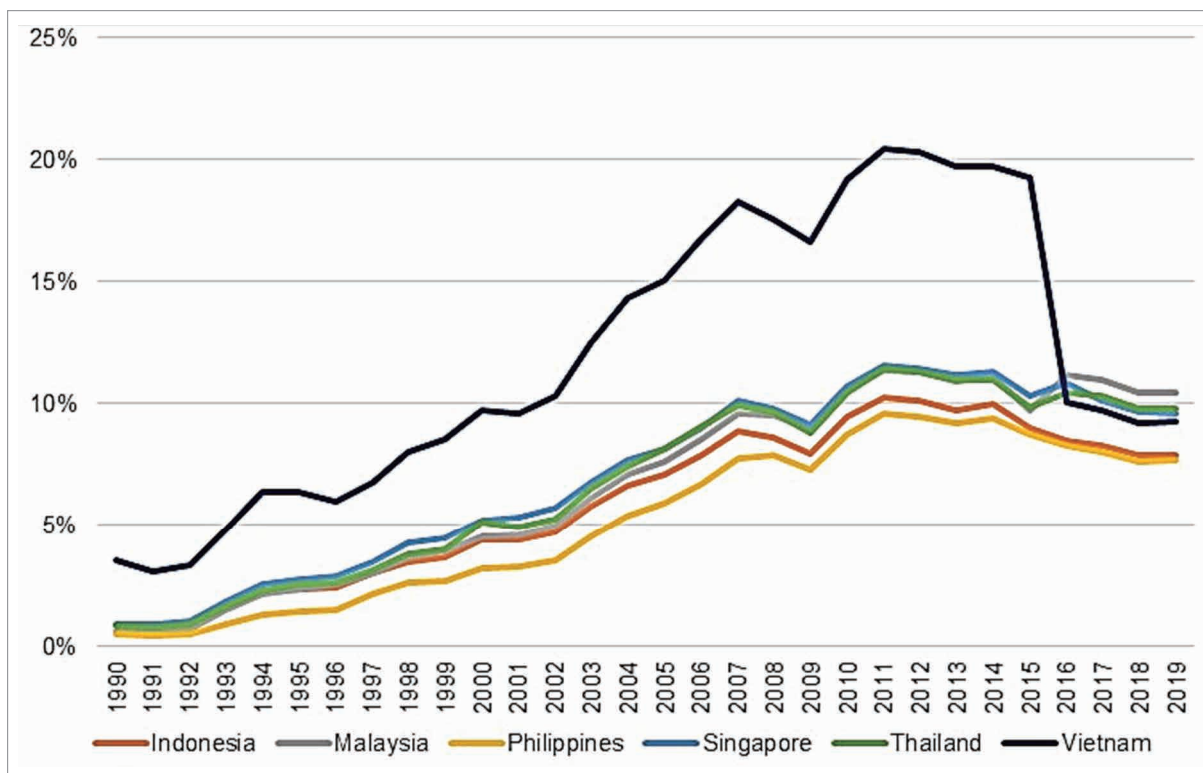
What is particularly noteworthy in recent years is the fact that China's forward participation ratio has risen sharply since 2016. This fact, considered in conjunction with the increase in China's exports to ASEAN seen in Section 3 can be interpreted as reflecting the fact that multinational companies, including Chinese companies, have partly transferred production of final goods from China to ASEAN and switched their exports from China to exports via ASEAN countries, thereby increasing intermediate goods exports from China.



Source: UNCTAD-Eora Global Value Chain Database

**Figure 1-16 Forward Participation Ratio in China and Major ASEAN countries, All Industries, to the World**

Figure 1-17 shows the share of China in the total forward participation of major ASEAN countries, i.e., the share of intermediate goods exports from each country that are used for final goods exports from China to the total intermediate goods exports. While these shares were rising until 2015, they have been declining since 2016. Notably, the share for Vietnam has plummeted from around 20 percent to around 10 percent. This trend may reflect the fact that, amidst the tensions between the US and China, multinational companies have partially modified the "East Asian production system with China as the starting point" (Inomata 2019) and shifted to a system of direct exports from Vietnam and other countries.



Source: UNCTAD-Eora Global Value Chain Database

**Figure 1-17 China's Share of Forward Participation in Major ASEAN countries (All Industries)**

Table 1-2 presents the share of each trade partner in terms of the forward linkages of major ASEAN countries in 2019. In Indonesia, Malaysia, and the Philippines, supplies of parts to Singapore's production were the largest. On the other hand, for Thailand and Vietnam, supplies of parts to China were still the largest, though they have declined in recent years, as mentioned earlier.

**Table 1-2 Forward Linkages for Major ASEAN countries by Trade Partner, 2019**

Indonesia (%)			Malaysia (%)			Philippines (%)		
1	Singapore	26.8	1	Singapore	20.7	1	Singapore	5.5
2	Japan	9.0	2	China	7.6	2	Netherlands	3.9
3	South Korea	8.5	3	Germany	5.2	3	Japan	3.4
4	China	7.9	4	Japan	4.7	4	Germany	3.4
5	Germany	6.2	5	South Korea	3.8	5	China	2.9

Singapore (%)			Thailand (%)			Vietnam (%)		
1	Malaysia	14.6	1	China	9.8	1	China	9.2
2	China	9.6	2	Germany	9.6	2	Germany	8.9
3	Germany	8.4	3	Singapore	8.7	3	Belgium	8.4
4	UK	4.9	4	Netherlands	7.7	4	France	6.5
5	Ireland	4.4	5	Malaysia	7.3	5	Japan	5.8

Source: UNCTAD-Eora Global Value Chain Database

In 2000, supplies of parts to China were much less important for major ASEAN countries, except for Vietnam (Table 1-3). It can be said that GVC linkages in the form of major ASEAN countries supplying parts to China and China producing final goods have developed throughout the 2000s.

**Table 1-3 Forward Linkages of Major ASEAN countries, by Trade Partner, 2000**

Indonesia (%)			Malaysia (%)			Philippines (%)		
1	Singapore	18.0	1	Singapore	24.6	1	Chinese Taipei	11.8
2	South Korea	10.5	2	Japan	6.7	2	Singapore	11.5
3	Japan	9.2	3	Germany	6.3	3	Japan	9.8
4	Malaysia	6.8	4	Chinese Taipei	6.2	4	Germany	8.1
5	Chinese Taipei	6.7	5	USA	5.7	5	USA	7.7

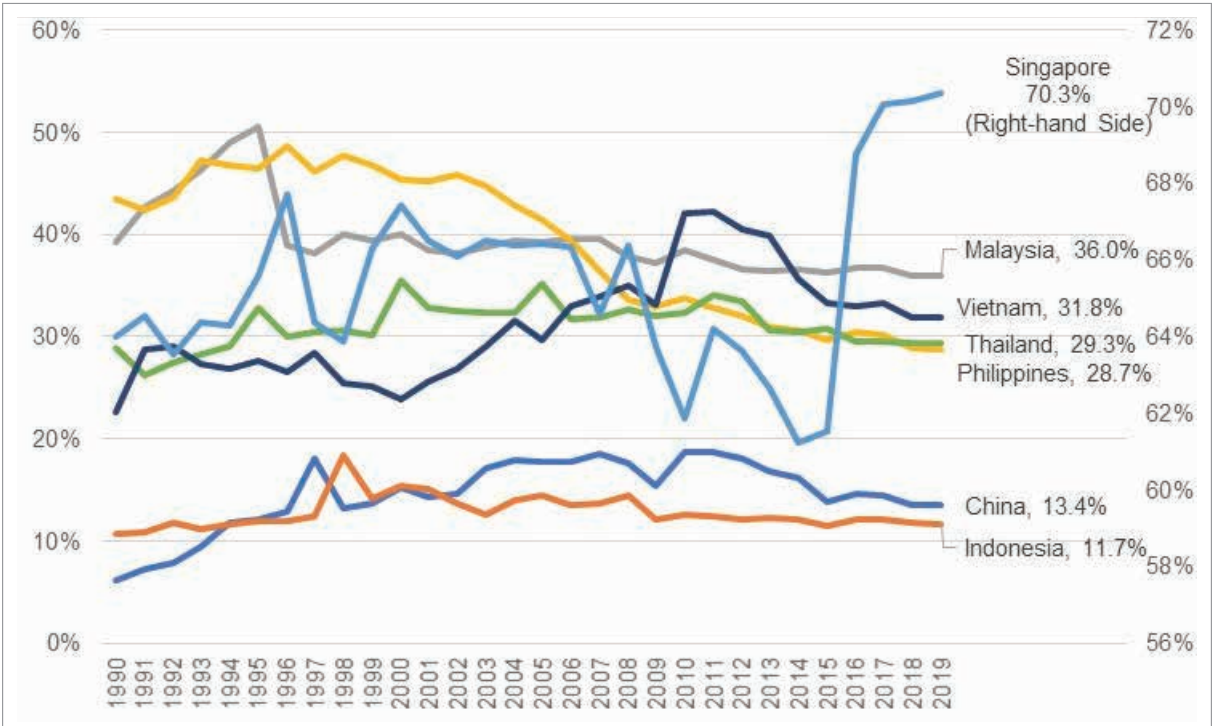
  

Singapore (%)			Thailand (%)			Vietnam (%)		
1	Malaysia	16.4	1	Singapore	9.0	1	China	9.7
2	Philippines	6.8	2	Malaysia	8.3	2	Germany	9.2
3	Germany	6.3	3	Germany	8.0	3	Japan	8.4
4	Ireland	6.1	4	Japan	6.8	4	Chinese Taipei	7.2
5	Chinese Taipei	5.8	5	Chinese Taipei	6.3	5	Indonesia	5.9

Source: UNCTAD-Eora Global Value Chain Database

**5.2 Backward Participation Ratio**

Figure 1-18 shows the backward participation ratios of Asian countries (trading partner: world, industry: all industries). Singapore has had the highest ratio and has been on an upward trend in recent years. In other countries, including China, there is a pattern of initial increases followed by

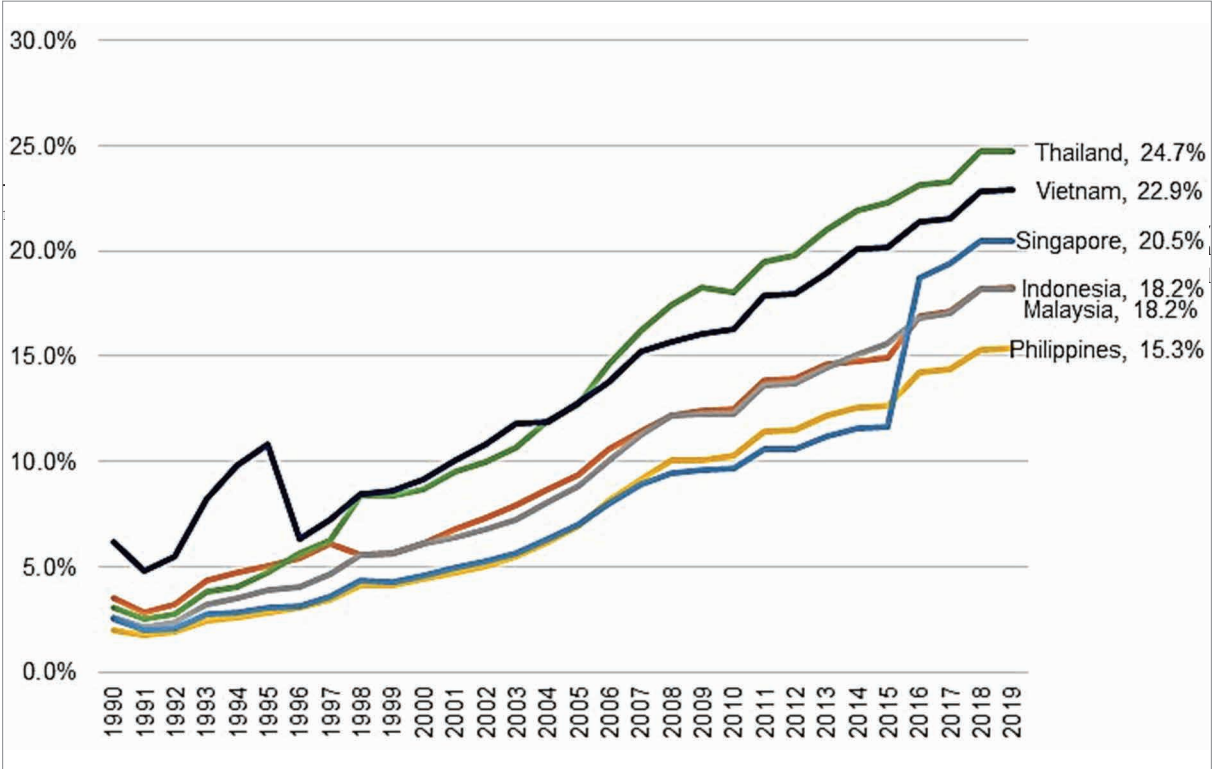


Source: UNCTAD-Eora Global Value Chain Database

**Figure 1-18**

downward trends after certain points, though the level and timing vary from country to country. As UNCTAD (2013) points out, there is a tendency for the use of imported intermediate goods to increase (i.e., the backward participation ratio rises) and then for domestic value added to increase (i.e., the backward participation ratio decreases).<sup>17</sup>

As mentioned earlier, the backward participation ratio refers to the foreign value-added content of exports. Figure 1-19 shows the shares of China in the backward participation of major ASEAN countries (i.e., the ratio of Chinese value added to the total foreign value added in each country). The shares have been rising for all countries, with particularly notable increases for Vietnam, Malaysia, and Thailand. This can be inextricably linked to the rise in China's forward participation ratio in major ASEAN countries and its growing status as a component supplier, as seen in Section 5.1 . In addition to the aspect of being a shipper of final goods, China has been increasing its importance as a provider of intermediate goods to Factory Asia. Furthermore, from 2016 onward, the transfer of production from China to Asia amid the US-China tensions mentioned in Section 5.1 thought to have accelerated the increase in component exports from China.



Source: UNCTAD-Eora Global Value Chain Database

**Figure 1-19 China's Share of Major ASEAN countries' Backward Participation ratio (All Industries)**

Table 1-4 indicates the share of each trade partner in terms of the backward linkages of major ASEAN countries in 2019. China ranks first among all of the countries, indicating the significant influence of China as a supplier of components.

**Table 1-4 Backward Linkages for Major ASEAN countries, by Trade Partners, 2019**

Indonesia (%)			Malaysia (%)			Philippines (%)		
1	China	18.2	1	China	18.2	1	China	15.3
2	Japan	10.1	2	Japan	11.9	2	Japan	15.3
3	USA	9.1	3	USA	10.7	3	USA	9.9
4	Malaysia	6.8	4	Indonesia	6.4	4	South Korea	6.8
5	Australia	5.5	5	Singapore	5.6	5	Chinese Taipei	6.5

Singapore (%)			Thailand (%)			Vietnam (%)		
1	China	20.5	1	China	24.7	1	China	22.9
2	Indonesia	12.6	2	Japan	11.2	2	Japan	20.5
3	Japan	11.9	3	USA	7.0	3	South Korea	7.7
4	Malaysia	9.7	4	Malaysia	5.5	4	Thailand	5.5
5	USA	8.7	5	Germany	5.3	5	Singapore	5.4

Source: UNCTAD-Eora Global Value Chain Database

In 2000, Japan, the US, Chinese Taipei, and other countries were the main suppliers of parts for the production of each country, according to Table 1-5. A comparison between 2000 and 2019 reveals that the much greater importance of China's parts supply.

**Table 1-5 Backward Linkages of Major ASEAN countries, by Trade Partners, 2000**

Indonesia (%)			Malaysia (%)			Philippines (%)		
1	Japan	15.2	1	Japan	21.0	1	Japan	22.6
2	USA	14.4	2	USA	17.0	2	USA	14.8
3	China	6.1	3	China	6.1	3	Chinese Taipei	12.4
4	Malaysia	5.5	4	Chinese Taipei	5.5	4	South Korea	6.7
5	South Korea	5.3	5	Germany	4.9	5	Singapore	4.6

Singapore (%)			Thailand (%)			Vietnam (%)		
1	Japan	21.0	1	Japan	21.9	1	Chinese Taipei	18.1
2	USA	18.0	2	USA	11.8	2	Japan	15.5
3	Malaysia	8.5	3	China	8.6	3	China	9.2
4	Indonesia	5.9	4	Chinese Taipei	5.0	4	USA	7.7
5	China	4.6	5	Germany	5.0	5	South Korea	7.5

Source: UNCTAD-Eora Global Value Chain Database



### Box 1-3 Trade Structures of Chinese Taipei and Hong Kong, China

As mentioned earlier, this chapter has focused its analysis on the "major ASEAN countries," that is, the six ASEAN countries (Singapore, Vietnam, Thailand, Malaysia, Indonesia, and the Philippines). Notwithstanding, it goes without saying that Chinese Taipei and Hong Kong, China are also important players in Asian trade, as shown in Table 1-6. This Box confirms the trade structures of both economies.

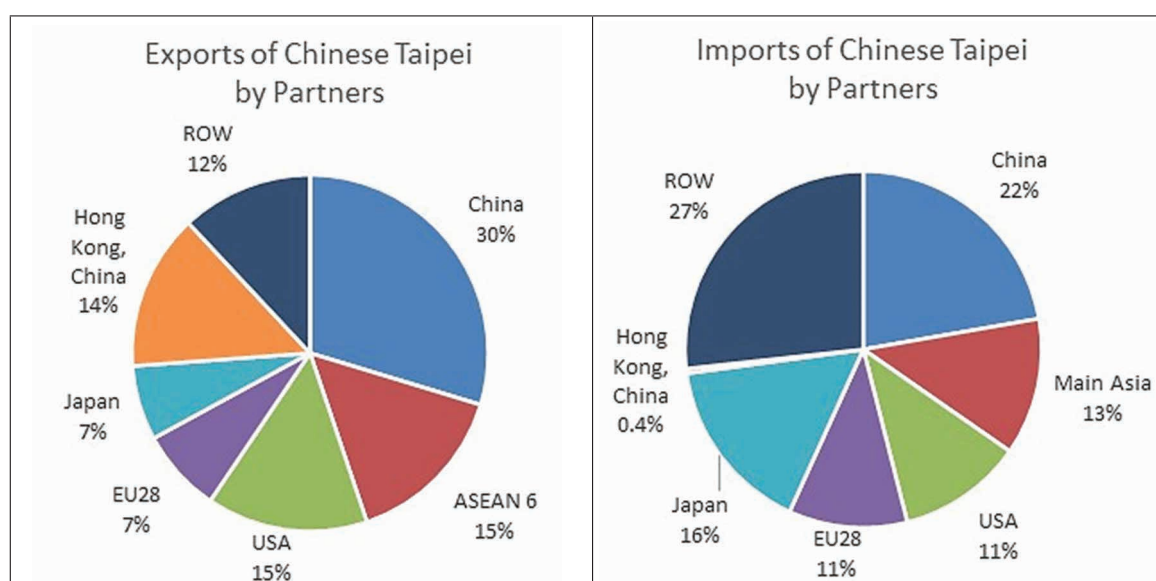
**Table 1-6 Exports from selected economies in Asia (2020, in millions of dollars)**

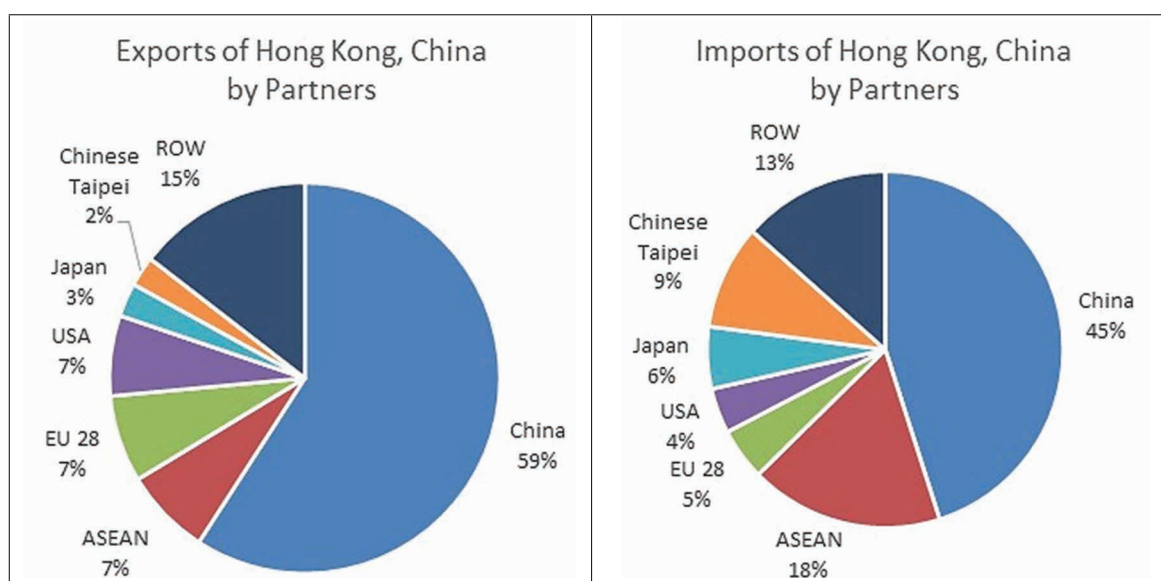
China	Hong Kong, China	Singapore	Chinese Taipei	Vietnam
2,597,571	507,149	374,248	347,132	282,646
Thailand	Malaysia	Indonesia	Philippines	
231,468	234,087	163,306	65,215	

Source: CEIC

First, let us examine trade by partners. Imports from and exports to and China have been growing at higher rates than those with other trading partners, and in 2020 (Figure 1-20), China ranked first in all of them. For Chinese Taipei, trade with ASEAN, Japan, the United States, and Europe was also substantial, and so were exports to Hong Kong, China. This suggests that Chinese Taipei is in a high value-added position in GVCs, exporting directly to final goods markets and supplying components for production in Hong Kong, China, and ASEAN.

On the other hand, for Hong Kong, China, imports and exports with China are overwhelmingly large. This shows the strength of the ties between China and Hong Kong, China in terms of imports and exports of intermediate and final goods. Imports from Chinese Taipei account for a certain amount of the total imports, which is the flip side of the statistics of Chinese Taipei mentioned above.





Source: CEIC

**Figure 1-20 Trading partners of Chinese Taipei and Hong Kong, China (2020)**

A similar trend can be observed with GVC indicators. Among Chinese Taipei's GVC indices shown in Table 1-7, the forward participation ratio which corresponds to parts exports, shows that China ranks eighth at 5.2 percent (not shown in the table), indicating that the importance of parts exports for production in China is relatively low. In addition, in terms of the backward participation ratio corresponding to parts imports, that is, the supply of parts from other countries as a percentage of exports, parts from China remain at a low level compared to Japan and the United States. One interpretation is that Chinese Taipei specializes in the production and export of higher value-added products, such as semiconductors, and imports advanced components from Japan and the United States for this purpose.

**Table 1-7 Chinese Taipei's Trade Partner Share of GVC Indicators (2019)**

(a) Forward Participation Ratio (%)

1	Hong Kong, China	9.6
2	Japan	9.0
3	Germany	7.8%
4	Netherlands	7.7%
5	Singapore	5.8%

(b) Backward Participation Ratio (%)

1	Japan	20.5
2	USA	18.1
3	China	10.1
4	Germany	4.9
5	South Korea	4.5

Source: UNCTAD-Eora Global Value Chain Database

On the other hand, looking at the forward participation ratio of Hong Kong, China's GVC index (Table 1-8), the largest share (24.7%) is via China, indicating the importance of parts supplies to China. In terms of the backward participation ratio, China accounts for the majority, suggesting that Hong Kong, China's export goods production is heavily dependent on the supply of parts from China.

**Table 1-8 Hong Kong, China's Trade Partner Share of GVC Indicators (2019)**

(a) Forward Participation Ratio  
(%)

1	China	24.7
2	Germany	7.6
3	Singapore	7.4
4	Malaysia	6.0
5	Netherlands	5.5

(b) Backward Participation Ratio  
(%)

1	China	54.4
2	Japan	8.5
3	South Korea	5.1
4	Germany	3.9
5	Chinese Taipei	3.7

Source: UNCTAD-Eora Global Value Chain Database

### 5.3 Summary and Trade Trends

Let us summarize the analysis so far. First, from China's standpoint, while its forward participation has risen and its status as a supplier of parts to major ASEAN countries has increased, its backward participation, that is, its status as a production base and starting point, has relatively declined in recent years. On the other hand, the opposite can be said in terms of the perspective of major ASEAN countries. In other words, while their dependence on parts imports from China is increasing, the supply of parts to China, which had been increasing until 2015, has been relatively decreasing since 2016, probably reflecting the US-China tensions.

Lastly, I would like to discuss the relationship between economic linkages and trade trends. It is often argued that excessive dependence on China in GVCs is a risk, but as far as the trade trends discussed in Sections 3 and 4 and the economic linkages discussed in Section 5 are concerned, no such trend has been observed. For instance, Vietnam is increasingly and extremely dependent on China, both in terms of forward and backward linkages, but Vietnam's export growth in 2020 was higher than that of other major ASEAN countries and China. It cannot be denied that dependence on China may be a risk for some items, such as security-related and medical items, but as far as trade as a whole is concerned, China and Asian countries are strengthening their ties, which appears to be leading to an early recovery in trade.

## 6. Conclusions

The findings of this chapter can be summarized as follows. First, while global trade declined significantly in the first half of 2020, it returned to almost the same level as the previous year from the fourth quarter onward, driven by China. Although the decline was large, it was minor compared with the global financial crisis period. In this process, China's share increased substantially.

Second, China and major ASEAN countries have been strengthening their trade ties since 2016, contrary to the argument that the US-China tensions and COVID-19 will cause decoupling. The quarterly analysis of trends in 2020 shows that, while trade from Asia to the US, Europe, and India has declined, trade between China and major ASEAN countries has continued to increase, from the perspective of both sides.

Third, in terms of economic linkages, the interdependence between China and major ASEAN countries has reached an all-time high. The depth of this interdependence seen in trade data seems to constitute a driving force for trade recovery rather than representing a risk for both sides.

Based on the above findings, the following three points can be said about the future of trade in Asia. First, China's presence in global trade is highly likely to continue to increase. Second, China and ASEAN countries will become increasingly interdependent.<sup>18</sup> Third, Japanese companies will need to compete and cooperate with Chinese and Southeast Asian companies in such competitive environments. In other words, dependence on China in terms of GVCs will increase rather than decrease. Of course, it is possible and necessary to build value chains in countries other than China and within Japan in specific fields, such as national security-related areas and medical products. However, as a whole, Japanese companies and Asian countries will need to consider their strategies based on the premise of dependence on China.

Finally, I would like to discuss the direction of future research. It is necessary to continue to observe how GVCs changed in 2020, the year of the COVID-19 outbreak, including inter-country input-output analysis. However, the analyses in this chapter and Chapter 3 suggest that it is unlikely that GVCs have fundamentally changed. We need to continue our observations from both a "bird's eye" view, as undertaken in this chapter, and the "insect's eye" view, which will be explored in Chapter 3.

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<sup>18</sup> A 2018 report by the ASEAN+3 Macroeconomic Research Office forecasts that ASEAN's exports to China will increase from US\$236 billion (8.5% of ASEAN's GDP) in 2017 to US\$911 billion (11.6% of ASEAN's GDP) in 2035, while China's exports to ASEAN will increase from US\$283 billion (2.4 % of China's GDP) to US\$860 billion (2.8 % of China's GDP) over the same period (AMRO 2018).

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## Chapter 2

# Impact of the COVID-19 Pandemic on Corporate Performance and Finances

- Overall financial conditions hold up with some sectors severely affected, partly due to restrictions on movement.

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### Summary

- The spread of the COVID-19 infection has put pressure on economic activities around the world. If it leads to the bankruptcy of many firms with weak financial positions, it will constrain macroeconomic recovery. In this chapter, we analyze the profitability (return on assets, or ROA), short-term liquidity (quick ratio), and long-term solvency (debt asset ratio) of five Southeast Asian countries (Thailand, Malaysia, Indonesia, Vietnam, and the Philippines) through 2020Q3.
- By country, Indonesia's corporate earnings have weakened noticeably, with solvency indicators deteriorating even in 2020Q3 when economic activity began to recover gradually. In Vietnam, on the other hand, the impact on corporate earnings was relatively limited due to the successful control of COVID-19 infections. Both Thailand and Malaysia saw improvements in corporate earnings in 2020Q3 while solvency indicators deteriorated in Thailand.
- By sector, the profitability of the tourism, transportation, and construction sectors deteriorated, along with their short-term liquidity, suggesting a weak cash flow position. Both the short-term liquidity and the solvency indicators deteriorated in the transportation and construction sectors in Thailand and Indonesia, as well as the tourism sector in Indonesia, indicating the accumulating risks in these sectors.
- We simulated the liquidity indicators of the firms based on the assumption that the business conditions in 2020Q3 will continue until the first half of 2021. The short-term liquidity in some sectors in Thailand will likely fall below the benchmark and not improve sufficiently even with policy support. However, in general, the short-term cash position in many countries and sectors is found to be relatively sound or could improve significantly with policy support. Although there are concerns that small and medium-sized enterprises (SMEs) are facing more difficult conditions, their liquidity positions are found to be strong and the debt burdens low in many countries.
- However, the high liquidity positions and low debt ratios of SMEs may be because they are forced to not rely on borrowing due to the difficulties in accessing bank credit. They may have adjusted their employment more easily than larger firms when facing difficult times. Furthermore, it should be noted that the analysis here focuses mainly on listed firms and does not capture the situation of the unlisted and informal sectors, which account for a large part of employment in these economies.

## 1. Introduction

The novel coronavirus, or COVID-19, whose expansion was first observed in China in January 2020, has since spread around the world. Southeast Asian countries, which rely heavily on tourism income and overseas remittances, and are deeply embedded in global value chains (GVCs), were significantly impacted. The economic impact was initially seen in terms of supply shock due to the shutdown of factories in China, and therefore, the aggregate demand measures through fiscal and monetary policies were thought to be less effective. Later, however, lockdown measures to prevent the spread of COVID-19 greatly restricted economic activities, not only trade and tourism but also dining out and entertainment. The decline in corporate profits, employment income, and consumption resulted in a significant economic recession. In response, governments have implemented large-scale support programs for the economy through fiscal and monetary stimulus measures.

In the following sections, we will assess the impact of the COVID-19 pandemic on five Southeast Asian economies (Thailand, Malaysia, Indonesia, Vietnam, and the Philippines<sup>1</sup>) mainly from the perspective of corporate finance. Specifically, we will analyze the impact on profitability (return on assets, or ROA), short-term liquidity (quick ratio<sup>2</sup>), and long-term solvency (debt-asset ratio) through 2020Q3 and simulate the effects of fiscal support measures on corporate liquidity positions.<sup>3</sup>

## 2. Economic situation after the spread of the COVID-19

While the spread of COVID-19 infections in the Southeast Asian region was still limited by 2020Q1, export growth had already turned negative, along with GDP growth in Thailand and the Philippines (Figures 2-1 and 2-2). Furthermore, as countries began to implement thorough restriction measures, including lockdown in 2020Q2, all the countries except Vietnam recorded significant negative growth. As a result, the unemployment rate rose too. In the Philippines, it jumped significantly, from 4.6% in 2020Q1 to 17.6% in 2020Q2, while in Indonesia, it rose from 5.0% in the first half of 2020 to 7.1% in the second half of the year.<sup>4</sup>

However, the unemployment rate may not be an appropriate indicator to measure the impact of the economic crisis. It does not capture the reductions in hours worked, wage reductions due to temporary layoffs, or exits from the labor market (by those who are not counted as unemployed).

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<sup>1</sup> Abbreviations used in the figures are ISO 3-digit codes, i.e., THA: Thailand, MYS: Malaysia, IDN: Indonesia, VNM: Vietnam, and PHL: the Philippines.

<sup>2</sup> The short-term cash flow indicator is calculated by dividing current assets by current liabilities. But the *current ratio*, the indicator usually used, may not be appropriate under the current situation. It includes accounts receivable and inventory in the numerator, which are difficult to convert into cash quickly during a sharp economic downturn. Therefore, in this chapter, we will use the *quick ratio*, which excludes these from the current assets.

<sup>3</sup> EMIS database is used. Figures cited as "author's calculation" are based on the EMIS database. The database consists of 14 industrial classifications, but we used only 13 sectors, excluding banking and insurance, which have different characteristics. In cases where the same firm has more than one major industrial classification, such firms are recorded in more than one sector in the sector-wise analysis. The names of the sectors, abbreviations in the graphs, and the amount of available data is shown at the end of this chapter. As of the time of writing, there was insufficient full-year data available, including 2020Q4 data, so the analysis was based on data up to 2020Q3.

<sup>4</sup> Unemployment rate data is monthly for Thailand and Malaysia, quarterly for the Philippines and Vietnam, and semi-annual for Indonesia.

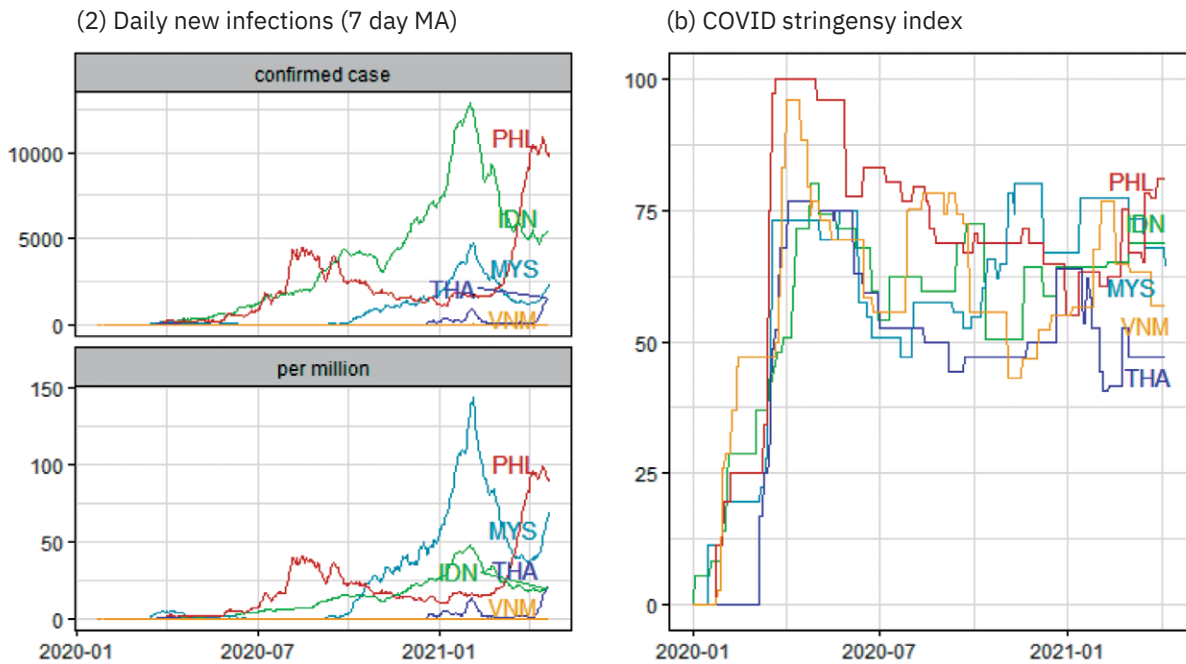
For example, according to the ILO (2020), the decline in working hours in 2020Q2 and Q3 across Southeast Asia was 17.2% and 10.9%, respectively (compared to 2019Q4), equivalent to 48 million and 30 million full-time workers, respectively.<sup>5</sup> In the case of Thailand, only 1% of the labor became unemployed (i.e., looking for a job), while 43% faced a reduction in working hours, 43% were employed but had no working hours, and 13% exited the labor market. In Vietnam, only 4% were unemployed, while 49% exited the labor market, 33% reduced their working hours, and 14% had zero working hours. Even in countries that did not experience sharp increase in unemployment, the population faced various forms of acute income decline.

While the COVID-19 infection spread further, the negative impact on the real economy has gradually shrunk since 2020Q3, thanks to the use of fiscal and monetary policy measures. However, the pace of recovery in the region is still slow, recording negative growth for the full year of 2020, excluding Vietnam.



**Figure 2-1 Macroeconomic indicators**

<sup>5</sup> The labor force at the end of 2019 was 334 million.



**Figure 2-2 COVID infection and stringency index**

When stock prices fell sharply in the US in March 2020, emerging economies, including those of Southeast Asia, also faced capital outflows. This caused a sharp fall in stock prices and a rise in interest rates (Figure 2-3). As financial markets in developed countries stabilized following aggressive monetary easing by the US and other industrialized countries, capital flows to Southeast Asia (especially bonds) also recovered, and domestic interest rates stabilized after a brief spike.<sup>6</sup> Although the return of equity inflows has been weak, the stock indices in each country have almost recovered to their pre-crisis levels.

The economic support measures were extended both through fiscal and monetary policies. The banking sector's credits to the central government showed a sharp increase from around March 2020, except in Malaysia, evidencing an expansion of fiscal deficit. There was also a sharp increase in private deposits (Figure 2-4).<sup>7</sup> As we will see later, the corporate sector seems to have taken measures to increase liquidity positions amid the economic downturn. These accommodating policies are likely to have supported the economy.

<sup>6</sup> However, since the beginning of 2021, interest rates in many countries have risen in response to the rising US interest rate, while bond flows have fallen in Indonesia.

<sup>7</sup> Based on monetary survey data. Deposits consist of both firms and households but exclude central government. Malaysia's budget deficit also widened to 6.0% of GDP from 3.4% of GDP in the previous year, but due to the holdings of the non-bank sector and other factors, this significant increase is not shown in Figure 2-4 panel (a).

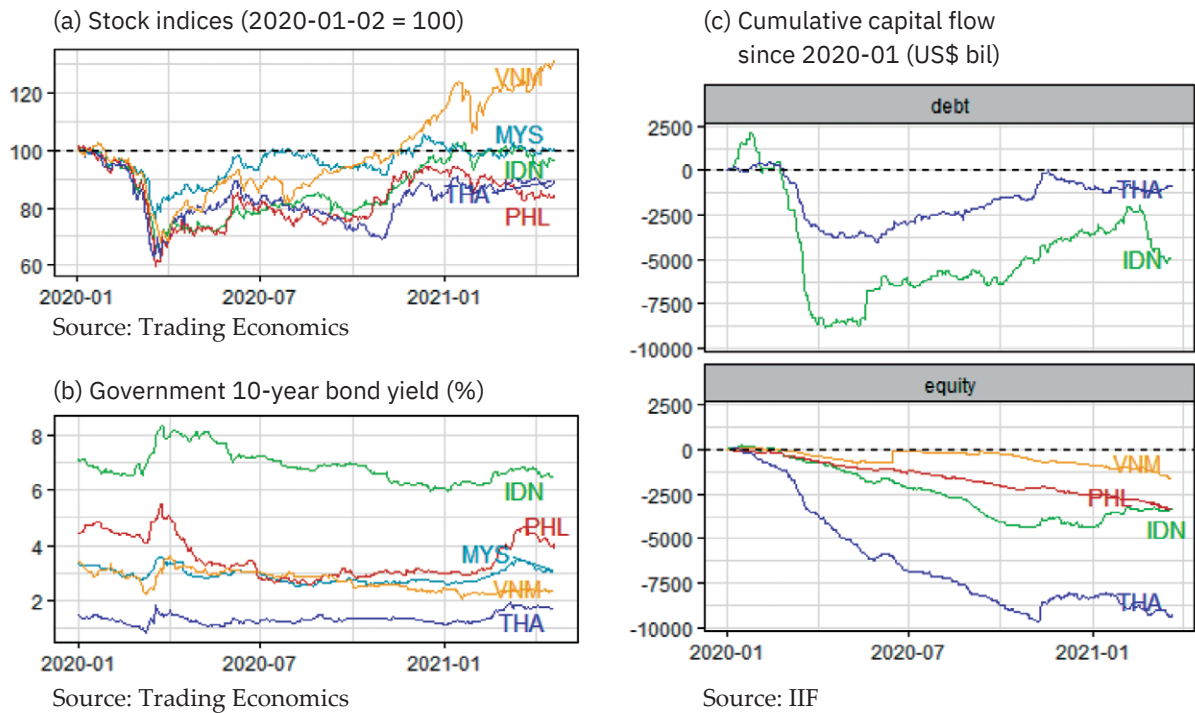


Figure 2-3 Capital flow and financial markets

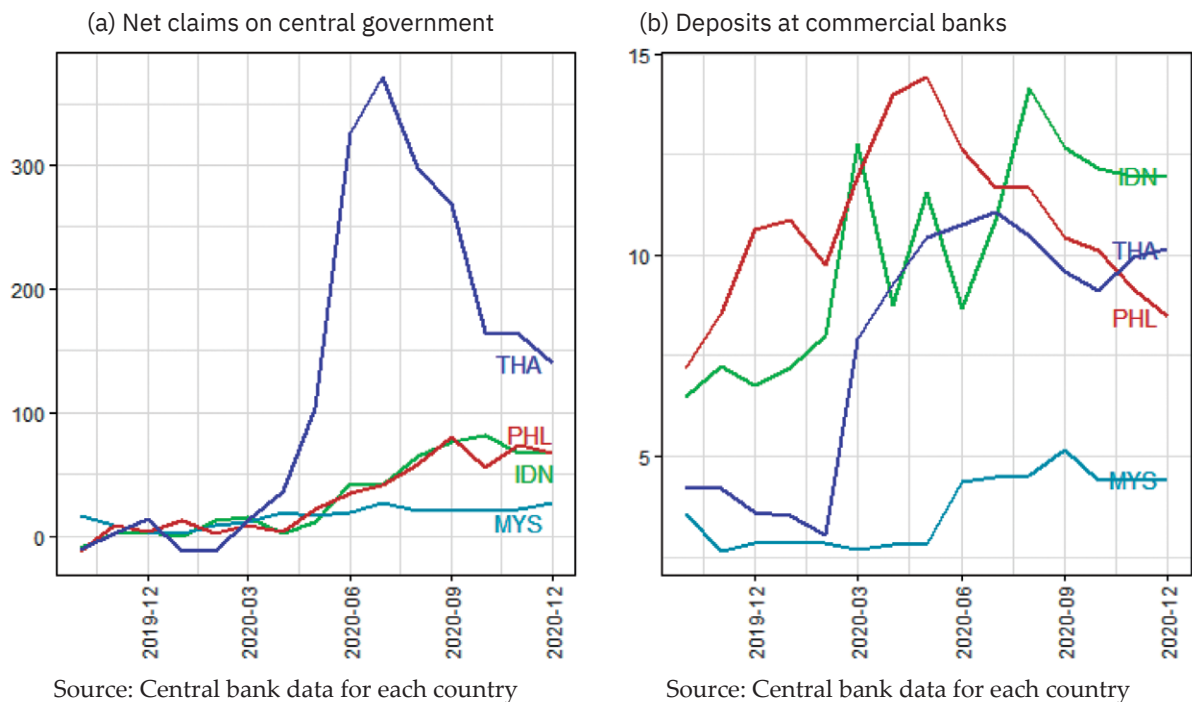


Figure 2-4 Banking sector development (y/y %)

However, with the uncertain economic outlook, bank lending, especially for the corporate sectors, was not very active (Figure 2-5). In the Philippines and Indonesia, the growth in loans outstanding (year-on-year) for both households and the corporate sector has decelerated, with corporate lending in particular staying negative. In Malaysia, the lending to households has been stable, while the lending to businesses has been declining. In both countries, there was a temporary



increase in lending in 2020Q1, which may have been an attempt by firms to secure cash due to concerns over the business.

On the other hand, while corporate lending has remained stable in Thailand, the lending to SMEs has plummeted since 2020Q2. The preventive measures to ensure social distance hit restaurants and other businesses particularly hard. These firms are most likely SMEs. In Indonesia, lending to micro-enterprises, the smallest of the SMEs, has declined significantly. If small enterprises, especially those with weak financial positions, are unable to secure access to finance, these generally more labor-intensive sectors will be forced into bankruptcy, leading to increased unemployment, worsening poverty, and greater inequality in income distribution.

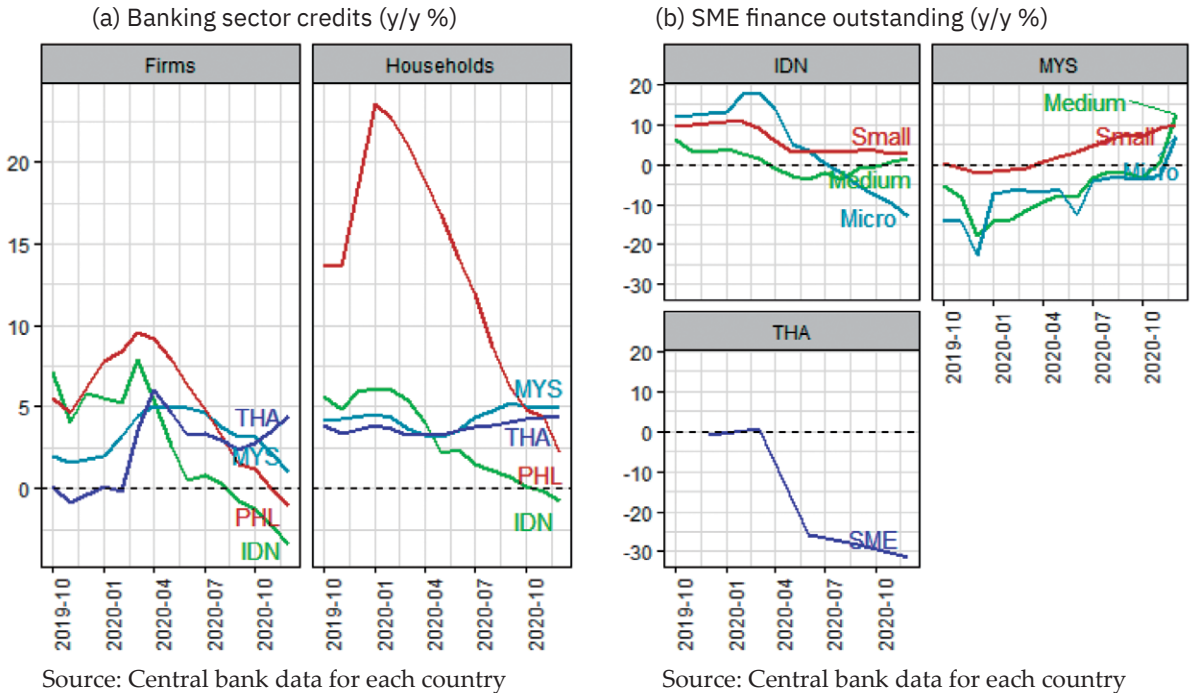
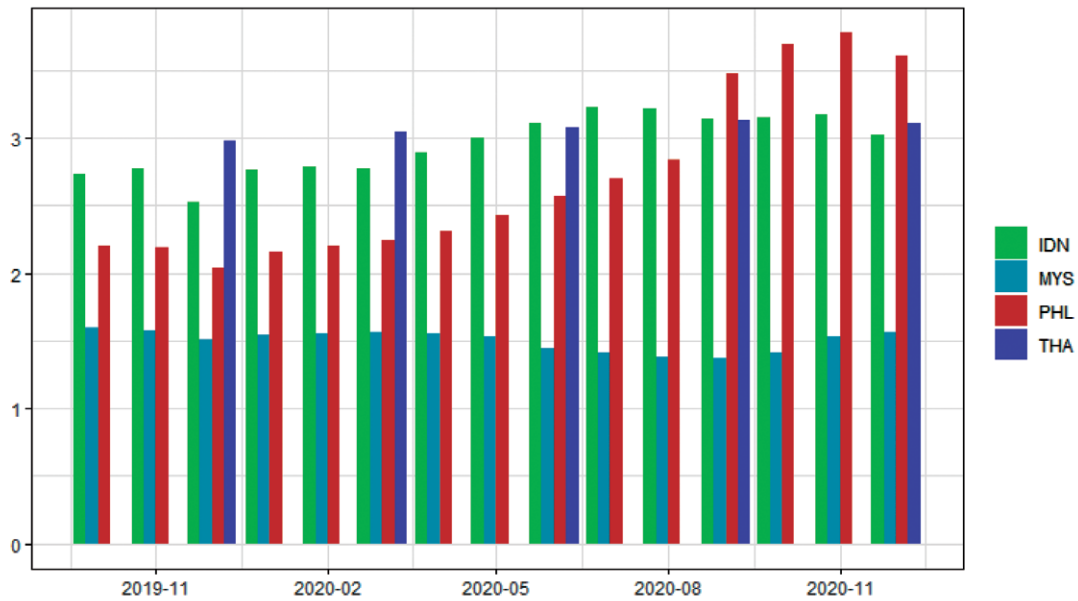


Figure 2-5 Banking sector credits

While there is a concern that corporate credits will turn into non-performing loans, the Philippines is the only country where the NPL ratio has risen significantly so far. There is a slight increase in Indonesia and no significant deterioration as yet in Thailand or Malaysia (Figure 2-6). Even in the Philippines, the net NPL ratio after provisioning has only risen from 1.14% in January 2020 to 1.98% in December 2020.

On the other hand, the accumulation of debt in the government sector needs to be curbed. While the corporate sector’s debt has not recorded a significant rise, government debt has risen by around 10 percentage points of GDP (Figure 2-7).<sup>8</sup> Although mainly denominated in domestic currencies, the rise in interest rates will put pressure on fiscal management as the financial environment normalizes going forward.

<sup>8</sup> The Philippines and Vietnam are not shown in the graph since currency-related data were not available. The Philippines recorded an increase from 37.0% to 48.4%, while Vietnam recorded only a 5-percentage point increase from 54.8% to 59.3%. LCU = domestic currency, USD = US dollar, EUR = Euro, OTH = other currencies.



Source: Central bank data for each country

Figure 2-6 NPL ratio (% of total loan)



Source: IIF

Source: IIF

Figure 2-7 Debt stock by currencies (% of GDP)

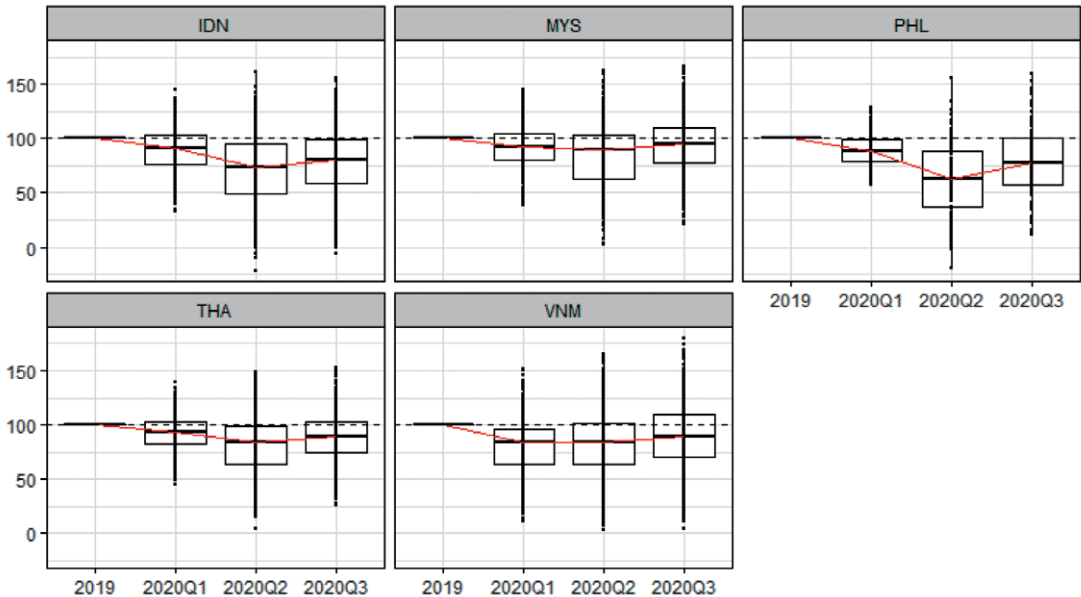
### 3. Impact on corporate finances

Next, we will assess the impact of the COVID-19 pandemic on corporate finance. First, total operating revenue had already begun to deteriorate in 2020Q1, but in many Southeast Asian countries, the deterioration became more pronounced in Q2 (Figure 2-8).<sup>9</sup> In the Philippines, the

<sup>9</sup> The revenue data for the full year of 2019 have simply been quartered for the purpose of comparison. The data are not seasonally adjusted. In the graph, the boxes indicate the 25-75 percentile distribution, and the horizontal bars in the boxes indicate the medians.

median value fell to about 60% of the 2019 level, and in Indonesia, it was about 70%. Thailand and Malaysia experienced limited declines, but larger declines were observed in Q2 than in Q1.

Vietnam differs from the other four countries in that the Q2 decline was smaller than Q1. While more than 75% of firms were below 2019 levels in Q1, the extent of the decline was slightly smaller in Q2. As we saw in Chapter 1, Vietnam is a country that has seen a significant increase in backward linkages from China in recent years. While the supply shock from China was pronounced in Q1,<sup>10</sup> the country's success in controlling the transmission of the COVID-19 is likely to have helped contain the subsequent domestic demand shocks.



Source: Author's calculation

**Figure 2-8 Total operating revenue (% against 2019 level)**

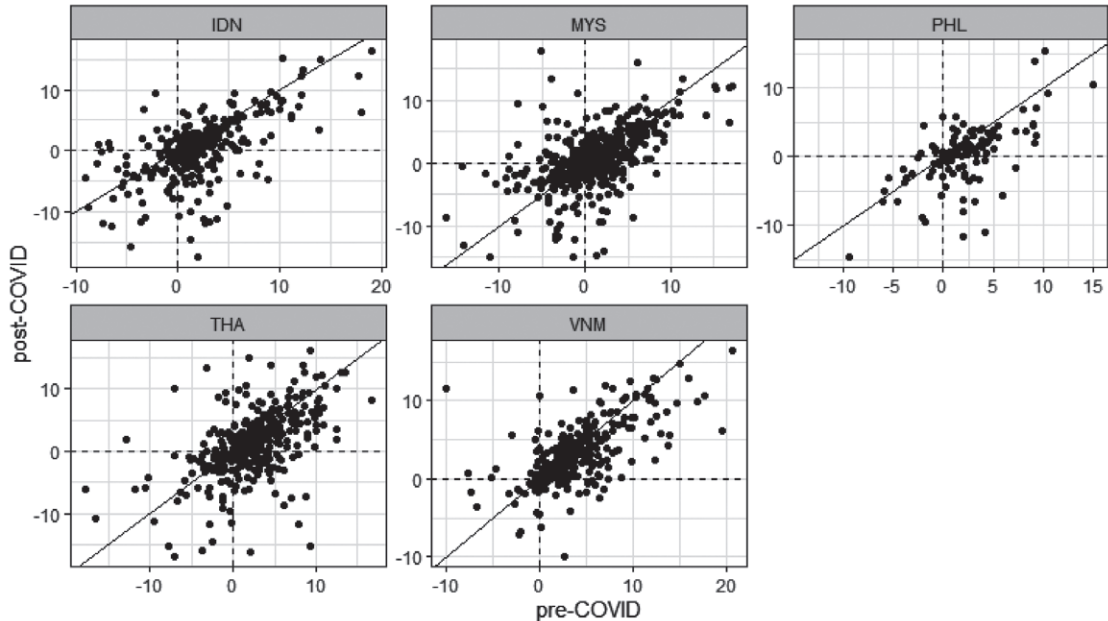
Next, we compare the ROA before and after COVID-19 (Figure 2-9). To eliminate the effects of seasonality, we compare the cumulative ROA in 2019Q1-Q3 with that of 2020Q1-Q3. The straight line in the figure indicates the 45-degree line; the distribution below (above) this line indicates that ROA declined (improved) after COVID-19. Overall, the number of firms that experienced a decline is larger.

In particular, the lower-right area of the figure shows that ROA turned from positive to negative after COVID-19. The share of firms in this area in Indonesia is 24.7%, Malaysia 14.8%, the Philippines 18.9%, Thailand 19.5%, and Vietnam 11.1%. Although the decline in Indonesia's GDP and private consumption was smaller than most other countries, the impact on corporate profitability was large. On the other hand, in Vietnam, the impact on the economy was relatively limited due to the successful control of infections, and the number of firms that began to make losses was also limited.

<sup>10</sup> Vietnam's import growth from Chinese Taipei grew from 15.5% (y/y) in 2019Q4 to 18.9% in 2020Q1, while import growth from China plummeted from 10.7% to -0.3% in the same period, likely due to the shutdown of factories in China (data: Direction of Trade Statistics).

Looking at the firms with the largest changes in ROA (i.e., changed more than twice the standard deviation from the mean), however, a relatively large number of firms in Vietnam faced negative shock. Twenty-five firms (4.4%) out of 568 experienced a large shock, while just three firms recorded positive changes. In terms of the sectors with negative shock, the majority (13 firms) were in the tourism and transportation sectors. Moreover, in Indonesia, 13 firms (3.2% of the total) were identified as having suffered large shocks, of which 11 firms faced negative shocks and 5 firms belonged to the tourism or transportation sectors.

In contrast, Thailand has 16 firms that exhibited large shocks in ROA (3.3% of the total, including 6 firms with positive changes), but only 2 firms out of those with negative shocks were in the tourism sector. The largest number were in the media and telecommunications (4 firms).

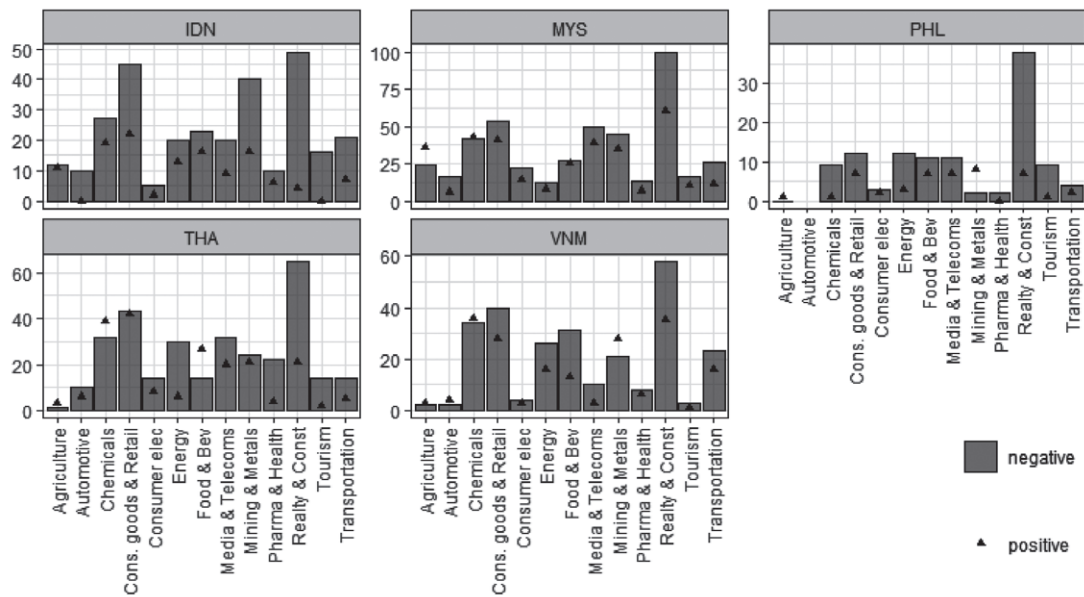


Source: Author's calculation

**Figure 2-9 ROA comparison 2019Q1-3 and 2020Q1-3**

Comparing the number of firms whose ROA fell (bar graph) with whose ROA rose (▲ graph), shown in Figure 2-10, the former exceeds the latter in most sectors.<sup>11</sup> But the situation is the opposite of resource-related sectors such as agriculture, chemicals, and mining. This might have been due to the cost reduction after the price of materials fell following the collapse of global demand.

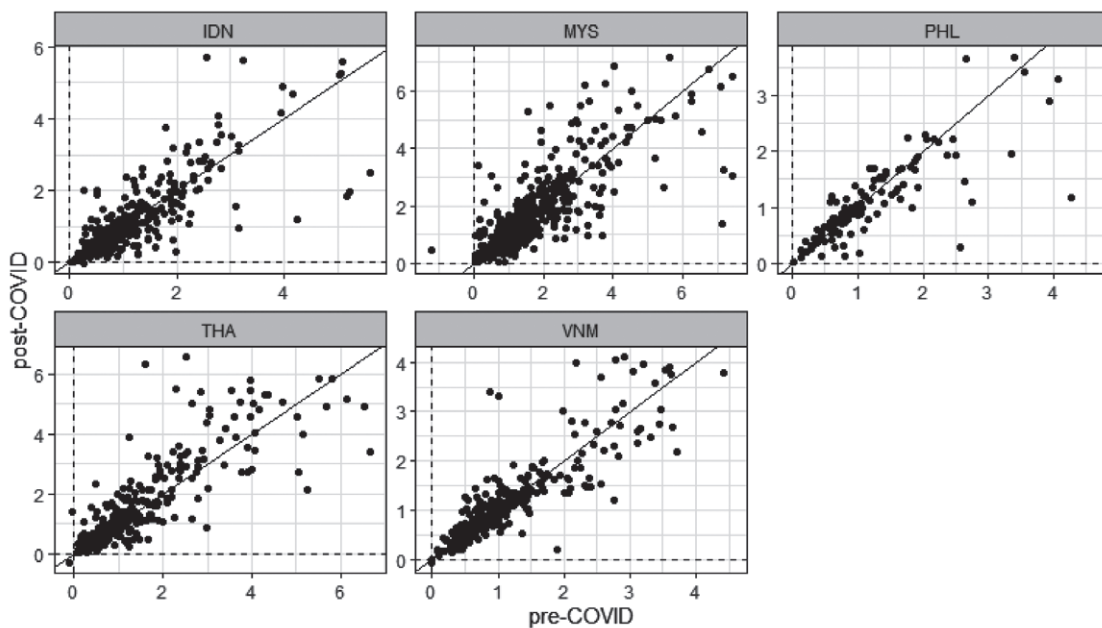
<sup>11</sup> Note that the automobile sector includes not only the manufacturers of automobiles and parts but also dealers. The pharmaceutical sector also includes drugstores and other retail businesses. Therefore, not all firms under these industrial categories are manufacturing firms.



Source: Author's calculation

**Figure 2-10 Number of firms with positive / negative ROA change (2019Q1-3 vs 2020Q1-3)**

As for the quick ratio, the share of firms that improved the ratio after COVID-19—those above the 45-degree line—is less than half of those in Indonesia (46.1%) while slightly more than a half in other Southeast Asian countries, with Thailand reaching 53.5%, Vietnam 52.4%, Malaysia 51.4%, and the Philippines 50.4% (Figure 2-11). The firms may have tried to hold enough liquidity amidst the deteriorating business environment. Among the firms with exceptionally large changes after the COVID-19, 11 out of 16 Thai firms, four out of six in the Philippines and two out of three in Indonesia exhibit positive changes. But in Vietnam, only two out of seven experienced positive shocks. In Malaysia, only one firm is identified as having faced a large (and negative) shock.



Source: Author's calculation

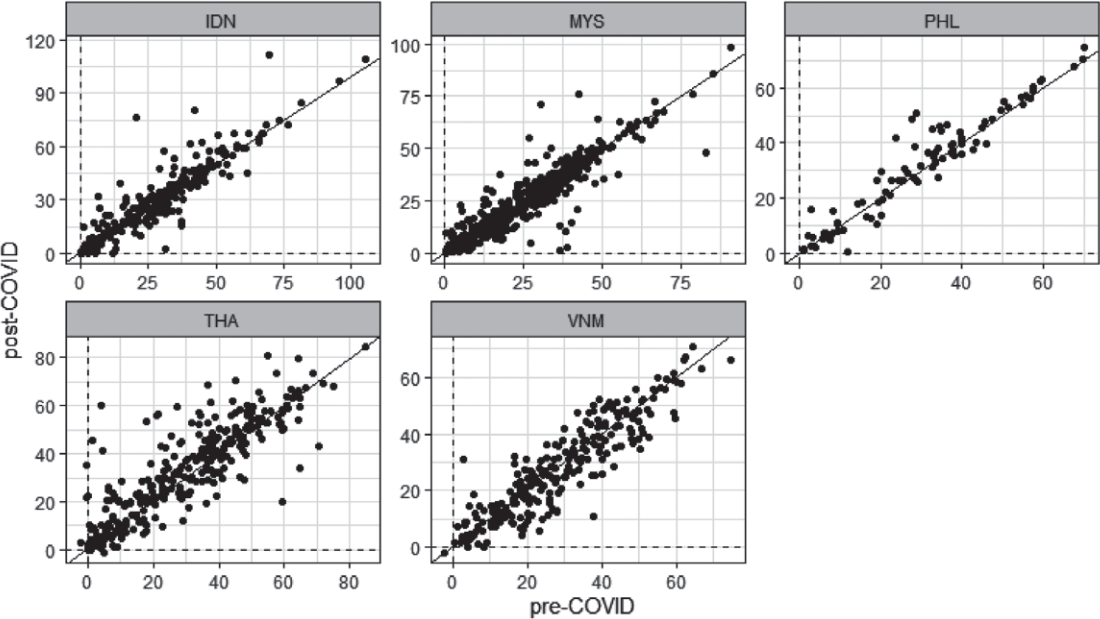
**Figure 2-11 Quick ratio comparison 2019Q1-3 and 2020Q1-3**



In the case of the debt asset ratio, 66.2% of firms in Thailand, 60.2% in the Philippines, and 57.7% in Indonesia recorded higher ratios after COVID-19, the opposite of Vietnam and Malaysia; with only 44.8% and 44.3%, respectively (Fig. 2-12).

Eighteen firms (4.6%) have been identified in Thailand with large changes, but only three were changes to lower their debt asset ratios. Some firms have noticeably increased their debt asset ratios. Indonesia also faced relatively large increases in debt ratios—13 firms (or 4.3%, of which only two recorded negative changes). For the other three countries, the distribution of shocks was relatively balanced—Malaysia had 20 firms with large changes (3.6%, 11 of which were negative changes), Vietnam 12 firms (2.8%, five negative changes), and the Philippines only four firms (3.4%, and no negative changes).

While many firms were striving to secure cash reserves, many firms at the same time increasing their overall debt. As we have already seen, there were many firms who experienced higher profitability after COVID-19. For those firms, the higher debt ratio may suggest positive investments.

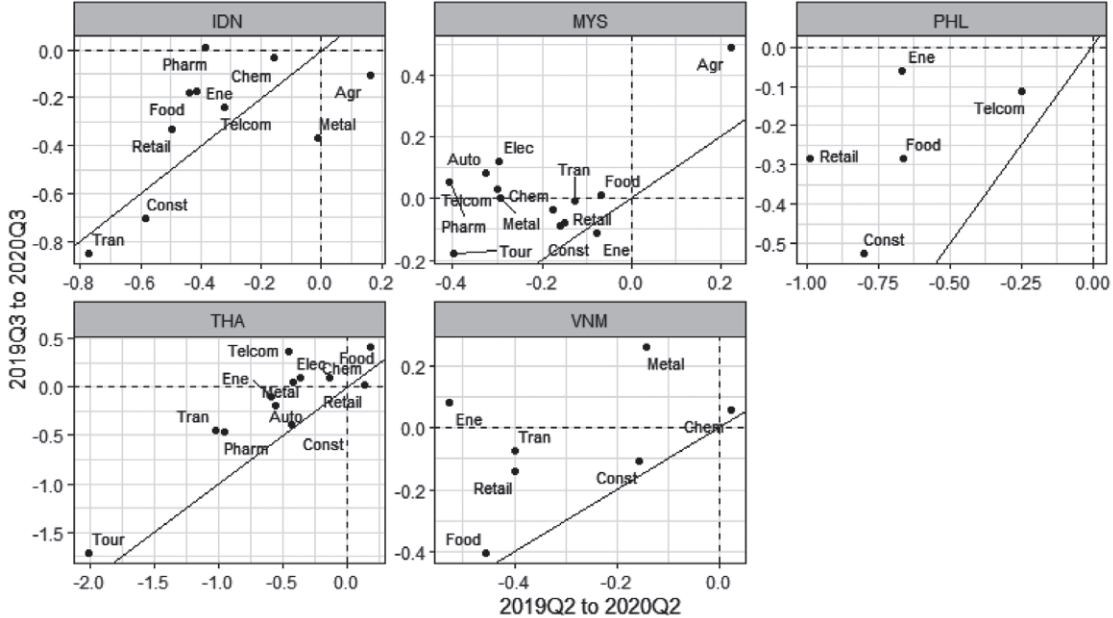


Source: Author's calculation

**Figure 2-12 Debt asset ratio comparison 2019Q1-3 and 2020Q1-3**

As seen earlier, the impact on the macroeconomy was the largest in 2020Q2, with a gradual recovery observed in 2020Q3. Figure 2-13 plots the median values of the year-on-year change in ROA in Q2 (2019Q2 → 2020Q2; percentage points) on the horizontal axis and the same in Q3 on the vertical axis. Only industries with data available for more than 15 firms are depicted. The upper-right area shows the positive changes from the previous year in both quarters, the lower-left area depicts the declines in both quarters, and the upper-left shows the recovery in Q3 after the decline in Q2. The sectors above the straight line (45-degree line) exhibit the larger ROA recoveries (median) in Q3 than in Q2.

Some sectors show positive ROA changes from the previous year in both periods (e.g., agriculture in Malaysia, chemicals in Vietnam, food in Thailand). Some sectors also showed a remarkable recovery in Q3 (e.g., automobiles and chemicals, as well as consumer electronics, media and telecommunications, which may have been due to higher demand from telecommuting). But most sectors are located in the lower-left area (lower ROAs in both periods), indicating the difficult business environment since the global spread of COVID-19. In general, the tourism (especially in Thailand), transportation, construction and real estate sectors, as well as consumer-oriented sectors (retail and food; excluding Thailand), are the sectors where business conditions have deteriorated in both quarters.<sup>12</sup> However, even for the sectors experiencing lower ROAs in both periods, most sectors are located above the 45-degree line, suggesting that the situation had more or less improved by 2020Q3, as seen in the macroeconomic indicators. However, in Indonesia, although there was a slight improvement in overall sales in Q3, ROAs in many sectors deteriorated further in Q3, such as agriculture, construction, metals, and transportation.<sup>13</sup>



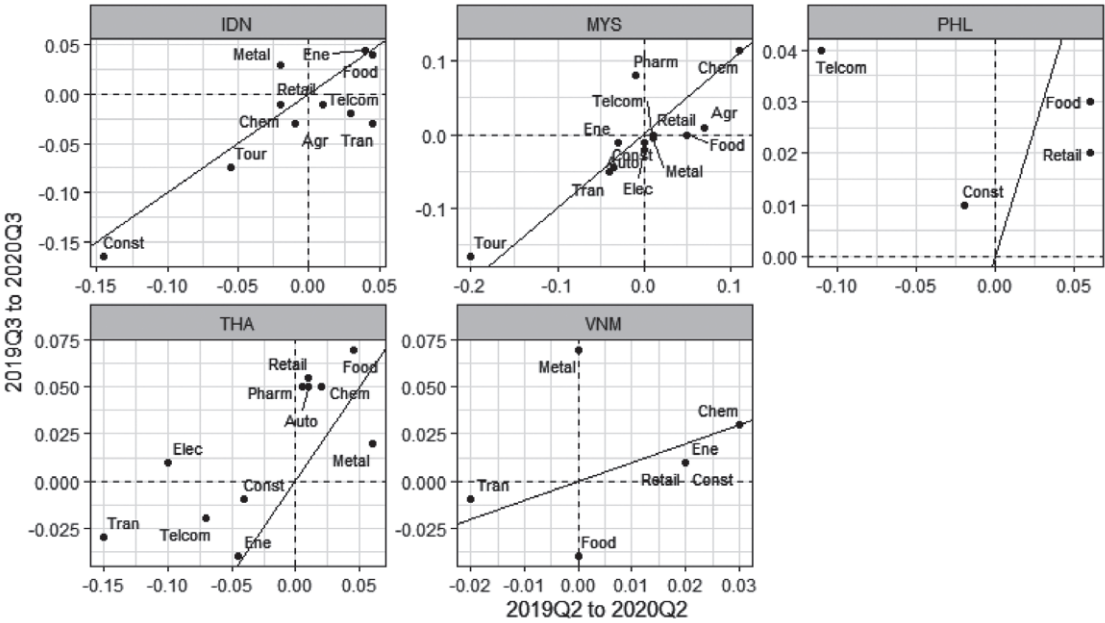
Source: Author's calculation

**Figure 2-13 Change in median ROA (2019Q2,Q3 to 2020"2,Q3)**

As for short-term liquidity, many sectors are in the upper-right or lower-left areas, indicating a polarization by sectors (improvement or deterioration in both periods) (Figure 2-14).<sup>14</sup> In addition to the tourism and transport sectors, the construction and real estate sectors also faced a deterioration in Thailand, Malaysia, and Indonesia. On the other hand, in the food sector,

<sup>12</sup> The slump in the construction sector may be due to uncertainty about the economic outlook or the cessation of speculative funding for real estate (including from overseas), but it is also due to the characteristics of the sector. Construction is heavily influenced by measures to prevent the spread of infection, which require ensuring social distances and remote work is not possible at construction sites (see also the interview results in Chapter 3).  
<sup>13</sup> However, it should be noted that this is a simple year-on-year change, and the possibility of a special factor (such as a boom in Q3 last year) cannot be excluded.  
<sup>14</sup> The indicator is expressed as a multiple of current assets to current liabilities. For example, "plus 0.05" indicates an increase of 0.05 times current liabilities ( $\neq$  0.05 percentage points).

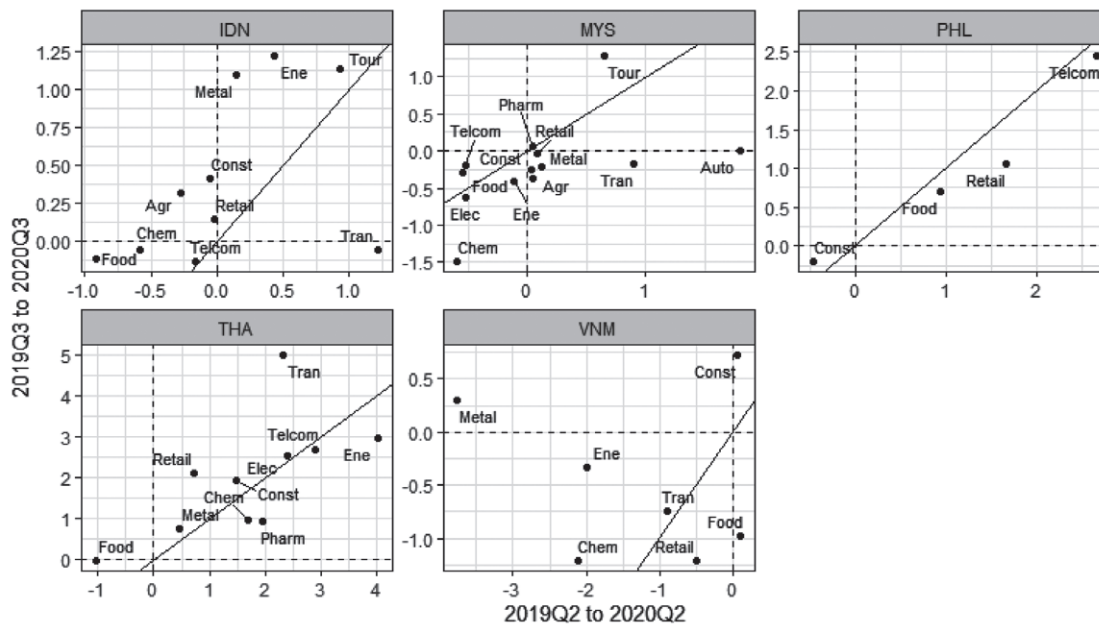
Indonesia saw a deterioration in both periods and Vietnam in Q3, while the other three countries recorded an improvement. In the food sector, daily demand did not drop significantly even with the economic slowdown, while demand for restaurants dropped markedly, which may have caused the differences among countries.



Source: Author's calculation

**Figure 2-14 Change in median quick ratio (2019Q2,Q3 to 2020Q2,Q3)**

In terms of long-term solvency, Thailand and the Philippines faced deterioration (higher ratios) almost across the board, while Indonesia experienced it in most sectors in Q3. On the other hand, Vietnam saw improvements in most sectors in both periods, and Malaysia showed a marked improvement in Q3, as most sectors are located below the horizontal line (Figure 2-15). However, comparing Q2 and Q3, the increase in Q3 in Malaysia and the Philippines is smaller than in Q2 (below the 45-degree line), while the opposite is true in Indonesia and Vietnam, and 50-50 in Thailand. The solvency indicators do not necessarily seem to match the trend in ROAs. However, transportation and construction in Thailand and Indonesia, as well as tourism in Indonesia, faced a deteriorating short-term cash position in addition to the worsening solvency indicators, suggesting that risks posed by a prolonged recession may be accumulating in these sectors.



Source: Author's calculation

**Figure 2-15 Change in median debt asset ratio (2019Q2,Q3 to 2020Q2,Q3)**

The above observations can be summarized as follows. In terms of profitability, Indonesia and the Philippines faced worsening trends in both periods, while Thailand, Malaysia, and Vietnam recorded recoveries in Q3. As for the short-term cash position, the overall trend was polarized, but Indonesia and Malaysia showed a relatively weakening trend in Q3, while Thailand recorded an improvement. In terms of solvency, however, Thailand recorded a severe deterioration (and its debt level itself was high), while Malaysia showed an improvement in Q3, indicating that short-term cash flow and solvency did not necessarily move in the same direction.

By sector, the deterioration in profitability, short-term cash position, and solvency were all strongly observed in tourism, transportation, and construction. In other sectors, these indicators did not necessarily move in the same direction. The deterioration in profitability does not directly lead to deteriorating cash flow or excessive debt. This may suggest that firms may have taken various measures to cope with the weak earnings environment, including raising funds through borrowing or converting long-term assets to cash. Certain firms with a higher debt ratio and improving profitability may also be making positive investments.

**Table 2-1 Major characteristics in profitability, short-term cash flow and solvency**

	Profitability	Short-term cash flow	Solvency
Indonesia	deteriorated almost entirely in both quarters (especially in transport and construction)	polarized in Q2 and marked deterioration in Q3. Construction and tourism deteriorated significantly in both periods	polarized trend, but noticeable worsening in
Thailand	deteriorated almost entirely in Q2 (except for food and retail), but split in Q3; tourism deteriorated significantly	deteriorated almost entirely in Q2 (except for food and retail), but split in Q3; tourism deteriorated significantly	deteriorated almost entirely (excluding food); the extent of deterioration is larger than in other countries
Malaysia	overall deterioration in Q2 (except agriculture), while split in Q3	polarized overall (tourism noticeably worsened in Q2), but worse in Q3 than Q2	tourism deteriorated in both periods; other sectors were split in Q2 but improved in Q3
Vietnam	almost entirely deteriorated in Q2 (except chemical), but some improved in Q3	polarized in general (though data is limited)	most sectors improved in both periods (though data is limited); a slight deterioration for construction in both periods.
Philippines	all sectors deteriorated (though data is limited)	improved in Q3 (but only a little data available)	worsening in both periods though data is limited
Tourism	deteriorated significantly in Thailand; the most deteriorated sector in Malaysia.	deteriorated in Indonesia and Malaysia	deteriorated in Indonesia and Malaysia (larger deterioration in Q3)
Transport	deteriorated the most in Indonesia, and also in Thailand, Malaysia, and Vietnam, especially in Q2 (the extent of deterioration softened in Q3)	deterioration in Q2 was large in Thailand and Vietnam	deteriorated significantly in Thailand (especially in Q3), and in Indonesia and Malaysia in Q2; improvement in Vietnam in both periods
Construction	deteriorated sharply in Indonesia and the Philippines, and to a lesser extent in the other three countries in both periods.	Indonesia and Thailand worsened in both periods, while Vietnam improved in both periods	deterioration in Thailand, slight deterioration in Indonesia and Vietnam in Q3; improvement in Malaysia and the Philippines
Retail	deteriorated in both periods (especially in Q2), except in Thailand	improved in Thailand, the Philippines, and Vietnam in both periods	deteriorated in Thailand and the Philippines, slightly worsened in Indonesia in Q3; improved in Vietnam
Food	performed well in Thailand, but deteriorated in Indonesia, the Philippines, and Vietnam; deteriorated in Malaysia only in Q2	improved in both quarters for Thailand, Indonesia and the Philippines, while only in Q2 for Malaysia	deteriorated in the Philippines in both periods
Media & telecom	deteriorated in Indonesia and the Philippines in both periods; improved in Malaysia and Thailand in Q3	deteriorated in both periods in Thailand	deteriorated in Thailand and the Philippines in both periods, but improved in Indonesia and Malaysia
Automotive	deteriorated in Thailand for both periods (the extent of deterioration narrowed in Q3); improved in Malaysia in Q3 after deteriorating in Q2	improved in both periods in Thailand	deteriorated in Malaysia only in Q2
Energy	deteriorated in both periods except for Vietnam (where it deteriorated only in Q2)	deteriorated in Thailand and Malaysia in both periods, but improved in Indonesia and Vietnam	deteriorated in Thailand and Indonesia in both periods.
Agriculture	performed well in Malaysia, deteriorated in Indonesia in Q3	improved in Malaysia for both periods, but deteriorated in Indonesia for both periods.	

In the above section, we looked at the year-on-year changes in indicators. In the following section, we will look at how the *level* of each indicator ( $\neq$  *change* from the previous year) changed from 2019Q4 to 2020Q3, focusing on the firm sizes using total assets in 2019, with “1” being the group with the smallest assets and “5” the largest (Figure 2-16).<sup>15</sup> In order to look at the interrelationships between the indicators, the different pairs of indicators are plotted on the vertical and horizontal axes.

In terms of the ROA and the quick ratio (upper panel), the smallest firms, except for Indonesia, have ample cash positions, and both indicators have either improved or not moved significantly. Small firms are not necessarily facing higher risks in terms of cash position.<sup>16</sup> On the other hand, for large firms, Thailand and Vietnam have the lowest liquid assets, and both ROA and quick ratios have dropped significantly. In Indonesia, except for third quintile firms, both the ROA and

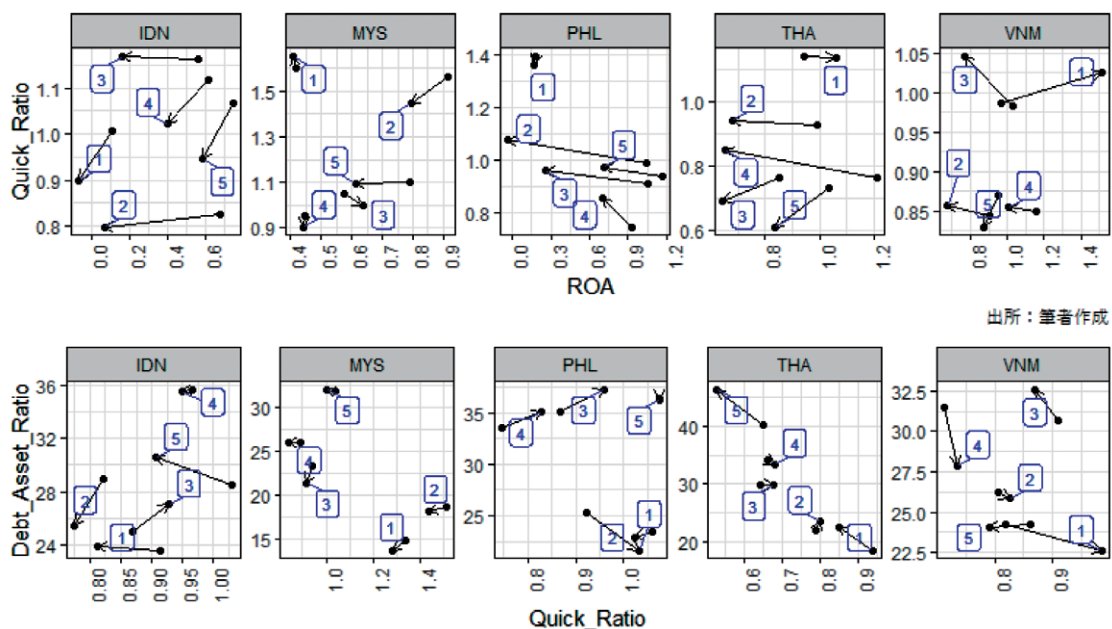
<sup>15</sup> Seasonal adjustments were made using quarterly data from 2015.

<sup>16</sup> However, the graphs in Figure 2-16 only cover firms whose financial data is publicly available, and the situation is not necessarily the same for micro enterprises such as those in the informal sector.



quick ratio dropped significantly after COVID-19.

Looking at the pair of the quick ratio and the debt asset ratio (bottom panel), small firms tend to have high quick ratios and low debt ratios (although the quick ratio is low in Indonesia). They seem to have a certain degree of resistance to the recessionary environment. However, as we have already seen, the loans to SMEs were stagnant in Thailand and Indonesia, which may indicate that they are forced to maintain short-term liquidity due to creditworthiness constraints. On the other hand, large firms tend to have high debt ratios across the board, except for the fifth quintile in Vietnam. And the ratio in Thailand is particularly high (note that different scales are used on the vertical axis for each country). Indonesia (4th quintile) and Malaysia (5th quintile) also have high debt ratios, although lower than those of Thailand. If liquidity were secured by borrowing, the arrow would move upward to the right, but this is the case only in the third and fourth quintiles of the Philippines and Indonesia.



Source: Author's calculation

Figure 2-16 Transition of indicators (2019Q4 to 2020Q3)

#### 4. The cluster analysis

In the above sections, we provided an overview of countries and sectors based on changes in financial indicators. As we saw at the beginning of this chapter, the movements of indicators are not uniform even within the same country or the sector. Here, we will cluster the countries and sectors by these indicators (year-on-year change of ROA, quick ratio, and debt-asset ratio) and analyze which countries and sectors tend to be included in different clusters for each period.<sup>17</sup>

<sup>17</sup> The k-medoids method was used, as it is less prone to outliers. However, because there are some outliers far beyond normal (e.g., a debt-asset ratio of 2700%), outliers are excluded with a relatively large tolerance.

The number of clusters is set at 6 across the periods. Since this is not a panel clustering, the firms do not belong to the same cluster across the periods. For example, a firm belonging to a certain cluster in 2020Q1 may belong to another cluster in 2020Q2. However, as shown in Table 2-2, there is a certain degree of continuity, especially for clusters *b* through *e*, as many firms belong to the same cluster from one period to the next. On the other hand, for clusters *a* and *f*, a majority of firms move to other clusters. We will pay particular attention to these clusters.

**Table 2-2 Cluster transition matrix (%)**

		20Q1								20Q2					
19Q4		a	b	c	d	e	f	20Q1		a	b	c	d	e	f
a		22.6	0.0	24.5	23.6	17.0	12.3	a		21.0	1.7	15.1	23.5	17.6	21.0
b		10.0	50.0	7.5	27.5	2.5	2.5	b		16.0	68.0	0.0	12.0	0.0	4.0
c		7.7	1.0	65.1	16.9	3.6	5.6	c		5.2	1.8	52.0	29.2	7.4	4.4
d		7.3	0.6	21.5	43.3	10.8	16.6	d		12.9	1.3	11.9	56.3	14.2	3.3
e		12.9	0.0	6.6	24.8	45.8	9.8	e		9.7	0.5	8.8	16.6	54.4	10.1
f		13.9	1.0	21.8	12.9	22.8	27.7	f		10.9	2.9	17.4	27.5	15.9	25.4

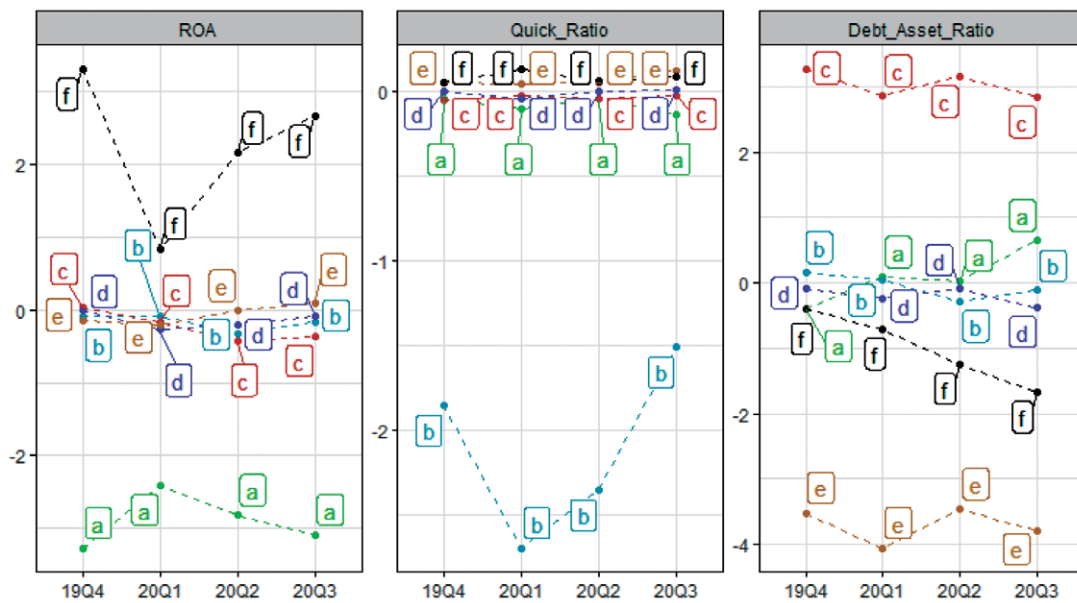
  

		20Q3					
20Q2		a	b	c	d	e	f
a		27.1	5.9	22.9	21.2	16.1	6.8
b		9.1	69.7	6.1	3.0	9.1	3.0
c		5.0	0.8	63.4	16.0	7.6	7.1
d		5.1	2.8	17.5	56.8	11.9	5.9
e		7.1	1.3	7.1	30.8	43.8	9.8
f		6.7	4.8	9.5	21.9	19.0	38.1

Source: Author's calculation

Figure 2-17 compares the trend of median values of indicators. For clusters *b* through *e*, ROA stays at a similar level to the previous year. The ROA of cluster *a*, on the other hand, deteriorated significantly while cluster *f* improved. The quick ratio of cluster *a* deteriorated more than other clusters (except for cluster *b*, which shows a large decline), and the debt asset ratio also increased (i.e., deteriorated) further than others (except for cluster *c*). Conversely, cluster *f* shows a slight upward trend in the quick ratio and a strong downward trend in the debt-asset ratio when compared to the others (except for *e*). In other words, we can classify cluster *a* as a group that has been severely affected by COVID-19, and cluster *f* as a group that has improved its financial situation even during the pandemic.

Among clusters *b* through *e* with relatively stable ROAs, the quick ratio of cluster *b* and the debt-asset ratio of cluster *c* deteriorated, while the debt asset ratio of cluster *e* improved. Cluster *d* is a group that was not significantly affected in either a positive or negative direction. While paying attention mainly to which countries and sectors tend to be in clusters *a* and *f*, we will also look at *c* (*e*), where the solvency indicators are deteriorating (improving), and *b* where there are concerns about short-term liquidity.



Source: Author's calculation

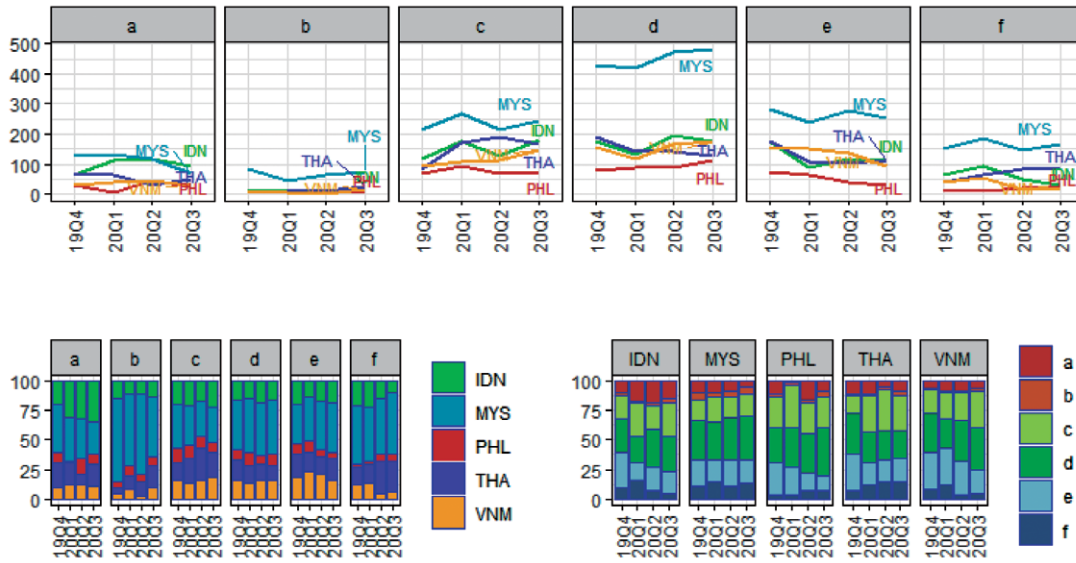
**Figure 2-17 Median values by clusters (y/y %)**

	ROA	Quick ratio	Debt asset ratio
a	deteriorate	slightly deteriorate	slightly deteriorate
b	–	deteriorate	–
c	slightly deteriorate	–	deteriorate
d	–	–	–
e	–	–	imrove
f	imrove	slightly imrove	slightly imrove

As for the country share in each cluster (Figure 2-18), Malaysia's share in cluster *a*, which is of the most concern, has fallen, while Indonesia's share has gradually increased throughout the period.<sup>18</sup> On the other hand, in cluster *f*, where the financial indicators improved significantly, Malaysia's share is the highest. However, Thailand has also taken some of the share.

Overall, clusters *a* through *c* show a worsening trend in any or all earnings, short-term liquidity, and debt burden indicators, while clusters *e* and *f* show an improving trend. Looking at the cluster's share in each country from this perspective, the share of the former group is increasing while the latter is declining in Vietnam and Indonesia. The share of the former group does not change much while the latter is declining in the Philippines.

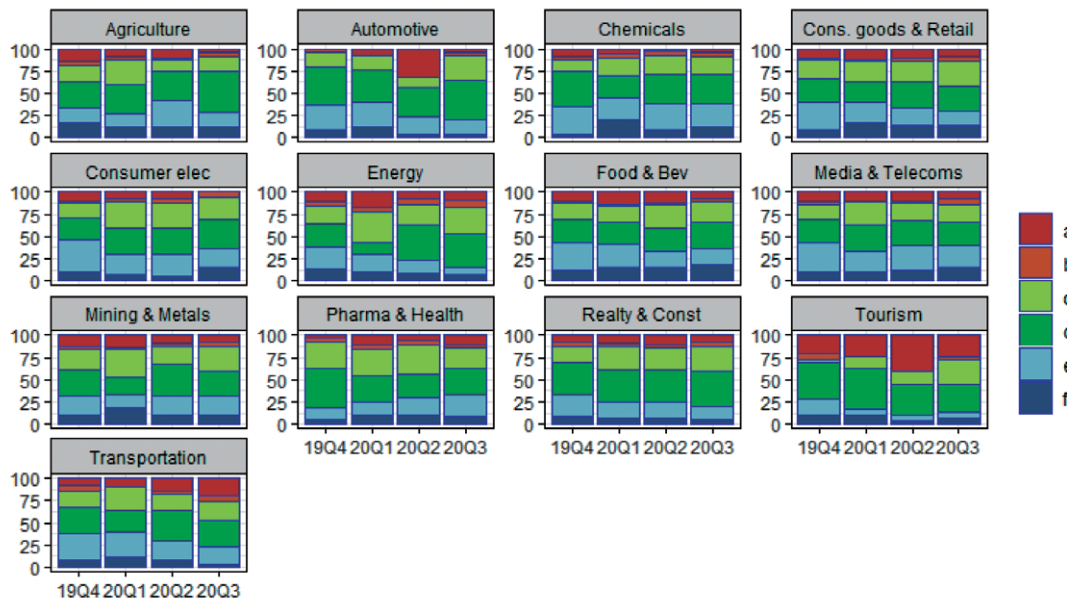
<sup>18</sup> Note that there are differences in the numbers of firms for which data are available per country.



Source: Author's calculation

**Figure 2-18 Firm numbers or shares by clusters**

Looking at the cluster shares in each sector (Figure 2-19), the share of the deteriorating groups (*a* to *c*) is increasing in the tourism and the transportation sectors, and the automobile sector is also not doing well. The rapid expansion of cluster *a* in the tourism sector is particularly noticeable. On the contrary, the groups with strong indicators (*e* and *f*) have risen in the agriculture and pharmaceutical sectors. Cluster *f* has a stable and high share in the agriculture, retail, and food sectors. Consumer electronics saw the increasing share of *f* in Q3, but the share of *c* also expanded during the pandemic, suggesting polarization in terms of solvency.



Source: Author's calculation

**Figure 2-19 Share of clusters by sector**

A multinomial logit analysis was conducted to see what countries/sectors tend to be in each cluster and whether there are any changes between periods. With cluster *d*, which is the most stable and has the largest number of firms as a reference cluster, Table 2-3 shows which countries and sectors are more/less likely to belong to another cluster. Malaysia and the construction sector, which have the largest number of firms in cluster *d*, are used as the base country and sector, respectively, and dummies are used for the other countries and sectors. Asset size (asset) is the total asset size in 2019Q4 (in US dollars with log transformation).

**Table 2-3 Multinomial logit estimation**

Dependent variable:					Dependent variable:					Dependent variable:				
	cluster					cluster					cluster			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)		
(Intercept):a	-0.124 (0.401)	-1.287*** (0.390)	-1.170*** (0.379)	-0.756* (0.428)	Agr.a	0.666 (0.539)	-0.146 (0.616)	-0.014 (0.569)	-0.996 (0.794)	Metal:a	0.295 (0.414)	1.003** (0.416)	-0.246 (0.412)	-0.033 (0.464)
(Intercept):b	-0.67 (0.540)	-1.900*** (0.696)	-1.180** (0.602)	-1.038** (0.528)	Agr.b	-0.349 (0.825)	0.278 (0.858)	-0.639 (1.102)	-0.216 (0.827)	Metal:b	-0.641 (0.690)	0.121 (0.850)	-0.781 (0.825)	0.256 (0.605)
(Intercept):c	-0.312 (0.321)	-0.797*** (0.295)	-1.060*** (0.305)	-0.834*** (0.290)	Agr.c	0.309 (0.475)	0.247 (0.417)	-0.297 (0.516)	-0.599 (0.452)	Metal:c	0.408 (0.330)	0.856*** (0.328)	-0.014 (0.319)	0.289 (0.308)
(Intercept):e	-0.236 (0.290)	-0.890*** (0.318)	-0.425 (0.306)	-0.339 (0.315)	Agr.e	-0.15 (0.481)	0.105 (0.498)	0.682 (0.418)	-0.178 (0.463)	Metal:e	-0.061 (0.324)	0.605 (0.381)	0.159 (0.328)	0.52 (0.340)
(Intercept):f	0.017 (0.394)	-0.362 (0.386)	-0.239 (0.402)	-0.911** (0.431)	Agr.f	0.561 (0.514)	0.44 (0.557)	0.548 (0.560)	0.619 (0.564)	Metal:f	-0.036 (0.432)	1.311*** (0.418)	0.048 (0.443)	0.801* (0.475)
IDN:a	0.259 (0.322)	0.883*** (0.290)	1.008*** (0.283)	1.290*** (0.330)	Auto:a	-16.286 (1838.921)	-0.324 (0.824)	1.216** (0.560)	-1.243 (1.090)	Pharm:a	-1.705 (1.071)	0.179 (0.640)	-0.519 (0.815)	0.026 (0.658)
IDN:b	-0.684 (0.489)	-0.67 (0.671)	-1.005* (0.585)	-0.282 (0.470)	Auto:b	-0.593 (1.102)	-17.58 (7587.312)	-15.752 (2781.817)	-0.371 (1.115)	Pharm:b	-0.073 (0.834)	0.887 (0.880)	0.733 (0.877)	-0.369 (1.112)
IDN:c	0.34 (0.259)	0.640*** (0.247)	0.357 (0.250)	0.715*** (0.234)	Auto:c	-0.257 (0.621)	-0.466 (0.629)	-0.511 (0.707)	-0.183 (0.520)	Pharm:c	0.328 (0.446)	0.306 (0.464)	0.57 (0.471)	-0.008 (0.486)
IDN:e	0.505** (0.234)	0.075 (0.281)	0.093 (0.249)	0.268 (0.258)	Auto:e	-0.116 (0.519)	0.637 (0.544)	0.281 (0.606)	-0.29 (0.623)	Pharm:e	-0.901* (0.546)	-0.007 (0.577)	0.31 (0.533)	0.482 (0.498)
IDN:f	0.11 (0.317)	0.415 (0.291)	-0.204 (0.338)	-0.56 (0.373)	Auto:f	-0.611 (0.817)	0.271 (0.730)	-0.868 (1.111)	-0.689 (1.100)	Pharm:f	-1.002 (0.800)	0.293 (0.655)	0.321 (0.666)	0.426 (0.733)
PHL:a	0.569 (0.431)	-1.640** (0.759)	0.922** (0.385)	0.674 (0.470)	Chem:a	-0.552 (0.446)	-0.283 (0.493)	-1.531** (0.646)	-1.044* (0.552)	Retail:a	0.216 (0.406)	0.584 (0.398)	0.073 (0.381)	-0.049 (0.426)
PHL:b	-0.837 (0.778)	-0.475 (0.815)	-0.645 (0.791)	-0.129 (0.592)	Chem:b	-0.319 (0.591)	0.82 (0.656)	0.334 (0.633)	0.121 (0.582)	Retail:b	-1.011 (0.801)	-0.174 (0.841)	0.035 (0.658)	0.207 (0.573)
PHL:c	0.659** (0.335)	0.407 (0.304)	0.456 (0.325)	0.115 (0.309)	Chem:c	-0.56 (0.364)	0.142 (0.328)	0.089 (0.316)	-0.347 (0.318)	Retail:c	0.409 (0.319)	0.387 (0.305)	0.223 (0.300)	0.252 (0.284)
PHL:e	0.347 (0.323)	0.178 (0.333)	-0.048 (0.372)	-0.453 (0.395)	Chem:e	-0.053 (0.288)	0.660** (0.333)	0.484 (0.311)	0.437 (0.319)	Retail:e	0.396 (0.287)	0.807** (0.321)	0.283 (0.318)	0.166 (0.337)
PHL:f	-0.892 (0.645)	-1.153* (0.639)	0.146 (0.473)	-0.347 (0.462)	Chem:f	-1.300** (0.541)	1.001** (0.395)	-0.016 (0.454)	0.732 (0.456)	Retail:f	-0.046 (0.420)	1.049*** (0.392)	0.567 (0.399)	1.096** (0.427)
THA:a	0.333 (0.318)	0.372 (0.322)	-0.01 (0.403)	1.138*** (0.383)	Elec:a	0.027 (0.656)	0.061 (0.706)	-0.102 (0.700)	-16.813 (2201.967)	Telcom:a	0.092 (0.486)	0.447 (0.456)	0.12 (0.457)	-0.117 (0.539)
THA:b	-1.783** (0.756)	-0.753 (0.671)	-0.656 (0.580)	0.35 (0.439)	Elec:b	-0.719 (1.113)	-0.042 (1.139)	0.267 (0.877)	-0.041 (0.851)	Telcom:b	-0.413 (0.714)	-17.449 (3908.502)	-0.545 (0.847)	0.561 (0.598)
THA:c	-0.144 (0.277)	0.597** (0.247)	1.027*** (0.245)	0.956*** (0.252)	Elec:c	0.109 (0.560)	0.548 (0.460)	0.546 (0.474)	0.134 (0.463)	Telcom:c	0.248 (0.394)	0.27 (0.342)	0.159 (0.367)	0.104 (0.365)
THA:e	0.327 (0.233)	0.157 (0.269)	0.203 (0.267)	0.498* (0.271)	Elec:e	0.643 (0.456)	0.62 (0.498)	0.547 (0.485)	0.189 (0.500)	Telcom:e	0.620* (0.336)	0.602* (0.362)	0.632* (0.354)	0.730** (0.366)
THA:f	-0.331 (0.351)	-0.067 (0.315)	0.644** (0.304)	0.600** (0.304)	Elec:f	-0.011 (0.653)	-0.089 (0.716)	-0.656 (0.826)	0.79 (0.596)	Telcom:f	0.074 (0.482)	0.19 (0.488)	0.268 (0.469)	1.086** (0.479)
VNM:a	-0.756* (0.410)	0.063 (0.378)	0.232 (0.368)	-0.241 (0.437)	Ene:a	0.789 (0.558)	1.569*** (0.545)	-0.714 (0.595)	0.001 (0.573)	Tour:a	0.602 (0.581)	0.725 (0.546)	1.283** (0.500)	1.122* (0.599)
VNM:b	-1.996** (0.776)	-1.14 (0.809)	-2.806** (1.058)	-1.049* (0.547)	Ene:b	0.808 (0.732)	1.827** (0.810)	1.217* (0.694)	1.197* (0.626)	Tour:b	-0.108 (0.831)	-18.091 (7886.478)	-16.018 (2884.250)	0.103 (1.119)
VNM:c	0.043 (0.285)	0.358 (0.283)	0.453* (0.271)	0.591** (0.255)	Ene:c	0.584 (0.440)	1.124** (0.455)	-0.116 (0.391)	-0.099 (0.369)	Tour:c	-1.802* (1.063)	-0.741 (0.600)	-0.206 (0.621)	0.386 (0.518)
VNM:e	0.284 (0.254)	0.651** (0.274)	0.228 (0.258)	-0.178 (0.278)	Ene:e	0.312 (0.415)	1.133** (0.507)	-0.019 (0.445)	-0.452 (0.540)	Tour:e	-0.468 (0.567)	-0.935 (0.786)	-0.746 (0.801)	-0.557 (0.811)
VNM:f	-0.594 (0.378)	-0.425 (0.343)	-1.676*** (0.513)	-1.365*** (0.449)	Ene:f	1.048** (0.517)	1.635*** (0.619)	0.523 (0.581)	0.696 (0.638)	Tour:f	-0.197 (0.704)	0.05 (0.712)	-0.705 (1.090)	0.557 (0.847)
asset:a	-0.386*** (0.083)	-0.068 (0.075)	-0.096 (0.073)	-0.347*** (0.087)	Food:a	0.35 (0.460)	0.811* (0.432)	0.296 (0.429)	-0.069 (0.504)	Tran:a	0.062 (0.634)	0.265 (0.586)	0.085 (0.507)	0.943* (0.505)
asset:b	-0.211* (0.116)	-0.091 (0.151)	-0.222* (0.131)	-0.329*** (0.110)	Food:b	-1.134 (1.073)	-0.466 (1.101)	-0.753 (1.093)	0.044 (0.711)	Tran:b	0.503 (0.720)	-16.957 (5088.032)	0.496 (0.848)	0.837 (0.736)
asset:c	-0.148** (0.062)	0.036 (0.057)	0.059 (0.058)	0.038 (0.055)	Food:c	0.28 (0.378)	0.038 (0.366)	0.404 (0.340)	0.023 (0.339)	Tran:c	0.287 (0.457)	0.328 (0.430)	-0.2 (0.448)	-0.066 (0.433)
asset:e	-0.096* (0.055)	-0.024 (0.062)	-0.123** (0.060)	-0.170*** (0.063)	Food:e	0.456 (0.328)	0.825** (0.356)	0.38 (0.372)	0.404 (0.373)	Tran:e	0.298 (0.408)	0.777** (0.434)	0.206 (0.432)	0.483 (0.458)
asset:f	-0.335*** (0.083)	-0.359*** (0.078)	-0.385*** (0.085)	-0.273*** (0.083)	Food:f	0.458 (0.445)	1.064** (0.443)	0.787* (0.448)	1.436*** (0.453)	Tran:f	-0.106 (0.626)	0.614 (0.581)	0.248 (0.636)	0.251 (0.821)
Observations	1,072	1,072	1,072	1,072										
R2	0.042	0.052	0.056	0.054										
Log Likelihood	-1,644.98	-1,650.07	-1,623.40	-1,629.60										
LR Test (df = 90)	143.262***	180.529***	193.823***	185.371***										

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Source: Author's calculation



First, by country, the coefficient of cluster *a* (which is of most concern) is positive and significant for Indonesia in each period after the COVID-19 pandemic began. As we saw earlier, Indonesia's share in cluster *a* increased. On the other hand, the coefficient of Thailand for cluster *a* is positive and significant in Q3, but the same is true for cluster *f* in Q2 and Q3, suggesting that the situation in Thailand may be polarized. However, the coefficient for cluster *c* (deteriorating solvency) is also positive and significant throughout the period, reflecting concerns about the country's debt level. In Vietnam, the coefficient of cluster *c* is positive and significant in Q2 and Q3 as well.

As for asset size, the coefficient for cluster *f* is negative and significant in all periods. The coefficient for cluster *a* is negative through Q1 to Q3, though only significant in Q3. In other clusters, the coefficient's sign is negative and significant except for cluster *c* (but not significant). These suggest that larger firms tend to belong to cluster *d*, which is stable with no major fluctuations in financial indicators.

By sector, as expected, the sign of cluster *a* is positive and significant in Q2 and Q3 for the tourism sector, and in Q3 for the transportation sector, indicating that the prolonged restrictions on international and long-distance travel are putting pressure on both sectors. On the other hand, the sign of cluster *f* is positive and significant for the food and the retail sectors, suggesting that these sectors, which are closely related to daily lives, are continuing to perform well despite the restrictions on social activities. In addition, the signs of cluster *f* and *e* are positive and significant in the media and communications sector in Q3, suggesting that demand for communications due to longer hours spent at home may be providing a tailwind.<sup>19</sup>

## 5. Financial Simulation

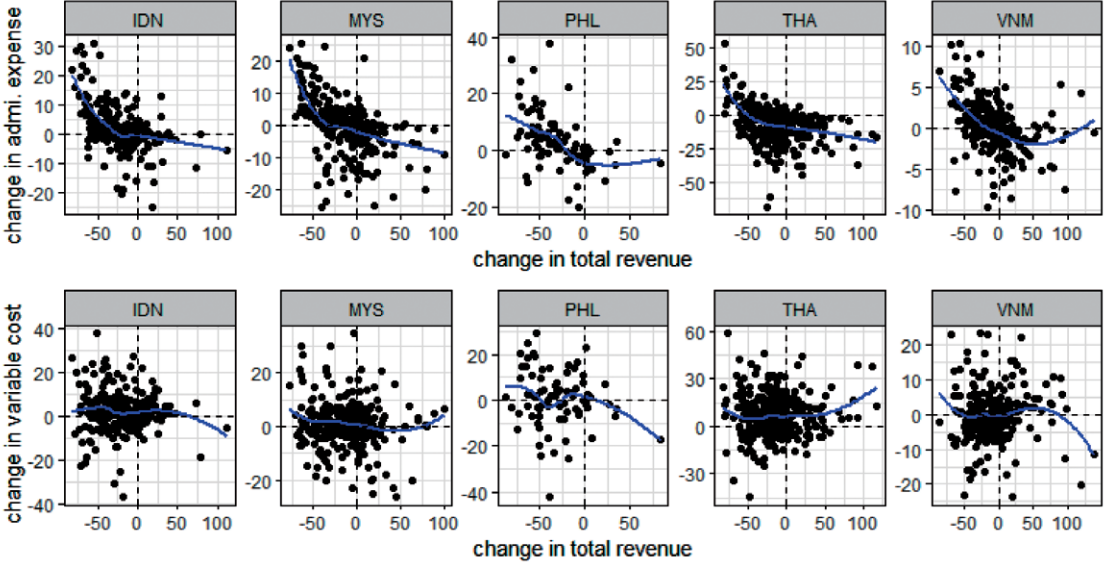
The impact of the pandemic on corporate performance and cash flow is not uniform. But if the difficult business environment continues, more firms may be forced into bankruptcy due to the cash flow problems. The governments in the region have extended various types of supports to the firms. Though such supports involve a certain level of fiscal burden, more firms may have gone bankrupt without these support measures. In the following, we simulate the short-term cash flow situation, assuming that the business conditions in 2020Q3 continue until the first half of 2021 (when the situation is generally expected to improve), as well as the degree of improvement if policy support is provided.

Faced with a decline in sales, firms can adjust variable costs, such as raw material costs, according to the sales. But it will be difficult to flexibly adjust fixed costs (such as administrative expenses and rent). As a result, corporate profits will drop significantly, putting pressure on cash flows in the short term and force firms into bankruptcy in the worst cases. Figure 2-20 plots the changes in sales in 2020Q2 from 2019 on the horizontal axis and the changes in the ratio of the two types

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<sup>19</sup> In the Appendix, another analysis is conducted focusing on sectors closely related to production activities (i.e., excluding tourism, transportation, and retail).

of expenses to sales (administrative expenses and variable costs<sup>20</sup>) on the vertical axis. As we can see, the ratio of administrative expenses tends to grow upward when sales turn negative, while the ratio of variable costs does not show such a trend.



Source: Author's calculation

**Figure 2-20 Cost (% of revenue) vs revenue (ratio of 2020Q2 to 2019)**

We simulate the operating balance, assuming that the flow of sales, variable costs, and fixed costs in 2020Q3 continue through 2021H1. The deficit is financed by short-term debt (an increase in current assets in the case of a surplus), which is added to the balance of current assets and liabilities in 2020Q3 (**sim1**; **base** is the actual for 2019Q4). Then, the quick ratio is calculated reflecting the increase in current liabilities (increase in the denominator) or current assets (increase in the numerator).

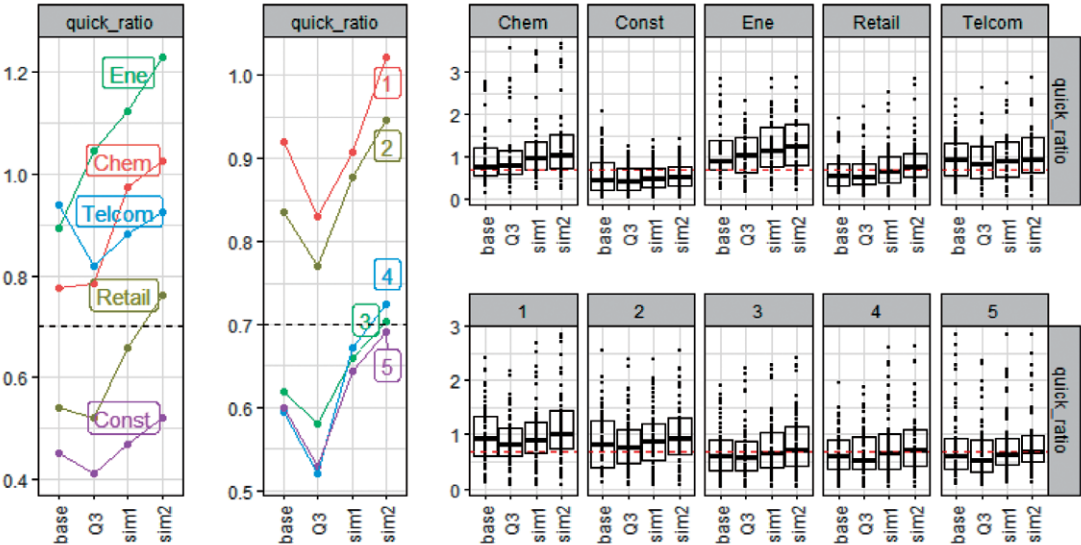
On the other hand, the government can provide financial support against declining sales, especially by covering the fixed costs such as labor costs. In this scenario, we simulate the quick ratio, assuming that a subsidy equivalent to 30% of administrative expenses is provided (**sim2**).

The graphs depict only the sectors with data for more than 40 firms in Thailand and Malaysia and 30 firms for other countries. In the Philippines, only the construction sector has data for more than 30 firms.<sup>21</sup> We also review the result by firm size (“1” being the smallest and “5” being the largest). For the quick ratio, 0.7 is used as a rough benchmark for safety. The box shows the 25-75 percentile distribution of the firms, and the horizontal bar inside the box corresponds to the median.

<sup>20</sup> These correspond to “Selling, general & administrative costs” and “Costs of goods & services” in financial statements. The latter mainly includes raw materials but also includes labor costs directly related to production and sales, while administrative personnel costs are included in the former.

<sup>21</sup> The same database is used as in the first part of this chapter, but the amount of data is smaller in this section because only firms with more detailed data are used.

In Thailand, the median level of short-term liquidity was below the threshold in the retail and construction sectors as of 2020Q3. While some improvement is expected by 2021H1,<sup>22</sup> a majority of the construction sector will remain below the benchmark and will not improve above the benchmark even with policy support. The retail sector can be expected to improve above the benchmark with policy support, but even so, only slightly more than half of the total number of firms will exceed the benchmark. By firm size, the first and second quintiles will be above the benchmark even without policy support, and the third and fourth quintiles will be able to meet or exceed the benchmark if provided with appropriate policy support. The largest size group, however, will be in a difficult position, with the majority of firms remaining below the benchmark even with policy support.

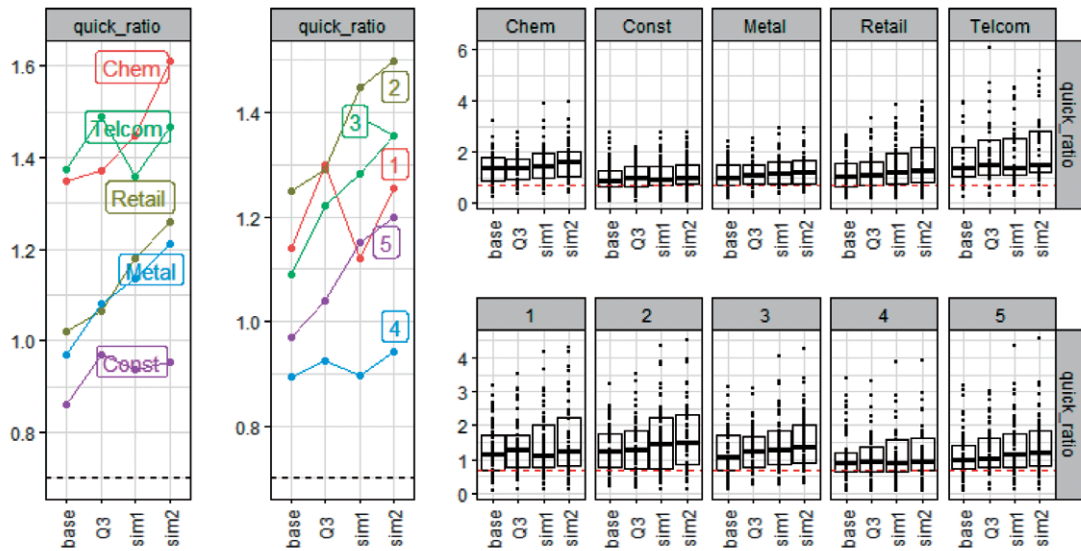


Source: Author's calculation

**Figure 2-21 THA: median and 25–75 percentile (5 = largest)**

In contrast, Malaysian firms will meet the benchmark without policy support, and all groups by firm size will be maintained at a sufficiently high level. The improvement in the indicators as of 2020Q3 suggests that the Malaysian firms have been able to weather the pandemic adequately, at least in terms of short-term cash flow.

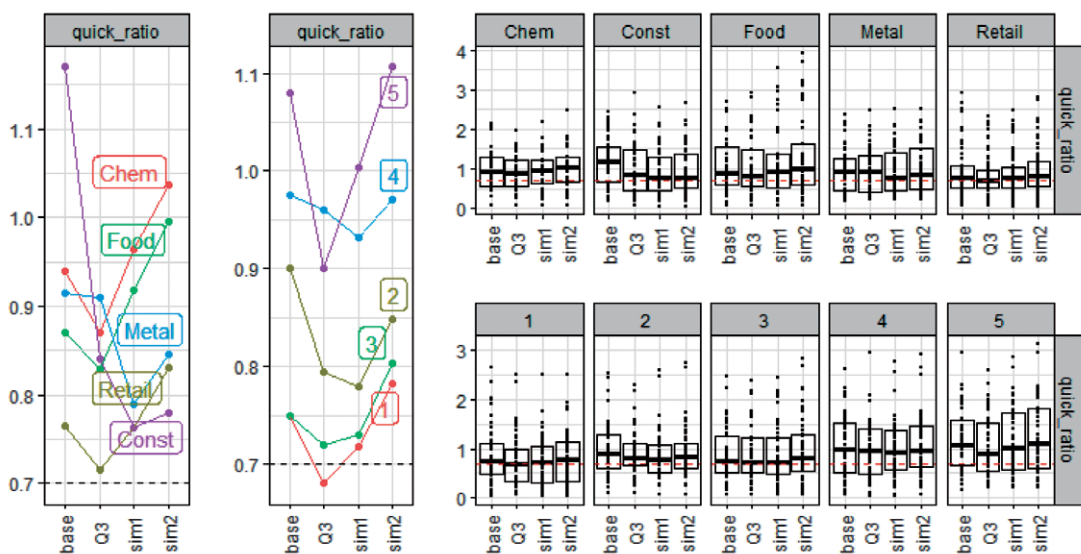
<sup>22</sup> As we have already seen, business conditions have improved in 2020Q3. Therefore, even if liquidity indicators deteriorated from the end of 2019 (base) to 2020Q3 (Q3), corporate earnings may have been sound in a single quarter of 2020Q3. Consequently, if the earnings in 2020Q3 continue, this will increase the cash holdings, and there will be cases where the simulation results in 2021H1 (sim1) improving on 2020Q3. We should carefully review the simulation results, not only the median of the indicators but also their distribution.



Source: Author's calculation

**Figure 2-22 MYS: median and 25–75 percentile (5 = largest)**

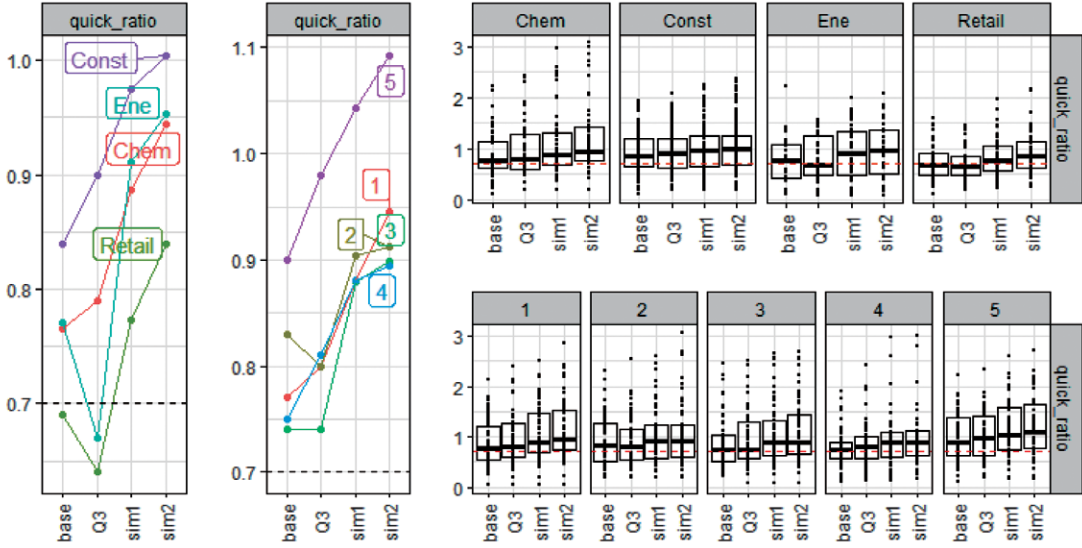
In Indonesia, more than half of the firms in each sector meet the benchmark even without policy support, but about half in the construction, retail, and metal sectors operate at or below the benchmark. Particularly in the construction sector, slightly less than half of the firms will remain below the benchmark even after policy support. By firm size, the first quintile firms were in a difficult position as of 2020Q3. If the situation in Q3 continues, a majority of firms will exceed the benchmark as of 2021H1. However, slightly less than half of the firms in the first and third quintiles will remain below the benchmark level.



Source: Author's calculation

**Figure 2-23 IDN: median and 25–75 percentile (5 = largest)**

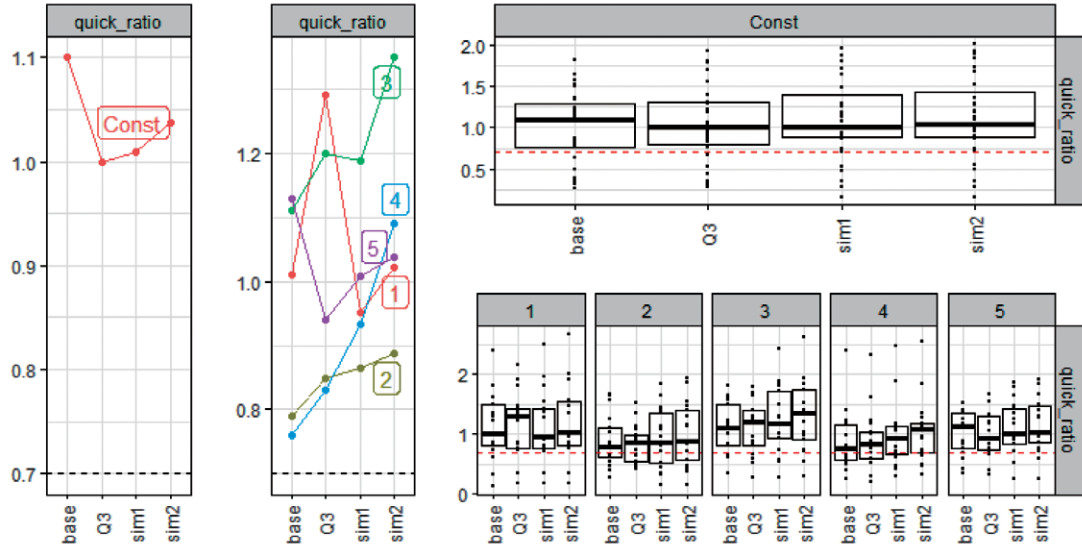
While Vietnam has been successful in deterring the spread of infection and many firms have remained strong in terms of profitability, the majority of firms in the retail and the energy sectors were below the benchmark as of 2020Q3. However, even without policy support, the level will improve to above the benchmark as of 2021H1. In the energy sector, however, although the median firm's quick ratio is well above the benchmark, the distribution within the sector is wide, and a certain number of firms are expected to be placed in a difficult cash position.



Source: Author's calculation

Figure 2-24 VNM: median and 25–75 percentile (5 = largest)

In the Philippines, the sectoral result is available only for the construction sector. Their financial position looks strong. On the other hand, by the firm size, the results through 2020Q3 show that the second and fourth quintile firms were in weak positions. Although the majority of firms will



Source: Author's calculation

Figure 2-25 PHL: median and 25–75 percentile (5 = largest)



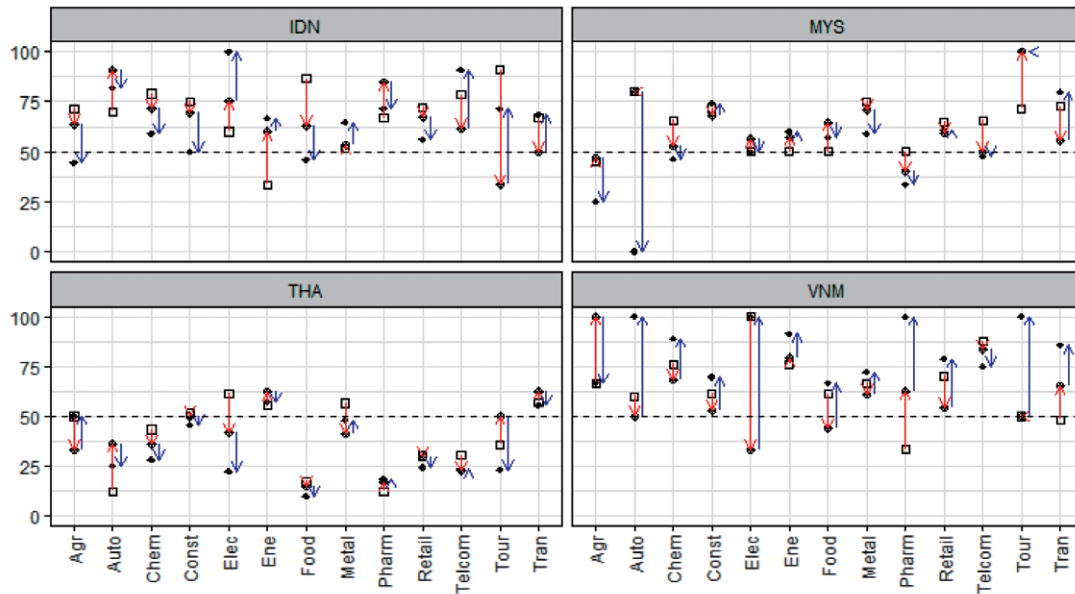
exceed the benchmark, a relatively large number of firms will remain below the benchmark even with policy support for the second quintile firms.

The above results indicate that most firms will not necessarily face difficulty in short-term cash position if the latest business conditions continue. However, this may mask the actual conditions that the firms are facing. Many firms may have reduced their fixed costs, such as the administrative costs (including personnel costs not directly involved in production and sales), in response to the deteriorating business conditions. In Figure 2-20, we saw that the average firms that experienced a decline in sales did not immediately reduce administrative expenses. While the main trend in the ratio of administrative expenses to sales tends to rise when revenue drops, there are also many firms that actually reduced their administrative expenses in response to a sales decline (i.e., those located in the lower-left area).

Figure 2-26 and Figure 2-27 show the share of firms that increased the ratio of administrative expenses to sales among those who faced a decline in sales. The red arrows indicate the change from Q1 to Q2 in 2020, while the blue arrows indicate the change from Q2 to Q3. Please note that the amount of data is not large because these only depict the shares among the firms whose sales declined.

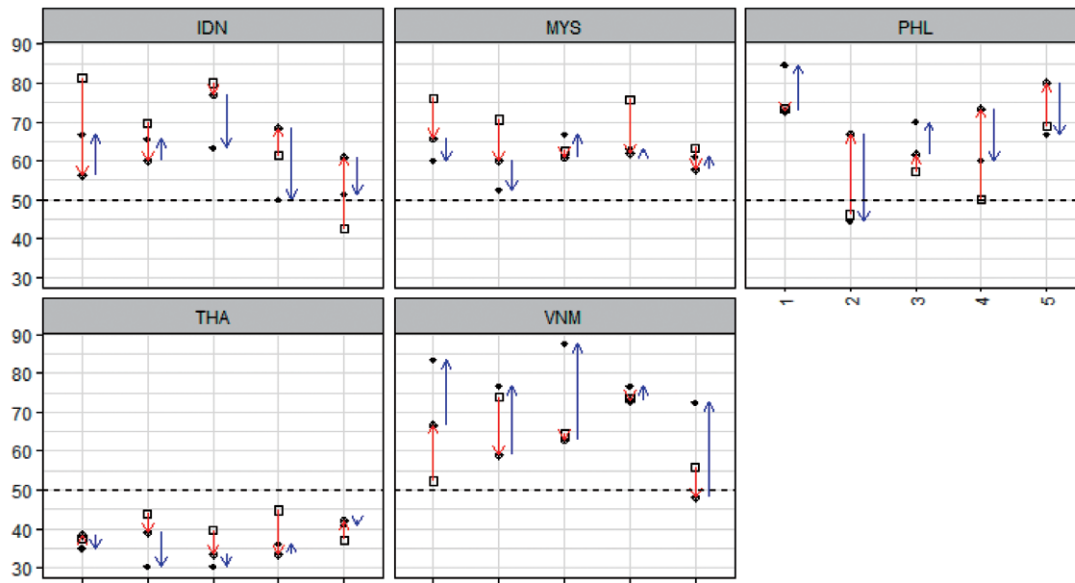
The majority of sectors in Thailand are below the 50% line (i.e., more firms have reduced their administrative cost ratios), suggesting that firms may have taken severe measures, including layoffs, in response to the decline in sales. In addition, the endpoint of the blue arrow (i.e., 2020Q3) points downward in many sectors, except Vietnam, indicating that many firms have taken such measures because the difficult environment has continued. Particularly in Thailand and Malaysia, the smaller the company, the more likely they are to lower their administrative cost ratios. In Indonesia, on the other hand, the larger firms took this approach. If this continues, the firms will no longer be able to continue taking such remedial measures and will be unable to avoid bankruptcy. This will also put severe pressure on the financial sector from the rising non-performing loan ratio, which is not yet high.

As we have already seen in Figure 2-1, the unemployment rate in the Philippines rose to an all-time high of 17.6% in 2020Q2. Five million people were newly unemployed, with an additional 12.5 million people who had jobs but were not actually able to work (ASEAN Secretariat, 2020). In the case of the Philippines, another 500,000 overseas workers lost their jobs, placing a heavy burden on their families who rely on remittances. Also, according to the ILO (2020), even those workers not counted as unemployed experienced a significant decline in working hours. The cumulative decline in labor income from 2020Q1-Q3 is estimated to have been 3.9% of GDP. Thus, though a full-scale loss of corporate earnings has been avoided, the severe employment adjustments may have been behind this trend.



Source: Author's calculation

**Figure 2-26 Share of firms raising administrative cost ratio: by sector (%)**



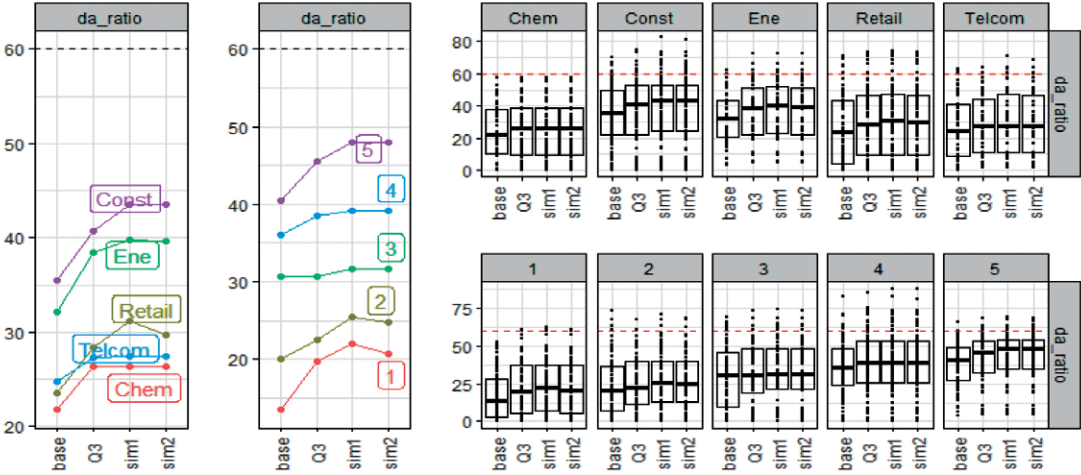
Source: Author's calculation

**Figure 2-27 Share of firms raising administrative cost ratio: by firm size (%)**

A prolonged slump in business conditions may also have an impact on long-term solvency through increases in corporate borrowing. The impact on solvency was also simulated for Thailand, which has weak solvency indicators.<sup>23</sup> The construction sector and the largest firms (fifth quintile) are expected to increase their debt asset ratios by about 3 percentage points if the current business conditions continue. However, many of them will not reach the provisionally set benchmark of

<sup>23</sup> The assumption is the same as for short-term cash flow. A deficit will be financed by short-term borrowing, and simulate the total liabilities, the sum of short-term and long-term liabilities.

60%. In the case of the fifth quintile, the median indicator will rise by about 8 percentage points from the end of 2019. For the smallest firms (first quintile), the median level will increase by nearly 10 percentage points, without policy support, although the level itself is low. Such an increase in the solvency burden should be monitored.



Source: Author's calculation

**Figure 2-28 THA: median and 25-75 percentile (5 = largest)**

**6. Conclusion**

Based on the above observations, the country and sector-specific characteristics can be summarized as follows. First, by country, Indonesia has recorded a weakening in corporate profits, and its solvency ratio has deteriorated, especially in 2020Q3. Indonesia is likely to belong to the worst-performing group in the clustering. The Philippines is likely to be in a similar situation, although the clustering did not produce a significant conclusion due to the data limitations. On the other hand, in Thailand, Malaysia, and Vietnam, corporate profits appear to be improving from 2020Q3. However, the overall deterioration in solvency indicators in Thailand is a concern. In Indonesia, the degree of weakening in macroeconomic indicators, such as GDP, is limited. Performance in terms of controlling the transmission of the COVID-19 has been poor, and as a result, corporate activities may have been severely constrained.

By sector, tourism has seen a notable deterioration in profitability, short-term cash flow, and solvency ratio in Thailand, Indonesia, and Malaysia (though with slight differences among the countries). The negative impact of the COVID-19 pandemic has been most pronounced in the tourism sector. Transportation is another sector that has been severely impacted in many countries. One of the main characteristics of the COVID-19 pandemic was the restrictions on cross-border and long-distance travel. There is no doubt that both of these sectors have been significantly affected by this policy. The construction sector also recorded a relatively negative impact in most countries. In addition to being a sector where it is difficult to telework, the turmoil in the financial markets of industrial countries may have had an impact on real estate development, which is relatively prone to speculative bubbles.

There are sectors where the debt asset ratio rises while profitability improves. The increased borrowing in such cases may be a positive investment. On the other hand, some sectors that experienced a pronounced decline in profitability also accumulated short-term liquidity. This may indicate that firms responded to the deterioration in business conditions through a variety of financial means, including converting long-term assets into cash.

The worsening business conditions will put pressure on corporate cash flow, possibly leading to increased bankruptcies and layoffs. The international community, including JICA, extended financial support to many countries. The simulations based on simple assumptions in this chapter show that many sectors have tended to see an improvement in their short-term cash flow indicators. Their financial conditions also appear to be stronger than initially expected. However, this may be the result of remedial measures already taken by the firms, including labor cost reductions (layoffs, shortening of working hours, salary reductions, etc.). This does not necessarily mean that policy support is not needed.

The impact of the pandemic on the corporate sector varies greatly from country to country and sector to sector. It is necessary to extend support based on the severity of the impact and the financial situation of the firms (whether short-term cash flow problems or solvency problems, etc.). However, any delays in providing policy support while such support mechanisms are being articulated by governments could result in a significant impact on many workers, especially low-income households that are vulnerable to the economic crisis. Firms may take measures such as reducing their workforce and working hours before the support will become available.

There was also a concern that the SMEs might be facing more difficult circumstances. In many countries, smaller firms tended to have stronger liquidity positions and lower debt burdens. However, smaller firms, which are less creditworthy than larger firms, do not always have easy and timely access to credit and are therefore forced to operate without a large reliance on borrowing. This constraint may be reflected in their high liquidity positions and low debt ratios. Furthermore, as they tend to adjust their employment more readily than large firms, in cases where adequate support is not provided, the social cost of the pandemic is likely to increase. We therefore believe that there is a strong need for policy support focused on SMEs.

The analysis here is mainly related to listed firms and does not capture the impact on the informal sector, which accounts for the majority of employment in developing countries. Analysis of the pandemic's impact on the economy requires careful assessments using data other than corporate finances or business surveys.<sup>24</sup> Furthermore, since the informal sector is not registered and does not keep accurate financial data, it is difficult to provide support through normal policy channels, such as tax breaks and public loans. It is necessary to design ways of extending assistance to these firms promptly.

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<sup>24</sup> According to the ILO (2020), 61% of the decline in employment in Vietnam in 2020Q2 was in the informal sector. On the other hand, 86% of employment growth in 2020Q3 was also in the informal sector. As the informal sector is outside of the scope of labor regulations, employment adjustments are likely to be made flexibly in response to changes in business conditions.

## Summary of firm data

sector	Abbrev.	Thailand (THA)			Malaysia (MYS)			Indonesia (IDN)			Vietnam (VNM)			Philippines (PHL)		
		Debt asset ratio	Quick ratio	ROA	Debt asset ratio	Quick ratio	ROA	Debt asset ratio	Quick ratio	ROA	Debt asset ratio	Quick ratio	ROA	Debt asset ratio	Quick ratio	ROA
all		316	391	398	477	575	584	258	315	344	263	336	343	96	131	134
Agriculture	Agr	2	4	4	49	62	61	21	25	25	4	5	5	1	1	1
Automotive	Auto	10	16	16	19	22	22	8	10	10	5	6	6	0	0	0
Chemicals	Chem	48	71	71	66	88	88	35	48	48	54	70	70	6	11	11
Cons. goods & Retail	Retail	66	87	87	81	103	102	56	74	74	54	69	69	18	21	21
Consumer elec	Elec	18	23	23	26	37	37	6	9	9	7	7	7	4	5	5
Energy	Ene	35	37	37	17	20	20	32	34	35	31	43	43	12	16	16
Food & Bev	Food	33	42	42	44	59	58	32	43	43	37	44	44	16	19	19
Media & Telecoms	Tele	45	56	56	69	90	92	23	30	30	10	13	13	15	19	19
Mining & Metals	Metal	37	47	46	71	83	83	49	57	58	40	49	49	8	10	10
Pharma & Health	Pharm	19	26	26	18	21	21	11	17	17	10	14	14	1	2	2
Realty & Const	Const	78	87	87	148	163	163	51	55	55	78	93	93	31	46	46
Tourism	Tour	13	17	17	24	26	26	18	19	19	3	4	4	7	10	10
Transportation	Tran	17	19	19	37	38	38	30	31	31	26	41	41	6	6	6

Firm numbers of each sector may not add up since one firm may be classified for multiple sectors.



## [Appendix]

In this chapter, we conducted a cluster analysis of 13 sectors. However, the effects of tourism and transportation, which were severely affected by the COVID-19, and retail trade, which benefited from the pandemic, were so large that the impacts on other sectors, especially manufacturing firms, may not have been clearly distinguished. Therefore, in this Appendix, the same analysis was conducted using the data of nine sectors that are close to the production of goods, excluding the three sectors of tourism, transportation, and retail.<sup>25</sup> This may change the relative position of the sectors, including the clustering results, and may reveal a slightly different picture.

First, the behavior of each indicator (median) by the same six clusters is shown below. The trend looks similar to that of the 13 sectors. The number of firms and the share of each country belonging to each cluster are also not noticeably different.

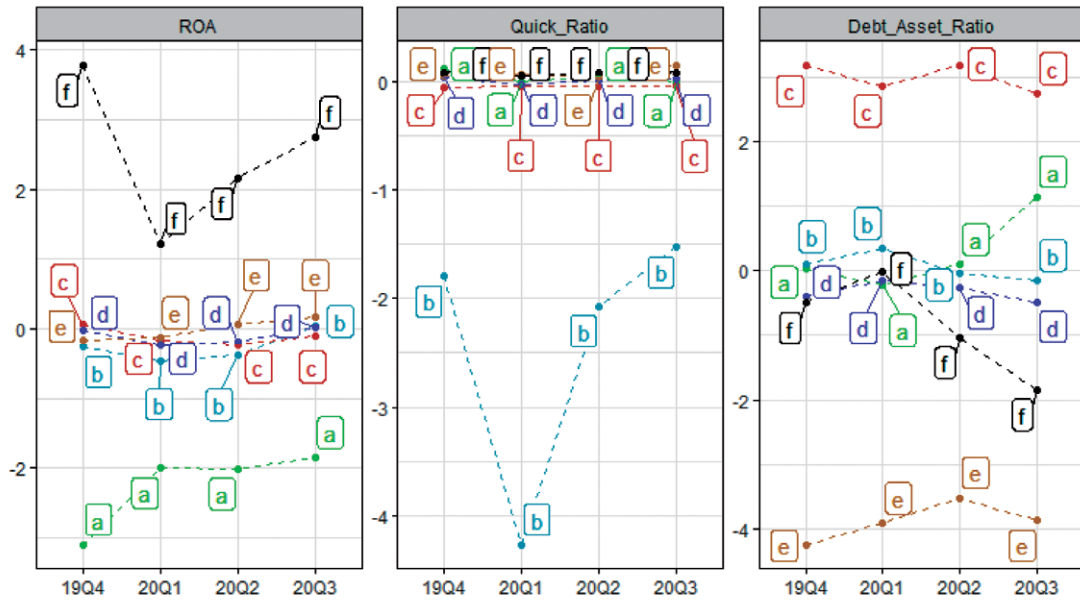
On the other hand, with regard to the cluster shares in each sector, the share of cluster *a* in the automotive sector in 2020Q2 and Q3 is noticeable. In the original clustering of 13 sectors, the share of cluster *a* in Q2 was high but shrank significantly in Q3. The pharmaceutical sector also shows a notable increase in the share of *a*, especially in Q3. In addition, although not as pronounced as in these two sectors, energy and media/telecommunications also show a relatively large increase in the share of *a*.

Similarly, a multinomial logit analysis shows that Indonesia is still the most likely country to belong to cluster *a*, which is the worst-performing cluster, and Thailand is the most likely country to belong to cluster *c*, which has the highest debt ratio.

By sector, the coefficient of cluster *a* was positive and significant for automobiles, energy, metals, and pharmaceuticals. In the energy sector, the coefficient of cluster *b*, where the quick ratio is lower in Q3, is also positive and significant. This may reflect the fact that the automobile sector has been forced to reduce production in some countries due to the shortage of semiconductors caused by the increase in demand for personal computers, especially as telework increases. Energy and metals may also be related to this sluggish demand in the industrial sector.

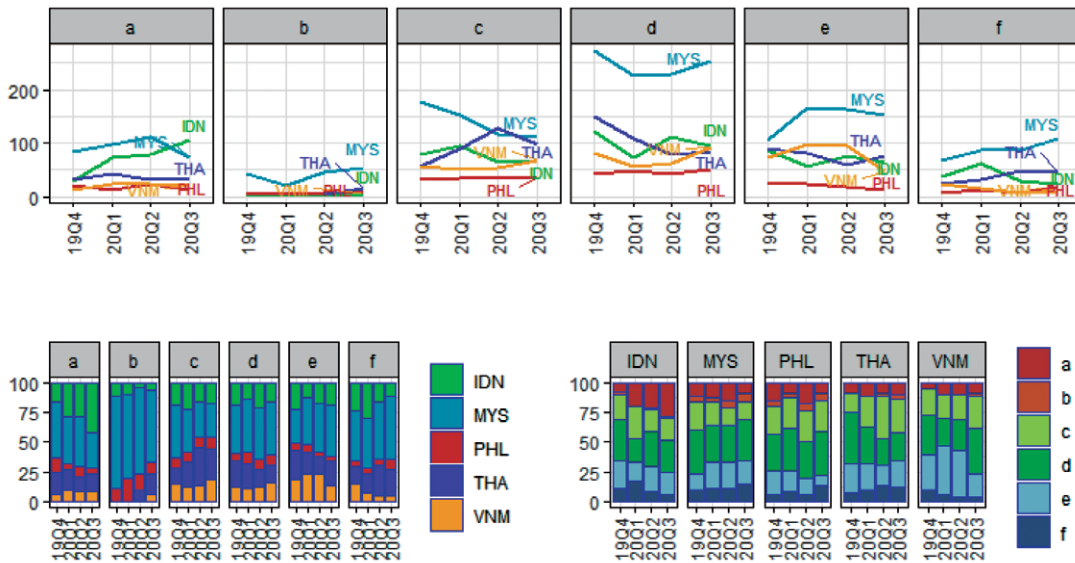
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<sup>25</sup> It should be noted that the pharmaceutical and the automobile sectors include drugstores and dealers. Not all the firms are involved in the production of goods.



Source: Author's calculation

**Suppl Figure 1 Median indicator values by clusters (y/y %pt)**



Source: Author's calculation

**Suppl Figure 2 Firm numbers or shares by clusters**



Source: Author's calculation

Suppl Figure 3 Share of firms in each cluster by sector

Suppl Table 1

	Dependent variable:					Dependent variable:					Dependent variable:			
	(1)	cluster (2)	(3)	(4)		(1)	cluster (2)	(3)	(4)		(1)	cluster (2)	(3)	(4)
(Intercept):a	-1.080** (0.468)	-0.819* (0.468)	-0.836* (0.468)	-1.341*** (0.485)	Agr.a	0.812 (0.595)	-0.244 (0.636)	0.308 (0.616)	0.181 (0.610)	Food.a	0.263 (0.537)	0.700 (0.497)	0.865* (0.505)	0.688 (0.519)
(Intercept):b	-1.121 (0.731)	-0.865 (0.858)	-0.187 (0.643)	-0.493 (0.590)	Agr.b	0.349 (0.966)	-1.003 (1.224)	-1.073 (1.164)	-0.426 (0.894)	Food.b	-0.589 (1.200)	-0.898 (1.232)	-1.142 (1.150)	-0.082 (0.767)
(Intercept):c	-0.761** (0.360)	-0.695* (0.387)	-0.638* (0.384)	-1.338*** (0.396)	Agr.c	0.44 (0.484)	0.023 (0.478)	-0.517 (0.560)	-0.49 (0.551)	Food.c	0.304 (0.406)	-0.063 (0.433)	0.143 (0.407)	0.145 (0.412)
(Intercept):e	-1.122*** (0.364)	0.133 (0.365)	0.058 (0.368)	-0.023 (0.366)	Agr.e	-0.342 (0.580)	-0.763 (0.530)	0.157 (0.468)	-0.626 (0.519)	Food.e	0.332 (0.374)	0.056 (0.396)	-0.082 (0.420)	-0.023 (0.415)
(Intercept):f	-1.616*** (0.530)	0.337 (0.440)	0.005 (0.476)	-0.236 (0.448)	Agr.f	1.305** (0.634)	-0.552 (0.619)	0.448 (0.625)	-0.029 (0.595)	Food.f	0.934* (0.562)	0.201 (0.482)	0.816 (0.511)	0.754 (0.478)
IDN.a	-0.075 (0.431)	0.799** (0.374)	0.627* (0.345)	1.436*** (0.356)	Auto.a	-19.588 (11122.910)	-0.43 (0.868)	1.796*** (0.656)	1.308** (0.620)	Metal.a	0.770 (0.474)	0.819* (0.478)	0.478 (0.478)	1.006** (0.479)
IDN.b	-1.168 (0.807)	-1.061 (1.119)	-2.118* (1.082)	-1.208 (0.801)	Auto.b	0.157 (1.230)	-17.729 (7190.727)	0.121 (1.211)	-0.391 (1.156)	Metal.b	0.109 (0.863)	-1.193 (1.201)	-1.142 (0.888)	-0.087 (0.707)
IDN.c	-0.061 (0.312)	0.584* (0.336)	0.155 (0.343)	0.402 (0.352)	Auto.c	-0.061 (0.592)	-0.5 (0.671)	-0.44 (0.767)	-0.985 (0.829)	Metal.c	0.631* (0.372)	0.577 (0.395)	-0.001 (0.377)	0.627 (0.384)
IDN.e	0.708** (0.328)	0.124 (0.366)	0.167 (0.327)	0.301 (0.344)	Auto.e	-0.466 (0.625)	-0.081 (0.574)	0.188 (0.669)	-0.764 (0.714)	Metal.e	0.184 (0.375)	-0.143 (0.403)	-0.159 (0.374)	0.308 (0.379)
IDN.f	0.335 (0.415)	0.912** (0.394)	-0.092 (0.440)	-0.328 (0.459)	Auto.f	-0.44 (1.120)	-0.358 (0.752)	-0.552 (1.155)	-1.13 (1.111)	Metal.f	0.954* (0.541)	0.46 (0.447)	0.028 (0.516)	0.042 (0.517)
PHL.a	0.659 (0.544)	-0.721 (0.618)	0.359 (0.514)	-0.037 (0.626)	Elec.a	0.622 (0.644)	0.068 (0.696)	0.751 (0.641)	-0.874 (1.110)	Pharm.a	-1.032 (1.093)	0.233 (0.645)	0.37 (0.700)	1.631*** (0.620)
PHL.b	0.234 (0.872)	0.337 (0.955)	0.244 (0.764)	-0.095 (0.725)	Elec.b	-0.184 (1.217)	-0.67 (1.223)	-0.246 (0.929)	-0.206 (0.895)	Pharm.b	1.052 (0.998)	-0.074 (1.230)	0.405 (0.941)	-0.091 (1.160)
PHL.c	0.139 (0.456)	-0.075 (0.446)	0.42 (0.458)	0.198 (0.446)	Elec.c	0.371 (0.550)	0.181 (0.527)	0.118 (0.541)	0.556 (0.515)	Pharm.c	0.938** (0.460)	0.045 (0.524)	0.122 (0.527)	0.53 (0.573)
PHL.e	0.358 (0.490)	-0.395 (0.487)	-0.261 (0.540)	-0.83 (0.601)	Elec.e	0.753 (0.491)	-0.020 (0.496)	0.076 (0.534)	-0.14 (0.545)	Pharm.e	-0.930 (0.680)	-0.336 (0.526)	-0.164 (0.559)	0.431 (0.564)
PHL.f	-0.071 (0.705)	-0.097 (0.635)	-0.148 (0.705)	-0.031 (0.547)	Elec.f	0.283 (0.873)	-1.882* (1.093)	-0.648 (0.861)	0.295 (0.612)	Pharm.f	0.133 (0.861)	-1.143 (0.838)	0.265 (0.702)	0.236 (0.764)
THA.a	-0.105 (0.416)	-0.173 (0.392)	-0.097 (0.426)	0.355 (0.431)	Ene.a	0.649 (0.660)	1.385** (0.584)	0.573 (0.583)	0.958* (0.569)	Telcom.a	0.318 (0.531)	0.338 (0.508)	1.191** (0.508)	0.702 (0.549)
THA.b	-18.527 (3694.851)	-17.719 (3253.038)	-1.172 (0.804)	-0.234 (0.573)	Ene.b	1.375 (1.096)	0.923 (1.210)	1.207 (0.895)	1.472* (0.755)	Telcom.b	-0.075 (0.871)	-18.118 (3798.918)	-0.475 (0.807)	0.272 (0.660)
THA.c	-0.554* (0.329)	0.203 (0.319)	1.110*** (0.325)	0.935*** (0.335)	Ene.c	0.892* (0.467)	0.777 (0.499)	-0.058 (0.464)	0.272 (0.463)	Telcom.c	0.292 (0.418)	0.055 (0.418)	0.135 (0.442)	0.427 (0.430)
THA.e	0.49 (0.316)	-0.053 (0.321)	0.168 (0.358)	0.387 (0.340)	Ene.e	0.398 (0.468)	0.274 (0.525)	-0.334 (0.502)	-0.374 (0.558)	Telcom.e	0.546 (0.387)	-0.085 (0.393)	0.476 (0.416)	0.366 (0.408)
THA.f	-0.261 (0.465)	-0.264 (0.429)	0.559 (0.409)	0.215 (0.395)	Ene.f	1.512** (0.643)	0.457 (0.664)	0.43 (0.698)	0.233 (0.686)	Telcom.f	0.952* (0.575)	-0.951* (0.565)	0.442 (0.547)	0.391 (0.504)
VNM.a	-0.751 (0.603)	-0.253 (0.497)	-0.223 (0.489)	-0.359 (0.508)	asset.a	-0.172 (1.106)	-0.125 (0.993)	-0.201** (0.909)	-0.195** (0.993)	asset.a	-0.106 (0.340)	-0.093 (0.246)	-0.09 (0.391)	-0.093 (0.399)**
VNM.b	-18.492 (4163.168)	-18.125 (4294.260)	-17.89 (2560.781)	-1.800** (0.826)	asset.b	-0.340* (0.186)	-0.246 (0.252)	-0.391** (0.178)	-0.399** (0.15)	asset.b	-0.186 (0.023)	-0.252 (0.05)	-0.178 (0.0004)	-0.15 (0.099)
VNM.c	0.107 (0.367)	0.303 (0.404)	0.455 (0.398)	0.616* (0.367)	asset.c	-0.074 (0.011)	-0.077 (0.105)	-0.078 (0.158)	-0.078 (0.169)**	asset.c	-0.074 (0.076)	-0.077 (0.08)	-0.078 (0.081)	-0.078 (0.084)
VNM.e	0.885** (0.367)	0.646* (0.363)	0.710** (0.360)	-0.367 (0.382)	asset.e	-0.011 (0.076)	-0.105 (0.08)	-0.158* (0.081)	-0.169** (0.084)	asset.e	-0.011 (0.076)	-0.105 (0.08)	-0.158* (0.081)	-0.169** (0.084)
VNM.f	0.179 (0.502)	-0.969* (0.577)	-1.379** (0.682)	-1.810*** (0.660)	asset.f	-0.196* (0.107)	-0.401*** (0.11)	-0.452*** (0.116)	-0.288*** (0.106)	asset.f	-0.196* (0.107)	-0.401*** (0.11)	-0.452*** (0.116)	-0.288*** (0.106)
Observations	617	617	617	617										
R2	0.046	0.053	0.06	0.063										
Log Likelihood	-924.095	-943.607	-955.502	-961.117										
LR Test (df = 70)	89.273*	105.624***	121.874***	130.244***										

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

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## Chapter 3

# The Impact of COVID-19 and US-China tensions on the business activities of Japanese companies: findings from interviews with Japanese companies

— Despite limited impacts thus far, attention is still required

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### Summary

- Our questionnaires and in-depth interviews with 20 local subsidiaries of Japanese companies operating value chains in the Asian region have revealed the impacts of COVID-19 and US-China tensions on global value chains (GVCs).
  - Findings regarding the impacts of COVID-19 on value chains include the normalization of the once-disrupted supply chains for selected goods, the impacts on demand (positive or negative depending on the industry), the adverse impacts of restrictions on international travel of technical staff, and the under capacity of labor-intensive processes. Widespread impacts resulting from COVID-19 were confirmed, regardless of the industry or location of each company. Among these impacts, the impact on demand (positive or negative), the slowdown of some processes in the value chain due to international travel restrictions and under capacity in labor-intensive processes are expected to continue until COVID-19 has been fully contained.
  - As for the impact of US-China tensions on the value chain, this study identified changes in the supply chain for goods subject to trade restrictions, i.e., changes in supply route for products destined for the US, and the negative impact on demand in the high-tech industry (sanctions against Huawei). The impact of US-China tensions was observed in a limited number of industries and countries. Furthermore, many companies viewed the impact of trade restrictions between the US and China on the real economy as being minor, suggesting that there is a gap between the media's view and local perceptions of companies on the ground. It was also revealed that supply chains that relied significantly less on China would not be realistic at this moment. However, in the long-term, international political factors, such as the value chain strategies of the US and Chinese governments, will affect the supply chain strategies of companies, and therefore it is necessary to keep a close eye on political trends.
  - The impact of COVID-19 as well as that of US-China tensions has been partial, and these issues are not likely to have a big impact on the value chain strategies of companies that are in place, and therefore will only have limited impact on value chains including supply chains at the timing of this survey.
  - The following nine points summarize the impact of COVID-19 and US-China tensions on global value chains.
1. COVID-19: Supply chains have been recovering from the temporary and limited supply-side shocks of the first half of 2020.



2. COVID-19: Demand-side impact varies widely by industries.
3. COVID-19: The impact of the continuing international travel restrictions on value chains should not be underestimated.
4. COVID-19: Preventive measures for COVID-19 directly affect operational efficiency for labor-intensive process of the value chain.
5. US-China tensions: In the case of goods subject to trade restrictions (increased tariffs), some supply routes from China to the US were re-routed.
6. US-China tensions: Apart from high-tech industries such as semiconductors, the range of trade goods subject to trade regulations due to US-China tensions seems to have been carefully selected by considering their impact on the real economy. US-China tensions are unlikely to change the basic structure of international trade in the short term.
7. US-China tensions: Demand for parts/products from HUAWEI is likely to have been affected to some extent by US-China tensions.
8. US-China tensions: Supply chains with significantly reduced reliance on China are not realistic, at least in the short term.
9. COVID-19/US-China tensions: Fundamental changes in supply chains due to COVID-19 and US-China tensions are likely to be limited.

## **1. Background and framework of the interview survey**

### **1.1 Background**

The aim of this chapter is to analyze the impact of COVID-19 and US-China tensions on the economic and social structure of Asia and to provide some recommendations on JICA's future operations in the region. Regarding the supply chains and global value chains<sup>1</sup> in the light of COVID-19 and US-China tensions, the following arguments are proposed: firstly, there will be a return to domestic supply changes and a move away from global supply chains; secondly, supply chains will be multidimensional and resilient; and thirdly, there is a possibility of supply chain divide due to the decoupling of the US-China economic tensions (Kwan 2019). In order to consider the future role of supply chains and value chains, it is important to understand and analyze macro and aggregate trends, as described in Chapters 1 and 2, and to consider the facts on the ground at the micro-level with regard to the industry, product, and target market.

One of the reasons for this approach is that the impacts of COVID-19 and US-China tensions on the Asian region tend to vary depending on the industry and major sales market. For example, changes in lifestyles (“the new normal”) due to COVID-19 have led to a demand increase in industries with products and services related to staying at home. For example, spending on consumer electronics, home delivery logistics, food for eating at home, and telecommunications services have increased based on the premise that people are now staying at home. By contrast,

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<sup>1</sup> There are various definitions of the term “value chain” in the literature. For example, Todo (2020) defines a value chain as the flow of economic activities that includes the supply chain, which is the flow of materials through the production of components to the production of final products. It also incorporates the development of products, technologies, and designs further upstream, as well as marketing and after-sales services downstream, and finally, data analysis for these activities. This is the flow of economic activities.

demand for travel and restaurant food, which requires that people go out, tends to be more restrained (Nissay Research Institute 2020). In addition, the degree of success of countermeasures against COVID-19 varies between countries, even within the Asian region, with outbreaks and containments of COVID-19 occurring at different times in each country. The degree of impacts varies from economies such as China and Chinese Taipei, which are deemed to have been relatively successful in the containment of COVID-19, and India,<sup>2</sup> which has been continuously affected by large-scale lockdowns.

Furthermore, it should be noted that the import/export restrictions due to US-China tensions mean additional tariffs and trade restrictions on imports and exports between the US and China. Considering that the global supply chains are multilateral, global, and multilayered, especially in the manufacturing industry, only a part of the whole supply chain is impacted negatively under US-China tensions. These tensions have also mainly affected high-tech industries such as semiconductors<sup>3</sup> (Japan Center for Economic Research 2020).

In other words, the impacts of COVID-19 and US-China tensions are likely to be localized, and thus, it is important to understand the impact at the micro level through an interview survey with each company. In conducting this survey, it is important to clarify which parts of the supply chain and the value chain are affected by COVID-19 and US-China tensions and also to analyze whether the localized effects could have an impact on the overall structure of the value chain. This will lead to a more accurate understanding of the post-COVID-19 economic structure of the Asian region.

The survey covers 20 local subsidiaries of Japanese companies, which is not a statistically sufficient sample size. Therefore, our analysis is not intended to be used for the generalization of the survey results. Rather, we will try to understand, at a micro level, the reasons and thinking behind the behavior at a deeper level, and how they recognize and try to cope with major changes in international trends such as COVID-19 and US-China tensions. In addition, we provide a snapshot of business activities in the midst of major business environmental changes, which are COVID-19 and the US and China tensions, with the aim of deriving some implications for use in considering the economic structure of the post-COVID-19 Asian region.

## 1.2 Literature review

Similar previous surveys and studies include Abe et al. (2020), JETRO (2020a, 2020b, 2020c, 2020d), and JBIC (2020), which focused on Japanese firms, while JETRO (2020d) focused on Western firms (operating outside Japan). These surveys thus include a selection of both Japanese and international firms.

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<sup>2</sup> In India, COVID-19 is spreading mainly among the poor: as of January 2021, the cumulative number of infected people had reached 10.5 million and the impact of COVID-19 was delaying the normalization of the economy (Nihon Keizai Shimbun, Morning Edition, January 16, 2021).

<sup>3</sup> There are various definitions of the high-tech industry, but the term generally refers to industries that require advanced science and technology, such as electronics, machinery, biotechnology, and new materials. In this paper, the focus is on high-tech industries involved in electronics, computer technology, and digital information and communications, utilizing semiconductors, that are now at the center of the US-China tensions. In addition, EVs (electric vehicles) may also become a major focus in the future.

During the early stage of the spread of COVID-19, Abe et al. (2020) conducted a questionnaire survey of 22 Japanese manufacturing companies in May 2020 to analyze the impact of COVID-19 on their supply chains and their countermeasures. The results suggest that the pandemic has had impacts on both the upstream and downstream elements of supply chains on a global scale, affecting production and procurement activities, and that the reasons behind the impacts vary by region. Moreover, the impacts differ between companies that produce the final products and those companies that provide supplies.

JETRO (2020a) conducted a questionnaire survey of 1,085 Japanese companies operating overseas on their future business look due to COVID-19. The results show that about 60% of the Japanese companies reviewed their business strategies and business models in response to COVID-19. More precisely, 20% of them reviewed their suppliers, and 10% of them reviewed production sites. In addition, about 70% were considering updating their sales strategies. Although most companies are cautious about revising their supply chains in terms of procurement for material and production sites, those revising their supply chains have indicated that they would like to diversify their production sites, increase exports from neighboring countries and/or Japan (rather than producing within the targeted country), and adapt a local production for local consumption strategy.

In another study, JETRO (2020b) conducted a questionnaire survey of 9,182 Japanese companies in 86 countries in September 2020 to build an understanding of Japanese companies' operations. The results indicate that companies are expecting the business situation to normalize by the end of 2021 and are hurrying to build new business strategies and business models, including the proactive use of digital technology, diversification of procurement and supply routes, and a shift to "non-contact" methods through remote operations and on-site automation.

Drawing from the results of this study (JETRO 2020b), JETRO (2020c) conducted a detailed analysis of the results of a questionnaire survey of 5,976 Japanese companies operating in Asia and Oceania and found that, although overall business confidence was at a record low due to COVID-19, the business confidence of companies operating in China was relatively moderate. In response to COVID-19, companies are shifting to digital technology at an accelerated pace. The survey revealed that 52.2 % of companies plan to revise their business models, specifically by increasing telework (53.8 %), virtual exhibitions and online business meetings (24.6 %), and the use of digital marketing and AI (23.8 %).

JETRO(2020d) conducted interviews with the regional headquarters of European and US companies based in Singapore about the impact of US-China tensions in the region and countermeasures to deal with them. They also investigated the possibility of supply chain diversification. The results demonstrated that, while only a few companies are trying to diversify their supply chains,<sup>4</sup> such companies are implementing the process quickly, and that regional headquarters play an

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<sup>4</sup> The concept of diversification includes the reconfiguration of the supply chain, including the transfer of production sites and changes in production items while retaining existing factories (JETRO 2020d).

important role in the diversification process.

JBIC (2020) conducted a survey of Japanese companies with at least three overseas subsidiaries (with the requirement that at least one of them should be a production site). The survey, which received responses from 530 companies, covered current views and future prospects for their overseas business development. The survey found that the return of supply chains to Japan is unlikely to occur as a major trend and that a certain number of companies have already decoupled or intend to decouple their supply chains between the US and China. Companies have already made a decision about which supply chains in the US and China they will cut off or have already taken steps to cut them off, suggesting that in the post-COVID-19 world, the local production for local consumption strategy is recognized as one solution.

There are three main differences between these existing surveys and this survey. The first difference is the timing of the survey: JETRO (2020d) was conducted in 2019 before COVID-19, while Abe et al. (2020) was carried out in May 2020, just after the global spread of COVID-19. On the other hand, JETRO (2020b), JETRO (2020c), and JBIC (2020) were conducted in September 2020. In contrast, this survey was conducted from November 2020 to March 2021, when the first wave of the spread of COVID-19 was over and the second and/or third waves were in full swing. Secondly, there are differences between the areas of focus in the survey, such as the impact of COVID-19 and/or US-China tensions. While Abe et al. (2020), JETRO (2020b), and JETRO (2020c) focus on the impact of COVID-19 in detail, Abe et al. (2020) also focus on the impact of COVID-19 in terms of supply chain disruption. Our study examines the impact of both COVID-19 and US-China tensions.<sup>5</sup> Third, while existing surveys, with the exception of JETRO's (2020d), employ questionnaire surveys in an aggregate manner, this survey employs an interview method to acquire more detailed background on the companies and examine the reasons behind the responses, as well as analyzing questionnaire responses.

Table 3-1 shows the relationship between the existing surveys and this survey. This study is unique since it (1) analyzes the impact of both COVID-19 and US-China tensions on supply chains and value chains; (2) covers the period from November 2020 to March 2021, which is in the midst of the second or third wave of COVID-19; and (3) adopts an interview survey method for each company. On the other hand, since value chains and supply chains have become increasingly complex in the wake of COVID-19 and US-China tensions, existing surveys and this study can be said to have complementary relationships. It is hoped that combining the findings of other existing surveys with this survey will lead to a more accurate understanding of the current and future picture of value chains and supply chains.

In this survey, based on the results of existing surveys, we conducted interviews with 20 Japanese companies with value chains in the Asian region to understand what kinds of issues and problems they are facing, and how they are trying to overcome them. In this way, the survey aims to

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<sup>5</sup> JBIC (2020) is also investigating the impact of both COVID-19 and US-China tensions, but its survey method (questionnaire survey of a large sample) differs from this study (interview survey of a small sample).

understand value chains and supply chains in the Asian region more accurately.

**Table 3-1 Relationship between existing surveys and this survey**

<b>Surveys</b> <b>Survey period</b>	Abe et al. (2020)	JETRO (2020a)	JETRO (2020b and c)	JETRO (2020d)	JBIC (2020)	This survey
November 2019 to December 2019.				■		
May 2020	■					
September 2020		■	■		■	
November 2020 to March 2021						■
<b>Survey target</b>						
COVID-19	■	■	■		■	■
US-China tensions				■	■	■
<b>Survey Methodology</b>						
Questionnaire	■	■	■		■	(■)
Interview				■		■
<b>Types of companies surveyed</b>						
Japanese companies operating overseas	■	■	■	■		■
European and American companies				■		

Source: Author

### 1.3 Methods

This research employs an interview survey. The study was conducted between November 2020 and March 2021. We sent the questionnaire to the interviewees in advance, collected their responses, and then conducted interviews lasting 30 to 90 minutes. Based on the answers to the questionnaire, we conducted detailed interviews on the actual impacts of COVID-19 and US-China tensions on supply chains and value chains to better understand the background and the reasons behind their answers. Some companies were not able to answer the questionnaire in writing from the viewpoint of confidentiality of internal corporate information but were able to express their views orally at interviews. The target companies are local subsidiaries of Japanese companies that have production and sales bases in Asian countries. The interviews were conducted online.

### 1.4 Overview of the surveyed companies

The companies surveyed were 20 local subsidiaries of Japanese companies that have value chains in the Asian region. Table 3-2 provides an overview of the surveyed companies, and Table 3-3 shows the list of surveyed companies. Although the surveyed companies include subsidiaries located in different countries/regions belonging to the same corporate group, each subsidiary is counted as one company because they are different legal entities. Since the questionnaire contains



sensitive corporate information, we asked the respondents to answer the questionnaire on the condition that their company names would remain anonymous. As shown in Table 3-3, the survey covered mainly Japanese manufacturers with production bases in China and also included trading companies and the food industry located in India and Southeast Asia. The main target market is the Chinese market as well as other major markets, including the US, Europe, and Southeast Asia. Although the sample size is small, the survey covers major markets (China, US, etc.), major production/sales locations (China and South-east Asia), and industries (manufacturing industry) in terms of the current global economy.

Figure 3-1 shows the distribution of the impacts resulting from COVID-19 and US-China tensions in terms of each company’s location (China or other countries). Among the 14 companies that responded to the questionnaire, 8 were affected by both COVID-19 and US-China tensions, and more than half (5 companies) of these were located in China. In addition, there was one company that was not affected by COVID-19 but was affected by US-China tensions, and one company that was not affected by either COVID-19 or US-China tensions. Therefore, COVID-19 had impacts on the business of almost all companies, while the relatively large number of companies located in China were affected by both COVID-19 and the US-China tensions. Figure 3-2 shows the distribution of the impacts of COVID-19/US-China tensions in terms of the target markets (China, the US, and other countries). Among the 9 companies that answered that their business was affected by US-China tensions, 6 were companies targeting the Chinese market and 3 were companies targeting the US market, indicating that companies targeting the Chinese and US markets were more affected by US-China tensions. On the other hand, of the 12 companies that responded that they had been affected by COVID-19, 6 were in China, 2 were in the US, and 8 were in other Asian countries and regions. Although the sample size is limited, this survey aims to clarify the impacts of COVID-19 and US-China tensions at the individual company level. It also examines companies’ perceptions of COVID-19 and US-China tensions, as well as any countermeasures taken.

**Table 3-2 Overview of surveyed companies**

Number of companies surveyed	20 companies (local subsidiaries of Japanese companies)
Type of industry	Mainly in the manufacturing industry (with some involved in the trading and food industries)
Countries where the surveyed companies are located	China (mainly Shanghai) (11), Singapore (3), India (1) Vietnam (1), Malaysia (1), Thailand (1), Philippines (1) Indonesia (1)
Roles of the surveyed companies in the supply chain	Production (9), Sales (7), Others (trading companies, etc.) (5)
Major markets of the surveyed companies	China (12), Southeast Asia (3), United States (3), Europe (2), Thailand (1), Malaysia (1), India (1), Philippines (1) Indonesia (1), Africa (1) Note: The total number of companies does not equal the number of companies because in some cases one company covers multiple markets.

Source: Questionnaire and interview responses

**Table 3-3 List of surveyed companies**

No	Company name	Type of industry <sup>6</sup>	Main Products	Main target markets	Roles in the supply chain	Location
1	Company A	Electronic Equipment	Coating machines for flat-screen TVs, cell phones, PCs and other displays (Coating machine)	China	Production	China (Shanghai)
2	Company B	Electronic Equipment	Substation equipment for infrastructure projects	Hong Kong, Macau	Sales	Hong Kong, China
3	Company C	General Machinery	Industrial embroidery machines (sewing machines)	United States, Europe	Production	China (Shanghai)
4	Company D	Electronic Equipment	Power substation and distribution equipment for factories and railroads	Malaysia	EPC <sup>7</sup>	Malaysia
5	Company E	Electronic Equipment Components	Optical film	China	Production	China (Shanghai)
6	Company F	Electronic Equipment	Power substation and distribution equipment for factories and power plants	Thailand	EPC	Thailand
7	Company G	Ferrous, nonferrous and metals	Copper wire as a source of electric wire	Southeast Asia, China	Sales	Singapore
8	Company H	Electronic Equipment	Electrical equipment such as transformers, switchboards, circuit breakers, etc.	Southeast Asia and US	Production	Singapore
9	Company I	Foodstuffs	Premix ingredients (fried flour, pancake flour, etc.)	China	Production	China (Shanghai)
10	Company J	Electronic Equipment	Control and monitoring systems for ships	Southeast Asia	Production and maintenance	Singapore
11	Company K	Electronic Equipment	Transformers and electrical equipment for industrial and social infrastructure systems	India, some products in Africa	Production	India
12	Company L	General Machinery	Large Compressors for plants (compressors)	Mainly China and others	Other (Procurement)	China (Shanghai)
13	Company M	Foodstuff	Processed foods, meat	China	Production and sales	China (Shanghai)
14	Company N	Transportation equipment parts	After-sales service parts for automobiles <sup>8</sup>	China	Sales	China (Shanghai)
15	Company O	Trading company	Industrial machinery (electronics, electrical machinery, automotive, LIB, <sup>9</sup> chemical, pharmaceutical)	China	Sales	China (Shanghai)

<sup>6</sup> Industry classification is based on JETRO (2020c).

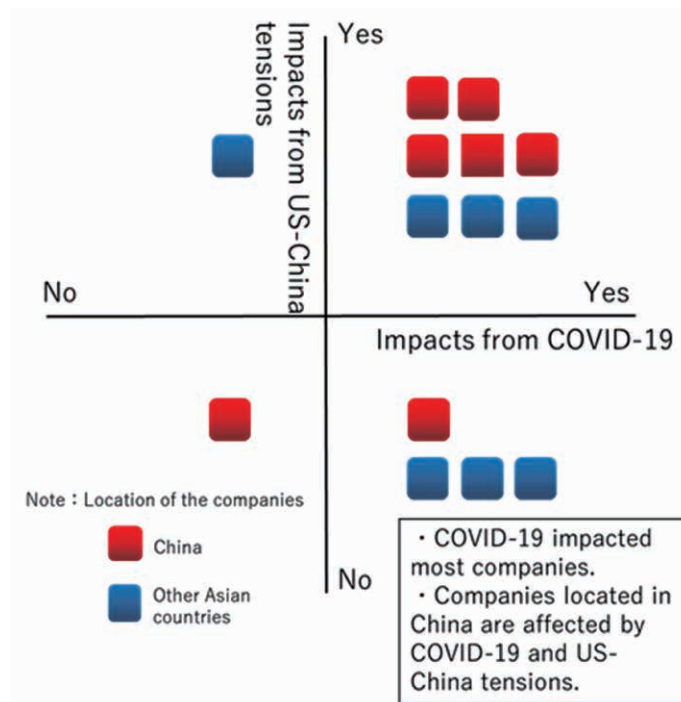
<sup>7</sup> Construction contract for a project, which includes engineering, procurement, and construction.

<sup>8</sup> Replacement parts and related services for vehicles already in use.

<sup>9</sup> Lithium-ion battery (LIB).

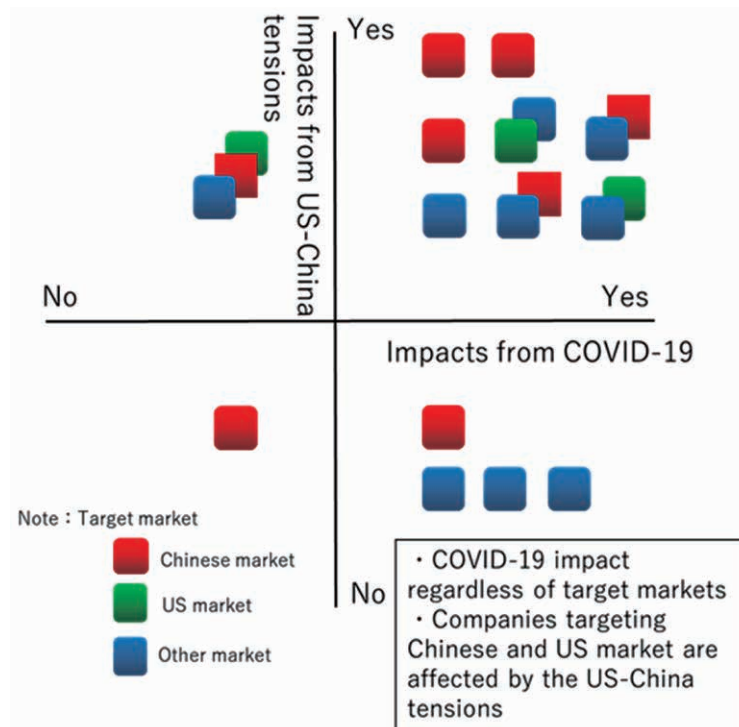
No	Company name	Type of industry <sup>6</sup>	Main Products	Main target markets	Roles in the supply chain	Location
16	Company P	General Machinery	Septic tanks (for home use)	China	Sales	China (Shanghai)
17	Company Q	Equipment Components	Parts for semiconductor manufacturing equipment and facilities	Japan, USA, China, Europe	Production	Vietnam
18	Company R	Trading company	Power development, food, real estate development, etc.	Philippines	Business investment	Philippines
19	Company S	Electronic Equipment	High-speed cameras	China	Sales	China (Shanghai)
20	Company T	Trading company	Power development, industrial parks, automobiles, railway, real estate, etc.	Indonesia	Business investment, etc.	Indonesia

Source: Questionnaire and interview responses



Source: Author, based on the questionnaire

**Figure 3-1 Impact of COVID-19 and US-China tensions on business activity (n=14) (By company location)**



Source: Author, based on the questionnaire

**Figure 3-2 Impact of COVID-19 and US-China tensions on business activity (n=14) (By target market)**

## 2. Results : Impacts of COVID-19 and US-China tensions

This section presents the findings from the corporate surveys about the impacts of COVID-19/US-China tensions on value chains, including supply chains. To ensure confidentiality, each company is referred to in the text using the following formula:

Example:

Company A (B; C)

Company A: Pseudonym of the company

B: Major products and/or services that Company A manufactures or sells

C: Location of Company A

### 2.1 COVID-19: Supply chains recovering from the temporary and limited supply-side shocks from the first half of 2020

From March to May 2020, many companies experienced disruptions in their global supply chains due to the shutdown of factories (Abe et al. 2020). In the early stages, one of the major impacts of COVID-19 was the temporary shutdown of factories and the reduced factory operating ratio, but since then, these have largely normalized.<sup>10</sup> In the first half of 2020, the factory of Company

<sup>10</sup> However, there are still some risks in the procurement of medical goods by the manufacturing industry because medical applications are a priority. For example, Company E [Optical film; Shanghai] imports rubber gloves for cleanroom use from Malaysia, but the company responded that they might not be able to procure them in the future because they are supplied preferentially for medical use.

B [Sales of substation equipment; Hong Kong, China] in Shanghai stopped operating for about a month and the supply of its products was delayed, resulting in a temporary drop in sales (supply-side factor). Company K [Transformers and electrical equipment for industrial and social infrastructure; India], with a supply chain for local production for local consumption in India, stated that supplies from vendors tended to be delayed in June and July 2020, but since October 2020, they have returned to normal.<sup>11</sup>

Another impact of COVID-19 on the supply chain is disruption in transportation. First, in terms of international transportation, Company G [Sales of copper wire; China and Southeast Asia] experienced a sharp rise in the international air freight rate from May to July 2020, making imports of parts and other products from Japan extremely costly, but supplies did not stop and the freight tariff normalized around August 2020. Company M [Processed food, meat; Shanghai] reported that maritime transportation costs are rising due to a shortage of containers.<sup>12</sup> Company L [Large compressors for plants; Shanghai] stated that their supply chain has also been affected by logistical issues, with costs rising up to four or five times. The reason for this is the shortage of air cargo space due to the global reduction of flights. There is also a shortage of container ships and shippers are competing with each other.

Domestic logistics have also normalized after temporary disruptions. However, the situation remains unpredictable depending on the changing COVID-19 situation. Company N [Automobile after-sales service parts; Shanghai] mentioned that all logistics from Beijing were temporarily halted due to the increasing number of positive cases of COVID-19 in Hebei Province and Beijing City in December 2020. Company E [Optical film; Shanghai] also mentioned that domestic transportation was suspended for two to three days in February and March 2020, but there were no major impacts and the situation has now returned to normal.

As described above, shocks to the supply of goods caused by factory shutdowns and other factors in the first half of 2020 were limited and temporary, and at the time of the survey (November 2020 to March 2021), international transportation, including marine transportation, was returning to normal, albeit with some risks.<sup>13</sup>

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<sup>11</sup> In addition to manufacturing, among the various products handled by trading company R [Power development, Food, Real estate development, etc.; Philippines], before COVID-19, the automobile industry was affected by the eruption of the Taal volcano in January 2020. Volcanic ash fell on imported automobiles, resulting in detrimental impacts for automobile businesses. In March 2020, there was a lockdown, and in April 2020, sales dropped by 99% due to delays in customs clearance at ports and other factors that resulted in imported automobiles being left at ports. Since then, the supply chain has gradually recovered and is now back to normal, with a total of 20% year-on-year growth through December 2020.

<sup>12</sup> Although problems related to the reduction in container shipping have eased for now, current services will be insufficient to keep up with recovering demand. At present, freight rates from Shanghai to the US are around \$4,000 per 40 cubic feet, 2.5 times higher than at the beginning of 2020 (Nihon Keizai Shimbun, Morning Edition, February 18, 2021).

<sup>13</sup> According to Company D [Substation and distribution facilities for factories and railroads; Malaysia], due to the lockdown in Malaysia beginning on March 18, 2020, a project for the construction of new facilities was halted. In mid-April of the same year, interstate movement was restricted and the government took measures to restrict ongoing projects according to their level of priority. Projects were allowed to resume in stages depending on whether the project was considered essential or not. Company H [Electrical equipment such as transformers, switchboards, circuit breakers, etc.; Singapore] also reported that it was not allowed to operate in Singapore unless the project was certified by the authorities, and that it had been operating normally between April and May. Around May, some production sites and other facilities were shut down. However, the sites have now resumed operations in compliance with Singapore's strict quarantine standards.



## 2.2 COVID-19: Demand-side impact varies widely by industry

Company D [Substation and distribution equipment for factories and railroads; Malaysia] expects demand to increase as the Malaysian government will secure a budget from the next fiscal year as part of its economic stimulus measures. According to Company F [Substation and distribution equipment for factories and railroads; Thailand], demand in the automobile sector decreased significantly,<sup>14</sup> while demand in infrastructure, such as power generation and railroads, is doing well even under COVID-19.<sup>15</sup> The clients of Company H [Transformers, switchboards, circuit breakers, and other electrical equipment; Singapore] are mainly public companies, including government agencies and electric power companies. Thus it is expected that there will be a certain level of demand in the medium to long term due to the construction and renewal of railway lines. Many of the customers of Company L [Large compressors for plants; Shanghai], such as oil refineries and petrochemical companies, are Chinese state-owned companies, and regardless of external factors such as COVID-19, they often proceed with new plant construction and expansion according to their long-term business plans. Company P [Septic tanks; Shanghai] is working with local distributors to supply septic tanks ordered by local governments and expects that demand for septic tanks will remain strong, as investment demand has been fixed in five-year plans.

On the other hand, for businesses that serve the private sector, the degree of impact on demand varies greatly by industry. Company G [Sales of copper wire for electric wire; Singapore] was selling copper ingots,<sup>16</sup> mainly to Indonesia. However, Indonesia was severely affected by COVID-19 and many construction projects were suspended due to the lockdown, resulting in a drop in demand for copper wire from construction companies, general contractors, and real estate developers who use electric wire. Company C [Industrial embroidery machines; Shanghai] expects that overall demand will not increase for some time, as demand for apparel is shrinking due to COVID-19.

Company I [Premix ingredients (fried flour, pancake flour, etc.); Shanghai] reported that demand for commercial-use declined,<sup>17</sup> but demand for consumers increased due to stay-home trends. Company M [Processed food; Shanghai] expects that demand for commercial-use, including bakery chains, convenience stores, and online retailers, will increase,<sup>18</sup> as many consumers will now eat at home instead of eating out due to COVID-19. Company R [Power development, food, real estate development, etc.; Philippines], which handles a wide variety of products and services, reported that the demand for automobiles, convenience store business, elevators, and

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<sup>14</sup> According to Company F [Substation and distribution equipment for factories and railroads; Thailand], orders from Japanese automotive-related customers have fallen by more than 50%, including a 20-30% decline in sales in the maintenance business compared to previous years.

<sup>15</sup> On the other hand, according to Company D [Substation and distribution equipment for factories and railroads; Malaysia], the business for Japanese private companies is in a difficult situation because big capital investment is not expected in industries such as automobiles, resins, and semiconductors, as demand is expected to decline in the next fiscal year and beyond.

<sup>16</sup> A metal that has been refined and cast into a highly pure lump of metal.

<sup>17</sup> The sales of Company I [Premix ingredients (fried flour, pancake flour, etc.); Shanghai] for commercial-use declined significantly in February/March 2020 but have recovered since the 3<sup>rd</sup> quarter of FY2020.

<sup>18</sup> According to Company M [Processed food; Shanghai], compared to the previous year, 1.5 times sales for bakery chains, 1.2 times sales for convenience stores, and 4.0 times sales for online retailers were recorded.

food (marine products<sup>19</sup>) has been severely impacted due to the lockdown.

By contrast, the demand decline in the electricity and real estate development industries was relatively limited. In the case of Company T [Power development, industrial parks, automobiles, railroads, real estate, etc.; Indonesia], business segments such as automobiles and chemicals are expected to have a net decrease compared to the same period last year.<sup>20</sup> However, their electric power development business recorded an increase compared to the same period of the previous fiscal year since sales have not been greatly affected by demand trends thanks to the business scheme (IPP).<sup>21</sup>

Company E [Optical film; Shanghai] experienced a demand increase for smartphones, tablets, and notebook computers due to the expansion of teleworking, and its business performance has reached a record high. Company J [Control and monitoring systems for ships; Singapore], whose main customers are shipping companies, expects demand to increase as container shipping companies report large profits, and demand for new shipbuilding is expected due to the growth of logistics demand. Company Q [Parts for semiconductor manufacturing equipment and facilities; Vietnam] responded that the semiconductor market is not stable but currently experiencing positive trends. Specifically, global demand rose in 2018 due to 5G, IoT (Internet of things) and DX trends, but in 2019, there was a temporary drop in sales due to US-China tensions. At the time of this research in 2021, demand was following a steadily increasing trend.

While the supply-side shock is gradually normalizing, demand-side impact continues. Therefore, at the time of this survey, it is reasonable to regard the impact of COVID-19 as a demand-side impact. The impact of COVID-19 on demand is relatively limited in the infrastructure industry (as the public sector is often its final customer), while the impact of COVID-19 on business for private companies varies greatly from industry to industry. Specifically, demand for home appliances, food products, and logistics has been increasing due to the stay-at-home trend, but demand for construction work, which is significantly affected by social distancing regulations, and demand for apparel and food services have been decreasing due to the stay-home trend.

### **2.3 COVID-19: The impact of continuing international travel restrictions on value chains should not be underestimated**

As described in Section 2.1, the supply of goods is returning to normal, but many companies are concerned about the impact of the ongoing restrictions on international passenger travel on their value chains. Company D [Substation and distribution equipment for factories and railroads; Malaysia] procures some parts from Swiss manufacturers, but the dispatch of engineers for

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<sup>19</sup> According to Company R [Power development, food products, real estate development, etc.; Philippines], demand for food products varies depending on whether it is a luxury item or a necessity item. For example, imported salmon and other luxury items experienced a significant decline while changes in curry and other necessities were relatively limited.

<sup>20</sup> According to Company T [Power development, industrial parks, automobiles, railroads, real estate, etc.; Indonesia], there was a significant drop in demand around March 2020, at the time of the first COVID-19 outbreak. After that, the overall trends have been increasing even though COVID-19 has increased and decreased in waves, resulting in multiple lockdowns in Indonesia. However, as of the time of the interview (March 2021), demand level has not returned to the pre-COVID-19 level.

<sup>21</sup> Abbreviation for Independent Power Producer. Under IPP, sales are likely to be basically fixed regardless of demand fluctuations.

quality assessment and control (from Japan to Malaysia and from Malaysia to a third country) has become difficult due to the 14-day quarantine period. Even if they can be dispatched, the company is faced with the problem of whether Company D or the client company should bear the additional cost. According to Company F [Substation and power distribution equipment for factories and railways; Thailand], supervisors working for substation equipment usually come from countries outside of Thailand, such as India and China. However, due to COVID-19, the supervisors were unable to enter Thailand. Therefore, the construction work was delayed even though Japanese expatriates in Thailand tried to replace their roles. Company J [Control and monitoring systems for ships; Singapore] mentioned that maintenance services, which account for about half of the company's sales, used to be provided on a business trip basis. However, due to the travel restrictions by COVID-19, Company J had to rely on a subcontract with a partner company in a third country.

Company O [Industrial machinery (electronics, electrical, automotives, lithium-ion batteries (LIB), chemicals, pharmaceuticals); Shanghai] was able to transport equipment but not able to dispatch the engineers to install it. For example, since the summer of 2020, an invitation letter from the Chinese government has been required for Japanese engineers to travel to China to install equipment exported from Japan. However, with the increase in cases of COVID-19 in Japan, the issuance of invitation letters has been restricted. Therefore, Company O has examined the possibility of remote installation, but this process is not yet at the practical stage due to the poor internet quality in China. Company S [High-speed cameras; Shanghai] also used to dispatch technicians from Japan to repair its products, but due to COVID-19, it has been difficult to dispatch technicians to/from China. Company T [Power development, industrial parks, automobiles, railroads, real estate, etc.; Indonesia] has a power plant construction project in Indonesia that is in the final stages of completion before commencing operations, but the process has been delayed due to travel restrictions on the entry of engineers from Japan, Korea, and China.

These phenomena are not common to all industries and processes but affect specific work processes, such as the inspection of custom-made products, installation of equipment, maintenance, and inspection, etc. Face-to-face work that requires technicians to come and go, such as maintenance and inspection, is still important. At the time of the survey, some work still cannot be replaced by IT and AI.<sup>22</sup>

**Box 3-1 Digitization/DX (Digital transformation) during COVID-19**

Even before COVID-19, it was pointed out that digitalization could increase the interdependence between manufacturing and service industries in global value chains, thereby increasing the productivity of manufacturing (Helble and Shepherd 2019). In addition, cross-border

<sup>22</sup> This depends on the IT environment in each country. For example, Company K [Transformers and electrical equipment for industrial and social infrastructure; India] responded that, with regard to the use of AI and IT, there is a trend toward digitization of performance verification for custom-made products, which used to be done in person. However, there are both positive and negative aspects, and they are still in the trial-and-error stage.

electronic commerce (EC, defined as buying and selling goods and services on the Internet) through platform businesses such as Grab and Gojek, which are mainly based in China and Southeast Asian countries, has been growing (Hemmi 2021, 126-132). With the new normal lifestyle appearing under COVID-19 and the development of platform businesses, value chain strategies with DX will be the focus as a source of growth.

According to the interviews, each company is likely to explore new strategies on DX. Company R [Power development, food products, real estate development, etc.; Philippines] has indicated that the direction of its business development in response to COVID-19 is to shift to DX and further promote e-commerce in two ways: by starting new DX projects or by incorporating DX perspectives into an existing business. Examples of this include developing ways to reduce wastage in the food business, reducing congestion and utilizing digital maps of cities in the transport business, and logistics improvement in the convenience store business. Company T [Power development, industrial parks, automobiles, railways, real estate, etc.; Indonesia] recognizes that challenges in the Indonesian context lie in the communication environment (even 3G technology is unusual in many places) and stable access to electricity. In particular, from an Environmental, Social, and Governance (ESG) perspective, the development of green electricity such as renewable energy is a key goal.

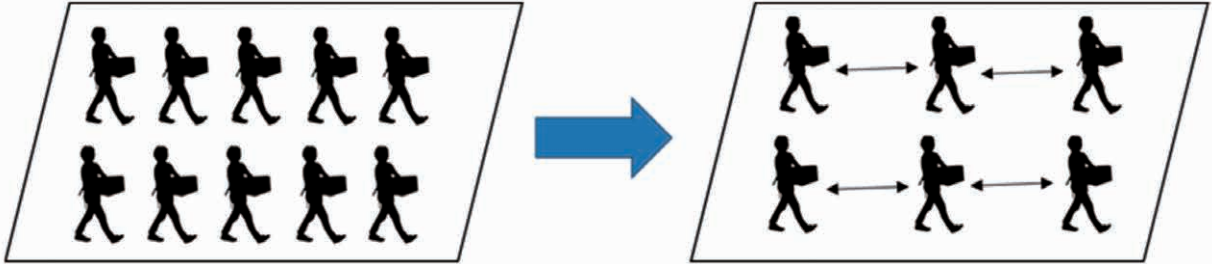
The interviews with Japanese companies suggest that full-scale implementation of digitization and DX is the urgent issue for them.

#### **2.4 COVID-19: Preventive measures for COVID-19 directly affect operational efficiency in labor-intensive processes across the value chain**

Company K [Transformers and electrical equipment for industrial and social infrastructure; India] experienced a significant drop in sales in the first half of 2020. Due to the lockdown in April 2020, all construction sites for equipment installation were shut down, as construction workers had to return home. This resulted in a significant drop in operational efficiency at the sites. The lockdown was partially lifted in June 2020, and workers gradually returned to the sites in July and August of the same year. However, the number of workers on the sites remains lower than during the pre-COVID-19 situation. Company H [Electrical equipment such as transformers, switchboards, circuit breakers, etc.; Singapore] reported that, although production itself has not been affected, there have been delays due to deferrals of onsite work such as installation, delivery, and testing. The Singapore government has implemented various regulations to prevent the spread of COVID-19, and work efficiency has dropped to 70-80% of the previous level in order to ensure safe distances. According to Company A [Display coating machine; Shanghai], delivery time is one to two months longer than before COVID-19 due to the remote work environment.

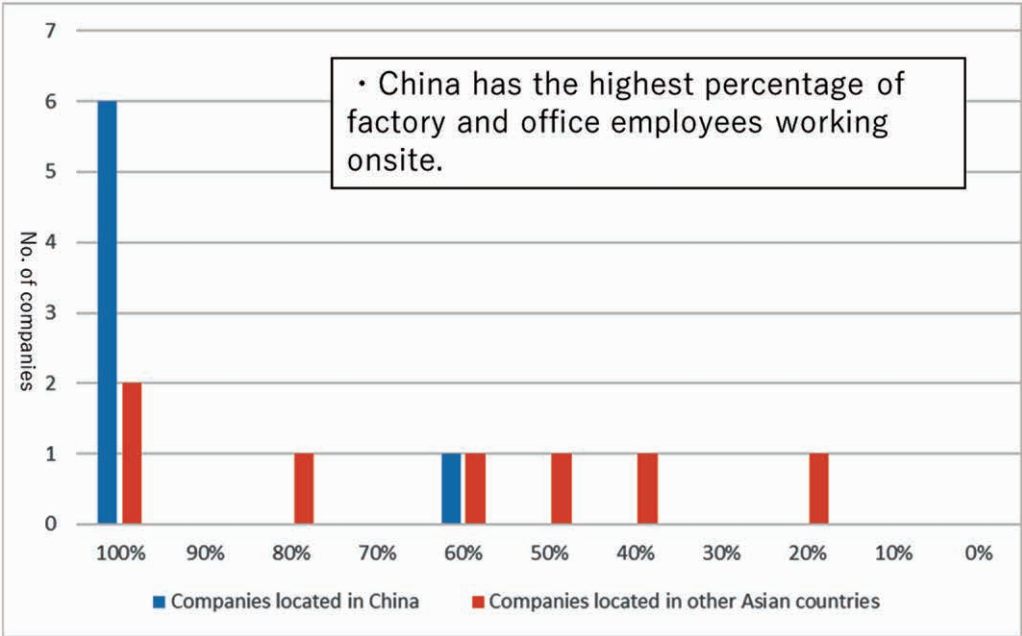
As shown in Fig. 3-3, the success or failure of COVID-19 infection control measures and the content of regulations have a direct impact over the decline in the operational efficiency rate for the labor-intensive processes of the supply chain. It was also confirmed that telework tends to delay the lead-time of the process.

As for the regulation of social distance and safe distances, the situation is different between China and other Asian countries. Figure 3-4 shows the staff attendance ratios in offices or factories. In companies located in China, almost 100% of the employees have returned to offices or factories while the attendance ratios in other Asian countries vary. In China, the impact of COVID-19 on the economy has been relatively limited under strict state-led COVID-19 countermeasures.<sup>23</sup>



Source: Author

**Figure 3-3 Decline in operational efficiency of labor-intensive processes due to COVID-19**



Source: Author, based on the questionnaire

**Figure 3-4 Employee attendance ratios for offices and factories**

<sup>23</sup> For example, according to Company I [Premix food ingredients (fried flour, pancake flour, etc.); Shanghai], if an employee becomes infected with COVID-19, the factory will be shut down, so the Business Continuity Plan (BCP) is important. In addition, when a person is tested as a falsely positive, the city authorities send a message via WeChat on the same day, requiring the employee to report his/her behavior record via smartphone.



## 2.5 US-China tensions: Rerouting of trade goods subject to trade restrictions<sup>24</sup> (increased tariffs) from China to the US

The supply routes for some parts from China to the US have drastically changed due to trade restrictions imposed as a result of US-China tensions. According to Company C [Industrial embroidery machines (sewing machines); Shanghai], as the tariffs on exports from China to the US increased following the rise in tensions, the total cost of production and trade became unreasonable. Therefore, as shown in Figure 3-5, the production site for exports to the US was transferred from Shanghai to Japan. Company H [Electrical equipment such as transformers, switchboards, circuit breakers, etc.; Singapore] was exporting some products (core equipment for substations) to the US via the Shanghai to US route. However, due to the rising tariffs caused by US-China tensions, this route has become unprofitable. As shown in Figure 3-6, Company H plans to move its production base from Shanghai to the US (planned for around March 2021). Although this next case is not related to US-China tensions, Company M [Processed food products, meat; Shanghai] mentioned that importing meat from Australia is restricted due to the political conflict between China and Australia. For this reason, Company M developed an import route from Uruguay as an alternative route.

As for the indirect impacts of the trade restrictions resulting from US-China tensions, Company N [automotive after-sales service parts; China] reported that the market environment has changed. Before COVID-19, the target of local Chinese automotive parts manufacturers (suppliers) was the US market. However, these suppliers have begun to focus on the domestic Chinese market since the price competitiveness of Chinese-made parts in the US market has disappeared due to increased tariffs. More specifically, the local Chinese suppliers did not pay much attention to

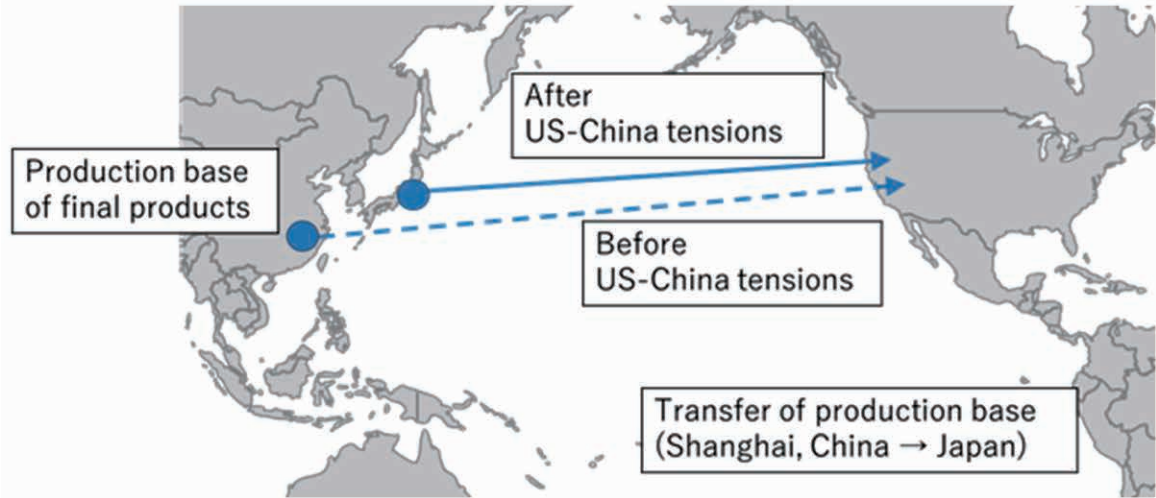
<sup>24</sup> A summary of the trade-restrictive measures is as follows.

Timing		Restriction measure from the U.S. side		Restriction measure from Chinese side	
		Outline of measures	Main target items	Outline of measures	Main target items
1st	6th July, 2018	For 818 items imported from China, an additional 25% tariff was levied on the equivalent of \$ 34 billion.	Cars, Strages like magnetic disk drives, liquid pump parts, printer parts, etc.	25% additional tariff was levied on 545 items imported from the U.S., equivalent to \$ 34 billion.	Soybeans, cars, cotton and cotton wool, etc.
2nd	23th August, 2018	An additional 25% tariff was levied on 279 items worth \$ 16 billion.	Plastics, semiconductors, railway vehicles / parts, tractors, etc.	Imposing an additional 25% tariff on 333 items worth \$ 16 billion.	Waste paper, copper scraps, aluminum scraps, lamp holders, plugs and sockets, passenger cars, etc.
3rd	24th September, 2018	An additional 10% tariff was levied on \$ 200 billion worth of 5,745 items. Further increased to 25% on May 10, 2019	Furniture, groceries, beverages, motor vehicle parts, textiles, rubber, wood, paper, etc.	An additional tariff of up to 10% was levied on \$ 60 billion worth of 5,207 items. Further increased to a maximum of 25% on June 1, 2019	Liquefied natural gas, machinery, optical equipment, chemical wood pulp, medical equipment, etc.
4th	1st September, 2019	An additional 15% tariff was levied on \$ 300 billion worth of 3,798 items. Listing 4A (3,243 items) came into effect on September 1, 2019. Listing 4B (555 items) would be activated on December 15th, 2019.	Listing 4A are smart watches, flat-screen TVs, sweaters, etc. Listing 4B are mobile phones, notebook computers, video game equipment, etc.	An additional tariff of up to 10% was levied on \$ 75 billion worth of 5078 items. List 1 (1,717 items) would be activated on September 1st 2019, and List 2 (3,361 items) would be activated on December 15th 2019.	"Listing 1 are frozen marine products, beans, crude oil, etc. Listing 2 are corn, passenger cars, motorcycles, whiskey, etc.

Source: Maie (2019)

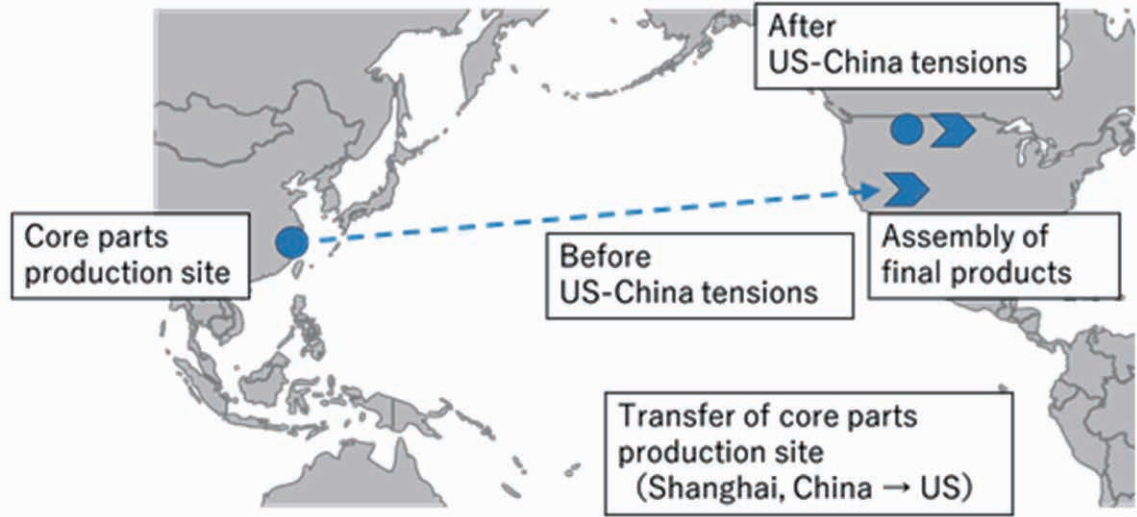
Company N's proposals for business in China, but now it is easier to do business with Chinese suppliers. On the other hand, these local suppliers could become potential competitors in the future.

In summary, to an enormous extent, the US-China tensions have resulted in a change of supply routes from China to the US for trade goods subject to trade restrictions (increased tariffs).



Source: Author, based on questionnaires and interviews

**Figure 3-5** Example of a change in the supply route bound for the US (Production base transfer from Shanghai to Japan)



Source: Author, based on questionnaires and interviews

**Figure 3-6** Another example of a change in the supply route for products bound for the US (Transfer of procurement site for core components from China to the US)

## 2.6 US-China tensions: The scope of trade goods

*Apart from high-tech industries such as semiconductors, the range of trade goods subject to trade regulations due to US-China tensions seems to have been carefully selected by considering their impact on the real economy. US-China tensions are unlikely to change the basic structure of international trade in the short term.*

As mentioned in Section 2.5, some of the supply routes of those trade goods subject to trade restrictions from China to the US<sup>25</sup> were affected by US-China tensions. Although decisions on which items are subject to trade restrictions depend on political factors, several interviewees suggested that the Chinese government took care not to cause fatal damage to its domestic economy when selecting the goods that would be subject to the trade regulations. Company L [Large compressors for plants; Shanghai] mentioned that the materials and equipment used in the manufacture of Company's L products rarely fall under the items subject to regulations.

Even if restrictions are imposed on imports and exports between the US and China, many materials/equipment can be produced domestically or procured from alternative locations. For example, a major US company that has a business relationship with Company L shifted its main production base from three plants in the US to plants in China and India for the procurement of materials/parts for cast metal to build a supply chain that is resilient to the negative impacts of US-China tensions. In addition, according to Company I [Premix ingredients (fried flour, pancake flour, etc.); Shanghai], barley<sup>26</sup> is another issue, although this is not related to US-China tensions but the ongoing trade dispute between China and Australia since 2020. However, barley can be procured within China and would not have a major impact on their business in China. This suggests that, even if trade restrictions were imposed, a serious situation, such as a disruption in the supply chain, is unlikely to occur. It also suggests that we need to think about the political aspects of US-China tensions reported in the media and the impacts on the real economy separately.

## 2.7 US-China tensions: Demand for parts/products from HUAWEI likely to have been affected by US-China tensions

One of the final buyers for products made by Company A [Display coating machine; Shanghai] is Huawei, and Company A was aware that the production volume for Huawei was falling. An additional concern is the possibility that US-China tensions may lead to a contraction of business for Apple, since the panel manufacturer for Apple is a customer of Company A. Moreover, Huawei may run out of semiconductor inventory, making it impossible to manufacture Huawei smartphones, and thereby decreasing the demand for Company A's products. Company E [Optical film; Shanghai] suggested that demand from Huawei as a final buyer was decreasing. However, it has not affected the current sales of Company E itself since overall demand for smartphones in

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<sup>25</sup> It is highly likely that the supply route from the US to China for the items subject to trade restrictions has also been affected in the same way. However, in this survey, we did not interview companies located in the US, so we cannot say this with certainty.

<sup>26</sup> In May 2020, China imposed countervailing duties on Australian barley for five years, totaling over 80 % in anti-dumping and anti-subsidy measures. On December 16 of the same year, Australia announced that it would file a complaint with the WTO. China, on the other hand, expressed regret over the Australian government's decision and indicated that it would deal with the case in accordance with the WTO dispute settlement procedure (Bloomberg 2020).

China remains strong, and demand for other smartphone manufacturers has increased.

By contrast, products made by Company S [High-speed cameras; Shanghai] were not subject to US laws at the time of the survey, but when US laws are revised in the future (US materials/parts account for less than 10% of total products), some products may be subject to the revised laws. Thus, the tightening of regulations in the future may also be a concern. Company O<sup>27</sup> [Industrial machinery (Electronics, electrical machinery, automotive, LIB, chemical, pharmaceutical); Shanghai] does not sell chips for smartphones, nor does it sell to Huawei, so the sanctions on Huawei will not affect this business directly. However, Company O stated that, based on indirectly obtained information indirectly, Huawei may be aware that it is difficult for them to do business in the smartphone business alone due to the delay in chip procurement. Huawei would then be forced to change their business by focusing on the 5G business. According to Company O, the smartphone market as a whole is strong, and even if Huawei's production declines, its decline will be covered by increased production by other companies. Therefore, the smartphone market as a whole will not be significantly affected. In fact, an EMS<sup>28</sup> company with Huawei is no longer receiving orders from Huawei but is instead receiving orders for consignment processing from other leading smartphone manufacturers such as Xiaomi.<sup>29</sup>

From the above description, demand for Huawei could be affected to a certain extent by political trends in US-China tensions.<sup>30</sup> However, even if demand from Huawei declines, the overall smartphone market is strong due to the robust demand from other smartphone manufacturers.<sup>31</sup>

## **2.8 US-China tensions: Supply chains with significantly reduced reliance on China are not realistic, at least in the short term**

Rising labor costs within China, tightening environmental controls, and safety regulations are risk factors for business in China. On the other hand, China has been relatively successful in containing COVID-19, and as a result, the Chinese market recovered from COVID-19 sooner than other major markets globally. Furthermore, the huge Chinese market itself is the reason that companies seek to do business in China. Company I [pre-mix ingredients (fried flour, pancake flour, etc.); Shanghai], while recognizing the continued rise in labor costs and the cost of complying with increasingly stringent safety<sup>32</sup> and environmental regulations<sup>33</sup> as risk factors, believes that

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<sup>27</sup> Company O delivers "mounting machines" [Automatic mounting/assembling machines for electronic components, etc.; Shanghai] and "semiconductor manufacturing equipment" to the electronic and electrical industries and to the smartphone industry. It delivers many mounting machines to a major EMS that manufactures smartphones on consignment.

<sup>28</sup> The abbreviation EMS stands for electronics manufacturing service, a service that provides contract manufacturing of electronic devices.

<sup>29</sup> Xiaomi is a general consumer electronics and smartphone manufacturer headquartered in Beijing, China.

<sup>30</sup> Company G [Sales of copper wire, the basis of electric wire; Singapore] responded that telecom-related business accounts for a large proportion of its group companies, and since Huawei is a major customer, demand trends from Huawei may affect Company G as a whole.

<sup>31</sup> According to Company R [Power development, food, real estate development, etc.; Philippines], two of the largest telecommunications companies in the Philippines rely on Huawei's technology, and Huawei has a large presence in the Philippines. The impact of US sanctions on Huawei may be marginal in the Philippines.

<sup>32</sup> According to Company I [Premix ingredients (fried flour, pancake flour, etc.); Shanghai], the inspection system for food safety regulations is considerably stricter than in Japan, and it is necessary to deal with unannounced inspections by the authorities twice a month and 24-hour factory-surveillance cameras.

<sup>33</sup> Ikebe (2020a) argues that there are risk factors associated with locating production bases in China: (1) natural disasters and infectious diseases, such as the Sichuan earthquake in 2008 or SARS (severe acute respiratory syndrome) in 2003; (2)

the volume of the food market in China remains attractive and the market will continue to grow in the future. Considering the increase in the middle-income class and changes in lifestyles (e.g., expansion of the restaurant market), the company recognizes that it is realistic to relocate its bases to inland areas in China where labor costs are lower than in coastal areas, rather than move to neighboring countries such as Vietnam.

Figure 3-7 shows the reasons for location selection for companies based in China. For companies targeting the Chinese market, the main reasons for selecting China are the "existence of a market" and "good accessibility,"<sup>34</sup> with proximity to the robust Chinese market itself being the most important reason. In addition, wages are not already the main reason for locating in China.<sup>35</sup> Figure 3-8 shows the reasons for selecting a location for companies located in Asian countries other than China. While the existence of a market is still the biggest reason, the companies mentioned various other reasons.<sup>36</sup> These contrasting results show that the main reason for locating their business in China is market proximity. China is vast, and from a market point of view, it is appropriate to consider China not as a single country but as separate regions within China. In terms of how to deal with risks, such as rising wages and stricter safety and environmental regulations, a possible solution is to change the location of production bases within China (from coastal areas to inland areas). Several companies in the interviews also expressed the need to take a cautious stance about immediately moving production bases outside of China, such as to Vietnam.<sup>37</sup>

Company T [Power development, industrial parks, automobiles, railroads, real estate, etc.; Indonesia] responded that a number of Chinese products/parts are used in their final products. Therefore, it is not realistic to build supply chains with much less dependence on China. In addition, Indonesia has strong political and economic ties with overseas Chinese populations, making it<sup>38</sup> unrealistic to do business without China.

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rising wages and social insurance costs, stricter labor-related regulations according to economic and social development; (3) inadequate protection of intellectual property rights, such as the spread of counterfeit products and technology leaks; (4) aggressive diplomacy by Chinese as a major power, including anti-dumping taxes; (5) state control of corporate activities and information control, such as the blocking of international Internet services and the management of data collected by companies; and (6) historical and territorial issues with Japan. In the interview survey, several companies cited (2) as a risk factor.

<sup>34</sup> This includes both human travel for meetings with customers, delivery inspections and maintenance, and logistics for transporting products to customers. It also relates to the level of infrastructure development in the country of entry, and thus, "good accessibility" can be interpreted as proximity (access) between the customer and the company in a broad sense that includes cost and time and is a component of market proximity.

<sup>35</sup> Company L [Large compressors for plants; Shanghai] responded that it is highly possible to maintain its production base in China rather than transferring its operations to Vietnam, Thailand, etc., where labor costs are lower than China, unless there is a catastrophic natural disaster or major political system change, affecting stable business operations. The reasons for this are that Vietnam has a limited range of items that can be procured and a weak logistics network, and Thailand's non-generic design products cost more than in China.

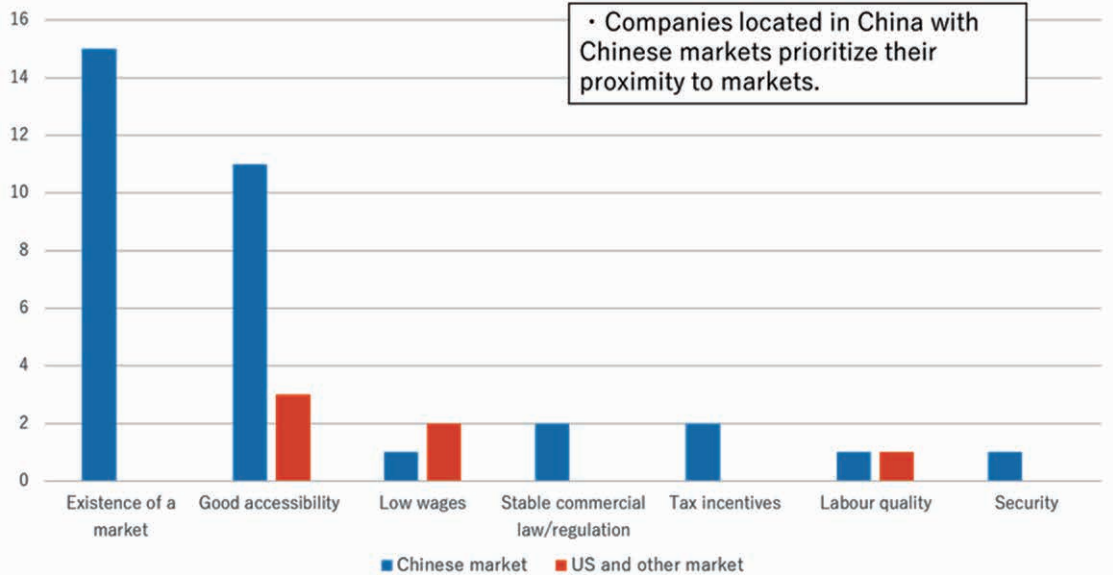
<sup>36</sup> Company H [Electrical equipment such as transformers, switchboards, circuit breakers, etc.; Singapore] stated that the presence or absence of a good business network, such as proximity to customers and relationships with suppliers, is an important point in considering the location of a production base, and that it is not simply a matter of cost.

<sup>37</sup> Although in a different context from US-China tensions, it was confirmed that there has been a move to decentralize production to Vietnam and other countries. For example, Company E [Optical film; Shanghai] has seen a significant increase in orders due to stay-home trends, and since the processing of optical film for smartphones had previously been concentrated only in Shanghai, the company has begun to diversify its production by starting production in Chinese Taipei and building a plant in Vietnam.

<sup>38</sup> In the view of Company T [Power development, industrial parks, automobiles, railroads, real estate, etc.; Indonesia], Indonesia has a strong relationship with the US (many leaders in the political and business sector are graduates of US universities), and their impression is that they have to maintain a delicate balance between the US and China.



The above suggests that, at least in the short term, the construction of supply chains with a low rate of reliance to China is not a realistic goal.<sup>39</sup>

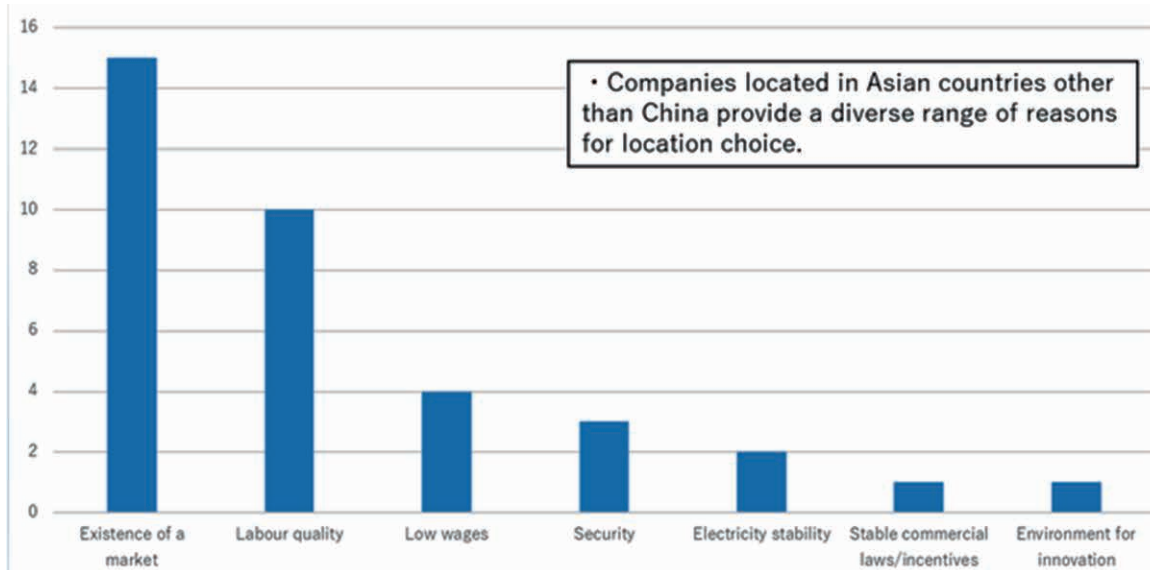


Source: Author, based on the questionnaire  
 Note: The questionnaire asks respondents to rank the reasons for site selection by prioritizing their responses from first to third. To calculate the results in the figure, based on the participant selections, first place received 3 points, second place received 2 points, and third place received 1 point.

**Figure 3-7 Reasons for selecting a location for companies located in China<sup>40</sup>**

<sup>39</sup> It can be inferred that the degree of dependence on China in the supply chain varies depending on the target market and industry (high-tech industry or not). For example, as shown in Section 2.8, the degree of dependence on China in the supply chain for the Chinese market is not expected to decrease significantly, but the Southeast Asian market and Western markets may move toward a neutral (i.e. one that is delinked from China) supply chain irrespective of US-China tensions. Ikebe (2021d) points out that the global supply chain for automobiles in ASEAN involves close collaboration between Japan, China, and the United States and that it is necessary to make the supply chain independent from US and China for key components such as rare earths, sensors, and semiconductors from the perspective of US-China tensions. In this case, the degree of dependence on China in the supply chain is expected to decrease.

<sup>40</sup> In the questionnaire, the respondents were asked to select their reasons for selecting a location in order of importance from the following list: the existence of markets, accessibility, stable electricity supply, stable water supply, location in an industrial park, preferential taxation system, low wages, quality of workers, quality of managers, stability of commercial and other systems, local partners, innovation environment, local financing, ability to remit money outside the country, lack of natural disasters, public safety, or no particular reason.

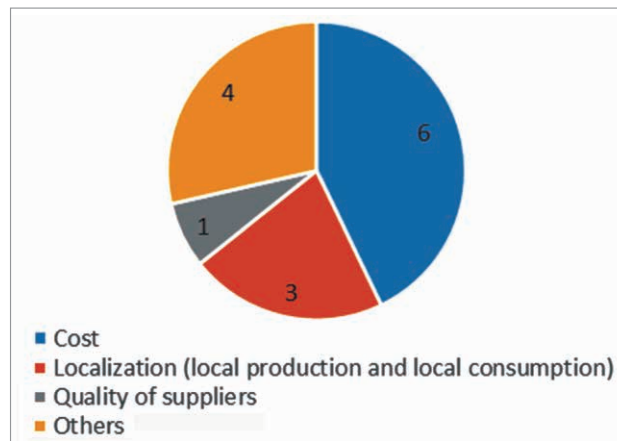


Source: Author, based on the questionnaire  
 Note is the same as Figure 3-7

**Figure 3-8 Reasons for selecting locations given by companies located in Asian countries other than China**

## 2.9 COVID-19/US-China tensions: Fundamental changes in supply chains due to COVID-19 and US-China tensions are likely to be limited

As shown in Figure 3-9, the most important challenge in the supply chain recognized by the companies was "cost," followed by "localization (local production and local consumption)." As shown in Figure 3-10, more than half of the surveyed companies have no plans to change their procurement of raw materials, parts, or services, followed by "no change at present, but considering some changes in the future."<sup>41</sup>

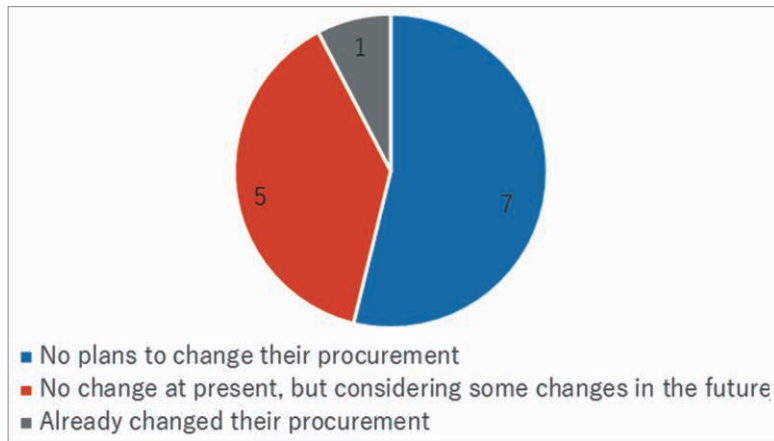


Source: Author, based on questionnaire.

**Figure 3-9 Supply chain issues faced by surveyed companies<sup>42</sup> (Number of responses)**

<sup>41</sup> The finding that only a limited number of firms are considering changes in their supply chains is consistent with JETRO (2020a, 2020b, 2020c, 2020d) and JBIC (2020).

<sup>42</sup> In the questionnaire, respondents selected from risk management/diversification, localization (local production for local consumption), cost aspects, visualization, and others. For others, some answers were written in the text and some were not.



Source: Author, based on questionnaire.

**Figure 3-10 Stance on changes in the procurement of raw materials, parts, and services (number of responses)**

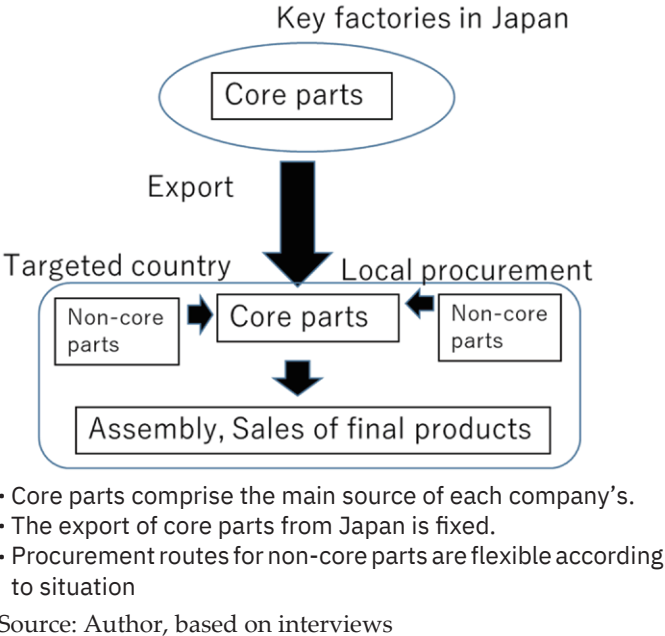
In summary, it is likely that most companies are not currently trying to make fundamental changes in their supply chains, such as diversification and localization, but some companies are considering future localization and are changing their suppliers of parts and other items, thus constituting a limited and partial change. In fact, only Company H [Electrical equipment such as transformers, switchboards, circuit breakers, etc.; Singapore] was considering the localization of its supply chain after developing a concrete plan.

This result might be due to the supply chain structure, for which two types of supply chains were identified. The first is a supply chain mainly for the manufacturing industry, where core components are manufactured in Japan and other components are procured from countries where manufacturing bases are located (Figure 3-12). The second is companies that have already built a local production for local consumption supply chain (Figure 3-13). As an example of the first pattern, Company B [sales of substation equipment: Hong Kong, China] stated that it has no plans to change its supply chain. Company J [Control and monitoring systems for ships; Singapore] responded that Company J can only manufacture core components at its main plants in Japan or Malaysia, and thus Company J manufactures its final products with other non-core components in Singapore. Company H [Electrical equipment such as transformers, switchboards, circuit breakers, etc.; Singapore] currently imports core components from Japan and assembles them in Singapore for its products such as transformers, switchboards, and circuit breakers. Company H is currently studying the feasibility of localization of its supply chain from various aspects, but the company had no plans to make any immediate changes at the time of interview. In the case of the first pattern (supply chains with fixed suppliers of core components), there are few companies that have plans to change their supply chains because the suppliers of core components are fixed. The survey revealed that companies, except for Company H, have no plans to change their supply chain.

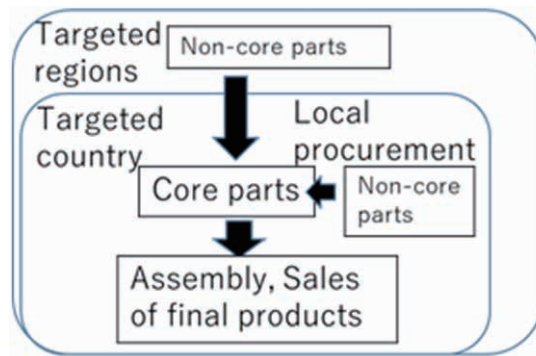
Company G [Sales of copper wire, which is the basis of electric wire; Singapore] has already built a supply chain based on the second pattern of local production for local consumption. The company has its main plant in Indonesia and ships the products manufactured there to plants in

targeted Asian countries, which in turn sell them to customers. The reason for the local production for local consumption supply chain is that relatively high costs in Japan including labor costs make it difficult to compete without local procurement. In addition, the local production for local consumption supply chain had not been developed overnight, but rather, it was built over a span of ten years by building relationships with local partners, and had proved to be challenging to start up. Company K [Transformers and electrical equipment for industrial and social infrastructure; India] also has a history of building a supply chain for local production for local consumption through many trial-and-error processes. Company K, as a local production for local consumption supply chain, has been procuring components from vendors in India in the midst of COVID-19, but its local production for local consumption supply chain was built much before COVID-19. Therefore, the companies that have established locally produced and locally consumed supply chains took the time to build their supply chains even before COVID-19 or US-China tensions, and no companies interviewed had changed their locally produced or locally consumed supply chains in response to COVID-19 or US-China tensions.

From the above, it can be seen that COVID-19 and US-China tensions have not caused drastic changes in the supply chain but limited and partial changes. Some of the interviewed companies were considering localization. However, it was suggested that the construction of a supply chain for local production for local consumption may take a longer time. Changes in supply chains, even if they are minor changes, are more likely to be made over the mid to long-term rather than immediately.



**Figure 3-12 Supply Chain with Fixed Core Components**



- Local suppliers should have a technical expertise enough to manufacture the core parts.
- Need to allow sufficient time to build up local production for a local consumption supply chain.

Source: Author, based on interviews

**Figure 3-13 Supply chain for local production for local consumption**

**Box 3-2 Redefining local production for local consumption: Local production for local consumption supply chains at the regional level**

COVID-19 might be an opportunity for global manufacturers with global supply chains to rethink their global supply chains that they have built to date and move more toward "local production for local consumption" (Roland Berger 2020). The media often advocate for "local production for local consumption." Local production for local consumption in the supply chain means the construction of a supply chain within a geographically limited area, such as production and sales within the country where the company is operating (JETRO 2020e). From the perspective of regional trade frameworks such as the Regional Comprehensive Economic Partnership (RCEP), we should also focus on local production for local consumption at the "regional" level, which is an intermediate area between conventional global supply chains and local supply chains for local production intended for local consumption.



**2.10 Summary of the interview survey**

Table 3-4 shows the relationship between the impacts extracted from the interview survey and the companies that experienced these impacts. The impacts of COVID-19 can be seen across multiple industries. Many companies mentioned the impact as the normalization of temporarily disrupted supply networks as well as increases or decreases in demand. It is also noteworthy that several of the companies noted the impact of restrictions on travel, and companies involved in construction



work mentioned the under capacity of labor-intensive processes.

The US-China tensions can be interpreted as having localized impacts on specific companies rather than impacts across all of the companies. Only one company is considering a drastic change to local production and local consumption in its supply chain.

**Table 3-4 Impacts for companies affected by COVID-19/US-China tensions<sup>43</sup>**

Impacts/affected companies	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	
COVID-19	2.1 Normalization of temporarily disrupted supply networks	■	■		■	■		■		■		■	■	■		■		■			
	2.2 Impact on demand (increase or decrease)			■	■	■	■	■		■	■		■					■	■		■
	2.3 Travel restrictions				■		■				■	■				■		■		■	■
	2.4 Under capacity of labor-intensive processes								■			■									
US-China tensions	2.5 Change of supply route from China to US			■					■												
	2.6 Minor impacts on the real economy due to trade restrictions	N.A.																			
	2.7 Demand for Huawei products	■				■		■													■
	2.8 Unrealistic view of supply chains with low rate of reliance on China	■			-		-	-	-	■	-	-	■					-	-		-
COVID-19 / US-China tensions	2.9 Fundamental change of supply chain							■													

Source: Author, based on interviews

The findings from the interview survey can be summarized as follows:

1. The impact of COVID-19 on the value chain can be interpreted as the impact on demand,

<sup>43</sup> For Point 2.6, “Minor impacts on the real economy due to trade restrictions” is indicated as N.A. because it is the perception of each company and is not an item indicating a specific impact. As for Point 2.8, the “Unrealistic view of supply chains with a low rate of reliance on China,” only companies located in China were interviewed, so companies locating outside of China are not included and are indicated with a (-).

which varies from industry to industry and country to country.

2. Another impact of COVID-19 on the value chain is the delay in some processes of the value chain due to under capacity in labor-intensive processes caused by social distance regulations, delays in delivery and inspections due to restrictions on international travel for engineers, and increased lead times in some processes as a result of teleworking. These impacts tend to reduce the speed of some processes in the value chain.
3. The impacts of US-China tensions on the value chain are as follows: the supply route from China to the US for items subject to trade restrictions has changed, and the sanctions against Huawei had a negative impact on demand in the high-tech industry (a decline in demand for parts and equipment for Huawei products). By contrast, there was no noticeable impact other than the above. Regardless of the sanctions against Huawei, overall demand for smartphones is very sound, and thus falling demand for Huawei was replaced by demand from other smartphone manufacturers due to strong growth in demand for Chinese smartphones. Therefore, it is likely that the impact from US-China tensions on the value chain has been partial and limited.
4. Some companies are considering changes in their value chains (including supply chains), but they are taking the time to examine the feasibility rather than making immediate changes. Companies seem to have a solid value chain strategy. At the timing of this interview survey, COVID-19 and US-China tensions have not changed the value chain strategies of these companies. The value chain strategies of the interviewed companies will be discussed in the next section.

Finally, the comparison between our findings with the results from previous surveys can be summarized as follows. First, the various negative shocks on the supply chain in the early stages of COVID-19, revealed by Abe et al. (2020), were almost recovered. Second, our finding that only a limited number of companies are considering changes to their supply chains is consistent with the findings of JETRO (2020a; 2020b; 2020c; 2020d) and JBIC (2020). Third, in contrast to JETRO (2020a), JETRO (2020b), JETRO (2020c), and JBIC (2020), no clear direction of change in supply chains was identified, including local production and local consumption. This may be due to the small sample size of this survey.

### **3. Discussion: Some perspectives for GVC in the post-COVID-19 era**

#### **3.1 Types of value chain strategies<sup>44</sup> and their robustness**

Although the sample size in our survey was small, the findings suggest that each company has a clear understanding of its own strengths as well as the sources of its profits and growth. Figure 3-14 shows how these elements can be classified in terms of the value chains. In some cases, a company may combine several of these five types of strategies.

The first type of value chain strategy is based around Japanese core technology. The core components of the products themselves are the source of the company's competitiveness. The

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<sup>44</sup> In this chapter, the value chain strategy is defined as a strategy that includes supply chain strategies and is based on where in the value chain the source of medium- to long-term profits for each company is generated.

core components are manufactured at the company's key plants in Japan and exported to the target country, assembled together with non-core components procured in the targeted country or region, and then delivered and sold as final products. In this way, the backbone of the supply chain is the import of core components from Japan, and this part of the supply chain is unchangeable. Therefore, even if supply chains are somehow affected by COVID-19 and/or US-China tensions, the basic framework of the supply chain will remain unchanged, and only partial changes might be made, such as adjustments to the suppliers of non-core components. Furthermore, from the perspective of procurement costs of non-core parts and after-sales service, countries and regions close to the sales market are likely to be selected as locations for production and sales bases.

The second type utilizes the proximity of the business to customers. This type is mainly B to B businesses that have long-term relationships with specific customers,<sup>45</sup> such as Japanese companies in the targeted country who prioritize customer proximity. It is a customer-driven value chain that prioritizes meeting customer demands<sup>46</sup> quickly and builds production systems and supply chains to meet those demands. It is unlikely that a company would be able to withdraw from a targeted country easily, since constant follow-up with customer companies for after-sales service and information sharing on new demand is highly important. From the perspective of proximity to customers, production and sales bases will be located in the targeted countries and regions.

The third type of value chain strategy consists of specific infrastructure-related business. The products of these types of businesses are custom-made products for specific infrastructure such as railways, power generation, and substations (e.g., substation facilities for commuter lines in the metropolitan area of Country A). The key to this type is the technical capacity to manufacture highly technical products that meet the functions and specifications required for the specific infrastructure and the long life cycle of the business, including maintenance. The location of production and sales bases is likely to be selected in targeted countries and regions where markets exist, considering the long-timespan of maintenance work.

The fourth type focuses on the goal of cost minimization. The ability to supply products at a lower cost is important to a company's competitiveness, and from the perspective of cost minimization, many supply chains are designed for local production for local consumption. In this type, it takes time to build a supply chain for local production for local consumption, including the need to building relationships with local suppliers of a certain technical quality and training local employees. The location of production and sales bases should be in targeted countries or regions where markets exist, as the supply chain is local production for local consumption.

The fifth type of value chain strategy seeks to optimize production sites, for which the optimal




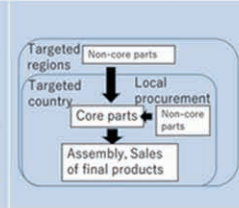

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<sup>45</sup> As one of its main businesses, Company D [Substation/distribution equipment for factories and railroads; Malaysia] is engaged in providing electrical equipment for Japanese companies, such as substation equipment for factories. Company F [Substation/distribution equipment for factories and railroads; Thailand] is also engaged in comprehensive EPC (engineering, procurement, and construction) for Japanese companies in Thailand, including electrical work, services and engineering (EPC) for Japanese companies in Thailand.

<sup>46</sup> Company E [Optical film; Shanghai] has not been able to keep up with production due to increased demand, but they have responded that they will not refuse orders and will respond to customer orders as much as possible.

production site is selected from a global perspective for intermediate goods in the manufacturing industry. Materials and parts are procured from outside the targeted country while products are manufactured in the targeted country and shipped outside of the targeted country. The targeted country to be the production base is selected from a medium- to long-term perspective, and cost is not necessarily the most important factor. Several other factors are involved in the selection of a country as the production base,<sup>47</sup> such as the stability of the business environment over the medium to long term, the safety and the diligence of the people of the country, and the quality of human resources and growth potential. In selecting production sites, each company weights the factors and selects sites from a global perspective, so the sites are not necessarily located in countries or regions where markets exist.

These types of value chain strategies may not be explicitly recognized by the companies themselves, and it would have been difficult to extract this information directly through questionnaire surveys. Since we conducted interview surveys, it was possible to interview each company at length and compare it with other companies. Off the back of our interview surveys, we have a strong impression that each of the company’s behaviors is underpinned by its corporate strategy, which is supported by the otherwise hidden corporate constitution of each company, such as its history and corporate culture. These corporate strategies have been refined and formed over a long period of time and are robust enough not to be affected by minor environmental changes. In fact, COVID-19 and US-China tensions have not caused any companies to fundamentally rethink their

Japanese core technology	Proximity to business customer	Specific-infrastructure related business	Cost minimization	Production site optimization
				
<ul style="list-style-type: none"> <li>- Core parts produces in Japan are the source of company competitiveness</li> <li>- Assembling the final products for sales in targeted country</li> </ul>	<ul style="list-style-type: none"> <li>- B to B business</li> <li>- Proximity to the customer is important</li> <li>- Responding to customer needs (increased demand)</li> </ul>	<ul style="list-style-type: none"> <li>- Custom-made products for specific infrastructure</li> <li>- Life-cycle business foreseeing the maintenance business</li> </ul>	<ul style="list-style-type: none"> <li>- Cheaper costs are the source of company competitiveness</li> <li>- Local production for local consumption-style supply takes time to build</li> </ul>	<ul style="list-style-type: none"> <li>- Intermediate goods for manufacturing industry</li> <li>- Selecting the optimized location from global perspectives</li> <li>- Not only cost but also security, character of people etc</li> </ul>

Source: Author

**Figure 3-14 Classification of company value chain strategies**

<sup>47</sup> For example, Company Q [Parts for semiconductor manufacturing equipment and facilities; Vietnam] cited safety as the first reason for selecting a location for its production base, the friendliness of the two countries (Japan and Vietnam) as the second, and infrastructure and labor costs as the last.

corporate strategies. In other words, COVID-19 and US-China tensions have not had sufficient impact to fundamentally change corporate value chain strategies at the time of the interviews.

This suggests that, when looking at the form that post-COVID-19 value chains might take, it is helpful to analyze the current value chains, the supply chains, and sales of each company operating in the target countries and regions, and to determine the type of value chain strategies that underlie them.

### **3.2 GVC areas impacted by COVID-19 and US-China tensions**

We now turn to examine what aspects of the value chain have been most impacted by COVID-19 and/or US-China tensions, according to our interview surveys. Regarding COVID-19, the first impact is the effect on demand. The extent of the impact depends on changes in the demand patterns of industries, products, and companies in their operating countries in accordance with the COVID-19 situation and the strictness of measures to prevent infections. Therefore, it is necessary to analyze the scale of the impacts on demand and how long these impacts will continue.

Another impact on the value chain by COVID-19 has been the delay of some processes due to the under capacity of labor-intensive processes. This has been caused by social distancing measures, with the strictness of restrictions in the country determining the impact. Another cause of delays is international travel restrictions on technicians, for which the degree and duration of the impact depend on the global COVID-19 situation and the timing of recovery from it. These impacts are likely to disappear with the accelerations of vaccinations and the normalization of economic and social activities, and thus can be regarded as short-term impacts.

With regard to supply chains, according to the survey, no company changed its supply chains immediately or fundamentally in response to COVID-19,<sup>48</sup> and the pandemic is unlikely to cause fundamental changes in supply chains in the short term. On the other hand, COVID-19 and US-China tensions may be factors in gradual changes in the supply chain. Urata (2020) points out that "companies will implement supply chain diversification and make the supply chains more resilient only when the benefits outweigh the costs," and companies interested in changing their supply chains are likely to currently consider the feasibility of doing so, including when to best implement such changes.

The impacts of US-China tensions are twofold. The first is related to trade goods produced in China and exported to the US market that have been subjected to trade restrictions. According to the interviewees, they were forced to drastically review their supply routes for goods subject to restrictions, taking measures such as relocating their production sites from China to the US or third countries. Several comments from the interviewees indicated a perception that the Chinese government seemed to be taking care not to cause fatal damage to their own domestic industries

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<sup>48</sup> In the early, second, and third waves of COVID-19, several cases were confirmed in which companies that experienced partial disruptions in their supply chains decentralized procurement routes of some parts from the perspective of BCP. It is appropriate to interpret this change as a partial decentralization for risk diversification rather than a drastic change in the structure of the supply chain.



when introducing trade restrictions. For this reason, it is unlikely that the trade restrictions themselves will have a fundamental impact on the international trade structure. However, it is necessary to continue to monitor the situation closely.

The second impact from US-China tensions is the high-tech industry, epitomized by the sanctions on Huawei. Some interviewees mentioned concerns about a drop in demand for Huawei products. Inomata (2019, pp. 97) points out that underlying US-China tensions is competition for dominance in developing the technology for the most advanced intellectual capital related to 5G and the battle over which will hold the highest value-added zone on the smile curve.<sup>49</sup> This point is consistent to some extent with the results of the interview survey, which confirmed the impact of the Huawei sanctions on the real business. Among high-tech products like semiconductors, 5G, and smartphones, high-value-added processes such as research and development, branding, design, marketing, and after-sales service might be a focus.

The conventional pre-COVID-19 value chain is based on the global supply chain, which prioritizes economic optimization at the global level (Ikebe 2021c). In the post-COVID-19 era, however, international politics, including the value chain strategies of the US and Chinese governments, may also greatly influence the value chain of each company. Therefore, it is necessary to bear in mind that the impacts identified in this study may only apply at the time of the interview survey and that circumstances may change based on future trends<sup>50</sup> in the value chain strategies of the US and Chinese governments.

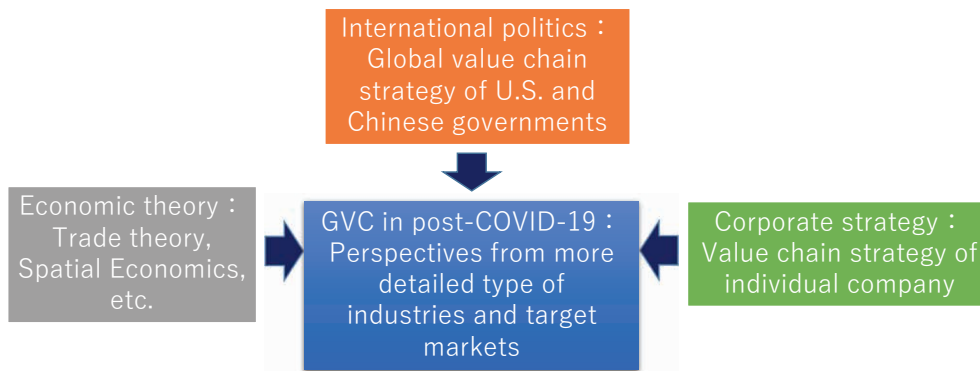
Figure 3-15 proposes a framework for examining value chains in the post COVID-19 era. It is necessary to take a balanced look at the following three perspectives: "international politics," as manifested in the value chain strategies of the US and Chinese governments; "economic theory," as represented by trade theory and spatial economics, etc.; and "corporate strategy," as embodied in value chain strategies of individual companies, as described in Section 3.1. In addition, it is important to look at both of the axes for examining value chains: the "industries" axis, which has more detailed industrial segments than the conventional industry classification, and the "target markets" axis, which refers to whether the market is the US market, the Chinese market, or other markets. These will be key tools for interpreting increasingly complex global value chains<sup>51</sup>

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<sup>49</sup> The relationship between the two axes of production, division of labor and value allocation, which is how the production process is carved up (horizontal axis) and value added, and which parts are traded and at what price (vertical axis) (Inomata 2019, 21).

<sup>50</sup> At the timing of writing this report, the US administration of President Biden was collaborating with allies and allied regions in creating a supply chain for critical components, mainly semiconductors, batteries for EVs, rare earths, and medical products. With Japan and other Asian countries and regions in mind, the US aims to develop a system for stable procurement and break away from a supply chain that depends on China due to political tensions (Nihon Keizai Shimbun Morning Edition, February 24, 2021). The Chinese government, on the other hand, is also increasing its R&D spending for the period 2021-2025 in the priority areas of next-generation AI, quantum information, semiconductors, brain science, genetics, clinical medicine, and space, while aiming for a safer and more reliable supply chain that can cope with US sanctions (Nihon Keizai Shimbun, March 6, 2021).

<sup>51</sup> Ikebe (2021d) says that the automobile industry has already almost established a system where finished vehicles are assembled at the place of consumption, and that local production and local consumption of the automobile industry in the US and Chinese markets may be feasible. By contrast, 60-70% of the global production of ICT-related equipment is concentrated in East Asia, and he points out that a local production for local consumption supply chain in the US is impossible, even for the US market. In this way, the two axes of industry and market as a framework for GVC in post-COVID-19 may have some validity.



Source: Author

**Figure 3-15 A proposed framework for the post COVID-19 value chain.**

As we have seen, the impacts of COVID-19 and US-China tensions on the value chain that have been recognized at the time of this survey are, for COVID-19, demand and delays in some processes in the short term, and for US-China tensions, trade restrictions on goods and high-tech industries in the medium to long term. However, it is necessary to monitor the progress on the value chain strategies of the US and Chinese governments, as these may affect the trends identified in this survey.

### 3.3 Implications for JICA's operations

Based on the findings of this study, several implications for JICA's operation can be discussed in terms of sectors, operational strategies for individual countries, and individual projects. First, at the sectoral level, the impact of COVID-19 and US-China tensions is partial and limited, and it is unlikely to change the basic structure of the value chain in Asia. JICA's various projects to strengthen intra- and extra-regional connectivity (infrastructure, institutions, and people) (JICA, 2021a) remain essential. Transportation of delicate precision machinery requires flat and high-quality road pavement with few bumps or potholes. It also needs regular maintenance and management since shaking and shocks can be fatal<sup>52</sup> to delicate precision equipment. This is in line with the development of quality infrastructure (JICA 2021a), which emphasizes the "quality of infrastructure." Regarding the coverage of infrastructure, some companies mentioned the inadequacy of the road network in the last mile of the logistics network from the factory to the delivery destination as a challenge.<sup>53</sup> In addition to trunk roads, the development of feeder roads is also necessary for stable business.

Second is the improvement of the business environment. JICA's policy of supporting the private

<sup>52</sup> For example, according to Company O [Industrial machinery (Electronics, electrical machinery, automotive, LIB, chemicals, pharmaceuticals); China (Shanghai)], feeder road conditions in China are poor, making it very difficult to transport precision equipment. In addition to the poor road conditions, air suspension vehicles, which are common for trucks of Japanese transportation companies, are not common in Chinese transportation companies. When requesting transportation, it is necessary to specify an air suspension vehicle, but the number of such vehicles is limited, making the transportation of precision equipment difficult. Therefore, wherever possible, ships are used to reduce the distance of land transportation.

<sup>53</sup> Company A [Display coating machine; Shanghai] said that one of the issues in their supply chain is that they use water transportation due to the lack of infrastructure, especially inland areas and last-mile roads. In the case of inland customers, it may take up to 40 days in total to deliver the products via coastal shipping on the Yangtze River to the final destination by land.

sector is to emphasize the development of policies and systems for private sector development (JICA, 2021b). In accordance with this goal, the interview survey confirmed that some companies<sup>54</sup> emphasize industrial policies and investment promotion measures, such as special export zones. Therefore, the need for technical support for industrial policies, including the development of investment and business environment, remains important. In addition, with several respondents<sup>55</sup> expressing concern about the transparency of the operation of laws and regulations when considering where to set up a business, another important area of support is to increase the stability and transparency of laws and regulations. This can be done through the capacity building of civil servants who administer the laws and regulations.

The third is to support the development of industrial human resources. As shown in Figure 3-8, the quality of human resources was the second most important reason for selecting production locations for the interviewed companies located in Asian countries other than China. This suggests a need to raise the skills of industrial human resources. In addition, it should be noted that some companies are looking at the potential of industrial human resources from a long-term perspective (rather than a short-term perspective or a single point) and are considering the extent to which the level of human resources can grow in the future.<sup>56</sup>

Next, from the perspective of operational strategies for each country (especially in Southeast Asia), it is necessary to examine the potential of the manufacturing industry in industrial strategies with an economic relationship with China. In reality, not all countries in Southeast Asia are equally capable of developing manufacturing-oriented industrial policies. Although this study did not identify any cases of companies that are actively considering transferring production sites from China to Southeast Asia, as shown in Chapter 1, Vietnam is often considered a candidate as a destination for transferring labor-intensive industries from China due to its strong GVC linkages with China (e.g., Ikebe 2021e). The key is how to evaluate the potential of manufacturing industry development<sup>57</sup> in South Asian countries other than Vietnam and how to weigh up the manufacturing industry development as part of industrial policy as a whole. It will also be necessary to consider realistic strategies for promoting industrial and employment in countries where it is difficult to find sufficient potential in the manufacturing sector. It is still debatable as to whether it is possible to bypass the manufacturing sector and jump straight to the service sector.

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<sup>54</sup> Company Q [Parts for semiconductor manufacturing equipment and facilities; Vietnam] responded that it is benefiting from the preferential policies of the Vietnamese government by operating in the industrial park as an EPE (export processing enterprise) exempt from customs duties and VAT.

<sup>55</sup> Company H [Electrical equipment such as transformers, switchboards, circuit breakers, etc.; Singapore] responded that, although Vietnam and Myanmar are promising markets, they are not considering entering the market in the short-term due to uncertain business practices and time-consuming procedures. Company Q [Parts for semiconductor manufacturing equipment and facilities; Vietnam] also cited the unclear nature of legal reviews and judgments by officials in charge as a risk factor.

<sup>56</sup> Company Q [Parts for semiconductor manufacturing equipment and facilities; Vietnam] entered the Vietnamese market in the early 2000s. The company believes that the technical skills of Vietnamese engineers will improve, and the base of Vietnamese engineers will expand over the medium- to long-term time horizon. Although labor costs in Vietnam are on an upward trend, they are still relatively inexpensive. Given the diligent nature of the Vietnamese people, the company believes that upstream processes such as development and design can be handled in Vietnam in the future, and it will soon establish an R&D center in Vietnam.

<sup>57</sup> For example, Indonesia (Sato 2018), which is pursuing industrialization through aggressive infrastructure investment, could follow in Vietnam's footsteps, or will Vietnam be the sole winner in Southeast Asia's manufacturing sector?

Finally, in formulating specific projects such as infrastructure, special economic zone development, and industrial policy support, it is necessary to have a detailed understanding of the users of infrastructure, special economic zones, and industrial policy at the specific industry level.<sup>58</sup> This is because value chains in the post-COVID-19 era are likely to differ according to the industry. More specifically, it is necessary to have as much knowledge as possible of the industries and candidate groups of companies as potential users of projects. An analysis of the relationships between the current value chain and the potential impacts is also recommended, as described in Section 3.2 (e.g., trade-restricted items or high-tech industries), and the degree of the impact (i.e., whether it would have sufficient impact to change the value chain strategy of the company). This may contribute to formulating more effective projects formulation.

### **3.4 Limitations of this study and future research topics**

Through in-depth interviews with 20 companies, this survey captured the impacts of changes in the international environment, such as COVID-19 and US-China tensions, on the value chain in the Asian region. There are limitations to the survey results, and it is necessary to interpret the results cautiously to avoid an overly broad interpretation of the results. First, due to the limited sample size, it is appropriate to view the findings as a snapshot of the value chain on the ground in the Asian region rather than as a general view. Second, the interviewees were mainly from the manufacturing industry, and within that, the focus was on those companies involved in electrical and electronic equipment, devices, and components, so the survey did not sufficiently cover the trends in other industries. For example, this interview survey did not identify any companies that are actively transferring production from China to Vietnam in response to US-China tensions. However, Ikebe (2021b) points out that labor-intensive industries such as industrial clothing, footwear, furniture, and the assembly of information and communication technology (ICT)-related products are likely to be transferred from China to Vietnam. This survey did not capture such trends. Third, since the survey covered only Japanese companies, it is important to interpret the results within the scope of Japanese company-specific corporate culture (e.g., the authority of HQ is stronger than that of the local subsidiary, and the head of the local subsidiary is assigned from HQ). Fourth, the survey covers only local subsidiaries. It is possible that the survey results have not fully covered the HQ perspectives and that HQs have different points of view on the value chain.

By contrast, an advantage of utilizing the interview survey method is that it allows us to collect each company's views at a deeper level. As a result, the survey gives us some fresh perspectives on GVCs. Thus, two main issues for future research are articulated. First, it would be more effective to conduct an interview-based survey with a greater number of participants. Our results suggest that developing an understanding of the types of value chain strategies can contribute an important perspective. Those strategies cannot easily be perceived from public information or questionnaire surveys since each company does not necessarily recognize them explicitly. An interview-based survey is suitable for examining them. Given that five types were extracted from

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<sup>58</sup> For example, even within the same manufacturing industry, there is a high probability that the value chains of high-tech and middle-tech industries will differ to a considerable extent.

the sample of 20 companies, new types of value chains may be extracted by using a larger sample. Second, expanding the interview targets by looking at industries, non-Japanese companies, and headquarters as well as local subsidiaries may enable researchers to compare the results and may therefore be useful. Further research based on the results of the survey with a broader range of participants may lead to a more accurate understanding of the value chain in volatility, uncertainty, complexity, and ambiguity (VUCA)<sup>59</sup> when combined with the aggregated questionnaire survey.

**Box 3-3 Distinctive characteristics of Japanese companies:  
For a better interpretation of the survey results**

As shown in Section 3.4, this survey targets Japanese companies. JETRO (2020d) categorizes the differences between Western companies and Japanese companies in terms of regional headquarters. The report also points out that the regional headquarters of Western companies have the authority to review the supply chain, while the overall headquarters of Japanese companies have this authority. Although it is not possible to make a generalization of various types of Japanese companies, it is useful to keep in mind the general characteristics of Japanese companies. This may make it possible to recognize that survey results with Japanese companies do not provide a global picture of GVCs. It may also lead to a more appropriate understanding of the survey results.

**4. Conclusions**

In this chapter, the survey results on the impact of COVID-19 and US-China tensions on GVCs are presented through in-depth interviews with 20 local subsidiaries of Japanese companies that have value chains in the Asian region.

The impacts of COVID-19 on the value chain comprise the demand-side impacts and the slowdown of some processes in the value chain. The impacts of US-China tensions on the value chain are partial, with some supply route changes in the supply chain for goods subject to trade restrictions and decreased demand in the high-tech industry. At the time of this survey, the impacts are limited and not likely to fundamentally change the value chain strategies of each company, including the supply chain.

When considering value chains in the post-COVID-19 situation, three well-balanced perspectives are useful; "international politics," as manifested in the value chain strategies of the US and Chinese governments; "economic theory," as represented by trade theory and spatial economics, and "corporate strategy," as embodied by individual companies. Both the "industry" axis and the "market" axis are key tools for examining increasingly complex value chains.

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<sup>59</sup> The term VUCA is derived from four key words, volatility, uncertainty, complexity, and ambiguity. It refers to the state in which all environments are rapidly changing and unpredictable.



Since this survey is based on a limited sample size, it is appropriate to view the results not as a general view but as a snapshot of the value chain on the ground in the Asian region. The result of surveys, combined with other surveys such as macro-corporate surveys, is expected to lead to a more accurate understanding of the value chain in the post-COVID-19 era.

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# Epilogue

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During the first wave of COVID-19, JICA became aware that its international cooperation activities would be significantly affected by the pandemic. Several efforts were initiated to support developing countries with vulnerabilities. Around this time, the Sadako Ogata Institute for Peace and Development created several fora to explore key questions concerning the world during and post-COVID-19. The topics included international order and architecture, global trends in political economy, ways of combating diseases, and the strengthening of health systems. Exchanges with prominent thinkers revealed that 2020 was exceptional, not only as the year in which the COVID-19 pandemic spread but also as the year when ongoing structural challenges surfaced and were then reinforced. One such structural challenge was the US-China tensions over global value chains, or GVCs.

This research is one of the products from this series of fora. We took COVID-19 as an external shock and the US-China tensions over GVC as an ongoing structural change. The geographical focus of this study is East and Southeast Asia, applying a Japanese lens to identifying elements that will persist into the post-COVID-19 world. We approached GVCs first from a theoretical perspective to understand the underlying mechanisms, and then secondly, we examined the situation using macro and microdata. We based our analysis on the hypotheses developed around the impacts of COVID-19 and US-China tensions.

What can we say about the hypotheses initially presented in the prologue?

As a result of COVID-19,

- 1) demand will decrease due to lockdowns or declining incomes in target markets ⇒ Demand decreases may continue, although there are also cases of demand increase, such as goods and services consumed at home;
- 2) for labor-intensive processes located in clusters/cities, people will be unable to work onsite ⇒ Difficulties may continue.
- 3) when the distance between processes is long, there will be a risk of logistical disruptions ⇒ There were instances of bottlenecks (and sharp rate increases) for both air and surface transport, but these were not totally interrupted.
- 4) there will be decreases in productivity in the services industry (despite the relative ease of turning online, innovation may be affected) ⇒ Tourism was seriously affected due to the difficulty of going online. Other cases of decreases in productivity among services were not confirmed in this study.
- 5) there will be negative effects on R&D and innovation for non-service industries ⇒ Not confirmed in this study.
- 6) there will be negative effects on processes that require human-led face-to-face integration for manufacturing and infrastructure ⇒ Cases confirmed of processes that included onsite inspection or installation of machinery/facilities.



As a result of ongoing US-China tensions,

- 7) development and innovation for core technologies will be affected, especially those that need to be acquired abroad ⇒ Not confirmed in this study. Negative effects caused by US tariff increases were found in specific cases.
- 8) regardless of whether consumer market dominance is achieved through platforms, connecting both ends of the smile curve will continue to be effective. ⇒ Yet to be established, high-speed communication infrastructure is not stable even in large cities.
- 9) further cost reduction at the middle of the smile curve will be affected, especially in relation to expanding into Southeast Asia in the search for an “exit point for the US market.” ⇒ Processes are relocating from China to ASEAN, with Vietnam being one of the top destinations.

In this study, a complete picture of the services industries was not captured due to data limitations. The impact of COVID-19 on the informal sector and jobs was also missing. Having said that, overall, East and Southeast Asia are on the path to recovery from the pandemic with the support of effective response policies. In the process, the utilization of GVCs is gravitating toward countries that were successful in containing the infection (China, Vietnam). As part of the strategies deployed in the recovery from COVID-19, countries in Southeast Asia have been keen to enter into new opportunities throughout the GVCs across “factory Asia,” with continued gravitation towards China (ADBI, 2021).

We have observed limited impact arising from US-China tensions. There were some cases of negative impacts due to the increase in US tariffs and restrictions on transactions related to high-tech industries. Most of the firm-level business models or GVC structures remained robust and intact. At the time of the interview, the shared bottom line was that business transactions remained business as usual while diplomatic tensions escalated.

What then could be the implications for JICA’s activities? As discussed in Chapter 3, continuing to provide support for connectivity in Asia is important, such as in the form of infrastructure. Looking into the future, there may be interesting variations to consider. During the in-depth firm-level interviews, we heard many stories regarding the challenges of maintaining the logistics flows when commercial flights became extremely scarce due to COVID-19. In the past, the task of building warehouse facilities at airports was left to the private sector because commercial risks were considered best taken by them. However, this pandemic, an unforeseen major risk, may provide a case for public-private partnerships to build airport warehouses. In terms of capacity building, there may be opportunities for collaboration between the policy side and the business side on how to build back better in ways that will promote access to GVCs across “factory Asia.”

Nevertheless, it is too early to conclude that it will be business as usual for GVCs in East and Southeast Asia. At the timing of writing this epilogue, the new US administration was just beginning to take shape. We would like to finish by offering a couple of questions to explore in the future.

First, firms started to react explicitly to US-China tensions and changed their behaviors, especially when the target markets are outside China. As mentioned, many production processes were relocated from China to Vietnam in order to continue supplying to the US market (Ikebe 2021). If US-China tensions in trade escalate, this link may become politically vulnerable. Inomata (2021) argues that partial disruption of supply chains between China and the US will likely become a reality in reaction to the US presidential decree in February 2021.

Secondly, what will happen when the gravity of factory Asia concentrates further in China/Vietnam as the region recovers from the pandemic? In particular, concerns are growing about a K-shaped recovery, leaving divergences in job creation and demand. It may be the case that Southeast Asian countries will find ways into the GVCs and increase job opportunities, bearing in mind that they will also be confronting risks similar to Vietnam. Mismatches in labor demand and supply may continue to be a problem. What will be the set of policies, cooperation frameworks and governance required to overcome such difficulties ahead (IMF 2021)? How Southeast Asia recovers from the pandemic might also influence some future rounds of US-China tensions.

Thirdly, what will the role and function of the Regional Comprehensive Economic Partnership Agreement (RCEP) in the recovery from COVID-19 be? Southeast Asian countries took joint leadership of RCEP because it has deepened economic integration in the region, provides access to the Chinese as well as EU/US markets, and because it is a framework to manage shocks. The recovery process will be a challenge. There have been attempts to strengthen GVCs within Southeast Asia, but would this be feasible when countries and sectors experience K-shaped recoveries? In particular, there are concerns over the operationalization of RCEP rules and whether they would be predisposed towards the requirements of the Chinese market.

Lastly, regarding long-term productivity growth, which is largely defined by innovation, what is the best combination of online and face-to-face approaches to maximize productivity? What would the effects of innovation be on technological breakthroughs or improvements in production processes under COVID-19? Going back to the smile curve, innovation creates value at both ends of the curve, especially by understanding and capturing the clientele (market orientation). With COVID-19 lingering outside China and US-China tensions escalating, how will the firms identify sources of innovation? What set of policies will enable that? How will digital innovation by fintech and platforms accelerate interactive innovation? Southeast Asian countries are keenly observing the developments in China and the US markets.

The primary role of our study was to capture the sentiment of Japanese firms with GVCs in Asia at the beginning of the Biden administration. Above, we have also set out the next series of research questions so that the journey may continue.

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